Technical Specifications

This appendix contains the following technical specifications for the Cisco CVA122/CVA122E Cable Voice Adapter:

- Physical, Power, and Environmental Specifications
- Data Specifications
- Voice Specifications

Physical, Power, and Environmental Specifications

Table A-1 lists the Cisco CVA122/CVA122E Cable Voice Adapter physical specifications and power requirements.

Table A-1 Cisco CVA122/CVA122E Cable Voice Adapter Physical Specifications

Description	Specification
Dimensions (H x W x D)	1.6 x 6.75 x 8.25 in. (4.1 x 17.1 x 21.0 cm)
Weight	1.5 lb (0.6 kg) 0.75 lb (0.3 kg) for the AC-input external power supply 8 lb (3.5 kg) for the Cisco CVA120 Series Uninterruptible Power Supply (UPS)
AC-input voltage	120 to 240 VAC[1] input with power factor correction
AC-input current rating	1.0 A[2] maximum
AC-input cable	18 AWG[3] two-wire cable, with a two-lead receptacle on the power supply end. The power source end contains a North American (NEMA 1-15P) plug or other country-specific cords and plug as ordered.
DC-output voltage and current rating	+5.0 VDC at 2.65A maximum -30VDC at 0.130 A maximum -56VDC at 0.08A maximum
Frequency	50 to 60 Hz[4]
Temperature, ambient	32° to 104°F (0 to 40°C) operating; -22° to 149°F (-30° to 65°C) nonoperating/storage
Humidity, ambient	5 to 95% noncondensing, operating and nonoperating/storage
Noise level	38 dBa[5] maximum at desktop, 43 dBa maximum in an office
Altitude, operating and nonoperating	Sea level to 10,000 ft (3,050 m)

Table A-1 Cisco CVA122/CVA122E Cable Voice Adapter Physical Specifications (continued)

Description	Specification
Vibration, operating	10 to 200 Hz, 0.0005 g (1 oct./min.)
Vibration, nonoperating	10 to 100 Hz, 0.0065 g (1 oct./min.)
Software requirement	Cisco CVA122/CVA122E Cable Voice Adapter software—Cisco IOS Release 12.2(1)XA or higher
Agency approvals	Safety: CSA 950-95 (Third Edition), IEC 950 (Second Edition with Amendments 1, 2, 3, and 4), EN60950:1922 (with Amendments 1, 2, 3, 4, and 11), AS/NZS 3260:1966 (with Amendments 1, 2, 3, and 4), TS001:1997. Emissions: CFR 47 Part 15 Class B, EN55022 Class B, VCCI Class B, AS/NRZ 3548:1992 Class B, ICES-003 (Issue 2, Class B, April 1997) See also Appendix C, “Regulatory Compliance and Safety Information.”

1. VAC = volts alternating current.
2. A = ampere.
3. AWG = American Wire Gauge.
4. Hz = hertz.
5. dBa = adjusted decibels.

Data Specifications

Table A-2 lists the specifications for the data transmitted on the Cisco CVA122/CVA122E Cable Voice Adapter's cable interface.

Table A-2 Cisco CVA122/CVA122E Cable Voice Adapter Data Specifications

Description	Downstream Values	Upstream Values
Frequency Range	88 to 860 MHz (CVA122, DOCSIS) 88 to 860 MHz (CVA122E, EuroDOCSIS)	5 to 42 MHz (CVA122, DOCSIS) 5 to 65 MHz (CVA122E, EuroDOCSIS)
Modulation	64 QAM 256 QAM	QPSK 16 QAM
Data Rate	30 Mbps/64 QAM (27 Mbit/sec after FEC overhead) 42.8 Mbps/256 QAM (36 Mbit/sec after FEC overhead)	QPSK—320 Kbit/sec to 5 Mbit/sec 16 QAM—640 Kbit/sec to 10 Mbit/sec
Bandwidth	6 MHz	200K, 400K, 800K, 1.6M, 3.2 MHz
FEC	RS (122, 128) Trellis	
Signal-to-Noise Ratio (SNR)	64 QAM: >23.5 dB @ BER<10^8 256 QAM*: >30 dB @ BER <10^-8 (For input level between +15 and -8 dBmV, SNR must be greater than 30 dB. For input level between -8 and -15 dBmV, SNR must be greater than 33 dB.) **Note** These performance numbers are in laboratory-controlled conditions, against statistically pure noise sources (AWGN). Since such conditions do not exist in practise, a 6 or more dB SNR margin is required for reliable operation. Check with your local system guidelines.	QPSK: >15 dB @ BER<10^-8 (QPSK will work at 98% successful ping rate for SNR>13 dB. An SNR of 15 dB will be needed to get almost optimal packets per minute transition.) 16 QAM: >22 dB @ BER <10^-8 (For 16 QAM, an SNR>22 dB results in 98% ping efficiency. To get a quality packet rate, you need SNR>25 dB) **Note** These measurements were done for 0 and -10 dBmV input to the CMTS, 1280 ksym/sec and 64 bytes packet size under laboratory-controlled conditions.

Table A-2 Cisco CVA122/CVA122E Cable Voice Adapter Data Specifications (continued)

Description	Downstream Values	Upstream Values
One Channel	Receive level of digital signal -15 to +15 dBmV **Note** Most field measurements are of nearby or adjacent analog signal which is normally +6 to +10 dB (system specific) above the digital signal level	QPSK— +8 to +58 dBmV 16 QAM— +8 to +55 dBmV
Security	DES decryption: DOCSIS Baseline Privacy (BPI), 40-bit and 56-bit DES encryption, as controlled by the headend and configuration files. **Note** Cisco IOS images must contain encryption software at both the CMTS and the Cisco CVA120 Series Cable Voice Adapter. Both units must be enabled and properly configured to support encryption.	

Voice Specifications

Table A-3 lists the specifications for the voice ports on the Cisco CVA122/CVA122E Cable Voice Adapter.

Table A-3 Cisco CVA122/CVA122E Cable Voice Adapter Voice Specifications

Metric	Value
Loss (between DCS and BTI gateway)	Nominal: 4 dB ±.5 dB (off hook) Nominal: 9 dB ±.5 dB (on hook)
Attenuation distortion: DCS <> BTI (200Hz-3.5kHz) BTI<> DCS (304 Hz-3004Hz) DCS -> BTI (204 Hz-3004 Hz)	Nominal: +1 dB/-3 dB ±0.5 dB ±0.5 dB0
Idle channel noise	<= 18 dBmC (noise shall not exceed)
Signal to C-notched noise	>= 35 dB
Inter-modulation distortion: R2 R3	 >= 52 dB >= 52 dB
Single frequency interference: 0 to 12 kHz 0 to 4 kHz	 <= -28 dBmO <= -40 dBmO
Frequency shift (offset)	<= ±0.2 Hz (max) <= ±0.1 Hz (99.5%)
Amplitude tracking (input Level, dBmO): -37 to 0 (on-hook) -37 to +3 (off hook) -50 to -37 (off-hook) -55 to -50 (off-hook)	Max Dev. Ave. Dev. <= ±.5 dB <= ±.5 dB <= ±.25 dB <= ±1.0dB <= ±.5 dB <= ± 3.0 dB <= ±1.5 dB
Crosstalk	<= -65 dBmO
Codec Support (dependant on software release)	G.711, G.723.1, G.726, G.728, G.729, G.729a
Amplitude jitter 20-300 Hz 4-300 Hz	 <= 2.5% Peak <= 2.9% Peak
Phase jitter 20 to 300 Hz 4 to 300 Hz	<= 1.5 P-P <= 1.8 P-P
Envelope delay distortion: 1704 Hz to 604 Hz 1704 Hz to 2804 Hz 1704 Hz to 204 Hz 1704 Hz to 3404 Hz	<= 350 usec <= 195 usec <= 580 usec <= 400 usec

Table A-3 Cisco CVA122/CVA122E Cable Voice Adapter Voice Specifications (continued)

Metric	Value
Hybrid balance:	
Echo Return Loss (ERL)	> 26 dB (standard test line) > 14 dB (station off hook)
SRL	> 21 dB (standard test line) > 11 dB (station off hook)
Clipping: Speech segments <5 ms Speech segments > 5ms	 < 0.5% 0.0%
Impulse noise: (>= 6 dB below receive signal)	 0 in 93% of all 15 min intervals <= 1 count in all 30 min intervals
Phase hits (>= 10 deg)	0 in 99.75% of all 15 min intervals <= 1 count in all 30 min intervals
Gain hits (>= ± 3dB)	0 in 99.9% of all 15 min intervals <= 1 count in all 30 min intervals
Dropouts (>= 12)	0 in 99.9% of all 15 min intervals <= 1 count in all 60 min intervals
Ringing Characteristics	
Ringing Voltage	46.5 VRMS (balanced ringing only)
Ring Frequency (adjustable)	20 Hz (default), 25 Hz, 50 Hz
Ring Load (per line) 5 REN (Ringer Equivalence Number) 4REN 3REN 2REN 1REN	**Maximum Distance** 2225ft 3125ft 4650ft 7900ft 17500ft
On Hook/Off Hook Characteristics	
On-Hook Voltage (Tip/Ring)	-30V
Off-Hook Current	25mA
Port Terminating Impedance	600 ohms resistive (default) 900 ohms resistive, complex