

Cisco VG350 Analog Voice Gateway

The Cisco[®] VG350 High-Density Analog Voice Gateway enables an IP telephony solution to continue using traditional analog devices while taking advantage of the productivity afforded by IP infrastructure (Figure 1).

The Cisco Unified Communications portfolio of voice and IP communications products and applications enables organizations to communicate more effectively - helping them to streamline business processes, reach the right resource the first time, and improve revenue sales and profitability. The Cisco Unified Communications portfolio is a critical part of the Cisco Business Communications Solution - an integrated solution for organizations of all sizes that also includes network infrastructure, security, and network management products, wireless connectivity, and a lifecycle services approach, along with flexible deployment and outsourced management options, end-user and partner financing packages, and third-party communications applications.

Figure 1. Cisco VG350 High-Density Analog Gateway



The Cisco VG350 High-Density Analog Gateway is a Cisco IOS[®] Software-based analog phone gateway. It connects analog phones, fax machines, modems, and speakerphones to an enterprise voice system based on Cisco Unified Communications Manager (UCM). The tight integration with the IP-based phone system is advantageous for increased manageability, scalability, and cost-effectiveness. Businesses can also use the Cisco VG350 with Cisco Unified Communications Manager Express to effectively augment an integrated services router (ISR) environment. Either topology environment will support business needs for high concentration of analog voice ports for modem calls, fax calls, and analog supplementary services (Figure 2).

The Cisco VG350 offers Cisco IOS Software manageability on analog phone lines to enable them to be used as extensions to the Cisco Unified Communications Manager or Cisco Unified Communications Manager Express system. The Cisco VG350 is offered in a 19-inch rack-mount chassis form.

Features and Benefits

- Cisco IOS Software-based hardware: The hardware includes uniform Cisco command-line interface (CLI) and Simple Network Management Protocol Version 3 (SNMPv3) support for ease of gateway configuration and operation.
- Robust voice quality: Cisco experience in providing toll-quality packet-voice service helps ensure that the Cisco VG350 provides the clear, robust voice quality end users have come to expect from telephony services.

- Investment protection: Customers can continue to use existing analog phones, fax machines, and modems while taking advantage of IP telephony. Basic analog phone connectivity is needed when the infrastructure (wiring) or application does not support or require IP phones. The Cisco VG350 is the ideal platform to support centralized and highly concentrated analog phone line deployments, allowing organizations to deploy IP telephony without having to purchase IP phones for all users and to continue using existing devices. The Cisco VG350 can also be used in a Cisco Unified Communications Manager Express environment and migrated to Cisco Unified Communications Manager deployment with 100-percent investment protection.
- High availability: The Cisco VG350 has three Gigabit Ethernet ports to enable link redundancy configurations toward the LAN.
Customers will experience less voice downtime due to WAN link failure. The Cisco VG350 has built-in Media Gateway Control Protocol (MGCP) failover to an H.323 connection to a Survivable Remote Site Telephony (SRST) router. This failover will maintain voice service for analog endpoints if the WAN link fails and loses connectivity to the Cisco Unified Communications Manager.
- Cisco VG350 powered by high-performance multicore processors: In this platform, power redundancy is available by installing an optional integrated Cisco Redundant Power System (RPS), thereby decreasing network downtime and protecting the network from power-supply failures.
- Reduced barrier to entry: The Cisco VG350 provides a low-cost alternative for low-end analog phones and allows organizations to take advantage of IP telephony with a lower overall IP telephony investment.

Figure 2. Cisco VG Integration with Cisco Unified Communications Manager

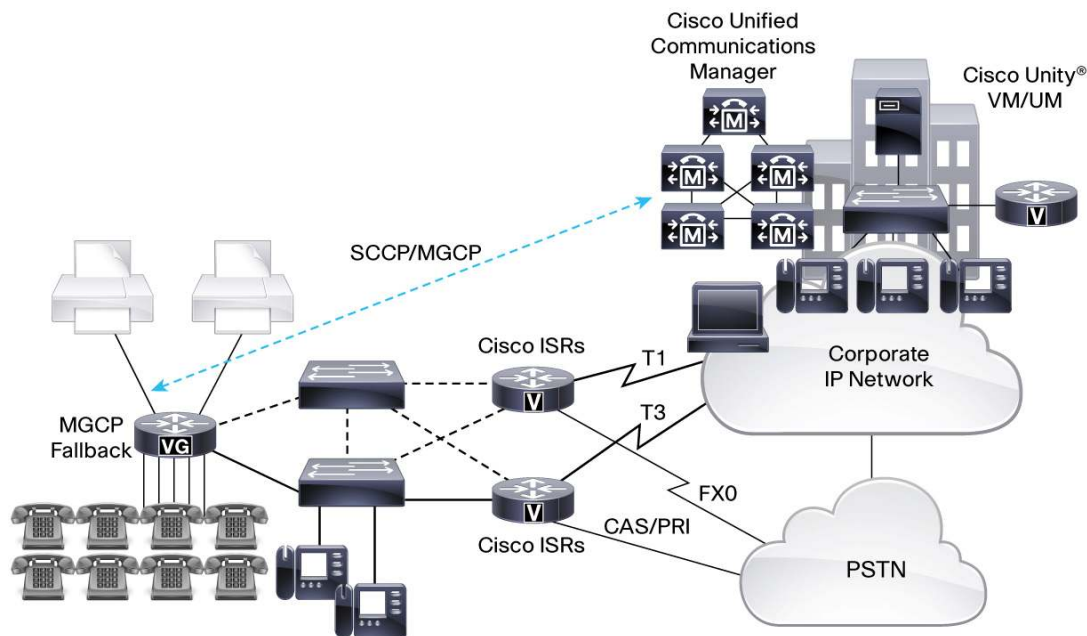
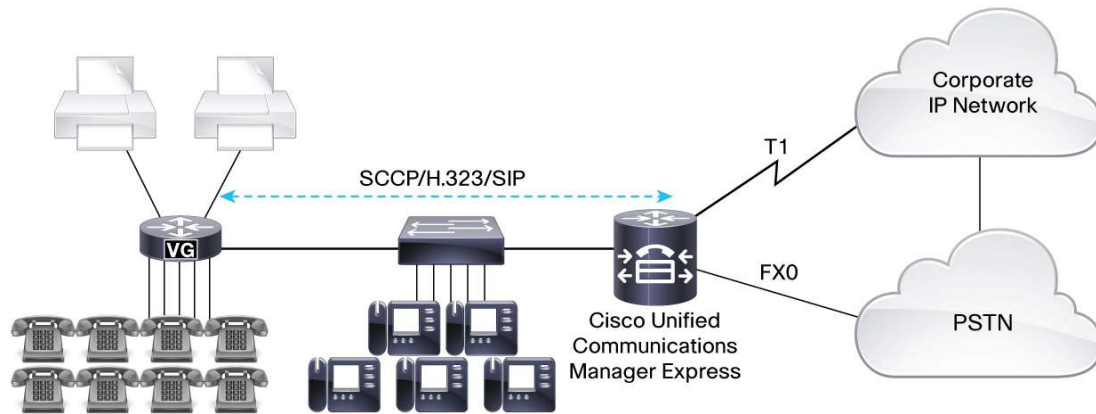


Figure 3. Cisco VG Integration with Cisco Unified Communications Manager Express



Analog Phone Connectivity

The Cisco VG350 is ideal for analog phone deployments ranging from centralized to sparsely concentrated or distributed topologies. It provides a high level of availability at locations with Media Gateway Control Protocol (MGCP) Fallback, with ease of manageability using Cisco IOS Software monitoring features. It offers many supplementary analog calling features depending on the call control and signaling type used. Refer to Table 1 for the supplementary analog calling features available.

Table 1. Analog Supplementary Features Available on Analog Voice Gateways

	Skiny Client Control Protocol (SCCP) Features with Cisco Unified Communications Manager	SCCP Features with Cisco Unified Communications Manager Express	Session Initiation Protocol (SIP) Features with Cisco Unified Communications Manager
Basic call	X	X	X
Call forward all	X	X	
Call forward busy	X	X	
Call forward cancel	X	X	
Call forward no answer	X	X	
Call hold or resume	X	X	X
Call pickup group	X	X	
Call pickup local	X	X	
Call transfer blind	X	X	
Call transfer consultative	X	X	X
Call waiting	X	X	X
Caller ID	X	X	X
Caller ID on call waiting	X	X	X
Malicious caller ID	X		
Conference call	Up to 3 parties	Up to 3 parties	Up to 3 parties
Impromptu conference call	Up to 3 parties	Up to 3 parties	
Meet-me conference call	X	X	
Directed call park		X	
Directed call pickup		X	

	Skinny Client Control Protocol (SCCP) Features with Cisco Unified Communications Manager	SCCP Features with Cisco Unified Communications Manager Express	Session Initiation Protocol (SIP) Features with Cisco Unified Communications Manager
Directed call pickup of ringing extension		X	
Redial	X	X	
Speed dial	X	X	
Call toggle	X	X	X
Music on Hold (MoH)	X		
Shared-line support*	X		
Shared line - privacy	X		
Precedence and preemption	X		
Call back on busy	X		
DC voltage visible message waiting indication (VMWI)	X		

* Simultaneous ringing, hold, and resume across analog and IP phone

The Cisco VG350 supports Feature Access Codes (FAC) in conjunction with Cisco Unified Communications Manager and Cisco Unified Communications Manager Express. Refer to Cisco Unified Communications Manager and Cisco Unified Communications Manager Express documentation for details.

Fax and Modem Connectivity

The Cisco VG350 supports fax machines and modems. When using fax machines, it supports Cisco Fax Relay, T.38 Fax Relay, and fax pass-through. Cisco or T.38 Fax Relay technologies allow transfer of faxes across the network with high reliability using less bandwidth than a voice call. All modems can be connected to the Cisco VG350 and will be transferred over the network using modem pass-through.

Protocols Supported

- SCCP
- H.323v4
- MGCP
- SIP
- Real-Time Transport Protocol (RTP)
- Secure Real-Time Transport Protocol (SRTP)
- Trivial File Transfer Protocol (TFTP)
- HTTP server
- SNMP
- Telnet
- Dynamic Host Configuration Protocol (DHCP)
- Domain Name System (DNS)
- Cisco Unified Communications Manager or Cisco Unified Communications Manager Express redundancy support using Hot Standby Router Protocol (HSRP)
- Call survivability - MGCP failover to an H.323 connection to the SRST router

- T.38 Fax Relay, and modem pass-through
- Coder/decoder (codec) support, G.711, and G.729a
- RADIUS and TACACS+ for Telnet and authorization

Technical Specifications

Table 2 gives the Cisco VG350 technical specifications.

Table 2. Cisco VG350 Technical Specifications

Category	
System	VG350
Processor	High-performance multicore processors
Memory (default)	1GB SDRAM
Compact Flash	256 MB
Ethernet	Up to three 10/100/1000 Ethernet LAN ports. Two of the 10/100/1000 Ethernet LAN ports can support Small Form-Factor Pluggable (SFP)-based connectivity in lieu of RJ-45 ports, enabling fiber connectivity.
Console/auxiliary (max)	A new, innovative, mini-B USB console port supports management connectivity when traditional serial ports are not available. Traditional console and auxiliary ports are also available.
Power	
AC Input Voltage	100 to 240 VAC autoranging
AC Input Current (max)	7.1 to 3.0Amp
DC Input Voltage	-48V DC
Frequency	47 to 63 Hz
Power Dissipation	230Watts (maximum consumption) (Power Supply rated for 540W capacity)
Redundant Power Supply	Optional integrated Redundant Power Supply (RPS)
Physical	
Width	17.25 inches (438.15 mm)
Height	5.25 x (133.35 mm)
Depth	18.75 inches (476.25 mm)
Weight (max)	48.08 lbs.
Mounting	3 RU, 19 in. EIA/23 in.
Environment	
Operating Temperature	32 to 104°F (0 to 40°C)
Non-operating Temperature	-40 to 158°F (-40 to 70°C)
Operating Humidity	5 to 95%
Noise Level (max)	Sound Pressure: 57.6 dB typical, 77.6 dB maximum Sound Power: 67.8 dB typical, 84.7 dB maximum
On-Premise or Off-Premise	On premise only, restricted access area, permanent ground required, to be installed and serviced only by trained professionals
Compatibility	
Cisco IOS Software Release	15.2(4)M or later
Cisco Unified Communications Manager Version	8.6.2(SU2), 9.0.1 or higher
Cisco Unified Communications Manager	7.1, 8.0, 8.1, 8.5, 8.6, 8.8, 9.0, 9.1 or higher

Category	
Express Version	
Tip/Ring Interfaces for Each FXS Port (SLIC)	
Interface Type	FXS (on-premise connection only)(RJ-21) (Optional HWIC FXS modules on mother board have RJ-11 connectors)
Address Signaling Formats	In-band DTMF Out-of-band pulse (8-12 pps)
FXS Signaling Formats	SM-D-72FXS and SM-D-48FXS-E support Loop-start and Ground-start signaling HWIC slots on mother board support FXS loop-start, ground-start and DID signaling
FXS Loop Resistance	Up to 600 ohms (including phone or terminal equipment) for short loop-length port Up to 1400 ohms (including phone or terminal equipment) for long loop-length port
On-Hook Voltage	-44V
Off-Hook Loop Current	25 mA (maximum) short loop-length port 35mA (maximum) long loop-length port
Ring Tone	Configurable for different country requirements
Ring Voltage	54 Vrms into 5REN at zero loop length (balanced) (short loop-length port) 62 Vrms into 2REN at zero loop length (balanced) (long loop-length port)
Ring Frequency	20 Hz, 25 Hz, 30 Hz, 50 Hz
Ring Waveform	Sine wave if no DC offset
REN Loading	5REN per port (short loop-length port) 2REN per port (long loop-length port) (Max 40 total REN load per each SM-D-72FXS module; Max 30 total REN load per each SM-D-48FXS-E module)
RJ-11 FXS Port Terminating Impedance Option	600c, 600r, 900c, 900r, complex1, complex2, complex3, complex4, complex5 and complex6
Disconnect Supervision	Power denial (Calling Party Control, far-end disconnect)
Caller ID	On-hook transmission of frequency-shift-keying (FSK) data
VMWI	FXS ports on HWIC slot supports FSK VMWI only FXS ports on SM-D-FXS modules support both FSK and DC voltage VMWI. Default to FSK. (DC voltage VMWI is only supported with STCAPP protocol)
FXS Loop Length	Short loop-length port 3000 ft, 26 AWG 5500ft, 24AWG Long loop-length port 11,000ft, 26AWG 18,000 24AWG
Category Cable	Cat3, Cat5
Physical Connector	RJ-21 and RJ-11
Number of Connectors/Ports	160 (144 using two SM-D-72FXS modules with RJ21 connectors and 16 using FXS VIC modules with RJ11 connectors)
Certifications	
Safety	<ul style="list-style-type: none"> • UL 60950-1 • CAN/CSA C22.2 No. 60950-1 • EN 60950-1 • AS/NZS 60950-1 • IEC 60950-1
Immunity	<ul style="list-style-type: none"> • EN 55024, CISPR 24 • EN50082-1 • EN 61000

Category	
EMC	<ul style="list-style-type: none"> • 47 CFR, Part 15 • ICES-003 Class A • EN55022 Class A • CISPR22 Class A • AS/NZS 3548 Class A • VCCI V-3 • CNS 13438 • EN 300-386
TELCOM	<ul style="list-style-type: none"> • TIA/EIA/IS-968 • CS-03 • ANSI T1.101 • ITU-T G.823, G.824 • IEEE 802.3 • RTTE Directive • Homologation requirements vary by country and interface type. For specific country information, see the on-line approvals data base: http://www.ciscofax.com

This equipment complies with all the regulatory requirements for connection to the communications networks of each country in which it is sold.

Ordering Information

To order this product, use the information provided in Table 3.

Table 3. Ordering Information

Product Number	Product Description
VG350/K9	Cisco VG350 High Density Voice over IP Analog Gateway
SM-D-72FXS	72 Port FXS Double Wide Service Module
SM-D-48FXS-E	48 Port FXS OPX-Lite Double Wide Service Module
VG350-144FXS/K9	Cisco VG350 144 FXS Bundle
VG350-98FXSE/K9	Cisco VG350 96 FXS OPX-Lite Bundle
VG350-72F48E/K9	Cisco VG350 72 FXS & 48 FXS OPX-Lite Bundle

Services and Support

Using the Cisco Lifecycle Services approach, Cisco and our partners offer a broad portfolio of end-to-end services. These services are based on proven methodologies for deploying, operating, and optimizing IP Communications solutions. Initial planning and design services, for example, can help you meet aggressive deployment schedules and minimize network disruption during implementation. Operate services reduce the risk of communications downtime with expert technical support. Optimize services enhance solution performance for operational excellence. Cisco and our partners offer a system-level service and support approach that can help you create and maintain a resilient, converged network that meets your business needs.




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