

## Cisco 112-FXS Bundle, VG 224, VG 204 and VG 202 Analog Phone Gateways

The Cisco® 112-FXS Bundle, Cisco® VG 224, Cisco® VG 204 and Cisco® VG 202 Analog Phone Gateways enable an IP telephony solution to continue using traditional analog devices while taking advantage of the productivity afforded by IP infrastructure.

The Cisco Unified Communications system 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 impact the top and bottom line. The Cisco Unified Communications portfolio is a key part of the Cisco Business Communications Solution—an integrated solution for organizations of all sizes which 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 112-FXS Bundle



**Figure 2.** Cisco VG 224 Analog Phone Gateway



**Figure 3.** Cisco VG 204 Analog Phone Gateway



**Figure 4.** Cisco VG 202 Analog Phone Gateway



The Cisco 112-FXS Bundle (Figure 1), Cisco VG 224 (Figure 2), Cisco VG 204 (Figure 3), and Cisco VG 202 (Figure 4) are Cisco IOS® Software-based analog phone gateways. The Cisco 112-FXS Bundle is a high-density 112-port gateway, Cisco VG224 is a 24-port gateway, and the Cisco VG 204 and Cisco VG 202 are low-density 4 and 2 port gateways, respectively. These gateways connect analog phones, fax machines, modems, and speakerphones to an enterprise voice system based on Cisco Unified Communications Manager (UCM). Having these devices tightly

integrated with the IP-based phone system is advantageous for increased manageability, scalability, and cost-effectiveness (Figure 5). Commercial businesses can also use the Cisco 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 with Cisco Unified Communications Manager Express to effectively augment an integrated services router (ISR) environment. Either topology environment will support business needs, ranging from high to low concentration of analog voice ports for modem calls, fax calls, and analog supplementary services (Figure 5).

The Cisco 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 offer 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 112-FXS bundle and Cisco VG 224 offers 19-inch rack-mount chassis, while the Cisco VG204 and Cisco VG202 offer desktop form factor chassis with fanless design.

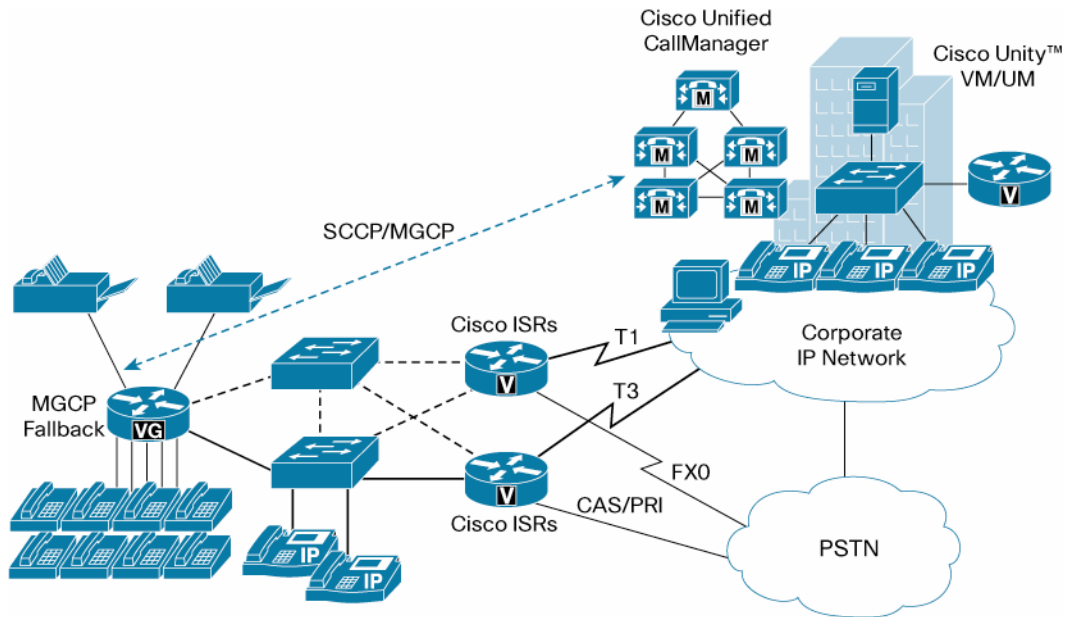
### Features and Benefits

- **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 112-FXS Bundle, Cisco VG 224, Cisco VG204 and Cisco VG 202 provide 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 112-FXS Bundle and Cisco VG 224 is the ideal platform to support centralized analog phone line deployments, while Cisco VG 204 and Cisco VG 202 are ideal platforms to support sparsely concentrated, distributed analog phone deployments, allowing organizations to deploy IP telephony without having to purchase IP phones for all users and to continue using existing devices. Cisco 112-FXS Bundle and Cisco VG 224 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:** Customers will experience less voice downtime due to WAN link failure. Cisco 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 have 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 in the event of WAN link failure and lost connectivity to the Cisco Unified Communications Manager.

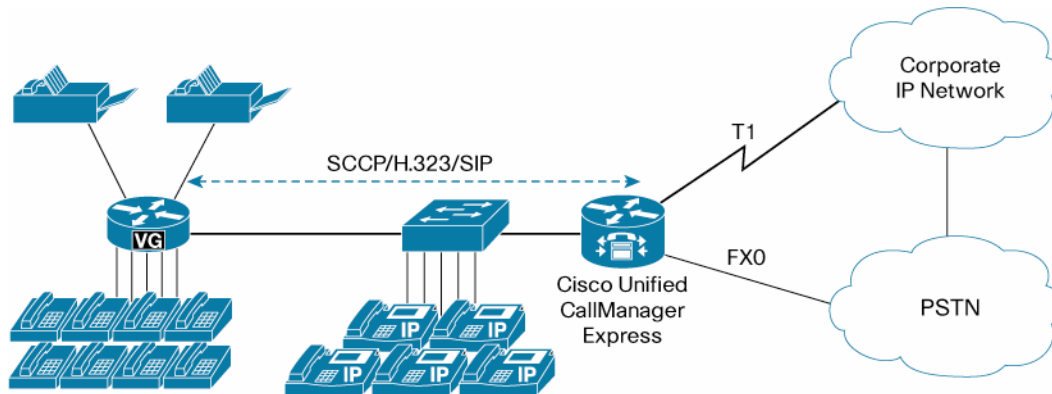
Cisco 112-FXS Bundle is built on Cisco Integrated Services Routers Generation 2 (ISR G2) platform powered by high-performance multicore processors. In this platform, power redundancy is available by installing an optional integrated RPS, thereby decreasing network downtime and protecting the network from power-supply failures. Cisco VG 224 offers high-availability during power failure using an external 12V DC UPS for battery backup.

- **Reduced Barrier to Entry:** These analog phone gateways provide 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 5.** Cisco VG Integration with Cisco Unified Communications Manager



**Figure 6.** Cisco VG Integration with Cisco Unified Communications Manager Express



**Analog Phone Connectivity**

The Cisco 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 are ideal for analog phone deployments ranging from centralized to sparsely concentrated or distributed topologies. These analog phone gateways provide a high level of availability at locations with MGCP Fallback, with ease of manageability using Cisco IOS Software monitoring features. They offer 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

	SCCP Features With Cisco Unified Communications Manager	SCCP Features With Cisco Unified Communications Manager Express	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	

	SCCP Features With Cisco Unified Communications Manager	SCCP Features With Cisco Unified Communications Manager Express	SIP Features With Cisco Unified Communications Manager
Call Hold / 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
Ad Hoc Conference Call	Up to 3 parties	Up to 3 parties	
Meet Me Conference Call	X	X	
Directed Call Park		X	
Directed Call Pickup		X	
Directed Call Pickup of Ringing Extension		X	
Redial	X	X	
Speed Dial	X	X	
Call Toggle	X	X	X
Music on Hold	X		
Shared Line Support*	X		
Shared Line—Privacy	X		
Precedence and Preemption	X		
Call Back on Busy	X		
DC voltage VMWI	X (only for FXS on VG224)		

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

Cisco 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 support 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 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 support fax machines and modems. When using fax machines, they support 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 112-FXS Bundle, Cisco VG 224, Cisco VG 204 and Cisco VG 202 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
- Cisco fax relay, T.38 fax relay, and modem pass-through
- Coder/decoder (codec) support, G.711, G.729a
- RADIUS and TACACS+ for Telnet and authorization

## Technical Specifications

**Table 2.** Technical Specifications

Category	112-FXS Bundle	VG 224	VG 204 / VG 202
<b>System</b>			
Processor	High-performance multicore processors	RISC processor	Power QUICC (Power PC based) processor
Memory (default)	1GB SDRAM	128 MB SDRAM	128 MB DDR2 RAM
Compact Flash	256 MB	64 MB, One slot Type II	128 MB NAND Flash
Ethernet	Up to four 10/100/1000 Ethernet WAN ports. Two of the 10/100/1000 Ethernet WAN ports can support Small Form-Factor Pluggable (SFP)-based connectivity in lieu of RJ-45 ports, enabling fiber connectivity.	Two 10/100BASE-T Ethernet ports	Two 10/100BASE-T Ethernet ports
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.	Up to 119.2 kbps per port	Up to 115.2 kbps per port
Cisco Configuration Professional	Cisco Configuration Professional is a GUI device-management tool for Cisco IOS Software-based access routers.	N/A	N/A
<b>Power</b>			
AC Input Voltage	100 to 240 VAC autoranging	100 to 240 VAC	100 to 240 VAC
AC Input Current (max)	7.1 to 3.0Amp	1 Amp	0.5 Amp
DC Input Voltage	-	12V	12V
Frequency	47 to 63 Hz	50 to 60 Hz	50 to 60 Hz
Power Dissipation	540W	60W	30W
Redundant Power Supply	Optional integrated Redundant Power Supply (RPS)	External 12V DC UPS	N/A
<b>Physical</b>			
Width	17.25 inches (438.15 mm)	17.5 inches (444.5 mm)	8.81 inches (223.8 mm)
Height	5.25 x (133.35 mm)	1.75 inches (44.4 mm) (add 0.17 inch for optional rubber feet)	1.78 inches (45.2 mm) with rubber feet

Category	112-FXS Bundle	VG 224	VG 204 / VG 202
Depth	18.75 inches (476.25 mm)	13.5 inches (342.9 mm)	8.13 inches (206.5 mm)
Weight (max)	60 lb (27.2 kg)	11 lb (4.106 kg)	2.98 lbs (1.351 Kg)
Mounting	3 RU, 19 in. EIA/23 in.	Rack and wall mountable	Desktop and wall mountable
<b>Environment</b>			
Operating Temperature	32 to 104°F (0 to 40°C)	32 to 122°F (0 to 50°C)	32° to 104°F (0° to 40°C)
Non-operating Temperature	-40 to 158°F (-40 to 70°C)	-40 to 185°F (-40 to 85°C)	4° to 149°F (-20° to 65°C)
Operating Humidity	5 to 95%	5 to 95% non-condensing	10 to 85% non-condensing
Noise Level (max)	Sound Pressure: 57.6 dB typical, 77.6 dB maximum Sound Power: 67.8 dB typical, 84.7 dB maximum	38-dBA @ 3 feet (0.914 meters)	No fan, 0 db
On-Premise or Off-Premise	On premise only, restricted access area, permanent ground required, to be installed and serviced only by trained professionals	On premise only, restricted access area, permanent ground required, to be installed and serviced only by trained professionals	On premise only, permanent ground required, to be installed and serviced only by trained professionals
<b>Compatibility</b>			
Cisco IOS Software Release	15.0(1)M1 or later	12.3(4)T or later	12.4(22)T or later
Cisco Unified Communications Manager Version	6.1.5, 7.1.3, 8.0 or higher	3.3.3 SR2 or higher	6.1.3, 7.0.1 or higher
Cisco Unified Communications Manager Express Version	7.1, 8.0 or higher	4.3.2 or higher	7.0.1 or higher
<b>Tip / Ring Interfaces for Each FXS Port (SLIC)</b>			
Interface Type	FXS (on-premise connection only) and DID trunk	FXS (on-premise connection only)	FXS (on-premise connection only)
Address Signaling Formats	In-band DTMF Out-of-band pulse (8-12 pps)	In-band DTMF Out-of-band pulse (8-12 pps)	In-band DTMF Out-of-band pulse (8-12 pps)
FXS Signaling Formats	FXS: Loop-start and Ground-start DID: Immediate, Delay-dial, WinkStart	Loop-start and Ground-start	Loop-start and Ground-start
FXS Loop Resistance	Up to 600 ohms (including phone or terminal equipment)	Up to 600 ohm (including the phone or terminal equipment)	Up to 600 ohm (including the phone or terminal equipment)
DID Loop Resistance	Up to 1800 Ohms (including terminal equipment)	N/A	N/A
On-Hook Voltage	-44V	-43 V	-43 V
Off-Hook Loop Current	25 mA (maximum)	25 mA (maximum)	25 mA (maximum)
Ring Tone	Configurable for different country requirements	Configurable for different country requirements	Configurable for different country requirements
Ring Voltage	45 Vrms into 5REN at zero loop length (balanced)	50Vrms into 5 REN at zero loop length (balanced) if no DC offset	54Vrms into 5 REN at zero loop length (balanced) if no DC offset
Ring Frequency	20 Hz, 25 Hz, 30 Hz, 50 Hz	20, 25, 30, 50 Hz	20, 25, 30, 50 Hz
Ring Waveform	Sine wave if no DC offset	Sine wave if no DC offset 20V and 24V DC offset will be trapezoidal	Sine wave up to 35V DC offset
Ring Load	-	5REN with no DC offset 2REN with DC offset	5REN with no DC offset 2REN with DC offset
REN Loading	5 REN/port or 2REN/port if mixed DID and FXS, 192 REN/System (maximum)	5 REN/port, 12 REN/system (maximum)	5 REN/port, 12 REN/system (maximum)
RJ-11 FXS Port Terminating Impedance Option	600 ohm complex, 600 ohm real, 900 ohm complex, 900 ohm real, complex1, and complex2	600 ohm complex, 600 ohm real, 900 ohm complex, 900 ohm real, complex1, and complex2	600 ohm complex, 600 ohm real, 900 ohm complex, 900 ohm real, complex1, and complex2
Disconnect Supervision	Power denial (Calling Party Control, far-end disconnect)	Power denial (Calling Party Control, far-end disconnect)	Power denial (Calling Party Control, far-end disconnect)

Category	112-FXS Bundle	VG 224	VG 204 / VG 202
Caller ID	On-hook transmission of frequency-shift-keying (FSK) data	On-hook Transmission of Frequency-Shift-Keying Data	On-hook Transmission of Frequency-Shift-Keying Data
FXS Loop Length	3000 ft, 26 AWG	3000 ft, 26 AWG	3000 ft, 26 AWG
Category Cable	Cat3, Cat5	Cat3, Cat5	Cat3, Cat5
Physical Connector	RJ-21 and RJ-11	RJ-21	RJ-11
Number of Connectors/Ports	112 FXS ports	24 FXS ports	2 FXS ports on VG 202 4 FXS ports on VG 204
MTBF	1,390,019 hours	195,671 hours	200,000 hours
<b>Certifications</b>			
Safety	<ul style="list-style-type: none"> <li>• UL 60950-1</li> <li>• CAN/CSA C22.2 No. 60950-1</li> <li>• EN 60950-1</li> <li>• AS/NZS 60950-1</li> <li>• IEC 60950-1</li> </ul>	<ul style="list-style-type: none"> <li>• UL 60950 3rd edition</li> <li>• IEC 60950 3rd edition</li> <li>• AS/NZS 3260: 1993 with Amendments 1, 2, 3, and 4</li> <li>• TS001:1996 with Amendment 1</li> </ul>	<ul style="list-style-type: none"> <li>• UL 60950</li> <li>• CAN/CSA C22.2 No. 60950</li> <li>• IEC 60950</li> <li>• EN 60950-1</li> <li>• AS/NZS 60950</li> </ul>
Immunity	<ul style="list-style-type: none"> <li>• EN 55024, CISPR 24</li> <li>• EN50082-1</li> <li>• EN 61000</li> </ul>	<ul style="list-style-type: none"> <li>• EN55024 and EN50082-1 (including</li> <li>• EN 61000 4-2 electrostatic discharge;</li> <li>• EN 61000 4-3 radiated susceptibility;</li> <li>• EN 61000 4-4 electrical fast transients;</li> <li>• EN 61000 4-5 power and signal line surges;</li> <li>• EN 61000 4-6 injected RF swept immunity) post telephone and telegraph administration (PTT)</li> </ul>	<ul style="list-style-type: none"> <li>• EN300386</li> <li>• EN55024/CISPR24</li> <li>• EN50082-1</li> <li>• EN61000-6-1</li> </ul>
EMC	<ul style="list-style-type: none"> <li>• 47 CFR, Part 15</li> <li>• ICES-003 Class A</li> <li>• EN55022 Class A</li> <li>• CISPR22 Class A</li> <li>• AS/NZS 3548 Class A</li> <li>• VCCI V-3</li> <li>• CNS 13438</li> <li>• EN 300-386</li> </ul>	<ul style="list-style-type: none"> <li>• 47CFR15 Class A (FCC)</li> <li>• CISPR22 Class A</li> <li>• EN55022 Class A</li> <li>• AS/NZS 3548 Class A (ACA)</li> <li>• ICES003 Class A (Industry Canada)</li> <li>• V-3 Class A (VCCI)</li> <li>• CNS13438 Class A (BSMI)</li> </ul>	<ul style="list-style-type: none"> <li>• FCC Part 15 Class B</li> <li>• ICES-003 Class B</li> <li>• EN55022 Class B</li> <li>• CISPR22 Class B</li> <li>• VCCI Class B</li> <li>• EN 300386 Class B</li> <li>• EN61000-3-3</li> <li>• EN61000-3-2</li> </ul>
TELCOM	<ul style="list-style-type: none"> <li>• TIA/EIA/IS-968</li> <li>• CS-03</li> <li>• ANSI T1.101</li> <li>• ITU-T G.823, G.824</li> <li>• IEEE 802.3</li> <li>• RTTE Directive</li> <li>• Homologation requirements vary by country and interface type. For specific country information, see the on-line approvals data base: <a href="http://www.ciscofax.com">http://www.ciscofax.com</a></li> </ul>	<ul style="list-style-type: none"> <li>• TheVG224 platform complies with FCC Part 68, CS-03, European Directive 99/5/EC and other standards.</li> <li>• Homologation requirements vary by country and interface type. For specific country information, see the on-line approvals data base: <a href="http://www.ciscofax.com">http://www.ciscofax.com</a></li> </ul>	<ul style="list-style-type: none"> <li>• TheVG202 and VG204 platforms comply with FCC Part 68, CS-03, European Directive 99/5/EC and other standards.</li> <li>• Homologation requirements vary by country and interface type. For specific country information, see the on-line approvals data base: <a href="http://www.ciscofax.com">http://www.ciscofax.com</a></li> </ul>

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 following information:

Product Number	Product Description
<b>C3945-112FXS/K9</b>	Cisco 112-FXS Bundle
<b>VG 224</b>	Cisco VG 224 Analog Phone Gateway
<b>VG 204</b>	Cisco VG 204 Analog Phone Gateway
<b>VG 202</b>	Cisco VG 202 Analog Phone Gateway

## Services and Support

Using the Cisco Lifecycle Services approach, Cisco Systems® and its 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. Upfront 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 its 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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