City Council

Agenda Item

Subject: Approval of Quote Awards to multiple vendors for the Information Technology, Audio & Video, and Data Cabling and Networking packages for the Wells Fargo Renovation and Addition for City Hall, Project No. 2035, in the total amount of $329,925.87.

Meeting: City Council - Jun 03 2024

From: Amanda Mack, City Manager

BACKGROUND INFORMATION:

These quotes are from multiple vendors for the Information Technology package provided to the City for the Wells Fargo Renovation and Addition for City Hall project. The IT package includes cabling, some conduit, network racks, fiber, battery back-ups, security door access and cameras, digital signage and TV/video/presentation monitors for conference rooms and offices, and AV equipment for the City Council Chambers, the main Basement conference room, and the remaining meeting rooms throughout. The package total is $329,925.87, which is less than the budgeted $400,000 for the project.

- Mid States: $181,927.82 (Audio/Video, Camera, multiple conference rooms)
- Karl's: $8,924.80 (Digital Signage/Presentation Monitors)
- WMU: $13,989.31 (Network Cabling)
- Swiftel: $47,660.00 (Communications Cabling)
- Connecting Point: $4,850.26 (Network Gear-Racks)
- Connecting Point: $22,842.00 (Network Gear-Switches/Firewalls)
- ESEind, Inc: $42,545.00 (Security Cameras and Door Access Control equipment)
- Connecting Point: $7,186.68 (Teleconferencing)

Total: $ 329,925.87

The City will also have Owner-provided FF&E, interior signage, and geotechnical testing as part of this project that staff have yet to finalize and bring forth. With all remaining quotes and bids, the total estimated cost for this project is $5,369,682.00.

FINANCIAL CONSIDERATIONS:

There is $10,241,463.46 remaining in the Capital Improvement Fund, Account 505-45603-43202, to be used for this project.

OVERSIGHT / PROJECT RESPONSIBILITY:

Peter Boyle, IT Director
Heath VonEye, ACM/PWD

STAFF RECOMMENDATION / SUGGESTED MOTION:
Staff recommends approval of these quote awards through the following motion:

I move to approve the Quote Awards to multiple vendors for the Information Technology, Audio & Video, and Data Cabling and Networking packages for the Wells Fargo Renovation and Addition for City Hall, Project No. 2035, in the total amount of $329,925.87.

ATTACHMENT(S):
Audio and Video City of Watertown SD P-1217 (2)
Digital Signage - Karls-TV-New-City-Hall
Network Cabling - Estimate for Fiber to New City Hall - (5-2-2024)
Network Cabling - Watertown City Hall-Communications Cabling-R1
Network Gear - Racks - CityHall-Network-Racks
Network Gear - switches and firewalls -City of Watertown IT Dept. - Meraki MS130 & MR46 2025 Budget
Security-cameras-13798
Security-doorAccess-13797
Teleconferencing-Logitech-Rally-Bar
City Hall Budget Summary-Cost to Finish

Proposal To:

City of Watertown SD

23 2nd Street NE
Watertown, SD 57201

For:

Watertown City Hall- Watertown SD

May 30, 2024

Sales Contact: Steve Ver Maas

Project Version: 3

P-1217

Confidentiality Agreement

The information contained in this proposal from Mid States Audio, Inc. is privileged and confidential information, intended only for the use of the entity named as recipient. Any disclosure or use of this proposal/design not authorized by Mid States Audio, Inc. is strictly prohibited. This includes utilizing design to use as a bid specification. If any portion of design is to be used without written permission from Mid States Audio, Inc, a 5% of total price design fee will be assessed to the undersigned. By signing this affidavit, the undersigned agrees to all the terms of the Confidentiality Agreement. Notice is given that any dissemination or copying of this proposal or information contained herein, is strictly prohibited and punishable by law.

Company: _____

Print: _____

Signature: _____

Title: _____

Date: _____

CITY COMMISSION MEETING 153

AUDIO

IMAGE	QTY	DESCRIPTION
	1	Mid States Audio & Video Installation Re-Location of Existing Owner Erquipment
	1	Middle Atlantic LT-GN-PNL 1SP,DUAL LED LIGHT PANEL
	2	Middle Atlantic PDX-920R-SP 20A 9 OUT SERIES SURGE W/CTRL
	1	LEA Professional CONNECT 354D 4 Channel x 350 watt @ 4 ohms, 8 ohms, 70V and 100V per channel. Internal DSP w/ Crossovers and Dante, IoT Device with built in WiFi Hotspot, Wifi or FAST Ethernet connectivity and Highly Efficient Power Supply with Class D Output Stage
	15	QSC AD-C4T-ZB-WH 4.5" Two-way ceiling speakers, 70/100V transformer with 16Ohm bypass, zero bezel design, 150° conical DMT coverage, includes C-ring and rails for blind mount installation. Priced indvidually, must be purchased in pairs. White Only.
	15	Shure MX400DP Small Desktop Base with input, switched preamplifier, programmable logic switch and LED. Supports standard and light ring microphones
	15	Shure MX415RLPDF/C 15" Shock-Mounted Gooseneck, Red LED Ring on top, Less Preamplifier, Dual Flexible, Cardioid
	1	SmartWire 1802P-WHT 18-02 UNS STR CMP Wht Jkt BR
	1	Mid States Audio & Video Miscellaneous Hardware
	1	Middle Atlantic U2V 2SP VENTED UTILITY SHELF
	2	Middle Atlantic PDT-2020C-RN 20 OUT20ASRG&NFYCORD
	1	Middle Atlantic SR28-46-32 28W/46SP/32D SWING WALLRK

IMAGE	QTY	DESCRIPTION
	1	Middle Atlantic LVFD28-46 28W/46SP SR PERF FRNT DR
	1	Mid States Audio & Video Installation Programming of New Equipment For Use with Qsys

AUDIO TOTAL $53,749.08

VIDEO

IMAGE	QTY	DESCRIPTION
	4	LG Electronics 75UR640S9UD HDMI(3), USB(1), WIFI, RF In, R Out(RS-232C), RJ45, Audio Out, External Speaker Out (Amplifier NOT included)
	4	Chief TS525TU THIN SWING ARM (LARGE)
	14	ASUS MB17AHG Full HD, IPS, 144Hz, USB Type-C, FreeSync Premium, Eye Care, L-shaped kickstand, Tripod Mountable, HDMI, FSC Certified, 3-Year Warranty, BLACK
	2	Crestron HD-DA4-4KZ-E 1:4 HDMI Distribution Amplifier w/4K60 4:4:4 & HDR Support
	1	Netgear GSM4248UX-100NAS AV LINE M4250-40G8XF-POE++ 40X1G ULTRA90
	2	Crestron HD-DA8-4KZ-E 1:8 HDMI Distribution Amplifier w/4K60 4:4:4 & HDR Support
	1	Epson V12H758020 EPSON DC-21 Document Camera
	7	QSC NV-21-HU 4K60 4:4:4 Network Video Endpoint for Q-SYSEcosystem, (Decoders). 1 HDMI 2.0 Input, 1 USB-C Input, 1 HDMI 2.0 output.
	4	QSC NV-21-HU 4K60 4:4:4 Network Video Endpoint for Q-SYSEcosystem, software configurable as (Encoder) . 1 HDMI 2.0 Input, 1 USB-C Input, 1 HDMI 2.0 output.
	4	West Penn Wire 254346AWH1000 4P 23G CAT6A UTP CMP
	11	C2G C2G10380 15ft/4.5m UltraFlex Active HDMI Cable 4K

IMAGE	QTY	DESCRIPTION
	4	C2G C2G10376 3ft/0.9m Ultra Flexible HDMI Cable 4K
	2	Middle Atlantic UMS1-11.5K 1SP UM SHELF,11.5"D,KIT

VIDEO TOTAL $62,715.18

CAMERA CAPTURE

IMAGE	QTY	DESCRIPTION
	1	Blackmagic Design SWPANELADV1ME10 ATEM 1 M/E Advanced Panel 10
	1	Blackmagic Design BMD-SWATEMPSW1ME4K Blackmagic Design SWATEMPSW1ME4K ATEM 1 M/E Production Studio 4K Production Switcher
	1	West Penn Wire 254346AWH1000 4P 23G CAT6A UTP CMP
	1	SmartWire RG6HDP-WHT RG6U HDSDI CMP Wht Jkt
	1	Mid States Audio & Video Miscellaneous Hardware
	4	QSC NC-12x80 12x Optical Zoom 80° Horizontal Field of View, PTZ Network Camera, PoE, with HDMI and SDI output. Includes PTZ-WMB1 wall mount bracket
	4	Nigel B Design NB-AVCB-W White Finish Anti-Vibration Multi-Camera Mounting Bracket (Fits PTZ Cameras that use 1/4".20 Tripod Fittings)
	1	PTZOptics PTZ-PTSUPERJOYG1 PTZOptics PT-SUPERJOY-G1 SuperJoy PTZ Camera Joystick Controller with Simultaneous NDI / HX - IP & Serial Control
	1	Blackmagic Design CONVMSDIDA Blackmagic CONVMSDIDA 1x8 3G SDI Distribution Amplifier Mini Converter

CAMERA CAPTURE TOTAL $36,510.14

CONFERENCE

IMAGE	QTY	DESCRIPTION

IMAGE	QTY	DESCRIPTION
	1	QSC NV-21-HU 4K60 4:4:4 Network Video Endpoint for Q-SYSEcosystem, software configurable as Encoder or Decoder. 1 HDMI 2.0 Input, 1 USB-C Input, 1 HDMI 2.0 output. Optional Software License to enable AV Bridging (SLQBR-P).
	1	QSC SLQBR-P Q-SYS AV Bridging feature license. One license is required per TSC Series Gen 3 touch screen controller with AV Bridging enabled. Perpetual. For TSC-70-G3 & TSC-101-G3 & NV-21-HU
	1	QSC NV-21-PSU 12v 10a Aux Power Supply for NV-21-HU to enable USB-C device charging
	1	C2G C2G28887 6FT 2M THUNDERBOLT4 USBC-C ACTIVE (40GB)
	1	C2G CG54428 6in(.15m) USB C Female to USB A Male 3.0
	1	C2G C2G10377 6ft/1.8m Ultra Flexible HDMI Cable 4K
	2	Shure MXA920W-S Ceiling Array Microphone, Square, White, 24 inch
	1	QSC SLDAN-32-P Q-SYS Software-based Dante 32x32 Channel License, Perpetual.
	1	QSC SLQBR-P Q-SYS AV Bridging feature license. One license is required per TSC Series Gen 3 touch screen controller with AV Bridging enabled. Perpetual. For TSC-70-G3 & TSC-101-G3 & NV-21-HU

CONFERENCE TOTAL	$15,613.04
SHIPPING & HANDING	$4,677.38
CITY COMMISSION MEETING 153 TOTAL	**$173,264.82**

OPTIONAL 86" DISPLAYS

VIDEO

IMAGE	QTY	DESCRIPTION
	2	LG Electronics 86UR640S9UD 86" UHD, 3840 X 2160 (UHD), (webOS 6.0, (NOT SCAP support)), Smart Home (Launcher Bar), Quick Access, Web Browser, Pre-loaded App (YouTube only), SDP Server compatibility, SW Clock (World Clock / Alarm), Mood Display, Soft AP, WiFi Version (02. 11ac), Screen Share (Miracast), Smart Share, compatible LG ThinQ App, DIAL, Bluetooth Audio Playback, Mobile Connection Overlay, HDMI-ARC, USB Cloning, SNMP, Self Diagnostics, SI Compatible Protocol (TVLink Tuner), HTNG-CEC, Simplink(HDMI-CEC), IR Out, Multi IR Code, Hotel Mode / PDM / Installer Menu, Lock mode (Limited), Port Block, Welcome Screen (Splash Image), Insert Image, IP Channel Manager, External Speaker Out, , RJP (remote jack pack) Compatibility, Teleadapt/Guestlink (HDMI CEC), Moving Picture Playback (SD/HD/Plus HD), Auto Off / Sleep Timer, Energy Saving mode, Motion Eye Care, Vertical Setup, Fail Over, Play Via URL, NTP Server Setting, Crestron Certi. Compatibility, DPM (Digital Power management), Time scheduler , RTC (Real Time Clock) , NTP sync timer, BEACON, Embedded CM (contents manager), Embedded GM (Group manager) , Promota, SuperSign SW Compatibitlity - Control / Control Plus, CMS(Premium), Simple Editor, LG Connected Care, HDMI In 3 (2.0), USB1 (2.0), RF In , Digital Audio Out (Optical) , Audio Line Out(3.5mm phone jack), RJ45 (Usage Purpose),Safety - UL,EMCFCC,EPEAT, ISTA6

CREDITS FOR REPLACED ITEMS

	4	LG Electronics 75UR640S9UD HDMI(3), USB(1), WIFI, RF In, R Out(RS-232C), RJ45, Audio Out, External Speaker Out (Amplifier NOT included)

CREDITS	$-9,157.52

SUMMARY

OPTIONAL 86" DISPLAYS TOTAL	**-$2,941.98**

MID STATES CARE - SELECT LEVEL AGREEMENT

Select Agreement

The Mid States Select Agreement covers all items in a given room or room(s) as part of a larger system agreement. The Select Agreement includes a guaranteed response time, emergency number, and Mid States assumes all the costs of parts (covered by manufacturer's warranty) and labor. We work with major manufacturers to facilitate rapid response for manufacturer warranted equipment. Select Agreements also include up to 4 hours of re-programming control systems should you upgrade a specific component of the system or require minor functionality changes once in use.

Select Service Level Agreement

Covered Items
- Phone response within two (2) hours (during normal business hours M-F)
- Phone support by Technician
- On-site response (if needed) within two (2) business days
- All parts and labor (within manufacturer's warranty)
- Travel to and from site
- Removal, re-installation, and manufacturer service of equipment
- Up to four (4) hours of control system re-programming to accommodate changes
- Annual review of systems with recommended upgrades (if applicable)

Excluded items:
- Consumables (batteries, lamps, etc.)
- Owner furnished equipment
- Items damaged due to improper use

Contract Auto Renews Annually

MID STATES CARE - SELECT LEVEL AGREEMENT	**+$8,663.00**

ACCEPTANCE

FINANCIAL

PAYMENT SCHEDULE
50% Due at signing, with remaining balance due at completion.

PROJECT TOTAL $173,264.82

OPTIONS Not included in the project total. Initial to the left to add the option to your project.

_____	OPTIONAL 86" DISPLAYS	-$2,941.98
_____	MID STATES CARE - SELECT LEVEL AGREEMENT	+$8,663.00 (ANNUALLY)

TERMS

I accept this proposal and hereby authorize Mid States Audio & Video to proceed with the installation of the included systems at the facilities of City of Watertown SD constructing at 23 2nd Street NE Watertown, SD 57201 as described in the totality of this document. I further authorize Mid States Audio & Video to be granted the facility access that will be required to complete this project in a workmanlike and timely manner and for payment to be made to Mid States Audio & Video. In keeping with the Terms of Payment listed above: It has been made clear to me that there exist no understandings regarding this project with any relevant party unless and until City of Watertown SD and Mid States Audio & Video agree to such additional or alternate understandings in writing. Project cost and pricing are dependent upon a continual flow of work without interruption or delays imposed by City of Watertown SD or their staff, construction, other building trades or any other party, and additional costs may be incurred by City of Watertown SD from Mid States Audio & Video. If such delays result in additional costs that are not covered by the pricing in this proposal: I agree that any additions to and/or deletions from the materials and labor to be provided by my acceptance of this proposal and any resulting change(s) in cost of this project shall only be by way of written change order(s) and shall be valid only after being signed by City of Watertown SD and Mid States Audio & Video. This proposal is valid only if accepted in writing by City of Watertown SD and deposit payment received no later than 30 days from date on this proposal.

The completed system carries a ninety (90) day warranty against defective materials and workmanship including labor; in some instances the manufacturer warranty may be longer. This guarantee does not cover replacement of parts due to fire, flood, lightning, vandalism, or improper use of equipment.

ACCEPTANCE

CITY OF WATERTOWN SD

SIGNED _____ DATE _____

PRINT NAME _____ TITLE _____

MID STATES AUDIO & VIDEO

SIGNED _____ DATE _____

PRINT NAME _____ TITLE _____

MIDDLE ATLANTIC
A brand of legrand

NEXSYS™

Rackmount PDU

FEATURES

- Available in 15A and 20A
- 9 outlets
- **Protect your equipment from a surge with superior surge protection on all NEXSYS PDUs**. NEXSYS PDU's always have surge protection. Choose from enhanced multi-stage MOV or the patented Series Protection™ Surge technology.
- **Worried about the under/over voltage? Don't.** With the selectable on/off voltage protection from the front of the unit, it gives the option to protect sensitive equipment from over/under voltage scenarios.
  - If the voltage protection is on and an over or under voltage event happens the outlets will automatically be turned off to protect the equipment. Once the power restores within the acceptable voltage range the PDU will automatically turn the outlets back on.
- **Be in the know.** Remote notification of surge status via remote contact closure.
- **IEC Inlet:** Allows for cleaner cable management by selecting your desired length of power cord.
  - A standard 10' cord is included with all models

SPECIFICATIONS

NEXSYS Rackmount

EIA compliant 19" Rackmount power distribution unit shall be Middle Atlantic Products model # PDX-___ (refer to chart), with a __ amp power capacity (refer to chart), multi-stage MOV surge and spike protection L – N with no surge diversion to ground or patented non-sacrificial Series Surge with EMI filtering. Rackmount power distribution unit shall operate on 120 volt AC 60Hz frequency. Rackmount power distribution unit shall include 10' SignalSAFE™ IEC power cord with NEMA 5-__ plug (refer to chart), 8 rear outlets, 1 front outlet, and __ amp circuit breaker located on the power distribution unit's rear. Rackmount power distribution unit shall occupy one rackspace unit. Rackmount power distribution unit shall be controllable via contact closure on the rear of the unit and shall have voltage protection with automatic recovery. Rackmount power distribution unit shall be manufactured by an ISO 9001 and ISO 14001 registered company.

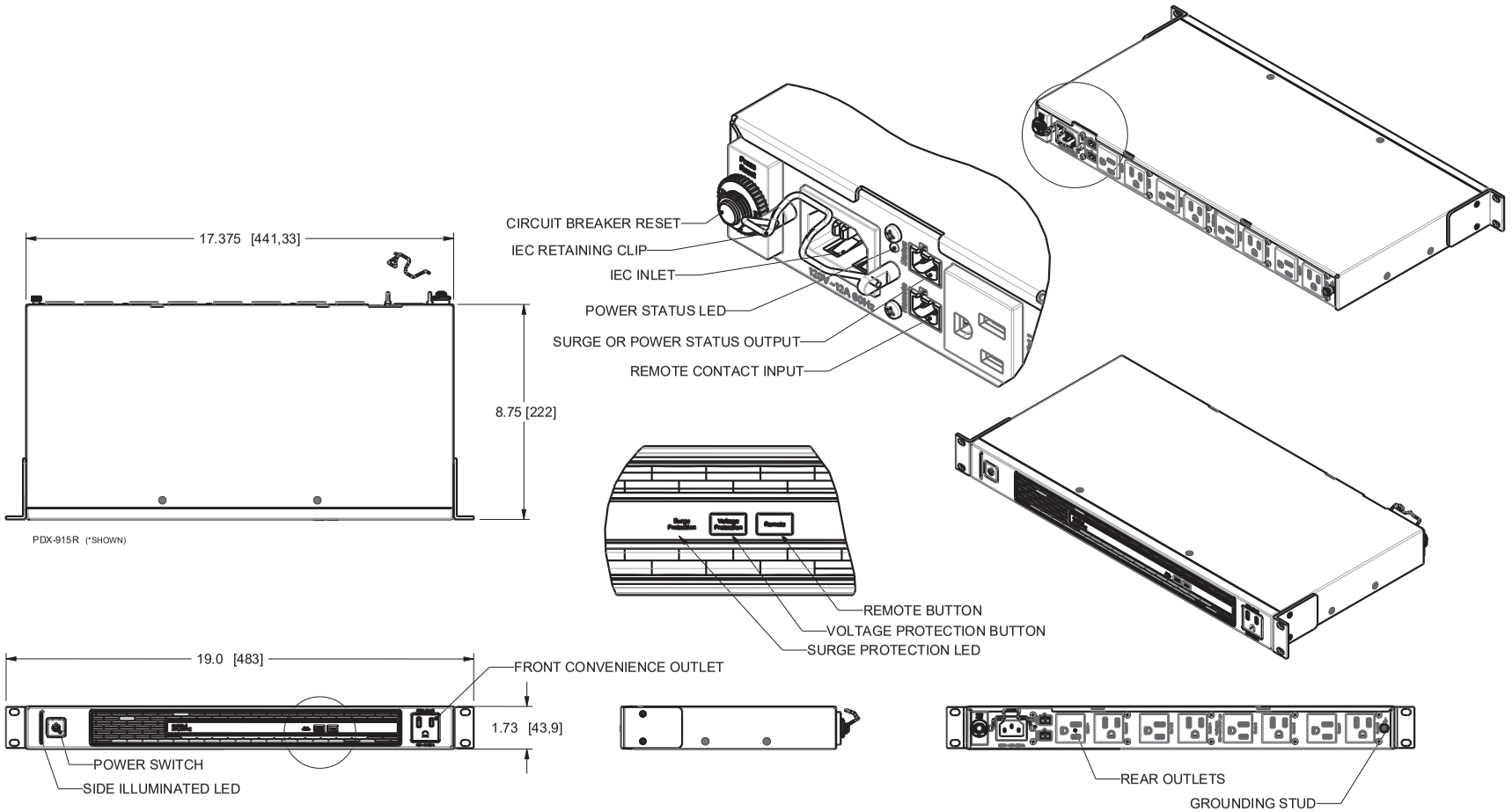
Rackmount power distribution unit shall be warrantied to be free from defects in materials and workmanship under normal use and conditions for a period of 3 years (multi-stage MOV surge models) and 12 years (Series Surge models). Rackmount power distribution unit shall be UL Listed to UL 62368, UL 1449, UL 1283 (Series Surge models) and FCC Class B and ICES 7.

c UL us LISTED

NEXSYS™ Rackmount PDU

Basic Dimensions

MODEL NUMBER	OUTLETS	RATINGS	SURGE PROTECTION	INLET	CORD LENGTH FT [M]
PDX-915R	9	12A, 120VAC~,60Hz	MULTI-STAGE MOV	IEC C14	10 [3]
PDX-920R	9	16A, 120VAC~,60Hz	MULTI-STAGE MOV	IEC C20	10 [3]
PDX-915R-SP	9	12A, 120VAC~,60Hz	SERIES	IEC C14	10 [3]
PDX-920R-SP	9	16A, 120VAC~,60Hz	SERIES	IEC C20	10 [3]



Multi-Stage MOV Surge Models

Electrical Specifications

Summary

Model	PDX-915R	PDX-920R
Nominal Voltage	120VAC	
Voltage Range	Minimum: 80VAC, Maximum: 140VAC	
Frequency	60 Hz	
Maximum Peak Load	15A	20A
Rated Load	12A	16A
Number of Outlets	9	
Outlet Type	NEMA 5-15R	NEMA 5-20R
Overload Protection	Circuit Breaker	
Outlet Control	Contact Closure	
No Load Power Dissipation	< 1W	
Input Power Cord	SignalSAFE IEC to 5-15P, 10' (3M)	SignalSAFE IEC to 5-20P, 10' (3M)
Certifications	UL 62368, UL 1449, FCC Class B, ICES 7	

Hardware Features

Model	PDX-915R and PDX-920R
Surge Protection	Multi-Stage MOV
Peak Impulse Current (8/20µS Waveform)	45,000 Amps, one time - Maximum peak impulse current pulse as defined between line and neutral. 19,500 Amps, two times within 5 minutes - Maximum multiple impulse current derated per spec.
Protection Mode	Line to Neutral only; no ground contamination.
Response Time	Less than 1 nanosecond.
Surge Energy Dissipation	705 Joules (10/100µS)
Voltage Protection Rating	500V (L-N); Type 3 SPD
EMI/RF Suppression	>20dB Calculated Line to Neutral - 100kHz to 1Mhz - based on nominal impedance.
Overvoltage Threshold	Upper Limit Cutoff: 135V RMS Upper Limit Restore: 126V RMS
Undervoltage Threshold	Lower Limit Cutoff: 100V RMS Lower Limit Restore: 105V RMS

Multi-Stage MOV Surge Models

Electrical Specifications

Physical

Model	PDX-915R	PDX-920R
Dimensions (Width x Height x Depth)	19″ (483mm) x 1.735″ (44mm) x 8.75″ (222mm)	
Product Weight	6.84 lbs (3.1 kg)	
Shipping Weight	9.92 lb (4.5 kg)	10.58 lb (4.8 kg)

Warranty

Model	PDX-915R and PDX-920R
Power Distribution	Three years limited for warranty information, refer to www.legrandav.com/policies/warranty_information

Series Surge Protection Models

Electrical Specifications

Summary

Model	PDX-915R-SP	PDX-920R-SP
Nominal Voltage	120VAC	
Voltage Range	Minimum: 80VAC, Maximum: 140VAC	
Frequency	60 Hz	
Maximum Peak Load	15A	20A
Rated Load	12A	16A
Number of Outlets	9	
Outlet Type	NEMA 5-15R	NEMA 5-20R
Overload Protection	Circuit Breaker	
Outlet Control	Contact Closure	
No Load Power Dissipation	<1W	
Input Power Cord	SignalSAFE IEC to 5-15P, 10' (3M)	SignalSAFE IEC to 5-20P, 10' (3M)
Certifications	UL 62368, UL 1283, UL 1449, FCC Class B, ICES 7	

Hardware Features

Model	PDX-915R-SP	PDX-920R-SP
Surge Protection	Series	
Voltage Protection Rating	330V (L-N); Type 3 SPD	
Maximum Applied Surge Voltage	6000 Volts (1.2 x 50µS Pulse, Industry Standard Combination Wave Per IEEEC62.41)	
Maximum Applied Surge Current	Unlimited (Due to Inherent Current Limiting)	
Maximum Applied Surge Energy	Unlimited (Due to Inherent Current Limiting)	
EMI Filter, Differential Mode	40dB@100kHz	50dB@100kHz
50Ω Load	50dB@3MHz	50dB@30MHz
EMI Filter, Common Mode	18dB@100kHz	30dB@100kHz
50Ω Load	50dB@3MHz	50dB@30MHz
Overvoltage Threshold	Upper Limit Cutoff: 135V RMS Upper Limit Restore: 126V RMS	
Undervoltage Threshold	Lower Limit Cutoff: 100V RMS Lower Limit Restore: 105V RMS	

Series Surge Protection Models

Electrical Specifications

Physical

Model	PDX-915R-SP	PDX-920R-SP
Dimensions (Width x Height x Depth)	19″ (483mm) x 1.735″ (44mm) x 8.75″ (222mm)	
Product Weight	8.6 lb. (3.9 kg)	
Shipping Weight	11.47 lb. (5.2 kg)	12.35 lb. (5.6 kg)

Warranty

Model	PDX-915R-SP and PDX-920R-SP
Series Surge Module	Twelve years limited for warranty information, refer to www.legrandav.com/policies/warranty_information

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AcousticDesign™ Series AD-C4T-ZB

KEY FEATURES

- Zero bezel design for the needs of modern applications
- Consistent tonal characteristics across the entire AcousticDesign Series for surface, ceiling, and pendant applications
- DMT (Directivity Matched Transition™) waveguide ensures smooth, uniform frequency response over the coverage area
- Snap-fit magnetic grille
- 3x double stepped, long travel dog-ear blind mount system
- Intrinsic Correction™ voicings available via the Q-SYS Platform including CX-Q amplifiers
- Blemish-free removable logo
- Removable conduit cover plate, also available as accessory for pre-install wiring
- UL1480 and UL2043 certified
- Available in white (RAL 9003)
- Complete EASE, CF2, CAD, & BIM information available online

Certified for Microsoft Teams

AcousticDesign™ Series AD-C4T-ZB

4.5" small format, zero bezel ceiling mount loudspeaker

The Q-SYS AcousticDesign™ AD-C4T-ZB is a 4.5" two-way, zero bezel ceiling loudspeaker ideally suited for a wide variety of foreground and background sound reinforcement applications which utilize 70/100V or 16Ω bypass configurations.

The AcousticDesign™ Series offers integrators a premium quality installed sound solution where performance, consistent coverage, and aesthetics are paramount. Specifically designed to maintain a consistent tonal characteristic across the entire family in ceiling, surface, and pendant applications, the AcousticDesign Series allows integrators seamless transitions within blended installations.

The AD-C4T-ZB features a high quality 4.5" weather treated paper cone woofer with a 1" voice coil and a .75" aluminum dome tweeter which is positioned on a DMT waveguide.

DMT (Directivity Matched Transition™) is Q-SYS's design philosophy where the high frequency waveguide is matched to the natural conical behavior of the woofer at the crossover point. The result is a coherent transition between transducers with improved off-axis power response for consistent 150° conical DMT coverage.

The accurate frequency response of the AD-C4T-ZB is maintained even in 70/100V applications by use of a low-loss, low-saturation 30-watt transformer with selectable taps, including 16Ω bypass, using a rotary selector located under the snap-fit magnetically attached powder coat steel grille.

To retain lasting good looks, the rugged ABS baffle is further protected by using UV inhibitors that prevent discoloration and by a powder coated steel back can. The magnetic grille features a stick-on logo that can be removed blemish-free for installations where branding is not permitted.

Installers will appreciate the 3x double stepped, long travel dog-ear blind mounting system, which captures from 0" - 2.25" of ceiling thickness. The conduit cover plate can be easily removed by losening the single captive Phillips screw allowing access to the locking 4-pole Euro-block connector which can accept up to four 18AWG pairs, eliminating the hassles of star topology wiring designs.

Intrinsic Correction™ voicings that optimize performance and speed the install process are easily deployed via the Q-SYS Platform including CX-Q Series amplifiers.

The AD-C4T-ZB is available in white (RAL 9003) and may be painted to match any decor.

For your system integration needs, complete EASE, CF2, CAD, and BIM files are available for download at Q-SYS.com.

AD-C4T-ZB

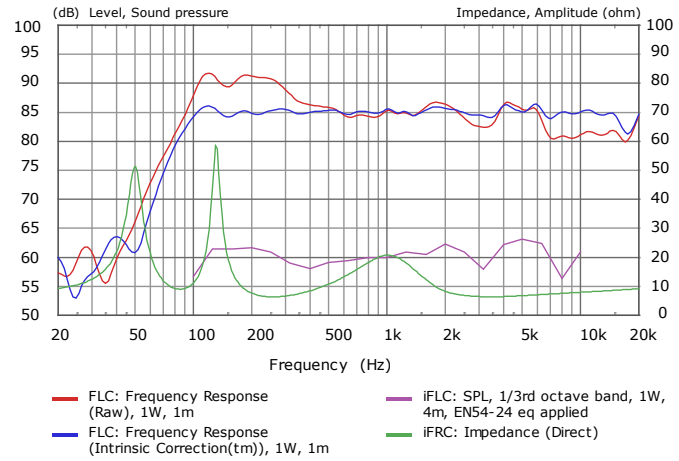
LF transducer	110 mm (4.5 in) weather treated paper cone woofer
HF transducer	19 mm (.75 in) aluminum dome tweeter
Effective frequency range [1, 2, 3, 8]	70 Hz – 20 kHz
Rated noise power / voltage [6]	30 W / 22 V (rms)
Sensitivity (dB)	Rated @1W, 1 m [2, 3, 4, 8]: 87
Coverage (-6 dB) (°) **Horizontal / Vertical** [9]	Rated [2, 5, 8] : 150 conical DMT 500Hz: 176 / 176, 1kHz: 160 / 160 2kHz: 156 / 152, 4kHz: 103 / 111
Declared values of SPL, 1/3rd octave band CPB, 1W, 4m (Hz : dB)[9]	500: 59.1; 630: 59.4; 800: 60.0; 1000: 60.0 1250: 61.0; 1600: 60.5; 2000: 62.3; 2500: 61.0 3150: 58.0; 4000: 62.2
Directivity factor [2, 5, 8]	4.5
Directivity index (dB) [2, 5, 8]	6.5
Maximum SPL (dB)	Rated, 1m (continuous / peak) [7]: 102 / 108
Recommended amplifier	60 watts
Transformer taps / impedance	Bypass:16 Ω 3.75 W (70 V); 7.5 W (100 V) Tap: 1333 Ω 7.5 W (70 V); 15 W (100 V) Tap: 667 Ω 15 W (70 V); 30 W (100 V) Tap: 333 Ω 30 W (70 V); N/A (100 V) Tap: 167 Ω
Input connector type	Euroblock connector with parallel output
Enclosure material	ABS baffle on powder coated steel back can
Grille material	Powder coated steel
Ingress protection	IP-34
Operating environment	Designed for indoor use
Operating temperature range	-20 to 50° C (-4 to 122° F)
Cutout dimension	Ø 195 mm (Ø 7.68 in)
Net weight	2.9 kg (6.4 lb)
Product dimensions (Ø x H)	Ø 230 x 176 mm (Ø 9.06 x 6.94 in)
Shipping weight	9.3 kg (20.5 lb), pair packed
Shipping dimensions (H x W x D)	279 x 711 x 318 mm (11 x 28 x 12.5 in), pair packed
Included accessories	C-ring and tile rails, rail screws, euroblock connector, cut-out template, grille
Optional accessories	AD-MR4 (pre-install mud ring)
Safety Agency	UL1480, UL2043, NFPA90, NFPA70 suitable for use in air handling spaces. Transformer UL registered per UL1876, ROHS, CE compliant. Baffle meets UL94-V0 and UL94-5VB flamibility rating; in accordance with IEC60849 / EN60849 systems.

[1] -10dB from rated sensitivity
[2] Full-space, IEC baffle, 4m
[3] Reference axis
[4] 200 - 10kHz average
[5] 500 - 5kHz average
[6] IEC, 2hrs
[7] Calculated from rated noise power and sensitivit

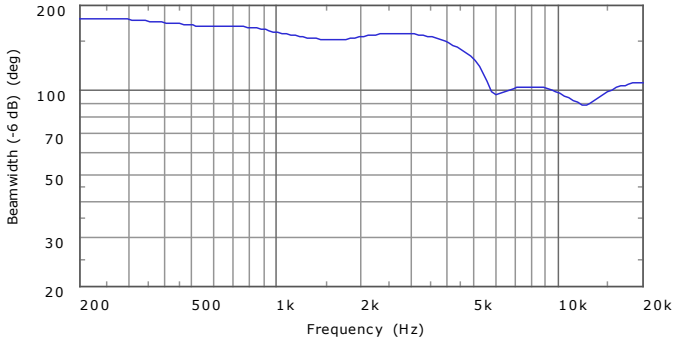
[8] *Reference plane* is the plane coincident with the loudspeaker baffle plane. *Reference axis* is the axis perpendicular to the reference plane and passing through the center of the baffle. *Vertical plane* is the plane intersecting the reference plane at a right angle, including the reference axis and the taps selector knob. *Horizontal plane* is the plane intersecting the reference plane and the vertical plane at a right angle, including the reference axis.

AD-C4T-ZB

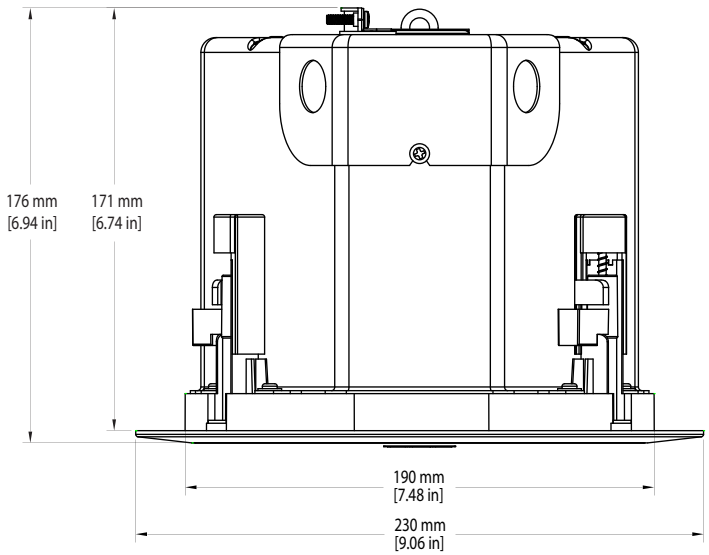
Impedance/Frequency Response:



Beamwidth:



Dimensions



As part of Q-SYS's ongoing commitment to product development, specifications are subject to change without notice.

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10/30/2023

PART NUMBER 18-02P-WHT

UL Listed and Rated Type CMP Multi-Conductor Non-Shielded Plenum Cable

CABLE SPECIFICATIONS

DESCRIPTION	18 AWG 2 Conductor Bare Copper, Non-Shielded Plenum, UL Listed C(UL)US CMP
CONDUCTOR	18 (7/26 Bare Copper)
INSULATION	Low-Smoke PVC .008"
COLOR CODE	Black/Red
SHIELD	N/A
DRAIN WIRE	N/A
JACKET	Low-Smoke PVC .018"
JACKET COLOR	White Jacket
MARKING	SMARTWIRE DEVICE / ZONE A B C D E 0 1 2 3 4 5 6 7 8 9 18 AWG C(UL)US CMP ROHS MADE IN THE USA
OVERALL DIAMETER	.158" Nom.
CABLE WEIGHT	16 Lbs/Mft.
CAPACITANCE	27 pF/Ft. Nom.
IMPEDANCE	70 Ohms
DC RESISTANCE	6.66 Ohms/Mft. maximum @ 20 C
TEMPERATURE RATING	0 C to 75 C / 300 Volt

INDUSTRY STANDARDS

FLAME RATING	Approved For Plenum Use Without Conduit Per NFPA 262 Flame Test
AGENCY APPROVALS	NEC Article 800; UL Listed C(UL)US CMP, RoHS Compliant, Made in the USA

All specifications referenced are nominal measurements unless otherwise noted.

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Middle Atlantic Products

EXCEPTIONAL SUPPORT & PROTECTION™

U Series/U317/UTR1 Rackshelves

EIA/TIA Compliant

U Series / U317 / UTR1 Rackshelves

Features

U Series - Universal rackshelves with solid and vented construction

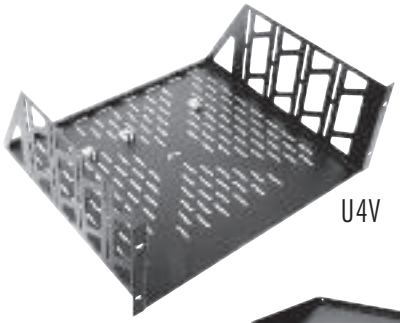
- Available in 1 through 4 rackspaces
- Weight capacity from 35 to 85 lbs. depending on size
- Accommodates most standard non-rackmountable components
- See chart for part numbers and dimensions
- Contractor packs available

U317 - Vented 3 space rackshelf

- 17- 3/4" depth allows for deeper components
- 60 lb. weight capacity
- Vent pattern provides air circulation
- Slotted rear flange for cable management

UTR1 - Half / third rack shelf

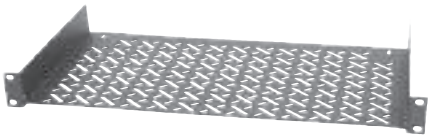
- 25 lb. weight capacity
- Generous vent pattern provides superior air circulation
- Hook & loop strips included for mounting any half or third space components without hardware
- Contractor packs available



U4V

U2

U317



UTR1

Architects' and Engineers' Specifications

U Series

EIA/TIA compliant 19" solid, one-piece 16-gauge steel rackshelf shall be Middle Atlantic Products model #Ux (x =#of rackspaces, refer to chart). Weight capacity shall be__(refer to chart). Rackshelf shall feature durable flat black powder coat finish. Contractor packs shall be available with twelve U1 or six U2 rackshelves and shall be model #U1-RP12 or U2-RP6. U series rackshelf shall be UL Listed in the US and Canada. U Series shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. U series shall be manufactured by an ISO 9001 and ISO 14001 registered company. U series rackshelf shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

U Series, Vented

EIA/TIA compliant 19" solid, one-piece 16-gauge steel rackshelf shall be Middle Atlantic Products model #UxV (x =#of rackspaces, refer to chart) and shall have a ventilated bottom and sides. Weight capacity shall be__(refer to chart). Rackshelf shall feature durable flat black powder coat finish. Vented U series rackshelf shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. Vented U series rackshelf shall be manufactured by an ISO 9001 and ISO 14001 registered company. Vented U series rackshelf shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

U317

EIA/TIA compliant 19" vented three rackspace rackshelf shall be Middle Atlantic Products model #U317. One-piece, 16-gauge rackshelf shall provide a 60 lb. weight capacity. U317 shall features slotted rear flange for cable management. Depth of 17-3/4" shall accommodate deeper components. U317 shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. U317 shall be manufactured by an ISO 9001 and ISO 14001 registered company. U317 shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

UTR1

EIA/TIA compliant 19" half / third rack shelf with 10" depth shall be Middle Atlantic Products model #UTR1. Weight capacity shall be 25 lbs. UTR1 shall include two 2" x 10" hook & loop strips for component mounting and a generous vent pattern for superior air circulation. Contractor packs shall be available with twelve UTR1 rackshelves and shall be model #UTR1-RP12. UTR1 shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. UTR1 shall be manufactured by an ISO 9001 and ISO 14001 registered company. UTR1 shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

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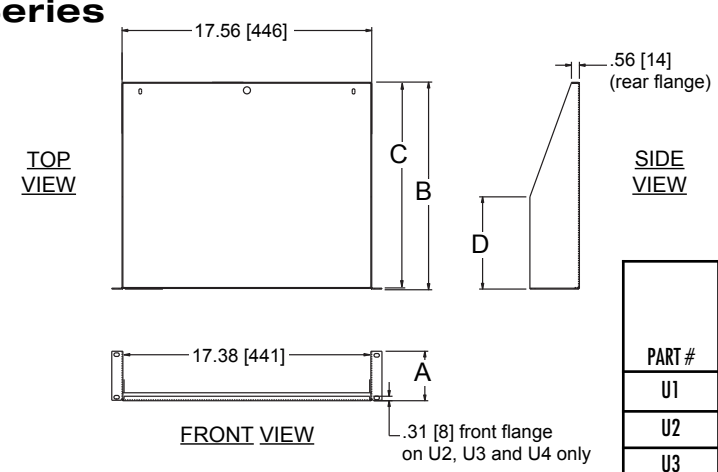
Canada: Ontario • British Columbia • Voice: 613-836-2501 Fax: 613-836-2690 • middleatlantic.ca

U Series/Vented U Series/U317/UTR1 basic dimensions

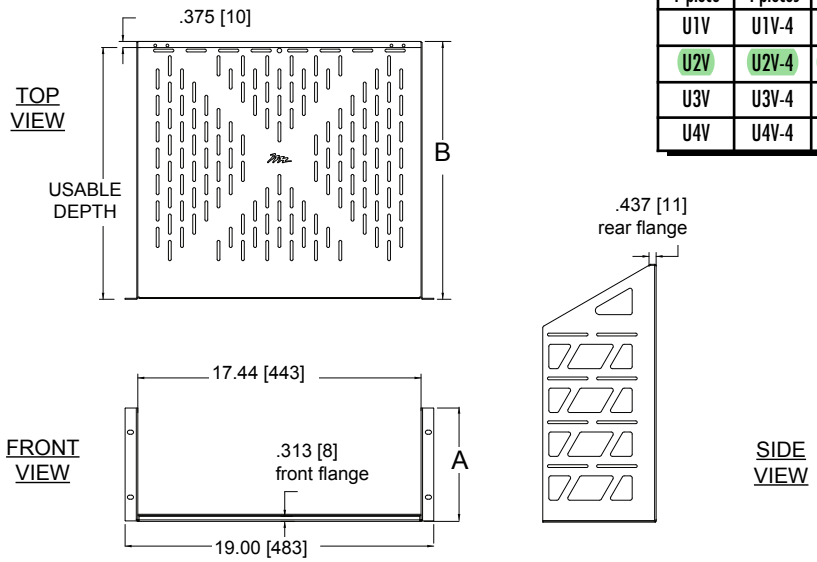
All dimensions in inches unless otherwise noted [Bracketed dimensions in millimeters]

U Series



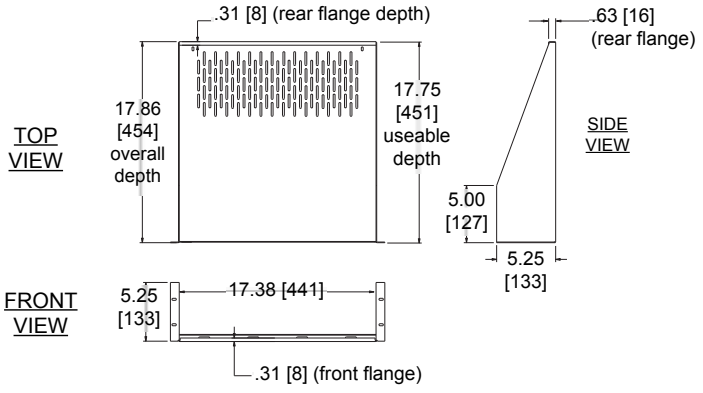
PART #	RACKING HEIGHT / RACKSPACES "A"	OVERALL DEPTH "B"	USEABLE DEPTH "C"	"D"	WEIGHT CAPACITY
U1	1.75 [44] (1 SP)	10.78 [274]	10.72 [272]	6.05 [154]	35 lbs. [16 kg]
U2	3.50 [89] (2 SP)	14.55 [370]	14.43 [367]	6.49 [165]	50 lbs. [23 kg]
U3	5.25 [133] (3 SP)	14.55 [370]	14.43 [367]	5.71 [145]	70 lbs. [32 kg]
U4	7.00 [178] (4 SP)	15.50 [394]	15.38 [391]	6.00 [152]	85 lbs. [39 kg]

Vented U Series

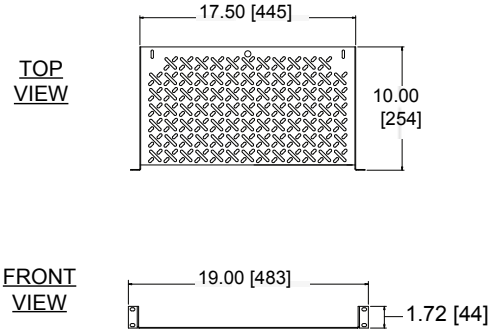


PART # 1 piece	PART # 4 pieces	RACKING HEIGHT/ RACKSPACES "A"	OVERALL DEPTH "B"	USEABLE DEPTH "C"	WEIGHT CAPACITY
U1V	U1V-4	1.75 [44] (1 SP)	10.78 [274]	10.41 [264]	35 lbs. [16 kg]
U2V	U2V-4	3.50 [89] (2 SP)	15.375 [390]	15.00 [381]	50 lbs. [23 kg]
U3V	U3V-4	5.25 [133] (3 SP)	15.375 [390]	15.00 [381]	70 lbs. [32 kg]
U4V	U4V-4	7.00 [178] (4 SP)	15.875 [403]	15.50 [394]	85 lbs. [39 kg]

U317



UTR1



		86UR640S9UD	75UR640S9UD	65UR640S9UD	55UR640S9UD	50UR640S9UD	43UR640S9UD
DISPLAY	Size	86"	75"	65"	55"	50"	43"
	Resolution	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)
	Backlight Unit Type	Direct	Direct	Direct	Direct	Direct	Direct
	Brightness	330 nits	330 nits	400 nits	400 nits	400 nits	300 nits
	Dynamic Contrast Ratio (Dynamic MCI (Hz))	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1
	Static (Panel) Contrast Ratio	1200:1	1200:1	1200:1	1300:1	5,000:1	1200:1
	Response Time (G to G)	5 ms	8 ms	8 ms	14 ms	19 ms	8 ms
	Refresh Rate	120 Hz	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	Life Span	30,000 hrs	30,000 hrs	30,000 hrs	30,000 hrs	30,000 hrs	30,000 hrs
	HDR_HDR 10 Pro	Yes	Yes	Yes	Yes	Yes	Yes
	HDR_HLG	Yes	Yes	Yes	Yes	Yes	Yes
AUDIO	Built-in Speakers	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W
	LG Sound Sync	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)
BROADCASTING	Broadcasting System	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC
	Global IPTV Support	Yes	Yes	Yes	Yes	Yes	Yes
SMART FEATURES	Smart Home (Launcher Bar)	Yes	Yes	Yes	Yes	Yes	Yes
	Quick Access	Yes	Yes	Yes	Yes	Yes	Yes
	Web Browser	Yes	Yes	Yes	Yes	Yes	Yes
	Pre-loaded App	YouTube	YouTube	YouTube	YouTube	YouTube	YouTube
	SDP Server compatibility	Yes	Yes	Yes	Yes	Yes	Yes
	SW Clock (World Clock / Alarm)	Yes	Yes	Yes	Yes	Yes	Yes
	Mood Display	Yes	Yes	Yes	Yes	Yes	Yes
	SoftAP	Yes	Yes	Yes	Yes	Yes	Yes
	Wi-Fi	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac
	Screen Share (Miracast)	Yes	Yes	Yes	Yes	Yes	Yes
	Smart Share	Yes	Yes	Yes	Yes	Yes	Yes
	LG ThinQ App	Yes	Yes	Yes	Yes	Yes	Yes
	DIAL	Yes	Yes	Yes	Yes	Yes	Yes
	Bluetooth Audio Playback	Yes	Yes	Yes	Yes	Yes	Yes
	Mobile Connection Overlay	Yes	Yes	Yes	Yes	Yes	Yes
OTHER FEATURES	HDMI-ARC	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2
	USB Cloning	Yes	Yes	Yes	Yes	Yes	Yes
	WOL	Yes	Yes	Yes	Yes	Yes	Yes
	SNMP	Yes	Yes	Yes	Yes	Yes	Yes
	Self Diagnostics (USB)	Yes	Yes	Yes	Yes	Yes	Yes
	SI Compatible Protocol	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner
	HTNG-CEC	Yes	Yes	Yes	Yes	Yes	Yes
	Simplink (HDMI-CEC)	1.4	1.4	1.4	1.4	1.4	1.4
	IR Out	RS-232C	RS-232C	RS-232C	RS-232C	RS-232C	RS-232C
	Multi-code IR	Yes	Yes	Yes	Yes	Yes	Yes
	Hotel Mode / PDM / Installer Menu	Yes	Yes	Yes	Yes	Yes	Yes
	Lock mode	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)
	Port Block	Yes	Yes	Yes	Yes	Yes	Yes
	Welcome Screen (Splash Image)	Yes	Yes	Yes	Yes	Yes	Yes
	Insert Image	Yes	Yes	Yes	Yes	Yes	Yes
	IP Channel Manager	Yes	Yes	Yes	Yes	Yes	Yes
	External Speaker Out	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type GND,L+, R+), 2W with 8Ω
	RJP (remote jack pack) Compatibility	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)
	Moving Picture Playback (SD/HD/Plus HD)	Yes	Yes	Yes	Yes	Yes	Yes
	Auto Off / Sleep Timer	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
	Energy Saving mode	Yes	Yes	Yes	Yes	Yes	Yes
	Motion Eye Care	Yes	Yes	Yes	Yes	Yes	Yes
	Crestron Certi. Compatibility	Yes	Yes	Yes	Yes	Yes	Yes
	DPM (Digital Power Management)	Yes	Yes	Yes	Yes	Yes	Yes
	Time scheduler	Yes	Yes	Yes	Yes	Yes	Yes
	RTC (Real Time Clock)	Yes	Yes	Yes	Yes	Yes	Yes
	NTP sync timer	Yes	Yes	Yes	Yes	Yes	Yes

		86UR640S9UD	75UR640S9UD	65UR640S9UD	55UR640S9UD	50UR640S9UD	43UR640S9UD
OTHER FEATURES	BEACON	Yes	Yes	Yes	Yes	Yes	Yes
	Embedded CM (Contents Manager)	Yes	Yes	Yes	Yes	Yes	Yes
	Embedded GM (Group Manager)	Yes	Yes	Yes	Yes	Yes	Yes
	Promota / Mobile CMS	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
	SuperSign Control / Control Plus	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
	SuperSign CMS(Premium)	Yes	Yes	Yes	Yes	Yes	Yes
	Simple Editor	Yes	Yes	Yes	Yes	Yes	Yes
INTERFACES	HDMI In	3 (v2.0)	3 (v2.0)	3 (v2.0)	3 (v2.0)	3 (v2.0)	3 (v2.0)
	RS-232C	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack
	Service Only	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack
	USB 2.0	1	1	1	1	1	1
	RF In	1	1	1	1	1	1
	Optical Digital Audio Out	1	1	1	1	1	1
	Line Out	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack
	RJ45 (LAN)	1	1	1	1	1	1
MECHANICAL	Stand Type	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole
	Front Color	Blue	Blue	Blue	Blue	Blue	Blue
	VESA Compatible	600 x 400	400 x 400	300 x 300	300 x 300	200 x 200	200 x 200
	Kensington Lock	Yes	Yes	Yes	Yes	Yes	Yes
	Weight without Stand	99.6 lbs / 45.2 kg	69.2 lbs / 31.4 kg	47.4 lbs / 21.5 kg	30.9 lbs / 14.0 kg	25.8 lbs / 11.7 kg	19.4 lbs / 8.8 kg
	Weight with Stand	101.2 lbs / 45.9 kg	70.8 lbs / 32.1 kg	48.1 lbs / 21.8 kg	31.3 lbs / 14.2 kg	26.2 lbs / 11.9 kg	19.6 lbs / 8.9 kg
	Shipping Weight	128.8 lbs / 58.4 kg	91.5 lbs / 41.5 kg	61.3 lbs / 27.8 kg	41.9 lbs / 19.0 kg	32.2 lbs / 14.6 kg	24.5 lbs / 11.0 kg
	Dimensions without Stand	75.9 x 43.5 x 2.4 in 1927 x 1104 x 59.9 mm	66.1 x 38.0 x 2.4 in 1678 x 964 x 59.9 mm	57.2 x 33.0 x 2.3 in 1454 x 838 x 57.7 mm	48.6 x 28.1 x 2.3 in 1235 x 715 x 57.5 mm	44.1 x 25.6 x 2.2 in 1121 x 651 x 57.1 mm	38.1 x 22.2 x 2.2 in 967 x 564 x 57.1 mm
	Dimensions with Stand	75.9 x 45.9 x 14.3 in 1927 x 1167 x 362 mm	66.1 x 40.4 x 14.3 in 1678 x 1027 x 362 mm	57.2 x 35.4 x 10.7 in 1454 x 899 x 271 mm	48.6 x 30.4 x 9.1 in 1235 x 772 x 232 mm	44.1 x 27.9 x 9.1 in 1121 x 708 x 232 mm	38.1 x 24.5 x 8.5 in 967 x 622 x 216 mm
	Dimensions in Shipping	83.3 x 47.8 x 9.0 in 2115 x 1215 x 228 mm	74.0 x 43.9 x 7.9 in 1880 x 1115 x 200 mm	63.0 x 38.2 x 6.8 in 1600 x 970 x 172 mm	53.5 x 31.9 x 6.4 in 1360 x 810 x 162 mm	47.8 x 30.5 x 6.0 in 1215 x 775 x 152 mm	41.5 x 26.0 x 5.6 in 1055 x 660 x 142 mm
	Bezel Width (L/R/U/B): On Bezel	15.9 / 15.9 / 15.9 / 19.9 mm	13.9 / 13.9 / 13.9 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm
	Bezel Width (L/R/U/B): Off Bezel	6.9 / 6.9 / 6.9 / 18.4 mm	7.9 / 7.9 / 7.9 / 18.4 mm	6.8 / 6.8 / 6.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm	7.3 / 7.3 / 7.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm
POWER	Power Supply (Voltage, Hz)	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz
	Power Consumption (Max)	339 W	228 W	198 W	166.3 W	144.8 W	119.1 W
	Power Consumption (Typ)	313 W	202 W	169 W	140.1 W	118.8 W	97.7 W
	Standby Power Consumption	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W
WARRANTY & OTHER	Standards	UL	UL	UL	UL	UL	UL
	EMC Certification	FCC	FCC	FCC	FCC	FCC	FCC
	Environmental	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6
	Accessories	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory

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SPEC_UR640S_072118_LR

LG Business Solutions

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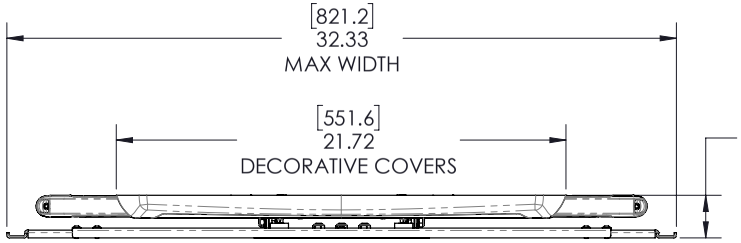
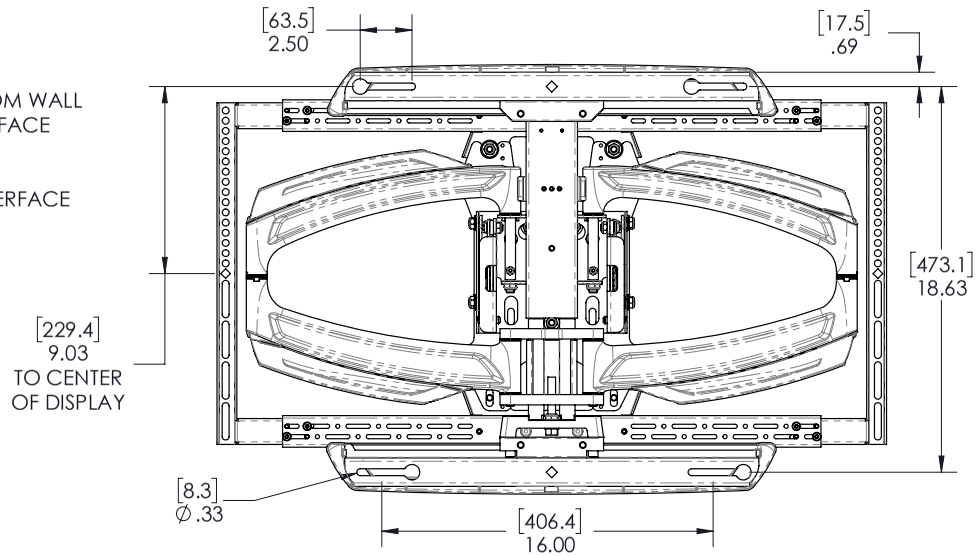
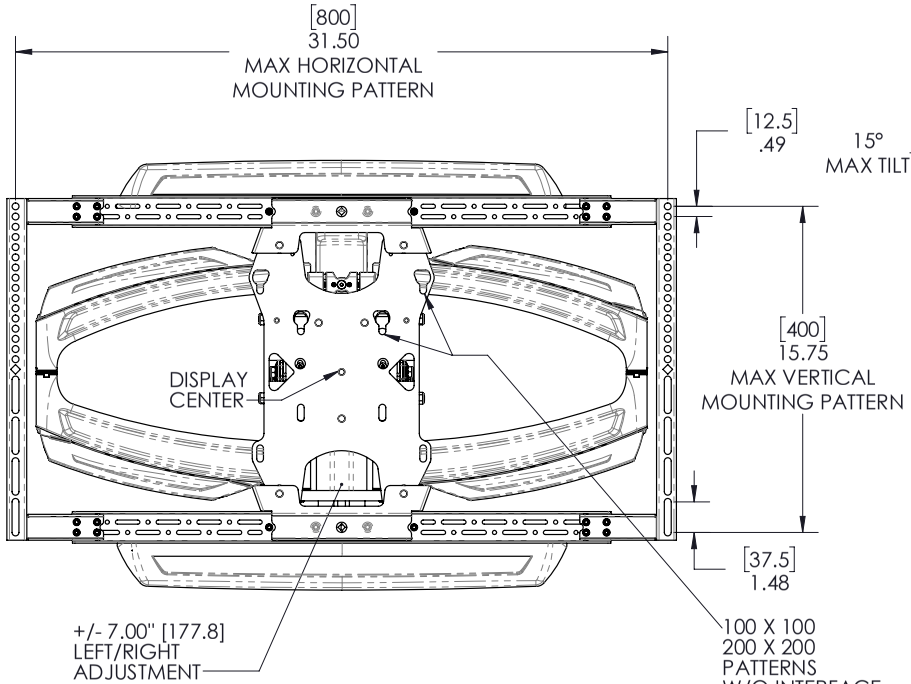
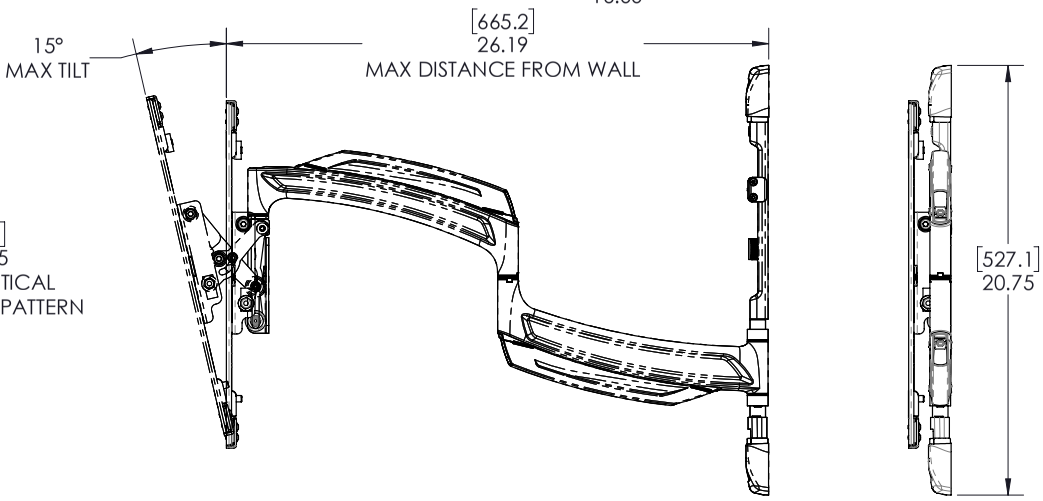
TECH-000750









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QA APPROVAL		

CHIEF

6436 CITY WEST PKWY
EDEN PRAIRIE MN, 55344
PHONE: 866-977-3901
FAX: 877-894-6918

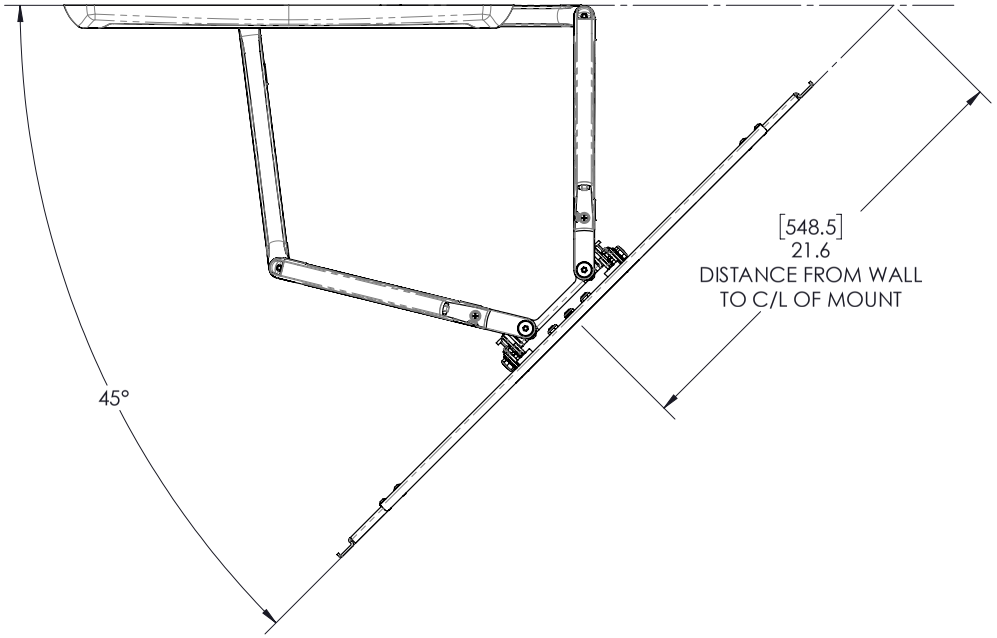
DESCRIPTION: TS525TU

MODEL NO.: TS525TU

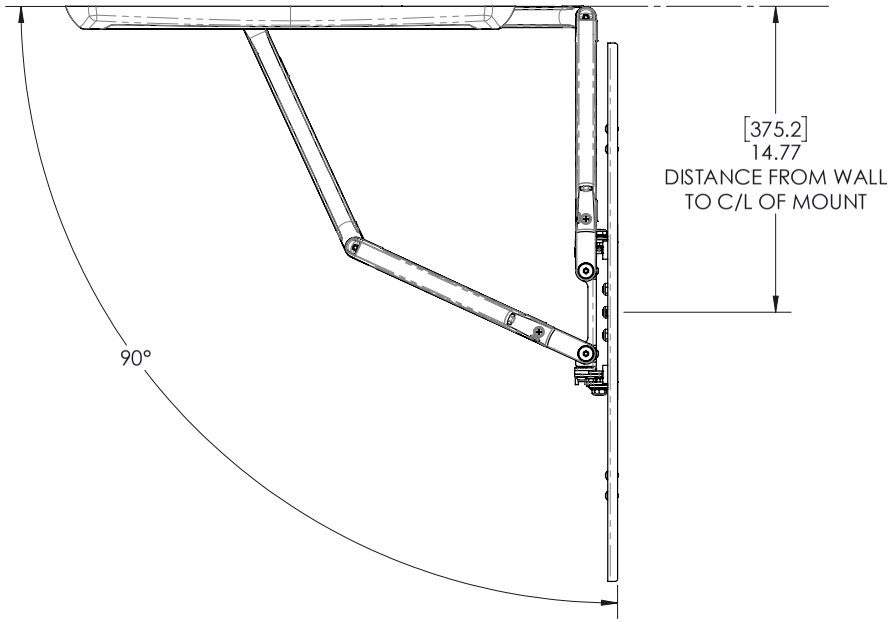
SHEET 1 OF 4 | SCALE: 1:6 | SIZE: B | DWG. NO.: TECH-000750 | REV.: 02

STATUS: MGW 07/14/2021 - RELEASED ON ECO: 500024424

TECH-000750



MAXIMUM SIDE SWIVEL



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a legrand brand
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PHONE: 866-977-3901
FAX: 877-894-6918

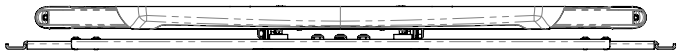
DESCRIPTION: TS525TU

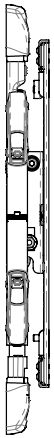
MODEL NO.: TS525TU

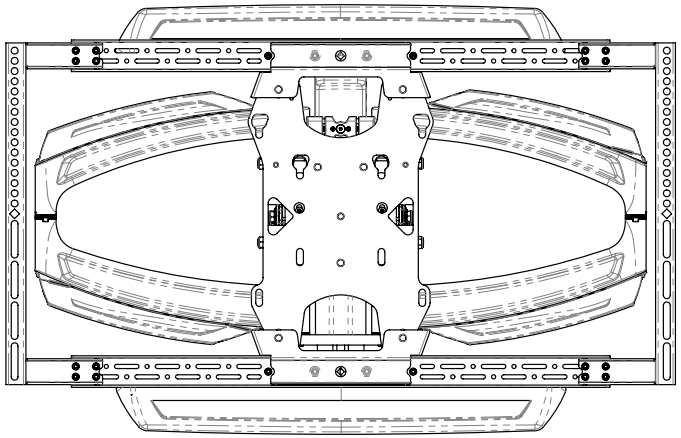
SHEET 2 OF 4 | SCALE: 1:6 | SIZE: B | DWG. NO.: TECH-000750 | REV.: 02

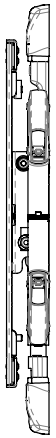
STATUS: MGW 07/14/2021 - RELEASED ON ECO: 500024424

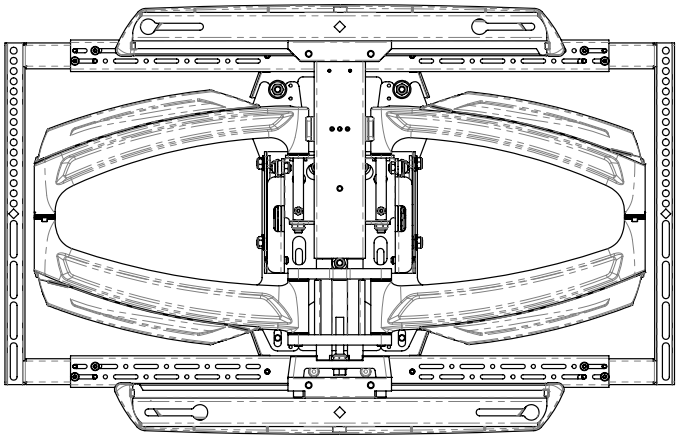
TECH-000750











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QA APPROVAL		

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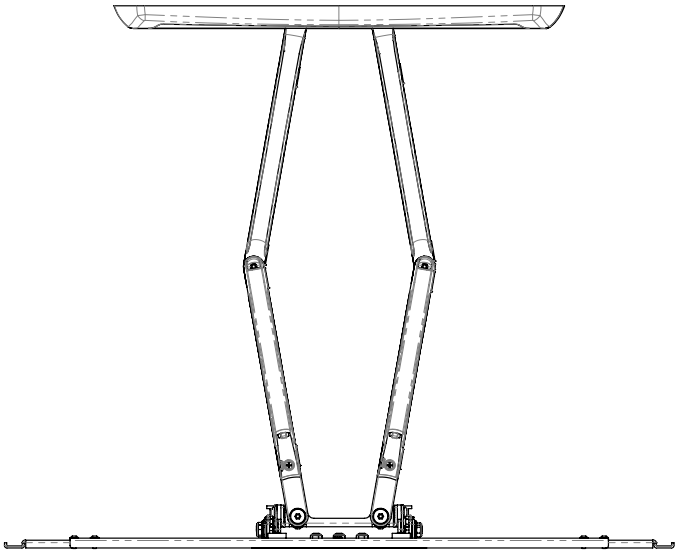
DESCRIPTION: TS525TU

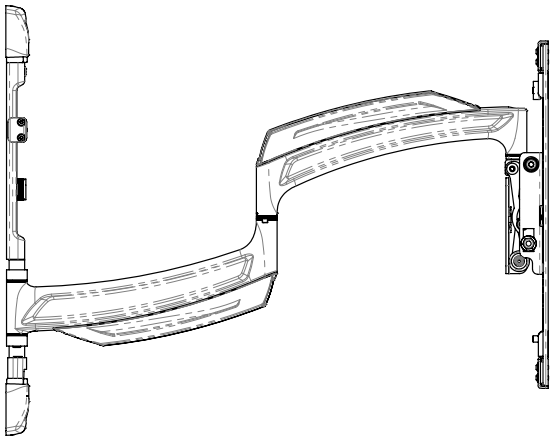
MODEL NO.: TS525TU

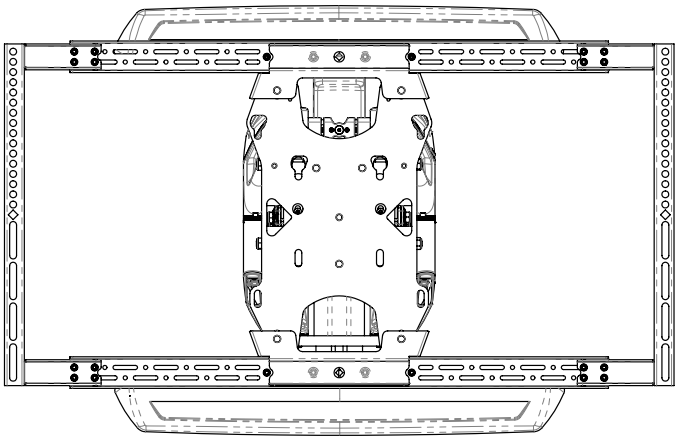
SHEET 3 OF 4 | SCALE: 1:6 | SIZE: B | DWG. NO.: TECH-000750 | REV.: 02

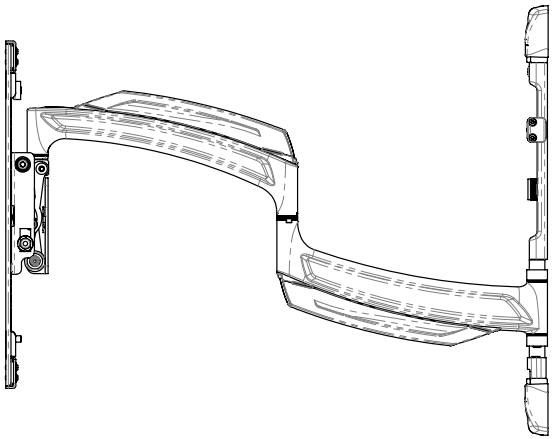
STATUS: MGW 07/14/2021 - RELEASED ON ECO: 500024424

TECH-000750









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SHEET 4 OF 4 | SCALE: 1:6 | SIZE: B | DWG. NO.: TECH-000750 | REV.: 02

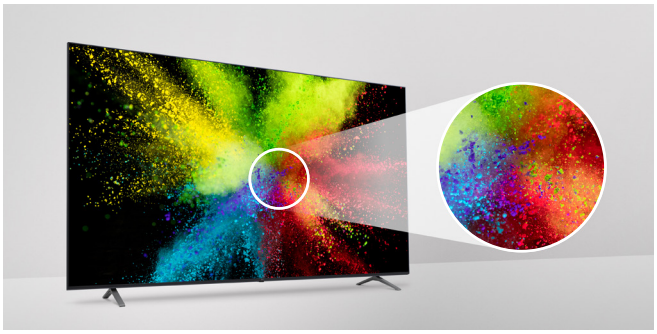
* All images in this datasheet are for illustrative purposes only.

UR640S9UD Series

LG Ultra HD TV Signage

- Superb Picture Quality with Ultra HD Resolution
- Attractive Design with Slim Depth
- Versatile Content Management with LG SuperSign CMS
- Embedded Content & Group Management

UR640S9UD Series	
Available Sizes	86" / 75" / 65" / 55" / 50" / 43"
Screen Resolution	3,840 × 2,160 (UHD)
Operation Time	16 Hours / 7 Days
Brightness	86" / 75": 330 nits 65" / 55" / 50": 400 nits 43"v: 300 nits
LG Solution Compatibility	Promota App, LG ConnectedCare, LG SuperSign CMS, LG SuperSign Control



SUPERB PICTURE WITH ULTRA HD RESOLUTION

With the resolution that is 4 times higher than Full HD, this model makes the color and details of the contents more vivid and realistic. In addition, the LG IPS panel provides a clear view of the picture contents even at extremely wide viewing angles.

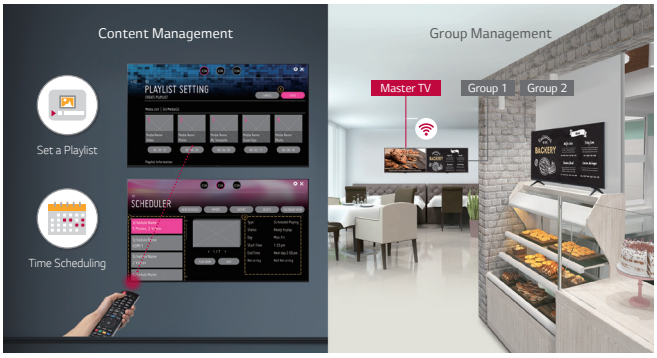
IMPROVED DESIGN WITH SLIM DEPTH

This series is thinner than LG conventional* models to save space and enable easy installation. In addition, its sophisticated design and color improve the décor of the space where the product is installed.

* 'LG Conventional' refers to LG UT640S series.

WIRELESS ACCESS POINT

The UR640S9UD series operates as a virtual router which can be an wireless access point for mobile devices.



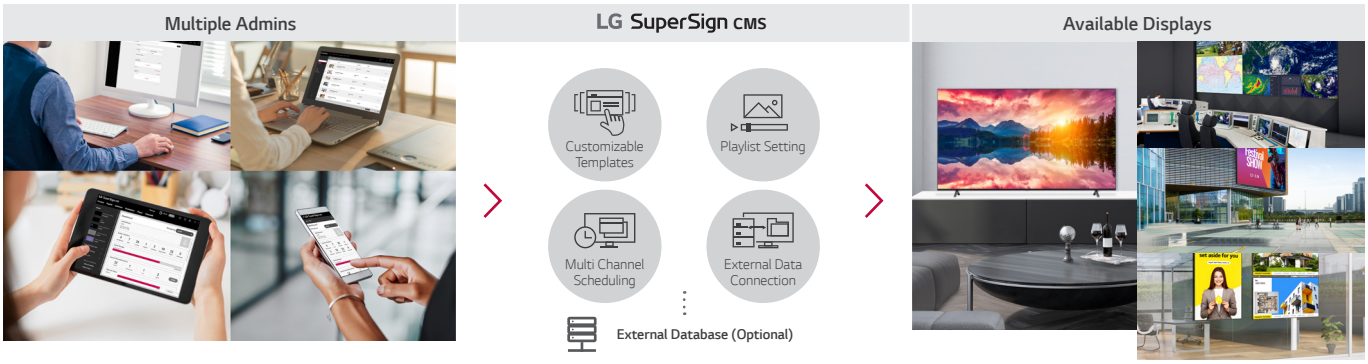
EMBEDDED CONTENT & GROUP MANAGEMENT

The embedded Content and Group Management System allows you to edit and play content, schedule playlists and groups, and control signage via remote control, mouse and mobile phone without the use of separate PC or software.

LG's SIMPLE ADVERTISEMENT HELPER, PROMOTA

Using LG's Promota* mobile application, you can easily create your own display contents. With Promota, you can add text and images to create an online profile for your business as well as deliver information such as event news, seasonal menus, promotions, and even more to your customers while leveraging easy-to-use templates relevant to your industry.

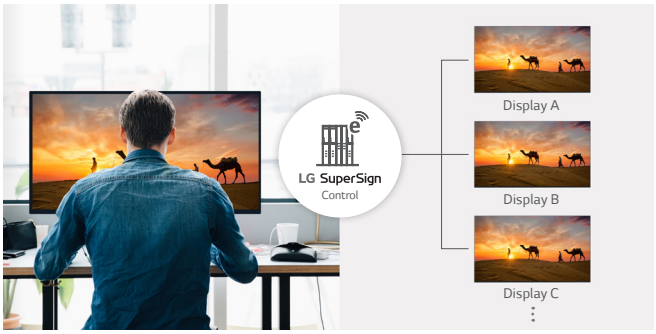
* LG Promota can be downloaded from the App Store and Google Play store.



VERSATILE CONTENT MANAGEMENT WITH LG SuperSign CMS

LG SuperSign CMS* is integrated management program supporting creation and management of digital media and content deployment, optimized for LG signage. With its simple and intuitive menus and layout options, it enhances content creation, editing, scheduling and distribution. In addition, it supports multiple displays and accounts, is able to be linked to external databases, and allows server access from mobile devices.

* LG SuperSign CMS is sold separately.



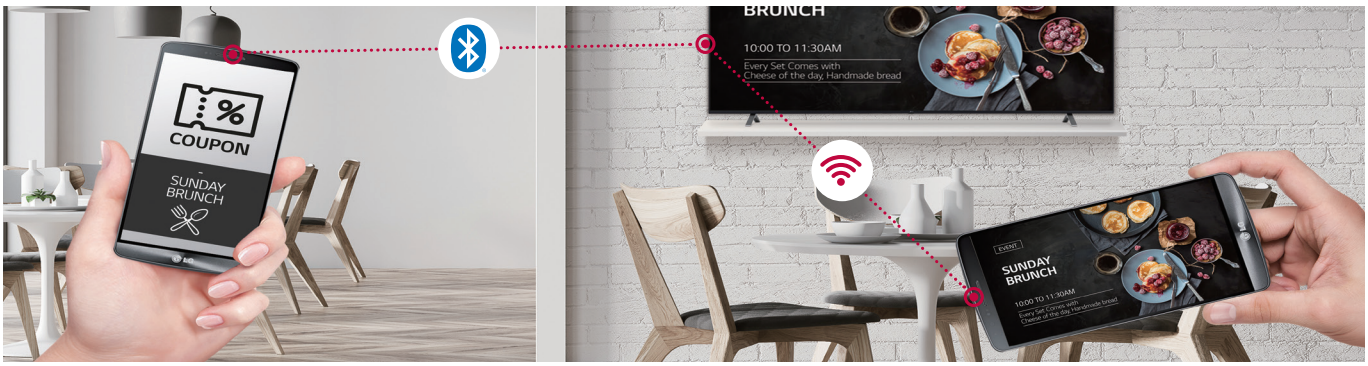
QUICK & EASY SIGNAGE CONTROL WITH LG SuperSign CONTROL

SuperSign Control is basic signage control software, and it can manage up to 100 displays through a single account and server. Power, volume, and scheduling can be remotely adjusted and firmware updates supported.

* LG SuperSign Control is sold separately.

DISPLAY POWER MANAGEMENT SUPPORT

Display Power Management (DPM) can be configured to be On only when there is a TV signal present to manage power more efficiently.



REAL-TIME PROMOTION

With Beacon and Bluetooth® Low Energy (BLE), shop managers can provide coupons and information in real-time.

CONTENT SHARING

Content Mirroring among devices is available on a same Wi-Fi network.

EASY MENU SETUP FOR VERTICAL NEEDS

The UR640S9UD series conveniently organizes frequently used menus* by industry.

* Pre-set support verticals: Corporate / Government / Retail / Meeting Room

REAL-TIME LG ConnectedCare SERVICE

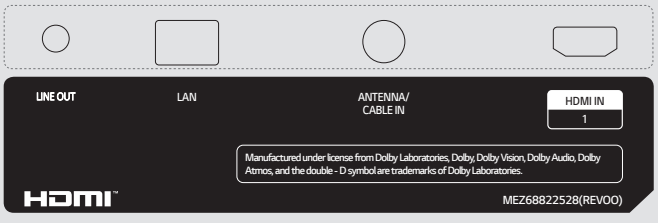
Maintenance is easy and fast with the optional LG ConnectedCare* service, a cloud service solution provided by LG. It remotely manages the status of displays in client workplaces for fault diagnosis and remote-control services, supporting the stable operation of clients' businesses.

* The availability of the 'LG ConnectedCare' service differs by region is sold separately. Contact the LG sales representative in your region for more details.

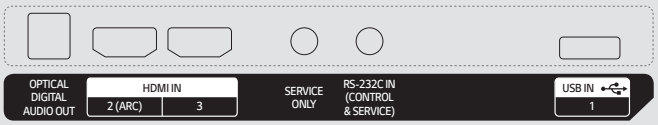
CONNECTIVITY

86"

Rear

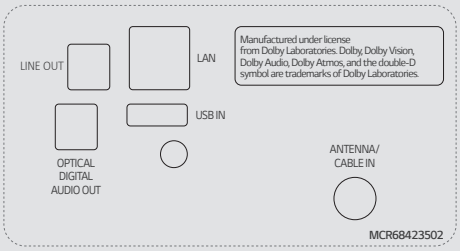


Side

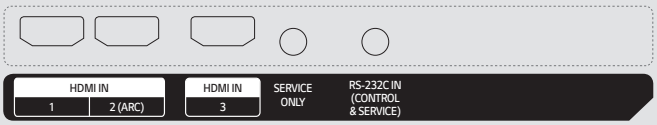


75" / 65" / 55" / 50" / 43"

Rear



Side



* Jack Panels may differ from the above image, so please contact LG sales team to verify before ordering.

		86UR640S9UD	75UR640S9UD	65UR640S9UD	55UR640S9UD	50UR640S9UD	43UR640S9UD
DISPLAY	Size	86"	75"	65"	55"	50"	43"
	Resolution	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)
	Backlight Unit Type	Direct	Direct	Direct	Direct	Direct	Direct
	Brightness	330 nits	330 nits	400 nits	400 nits	400 nits	300 nits
	Dynamic Contrast Ratio (Dynamic MCI (Hz))	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1
	Static (Panel) Contrast Ratio	1200:1	1200:1	1200:1	1300:1	5,000:1	1200:1
	Response Time (G to G)	5 ms	8 ms	8 ms	14 ms	19 ms	8 ms
	Refresh Rate	120 Hz	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	Life Span	30,000 hrs	30,000 hrs	30,000 hrs	30,000 hrs	30,000 hrs	30,000 hrs
	HDR_HDR 10 Pro	Yes	Yes	Yes	Yes	Yes	Yes
	HDR_HLG	Yes	Yes	Yes	Yes	Yes	Yes
AUDIO	Built-in Speakers	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W	2.0 channel, 10W + 10W
	LG Sound Sync	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)	Yes (Bluetooth Required)
BROADCASTING	Broadcasting System	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC
	Global IPTV Support	Yes	Yes	Yes	Yes	Yes	Yes
SMART FEATURES	Smart Home (Launcher Bar)	Yes	Yes	Yes	Yes	Yes	Yes
	Quick Access	Yes	Yes	Yes	Yes	Yes	Yes
	Web Browser	Yes	Yes	Yes	Yes	Yes	Yes
	Pre-loaded App	YouTube	YouTube	YouTube	YouTube	YouTube	YouTube
	SDP Server compatibility	Yes	Yes	Yes	Yes	Yes	Yes
	SW Clock (World Clock / Alarm)	Yes	Yes	Yes	Yes	Yes	Yes
	Mood Display	Yes	Yes	Yes	Yes	Yes	Yes
	SoftAP	Yes	Yes	Yes	Yes	Yes	Yes
	Wi-Fi	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac	802.11ac
	Screen Share (Miracast)	Yes	Yes	Yes	Yes	Yes	Yes
	Smart Share	Yes	Yes	Yes	Yes	Yes	Yes
	LG ThinQ App	Yes	Yes	Yes	Yes	Yes	Yes
	DIAL	Yes	Yes	Yes	Yes	Yes	Yes
	Bluetooth Audio Playback	Yes	Yes	Yes	Yes	Yes	Yes
	Mobile Connection Overlay	Yes	Yes	Yes	Yes	Yes	Yes
OTHER FEATURES	HDMI-ARC	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2
	USB Cloning	Yes	Yes	Yes	Yes	Yes	Yes
	WOL	Yes	Yes	Yes	Yes	Yes	Yes
	SNMP	Yes	Yes	Yes	Yes	Yes	Yes
	Self Diagnostics (USB)	Yes	Yes	Yes	Yes	Yes	Yes
	SI Compatible Protocol	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner
	HTNG-CEC	Yes	Yes	Yes	Yes	Yes	Yes
	Simplink (HDMI-CEC)	1.4	1.4	1.4	1.4	1.4	1.4
	IR Out	RS-232C	RS-232C	RS-232C	RS-232C	RS-232C	RS-232C
	Multi-code IR	Yes	Yes	Yes	Yes	Yes	Yes
	Hotel Mode / PDM / Installer Menu	Yes	Yes	Yes	Yes	Yes	Yes
	Lock mode	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)
	Port Block	Yes	Yes	Yes	Yes	Yes	Yes
	Welcome Screen (Splash Image)	Yes	Yes	Yes	Yes	Yes	Yes
	Insert Image	Yes	Yes	Yes	Yes	Yes	Yes
	IP Channel Manager	Yes	Yes	Yes	Yes	Yes	Yes
	External Speaker Out	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type(GND,L+,R+), 2W with 8Ω	Int / Fixed, 3.5mm, Stereo, Single ended Type GND,L+, R+), 2W with 8Ω
	RJP (remote jack pack) Compatibility	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)
	Moving Picture Playback (SD/HD/Plus HD)	Yes	Yes	Yes	Yes	Yes	Yes
	Auto Off / Sleep Timer	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
	Energy Saving mode	Yes	Yes	Yes	Yes	Yes	Yes
	Motion Eye Care	Yes	Yes	Yes	Yes	Yes	Yes
	Crestron Certi. Compatibility	Yes	Yes	Yes	Yes	Yes	Yes
	DPM (Digital Power Management)	Yes	Yes	Yes	Yes	Yes	Yes
	Time scheduler	Yes	Yes	Yes	Yes	Yes	Yes
	RTC (Real Time Clock)	Yes	Yes	Yes	Yes	Yes	Yes
	NTP sync timer	Yes	Yes	Yes	Yes	Yes	Yes

		86UR640S9UD	75UR640S9UD	65UR640S9UD	55UR640S9UD	50UR640S9UD	43UR640S9UD
OTHER FEATURES	BEACON	Yes	Yes	Yes	Yes	Yes	Yes
	Embedded CM (Contents Manager)	Yes	Yes	Yes	Yes	Yes	Yes
	Embedded GM (Group Manager)	Yes	Yes	Yes	Yes	Yes	Yes
	Promota / Mobile CMS	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
	SuperSign Control / Control Plus	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
	SuperSign CMS(Premium)	Yes	Yes	Yes	Yes	Yes	Yes
	Simple Editor	Yes	Yes	Yes	Yes	Yes	Yes
INTERFACES	HDMI In	3 (v2.0)	3 (v2.0)	3 (v2.0)	3 (v2.0)	3 (v2.0)	3 (v2.0)
	RS-232C	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack
	Service Only	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack
	USB 2.0	1	1	1	1	1	1
	RF In	1	1	1	1	1	1
	Optical Digital Audio Out	1	1	1	1	1	1
	Line Out	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack	3.5mm Stereo Jack
	RJ45 (LAN)	1	1	1	1	1	1
MECHANICAL	Stand Type	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole	86/75/65/55/50": 20Y 2Pole 43" : 18Y 2Pole
	Front Color	Blue	Blue	Blue	Blue	Blue	Blue
	VESA Compatible	600 x 400	400 x 400	300 x 300	300 x 300	200 x 200	200 x 200
	Kensington Lock	Yes	Yes	Yes	Yes	Yes	Yes
	Weight without Stand	99.6 lbs / 45.2 kg	69.2 lbs / 31.4 kg	47.4 lbs / 21.5 kg	30.9 lbs / 14.0 kg	25.8 lbs / 11.7 kg	19.4 lbs / 8.8 kg
	Weight with Stand	101.2 lbs / 45.9 kg	70.8 lbs / 32.1 kg	48.1 lbs / 21.8 kg	31.3 lbs / 14.2 kg	26.2 lbs / 11.9 kg	19.6 lbs / 8.9 kg
	Shipping Weight	128.8 lbs / 58.4 kg	91.5 lbs / 41.5 kg	61.3 lbs / 27.8 kg	41.9 lbs / 19.0 kg	32.2 lbs / 14.6 kg	24.5 lbs / 11.0 kg
	Dimensions without Stand	75.9 x 43.5 x 2.4 in 1927 x 1104 x 59.9 mm	66.1 x 38.0 x 2.4 in 1678 x 964 x 59.9 mm	57.2 x 33.0 x 2.3 in 1454 x 838 x 57.7 mm	48.6 x 28.1 x 2.3 in 1235 x 715 x 57.5 mm	44.1 x 25.6 x 2.2 in 1121 x 651 x 57.1 mm	38.1 x 22.2 x 2.2 in 967 x 564 x 57.1 mm
	Dimensions with Stand	75.9 x 45.9 x 14.3 in 1927 x 1167 x 362 mm	66.1 x 40.4 x 14.3 in 1678 x 1027 x 362 mm	57.2 x 35.4 x 10.7 in 1454 x 899 x 271 mm	48.6 x 30.4 x 9.1 in 1235 x 772 x 232 mm	44.1 x 27.9 x 9.1 in 1121 x 708 x 232 mm	38.1 x 24.5 x 8.5 in 967 x 622 x 216 mm
	Dimensions in Shipping	83.3 x 47.8 x 9.0 in 2115 x 1215 x 228 mm	74.0 x 43.9 x 7.9 in 1880 x 1115 x 200 mm	63.0 x 38.2 x 6.8 in 1600 x 970 x 172 mm	53.5 x 31.9 x 6.4 in 1360 x 810 x 162 mm	47.8 x 30.5 x 6.0 in 1215 x 775 x 152 mm	41.5 x 26.0 x 5.6 in 1055 x 660 x 142 mm
	Bezel Width (L/R/U/B): On Bezel	15.9 / 15.9 / 15.9 / 19.9 mm	13.9 / 13.9 / 13.9 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm
	Bezel Width (L/R/U/B): Off Bezel	6.9 / 6.9 / 6.9 / 18.4 mm	7.9 / 7.9 / 7.9 / 18.4 mm	6.8 / 6.8 / 6.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm	7.3 / 7.3 / 7.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm
POWER	Power Supply (Voltage, Hz)	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz
	Power Consumption (Max)	339 W	228 W	198 W	166.3 W	144.8 W	119.1 W
	Power Consumption (Typ)	313 W	202 W	169 W	140.1 W	118.8 W	97.7 W
	Standby Power Consumption	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W
WARRANTY & OTHER	Standards	UL	UL	UL	UL	UL	UL
	EMC Certification	FCC	FCC	FCC	FCC	FCC	FCC
	Environmental	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6	EPEAT, ISTA6
	Accessories	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory	L-Con Remote Control, Power Cable (2m, Attached), Optional Chromecast Anti-theft Accessory

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SPEC_UR640S_072118_LR

LG Business Solutions

HD-DA4-4KZ-E

1:4 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support

- *Splits one HDMI® source to four outputs*
- *Handles 4K60 4:4:4 and HDR video signals [1]*
- *Fully compatible with HD 1080p, UHD 4K, and DCI 4K sources and displays*
- *Handles 3D video and Deep Color*
- *Handles Dolby® TrueHD, Dolby Atmos®, DTS HD®, DTS:X®, and uncompressed 7.1 linear PCM audio*
- *Selectable handling of HDCP 2.2 or HDCP 1.4*
- *EDID management options*
- *Input and output video presence indication*
- *No programming or control system required*
- *Thin profile – less than one inch deep*
- *Surface, shelf, or single rack rail mountable*
- *External 100-240V universal power pack included*

The Crestron® HD-DA4-4KZ-E is a simple to use, high-performance 4K AV distribution amplifier designed to split a single HDMI® signal to feed up to four separate displays, switchers, and/or other devices. It provides full support for UHD and DCI 4K60 4:4:4 and HDR video, HDCP 1.4 or 2.2 copy protection, and high-bitrate 7.1 audio, to ensure optimal performance and compatibility for any HD or 4K video application. No programming or control system is required for operation.[1]

For smaller or larger applications, refer to models HD-DA2-4KZ-E and HD-DA8-4KZ-E.

SPECIFICATIONS

Video

Input Signal Type: HDMI w/HDR10, Deep Color, 3D, & 4K60 4:4:4 support [1] (DVI & Dual-Mode DisplayPort compatible [2])
Output Signal Type: HDMI w/HDR10, Deep Color, 3D, & 4K60 4:4:4 support [1] (DVI compatible [2])
Copy Protection: Selectable for HDCP 2.2, HDCP 1.4, or HDCP disabled

Maximum Resolutions:

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 DCI 4K & 3840x2160 4K UHD	24 Hz	4:4:4	36 bit
		30 Hz	4:4:4	36 bit
		60 Hz	4:2:2	36 bit
		60 Hz	4:4:4	24 bit
	2560x1600 WQXGA	60 Hz	4:4:4	36 bit
	1920x1080 HD1080p	60 Hz	4:4:4	36 bit
Interlaced	1920x1080 HD1080i	30 Hz	4:4:4	36 bit

NOTE: Common resolutions are shown; other resolutions are supported at pixel clock rates up to 600 MHz

Audio

Input Signal Type: HDMI (Dual-Mode DisplayPort compatible [2])
Output Signal Type: HDMI
Formats: Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS®, DTS-ES, DTS 96/24, DTS HD High Res, DTS HD Master Audio, DTS:X, LPCM up to 8 channels

Communications

USB: USB 2.0 host; supports firmware update and custom EDID upload via a USB flash drive
HDMI: HDCP & EDID (does not pass CEC)
HDCP Version: Selectable for HDCP 2.2, 1.4, or OFF;
HDCP encrypted content is blanked in OFF mode
EDID Mode: Selectable for DEFAULT or COPY 1ST;

- The factory default EDID is 4K60 4:4:4 non-HDR video with 2-channel LPCM audio;
- The factory default EDID can be replaced with a custom EDID via USB;
- Sliding the switch from DEFAULT to COPY 1ST copies and stores the EDID from the device at OUTPUT 1 and passes it to the INPUT source device;
- Sliding the switch from COPY 1ST to DEFAULT erases the stored EDID and uses the factory default or custom EDID;

Note: Changing the device at OUTPUT 1 will not update the stored EDID until the switch is moved to DEFAULT and back to COPY 1ST

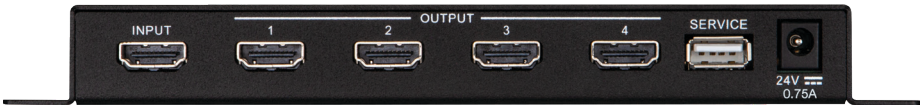
Connectors

INPUT: (1) HDMI Type A connector, female;
HDMI digital video/audio input [1];
(DVI & Dual-Mode DisplayPort compatible [2])

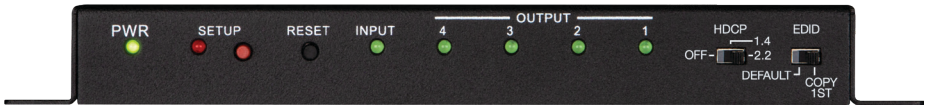
OUTPUT 1 – 4: (4) HDMI Type A connectors, female;
HDMI digital video/audio outputs [1];
(DVI compatible [2])

SERVICE: (1) USB Type A connector, female;
USB 2.0 host port;
For firmware update and custom EDID upload via a USB flash drive

HD-DA4-4KZ-E 1:4 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support



HD-DA4-4KZ-E – Front View



HD-DA4-4KZ-E – Rear View

24VDC 0.75A: (1) 2.1 x 5.5 mm DC power connector; 24 Volt DC power input; PW-2407WU power pack included

Controls & Indicators

PWR: (1) Bi-color LED, indicates operating power is supplied via the power pack; illuminates amber while booting, green when operating
SETUP: (1) Pushbutton and (1) red LED, restores factory settings
RESET: (1) Recessed pushbutton for hardware reset
INPUT: (1) Green LED, indicates video signal presence at the HDMI input
OUTPUT 1 – 4: (4) Green LEDs, each indicates video signal transmission at the corresponding HDMI output
HDCP: (1) 3-position slide switch, selects the HDCP version (OFF, 1.4, or 2.2)
EDID: (1) 2-position slide switch, selects the EDID mode (DEFAULT or COPY 1ST)

Power

Power Pack (included): Input: 100-240 Volts AC, 50/60 Hz; Output: 0.75 Amps @ 24 Volts DC; Model: PW-2407WU
Power Consumption: 5.5 W (typical)

Environmental

Temperature: 32° to 104° F (0° to 40° C)
Humidity: 10% to 90% RH (non-condensing)

Enclosure

Chassis: Metal, black finish, with (2) integral mounting flanges
Mounting: Freestanding, surface mount, or attach to a single rack rail

Dimensions

Height: 0.87 in (22 mm)
Width: 8.09 in (206 mm)
Depth: 4.67 in (119 mm)

Compliance

CE, IC, FCC part 15 Class B digital device

MODELS & ACCESSORIES

Available Models

HD-DA4-4KZ-E: 1:4 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support

Included Accessories

PW-2407WU: Wall Mount Power Pack, 24VDC, 0.75A, 2.1mm, Universal (Qty. 1 included)

Available Accessories

CBL-HD Series: High-Speed HDMI® Cables

Notes:

1. 4K60 4:4:4 and HDR support requires the use of HDMI cables and couplers with a minimum TMDS bandwidth of 18 Gbps. If 4K60 4:2:0 or 4K30 4:4:4 performance is acceptable, cables and couplers with a minimum bandwidth of 10.2 Gbps may be used. Please be aware that bandwidth loss is cumulative, so performance may be reduced when inserting multiple cables and couplers inline.
2. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or Dual-Mode DisplayPort signal. CBL-HD-DVI interface cables are available separately.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at https://www.crestron.com/How-To-Buy/Find-a-Representative or by calling 855-263-8754.

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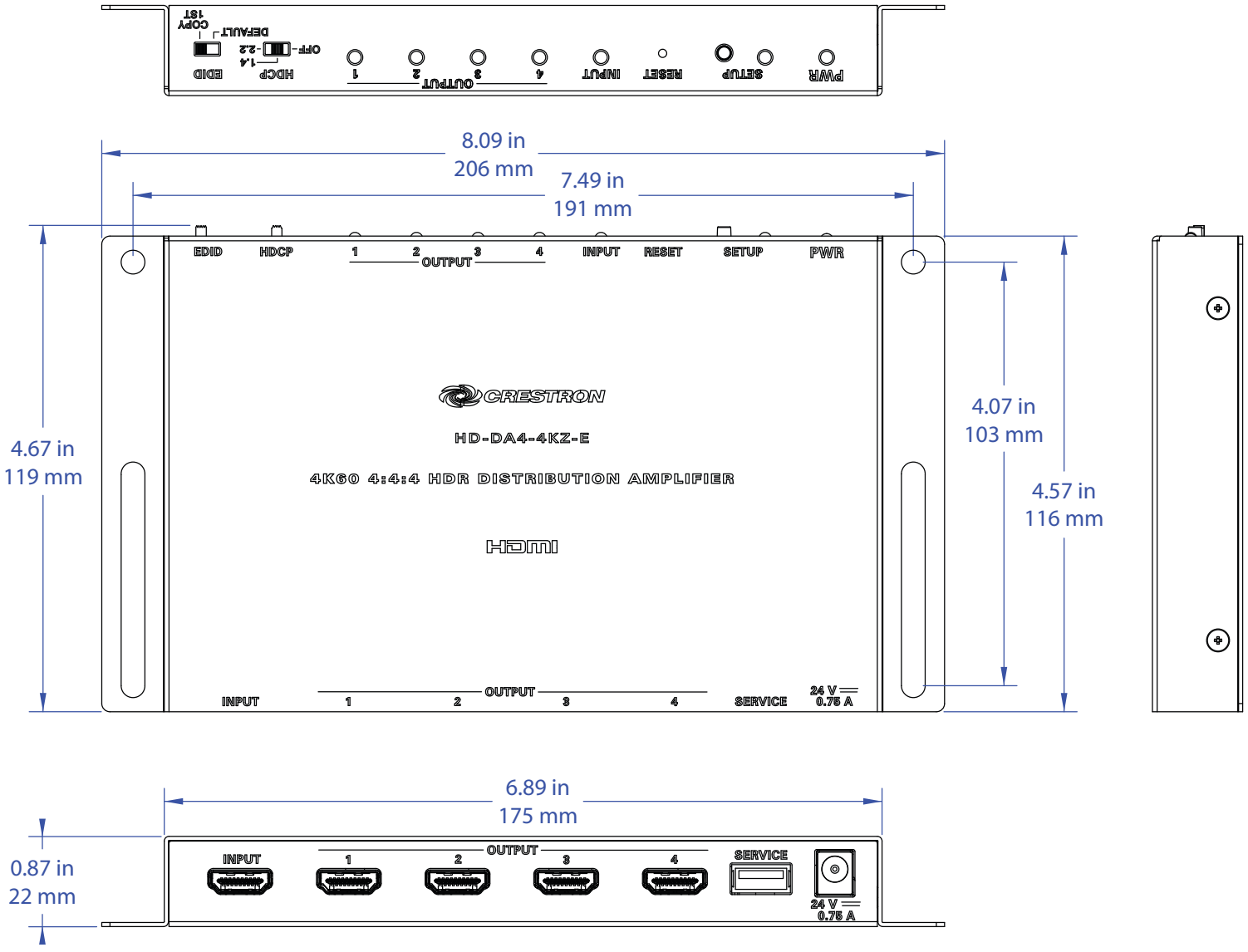
HD-DA4-4KZ-E 1:4 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support



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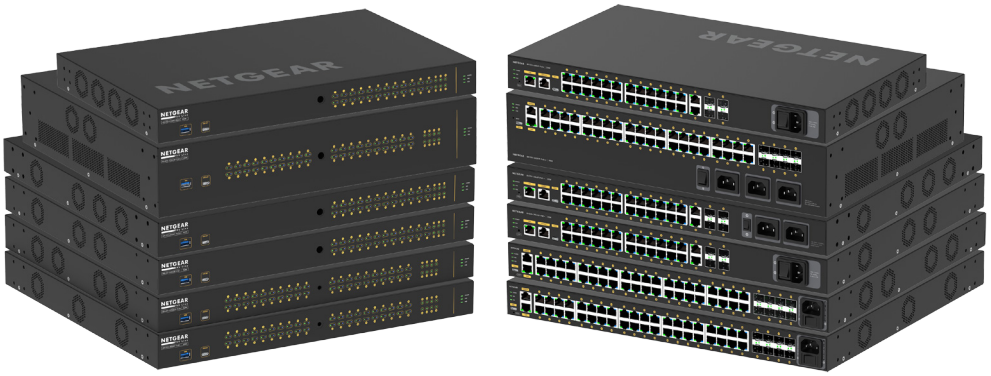
NETGEAR®

AV Line

Datasheet | **M4250 series**

AV Line Managed Switches



Switching Engineered for AV over IP

Introducing the NETGEAR AV Line of M4250 Switches, developed and engineered for audio/video professionals with dedicated service and support. M4250 has been built from the ground up for the growing AV over IP market, combining years of networking expertise in AV with M4300 and M4500 series with best practices from leading experts in the professional AV market. AV codecs generally use 1Gbps or 10Gbps per stream and the AV Line of M4250 targets the widespread 1Gbps codecs.

PoE+, Ultra90 PoE++ and rear-facing ports ensure a clean integration in AV racks. M4250 switches come pre-configured for standard audio and video signals. When requirements are more specific, an AV user interface offers customization with port-based profiles. For audio Dante, Q-SYS and AES67 profiles are available, as well as an AVB profile requiring an AVB license sold separately. For video the M4250 offers profiles for NVX, AMX, Q-SYS, NDI, Dante etc. as well as audio/video/control mixed profiles. When multiple switches are used, NETGEAR IGMP Plus™ brings automation for you to just connect them together, or with M4300 and M4500 switches.

Highlights

Extended AV features

- Dedicated AV web-based GUI interface for more specific AV installations
- Color-based AV profiles can be applied to the different ports
- Dante, Q-SYS, AES67 and AVB audio profiles
- AVB requires a license (sold separately)
- NVX, SVSI, Q-SYS, NDI and Dante video profiles
- Audio / video / control mixed profiles
- Automatic switch interconnect with NETGEAR Auto-Trunk, Auto-LAG and IGMP Plus
- Common Layer 2 and Layer 3 switching engine across all M4250 models
- Built-in IT web GUI, console, telnet and SSH consistent with other NETGEAR M4300 and M4500 series
- Feature set includes static, RIP and PIM routing, DHCP Server and PTPv2

Audio Video Bridging (AVB) services

- AVB is one of the many features designed into the M4250 product line
- AVB is an industry standard for transporting content over a network
- AVB is used most often when very low latency is required such as in live performances when lip sync is critical
- All of the AV Line M4250 switches can be optionally licensed for AVB support

Other IT use cases

- Standard or recessed mounting with all ports in the back, or all ports in the front
- Fully featured L2/L3/L4 platform for midsize Enterprise campus networks, IoT and IPTV

Industry standard management

- Industry standard command line interface (CLI), main NETGEAR IT web interface (GUI), SNMP, sFlow and RSPAN
- Single-pane-of-glass NMS300 management platform with centralized firmware updates and mass-configuration support

Industry leading warranty

- NETGEAR M4250 series is covered under NETGEAR ProSAFE Limited Lifetime Hardware Warranty*
- 90 days of Technical Support via phone and email, Lifetime Technical Support through online chat and Lifetime Next Business Day hardware replacement

Hardware-at-a-Glance

			REAR (REVERSIBLE)*					LEDs	MANAGEMENT	
Model Name	Form-Factor	Switching Fabric	10/100/1000 BASE-T RJ45 ports	100/1000/2.5G BASE-T RJ45 ports	1000BASE-X SFP ports	1000/10G BASE-X SFP+ ports	PSU	Status Information	Out-of-band Console	Model Number
M4250-10G2F-PoE+	1U rackmount 440 x 43.2 x 200mm	24 Gbps	8 ports PoE+ (125W) 2 additional ports	-	2 ports SFP 1G	-	1 x Fixed (C14) On/off switch	Available both in front and in the rear: Power LED PoE Max LED (PoE models) Fan LED Port LEDs	Ethernet: 1G Out-of-band (Rear) Console: RJ45 RS232 (Rear) Console: USB-C (Rear) Storage: USB-A (Front) LED Ext: USB-C (Front)	GSM4212P
M4250-10G2XF-PoE+	1U rackmount 440 x 43.2 x 200mm	60 Gbps	8 ports PoE+ (240W) 2 additional ports	-	-	2 ports SFP+ 1G, 10G	1 x Fixed (C14) On/off switch			GSM4212PX
M4250-10G2XF-PoE++	1U rackmount 440 x 43.2 x 257mm	60 Gbps	8 ports PoE++** (720W) 2 additional ports	-	-	2 ports SFP+ 1G, 10G	1 x Fixed (C14) On/off switch			GSM4212UX
M4250-26G4F-PoE+	1U rackmount 440x43.2x257mm	60 Gbps	24 ports PoE+ (300W) 2 additional ports	-	4 ports SFP 1G		1 x Fixed (C14) On/Off switch			GSM4230P
M4250-26G4F-PoE++	1U rackmount 440x43.2x400mm	60 Gbps	24 ports PoE++ (1,440W)** (1 PSU/720W; 2 PSU/1,440W) 2 additional ports	-	4 ports SFP 1G		2 x Fixed (C14) On/Off switch			GSM4230UP
M4250-26G4XF-PoE+	1U rackmount 440x43.2x400mm	132 Gbps	24 ports PoE+ (480W) 2 additional ports	-	-	4 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			GSM4230PX
M4250-40G8F-PoE+	1U rackmount 440x43.2x400mm	96 Gbps	40 ports PoE+ (480W)	-	8 ports SFP 1G		1 x Fixed (C14) On/Off switch			GSM4248P
M4250-40G8XF-PoE+	1U rackmount 440x43.2x400mm	240 Gbps	40 ports PoE+ (960W)	-	-	8 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			GSM4248PX
M4250-40G8XF-PoE++	2U rackmount 440x86.4x350mm	240 Gbps	40 ports PoE++ (2,880W)** (1 PSU/720W; 2 PSU/1,650W; 3 PSU/2,880W)	-	-	8 ports SFP+ 1G; 10G	3 x Fixed (C14) On/Off switch			GSM4248UX
M4250-12M2XF	1U rackmount 440x43.2x100mm	100 Gbps	-	12 ports 100M, 1G, 2.5G	-	2 ports SFP+ 1G, 10G	1 x Fixed (C14) On/Off switch			MSM4214X
M4250-16XF	1U rackmount 440x43.2x200mm	320 Gbps	-	-	-	16 ports SFP+ 10G only (First 12 ports support 1G)	1 x Fixed (C14) On/Off switch			XSM4216F

* Reversed mounting is possible when ports are desired on the front of the rack by using the standard rackmount ears, or the included alternate rackmount ears to mount the switch recessed by 2-Inches to allow for the cabling.

** Ultra90 PoE++ 802.3bt is compatible with 802.3af PoE (15.4W), 802.3at PoE+ (30W) and 802.3bt (60W, 75W and 90W).

Acoustic-at-a-Glance

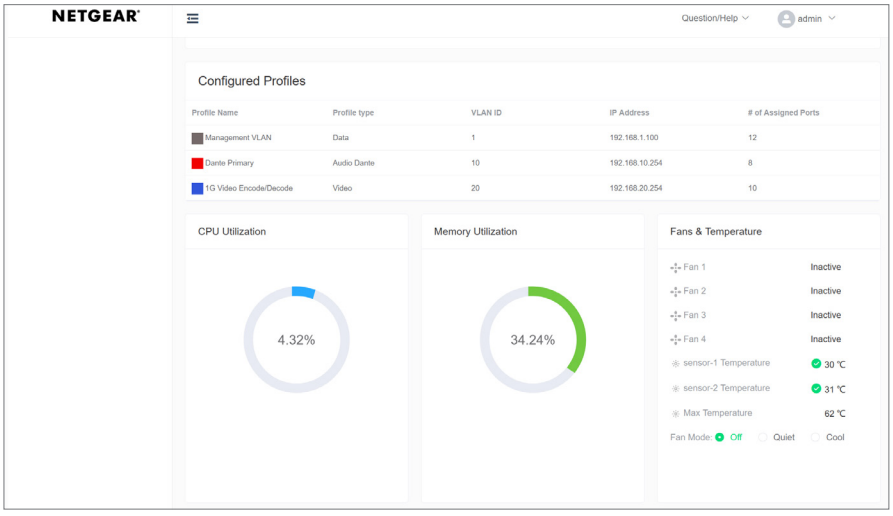
	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			
Model Name	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	Model Number
M4250-10G2F-PoE+	0dBA / 41.8°C Case Temp	25°C	<= 42°C	80W	All ports can be used	125W	25	<= 36°C	35.9°C	27.38dBA	100	27.2°C	55dBA	GSM4212P
M4250-10G2XF-PoE+	0dBA / 39.6°C Case Temp	25°C	<= 44°C	90W	All ports can be used	240W	25	<= 37°C	40.6°C	27.4dBA	100	30.9°C	56dBA	GSM4212PX
M4250-10G2XF-PoE++	0dBA / 44.6°C Case Temp	25°C	<= 67°C	45W	All ports can be used	0-250W	25	<= 49°C	42.9°C	34.57dBA	100	41.8°C	66.23dBA	GSM4212UX
						250-380W	30	<= 49°C	43.3°C	40dBA				
						380W-500W	35	<= 49°C	44.9°C	44.22dBA				
						500W-720W	40	<= 49°C	52.1°C	47.19dBA				
M4250-26G4F-PoE+	0dBA / 40.5°C Case Temp	25°C	S1<= 43°C S2<= 47°C	45W	8 ports PoE (no SFP)	0-200W	25	S1<= 43°C S2<=47°C	43.5°C	28dBA	100	36.7°C	57dBA	GSM4230P
						200W-300W	30	S1<= 44°C S2<=48°C	51.3°C	34dBA				
M4250-26G4F-PoE++	Not Supported					0-280W	20	S1<= 37°C S2<=39°C	52.9°C	28dBA	100	720W 36.7°C 1,440W 46°C	69dBA	GSM4230UP
						280W-360W	25	S1<= 38°C S2<=40°C	57.4°C	36dBA				
						360W-420W	30	S1<= 39°C S2<=41°C	54.4°C	41dBA				
						420W-480W	35	S1<= 40°C S2<=42°C	53.3°C	47dBA				
						480W-540W	40	S1<= 41°C S2<=43°C	52.3°C	50dBA				
						540W-600W	45	S1<= 42°C S2<=44°C	54.4°C	54dBA				
						600W-660W	50	S1<= 43°C S2<=45°C	53.6°C	57dBA				
						660W-1,440W	55	S1<= 44°C S2<=46°C	55.7°C	60dBA				
M4250-26G4XF-PoE+	0dBA / 43.4°C Case Temp	25°C	S1<= 41°C S2<= 46°C	45W	8 ports PoE (no SFP+)	0-350W	20	S1<= 41°C S2<=46°C	39.3°C	25dBA	100	32.3°C	67dBA	GSM4230PX
						350W-480W	30	S1<= 42°C S2<=47°C	36.8°C	42dBA				
M4250-40G8F-PoE+	0dBA / 45.2°C Case Temp	25°C	S1<= 37°C S2<= 50°C	30W	8 ports PoE (No SFP)	0-150W	20	S1<= 37°C S2<=50°C	43.1°C	30dBA	100	35.4°C	68dBA	GSM4248P
						150W-200W	25	S1<= 38°C	42.1°C	36dBA				
						200W-340W	30	S1<= 39°C S2<=51°C	44°C	40dBA				
						340W-480W	35	S1<= 40°C	47.6°C	47dBA				

Acoustic-at-a-Glance

	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			
Model Name	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	Model Number
M4250-40G8XF-PoE+	Not Supported					0-400W	20	S1<= 33°C S2<=46°C	54.2°C	29dBA	100	36.1°C	69dBA	GSM4248PX
						400W-480W	25	S1<= 34°C S2<=47°C	42.8°C	35dBA				
						480W-560W	30	S1<= 35°C S2<=48°C	41.9°C	41dBA				
						560W-640W	35	S1<= 36°C S2<=49°C	42.1°C	48dBA				
						640W-720W	40	S1<= 37°C S2<=50°C	40.9°C	51dBA				
						720W-800W	45	S1<= 38°C S2<=51°C	40.7°C	54dBA				
						800W-880W	50	S1<= 39°C S2<=52°C	40.4°C	57dBA				
						880W-960W	55	S1<= 40°C S2<=53°C	40.5°C	59dBA				
M4250-40G8XF-PoE++	Not Supported					0-160W	20	S1<= 37°C S2<=49°C	41.3°C	30dBA	100	720W 31.4°C 1,650W 33.5°C 2,880W 35.4°C	71dBA	GSM4248UX
						160W-240W	25	S1<= 38°C	38.8°C	36dBA				
						240W-320W	30	S1<= 39°C S2<=50°C	36.4°C	42dBA				
						320W-400W	35	S1<= 40°C	35.3°C	49dBA				
						400W-480W	40	S1<= 41°C S2<=51°C	34.4°C	51dBA				
						480W-560W	45	S1<= 42°C	34.3°C	55dBA				
						560W-640W	50	S1<= 43°C S2<=52°C	35.1°C	57dBA				
						660W-2,880W	55	S1<= 44°C	36.5°C	60dBA				
M4250-12M2XF	0dBA / 56°C Case Temp	25°C	<= 64°C	-	8 ports 2.5G (no SFP+)	-	25	<= 58°C	53.5°C	28.5dBA	100	33.2°C	55dBA	MSM4214X
M4250-16XF	0dBA / 41.3°C Case Temp	25°C	<= 78°C	-	8 ports SFP+	-	25	<= 67°C	41.6°C	27.44dBA	100	30.3°C	57dBA	XSM4216F

* Software-controlled fan adjustments enable the fans to be turned off when ambient temperature and PoE loads are appropriate for a totally fanless operation.

** dBA values are SPL (Sound Pressure Level) values, testing following the ISO-7779 standard. Bystander Mode. Chamber Temp 25°C during testing. Full, 100%, Data and PoE loaded. Worst case.



Software-at-a-Glance

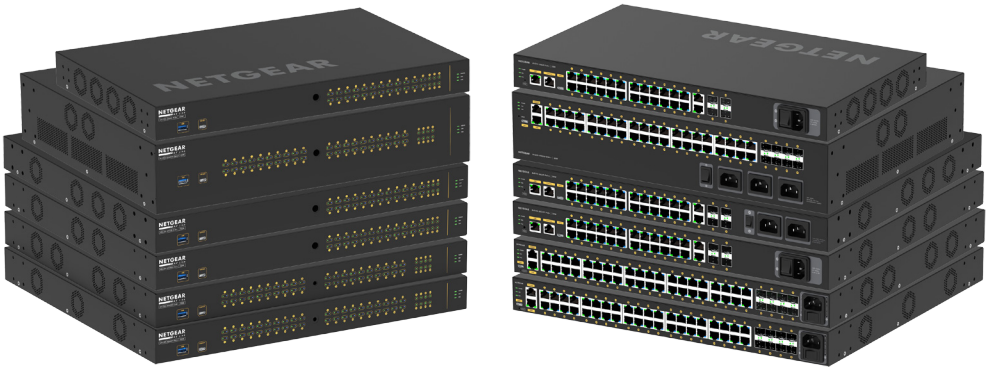
	LITE LAYER 3 PACKAGE											
Model Name	Management	AV Dedicated UI	IPv4 / IPv6 ACL and QoS, DiffServ	IPv4 / IPv6 Multicast Filtering	IPv4 / IPv6 Policing and Convergence	Spanning Tree Green Ethernet	VLANs	Trunking Port Channel	IPv4 / IPv6 Authentication Security	IPv4 / IPv6 Static Routing	IPv4 / IPv6 Dynamic Routing	Model Number
M4250 series	Out-of-band IT Web GUI (main) HTTPs CLI; Telnet; SSH SNMP, MIBs RSPAN Radius Users, TACACS+	AV web-based GUI Designed for AV installers AV-related controls Audio over IP profiles AVB profile* Video over IP profiles Mixed Audio and Video profiles	Ingress/ egress 1 Kbps shaping Time-based Single Rate Policing	NETGEAR IGMP™ Plus for automated IGMP between switches IGMPv3 MLDv2 Snooping, Proxy ASM & SSM IGMPv1,v2 Querier (compatible v3) Control Packet Flooding	Auto-VoIP Policy-based routing (PBR) LLDP-MED IEEE 1588 PTPv2 1-Step End-to-End Transparent Clock AVB*: 802.1AS, 802.1Qav, 802.1Qat MSRP, 802.1ak MMRP, 802.1ak MVRP	STP, MTP, RSTP PV(R)STP BPDU/STRG Root Guard EEE 802.3az (EEE is disabled by default)	Static, Dynamic, Voice, MAC GVRP/ GMRP Double VLAN mode Private VLANs	Auto-Trunk and Auto-LAG between M4250 Switches Static LAG, or Dynamic LACP (LACP automatically reverts to and from Static LAG) Seven (7) L2/ L3/L4 hashing algorithms	Successive Tiering (DOT1X; MAB; Captive Portal) DHCP Snooping Dynamic ARP Inspection IP Source Guard	Port, Subnet, VLAN routing Multicast static routes DHCPv4 Server DHCP Relay Stateful DHCPv6 Server	IPv4: RIP IPv4/IPv6: PIM-SM PIM-DM SSM	All models

* Requires AVB license, sold separately. All other software features are available, license-free.

Performance-at-a-Glance

	TABLE SIZE													
Model Name	MAC ARP/NDP	Routing/ Switching Capacity	Throughput 64-byte	Application Route Scaling	Packet Buffer	Latency	CPU	IP Multicast Routing Entries	Jumbo Frames	Multicast IGMP Group membership	VLANs	DHCP	sFlow	Model Number
M4250-10G2F-PoE+	16K MAC 4K ARP/ NDP	24 Gbps Line-Rate	17.86 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.27µs 1G	ARM A9 1.25Ghz 32-Bit 2GB RAM	512 IPv4 128 IPv6	Up to 12K	2K IPv4 2K IPv6	4K VLANs	DHCP Server: 2K leases IPv4: 256 pools IPv6: 16 pools	16 samplers 16 pollers 8 receivers	GSM4212P
M4250-10G2XF-PoE+	16K MAC 4K ARP/ NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.14µs 1G <0.84µs 10G								GSM4212PX
M4250-10G2XF-PoE++	16K MAC 4K ARP/ NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<1.84µs 1G <0.81µs 10G								GSM4212UX
M4250-26G4F-PoE+	16K MAC 4K ARP/NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.15.µs 1G	Quad-Core Cortex-A57 ARMv8 1.8Ghz 64-bit 2GB RAM							GSM4230P
M4250-26G4F-PoE++	16K MAC 4K ARP/NDP	60 Gbps Line-Rate	44.64 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.15µs 1G								GSM4230UP
M4250-26G4XF-PoE+	16K MAC 4K ARP/NDP	132 Gbps Line-Rate	98.21 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.29µs 1G <0.83µs 10G								GSM4230PX
M4250-40G8F-PoE+	16K MAC 4K ARP/NDP	96 Gbps Line-Rate	71.42 Mpps	Static: 894v4/126v6 RIP: 32v4	32Mb	<2.46µs 1G								GSM4248P
M4250-40G8XF-PoE+	16K MAC 4K ARP/NDP	240 Gbps Line-Rate	178.56 Mpps	Static: 894v4/126v6 RIP: 32v4	32Mb	<2.74µs 1G <0.73µs 10G								GSM4248PX
M4250-40G8XF-PoE++	16K MAC 4K ARP/NDP	240 Gbps Line-Rate	178.56 Mpps	Static: 894v4/126v6 RIP: 32v4	32Mb	<2.78µs 1G <0.73µs 10G								GSM4248UX
M4250-12M2XF	16K MAC 4K ARP/ NDP	100 Gbps Line-Rate	74.40 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<2.84.µs 1G <6.02µs 2.5G <0.81µs 10G	ARM A9 1.25Ghz 32-Bit 2GB RAM							MSM4214X
M4250-16XF	16K MAC 4K ARP/ NDP	320 Gbps Line-Rate	238.08 Mpps	Static: 894v4/126v6 RIP: 32v4	16Mb	<1.30µs 1G <0.86µs 10G								XSM4216F

Product Brief



The NETGEAR AV Line M4250 series was designed with input from AV Professionals. The result is a line of switches built from the ground up to support 1Gb audio and video over IP with customized hardware and software along with dedicated service and support.

NETGEAR M4250 series key features:

- Ranges from 8 to 48 ports with a variety of PoE+ and Ultra90 PoE++ options for 15.4W, 30W, 60W, 75W and 90W AVoIP endpoints
- Uplink options include 1G for audio installations or standalone video installations as well as 10G uplinks for larger scale video deployments
- Also includes 12-port multi-gigabit Ethernet and 16-port 1G/10G fiber models for plug and play aggregation in a star topology
- Designed for a clean integration with traditional, rack-mounted, AV equipment
- The M4250 switches come with a sleek, black display panel with status in front and all cabling plus additional status in the back
- Reversed mounting is possible when ports are desired on the front of the rack
- A second pair of rackmount ears allows the switches to be mounted recessed by 2-inches to allow for the cabling
- Software-controlled fan adjustments enable the fans to be turned off when ambient temperature and PoE loads are appropriate for a totally fanless operation
- Threaded holes on the bottom (4xM5 for 50x100mm VESA) and in front (1xM10 for clamps) allow for universal mounting options outside the rack as well

NETGEAR M4250 series AV software features:

- Pre-configured for audio and video over IP out of the box, the M4250 switches enable encoders and decoders to be connected with zero configuration
- When more configuration is required, an AV web-based GUI is available
- This interface has been specially designed for AV installers with specific AV-related controls made more accessible and with port-based profiles
- For audio, profiles for Dante, Q-SYS and AES67 are built-in, as well as an AVB profile (AVB license sold separately)
- For video, the M4250 offers profiles for NVX, SVSI, Q-SYS, NDI, Kramer KDS, Aurora Multimedia, ZeeVee, Atlona, Dante and SDVoE
- Other AV CODECs and manufacturers are supported as well as audio/video/control mixed profiles
- To further simplify star deployments, NETGEAR IGMP Plus™ brings multicast automation between all M4250 switches, and with M4300/M4500
- With Auto-Trunk and Auto-LAG, simply connect M4250 switches together and you are done!

NETGEAR M4250 series other software features:

- All M4250 switches share the same high-end NETGEAR Layer 2 / Layer 3 switching engine for a consistent experience
- All switches in the M4250 series have another main, IT web-based GUI for midsize Enterprise campus networks, IoT and IPTV

- Additional features include static, RIP and PIM-SM, DM and SSM multicast routing, DHCP Server and PTPv2 Transparent Clock (1-step E2E)
- AVB is the only feature requiring a license, all other advanced features are available license-free
- Advanced classifier-based, time-based hardware implementation for L2 (MAC), L3 (IP) and L4 (UDP/TCP transport ports) security and prioritization
- Selectable Port-Channel / LAG (802.3ad - 802.1AX) L2/L3/L4 hashing for fault tolerance and load sharing with any type of Ethernet channeling
- Voice VLAN with SIP, H323 and SCCP protocols detection and LLDP-MED IP phones automatic QoS and VLAN configuration
- Efficient authentication tiering with successive DOT1X, MAB and Captive Portal methods for streamlined BYOD
- Comprehensive IPv4/IPv6 static and dynamic routing including Policy-based routing and 6-to-4 tunneling
- Advanced IPv4/IPv6 security implementation including malicious code detection, DHCP Snooping, IP Source Guard protection and DoS attacks mitigation

NETGEAR M4250 series management features:

- DHCP/BootP innovative auto-installation including firmware and configuration file upload automation
- Industry standard SNMP, RMON, MIB, LLDP, AAA, sFlow, RSPAN and PTPv2
- Service port for out-of-band Ethernet management (OOB)
- Standard RS232 straight-through serial RJ45 and USB Type-C ports for local management console
- Standard USB-A port for local storage, logs, configuration or image files
- Dual firmware image for updates with minimum service interruption
- Single-pane-of-glass NMS300 management platform with mass configuration support
- Industry standard command line interface (CLI) for IT admins used to other vendors commands
- Fully functional Web console (main GUI) for IT admins who prefer an easy to use graphical interface
- Dedicated AV web-based GUI interface available at [switch IP address:8080] for AV installations

NETGEAR M4250 series warranty and support:

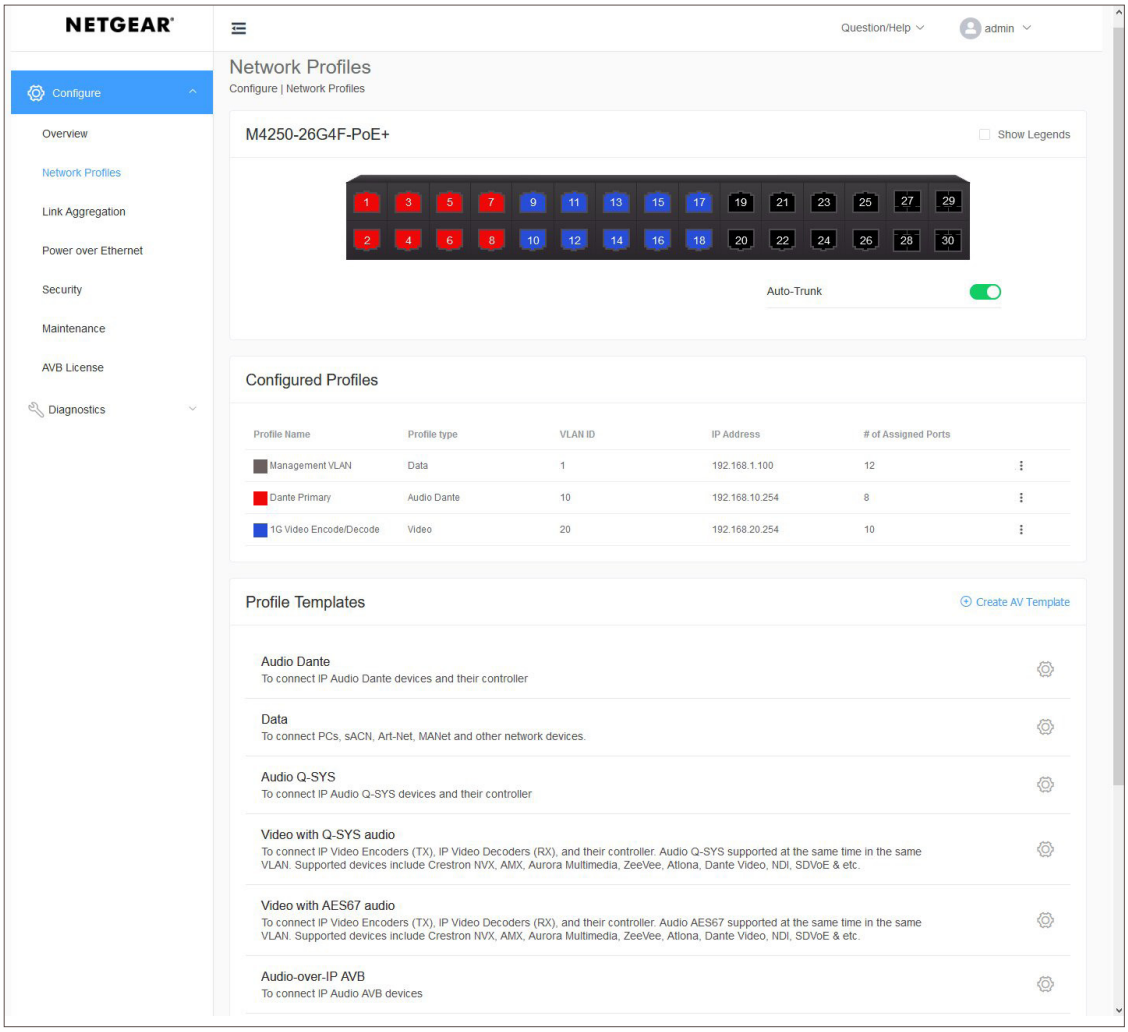
- NETGEAR ProSAFE Limited Lifetime Hardware Warranty**
- Included Lifetime Technical Support
- Included Lifetime Next Business Day Hardware Replacement
- Offering free network design services and installation support, the NETGEAR Engineering Services Team is ready to help ensure your 1G deployments with the M4250 AV over IP switches go as smooth as possible. Just drop us an email at ProAVDesign@netgear.com to get started!

Features highlights

Dedicated AV UI for AV installations

M4250 switch series is pre-configured for Audio and Video over IP out of the box with a dedicated AV web-based GUI interface for more specific AV installations

- Color-based AV profiles can be applied to the different ports
- Dante, Q-SYS, AES67 and AVB audio profiles (AVB license sold separately)
- NVX, AMX, Q-SYS, NDI, Kramer KDS, Aurora Multimedia, ZeeVee, Atlona, Dante, etc. video profiles
- Audio / video / control mixed profiles



Best value switching performance:

16K MAC address table, 4K ARP and 4K concurrent VLANs for typical midsize environnements

Low latency at all network speeds, including 10 Gigabit fiber interfaces

Jumbo frames support of up to 12KB accelerating performance with compatible nodes

Ranges from 8 to 48 ports with a variety of PoE+ and Ultra90 PoE++ 802.3bt options for 15.4W, 30W, 60W, 75W and 90W AVoIP (1G) endpoints

Tier 1 availability	
Rapid Spanning Tree (RSTP) and Multiple Spanning Tree (MSTP) allow for rapid transitionning of the ports to the Forwarding state and the suppression of Topology Change Notification	
NETGEAR PVSTP implementation follows the same rules than other vendor's Per VLAN STP for strict interoperability	• Including industry-standard PVST+ interoperability • PVSTP is similar to the MSTP protocol as defined by IEEE 802.1s, the main difference being PVSTP runs one instance per VLAN • In other words, each configured VLAN runs an independent instance of PVSTP • FastUplink feature immediately moves an alternate port with lowest cost to forwarding state when the root port goes down to reduce recovery time • FastBackbone feature selects new indirect port when an indirect port fails
NETGEAR PVRSTP implementation follows the same rules than other vendor's Per VLAN RSTP for strict interoperability	• Including industry-standard RPVST+ interoperability • PVRSTP is similar to the RSTP protocol as defined by IEEE 802.1w, the main difference being PVRSTP runs one instance per VLAN • In other words, each configured VLAN runs an independent instance of PVRSTP • Each PVRSTP instance elects a root bridge independent of the other • Hence there are as many Root Bridges in the region as there are VLANs configured • Per VLAN RSTP has in built support for FastUplink and FastBackbone
IP address conflict detection performed by embedded DHCP servers prevents accidental IP address duplicates from perturbing the overall network stability	
IP Event Dampening reduces the effect of interface flaps on routing protocols: the routing protocols temporarily disable their processing (on the unstable interface) until the interface becomes stable, thereby greatly increasing the overall stability of the network	
Ease of deployment	
Automatic configuration with DHCP and BootP Auto Install eases large deployments with a scalable configuration files management capability, mapping IP addresses and host names and providing individual configuration files to multiple switches as soon as they are initialized on the network	
Both the Switch Serial Number and primary MAC address are reported by a simple "show hardware" command in CLI - facilitating discovery and remote configuration operations	
M4300 DHCP L2 Relay agents eliminate the need to have a DHCP server on each physical network or subnet	• DHCP Relay agents process DHCP messages and generate new DHCP messages • Supports DHCP Relay Option 82 circuit-id and remote-id for VLANs • DHCP Relay agents are typically IP routing-aware devices and can be referred to as Layer 3 relay agents
Automatic Voice over IP prioritization with Auto-VoIP simplifies most complex multi-vendor IP telephones deployments either based on protocols (SIP, H323 and SCCP) or on OUI bytes (default database and user-based OUIs) in the phone source MAC address; providing the best class of service to VoIP streams (both data and signaling) over other ordinary traffic by classifying traffic, and enabling correct egress queue configuration	
An associated Voice VLAN can be easily configured with Auto-VoIP for further traffic isolation	
When deployed IP phones are LLDP-MED compliant, the Voice VLAN will use LLDP-MED to pass on the VLAN ID, 802.1P priority and DSCP values to the IP phones, accelerating convergent deployments	
Ease of management and granular control	
Dual firmware image and dual configuration file for transparent firmware updates / configuration changes with minimum service interruption	
Flexible Port-Channel/LAG (802.3ad - 802.1AX) implementation for maximum compatibility, fault tolerance and load sharing with any type of Ethernet channeling from other vendors switch, server or storage devices conforming to IEEE 802.3ad - including static (selectable hashing algorithms) - or to IEEE 802.1AX with dynamic LAGs or port-channel (highly tunable LACP Link Aggregation Control Protocol)	
LACP mode automatically reverts to and from Static LAG, useful when the host isn't LACP anymore, for instance during a factory reset or re-configuration	
Auto-LAG: If more than one link between two M4250 switches, a Link Aggregation Group is created, dynamically	
Unidirectional Link Detection Protocol (UDLD) and Aggressive UDLD detect and avoid unidirectional links automatically, in order to prevent forwarding anomalies in a Layer 2 communication channel in which a bi-directional link stops passing traffic in one direction	
Port names feature allows for descriptive names on all interfaces and better clarity in real word admin daily tasks	

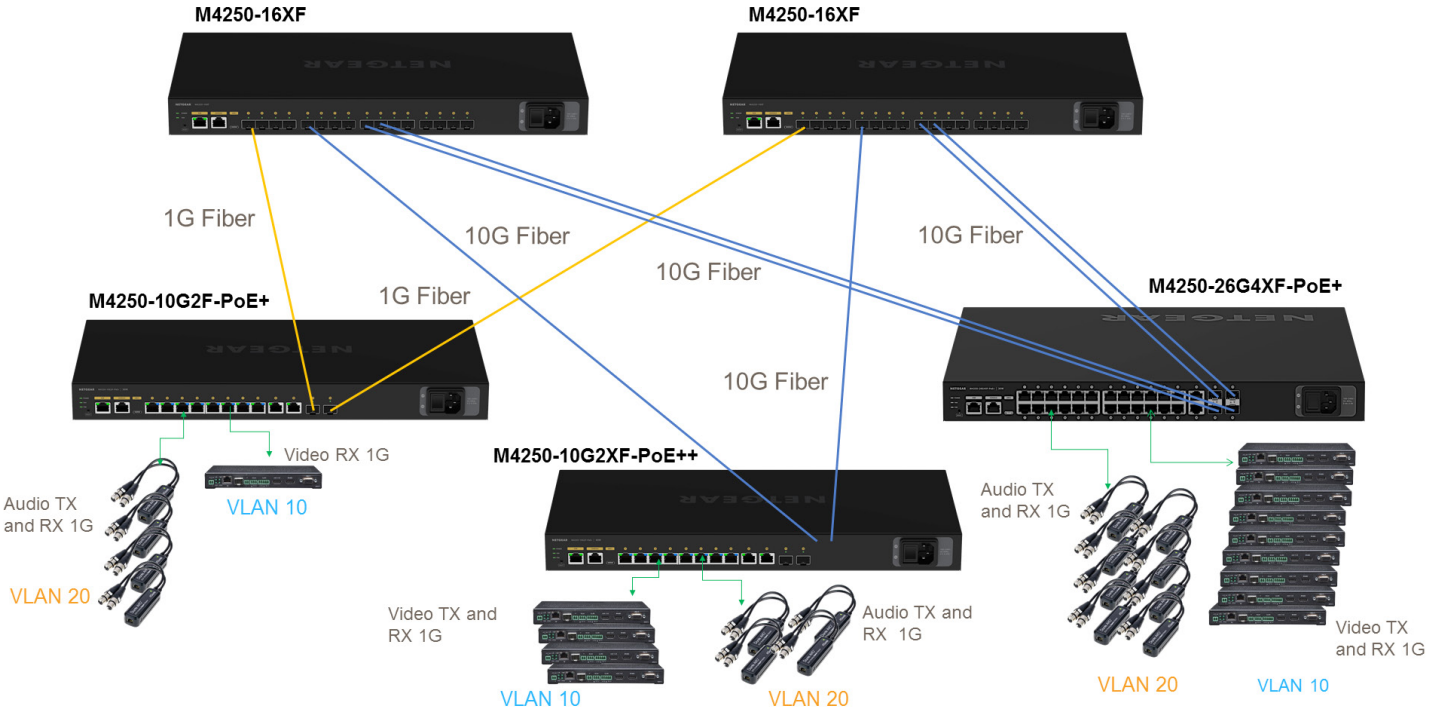
SDM (System Data Management, or switch database) templates allow for granular system resources distribution depending on IPv4 or IPv6 applications	• ARP Entries (the maximum number of entries in the IPv4 Address Resolution Protocol ARP cache for routing interfaces) • IPv4 Unicast Routes (the maximum number of IPv4 unicast forwarding table entries) • IPv6 NDP Entries (the maximum number of IPv6 Neighbor Discovery Protocol NDP cache entries) • IPv6 Unicast Routes (the maximum number of IPv6 unicast forwarding table entries) • ECMP Next Hops (the maximum number of next hops that can be installed in the IPv4 and IPv6 unicast forwarding tables) • IPv4 Multicast Routes (the maximum number of IPv4 multicast forwarding table entries) • IPv6 Multicast Routes (the maximum number of IPv6 multicast forwarding table entries)
Loopback interfaces management for routing protocols administration	
Private VLANs and local Proxy ARP help reduce broadcast with added security	
Management VLAN ID is user selectable for best convenience	
Auto-Trunk: Dynamic VLAN trunking as soon as a M4250 switch gets connected to another M4250 switch	
Industry-standard VLAN management in the command line interface (CLI) for all common operations such as VLAN creation; VLAN names; VLAN "make static" for dynamically created VLAN by GVRP registration; VLAN trunking; VLAN participation as well as VLAN ID (PVID) and VLAN tagging for one interface, a group of interfaces or all interfaces at once	
Simplified VLAN configuration with industry-standard Access Ports for 802.1Q unaware endpoints and Trunk Ports for switch-to-switch links with Native VLAN	
System defaults automatically set per-port broadcast, multicast, and unicast storm control for typical, robust protection against DoS attacks and faulty clients which can, with BYOD, often create network and performance issues	
IP Telephony administration is simplified with consistent Voice VLAN capabilities per the industry standards and automatic functions associated	
Comprehensive set of "system utilities" and "Clear" commands help troubleshoot connectivity issues and restore various configurations to their factory defaults for maximum admin efficiency: traceroute (to discover the routes that packets actually take when traveling on a hop-by-hop basis and with a synchronous response when initiated from the CLI), clear dynamically learned MAC addresses, counters, IGMP snooping table entries from the Multicast forwarding database etc...	
Syslog and Packet Captures can be sent to USB storage for rapid network troubleshooting	
Replaceable factory-default configuration file for predictable network reset in distributed branch offices without IT personnel	
All major centralized software distribution platforms are supported for central software upgrades and configuration files management (HTTP, TFTP), including in highly secured versions (HTTPS, SFTP, SCP)	
Simple Network Time Protocol (SNTP) can be used to synchronize network resources and for adaptation of NTP, and can provide synchronized network timestamp either in broadcast or unicast mode (SNTP client implemented over UDP - port 123)	
Embedded RMON (4 groups) and sFlow agents permit external network traffic analysis	
Engineered for convergence and AV-over-IP	
Audio (Voice over IP) and Video (multicasting) comprehensive switching, filtering, routing and prioritization	
Auto-VoIP, Voice VLAN and LLDP-MED support for IP phones QoS and VLAN configuration	
IEEE 1588 (section 10 and 11.5) PTPv2 Transparent Clock (TC) End-to-End implementation considering the residence time of PTPv2 packets from ingress to egress	• 1-step Transparent Clock mode, using the residence time of the PPTPv2 packet at the egress port level in Standalone mode, or Stack Master only • The "Sync" & "Delay_Req" fields of passing/egressing out PTPv2 packets are updated with the residence time in the switch, the other fields in PTPv2 packets ("Announce", "Delay_Resp", "Pdelay_Req" and "Pdelay_Resp") are not updated
NETGEAR IGMP Plus™ for automatic multicast across a M4250 / M4300 / M4500 L2 network (Spine and Leaf topologies), removing the need for L3 PIM routing	• IGMP Plus is pre-configured on default VLAN 1 out of the box • IGMP Plus can be configured on another VLAN for automatic IGMP across switches on that VLAN (uplinks can make part of that VLAN in trunk mode) • IGMP Plus allow AV-over-IP devices (TX/Encoders and RX/Decoders) to be connected across multiple switches in a star topology • The `show igmpsnooping group` command in CLI and GUI displays the Source and Group IP addresses along with their corresponding MAC addresses that are learnt through IGMP Snooping in a given VLAN on a given interface
The M4250 series automatically configure the interconnect between switches for robust topologies	
With IGMP Plus, Auto-Trunk and Auto-LAG, your deployment will JUST WORK	

IGMP Snooping and Proxy for IPv4, MLD Snooping and Proxy for IPv6, and Querier mode facilitate fast receivers joins and leaves for multicast streams and ensure multi-cast traffic only reaches interested receivers everywhere in a Layer 2 or a Layer 3 network, including source-specific (SSM) and any-source (ASM) multicast	
Multicast VLAN Registration (MVR) uses a dedicated Multicast VLAN to forward multicast streams and avoid duplication for clients in different VLANs	
Multicast routing (PIM-SM and PIM-DM, both IPv4 and IPv6) ensure multicast streams can reach receivers in different L3 subnets	
PoE power management and schedule enablement for powering on and powering off PoE nodes connected to the switch	
AVB is one of the many features designed into the M4250 product line	• IEEE 802.1BA-2011 Audio Video Bridging (AVB) when an AVB license is properly installed in the switch (license sold separately) • IEEE 802.1AS-2011 gPTP, IEEE 802.1Qav-2009 FQTSS, IEEE 802.1Qat-2010 MSRP, IEEE 802.1ak MMRP, IEEE 802.1ak MVRP • Maximum of 256 AVB streams per switch • AVB is not supported in LAG (link aggregation groups, or Etherchannel)
Layer 3 routing package	
Static Routes/ECMP Static Routes for IPv4 and IPv6	• Static and default routes are configurable with next IP address hops to any given destination • Permitting additional routes creates several options for the network administrator • The admin can configure multiple next hops to a given destination, intending for the router to load share across the next hops • The admin distinguishes static routes by specifying a route preference value: a lower preference value is a more preferred static route • A less preferred static route is used if the more preferred static route is unusable (down link, or next hop cannot be resolved to a MAC address)
Advanced Static Routing functions for administrative traffic control	• Static Reject Routes are configurable to control the traffic destined to a particular network so that it is not forwarded through the router • Such traffic is discarded and the ICMP destination unreachable message is sent back to the source • Static reject routes can be typically used to prevent routing loops • Default routes are configurable as a preference option
In order to facilitate VLAN creation and VLAN routing using Web GUI, a VLAN Routing Wizard offers following automated capabilities:	• Create a VLAN and generate a unique name for VLAN • Add selected ports to the newly created VLAN and remove selected ports from the default VLAN • Create a LAG, add selected ports to a LAG, then add this LAG to the newly created VLAN • Enable tagging on selected ports if the port is in another VLAN • Disable tagging if a selected port does not exist in another VLAN • Exclude ports that are not selected from the VLAN • Enable routing on the VLAN using the IP address and subnet mask entered as logical routing interface
DHCP Relay Agents relay DHCP requests from any routed interface, including VLANs, when DHCP server doesn't reside on the same IP network or subnet	• The agent relays requests from a subnet without a DHCP server to a server or next-hop agent on another subnet • Unlike a router which switches IP packets transparently, a DHCP relay agent processes DHCP messages and generates new DHCP messages • Supports DHCP Relay Option 82 circuit-id and remote-id for VLANs • Multiple Helper IPs feature allows to configure a DHCP relay agent with multiple DHCP server addresses per routing interface and to use different server addresses for client packets arriving on different interfaces on the relay agent server addresses for client packets arriving on different interfaces on the relay agent
Router Discovery Protocol is an extension to ICMP and enables hosts to dynamically discover the IP address of routers on local IP subnets	• Based on RFC 1256 for IPv4 • Routers periodically send router discovery messages to announce their presence to locally-attached hosts • The router discovery message advertises one or more IP addresses on the router that hosts can use as their default gateway • Hosts can send a router solicitation message asking any router that receives the message to immediately send a router advertisement • Router discovery eliminates the need to manually configure a default gateway on each host • It enables hosts to switch to a different default gateway if one goes down

Loopback interfaces are available as dynamic, stable IP addresses for other devices on the network, and for routing protocols	
Support of Routing Information Protocol (RIPv2) as a distance vector protocol specified in RFC 2453 for IPv4	• Each route is characterized by the number of gateways, or hops, a packet must traverse to reach its intended destination • Categorized as an interior gateway protocol, RIP operates within the scope of an autonomous system
IP Multinetting allows to configure more than one IP address on a network interface (other vendors may call it IP Aliasing or Secondary Addressing)	
ICMP Throttling feature adds configuration options for the transmission of various types of ICMP messages	• ICMP Redirects can be used by a malicious sender to perform man-in-the-middle attacks, or divert packets to a malicious monitor, or to cause Denial of Service (DoS) by blackholing the packets • ICMP Echo Requests and other messages can be used to probe for vulnerable hosts or routers • Rate limiting ICMP error messages protects the local router and the network from sending a large number of messages that take CPU and bandwidth
The Policy Based Routing feature (PBR) overrides routing decision taken by the router and makes the packet to follow different actions based on a policy	• It provides freedom over packet routing/forwarding instead of leaving the control to standard routing protocols based on L3 • For instance, some organizations would like to dictate paths instead of following the paths shown by routing protocols • Network Managers/Administrators can set up policies such as: – My network will not carry traffic from the Engineering department – Traffic originating within my network with the following characteristics will take path A, while other traffic will take path B – When load sharing needs to be done for the incoming traffic across multiple paths based on packet entities in the incoming traffic
Enterprise security	
Traffic control MAC Filter and Port Security help restrict the traffic allowed into and out of specified ports or interfaces in the system in order to increase overall security and block MAC address flooding issues	
DHCP Snooping monitors DHCP traffic between DHCP clients and DHCP servers to filter harmful DHCP message and builds a bindings database of (MAC address, IP address, VLAN ID, port) tuples that are considered authorized in order to prevent DHCP server spoofing attacks	
IP source guard and Dynamic ARP Inspection use the DHCP snooping bindings database per port and per VLAN to drop incoming packets that do not match any binding and to enforce source IP/MAC addresses for malicious users traffic elimination	
Time-based Layer 2 / Layer 3-v4 / Layer 3-v6 / Layer 4 Access Control Lists (ACLs) can be binded to ports, Layer 2 interfaces, VLANs and LAGs (Link Aggregation Groups or Port channel) for fast unauthorized data prevention and right granularity	
For in-band switch management, management ACLs on CPU interface (Control Plane ACLs) are used to define the IP/MAC or protocol through which management access is allowed for increased HTTP/HTTPS or Telnet/SSH management security	
Out-of-band management is available via dedicated service port (1G RJ45 OOB) when in-band management can be prohibited via management ACLs	
Bridge protocol data unit (BPDU) Guard allows the network administrator to enforce the Spanning Tree (STP) domain borders and keep the active topology consistent and predictable - unauthorized devices or switches behind the edge ports that have BPDU enabled will not be able to influence the overall STP by creating loops	
Spanning Tree Root Guard (STRG) enforces the Layer 2 network topology by preventing rogue root bridges potential issues when for instance, unauthorized or unexpected new equipment in the network may accidentally become a root bridge for a given VLAN	
Dynamic 802.1x VLAN assignment mode, including Dynamic VLAN creation mode and Guest VLAN / Unauthenticated VLAN are supported for rigorous user and equipment RADIUS policy server enforcement	• Up to 48 clients (802.1x) per port are supported, including the authentication of the users domain, in order to facilitate convergent deployments. For instance when IP phones connect PCs on their bridge, IP phones and PCs can authenticate on the same switch port but under different VLAN assignment policies (Voice VLAN versus other Production VLANs)
802.1x MAC Address Authentication Bypass (MAB) is a supplemental authentication mechanism that lets non-802.1x devices bypass the traditional 802.1x process altogether, letting them authenticate to the network using their client MAC address as an identifier	• A list of authorized MAC addresses of client NICs is maintained on the RADIUS server for MAB purpose • MAB can be configured on a per-port basis on the switch • MAB initiates after unsuccessful dot1x authentication process (configurable time out), when clients don't respond to any of EAPOL packets • When 802.1X unaware clients try to connect, the switch sends the MAC address of each client to the authentication server • The RADIUS server checks the MAC address of the client NIC against the list of authorized addresses • The RADIUS server returns the access policy and VLAN assignment to the switch for each client

With Successive Tiering, the Authentication Manager allows for authentication methods per port for a Tiered Authentication based on configured time-outs	• By default, configuration authentication methods are tried in this order: Dot1x, then MAB, then Captive Portal (web authentication) • With BYOD, such Tiered Authentication is powerful and simple to implement with strict policies – For instance, when a client is connecting, M4300 tries to authenticate the user/client using the three methods above, the one after the other • The admin can restrict the configuration such that no other method is allowed to follow the captive portal method, for instance
Double VLANs (DVLAN) pass traffic from one customer domain to another through the "metro core" in a multi-tenancy environment: customer VLAN IDs are preserved and a service provider VLAN ID is added to the traffic so the traffic can pass the metro core in a simple, secure manner	
Private VLANs (with Primary VLAN, Isolated VLAN, Community VLAN, Promiscuous port, Host port, Trunks) provide Layer 2 isolation between ports that share the same broadcast domain, allowing a VLAN broadcast domain to be partitioned into smaller point-to-multipoint subdomains accross switches in the same Layer 2 network	• Private VLANs are useful in DMZ when servers are not supposed to communicate with each other but need to communicate with a router • They remove the need for more complex port-based VLANs with respective IP interface/subnets and associated L3 routing • Another Private VLANs typical application are carrier-class deployments when users shouldn't see, snoop or attack other users' traffic
SSL version 3 and TLS version 2 ensure Web GUI sessions are secured	
Secure Shell (SSH version 2) and SNMPv3 (with or without MD5 or SHA authentication) ensure SNMP and Telnet sessions are secured	
2048-bit RSA key pairs, SHA2-256 and SHA2-512 cryptographic hash functions for SSLv3 and SSHv2 are supported on all M4300 models	
TACACS+ and RADIUS enhanced administrator management provides strict "Login" and "Enable" authentication enforcement for the switch configuration, based on latest industry standards: exec authorization using TACACS+ or RADIUS; command authorization using TACACS+ and RADIUS Server; user exec accounting for HTTP and HTTPS using TACACS+ or RADIUS; and authentication based on user domain in addition to user ID and password	
Superior quality of service	
Advanced classifier-based hardware implementation for Layer 2 (MAC), Layer 3 (IP) and Layer 4 (UDP/TCP transport ports) prioritization	
8 queues (7 in a stack) for priorities and various QoS policies based on 802.1p (CoS) and DiffServ can be applied to interfaces and VLANs	
Advanced rate limiting down to 1 Kbps granularity and mininum-guaranteed bandwidth can be associated with ACLs for best granularity	
Single Rate Policing feature enables support for Single Rate Policer as defined by RFC 2697	• Committed Information Rate (average allowable rate for the class) • Committed Burst Size (maximum amount of contiguous packets for the class) • Excessive Burst Size (additional burst size for the class with credits refill at a slower rate than committed burst size) • DiffServ feature applied to class maps
Automatic Voice over IP prioritization with protocol-based (SIP, H323 and SCCP) or OUI-based Auto-VoIP up to 144 simultaneous voice calls	
Flow Control	
802.3x Flow Control implementation per IEEE 802.3 Annex 31B specifications with Symmetric flow control, Asymmetric flow control or No flow control	• Asymmetric flow control allows the switch to respond to received PAUSE frames, but the ports cannot generate PAUSE frames • Symmetric flow control allows the switch to both respond to, and generate MAC control PAUSE frames
Allows traffic from one device to be throttled for a specified period of time: a device that wishes to in-hibit transmission of data frames from another device on the LAN transmits a PAUSE frame	• A device that wishes to inhibit transmission of data frames from another device on the LAN transmits a PAUSE frame
UDLD Support	
UDLD implementation detects unidirectional links physical ports (UDLD must be enabled on both sides of the link in order to detect an unidirectional link)	• UDLD protocol operates by exchanging packets containing information about neighboring devices • The purpose is to detect and avoid unidirectional link forwarding anomalies in a Layer 2 communication channel
Both "normal-mode" and "aggressive-mode" are supported for perfect compatibility with other vendors implementations, including port "D-Disable" triggering cases in both modes	

Target Application



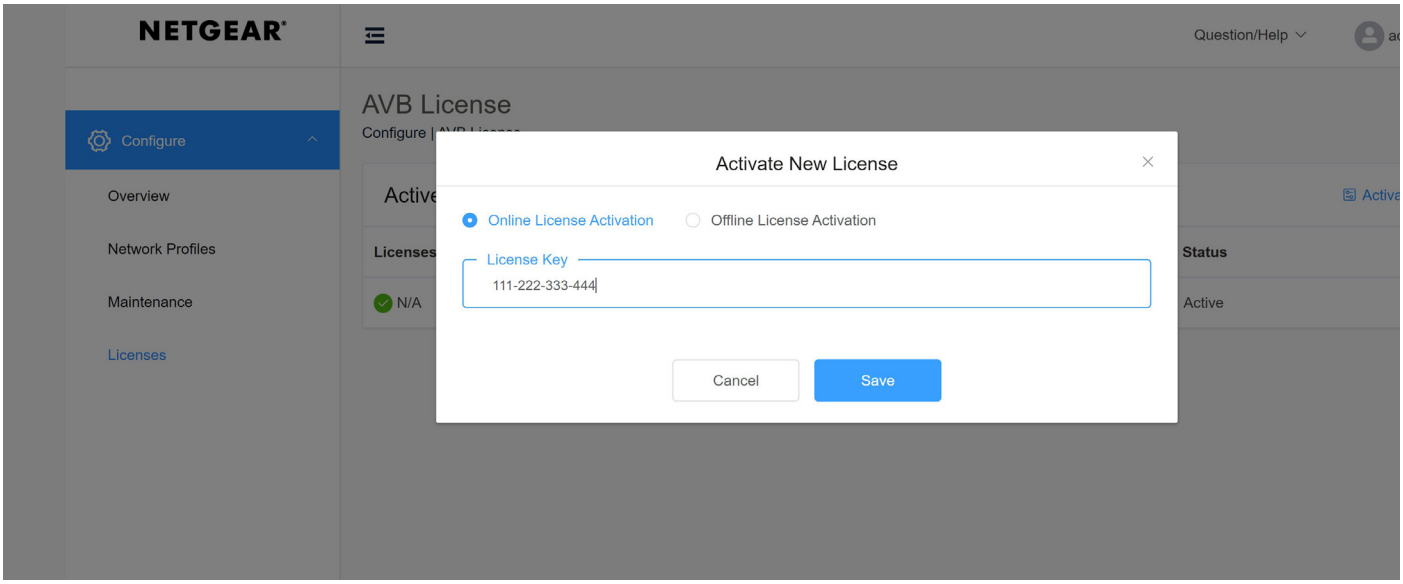
A new AV Line of M4250 switches with out-of-the-box functionality and an industry-first: a concurrent second user interface solely designed with the AV Pro in mind.

NETGEAR has enhanced the experience for AV professionals by including a new user interface designed from the ground up. Pro AV customers don't have to settle for an IT-centric interface with settings and IT-specific functionality they will never need. The new M4250 AV interface presents the common AV controls right up front with user-selectable profiles for common AV platforms making it a snap to ensure the settings are correct for a specific audio or video application.

When each M4250 is simply configured with AV profiles on certain ports, the AV Line offers automatic and dynamic configuration of multiple M4250 switches connected together. This automatic configuration, known as Auto-LAG and Auto-Trunk, combined with as NETGEAR IGMP Plus™, make setting up a complicated AV over IP network easier and quicker than ever before.

Components and Modules

M4250 AV Licenses



M4250 AVB Licenses are electronic SKUs. A license registration key is received by email and can be copied and pasted directly in the AV UI when the switch is online.

Components and Modules

M4250-10G2F-PoE+
AV Line Managed Switch

Ordering information

- Americas: GSM4212P-100NAS
- Europe: GSM4212P-100EUS
- Asia Pacific: GSM4212P-100AJS
- China: GSM4212P-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4212P-10000S (sold separatel

- 8-port 10/100/1000BASE-T (RJ45) PoE+ with 125W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 2-port 1000BASE-X (SFP)
- 24 Gbps non-blocking fabric across 12 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 200 x 43.2 mm
- Weight: 2.85Kg (6.28lb)

Components and Modules

M4250-10G2XF-PoE+
AV Line Managed Switch

Ordering information

- Americas: GSM4212PX-100NAS
- Europe: GSM4212PX-100EUS
- Asia Pacific: GSM4212PX-100AJS
- China: GSM4212PX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4212PX-10000S (sold separately)

- 8-port 10/100/1000BASE-T (RJ45) PoE+ with 240W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 2-port 1000/10GBASE-X (SFP+)
- 60 Gbps non-blocking fabric across 12 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 200 x 43.2 mm
- Weight: 2.9Kg (6.39lb)

Components and Modules

M4250-10G2XF-PoE++
AV Line Managed Switch

Ordering information

- Americas: GSM4212UX-100NAS
- Europe: GSM4212UX-100EUS
- Asia Pacific: GSM4212UX-100AJS
- China: GSM4212UX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4212UX-10000S (sold separately)

- 8-port 10/100/1000BASE-T (RJ45) Ultra90 PoE++ with 720W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 2-port 1000/10GBASE-X (SFP+)
- Compatible 802.3af (15.4W), 802.3at (30W), 802.3bt (60, 75 and 90W)
- 60 Gbps non-blocking fabric across 12 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 257 x 43.2 mm
- Weight: 3.83Kg (8.44lb)

Components and Modules

M4250-12M2XF

AV Line Managed Switch

Ordering information

- Americas: MSM4214X-100NAS
- Europe: MSM4214X-100EUS
- Asia Pacific: MSM4214X-100AJS
- China: MSM4214X-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4214X-10000S (sold separately)

- 12-port 100/1000/2.5GBASE-T (RJ45)
- 2-port 1000/10GBASE-X (SFP+)
- 100 Gbps non-blocking fabric across 14 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 100 x 43.2 mm
- Weight: 1.74Kg (3.85lb)

Components and Modules

M4250-16XF
AV Line Managed Switch

Ordering information

- Americas: XSM4216F-100NAS
- Europe: XSM4216F-100EUS
- Asia Pacific: XSM4216F-100AJS
- China: XSM4216F-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4216F-10000S (sold separately)

- 16-port 10GBASE-X (SFP+)
- The first 12 ports support 1000BASE-X (1G) SFP modules
- 320 Gbps non-blocking fabric across 16 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 200 x 43.2 mm
- Weight: 1.74Kg (3.85lb)

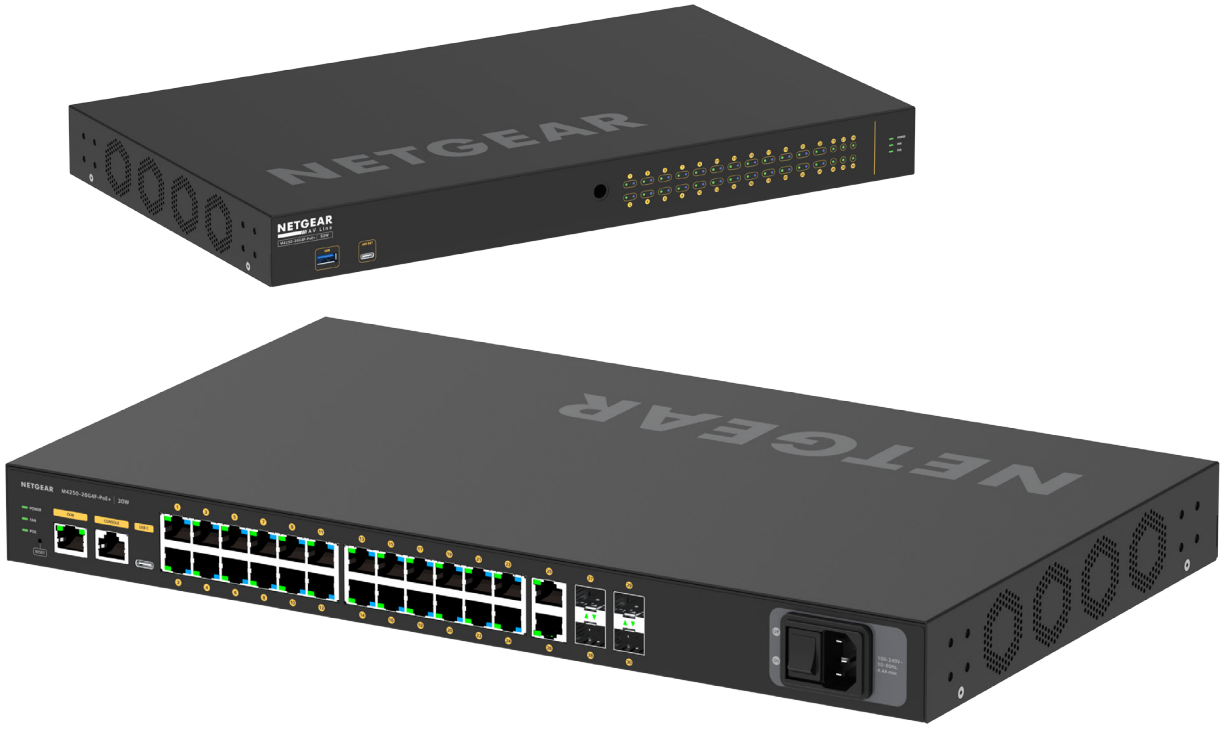
Components and Modules

M4250-26G4F-PoE+
AV Line Managed Switch

Ordering information

- Americas: GSM4230P-100NAS
- Europe: GSM4230P-100EUS
- Asia Pacific: GSM4230P-100AJS
- China: GSM4230P-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4230P-10000S (sold separately)

- 24-port 10/100/1000BASE-T (RJ45) PoE+ with 300W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 4-port 1000BASE-X (SFP)
- 60 Gbps non-blocking fabric across 30 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 43.2 x 257 mm
- Weight: 4.30Kg (9.47lb)



Components and Modules

M4250-26G4F-PoE++
AV Line Managed Switch

Ordering information

- Americas: GSM4230UP-100NAS
- Europe: GSM4230UP-100EUS
- Asia Pacific: GSM4230UP-100AJS
- China: GSM4230UP-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4230UP-10000S (sold separately)

- 24-port 10/100/1000BASE-T (RJ45) Ultra90 PoE++ with 1,440W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 4-port 1000BASE-X (SFP)
- Compatible 802.3af (15.4W), 802.3at (30W), 802.3bt (60, 75 and 90W)
- 2 internal, fixed PSUs (C14 inlets) with embedded RPS/EPS function
- When one PSU is used, PoE budget is 720W
- When two PSU are used, PoE budget is 1,440W
- 60 Gbps non-blocking fabric across 30 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for quiet or cool operation
- Dimensions (WxDxH): 440 x 43.2 x 400 mm
- Weight: 6.75Kg (14.87lb)

Components and Modules

M4250-26G4XF-PoE+
AV Line Managed Switch

Ordering information

- Americas: GSM4230PX-100NAS
- Europe: GSM4230PX-100EUS
- Asia Pacific: GSM4230PX-100AJS
- China: GSM4230PX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4230PX-10000S (sold separately)

- 24-port 10/100/1000BASE-T (RJ45) PoE+ with 480W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 4-port 1000/10GBASE-X (SFP+)
- 132 Gbps non-blocking fabric across 30 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 43.2 x 400 mm
- Weight: 5.45Kg (12.02lb)

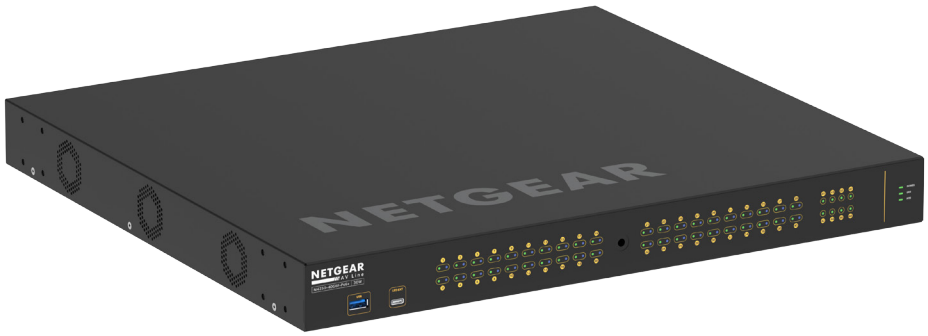
Components and Modules

M4250-40G8F-PoE+
AV Line Managed Switch

Ordering information

- Americas: GSM4248P-100NAS
- Europe: GSM4248P-100EUS
- Asia Pacific: GSM4248P-100AJS
- China: GSM4248P-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4248P-10000S (sold separately)

- 40-port 10/100/1000BASE-T (RJ45) PoE+ with 480W PoE budget
- 8-port 1000BASE-X (SFP)
- 96 Gbps non-blocking fabric across 48 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 43.2 x 400 mm
- Weight: 5.85Kg (12.90lb)



Components and Modules

M4250-40G8XF-PoE+
AV Line Managed Switch

Ordering information

- Americas: GSM4248PX-100NAS
- Europe: GSM4248PX-100EUS
- Asia Pacific: GSM4248PX-100AJS
- China: GSM4248PX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4248PX-10000S (sold separately)

- 40-port 10/100/1000BASE-T (RJ45) PoE+ with 960W PoE budget
- 8-port 1000/10GBASE-X (SFP+)
- 240 Gbps non-blocking fabric across 48 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for quiet or cool operation
- Dimensions (WxDxH): 440 x 43.2 x 400 mm
- Weight: 6.31Kg (13.91lb)

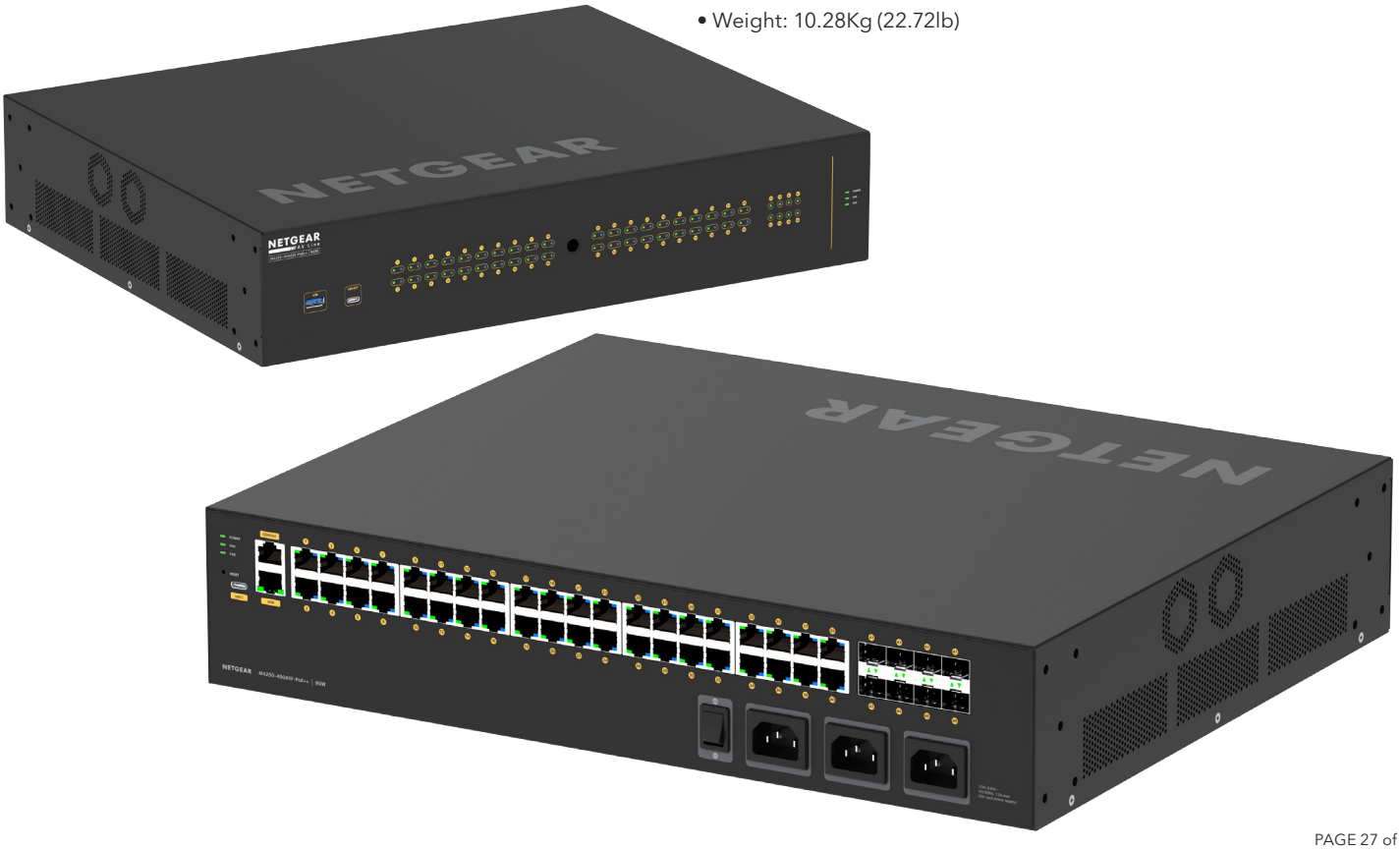
Components and Modules

M4250-40G8XF-PoE++
AV Line Managed Switch

Ordering information

- Americas: GSM4248UX-100NAS
- Europe: GSM4248UX-100EUS
- Asia Pacific: GSM4248UX-100AJS
- China: GSM4248UX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4248UX-10000S (sold separately)

- 40-port 10/100/1000BASE-T (RJ45) Ultra90 PoE++ with 2,880W PoE budget
- 8-port 1000/10GBASE-X (SFP+)
- Compatible 802.3af (15.4W), 802.3at (30W), 802.3bt (60, 75 and 90W)
- 3 internal, fixed PSUs (C14 inlets) with embedded RPS/EPS function
- When one PSU is used, PoE budget is 720W
- When two PSU are used, PoE budget is 1,650W
- When three PSU are used, PoE budget is 2,880W
- 240 Gbps non-blocking fabric across 48 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for quiet or cool operation
- Dimensions (WxDxH): 440 x 86.4 x 350 mm (2U)
- Weight: 10.28Kg (22.72lb)



GBIC SFP and SFP+ Optics for M4250 series

Ordering information • Worldwide: see table below • Warranty: 5 years	**Multimode Fiber (MMF)**		**Single mode Fiber (SMF)**
	OM1 or OM2 62.5/125µm	OM3 or OM4 50/125µm	9/125µm
10 Gigabit SFP+ • Fits into M4250 SFP+ interfaces	**AXM763** 10GBase-LRM long reach multimode 802.3aq - LC duplex connector up to 100m (328 ft) **AXM763-10000S (1 unit)**	**AXM763** 10GBase-LRM long reach multimode 802.3aq - LC duplex connector up to 165m (541 ft) **AXM763-10000S (1 unit)** **AXM761** 10GBase-SR short reach multimode LC duplex connector up to 300m (984 ft) **AXM761-10000S (1 unit)** **AXM761P10-10000S** **(pack of 10 units)**	**AXM762** 10GBase-LR long reach single mode LC duplex connector up to 10km (6.2 miles) **AXM762-10000S (1 unit)** **AXM762P10-10000S** **(pack of 10 units)** **AXM764** 10GBase-LR LITE single mode LC duplex connector up to 2km (1.2 mile) **AXM764-10000S (1 unit)**
Gigabit SFP • Fits into M4250 SFP+ and SFP interfaces • M4250-16XF (XSM4216F) supports 1G modules on ports 1-12 only	**AGM731F** 1000Base-SX short range multimode LC duplex connector up to 275m (902 ft) **AGM731F (1 unit)**	**AGM731F** 1000Base-SX short range multimode LC duplex connector OM3: up to 550m (1,804 ft) OM4: up to 1,000m (3,280 ft) **AGM731F (1 unit)**	**AGM732F** 1000Base-LX long range single mode LC duplex connector up to 10km (6.2 miles) **AGM732F (1 unit)**

AGM734
1000BASE-T RJ45 SFP (Gigabit)

Ordering information
- Worldwide: AGM734-10000S
- Warranty: 5 years

- Fits into M4250 SFP+ and SFP interfaces
- 1 port Gigabit RJ45
- Supports only 1000Mbps full-duplex mode
- Up to 100m (328 ft) with Cat5 RJ45 or better
- Conveniently adds 1G copper connectivity to M4250 fiber interfaces
- M4250-16XF (XSM4216F) supports AGM734 on its ports 1 to 12 only

AXM765
10GBASE-T RJ45 SFP+ (10 Gigabit)

Ordering information
- Worldwide: AXM765-20000S
- Warranty: 5 years

- Fits into M4250 SFP+ interfaces
- 1 port 10GBASE-T RJ45
- Copper connectivity up to 80m (262 ft) distance
- CAT6a or better wiring required for 10GBASE-T up to 80 meters
- Conveniently adds 10G copper connectivity to M4250 fiber interfaces

Direct Attach Cables for M4250 series

Ordering information • Worldwide: see table below • Warranty: 5 years	SFP+ to SFP+		
	1 meter (3.3 ft)	3 meters (9.8 ft)	5 meters (16.4 ft)
10 Gigabit DAC 	**AXC761** 10GSFP+ Cu (passive) SFP+ connectors **AXC761-10000S (1 unit)**	**AXC763** 10GSFP+ Cu (passive) SFP+ connectors **AXC763-10000S (1 unit)**	**AXC765** 10GSFP+ Cu (active) SFP+ connectors **AXC765-10000S (1 unit)**
	7 meters (23.0 ft)	10 meters (32.8 ft)	15 meters (49.2 ft)
	AXC767 10GSFP+ Cu (active) SFP+ connectors **AXC767-10000S (1 unit)**	**AXC7610** 10GSFP+ Cu (active) SFP+ connectors **AXC7610-10000S (1 unit)**	**AXC7615** 10GSFP+ (duplex fiber optic) SFP+ connectors **AXC7615-10000S (1 unit)**
	20 meters (65.6 ft)		
 • Fits into M4250 SFP+ interfaces	**AXC7620** 10GSFP+ (duplex fiber optic) SFP+ connectors **AXC7620-10000S (1 unit)**		

Technical Specifications

Requirements based on 13.0.2 software release

Model Name	Description	Model number
M4250-10G2F-PoE+	AV Line 8x1G PoE+ 125W 2x1G and 2xSFP Managed Switch	GSM4212P
M4250-10G2XF-PoE+	AV Line 8x1G PoE+ 240W 2x1G and 2xSFP+ Managed Switch	GSM4212PX
M4250-10G2XF-PoE++	AV Line 8x1G Ultra90 PoE++ 720W 2x1G and 2xSFP+ Managed Switch	GSM4212UX
M4250-26G4F-PoE+	AV Line 24x1G PoE+ 300W 2x1G and 4xSFP Managed Switch	GSM4230P
M4250-26G4F-PoE++	AV Line 24x1G Ultra90 PoE++ 1,440W 2x1G and 4xSFP Managed Switch	GSM4230UP
M4250-26G4XF-PoE+	AV Line 24x1G PoE+ 480W 2x1G and 4xSFP+ Managed Switch	GSM4230PX
M4250-40G8F-PoE+	AV Line 40x1G PoE+ 480W and 8xSFP Managed Switch	GSM4248P
M4250-40G8XF-PoE+	AV Line 40x1G PoE+ 960W and 8xSFP+ Managed Switch	GSM4248PX
M4250-40G8XF-PoE++	AV Line 40x1G Ultra90 PoE++ 2,880W and 8xSFP+ Managed Switch	GSM4248UX
M4250-12M2XF	AV Line 12x2.5G and 2xSFP+ Managed Switch	MSM4214X
M4250-16XF	AV Line 12x1G/10G SFP+ and 4x10G SFP+ Managed Switch	XSM4216F

Physical Interfaces

Gigabit and 10 Gigabit Ethernet Ports	Auto-sensing RJ45 PoE 10/100/1000BASE-T	Auto-sensing RJ45 10/100/1000BASE-T	Auto-sensing RJ45 100/1000/2.5GBASE-T	Auto-sensing SFP 1000BASE-X	Auto-sensing SFP+ 1000/10GBASE-X
M4250-10G2F-PoE+	8 ports PoE+ (125W)	2	-	2	-
M4250-10G2XF-PoE+	8 ports PoE+ (240W)	2	-	-	2
M4250-10G2XF-PoE++	8 ports Ultra90 PoE++ (720W)	2	-	-	2
M4250-26G4F-PoE+	24 ports PoE+ (300W)	2	-	4	-
M4250-26G4F-PoE++	24 ports Ultra90 PoE++ (1,440W)	2	-	4	-
M4250-26G4XF-PoE+	24 ports PoE+ (480W)	2	-	-	4
M4250-40G8F-PoE+	40 ports PoE+ (480W)	-	-	8	-
M4250-40G8XF-PoE+	40 ports PoE+ (960W)	-	-	-	8
M4250-40G8XF-PoE++	40 ports Ultra90 PoE++ (2,880W)	-	-	-	8
M4250-12M2XF	-	-	12	-	2
M4250-16XF	-	-	-	-	16 (only Ports 1-12 support 1G)

Total Usable Port Count	1G Ports	2.5G Ports	10G Ports
M4250-10G2F-PoE+	12	-	-
M4250-10G2XF-PoE+	10	-	2
M4250-10G2XF-PoE++	10	-	2
M4250-26G4F-PoE+	30	-	-
M4250-26G4F-PoE++	30	-	-
M4250-26G4XF-PoE+	26	-	4
M4250-40G8F-PoE+	48	-	-
M4250-40G8XF-PoE+	40	-	8
M4250-40G8XF-PoE++	40	-	8
M4250-12M2XF	-	12	2
M4250-16XF	-	-	16

Management Ports	Console ports	Service port (Out-of-band Ethernet)	Storage port
All models	Serial RS232 RJ45 (rear); USB-C (rear)	1 x RJ45 10/100/1000BASE-T (rear)	1 x USB-A (front)
Fixed Power Supplies			
M4250-26G4F-PoE++	2 internal PSU (C14 inlets) with 1 on/off switch		
M4250-40G8XF-PoE++	3 internal PSU (C14 inlets) with 1 on/off switch		
All other models	1 internal PSU (C14 inlet) with 1 on/off switch		
Fixed fans			
All models	Side-to-side airflow		

Power over Ethernet			
PSE Capacity	**PoE+ Ports (802.3at)**	**Ultra90 PoE++ Ports (802.3bt)**	
M4250-10G2F-PoE+	8	-	Ultra90 PoE++ 802.3bt is compatible with: 802.3af PoE (15.4W), 802.3at PoE++ (30W), and 802.3bt (60W, 75W and 90W).
M4250-10G2XF-PoE+	8	-	
M4250-10G2XF-PoE++	-	8	
M4250-26G4F-PoE+	24	-	
M4250-26G4F-PoE++	-	24	
M4250-26G4XF-PoE+	24	-	
M4250-40G8F-PoE+	40	-	
M4250-40G8XF-PoE+	40	-	
M4250-40G8XF-PoE++	-	40	

PoE Budget	PoE Budget @ 110V AC in
M4250-10G2F-PoE+	125 Watts
M4250-10G2XF-PoE+	240 Watts
M4250-10G2XF-PoE++	720 Watts
M4250-26G4F-PoE+	300 Watts
M4250-26G4F-PoE++	1 used PSU: 720Watts / 2 used PSU: 1,440 Watts
M4250-26G4XF-PoE+	480 Watts
M4250-40G8F-PoE+	480 Watts
M4250-40G8XF-PoE+	960 Watts
M4250-40G8XF-PoE++	1 used PSU: 720Watts / 2 used PSU: 1,650 Watts / 3 used PSU: 2,880 Watts

Features Support	M4250-10G2F-PoE+/M4250-10G2XF-PoE+ M4250-26G4F-PoE+/M4250-26G4XF-PoE+ M4250-40G8F-PoE+/M4250-40G8XF-PoE+	M4250-10G2XF-PoE++/M4250-26G4F-PoE++ M4250-40G8XF-PoE++
IEEE 802.3af (up to 15.4W per port)	Yes	Yes
IEEE 802.3at (up to 30W per port)	Yes	Yes
IEEE 802.3bt (up to 90W per port)	No	Yes
IEEE 802.3at Layer 2 (LLDP) method	Yes	Yes
IEEE 802.3at 2-event classification	Yes	Yes
IEEE 802.3bt Layer 2 (LLDP) method	No	Yes
IEEE 802.3bt auto-classification method	No	Yes
Pre-802.3bt standard method	No	Yes
PoE timer / schedule (week, days, hours)	Yes	Yes

Processor/Memory		
CPU		
M4250-26G4F-PoE+, M4250-26G4F-PoE++, M4250-26G4XF-PoE+, M4250-40G8F-PoE+, M4250-40G8XF-PoE+, M4250-40G8XF-PoE++	Dedicated Quad-Core Cortex-A57 ARMv8 1.8Ghz CPU (64-bit)	
All other models	Integrated ARM A9 1.25Ghz CPU in switching silicon (32-bit)	
System memory (RAM) - all models	2 GB	
Code storage (flash) - all models	256 MB	Dual firmware image

Packet Buffer Memory		
M4250-40G8F-PoE+, M4250-40G8XF-PoE+, M4250-40G8XF-PoE++	32 Mb	Dynamically shared across only used ports
All other models	16 Mb	
Performance Summary		
Switching fabric		
M4250-10G2F-PoE+	24 Gbps	Line-rate (non blocking fabric)
M4250-10G2XF-PoE+, M4250-10G2XF-PoE++	60 Gbps	
M4250-26G4F-PoE+, M4250-26G4F-PoE++	60 Gbps	
M4250-40G8F-PoE+	96 Gbps	
M4250-12M2XF	100 Gbps	
M4250-26G4XF-PoE+	132 Gbps	
M4250-40G8XF-PoE+, M4250-40G8XF-PoE++	240 Gbps	
M4250-16XF	320 Gbps	
Throughput (64-byte frames)		
M4250-10G2F-PoE+	17.86 Mpps	
M4250-10G2XF-PoE+, M4250-10G2XF-PoE++	44.64 Mpps	
M4250-26G4F-PoE+, M4250-26G4F-PoE++	44.64 Mpps	
M4250-40G8F-PoE+	71.42 Mpps	
M4250-12M2XF	74.40 Mpps	
M4250-26G4XF-PoE+	98.21 Mpps	
M4250-40G8XF-PoE+, M4250-40G8XF-PoE++	178.56 Mpps	
M4250-16XF	238.08 Mpps	

Latency - 10G Fiber	64-byte frames	512-byte frames	1024-byte frames	1518-byte frames
M4250-10G2F-PoE+	-	-	-	-
M4250-10G2XF-PoE+	0.838µs	0.821µs	0.820µs	0.819µs
M4250-10G2XF-PoE++	0.807µs	0.791µs	0.790µs	0.789µs
M4250-26G4F-PoE+	-	-	-	-
M4250-26G4F-PoE++	-	-	-	-
M4250-26G4XF-PoE+	0.834µs	0.818µs	0.817µs	0.816µs
M4250-40G8F-PoE+	-	-	-	-
M4250-40G8XF-PoE+	0.709µs	0.717µs	0.730µs	0.714µs
M4250-40G8XF-PoE++	0.708µs	0.716µs	0.728µs	0.713µs
M4250-12M2XF	0.807µs	0.791µs	0.790µs	0.789µs
M4250-16XF	0.811µs	0.834µs	0.860µs	0.831µs

Latency - 1G Fiber	64-byte frames	512-byte frames	1024-byte frames	1518-byte frames
M4250-10G2F-PoE+	2.271µs	2.257µs	2.267µs	2.266µs
M4250-10G2XF-PoE+	1.169µs	1.174µs	1.159µs	1.154µs
M4250-10G2XF-PoE++	1.148µs	1.141µs	1.137µs	1.156µs
M4250-26G4F-PoE+	1.164µs	1.129µs	1.124µs	1.146µs
M4250-26G4F-PoE++	1.141µs	1.126µs	1.119µs	1.140µs
M4250-26G4XF-PoE+	1.130µs	1.123µs	1.119µs	1.120µs
M4250-40G8F-PoE+	1.074µs	1.109µs	1.106µs	1.102µs
M4250-40G8XF-PoE+	1.106µs	1.120µs	1.107µs	1.128µs
M4250-40G8XF-PoE++	1.084µs	1.103µs	1.098µs	1.115µs
M4250-12M2XF	1.186µs	1.178µs	1.156µs	1.173µs
M4250-16XF	1.274µs	1.292µs	1.291µs	1.297µs
Latency - 1G Copper	**64-byte frames**	**512-byte frames**	**1024-byte frames**	**1518-byte frames**
M4250-10G2F-PoE+	2.133µs	2.136µs	2.131µs	2.142µs
M4250-10G2XF-PoE+	2.140µs	2.140µs	2.137µs	2.144µs
M4250-10G2XF-PoE++	1.837µs	1.829µs	1.828µs	1.826µs
M4250-26G4F-PoE+	2.146µs	2.148µs	2.140µs	2.150µs
M4250-26G4F-PoE++	2.139µs	2.140µs	2.133µs	2.146µs
M4250-26G4XF-PoE+	2.280µs	2.282µs	2.270µs	2.288µs
M4250-40G8F-PoE+	2.027µs	2.343µs	2.462µs	2.358µs
M4250-40G8XF-PoE+	2.220µs	2.595µs	2.744µs	2.613µs
M4250-40G8XF-PoE++	2.251µs	2.625µs	2.775µs	2.641µs
M4250-12M2XF	2.843µs	2.836µs	2.834µs	2.836µs
M4250-16XF	-	-	-	-
Latency - 2.5G Copper	**64-byte frames**	**512-byte frames**	**1024-byte frames**	**1518-byte frames**
M4250-10G2F-PoE+	-	-	-	-
M4250-10G2XF-PoE+	-	-	-	-
M4250-10G2XF-PoE++	-	-	-	-
M4250-26G4F-PoE+	-	-	-	-
M4250-26G4F-PoE++	-	-	-	-
M4250-26G4XF-PoE+	-	-	-	-
M4250-40G8F-PoE+	-	-	-	-
M4250-40G8XF-PoE+	-	-	-	-
M4250-40G8XF-PoE++	-	-	-	-
M4250-12M2XF	6.013µs	6.014µs	6.012µs	6.016µs
M4250-16XF	-	-	-	-
Green Ethernet				
Energy Efficient Ethernet (EEE)	Compliant with IEEE 802.3az Energy Efficient Ethernet Task Force		Deactivated by default	

Other Metrics		
Forwarding mode	Store-and-forward	
Addressing	48-bit MAC address	
Address database size	16K MAC addresses	
Number of VLANs	4,093 VLANs (802.1Q) simultaneously	
Number of multicast groups filtered (IGMP)	4K total (2,048 IPv4 and 2,048 IPv6)	
Number of Link Aggregation Groups (LAGs)	8 LAGs with up to 8 ports per group	802.3ad / 802.1AX-2008
Number of hardware queues for QoS	8 queues	
Number of routes IPv4 IPv6	 894 IPv4 Unicast Routes in Default IPv4 Basic SDM Template 126 IPv6 Unicast Routes in Default IPv4 Basic SDM Template	SDM (System Data Management, or switch database) templates allow for granular system resources distribution depending on IPv4 or IPv6 applications
Number of static routes IPv4 IPv6	 64 64	
RIP application route scaling IPv4	 32 in Default IPv4 Basic SDM Template	
Number of IP interfaces (port or VLAN)	128	
Jumbo frame support	up to 12KB packet size	
Acoustic noise	@ 25°C ambient (77°F)	
Testing method	Following the ISO-7779 standard. Bystander Mode. Chamber Temp 25°C during testing unless noted otherwise. Full, 100%, Data and PoE loaded. Worst case.	
SPL (Sound Pressure Level)	dBA values are SPL (Sound Pressure Level) values, testing following the ISO-7779 standard	
Fan management	Three modes are configurable using the AV GUI or the CLI: Fan Off mode, Quiet mode (default), and Cool mode	

Fan Off mode @ 25° C ambient (77° F) Maximum Conditions:	PoE Power Load	Internal Sensors	Case Temperature (Top)	Fan Duty	Acoustic Noise
M4250-10G2F-PoE+	80W (all ports can be used)	<= 42°C	41.8°C	0	0dBA
M4250-10G2XF-PoE+	90W (all ports can be used)	<= 44°C	39.6°C	0	0dBA
M4250-10G2XF-PoE++	45W (all ports can be used)	<= 67°C	44.6°C	0	0dBA
M4250-26G4F-PoE+	45W (no SFP)	S1<= 43°C S2<= 47°C	40.5°C	0	0dBA
M4250-26G4F-PoE++	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported
M4250-26G4XF-PoE+	45W (8 ports PoE+, no SFP+)	S1<= 41°C S2<= 46°C	43.4°C	0	0dBA
M4250-40G8F-PoE+	30W (8 ports PoE+, no SFP)	S1<= 37°C S2<= 50°C	45.2°C	0	0dBA
M4250-40G8XF-PoE+	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported
M4250-40G8XF-PoE++	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported
M4250-12M2XF	(4 ports 2.5G used in block 1-6 and 4 ports 2.5G used in block 7-12, no SFP+)	<= 64°C	56°C	0	0dBA
M4250-16XF	(8 ports SFP+)	<= 78°C	41.3°C	0	0dBA

Quiet mode @ 25° C ambient (77° F) Conditions:	PoE Power Load	Internal Sensors	Case Temperature (Top)	Fan Duty	Acoustic Noise
M4250-10G2F-PoE+	0-125W	<= 36°C	35.9°C	25	27.38dBA
M4250-10G2XF-PoE+	0-240W	<= 37°C	40.6°C	25	27.4dBA
M4250-10G2XF-PoE++	0-250W	<= 49°C	42.9°C	25	34.57dBA
	250-380W	<= 49°C	43.3°C	30	40dBA
	380-500W	<= 49°C	44.9°C	35	44.22dBA
	500-720W	<= 49°C	52.1°C	40	47.19dBA
M4250-26G4F-PoE+	0-200W	S1<= 43°C S2<=47°C	43.5°C	25	28dBA
	200W-300W	S1<= 44°C S2<=48°C	51.3°C	30	34dBA
M4250-26G4F-PoE++	0-280W	S1<= 37°C S2<=39°C	52.9°C	20	28dBA
	280W-360W	S1<= 38°C S2<=40°C	57.4°C	25	36dBA
	360W-420W	S1<= 39°C S2<=41°C	54.4°C	30	41dBA
	420W-480W	S1<= 40°C S2<=42°C	53.3°C	35	47dBA
	480W-540W	S1<= 41°C S2<=43°C	52.3°C	40	50dBA
	540W-600W	S1<= 42°C S2<=44°C	54.4°C	45	54dBA
	600W-660W	S1<= 43°C S2<=45°C	53.6°C	50	57dBA
	660W-1,440W	S1<= 44°C S2<=46°C	55.7°C	55	60dBA
M4250-26G4XF-PoE+	0-350W	S1<= 41°C S2<=46°C	39.3°C	20	25dBA
	350W-480W	S1<= 42°C S2<=47°C	36.8°C	30	42dBA
M4250-40G8F-PoE+	0-150W	S1<= 37°C S2<=50°C	43.1°C	20	30dBA
	150W-200W	S1<= 38°C	42.1°C	25	36dBA
	200W-340W	S1<= 39°C S2<=51°C	44°C	30	40dBA
	340W-480W	S1<= 40°C	47.6°C	35	47dBA
M4250-40G8XF-PoE+	0-400W	S1<= 33°C S2<=46°C	54.2°C	20	29dBA
	400W-480W	S1<= 34°C S2<=47°C	42.8°C	25	35dBA
	480W-560W	S1<= 35°C S2<=48°C	41.9°C	30	41dBA
	560W-640W	S1<= 36°C S2<=49°C	42.1°C	35	48dBA
	640W-720W	S1<= 37°C S2<=50°C	40.9°C	40	51dBA
	720W-800W	S1<= 38°C S2<=51°C	40.7°C	45	54dBA
	800W-880W	S1<= 39°C S2<=52°C	40.4°C	50	57dBA
	880W-960W	S1<= 40°C S2<=53°C	40.5°C	55	59dBA
M4250-40G8XF-PoE++	0-160W	S1<= 37°C S2<=49°C	41.3°C	20	30dBA
	160W-240W	S1<= 38°C	38.8°C	25	36dBA
	240W-320W	S1<= 39°C S2<=50°C	36.4°C	30	42dBA
	320W-400W	S1<= 40°C	35.3°C	35	49dBA
	400W-480W	S1<= 41°C S2<=51°C	34.4°C	40	51dBA
	480W-560W	S1<= 42°C	34.3°C	45	55dBA
	560W-640W	S1<= 43°C S2<=52°C	35.1°C	50	57dBA
	660W-2,880W	S1<= 44°C	36.5°C	55	60dBA
M4250-12M2XF	-	<= 58°C	53.5°C	25	28.5dBA
M4250-16XF	-	<= 67°C	41.6°C	25	27.44dBA

Cool mode @ 25 °C ambient (77 °F)	Case Temperature (Top)	Fan Duty	Acoustic Noise
M4250-10G2F-PoE+	27.2°C	100	55dBA
M4250-10G2XF-PoE+	30.9°C	100	56dBA
M4250-10G2XF-PoE++	41.8°C	100	66.23dBA
M4250-26G4F-PoE+	36.7°C	100	57dBA
M4250-26G4F-PoE++	(720W PoE) 36.7°C (1,440W PoE) 46°C	100	69dBA
M4250-26G4XF-PoE+	32.3°C	100	67dBA
M4250-40G8F-PoE+	35.4°C	100	68dBA
M4250-40G8XF-PoE+	36.1°C	100	69dBA
M4250-40G8XF-PoE++	(720W PoE) 31.4°C (1,650W PoE) 33.5°C (2,880W PoE) 35.4°C	100	71dBA
M4250-12M2XF	33.2°C	100	55dBA
M4250-16XF	30.3°C	100	57dBA

Heat Dissipation (BTU)	Without PoE, all ports	With Max PoE, all ports	Standby without any port connection
M4250-10G2F-PoE+	17.32W - 59.13 BTU/hr	163.9W - 559.55 BTU/hr	8.53W - 29.12BTU/hr
M4250-10G2XF-PoE+	25W - 85.35 BTU/hr	306.4W - 1046.05 BTU/hr	12.96W - 44.24BTU/hr
M4250-10G2XF-PoE++	26.3W - 89.79 BTU/hr	837.7W - 2859.91 BTU/hr	18W - 61.45BTU/hr
M4250-26G4F-PoE+	35.8W - 122.22 BTU/hr	401W - 1369.01 BTU/hr	23.4W - 79.89 BTU/hr
M4250-26G4F-PoE++	48.8W - 166.6 BTU/hr	1 PSU: 889W - 3035.05 BTU/hr	36.9W - 125.98 BTU/hr
		2 PSU: 1734W - 5919.88 BTU/hr	
M4250-26G4XF-PoE+	46.8W - 159.78 BTU/hr	614W - 2096.2 BTU/hr	33.9W - 115.73 BTU/hr
M4250-40G8F-PoE+	59.5W - 203.13 BTU/hr	624.8W - 2133.07 BTU/hr	46.4W - 158.41 BTU/hr
M4250-40G8XF-PoE+	89.2W - 304.53 BTU/hr	1197W - 4086.56 BTU/hr	74.5W - 254.34 BTU/hr
M4250-40G8XF-PoE++	82.6W - 282 BTU/hr	1 PSU: 912W - 3113.57 BTU/hr	68.5W - 233.86 BTU/hr
		2 PSU: 1998W - 6821.17 BTU/hr	
		3 PSU: 3523W - 12027.52 BTU/hr	
M4250-12M2XF	37.9W - 129.39 BTU/hr	-	14.1W - 48.14BTU/hr
M4250-16XF	47.84W - 163.33 BTU/hr	-	19.27W - 65.78BTU/hr

Mean Time Between Failures (MTBF)	@ 25 °C ambient (77 °F)	@ 45 °C ambient (113 °F)	@ 50 °C ambient (122 °F)
M4250-10G2F-PoE+	778,769 hours (~88.9 years)	530,659 hours (~60.6 years)	-
M4250-10G2XF-PoE+	576,889 hours (~65.9 years)	562,708 hours (~64.2 years)	-
M4250-10G2XF-PoE++	947,871 hours (~108.2 years)	493,860 hours (~56.4 years)	-
M4250-26G4F-PoE+	511,054 hours (~58.3 years)	342,368 hours (~39.1 years)	-
M4250-26G4F-PoE++	491,282 hours (~56.1 years)	262,204 hours (~29.9 years)	-
M4250-26G4XF-PoE+	509,057 hours (~58.1 years)	285,719 hours (~32.6 years)	-
M4250-40G8F-PoE+	341,680 hours (~39 years)	342,368 hours (~39.1 years)	-
M4250-40G8XF-PoE+	487,900 hours (~55.7 years)	285,719 hours (~32.6 years)	-
M4250-40G8XF-PoE++	304,916 hours (~34.8 years)	262,204 hours (~29.9 years)	-
M4250-12M2XF	720,892 hours (~82.3 years)	-	416,021 hours (~47.5 years)
M4250-16XF	844,633 hours (~96.4 years)	-	490,265 hours (~56 years)

L2 Services - VLANs		
IEEE 802.1Q VLAN Tagging	Yes	802.1Q-1998 Up to 4,093 VLANs - 802.1Q Tagging
Auto-Trunk	Yes	Dynamic VLAN trunking as soon as a M4250 switch gets connected to another M4250 switch
Protocol Based VLANs	Yes	
IP subnet	Yes	
ARP	Yes	
IPX	Yes	
Subnet based VLANs	Yes	
MAC based VLANs	Yes	
Voice VLAN	Yes	Based on phones OUI bytes (internal database, or user-maintained) or protocols (SIP, H323 and SCCP)
Private Edge VLAN	Yes	
Private VLAN	Yes	
IEEE 802.1x	Yes	802.1x-2004
Guest VLAN	Yes	
RADIUS based VLAN assignment via .1x	Yes	IP phones and PCs can authenticate on the same port but under different VLAN assignment policies
RADIUS based Filter ID assignment via .1x	Yes	
MAC-based .1x	Yes	
Unauthenticated VLAN	Yes	
Double VLAN Tagging	Yes	
Enabling dvlan-tunnel makes interface	Yes	
Global ethertype (TPID)	Yes	
Interface ethertype (TPID)	Yes	
Customer ID using PVID	Yes	
GARP with GVRP/GMRP	Yes	Automatic registration for membership in VLANs or in multicast groups
Multiple Registration Protocol (MRP)	Yes	Can replace GARP functionality
Multicast VLAN Registration Protocol (MVRP)	Yes	Can replace GARP functionality
MVR (Multicast VLAN registration)	Yes	
L2 Services - Availability		
IEEE 802.3ad - LAGs	Yes	Up to 8 LAGs and up to 8 ports per group
LACP	Yes	
LACP automatically reverts to and from Static LAG	Yes	
Static LAGs	Yes	
LAG Hashing	Yes	
LAG Member Port Flaps Tracking	Yes	
Auto-LAG	Yes	If more than one link between two M4250 switches, a Link Aggregation Group is created, dynamically
Storm Control	Yes	
IEEE 802.3x (Full Duplex and flow control)	Yes	Asymmetric and Symmetric Flow Control
Per port Flow Control	Yes	
UDLD Support (Unidirectional Link Detection)	Yes	
Normal-Mode	Yes	
Aggressive-Mode	Yes	
Link Dependency	Yes	Allow the link status of specified ports to be dependent on the link status of other ports
IEEE 802.1D Spanning Tree Protocol	Yes	
IEEE 802.1w Rapid Spanning Tree	Yes	
IEEE 802.1s Multiple Spanning Tree	Yes	
Per VLAN STP (PVSTP) with FastUplink and FastBackbone	Yes	PVST+ interoperability

Per VLAN Rapid STP (PVRSTP)	Yes	RPVST+ interoperability
STP Loop Guard	Yes	
STP Root Guard	Yes	
STP BPDU Guard	Yes	
STP BPDU Filtering	Yes	
STP BPDU Flooding	Yes	
L2 Services - Multicast Filtering		
IGMPv2 Snooping Support	Yes	
IGMPv3 Snooping Support	Yes	
NETGEAR IGMP Plus™ Enhanced Implementation	Yes	For automatic multicast across M4250 / M4300 / M4500 (Spine and Leaf) at Layer 2, removing the need for L3 PIM routing
MLDv1 Snooping Support	Yes	
MLDv2 Snooping Support	Yes	
Expedited Leave function	Yes	
Static L2 Multicast Filtering	Yes	
Enable IGMP / MLD Snooping per VLAN	Yes	
IGMPv1/v2 Snooping Querier, compatible v3 queries	Yes	
MLDv1 Snooping Querier	Yes	
MGMD Snooping		
Control Packet Flooding	Yes	
Flooding to mRouter Ports	Yes	
Remove Flood-All-Unregistered Option	Yes	
Multicast VLAN registration (MVR)	Yes	
L3 Services - Multicast Routing		
IGMP Proxy	Yes	
MLD Proxy	Yes	
Any Source Multicast (ASM)	Yes	
Source Specific Multicast (SSM)	Yes	
Multicast streams routing between subnets, VLANs	Yes	
Multicast static routes (IPv4, IPv6)	Yes	
Neighbor discovery	Yes	
PIM-DM (Multicast Routing - dense mode)	Yes	
PIM-DM (IPv6)	Yes	
PIM-SM (Multicast Routing - sparse mode)	Yes	
PIM-SM (IPv6)	Yes	
PIM multi-hop RP support	Yes	
PIM Timer Accuracy	Yes	
PIM-SM Unhandled Events	Yes	
IPMC replication (hardware support)	Yes	
L3 Services - DHCP		
DHCP IPv4 / DHCP IPv6 Client	Yes	
DHCP IPv4 / DHCP IPv6 Server (Stateless, Stateful)	Yes	
DHCP Snooping IPv4 / IPv6	Yes	
BootP Relay IPv4 / IPv6	Yes	
DHCP Relay IPv4 / IPv6	Yes	

DHCP Relay Option 82 circuit-id and remote-id for VLANs	Yes	
Multiple Helper IPs	Yes	
Auto Install (DHCP options 66, 67, 150 and 55, 125)	Yes	
L3 Services - Routing		
Static Routing / ECMP Static Routing	IPv4/IPv6	
Multiple next hops to a given destination	Yes	
Load sharing, Redundancy	Yes	
Default routes	Yes	
Static Reject routes	Yes	
Port Based Routing	Yes	
VLAN Routing	Yes	
802.3ad (LAG) for router ports	Yes	
Loopback Interfaces	Yes	
RIP	IPv4	
RIPv1/RIPv2	Yes	
IP Multinetting	Yes	
ICMP throttling	Yes	
Router Discovery Protocol	Yes	
DNS Client	IPv4/IPv6	
IP Helper	Yes	
Max IP Helper entries	512	
IP Event Dampening	IPv4/IPv6	
Proxy ARP	IPv4/IPv6	
ICMP	IPv4/IPv6	
ICMP redirect detection in hardware	Yes	
Policy Based Routing (PBR)	IPv4/IPv6	
Based on the size of the packet	Yes	
Based on the Protocol of the payload (Protocol ID field)	Yes	
Based on Source MAC address	Yes	
Based on Source or Destination IP address	Yes	
Based on VLAN tag	Yes	
Based on Priority(802.1P priority)	Yes	
Network Monitoring and Discovery Services		
ISDP (Industry Standard Discovery Protocol)	Yes	Can interoperate with devices running CDP
802.1ab LLDP	Yes	
802.1ab LLDP - MED	Yes	
SNMP	V1, V2, V3	
RMON 1,2,3,9	Yes	
sFlow	Yes (IPv4 and IPv6 headers)	
Security		
Network Storm Protection, DoS		
Broadcast, Unicast, Multicast DoS Protection	Yes	
Denial of Service Protection (control plane)	Yes	Switch CPU protection
Denial of Service Protection (data plane)	Yes	Switch Traffic protection

DoS Attacks Protection	SIPDIP SMACDMAC FIRSTFRAG TCPFRAG TCPFLAG TCPPORT	UDPPORT TCPFLAGSEQ TCPOFFSET TCPSYN TCPSYNFIN TCPFINURGPSH	L4PORT ICMP ICMPV4 ICMPV6 ICMPFRAG PINGFLOOD	SYNACK	
CPU Rate Limiting	Yes	Applied to IPv4 and IPv6 multicast packets with unknown L3 addresses when IP routing/ multicast enabled			
ICMP throttling	Yes	Restrict ICMP, PING traffic for ICMP-based DoS attacks			
Management					
Management ACL (MACAL)	Yes	Protects management CPU access through the LAN			
Max Rules	64				
Out of band Management	Yes	In-band management can be shut down entirely when out-of-band management network			
Radius accounting	Yes	RFC 2565 and RFC 2866			
TACACS+	Yes				
Malicious Code Detection	Yes	Software image files and Configuration files with digital signatures			
Network Traffic					
Access Control Lists (ACLs)	L2 / L3 / L4	MAC, IPv4, IPv6, TCP, UDP			
Time-based ACLs	Yes				
Protocol-based ACLs	Yes				
ACL over VLANs	Yes				
Dynamic ACLs	Yes				
IEEE 802.1x Radius Port Access Authentication	Yes	Up to 48 clients (802.1x) per port are supported, including the authentication of the users domain			
802.1x MAC Address Authentication Bypass (MAB)	Yes	Supplemental authentication mechanism for non-802.1x devices, based on their MAC address only			
Network Authentication Successive Tiering	Yes	Dot1x-> MAP -> Captive Portal successive authentication methods based on configured time-outs			
Port Security	Yes				
IP Source Guard	Yes			IPv4 / IPv6	
DHCP Snooping	Yes			IPv4 / IPv6	
Dynamic ARP Inspection	Yes			IPv4 / IPv6	
IPv6 RA Guard Stateless Mode	Yes				
MAC Filtering	Yes				
Port MAC Locking	Yes				
Private Edge VLAN	Yes	A protected port doesn't forward any traffic (unicast, multicast, or broadcast) to any other protected port - same switch			
Private VLANs	Yes	Scales Private Edge VLANs by providing Layer 2 isolation between ports across switches in same Layer 2 network			
Quality of Service (QoS) - Summary					
Access Lists	Yes				
L2 MAC, L3 IP and L4 Port ACLs	Yes				
Ingress	Yes				
Egress	Yes				
Time-based	Yes				
802.3ad (LAG) for ACL assignment	Yes				
Binding ACLs to VLANs	Yes				
ACL Logging	Yes				
Support for IPv6 fields	Yes				

DiffServ QoS	Yes
Edge Node applicability	Yes
Interior Node applicability	Yes
802.3ad (LAG) for service interface	Yes
Support for IPv6 fields	Yes
Ingress/Egress	Yes
IEEE 802.1p COS	Yes
802.3ad (LAG) for COS configuration	Yes
WRED (Weighted Deficit Round Robin)	Yes
Strict Priority queue technology	Yes
Single Rate Policing	Yes (CLI only)
Committed Information Rate	Yes
Committed Burst Size	Yes
Excessive Burst Size	Yes
DiffServ feature applied to class maps	Yes
Auto-VoIP	Yes, based on protocols (SIP, H323 and SCCP) or on OUI bytes (default database and user-based OUIs) in the phone source MAC address

QoS - ACL Feature Support

ACL Support (general, includes IP ACLs)	Yes
MAC ACL Support	Yes
IP Rule Match Fields:	
Destination IP	Inbound/Outbound
Destination IPv6 IP	Inbound/Outbound
Destination L4 Port	Inbound/Outbound
Every Packet	Inbound/Outbound
IP DSCP	Inbound/Outbound
IP Precedence	Inbound/Outbound
IP TOS	Inbound/Outbound
Protocol	Inbound/Outbound
Source IP (for Mask support see below)	Inbound/Outbound
Source IPv6 IP	Inbound/Outbound
L3 IPv6 Flow Label	Inbound
Source L4 Port	Inbound/Outbound
TCP Flag (ack, est, fin)	Inbound/Outbound
Supports Masking	Inbound/Outbound
MAC Rule Match Fields	
COS	Inbound/Outbound
Destination MAC	Inbound/Outbound
Destination MAC Mask	Inbound/Outbound
Ethertype	Inbound/Outbound
Source MAC	Inbound/Outbound
Source MAC Mask	Inbound/Outbound
VLAN ID	Inbound/Outbound
Rules attributes	
Assign Queue	Inbound
Logging -- deny rules	Inbound/Outbound
Mirror (to supported interface types only)	Inbound
Redirect (to supported interface types only)	Inbound
Rate Limiting -- permit rules	Inbound/Outbound

Interface	
Inbound direction	Yes
Outbound direction	Yes
Supports LAG interfaces	Yes
Supports Control-plane interface	Yes
Multiple ACLs per interface, dir	Yes
Mixed-type ACLs per interface, dir	Yes
Mixed L2/IPv4 ACLs per interface, inbound	Yes
Mixed IPv4/IPv6 ACLs per interface, inbound	Yes
Mixed IPv4/IPv6 ACLs per interface, outbound	Yes
QoS - DiffServ Feature Support	
DiffServ Supported	Yes
Class Type	
All	Yes
Class Match Criteria	
COS	Inbound/Outbound
COS2 (Secondary COS)	Inbound
Destination IP (for Mask support see below)	Inbound/Outbound
Destination IPv6 IP	Inbound/Outbound
Destination L4 Port	Inbound/Outbound
Destination MAC (for Mask support see below)	Inbound/Outbound
Ethertype	Inbound/Outbound
Every Packet	Inbound/Outbound
IP DSCP	Inbound/Outbound
IP Precedence	Inbound/Outbound
IP TOS (for Mask support see below)	Inbound/Outbound
Protocol	Inbound/Outbound
Reference Class	Inbound/Outbound
Source IP (for Mask support see below)	Inbound/Outbound
Source IPv6 IP	Inbound/Outbound
L3 IPv6 Flow Label	Inbound
Source L4 Port	Inbound/Outbound
Source MAC (for Mask support see below)	Inbound/Outbound
VLAN ID (Source VID)	Inbound/Outbound
VLAN ID2 (Secondary VLAN) (Source VID)	Inbound/Outbound
Supports Masking	Inbound/Outbound
Policy	
Out Class Unrestricted	Yes
Policy Attributes -- Inbound	
Assign Queue	Yes
Drop	Yes
Mark COS	Yes
Mark COS-AS-COS2	Yes
Mark COS2 (Secondary COS)	Yes
Mark IP DSCP	Yes
Mark IP Precedence	Yes
Mirror (to supported interface types only)	Yes
Police Simple	Yes
Police Single-Rate	Yes
Police Two-Rate	Yes
Police Color Aware Mode	Yes
Redirect (to supported interface types only)	Yes

Policy Attributes -- Outbound	Yes
Drop	Yes
Mark COS	Yes
Mark IP DSCP	Yes
Mark IP Precedence	Yes
Mirror (to supported interface types only)	Yes
Police Simple	Yes
Police Single-Rate	Yes
Police Two-Rate	Yes
Police Color Aware Mode	Yes
Redirect (to supported interface types only)	Yes
Service Interface	
Inbound Slot.Port configurable	Yes
Inbound 'All' Ports configurable	Yes
Outbound Slot.Port configurable	Yes
Outbound 'All' Ports configurable	Yes
Supports LAG interfaces	Yes
Mixed L2/IPv4 match criteria, inbound	Yes
Mixed IPv4/IPv6 match criteria, inbound	Yes
Mixed IPv4/IPv6 match criteria, outbound	Yes
PHB Support	
EF	Yes
AF4x	Yes
AF3x	Yes
AF2x	Yes
AF1x	Yes
CS	Yes
Statistics -- Policy Instance	
Offered	packets
Discarded	packets

QoS - COS Feature Support

COS Support	Yes
Supports LAG interfaces	Yes
COS Mapping Config	
Configurable per-interface	Yes
IP DSCP Mapping	Yes
COS Queue Config	
Queue Parms configurable per-interface	Yes
Drop Parms configurable per-interface	Yes
Interface Traffic Shaping (for whole egress interface)	Yes
Minimum Bandwidth	Yes
Weighted Deficit Round Robin (WDRR) Support	Yes
Maximum Queue Weight	127
WRED Support	Yes

PTP - PTPv2 Feature Support

PTPv2	
IEEE 1588 PTPv2 Section 10 and 11.5	Yes
Implementation	Transparent Clock (TC) End-to-End implementation considering the residence time of PTPv2 packets from ingress to egress
Limitations	PTPv1 packets are forwarded but not processed (no PTPv1 support).
Method	Residence time of the PPTPv2 packet at the egress port level
PTPv2 packet fields that are updated	The "Sync & Delay_Req" field of passing/egressing out PTPv2 packets is updated with the residence time in the switch
PTPv2 packet fields that are NOT updated	Other fields in PTPv2 packets ("Announce", "Delay_Resp", "Pdelay_Req" and "Pdelay_Resp") are not updated

TSN - Time Sensitive Networking AVB Feature Support	
AVB	
IEEE 802.1BA-2011 Audio Video Bridging (AVB)	Yes, when an AVB license is properly installed in the switch (license sold separately, see Ordering Information at the end of the Tech Spec section)
IEEE 802.1AS-2011 gPTP	Yes, with an AVB license
IEEE 802.1Qav-2009 FQTSS	Yes, with an AVB license
IEEE 802.1Qat-2010 MSRP	Yes, with an AVB license
IEEE 802.1ak MMRP	Yes, with an AVB license
IEEE 802.1ak MVRP	Yes, with an AVB license
Max number of AVB streams	256 streams per switch
Limitations	AVB isn't supported on a LAG (link aggregation group, or port channel)

Functional Summary - IETF RFC Standards and IEEE Network Protocols

Core Management

RFC 854 – Telnet	RFC 3414 – User-Based Security Model
RFC 855 – Telnet option specifications	RFC 3415 – View-based Access Control Model
RFC 1155 – SMI v1	RFC 3416 – Version 2 of SNMP Protocol Operations
RFC 1157 – SNMP	RFC 3417 – Transport Mappings
RFC 1212 – Concise MIB definitions	RFC 3418 – Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)
RFC 1867 – HTML/2.0 forms with file upload extensions	Configurable Management VLAN

RFC 1901 – Community-based SNMP v2	SSL 3.0 and TLS 1.2
RFC 1908 – Coexistence between SNMP v1 and SNMP v2	– RFC 2246 – The TLS protocol, version 1.0
RFC 2068 – HTTP/1.1 protocol as updated by draft-ietf-http-v11-spec-rev-03	– RFC 2346 – AES cipher suites for Transport layer security
RFC 2271 – SNMP framework MIB	– RFC 2818 – HTTP over TLS SSH 2.0
RFC 2295 – Transparent content negotiation	SSH 2.0
RFC 2296 – Remote variant selection; RSVA/1.0 state management cookies – draft-ietf-http-state-mgmt-05	– RFC 4253 – SSH transport layer protocol
RFC 2576 – Coexistence between SNMP v1, v2, and v3	– RFC 4252 – SSH authentication protocol
RFC 2578 – SMI v2	– RFC 4254 – SSH connection protocol
RFC 2579 – Textual conventions for SMI v2	– RFC 4251 – SSH protocol architecture
RFC 2580 – Conformance statements for SMI v2	– RFC 4716 – SECSH public key file format
RFC 3410 – Introduction and Applicability Statements for Internet Standard Management Framework	– RFC 4419 – Diffie-Hellman group exchange for the SSH transport layer protocol
RFC 3411 – An Architecture for Describing SNMP Management Frameworks	HTML 4.0 specification, December 1997
RFC 3412 – Message Processing & Dispatching	Java Script™ 1.3
RFC 3413 – SNMP Applications	

Advanced Management

Industry-standard CLI with the following features:

– Scripting capability	Optional user password encryption
– Command completion	Multisession Telnet server
– Context-sensitive help	Auto Image Upgrade

Core Switching	
IEEE 802.1AB – Link level discovery protocol	IEEE 802.1BA-2011, 802.1AS-2011 gPTP, 802.1Qav-2009 FQTSS, 802.1Qat-2010 MSRP, 802.1ak MMRP, MVRP with AVB license
IEEE 802.1D – Spanning tree	IEEE 802.3ac – VLAN tagging
IEEE 802.1p – Ethernet priority with user provisioning and mapping	IEEE 802.3ad – Link aggregation
IEEE 802.1Q – Virtual LANs w/ port-based VLANs	IEEE 802.3ae – 10 GbE
IEEE 802.1S – Multiple spanning tree compatibility	IEEE 802.3af – Power over Ethernet
IEEE 802.1v – Protocol-based VLANs	IEEE 802.3at – Power over Ethernet Plus
IEEE 802.1W – Rapid spanning tree	IEEE 802.3x – Flow control
iEEE 802.1AB – LLDP	ANSI/TIA-1057 – LLDP-MED
IEEE 802.1X – Port-based authentication	GARP – Generic Attribute Registration Protocol: clause 12, 802.1D-2004
IEEE 802.3 – 10Base-T	GMRP – Dynamic L2 multicast registration: clause 10, 802.1D-2004
IEEE 802.3u – 100Base-T	GVRP – Dynamic VLAN registration: clause 11.2, 802.1Q-2003
IEEE 802.3ab – 1000Base-T	RFC 4541 – IGMP snooping and MLD snooping
IEEE 802.3bz-2016 – 2.5GBASE-T	RFC 5171 – UniDirectional Link Detection (UDLD) Protocol
Additional Layer 2 Functionality	
Broadcast storm recovery	IGMP and MLD snooping querier
Double VLAN/VMAN tagging	Port MAC locking
DHCP Snooping	MAC-based VLANs
Dynamic ARP inspection	IP source guard
Independent VLAN Learning (IVL) support	IP subnet-based VLANs
IPv6 classification APIs	Voice VLANs
Jumbo Ethernet frames	Protected ports
Port mirroring	IGMP snooping
Static MAC filtering	Green Ethernet power savings mode
System Facilities	
Event and error logging facility	RFC 2030 – Simple Network Time Protocol (SNTP) V4 for IPv4, IPv6, and OSI
Runtime and configuration download capability	RFC 2131 – DHCP Client/Server
PING utility	RFC 2132 – DHCP options and BOOTP vendor extensions
XMODEM	RFC 2865 – RADIUS client
RFC 768 – UDP	RFC 2866 – RADIUS accounting
RFC 783 – TFTP	RFC 2868 – RADIUS attributes for tunnel protocol support
RFC 791 – IP	RFC 2869 – RADIUS extensions
RFC 792 – ICMP	RFC 28869bis – RADIUS support for Extensible Authentication Protocol (EAP)
RFC 793 – TCP	RFC 5176 – RADIUS Change of Auth

RFC 826 – ARP	RFC 3164 – The BSD syslog protocol with RFC 5424 update
RFC 951 – BOOTP	RFC 3580 – 802.1X RADIUS usage guidelines
RFC 1321 – Message digest algorithm	Power Source Equipment (PSE) IEEE 802.af Powered Ethernet (DTE Power via MDI) standard
RFC 1534 – Interoperability between BOOTP and DHCP	

Core Routing

RFC 826 – Ethernet ARP	RFC 1812 – Requirements for IPv4 routers
RFC 894 – Transmission of IP datagrams over Ethernet networks	RFC 2082 – RIP-2 MD5 authentication
RFC 896 – Congestion control in IP/TCP networks	RFC 2131 – DHCP relay
RFC 1027 – Using ARP to implement transparent subnet gateways (Proxy ARP)	RFC 2385–Protection of BGP Sessions via the TCP MD5 Signature Option
RFC 1256 – ICMP router discovery messages	RFC 2453 – RIP v2
RFC 1321 – Message digest algorithm	RFC 3021 – Using 31-Bit Prefixes on Point-to-Point Links
RFC 1519 – CIDR	RFC 3046 – DHCP/BOOTP relay

Quality of Service - DiffServ

RFC 2474 – Definition of the differentiated services field (DS Field) in IPv4/IPv6 headers	RFC 2697 – A Single Rate Three Color Marker
RFC 2475 – An architecture for differentiated services	RFC 3246 – An expedited forwarding PHB (Per-Hop Behavior)
RFC 2597 – Assured forwarding PHB group	RFC 3260 – New terminology and clarifications for DiffServ

Quality of Service - Access Control Lists (ACLs)

Permit/deny actions for inbound or outbound IP traffic classification based on: – Type of service (ToS) or differentiated services (DS) DSCP field – Source IP address – Destination IP address – TCP/UDP source port – TCP/UDP destination port – IPv6 flow label – IP protocol number	Permit/deny actions for inbound or outbound Layer 2 traffic classification based on: – Source MAC address – Destination MAC address – EtherType – VLAN identifier value or range (outer and/or inner VLAN tag) – 802.1p user priority (outer and/or inner VLAN tag) Optional rule attributes: – Assign matching traffic flow to a specific queue – Redirect or mirror (flow-based mirroring) matching traffic flow to a specific port – Generate trap log entries containing rule hit counts

Quality of Service - Class of Service (CoS)

Direct user configuration of the following: – IP DSCP to traffic class mapping – IP precedence to traffic class mapping – Interface trust mode: 802.1p, IP Precedence, IP DSCP, or untrusted – Interface traffic shaping rate – Minimum and maximum bandwidth per queue – Strict priority versus weighted (WRR/WDRR/WFQ) scheduling per queue – Tail drop versus Weighted Random Early Detection (WRED) queue depth management	Auto VoIP

Core Multicast

RFC 1112 – Host extensions for IP multicasting	RFC3973 – PIM-DM
RFC 2236 – IGMP v2	RFC4601 – PIM-SM
RFC 2710 – MLDv1	Draft-ietf-magma-igmp-proxy-06.txt – IGMP/MLD-based multicast forwarding (IGMP/MLD proxying)

RFC 2365 – Administratively scoped boundaries	Draft-ietf-magma-igmpv3-and-routing-05.txt – IGMPv3 and multicast routing protocol interaction
RFC 3376 – IGMPv3	Static RP configuration
RFC3810 – MLDv2	Static RP configuration
Core IPv6 Routing	
RFC 1981 – Path MTU for IPv6	RFC 3493 – Basic socket interface for IPv6
RFC 2373 – IPv6 addressing	RFC 3513 – Addressing architecture for IPv6
RFC 2460 – IPv6 protocol specification	RFC 3542 – Advanced sockets API for IPv6
RFC 2461 – Neighbor discovery	RFC 3587 – IPv6 global unicast address format
RFC 2462 – Stateless autoconfiguration	RFC 3736 – Stateless DHCPv6
RFC 2464 – IPv6 over Ethernet	RFC 4213 – Basic transition mechanisms for IPv6
RFC 2711 – IPv6 router alert	RFC 4291 – Addressing architecture for IPv6
RFC 3056–Connection of IPv6 Domains via IPv4 Clouds	RFC 4443 – Internet Control Message Protocol (ICMPv6) for the IPv6 Specification
RFC 3315 –Dynamic Host Configuration Protocol for IPv6 (DHCPv6)	RFC 6164 – Using 127-Bit IPv6 Prefixes on Inter-Router Links
RFC 3484 – Default address selection for IPv6	RFC 6583 – Operational Neighbor Discovery Problems
Supported MIBs	
Base Package MIBs	
ANSI/TIA-1057 – LLDP-EXT-MED-MIB	RFC 2674 – Q-BRIDGE-MIB
DIFFSERV DSCP TC (Draft – no RFC)	RFC 2677 – IANA Address Family Numbers MIB
DNS-RESOLVER-MIB (IETF DNS Working Group)	RFC 2819 – RMON MIB
DNS-SERVER-MIB (IETF DNS Working Group)	RFC 2925 – DISMAN-PING-MIB and DISMAN-TRACEROUTE-MIB
GreenEthernet Private MIB	RFC 3273 – RMON MIB for High Capacity Networks
IANA-ADDRESS-FAMILY-NUMBERS-MIB (IANA (3/2002)	RFC 3411 – SNMP Management Frameworks MIB
IEEE 802.1AB-2004 – LLDP MIB	RFC 3411 – SNMP-FRAMEWORK-MIB
IEEE 802.1AB-2005 – LLDP-EXT-DOT3-MIB	RFC 3412 – SNMP-MPD-MIB
POWER ETHERNET MIB (Draft – no RFC)	RFC 3413 – SNMP-NOTIFICATION-MIB
RFC 1155 – SMI-MIB	RFC 3413 – SNMP-PROXY-MIB (initial revision published as RFC 2273)
RFC 1450 – SNMPV2-MIB	RFC 3413 – SNMP-TARGET-MIB (initial revision published as RFC 2273)
RFC 2273 – SNMP Notification MIB, SNMP Target MIB	RFC 3414 – User-based Security Model for SNMPv3 MIB
RFC 2392 – IANA RTPROTO-MIB	RFC 3415 – View-based Access Control Model for SNMP MIB
RFC 2572 – SNMP Message Processing and Dispatching MIB	RFC 3417 – SNMPV2-TM
RFC 2574 – User-based Security Model for SNMPv3 MIB	RFC 3418 – SNMPv2 MIB
RFC 2575 – View-based Access Control Model for SNMP MIB	RFC 3434 – RMON MIB Extensions for High Capacity Alarms
RFC 2576 – SNMP Community MIB	RFC 3584 – SNMP Community MIB
RFC 2578 – SNMPV2-SMI	RFC 3621 – POWER-ETHERNET-MIB

RFC 2579 – SNMPV2-TC	SNMP-RESEARCH-MIB– SNMP research MIB definitions
RFC 2580– SNMPV2-CONF	SR-AGENT-INFO-MIB– SNMP research MIB definitions
RFC 2613 – SMON-MIB	USM-TARGET-TAG-MIB – SNMP research MIB definitions
Switching Package MIBs	
RFC 1213 – MIB-II	RFC 2011 – SNMPv2 Management Information Base
ANSI/TIA 1057 – LLDP-MED MIB	RFC 2213 – Integrated Services MIB
FASTPATH Enterprise MIBs supporting switching features	RFC 2233 – IF-MIB
FASTPATH-MMRP-MIB – MMRP private MIB for IEEE 802.1Q devices	RFC 2233 – The Interfaces Group MIB using SMI v2
FASTPATH-MSRP-MIB – MSRP private MIB for IEEE 802.1Q devices	RFC 2674 – VLAN and Ethernet Priority MIB (P-Bridge MIB)
FASTPATH-MVRP-MIB – MVRP private MIB for IEEE 802.1Q devices	RFC 2737 – Entity MIB (Version 2)
IANAifType-MIB – IANAifType Textual Convention	RFC 2819 – RMON Groups 1,2,3, & 9
IEEE 802.1AB – LLDP MIB	RFC 2863 – Interfaces Group MIB
IEEE 802.3AD MIB (IEEE8021-AD-MIB)	RFC 3291 – INET Address MIB
IEEE Draft P802.1AS/D7.0 (IEEE8021-AS-MIB)	RFC 3291 – Textual Conventions for Internet Network Addresses
IEEE LAG-MIB – Link Aggregation module for managing IEEE 802.3ad	RFC 3621 – Power Ethernet MIB
LLDP-EXT-DOT3-MIB (part of IEEE Std 802.1AB)	RFC 3635 – Etherlike MIB
LLDP-MIB (part of IEEE Std 802.1AB)	RFC 3636 – IEEE 802.3 Medium Attachment Units (MAUs) MIB
Private MIB for 802.1Qat, 802.1Qav Configuration	RFC 4022 – Management Information Base for the Transmission Control Protocol (TCP)
RFC 1493 – Bridge MIB	RFC 4113 – Management Information Base for the User Datagram Protocol (UDP)
RFC 1643 – Definitions of managed objects for the Ethernet-like interface types	RFC 4444 – IS-IS MIB
Routing Package MIBs	
FASTPATH Enterprise MIBs supporting routing features	RFC 2096 – IP Forwarding Table MIB
IANA-Address-Family-Numbers-MIB	RFC 2668 – IEEE 802.3 Medium Attachment Units (MAUs) MIB
IPv6 Management MIBs	
RFC 3419 – TRANSPORT-ADDRESS-MIB IPv6-ICMP-MIB (draft)	IPv6-MIB (draft)
IPv6 Routing MIBs	
RFC 2465 – IPv6 MIB	RFC 2466 – ICMPv6 MIB
QoS Package MIB	
RFC 3289 – DIFFSERV-MIB & DIFFSERV-DCSP-TC MIBs	Private MIBs for full configuration of DiffServ, ACL, and CoS functionality
Security MIB	
RFC 2618 – RADIUS Authentication Client MIB	IEEE8021-PAE-MIB – The Port Access Entity module for managing IEEE 802.1X
RFC 2620 – RADIUS Accounting MIB	IEEE 802.1X MIB (IEEE 8021-PAE-MIB 2004 Revision)

Multicast Package MIBs		
RFC 2932 – IPv4 Multicast Routing MIB for PIMDMv4	draft-ietf-magma-mgmd-mib-05.txt –Multicast Group Membership Discovery MIB (both IGMP and MLD)	
RFC 5060 – PIM-SM and PIM-DM MIB for IPv4 and IPv6	FASTPATH Enterprise MIBs supporting multicast features	
RFC 5240 – BSR Protocol MIB		
NETGEAR-BOXSERVICES-PRIVATE-MIB for SFP/SFP+ MIB Support		
boxServicesFiberPortsOpticsTable	boxServicesFiberPortOpticsPowerOut	
BoxServicesFiberPortsOpticsEntry	boxServicesFiberPortOpticsPowerIn	
boxServicesFiberPortIndex	boxServicesFiberPortOpticsTxFault	
boxServicesFiberPortOpticsTemperature	boxServicesFiberPortOpticsLos	
boxServicesFiberPortOpticsVoltage	boxServicesFiberPortOpticsFaultStatus	
boxServicesFiberPortOpticsCurrent		
Management		
Password management	Yes	
Configurable Management VLAN	Yes	
Out-of-band Management	Yes	In-band management can be shut down using Management ACLs when separate management network
Auto Install (BOOTP and DHCP options 66, 67, 150 and 55, 125)	Yes	Scalable deployment process (firmware, config)
Admin access control via Radius and TACACS+	Yes	Policies, Enable
Industry standard CLI (IS-CLI)	Yes	Command Line interface
CLI commands logged to a Syslog server	Yes	
Web-based graphical user interface (GUI)	Yes	Fully functional GUI (exceptions are noted below:)
Features without Web GUI support		
Authorization List	CLI only	
Control Plane ACL	CLI only	
UDLD	CLI only	
Policy Based Routing	CLI only	
LLPF	CLI only	
QoS Policy for Single Rate	CLI only	
DHCPv6 Snooping	CLI only	
IPv6 DHCP Relay	CLI only	
eMail Alerting	CLI only	
MMRP	CLI only	
Telnet	Yes	
IPv6 management	Yes	
Dual Software (firmware) image	Yes	Allows non disruptive firmware upgrade process
Editable Configuration file	Yes	Text-based (CLI commands) configuration file
Non disruptive Config Management	Yes	With new startup configuration file, the switch gracefully resolves any differences with the running config
IS-CLI Scripting	Yes	
Port descriptions	Yes	

SNTP client over UDP port 123	Yes	Provides synchronized network timestamp either in broadcast or unicast mode
XMODEM	Yes	
SNMP v1/v2	Yes	
SNMP v3 with multiple IP addresses	Yes	
RMON 1,2,3,9	Yes	
Max Ether Stats entries	34	
Max History entries	102	
Max buckets per History entry	10	
Max Alarm entries	102	
Max Event entries	102	
Max Log entries per Event entry	10	
Port Mirroring	Yes	
Number of monitor sessions	1 (multiple sessions are configurable)	
Tx/Rx	Yes	
Many to One Port Mirroring	Yes	
LAG supported as source ports	Yes	
Max source ports in a session	Total switch port count	
Remote Port Mirroring (RSPAN)	Yes When a particular session is enabled, any traffic entering or leaving the source ports of that session is copied (mirrored) onto a Remote Switched Port Analyzer (RSPAN) VLAN	
Flow based mirroring	Yes	
Cable Test utility	Yes	CLI, Web GUI
Outbound Telnet	Yes	
SSHv2	Yes	Secure Shell version 2 (OpenSSH 7.5p1)
SSH Session Configuration	Yes	
SSL v3 and TLS v1.2 for HTTPS web-based access	Yes	Open SSL 1.0.2o)
2048-bit RSA key pairs	Yes For SSLv3 and SSHv2	
SHA2-256 and SHA2-512 cryptographic hash functions	Yes For SSLv3 and SSHv2	
File transfers (uploads, downloads)	TFTP / HTTP	
Secured protocols for file transfers	SCP / SFTP / HTTPS	
HTTP Max Sessions	16	
SSL/HTTPS Max Sessions	16	
HTTP Download (firmware)	Yes	
Email Alerting	Yes (CLI only)	
Syslog (RFC 3164) (RFC 5424)	Yes, forwarding messages via UDP using the Syslog protocol to one or more collectors or relays	
Persistent log supported	Yes	
User Admin Management		
User ID configuration	Yes	
Max number of configured users	6	
Support multiple READWRITE Users	Yes	
Max number of IAS users (internal user database)	100	
Authentication login lists	Yes	
Authentication Enable lists	Yes	

Authentication HTTP lists	Yes
Authentication HTTPS lists	Yes
Authentication Dot1x lists	Yes
Accounting Exec lists	Yes
Accounting Commands lists	Yes
Login History	50
M4250 series - Platform Constants	
Maximum number of remote Telnet connections	5
Maximum number of remote SSH connections	5
Number of MAC Addresses	16K
Number of VLANs	4,093 VLANs (802.1Q) simultaneously
VLAN ID Range	1 - 4093
Number of 802.1p Traffic Classes	8 classes
IEEE 802.1x Number of .1x clients per port	48
Number of LAGs	8 LAGs with up to 8 ports per group
Maximum multiple spanning tree instances (MSTP)	16
Maximum per VLAN spanning tree instances (PVST)	32
MAC based VLANS Number supported	Yes 256
Number of network buffers	182
Number of log messages buffered	200
Static filter entries Unicast MAC and source port Multicast MAC and source port Multicast MAC and destination port (only)	 20 20 1024
Subnet based VLANs Number supported	Yes 128
Protocol Based VLANs Max number of groups Max protocols	Yes 128 16
Maximum Multicast MAC Addresses entries	1K
Jumbo Frame Support Max Size Supported	Yes 12k
Number of IP Source Guard stations	379
Number of DHCP snooping bindings	32K
Number of DHCPv6 snooping bindings	32K
Number of DHCP snooping static entries	1024
LLDP-MED number of remote nodes LLDP Remote Management address buffers LLDP Unknown TLV address buffers LLDP Organisationally Defined Large TLV buffers LLDP Organisationally Defined Small TLV buffers	32 32 100 16 100

Port MAC Locking	Yes	
Dynamic addresses per port	600	
Static addresses per port	20	
sFlow		
Number of samplers	16	
Number of pollers	16	
Number of receivers	8	
Radius		
Max Authentication servers	32	
Max Accounting servers	32	
Number of Routes (v4/v6)		
IPv4 Unicast Routes in Default IPv4 Basic SDM Template	894	SDM (System Data Management, or switch database)
IPv6 Unicast Routes in Default IPv4 Basic SDM Template	126	
RIP application route scaling (IPv4 only)	32	
Number of routing interfaces (including port/vlan)	128	
Number of static routes (v4/v6)	64/64	
DHCP Server		
Max number of pools	256	
Total max leases	2K	
DNS Client		
Concurrent requests	16	
Name server entries	8	
Seach list entries	6	
Static host entries	64	
Cache entries	128	
Domain search list entries	32	
DHCPv6 Server		
Max number of pools	16	
DNS domain names within a pool	5	
DNS server addresses within a pool	8	
Delegated prefix definitions within a pool	10	
Number of Host Entries (ARP/NDP)		
IPv4 only SDM build	4K	SDM (System Data Management, or switch database)
IPv4/IPv6 SDM build (v4/v6)	512	
Static v4 ARP Entries	128	
Number of ECMP Next Hops per Route	16	
Number of ECMP groups	128	
Total ECMP nexthops in Hardware	2048	
Maximum MFDB entries	1K	
IGMPv3 / MLDv2 Snooping Limits		
IGMPv3/MLDv2 HW entries when IP Multicast present	128/64	
IP Multicast		
IGMP Group Memberships per system	2K (IPv4) and 2K (IPv6)	
Multicast Routes	512 (IPv4) and 128 (IPv6)	
PIM-DM Neighbors	256	
PIM-SM Neighbors	256	
PIM-SM Static RP Entries	5	
PIM-SM Candidate RP Group Range Entries	20	
PIM-SM SSM Range Entries	5	
IGMP Sources processed per group per message	73	

ACL Limits	
Maximum Number of ACLs (any type)	100
Maximum Number Configurable Rules per List	1,023
Maximum ACL Rules per Interface and Direction	1,023 ingress / 511 ingress
Maximum ACL Rules per Interface and Direction (IPv6)	893 ingress / 253 egress
Maximum ACL Rules (system-wide)	16K
Maximum ACL Logging Rules (system-wide)	128
Maximum ACL per VLAN (system-wide)	64
COS Device Characteristics	
Configurable Queues per Port	8 queues (standalone) 7 queues (stack)
Configurable Drop Precedence Levels	3
DiffServ Device Limits	
Number of Queues	8 queues (standalone) 7 queues (stack)
Requires TLV to contain all policy instances combined	Yes
Max Rules per Class	13
Max Instances per Policy	28
Max Attributes per Instance	3
Max Service Interfaces	116
Max Table Entries	
Class Table	32
Class Rule Table	192
Policy Table	64
Policy Instance Table	768
Policy Attribute Table	2304
Max Nested Class Chain Rule Count	26
AutoVoIP number of voice calls	16
Voice VLAN number of devices	16
LEDs	
Per port	Speed, Link, Activity, PoE - Available both in front and in the rear
Per device	Power, Fan - Available both in front and in the rear
Physical Specifications	
Dimensions	
M4250-10G2F-PoE+	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 7.87 inches (200 mm)
M4250-10G2XF-PoE+	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 7.87 inches (200 mm)
M4250-10G2XF-PoE++	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 10.12 inches (257 mm)
M4250-26G4F-PoE+	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 10.12 inches (257 mm)
M4250-26G4F-PoE++	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 15.75 inches (400 mm)
M4250-26G4XF-PoE+	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 15.75 inches (400 mm)
M4250-40G8F-PoE+	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 15.75 inches (400 mm)
M4250-40G8XF-PoE+	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 15.75 inches (400 mm)
M4250-40G8XF-PoE++	Width: 17.32 inches (440 mm); Height: 2U - 3.40 inches (86.4 mm); Depth: 13.78 inches (350 mm)
M4250-12M2XF	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 3.94 inches (100 mm)
M4250-16XF	Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 7.87 inches (200 mm)
Weight	
M4250-10G2F-PoE+	6.28 lb (2.850 kg)
M4250-10G2XF-PoE+	6.39 lb (2.900 kg)
M4250-10G2XF-PoE++	8.44 lb (3.830 kg)
M4250-26G4F-PoE+	9.47 lb (4.300 kg)
M4250-26G4F-PoE++	14.87 lb (6.746 kg)
M4250-26G4XF-PoE+	12.02 lb (5.453 kg)
M4250-40G8F-PoE+	12.90 lb (5.852 kg)
M4250-40G8XF-PoE+	13.91 lb (6.312 kg)
M4250-40G8XF-PoE++	22.72 lb (10.280 kg)
M4250-12M2XF	3.85 lb (1.745 kg)
M4250-16XF	6.17 lb (2.800 kg)

Power Consumption	
All ports used, max PoE load, line-rate traffic, maximum	
M4250-10G2F-PoE+	163.9W - 559.55 BTU/hr
M4250-10G2XF-PoE+	306.4W - 1046.05 BTU/hr
M4250-10G2XF-PoE++	837.7W - 2859.91 BTU/hr
M4250-26G4F-PoE+	401W - 1369.01 BTU/hr
M4250-26G4F-PoE++	1 PSU: 889W - 3035.05 BTU/hr 2 PSU: 1734W - 5919.88 BTU/hr
M4250-26G4XF-PoE+	614W - 2096.2 BTU/hr
M4250-40G8F-PoE+	624.8W - 2133.07 BTU/hr
M4250-40G8XF-PoE+	1197W - 4086.56 BTU/hr
M4250-40G8XF-PoE++	1 PSU: 912W - 3113.57 BTU/hr 2 PSU: 1998W - 6821.17 BTU/hr 3 PSU: 3523W - 12027.52 BTU/hr
M4250-12M2XF	-
M4250-16XF	-
All ports used, no PoE, line-rate traffic, maximum	
M4250-10G2F-PoE+	17.32W - 59.13 BTU/hr
M4250-10G2XF-PoE+	25W - 85.35 BTU/hr
M4250-10G2XF-PoE++	26.3W - 89.79 BTU/hr
M4250-26G4F-PoE+	35.8W - 122.22 BTU/hr
M4250-26G4F-PoE++	48.8W - 166.6 BTU/hr
M4250-26G4XF-PoE+	46.8W - 159.78 BTU/hr
M4250-40G8F-PoE+	59.5W - 203.13 BTU/hr
M4250-40G8XF-PoE+	89.2W - 304.53 BTU/hr
M4250-40G8XF-PoE++	82.6W - 282 BTU/hr
M4250-12M2XF	37.9W - 129.39 BTU/hr
M4250-16XF	47.84W - 163.33 BTU/hr
Standby, no connection on any port	
M4250-10G2F-PoE+	8.53W - 29.12BTU/hr
M4250-10G2XF-PoE+	12.96W - 44.24BTU/hr
M4250-10G2XF-PoE++	18W - 61.45BTU/hr
M4250-26G4F-PoE+	23.4W - 79.89 BTU/hr
M4250-26G4F-PoE++	36.9W - 125.98 BTU/hr
M4250-26G4XF-PoE+	33.9W - 115.73 BTU/hr
M4250-40G8F-PoE+	46.4W - 158.41 BTU/hr
M4250-40G8XF-PoE+	74.5W - 254.34 BTU/hr
M4250-40G8XF-PoE++	68.5W - 233.86 BTU/hr
M4250-12M2XF	14.1W - 48.14BTU/hr
M4250-16XF	19.27W - 65.78BTU/hr

Environmental Specifications	
Operating:	
Temperature (non-PoE models: M4250-12M2XF, M4250-16XF)	32° to 122°F (0° to 50°C)
Temperature (all other models)	32° to 113°F (0° to 45°C)
Humidity	90% maximum relative humidity, non-condensing
Altitude	10,000 ft (3,000 m) maximum
Storage:	
Temperature	– 4° to 158°F (–20° to 70°C)
Humidity	95% maximum relative humidity, non-condensing
Altitude	10,000 ft (3,000 m) maximum

Electromagnetic Emissions and Immunity	
Certifications	FCC: 47 CFR FCC Part 15, Class A; ANSI C63.4:2014 ISED: ICES-003:2016 Issue 7, Class A CE: EN 55032:2015, Class A; EN61000-3-2:2014, Class A; EN 61000-3-3-:2013; EN 55024:2010; EN 55035:2017 RCM: AS/NZS CISPR 32:2015, Class A CCC (China Compulsory Certificate): GB/T9254-2008, Class A VCCI: VCCI-CISPR 32:2016, Class A KC: KN32; KN 35, Class A EAC: GOST IEC 62311-2013; GOST30804.3.2-2013; GOST30804.3.3-2013; GOST 30805.22-2013; GOST CISPR 24-2013 BSMI: CNS 13438, Class A

Safety	
Certifications	CB report/Certificate: IEC 62368-1 Ed.2; IEC 60950-1 Ed.2 Am2 CSA: UL/ANSI 62368-1 ed.2; CAN/CSA C22.2 No. 62368-1-14 CE: EN 62368-1:2014 RCM: AZ/NZS 62368.1:2018 CCC (China Compulsory Certificate): GB4943.1-2011 KC: K 60950-1 (2011-12) EAC: GOST IEC 62368-1-2014 BSMI: CNS 14336-1
Package Content	
All models	Switch Power cord(s) RJ45 straight-through wiring serial console cable to DB9 USB Type-C to USB-A 2.0 console cable Rubber caps for the SFP/SFP+ sockets Rubber footpads for tabletop installation Installation guide Two regular (short) brackets and screws for two-post rack mount (for front posts) allowing for mounting with ports on the back, or ports on the front of the rack Two longer brackets for two-post rack mount (for front posts) recessing the switch by 2 inches in order to make room for the cabling
ProSAFE Warranty and Support	
ProSAFE Limited Lifetime Hardware Warranty**	Included
90 days of Technical Support via phone and email*	Included, 90 days after purchase
Lifetime Technical Support through online chat	Included, lifetime
Lifetime Next Business Day hardware replacement	Included, lifetime
ProSupport Service Packs	
Installation contracts for:	All models
PSB0304-10000S	Remote Installation Setup and Configuration Service Contract (2-hour planned appointment)
Supplemental support contracts for:	M4250-10G2F-PoE+, M4250-10G2XF-PoE+, M4250-10G2XF-PoE++, M4250-12M2XF, M4250-16XF, M4250-26G4F-PoE+
PMB0312-10000S	OnCall 24x7 1-year Category 2
PMB0332-10000S	OnCall 24x7 3-year Category 2
PMB0352-10000S	OnCall 24x7 5-year Category 2
Supplemental support contracts for:	M4250-26G4F-PoE++, M4250-26G4XF-PoE+, M4250-40G8F-PoE+, M4250-40G8XF-PoE+, M4250-40G8XF-PoE++
PMB0313-10000S	OnCall 24x7 1-year Category 3
PMB0333-10000S	OnCall 24x7 3-year Category 3
PMB0353-10000S	OnCall 24x7 5-year Category 3

Ordering Information

Optional Modules and Accessories		
AGM731F	1000BASE-SX SFP LC Transceiver (multimode, 550m OM4/OM3 50/125µm, 275m OM2/OM1 62.5/125µm)	AGM731F
AGM732F	1000BASE-LX SFP LC Transceiver (single mode, 10km 9/125µm)	AGM732F
AGM734	1000BASE-T SFP RJ45 Transceiver	AGM734-10000S
AXC761	10G Direct Attach SFP+ to SFP+ 1 Meter Passive DAC Cable	AXC761-10000S
AXC763	10G Direct Attach SFP+ to SFP+ 3 Meter Passive DAC Cable	AXC763 -10000S
AXC765	10G Direct Attach SFP+ to SFP+ 5 Meter Active DAC Cable	AXC765-10000S
AXC767	10G Direct Attach SFP+ to SFP+ 7 Meter Active DAC Cable	AXC767 -10000S
AXC7610	10G Direct Attach SFP+ to SFP+ 10 Meter Active DAC Cable	AXC7610-10000S
AXC7615	10G Direct Attach SFP+ to SFP+ 15 Meter Fiber DAC Cable	AXC7615 -10000S
AXC7620	10G Direct Attach SFP+ to SFP+ 20 Meter Fiber DAC Cable	AXC7620 -10000S
AXM761	10GBASE-SR SFP+ LC Transceiver (multimode, 300m OM4/OM3 50/125µm, 33m OM2/OM1 62.5/125µm)	AXM761-10000S
AXM761 (pack of 10)	Pack of 10 AXM761 Transceivers (multimode, 300m OM4/OM3 50/125µm, 33m OM2/OM1 62.5/125µm)	AXM761P10-10000S
AXM762	10GBASE-LR SFP+ LC Transceiver (single mode, 10km 9/125µm)	AXM762-10000S
AXM762 (pack of 10)	Pack of 10 AXM762 Transceivers (single mode, 10km 9/125µm)	AXM762P10-10000S
AXM763	10GBASE-LRM SFP+ LC Transceiver (multimode, 165m OM4/OM3 50/125µm, 100m OM2/OM1 62.5/125µm)	AXM763-10000S
AXM764	10GBASE-LR LITE SFP+ LC Transceiver (single mode, 2km 9/125µm)	AXM764-10000S
AXM765	10GBASE-T SFP+ RJ45 Transceiver (80m)	AXM765-20000S

NETGEAR AV Line M4250-10G2F-PoE+ 8x1G PoE+ 125W 2x1G and 2xSFP Managed Switch (GSM4212P)			
Americas	GSM4212P-100NAS	Optional AVB License	AVB4212P-10000S
Europe	GSM4212P-100EUS		
Asia Pacific	GSM4212P-100AJS		
China	GSM4212P-100PRS		
NETGEAR AV Line M4250-10G2XF-PoE+ 8x1G PoE+ 240W 2x1G and 2xSFP+ Managed Switch (GSM4212PX)			
Americas	GSM4212PX-100NAS	Optional AVB License	AVB4212PX-10000S
Europe	GSM4212PX-100EUS		
Asia Pacific	GSM4212PX-100AJS		
China	GSM4212PX-100PRS		
NETGEAR AV Line M4250-10G2XF-PoE++ 8x1G Utra90 PoE++ 802.3bt 720W 2x1G and 2xSFP+ Managed Switch (GSM4212UX)			
Americas	GSM4212UX-100NAS	Optional AVB License	AVB4212UX-10000S
Europe	GSM4212UX-100EUS		
Asia Pacific	GSM4212UX-100AJS		
China	GSM4212UX-100PRS		
NETGEAR AV Line M4250-26G4F-PoE+ 24x1G PoE+ 300W 2x1G and 4xSFP Managed Switch (GSM4230P)			
Americas	GSM4230P-100NAS	Optional AVB License	AVB4230P-10000S
Europe	GSM4230P-100EUS		
Asia Pacific	GSM4230P-100AJS		
China	GSM4230P-100PRS		
NETGEAR AV Line M4250-26G4F-PoE++ 24x1G Ultra90 PoE++ 802.3bt 1,440W 2x1G and 4xSFP Managed Switch (GSM4230UP)			
Americas	GSM4230UP-100NAS	Optional AVB License	AVB4230UP-10000S
Europe	GSM4230UP-100EUS		
Asia Pacific	GSM4230UP-100AJS		
China	GSM4230UP-100PRS		

Ordering Information

NETGEAR AV Line M4250-26G4XF-PoE+ 24x1G PoE+ 480W 2x1G and 4xSFP+ Managed Switch (GSM4230PX)			
Americas	GSM4230PX-100NAS	Optional AVB License	AVB4230PX-10000S
Europe	GSM4230PX-100EUS		
Asia Pacific	GSM4230PX-100AJS		
China	GSM4230PX-100PRS		
NETGEAR AV Line M4250-40G8F-PoE+ 40x1G PoE+ 480W and 8xSFP Managed Switch (GSM4248P)			
Americas	GSM4248P-100NAS	Optional AVB License	AVB4248P-10000S
Europe	GSM4248P-100EUS		
Asia Pacific	GSM4248P-100AJS		
China	GSM4248P-100PRS		
NETGEAR AV Line M4250-40G8XF-PoE+ 40x1G PoE+ 960W and 8xSFP+ Managed Switch (GSM4248PX)			
Americas	GSM4248PX-100NAS	Optional AVB License	AVB4248PX-10000S
Europe	GSM4248PX-100EUS		
Asia Pacific	GSM4248PX-100AJS		
China	GSM4248PX-100PRS		
NETGEAR AV Line M4250-40G8XF-PoE++ 40x1G Ultra90 PoE++ 802.3bt 2,880W and 8xSFP+ Managed Switch (GSM4248UX)			
Americas	GSM4248UX-100NAS	Optional AVB License	AVB4248UX-10000S
Europe	GSM4248UX-100EUS		
Asia Pacific	GSM4248UX-100AJS		
China	GSM4248UX-100PRS		
NETGEAR AV Line M4250-12M2XF 12x2.5G and 2xSFP+ Managed Switch (MSM4214X)			
Americas	MSM4214X-100NAS	Optional AVB License	AVB4214X-10000S
Europe	MSM4214X-100EUS		
Asia Pacific	MSM4214X-100AJS		
China	MSM4214X-100PRS		
NETGEAR AV Line M4250-16XF 16xSFP+ Managed Switch (XSM4216F)			
Americas	XSM4216F-100NAS	Optional AVB License	AVB4216F-10000S
Europe	XSM4216F-100EUS		
Asia Pacific	XSM4216F-100AJS		
China	XSM4216F-100PRS		

** This product comes with a limited warranty that is valid only if purchased from a NETGEAR authorized reseller, and covers unmodified hardware, fans and internal power supplies – not software or external power supplies, and requires product registration at https://www.netgear.com/business/registration within 90 days of purchase; see https://www.netgear.com/about/warranty for details. Intended for indoor use only.

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HD-DA8-4KZ-E

1:8 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support

- *Splits one HDMI® source to eight outputs*
- *Handles 4K60 4:4:4 and HDR video signals [1]*
- *Fully compatible with HD 1080p, UHD 4K, and DCI 4K sources and displays*
- *Handles 3D video and Deep Color*
- *Handles Dolby® TrueHD, Dolby Atmos®, DTS HD®, DTS:X®, and uncompressed 7.1 linear PCM audio*
- *Selectable handling of HDCP 2.2 or HDCP 1.4*
- *EDID management options*
- *Input and output video presence indication*
- *No programming or control system required*
- *Thin profile – less than one inch deep*
- *Surface, shelf, or single rack rail mountable*
- *External 100-240V universal power pack included*

The Crestron® HD-DA8-4KZ-E is a simple to use, high-performance 4K AV distribution amplifier designed to split a single HDMI® signal to feed up to eight separate displays, switchers, and/or other devices. It provides full support for UHD and DCI 4K60 4:4:4 and HDR video, HDCP 1.4 or 2.2 copy protection, and high-bitrate 7.1 audio, to ensure optimal performance and compatibility for any HD or 4K video application. No programming or control system is required for operation.[1]

For smaller applications, refer to models HD-DA2-4KZ-E and HD-DA4-4KZ-E.

SPECIFICATIONS

Video

Input Signal Type: HDMI w/HDR10, Deep Color, 3D, & 4K60 4:4:4 support [1] (DVI & Dual-Mode DisplayPort compatible [2])
Output Signal Type: HDMI w/HDR10, Deep Color, 3D, & 4K60 4:4:4 support [1] (DVI compatible [2])
Copy Protection: Selectable for HDCP 2.2, HDCP 1.4, or HDCP disabled

Maximum Resolutions:

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 DCI 4K & 3840x2160 4K UHD	24 Hz	4:4:4	36 bit
		30 Hz	4:4:4	36 bit
		60 Hz	4:2:2	36 bit
		60 Hz	4:4:4	24 bit
	2560x1600 WQXGA	60 Hz	4:4:4	36 bit
	1920x1080 HD1080p	60 Hz	4:4:4	36 bit
Interlaced	1920x1080 HD1080i	30 Hz	4:4:4	36 bit

NOTE: Common resolutions are shown; other resolutions are supported at pixel clock rates up to 600 MHz

Audio

Input Signal Type: HDMI (Dual-Mode DisplayPort compatible [2])
Output Signal Type: HDMI
Formats: Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS®, DTS-ES, DTS 96/24, DTS HD High Res, DTS HD Master Audio, DTS:X, LPCM up to 8 channels

Communications

USB: USB 2.0 host; supports firmware update and custom EDID upload via a USB flash drive
HDMI: HDCP & EDID (does not pass CEC)
HDCP Version: Selectable for HDCP 2.2, 1.4, or OFF;
HDCP encrypted content is blanked in OFF mode
EDID Mode: Selectable for DEFAULT or COPY 1ST;

- The factory default EDID is 4K60 4:4:4 non-HDR video with 2-channel LPCM audio;
- The factory default EDID can be replaced with a custom EDID via USB;
- Sliding the switch from DEFAULT to COPY 1ST copies and stores the EDID from the device at OUTPUT 1 and passes it to the INPUT source device;
- Sliding the switch from COPY 1ST to DEFAULT erases the stored EDID and uses the factory default or custom EDID;

Note: Changing the device at OUTPUT 1 will not update the stored EDID until the switch is moved to DEFAULT and back to COPY 1ST

Connectors

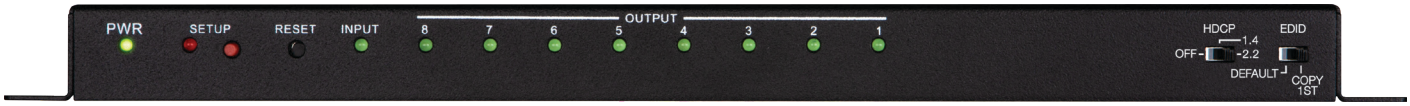
INPUT: (1) HDMI Type A connector, female;
HDMI digital video/audio input [1];
(DVI & Dual-Mode DisplayPort compatible [2])

OUTPUT 1 – 8: (8) HDMI Type A connectors, female;
HDMI digital video/audio outputs [1];
(DVI compatible [2])

SERVICE: (1) USB Type A connector, female;
USB 2.0 host port;
For firmware update and custom EDID upload via a USB flash drive

HD-DA8-4KZ-E 1:8 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support

HD-DA8-4KZ-E – Front View



HD-DA8-4KZ-E – Rear View

24VDC 0.75A: (1) 2.1 x 5.5 mm DC power connector; 24 Volt DC power input; PW-2407WU power pack included

Controls & Indicators

PWR: (1) Bi-color LED, indicates operating power is supplied via the power pack; illuminates amber while booting, green when operating
SETUP: (1) Pushbutton and (1) red LED, restores factory settings
RESET: (1) Recessed pushbutton for hardware reset
INPUT: (1) Green LED, indicates video signal presence at the HDMI input
OUTPUT 1 – 8: (8) Green LEDs, each indicates video signal transmission at the corresponding HDMI output
HDCP: (1) 3-position slide switch, selects the HDCP version (OFF, 1.4, or 2.2)
EDID: (1) 2-position slide switch, selects the EDID mode (DEFAULT or COPY 1ST)

Power

Power Pack (included): Input: 100-240 Volts AC, 50/60 Hz; Output: 0.75 Amps @ 24 Volts DC; Model: PW-2407WU
Power Consumption: 11.5 W (typical)

Environmental

Temperature: 32° to 104° F (0° to 40° C)
Humidity: 10% to 90% RH (non-condensing)

Enclosure

Chassis: Metal, black finish, with (2) integral mounting flanges
Mounting: Freestanding, surface mount, or attach to a single rack rail

Dimensions

Height: 0.87 in (22 mm)
Width: 12.82 in (326 mm)
Depth: 4.67 in (119 mm)

Compliance

CE, IC, FCC part 15 Class B digital device

MODELS & ACCESSORIES

Available Models

HD-DA8-4KZ-E: 1:8 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support

Included Accessories

PW-2407WU: Wall Mount Power Pack, 24VDC, 0.75A, 2.1mm, Universal (Qty. 1 included)

Available Accessories

CBL-HD Series: High-Speed HDMI® Cables

Notes:

1. 4K60 4:4:4 and HDR support requires the use of HDMI cables and couplers with a minimum TMDS bandwidth of 18 Gbps. If 4K60 4:2:0 or 4K30 4:4:4 performance is acceptable, cables and couplers with a minimum bandwidth of 10.2 Gbps may be used. Please be aware that bandwidth loss is cumulative, so performance may be reduced when inserting multiple cables and couplers inline.
2. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or Dual-Mode DisplayPort signal. CBL-HD-DVI interface cables are available separately.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at https://www.crestron.com/How-To-Buy/Find-a-Representative or by calling 855-263-8754.

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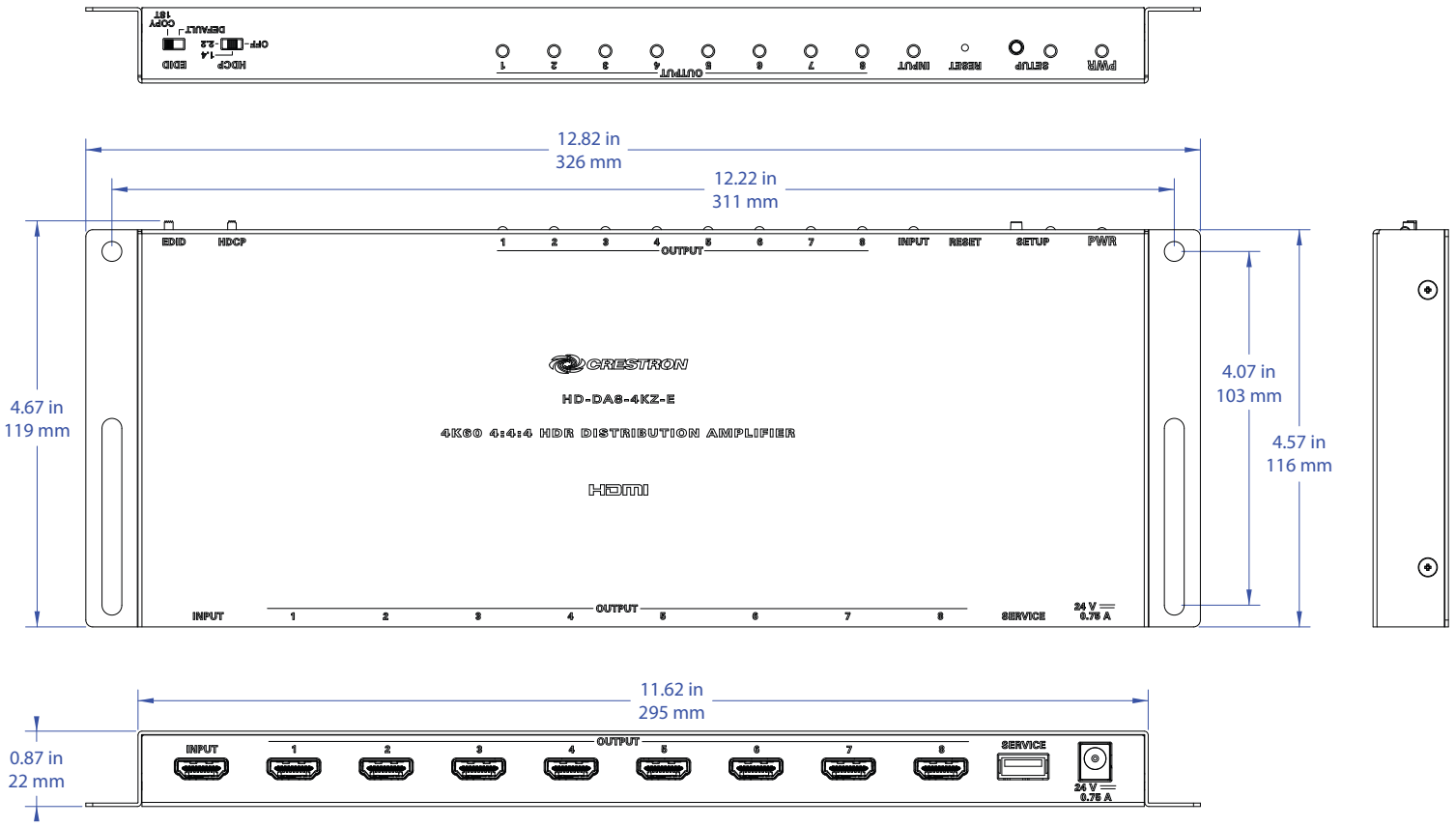
HD-DA8-4KZ-E 1:8 HDMI® Distribution Amplifier w/4K60 4:4:4 & HDR Support



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Specifications subject to change without notice. Revised 04/08/21

Q-SYS NV-21-HU

KEY FEATURES

- Single cable solution for video distribution, AV bridging[1], and device charging[2].
- Native HDMI video and audio distribution for Q-SYS
- Q-SYS Shift™ adaptive video compression
- Software configurable as an encoder or decoder
- HDMI and USB-C Mode selection

Q-SYS NV-21-HU

Native Network Video Endpoint for Q-SYS

The Q-SYS NV Series NV-21-HU enables native video distribution on the Q-SYS Platform. The NV-21-HU is a software configurable endpoint offering a comprehensive single-cable solution for video distribution, AV bridging, and device charging via USB-C. The NV-21-HU's compact size and reduced I/O make it ideal for supporting meeting rooms, learning spaces, hospitality and entertainment installations. The NV-21-HU can be used alongside other Q-SYS NV Series video endpoints, providing system design flexibility. Like all Q-SYS products, the NV-21-HU offers native integration and control, simplifying configuration and operation.

SINGLE CABLE SOLUTION

The Q-SYS NV-21-HU simplifies the user experience and intuitively supports a wide range of devices. A single USB-C connection to the NV-21-HU enables a user's device to distribute video formats up to 4K60 4:4:4 via Q-SYS Shift™ video codec, integrates Q-SYS video camera and audio feeds into a supported collaboration application[1] and charges their device simultaneously[2].

MAXIMIZE FLEXIBILITY IN DESIGN & SPECIFICATION

The NV-21-HU is software-configurable as an encoder or decoder in Q-SYS Designer Software and offers the ability to operate in either HDMI or USB-C mode, supporting a broader range of user devices without adapters or converters. In addition, the NV-21-HU supports the AV Bridging feature license to function as an AV bridging endpoint when needed.

- **HDMI Mode:** In HDMI mode, the NV-21-HU enables video distribution from the HDMI input and uses the USB-C connection to offer AV bridging and device charging.
- **USB-C Mode:** In USB-C mode, the NV-21-HU enables video distribution, AV bridging and device charging via the USB-C connection.

RIGHT-SIZED

The NV-21-HU provides designers with a more compact endpoint within the NV Series. The smaller design and reduced I/O (compared to the Q-SYS NV-32-H) enable simple and scalable designs across various applications, including meeting rooms, learning spaces, hospitality, and entertainment installations.

DESIGNED FOR Q-SYS

Q-SYS NV Series network video endpoints are native to Q-SYS, which is powered by the Q-SYS OS; this software foundation manages NV Series endpoints and all other Q-SYS Products from a single application. The Q-SYS Platform's modern IT architecture and development tools enable an entire ecosystem of third-party integrations developed by approved Q-SYS Partners and a worldwide community of developers using the available tools found in Q-SYS Open.

1. Optional AV Bridging feature license is required to activate AV Bridging on the NV-21-HU.
2. An external power supply is required for any device charging over the USB-C connection. NV-21-PSU available separately.

CONTROL

- **RS-232:** Three Pin Euro terminal connection to control third-party devices with Q-SYS Control, user-configurable.

USB

- **USB HID control:** Control host PCs with a USB connection using USB HID components in Q-SYS Designer Software.
- **Q-SYS AV Bridging:** The Q-SYS AV Bridging feature license expands the functionality of the NV-21-HU, allowing users to connect their devices via USB-C directly to the network video endpoint to integrate Q-SYS audio and camera feeds for remote meetings easily. The NV-21-HU emulates a webcam (for video streams from Q-SYS network cameras), a speakerphone, and a multi-channel soundcard over a single driverless USB connection.

AUDIO

- **HDMI Audio Input:** Receive up to 8 channels of PCM audio from your video source, which are routable within Q-SYS Designer Software.
- **USB-C Audio Input:** Receive up to 8 channels of PCM Audio from your video source, which are routable within Q-SYS Designer. Additional 1x1 Speakerphone and 2x2 Soundcard options are available with the Q-SYS AV Bridging feature license.
- **HDMI Audio Output:** Embed up to 8 channels of PCM audio from Q-SYS to the HDMI output of the NV-21-HU to utilize the built-in speakers of a display as a Q-SYS audio destination for source audio content or any other audio, including paging, background music, etc.

SECURITY AND AUTHENTICATION

- **AES-128:** NV Series supports AES-128 encryption for audio and video signals from encoders to decoders
- **Content Protection:** HDCP 1.4 & HDCP 2.3 complaint
- **802.1x:** 802.1x authentication is available and configurable through Q-SYS Peripheral Manager

Q-SYS SHIFT™ ADAPTIVE BITRATE CODEC

The NV-21-HU uses Q-SYS Shift™ video compression to provide high-quality, low-latency video streaming supporting video formats up to 4K60 4:4:4 over a standard gigabit network. Q-SYS Shift™ leverages DCT and temporal compression technologies, much like those found in H.264 and H.265 video compression codecs. Q-SYS optimized Shift™ to provide flawless image quality from the most demanding content sources. Further, Shift™ intelligently manages and optimizes the resulting network bitrate by only refreshing changes within each frame, allowing for significantly reduced bandwidth usage as compared to other compression codecs.

- **Modes:** Multicast and Unicast
- **Bitrates:** 10 Mbps - 800 Mbps
- **Streaming Protocol:** RTP

SUPPORTED VIDEO FORMAT

Resolution	Frame rate (Hz)	Chroma sampling level	Bit Depth
3840 x 2160 (4K UHD)	60, 59.94, 50, 30, 29.97, 25, 24	4:4:4	8 bit
3440 x 1400	60	4:4:4	8 bit
2560 x 1600	60	4:4:4	8 bit
2560 x 1440	60	4:4:4	8 bit
2560 x 1080	60, 59.94, 50, 30, 29.97, 25, 24	4:4:4	8 bit
1920 x 1200	60	4:4:4	8 bit
1920 x 1080 (1080 p)	60, 59.94, 50, 30, 29.97, 25, 24	4:4:4	8 bit
1920 x 720 (720 p)	60, 59.94, 50, 30, 29.97, 25, 24	4:4:4	8 bit
640 x 480	60	4:4:4	8 bit

* All video formats are progressive
4:2:0 Chroma subsampling and HDR not supported

SCALER

The NV-21-HU features a robust 4K60 4:4:4 scaler that can accommodate the most challenging resolution and frame rate conversions from network streams or local HDMI and USB-C sources. The scaler is capable of operating in three modes (configurable within Q-SYS Designer Software):

- Stretch-to-fit
- Maintain aspect ratio
- 1:1 pixel mapping

CONNECTORS

- **Power In:** Two-pin euroblock terminal connection for an external 12 V DC, 9 A power supply (not included, NV-21-PSU available separately). **An external power supply connection is required for any device charging over the USB-C connection.**
- **POE/LAN:** Connection to Q-LAN network; includes PoE Type 3, Class 5 capability via a network switch or midspan injector. **When powered via PoE, the NV-21-HU cannot charge devices over the USB connection.**
- **USB-A:** Reserved for future use
- **RS-232:** Three-pin euroblock terminal connection for extension of the Q-SYS Control Engine to third-party devices.
- **USB-C:** USB-C connection capable of receiving alt-mode DisplayPort video formats up to 4K60 4:4:4, Q-SYS Audio and Video Bridging and device charging up to 65 W. **An external power supply is required for any device charging over the USB-C connection**.
- **HDMI IN:** HDMI connection capable of receiving video formats up to 4K60 4:4:4, up to 8 channels PCM Audio from a connected source.
- **HDMI OUT:** HDMI connection capable of transmitting video formats up to 4K60 4:4:4, up to 8 channels PCM Audio to a connected output.
- **Simple Mounting:** Optional surface mounting brackets (included) provide installers with multiple options to optimize airflow in various installation scenarios. Mounting options and installation instructions are available in the hardware user guide.

Q-SYS NV-21-HU

Video I/O	
HDMI 2.0 input	1x HDMI 2.0, capable of receiving input video formats up to 4K60 4:4:4
USB-C input	USB 3.2 Gen 1x1 (5Gbps) Type-C Device Port - supporting DisplayPort Alt-Mode (DP 1.4 Sink) - USB Power Delivery up to 65W
HDMI 2.0 output	1x HDMI capable of scaling and outputting video formats up to 4K60 4:4:4
Scaler	HDMI output features a robust 4K60 4:4:4 scaler that can accomodate the most challenging resolution and frame rate conversions.
Audio I/O	
HDMI inputs	8-channel PCM audio, Q-SYS routable
USB Type C input	8-channel PCM audio, 1x1 speakerphone[1], 2x2 soundcard[1], Q-SYS routable
HDMI output	8-channel PCM audio, Q-SYS routable
Other connectors	
USB Type C input	**AV Bridging:** Route Q-SYS network camera and audio feeds to a host via USB connection[1]. **Device Charging:** Supports charging up to 65 Watts[3] **- 3A: 5V, 9V, 12V, 15V** **- 3.25A: 20V**
USB Type A input	Reserved for future use - 5V, 900 mA
LAN	1000BASE-T, 2.5GBASE-T compliant
Power Over Ethernet	PoE Type 3, Class 5 (40W at PD, 45W at PSE)[2]
Auxiliary Power Supply	12 V DC 9 A Power Supply. NV-21-PSU sold separately[3]
General	
Dimensions	7.3 x 5.2 x 1.2 in (185 x 131.5 x 30.5 mm)
Weight	1.75 lbs (794 g)
Mounting options	Flexible surface mounting hardware included
Environmental	
Ambient operating temperature range	0° to 40° C
Humidity	5 to 90 RH % non-condensing
Storage temperature	-20 to 70° C
Expected Product lifecycle	10 years
What's in the box?	NV-21-HU video endpoint Euro Terminal connector for RS-232 Surface mounting accessories Safety and warranty statements

1. Requires Q-SYS AV Bridging feature license.
2. When powered via PoE, the NV-21-HU cannot charge devices over the USB-C connection.
3. An external power supply is required for any device charging over the USB-C connection.

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Detailed Specification & Technical Data

WEST PENN WIRE Since 1971
AV, SECURITY & NETWORKING SOLUTIONS

254346A

4 Pair 23AWG UTP Cat6A 10G CMP - Small OD

Suitable Applications: Premise Horizontal Cable, Ethernet 10GBASE-T, Wi-Fi 6, Wi-Fi 5, In-Building Wireless, In-Building Small Cells, Mobile RAN, PoE++, PoE+, PoE, HDBaseT

Construction & Dimensions

CONDUCTOR PARAMETERS	-
Number Of Pairs	4
AWG Size	23
Conductor Stranding	Solid
Conductor Type	Bare Copper
Nominal DCR	21 Ohm/1000ft
INSULATION PARAMETERS	**-**
Insulation Type	Flouropolymer - FEP
Insulation Color Code	White & Blue, White & Orange, White & Green, White & Brown
SHIELDING PARAMETERS	**-**
Shield Type	Unshielded Twisted Pair (UTP)
ELECTRICAL CHARACTERISTICS	**-**
Nominal Impedance	100 Ohm
Nominal Capacitance Between Conductors	13 pF/ft

Overall Construction

OVERALL CONSTRUCTION PARAMETERS	-
Total Number of Conductors	8
Jacket Type	Flexible Plenum
Nominal Cable O.D.	.250in
Plenum	Yes
NEC UL Rating	CMP, CMP-LP
RoHS Compliant	Yes
ANSI/TIA Category	ANSI/TIA-568.2-D Category 6A
TIA Test	Category 6A
Pull Tension	25 lbs
Bend Radius	1.25 in
Cable Weight	37 lbs

Overall Electrical & Optical Characteristics

OVERALL ELECTRICAL/OPTICAL CHARACTERISTICS	-
Nominal Velocity of Propagation (VP)	69 %
Delay Skew	45 ns/100m
UL Flammability	NFPA 262 Plenum
CSA Flammability	FT6
Operating Range	-20 to 75 Deg C
UL Voltage Rating	300

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Electrical Performance

Frequency (Mhz)	Max. Insertion Loss	Min. NEXT	Min. PSNEXT	Min. PSACR	Min. ACR	Min. PSACRF (PSELF-EXT)	Min. ACRF (ELF-EXT)	Min. PSAACRF	Min. RL (Return Loss)	Min. TCL	Min. ELTCTL	Max/Min Input Imp. Unfit	Max/Min Fitted Imp.
1 MHz	2.1 db/100m	75.3 dB	73.3 dB	71.2 dB	65 dB	68.8 dB	68 dB	67 dB	20 dB	40 dB	35 dB	100 ± 15 Ohm	100 ± 15 Ohm
4 MHz	3.8 db/100m	66.3 dB	64.3 dB	60.5 dB	53 dB	56.8 dB	56 dB	67 dB	23 dB	40 dB	23 dB	100 ± 15 Ohm	100 ± 15 Ohm
8 MHz	5.3 db/100m	60.8 dB	59.6 dB	54.4 dB	46.7 dB	50.7 dB	49.7 dB	61.1 dB	24.5 dB	40 dB	17 dB	100 ± 15 Ohm	100 ± 15 Ohm
10 MHz	5.9 db/100m	60.3 dB	58.3 dB	52.4 dB	45 dB	48.8 dB	48 dB	59.2 dB	25 dB	40 dB	15 dB	100 ± 15 Ohm	100 ± 15 Ohm
16 MHz	7.5 db/100m	57.2 dB	55.2 dB	47.8 dB	41 dB	44.7 dB	43.9 dB	55.1 dB	25 dB	40 dB	10.9 dB	100 ± 15 Ohm	100 ± 15 Ohm
20 MHz	8.4 db/100m	54.8 dB	53.8 dB	45.4 dB	38.8 dB	42.8 dB	41.8 dB	53.2 dB	25 dB	38 dB	9 dB	100 ± 15 Ohm	100 ± 15 Ohm
25 MHz	9.4 db/100m	53.3 dB	52.3 dB	43 dB	36.8 dB	40.8 dB	39.8 dB	51.2 dB	24.3 dB	38 dB	7.1 dB	100 ± 15 Ohm	100 ± 15 Ohm
31.25 MHz	10.5 db/100m	52.9 dB	50.9 dB	40.4 dB	35.1 dB	38.9 dB	38.1 dB	49.3 dB	23.6 dB	35.1 dB	5.1 dB	100 ± 15 Ohm	100 ± 15 Ohm
62.5 MHz	15 db/100m	48.4 dB	46.4 dB	31.4 dB	29.1 dB	32.9 dB	32.1 dB	43.3 dB	21.5 dB	32 dB		100 ± 15 Ohm	100 ± 15 Ohm
100 MHz	19.1 db/100m	45.3 dB	43.3 dB	24.2 dB	25 dB	28.8 dB	28 dB	39.2 dB	20.1 dB	30 dB		100 ± 15 Ohm	100 ± 15 Ohm
155 MHz	24.1 db/100m	41.4 dB	39.4 dB	18.9 dB	22.1 dB	27.1 dB	25.6 dB	37.1 dB	19.2 dB	29 dB		100 ± 15 Ohm	100 ± 15 Ohm
200 MHz	27.6 db/100m	40.8 dB	38.8 dB	11.2 dB	19 dB	22.8 dB	22 dB	33.2 dB	18 dB	27 dB		100 ± 15 Ohm	100 ± 15 Ohm
250 MHz	31.1 db/100m	39.3 dB	37.3 dB	6.3 dB	17 dB	20.8 dB	20 dB	31.2 dB	17.3 dB	26 dB		100 ± 15 Ohm	100 ± 15 Ohm
300 MHz	34.3 db/100m	38.1 dB	36.1 dB	1.9 dB	15.5 dB	19.3 dB	18.5 dB	29.7 dB	16.8 dB	25.2 dB		100 ± 15 Ohm	100 ± 15 Ohm
350 MHz	37.2 db/100m	36.1 dB	35.1 dB		13.9 dB	17.9 dB	16.9 dB	28.3 dB	16.3 dB	24.6 dB		100 ± 15 Ohm	100 ± 15 Ohm
400 MHz	40.1 db/100m	35.3 dB	34.3 dB		12.8 dB	16.8 dB	15.8 dB	27.2 dB	15.9 dB	24 dB		100 ± 15 Ohm	100 ± 15 Ohm
450 MHz	43.3 db/100m	34.8 dB	35.5 dB		12.1 dB	15.7 dB	14.8 dB	26.1 dB	15.5 dB	23.5 dB		100 ± 15 Ohm	100 ± 15 Ohm
500 MHz	45.3 db/100m	34.8 dB	32.8 dB		11 dB	14.8 dB	14 dB	25.2 dB	15.2 dB	23 dB		100 ± 15 Ohm	100 ± 15 Ohm
550 MHz	48.2 db/100m	34.1 dB	32.2 dB		10.5 dB	14 dB	13.2 dB	24.45 dB	14.9 dB			100 ± 15 Ohm	100 ± 15 Ohm

Related Products

RELATED PRODUCTS	-
Non Plenum Item	4346A
Jack	KJ458MT-C6AC-xx
Modular Plug	CN-CAPFMUL-S1
Modular Plug 2	32-EZEx48 - Use Tool: TL-EXOCRIMP

Channel Reach -PoE

POE	10BaseT	100BaseT	1000BaseT	2.5G/5GBaseT	10GBaseT
15W PoE (Type 1)	140m (459 ft)	140m (459 ft)	100m (328 ft)	100m (328 ft)	100m (328 ft)
30W PoE (Type 2)	130m (426 ft)	130m (426 ft)	100m (328 ft)	100m (328 ft)	100m (328 ft)
60W PoE (Type 3)	130m (426 ft)	130m (426 ft)	100m (328 ft)	100m (328 ft)	100m (328 ft)
100W PoE (Type 4)	120m (394 ft)	120m (394 ft)	100m (328 ft)	100m (328 ft)	100m (328 ft)

DATA SHEET

C2G Performance Series Ultra Flexible High Speed HDMI® Cable - 4K 60Hz In-Wall, CMG (FT4) Rated

Extend HDMI signals over a high performance HDMI cable and support HDMI audio and video features including 4K Ultra HD

OVERVIEW

The C2G Performance Series Ultra Flexible High Speed HDMI Cable is perfect for connecting a wide variety of devices from computers to projectors and monitors, AV presentation furniture, or in-wall applications requiring high speed HDMI features and video resolutions up to 4k (4096 x 2160) at 60Hz — perfect for conference rooms, classrooms, churches, and other commercial installations.

This Ultra Flexible High Speed HDMI Cable was designed for installations in tight spaces and offers commercial grade connectors that feature compact overmolding for high density environments, integrated finger grips on the top, bottom, and sides, for easy insertion and removal, and the gripping connector shell has 2x greater port retention to keep your devices connected. The gold plated connectors on the cable allow for better shielding, increased electrical conductivity, and durability.

This Ultra Flexible High Speed HDMI Cable supports the updated library of Consumer Electronic Control (CEC) commands, allowing communication between devices connected through the HDMI ports. Lastly, this fully-functional, high bandwidth cable has been tested to perform at industry standards and is backed by a lifetime warranty.

FEATURES

- Supports all HDMI 2.0 features including resolutions up to 4K (4096 x 2160) at 60hz, which means higher quality video for viewing your screen content
- In-wall (CMG/FT4) rated jacket, so you can safely run the cable inside of a wall and have a clutter free, clean look
- Integrated finger grips on the connectors for easy insertion and removal
- Gripping connector shell for 2x greater port retention
- Gold plated connectors for increased electrical conductivity and enhanced durability
- Directional cable with source connector labeled and tagged to easily differentiate from the labeled display connector
- Supports CEC extensions for control of consumer electronics devices through a single control point
- Backed by a Lifetime Warranty for peace of mind

ITEM DESCRIPTION

C2G10373	1ft (0.3m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10374	18in (0.5m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10375	2ft (0.6m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10376	3ft (0.9m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10377	6ft (1.8m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10378	10ft (3m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated

DATA SHEET

SIGNAL SPECIFICATIONS

- Supports HDMI Resolutions up to 4K 60Hz, 4:4:4, 18 Gbps
- Supports Full HD Blu-ray Disc and HD DVD Video
- Supports 3D Video
- Perceptual Quantizer (PQ HDR OETF (SMPTE ST 2084)
- Hybrid Log-Gamma (HLG) HDR OETF
- Static HDR Metadata (SMPTE ST 2086)
- DVD Audio, Super Audio CD (DSD)
- Dolby® True HD, DTS-HD Master Audio Bitstream Capable
- 4 Audio Streams
- Ethernet Channel: 100 Mbit/s
- Consumer Electronic Control (CEC), with Updated List of CEC Commands

ELECTRICAL SPECIFICATIONS

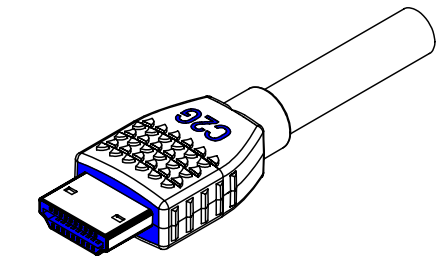
- Voltage Rating: 30V
- Temp: Connector: Temp Rating: 220°C
- Cable: Temp Rating: 75°C
- Conductor Resistance: 5Ω
- Insulation Resistance: 10MΩ
- Differential Data Input Voltage: 4.8V to 5.3V
- Differential Data Output Voltage: 4.7V to 5.3V

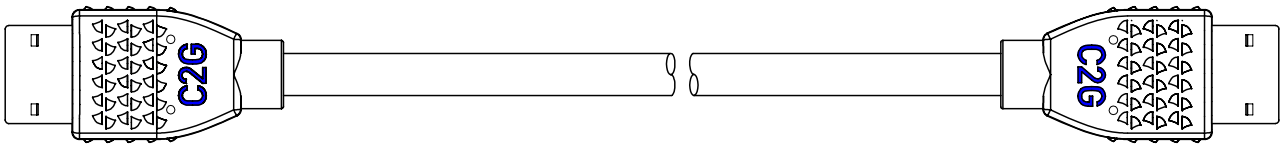
PHYSICAL SPECIFICATIONS

- Operating Temperature: -20°C to +75°C; 85% RH (Non-Condensing)
- Storage Temperature: -10°C to +55°C; 85% RH (Non-Condensing)
- Tensile Strength: 100N
- Minimum Bend Radius: 48
- Cable Jacket Ratings: CMG FT4
- Connector Gripping Force: HDMI Withdrawl Force: 3.12 to 3.28kgf (9.8N/1.0kgf Min; 39.2N/4.0kgf Max)
- Connector Gripping Force: HDMI Insertion Force: 2.54 to 2.61kgf (44.1N/4.5kgf Max)

PHYSICAL CHARACTERISTICS

- Material: Housing: PVC Molding
- SR-Mold: PVC, Color: Black
- Jacket Color: Black
- Connector Insulator: Blue; Front of the Housing: Blue; "C2G"
- Jacket OD: 6.00±0.20mm; Jacket Material: PVC; Jacket Thickness: 0.56mm (REF)
- Shield Drain: 7/0.10T (30AWG); Shield AL/Mylar: AL Face Inside; Shield Mylar; Transparent Mylar Tape
- Shield Filler: Filler; Shield Paper: Paper: Paper; Shield Consitution N/mm: 16/9/0.08; Shield Material: Tinned Copper; Shield Coverage %: 65%
- Connector: HDMI Type A Male Connector, Metal Shell Gold Plated, Electrical Contact Copper; Alloy Gold Plated 5u', Insulator Color: Blue
- Cable UL/CUL/CSA Rating: Type: (7/0.10T*1P+D+AL+MY) *5C+7/0.10T*3C+7/0.127T*1C+F+Paper+B16/9/0.08T OD: 6.00mm;
- Cable UL/CUL/CSA Rating: Print: High Speed HDMI Cable With Ethernet E468040 (UL) CL2 75°C 30AWG
- Product is CE Marked and Conforms to 2011/65/EU ROHS 2





C2G®

A brand of legrand®

c2g.com | legrandav.com
USA 800.CABL.911 trg@c2g.com

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COMMERCIAL AV BRANDS

C2G | Chief | Da-Lite | Luxul | Middle Atlantic | Vaddio | Wiremold

ATEM 1 M/E Production Studio 4K

The advanced ATEM 1 M/E Production Studio 4K model switches between SD, HD or Ultra HD video standards so you can connect a wide range of video sources such as cameras, disk recorders and computers. Featuring 10 inputs, chroma keys, transitions, media pool, 4 upstream keyers, downstream keyers, audio mixer, multi view, full motion DVE, stinger transitions, large media pool with full motion clips and 3 auxiliary outputs!

$2,705

Connections

Total Video Inputs
11 with 10 active.

Total Video Outputs
10

Total Aux Outputs
3

SDI Rates
270Mb, 1.5G, 3G, 6G

Total Audio Inputs
2 x XLR. 2 x RCA.

Total Audio Outputs
2 x XLR Program.

Timecode Connections
None

Reference Input
Tri-Sync or Black Burst.

Video Input Re-Sync
On all 10 inputs.

SDI Video Inputs
10 x 10-bit SD/HD/Ultra HD 4K switchable. 2 channel embedded audio.

HDMI Video Input
1 x HDMI type A. 10-bit SD/HD/Ultra HD 4K switchable. 2 channel embedded audio.

Analog Audio Outputs
2 x XLR.

SDI Audio Outputs
2 Ch embedded into SDI output on all outputs.

SDI Program Outputs
2 x 10-bit SD/HD/Ultra HD 4K switchable.

HDMI Program Outputs
1 x HDMI type A, 10-bit SD/HD/Ultra HD 4K switchable.

Down Converted SDI Program Output
1 x 10-bit (Ultra HD 4K to HD)

SDI Preview Output
1 x 10-bit SD/HD/Ultra HD 4K switchable.

Total Multi Views
1

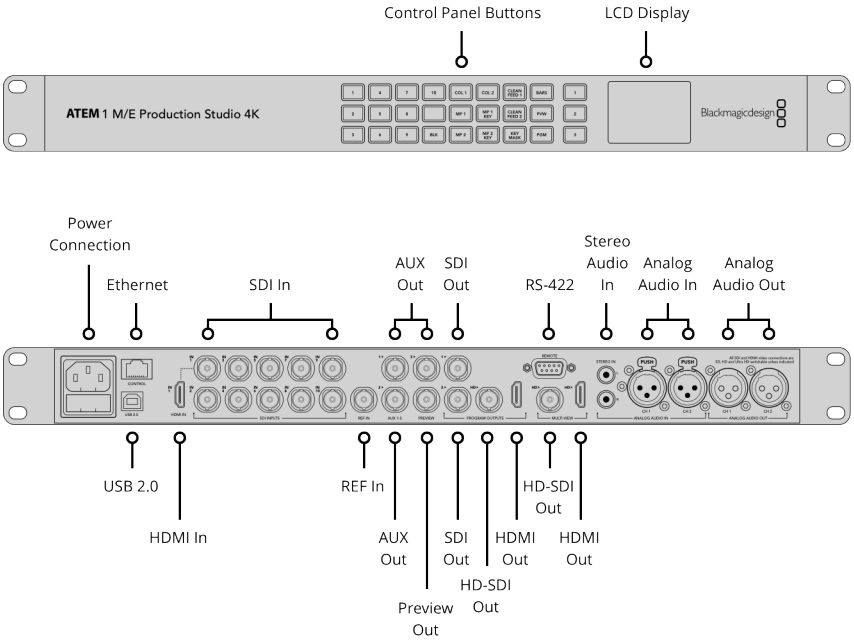
SDI Multi View Outputs
1

HDMI Multi View Outputs
1

Control Panel Connection
Ethernet supports 10/100/1000 BaseT. Allows direct connection between panel and chassis, or via network.

Tally Output
Added via ethernet connection to Blackmagic Design GPI and Tally Interface product. (Not included.)

Computer Interface
1 x USB 2.0 port.



Standards

SD Video Standards
525i59.94 NTSC, 625i50 PAL

HD Video Standards
720p50, 720p59.94
1080p23.98, 1080p24, 1080p25,
1080p29.97, 1080p50, 1080p59.94
1080i50, 1080i59.94

Ultra HD Video Standards
2160p23.98, 2160p24, 2160p25,
2160p29.97

SDI Compliance
SMPTE 259M, SMPTE 292M, SMPTE 424M.

Video Sampling
4:2:2.

Color Precision
10-bit

Color Space
REC 601, REC 709, REC 2020.

HDMI Input Resolutions for Computers
720 x 480i 59.94Hz,
720 x 576i 50Hz,
1280 x 720 59.94Hz,
1280 x 720 50Hz,
1920 x 1080 50Hz,
1920 x 1080 59.94Hz,
3840 x 2160 23.98Hz,
3840 x 2160 24Hz,
3840 x 2160 25Hz,
3840 x 2160 29.97Hz.

Product Specifics

Upstream Keyers
4 with Chroma/Linear/Luma key.

Downstream Keyers
2

Talkback Support
None

Mix Minus Support
None

Chroma Keyers
4

Linear/Luma Keyers
7

Transition Keyer (Stinger/DVE)
1 Stinger, 1 DVE.

Total Number of Layers
8

Pattern Generators
7

Color Generators
2

DVE with 3D Borders & Drop Shadow
1

Control Panel Compatibility
ATEM 1 M/E Broadcast Panel preferred. Compatible with ATEM 1 M/E Advanced Panel, ATEM 2 M/E Advanced Panel and ATEM 4 M/E Advanced Panel. Includes ATEM Software Control Panel.

Media Player

Media Players
2

Channels
Channels

Media Pool Still Image Capacity
32 with fill and key.

Media Pool Clip Capacity
2 with fill and key.

Media Player Clip Length in 720 HD
1600 frames.

Media Player Clip Length in 1080 HD
720 frames.

Media Player Clip Length in Ultra HD
180 frames.

Maximum Clip Length in NTSC/PAL
3600 frames.

Media Pool Still Image Format
PNG, TGA, BMP, GIF, JPEG and TIFF.

Media Pool Video File Format
TGA Sequence.

Media Pool Audio File Format
WAV, MP3 and AIFF.

Multi View Monitoring

Multi View Monitoring
1 x 10 views.

Routable Windows
8

Tally
Red for program and green for preview indication.

Windows Source Labels
Yes

Multi View Video Standard
HD

Display

Interface
Minimum monitor resolution of 1366 x 768.

Front Panel
Built in LCD monitor for video and 42 LED buttons for Aux switching.

Processing

Colorspace Conversion
Hardware based real time.

Processing Delay
< 2 Lines.

Audio Mixer
12 input x 2 channel mixer.
Selectable On/Off/Audio-Follow-Video.
Level and Peak metering.
Master gain control.
Analog outputs may be used for separate monitoring.

4K to HD Down Conversion
Yes, program x 1.

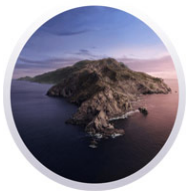
Software

Control Panel Included
ATEM Software Control Panel included free for
Mac 10.12 Sierra, Mac 10.13 High Sierra or later and Windows 8.1 64-bit or Windows 10 64-bit.

Software Updates
Using USB 2.0 connection directly connected
to Mac OS or Windows computers. Includes
ATEM Setup Utility

Configuration
Set via ATEM Software Control Panel, excluding
ATEM chassis IP address which is set via the ATEM Setup Utility connected via USB to chassis.

Operating Systems



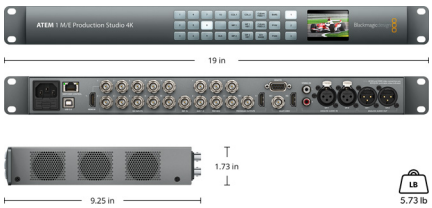
Mac 10.14 Mojave,
Mac 10.15 Catalina or later.

Windows 8.1 and 10.

Power Requirements

Power Supply
1 x Internal 100 - 240V AC.

Physical Specifications



Physical Installation

Physical Installation
1 Rack Unit Size.

Environmental Specifications

Operating Temperature
0° to 40° C (32° to 104° F)

Storage Temperature
-20° to 60° C (-4° to 140° F)

Relative Humidity
0% to 90% non-condensing

What's Included

ATEM 1 M/E Production Studio 4K
Welcome wallet with QR code for software download

Warranty

12 month Limited Manufacturer's Warranty.

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Blackmagic Design Authorized Reseller

Q-SYS NC-110
Q-SYS NC-12x80
Q-SYS NC-20x60

KEY FEATURES

- NC-110: fixed-lens, electronic pan, tilt, zoom (ePTZ) with 110° horizontal field of view
- NC-12x80: 12x optical zoom, 80° horizontal field of view
- NC-20x60: 20x optical zoom, 60° horizontal field of view
- Professional quality video conferencing for the Q-SYS AV-to-USB bridging solution
- Distribute video via the Q-LAN network anywhere it is needed
- Add as many network-based NC Series cameras to a design as needed to enable multi-camera functionality when integrating web conferencing platforms
- Distribute video via the Q-LAN network anywhere it is needed
- Simultaneously stream IP feeds and HDMI or SDI (PTZ models only)
- User-configurable resolution and quality for IP streams (up to 1080p), providing greater flexibility for a wide variety of use cases
- Comprehensive management via Q-SYS Designer Software and Q-SYS Reflect Enterprise Manager
- Complete camera imaging controls, including white balance, focus and exposure
- Image Rotation control inverts the video when the camera is mounted upside down. For PTZ cameras, the optional ceiling mount accessory is the PTZ-CMB1
- Power over Ethernet
- Local 12 V connection for PTZ models (power supply not included)
- PTZ models include PTZ-WMB1 wall mount bracket for simple installation; ePTZ model has built-in mounting hardware
- Includes lens cover for privacy (NC-110 only)

Q-SYS NC Series Cameras

Network cameras for collaboration

The Q-SYS NC Series conference cameras deliver high-quality video feeds natively to the Q-SYS Platform. With three models to choose from, these network cameras offer a simple and scalable video solution for any size meeting space.

Driven by the Q-SYS OS, the NC Series integrate seamlessly into any Q-SYS system, allowing for easy camera feed routing anywhere on the network without the need for complicated programming or video matrix hardware. These camera video feeds are delivered to any modern video conferencing applications such as Microsoft Teams, Zoom, Google Meet, and Cisco Webex via any Q-SYS AV bridging peripheral

BENEFITS

Rightsized camera options: Choose the right camera for your room. The Q-SYS NC-110 EPTZ camera drives the Q-SYS AV bridging solution into smaller, wider or more value-engineered room types and applications, while the Q-SYS NC-12x80 and Q-SYS NC-20x60 deliver professional PTZ functionality and presets, enabling larger and/or reconfigurable room layouts.

Network transport, USB delivery: NC Series solves the cable length limitations of traditional cameras solutions by enlisting a single network cable for video, power and control data transport into Q-SYS, and then employs USB technology to deliver the video to its intended PC/compute device. This greatly simplifies system design and deployment by eliminating the need for costly, unreliable USB cabling. Furthermore, NC Series goes beyond the traditional 1-to-1 limitation found in most USB cameras by allowing for a "many-to-any" scenario that allows users to integrate as many NC Series cameras as needed in their Q-SYS system design and take advantage of network-based realtime camera switching

Multiple camera support for UC platforms: Q-SYS uses the power of the network (rather than dedicated switching hardware) to allow you to add as many NC Series cameras to your system as you desire and do live switching between the cameras, all while delivering a singular UVC/UAC stream to your application of choice

Universal Compatibility: The feeds from NC Series cameras, along with Q-SYS room audio, can be delivered to the conferencing application of your choice. With this functionality, Q-SYS can scale the meeting experience for Zoom, Microsoft Teams, Google Meet, Cisco Webex and more into rooms of any size or configuration to ensure a great experience parity for both in-room and remote meeting participants.

Designed for Q-SYS: NC Series collaboration cameras are native to Q-SYS, a cloud-manageable audio, video and control **platform**, built to deliver scalable, flexible AV solutions into the future. At its foundation, the **Q-SYS OS** serves as the software foundation that manages your NC Series cameras along with a multitude of other native **Q-SYS Products** in the platform. Additionally, its modern IT architecture and development tools of the **Q-SYS Platform** enables an entire **Ecosystem** of third-party devices developed by approved Q-SYS Partners, as well as a worldwide community of Q-SYS developers.

Q-SYS NC Series Conference Cameras

	NC-12x80	NC-20x60	NC-110
System Details			
Description	Network PTZ conference camera		Network EPTZ conference camera
Image sensor	1/2.8" low-noise CMOS	1/1.8" low-noise CMOS	1/2.8" low-noise CMOS
Lens characteristics (wide to tele)	12x optical zoom f=3.47 to 41.65 mm F1.84 to F3.72	20x optical zoom f=6.25 to 125 mm F1.58 to F3.95	Fixed focus Lens 8x max zoom, 2x lossless f=1.86 mm Supports EPTZ
System scanning mode	Progressive		
Signal-to-noise ratio	≥ 55 dB		
Horizontal rotation range	± 170°		Supports EPTZ
Vertical rotation range	-30° to +90°		Supports EPTZ
Pan speed range	1.7° to 100°/s		
Tilt speed range	1.7° to 69.9°/s		
Horizontal and vertical flip	Supported (enables ceiling-mounted installations)		
Camera Imaging			
Minimum illumination	0.5 Lux @ (F1.8, AGC ON)		
Shutter	1/30s to 1/1000s		
White balance	Auto, indoor, outdoor, one push, manual, specified color temperature		
Digital noise reduction	3D digital noise reduction		
Supported Video Formats			
Supported bridging formats	Core Nano, Core 8 Flex, NV-32-H (Core Capable), I/O-USB Bridge: **MJPEG & YUY2** Core 110f: **YUY2** (360p max resolution on USB 2.0, 1080p30 max resolution on USB 3.0		
Supported bridging resolutions	**1080p:** 30, 15 fps | **720p:** 30, 15 fps | **360p:** 30, 15 fps | **180p:** 30, 15 fps		
IP stream resolutions (preview window)	H.264 @ 360p, 270p or 180p		
HDMI output (RGB 4:4:4 8 bit)	2160p @ 25, 29.97, 30 fps 1080p @ 25, 29.97, 30, 50, 59.94, 60 fps 1080i @ 50, 59.94, 60 fps 720p @ 30, 50, 59.94, 60 fps		No HDMI output
3G-SDI output	1080p @ 25, 29.97, 30, 50, 59.94, 60 fps 1080i @ 50, 59.94, 60 fps 720p @ 50, 59.94, 60 fps		No SDI output
Power			
DC power input	12 V (±20%), 12 W, JEITA connector		N/A
Power over Ethernet (PoE)	PoE Type 1, Class 3		PoE Type 1, Class 2
Power consumption	12.95 W max		6.4 W max
General Specifications			
Network interface	1000BaseT (IEEE 802.3ab) Ethernet interface		
Operating temperature	0°C - 40°C		
Storage temperature	-40°C - 60°C		
Size	6.7 x 7.95 x 5.6 in (170 x 201 x 142 mm)		7.6 x 2.2 x 3.8 in (194.5 x 54.7 x 95.7 mm), with bracket
Net weight	3.5 lbs (1.6 kg)		0.9 lbs (0.4 kg), with bracket

Q-SYS NC Series Cameras

NC-110

NC-12x80

NC-20x60

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MXA920

Specifications

Specifications for Shure MXA920-S and MXA920-R ceiling array microphones.
Version: 0.1 (2022-D)

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MXA920 Specifications

General

Coverage Type

Automatic or steerable

Power Requirements

Power over Ethernet (PoE), Class 0

Power Consumption

10.1 W maximum

Control Software

Designer or web application

Plenum Rating

MXA920-S	UL2043 (Suitable for Air Handling Spaces)
MXA920-R	Not rated

Dust Protection

IEC 60529 IP5X Dust Protected

Operating Temperature Range

−6.7°C (20°F) to 40°C (104°F)

Storage Temperature Range

−29°C (−20°F) to 74°C (165°F)

Networking

Cable Requirements

Cat5e or higher (shielded cable recommended)

Connector Type

RJ45

Audio

AES67 or Dante Digital Output

Channel Count	Automatic coverage on	2 total channels (1 output, 1 AEC reference in channel)

	Automatic coverage off	10 total channels (8 independent transmit channels, 1 automix output, 1 AEC reference in channel)
Sampling Rate		48 kHz
Bit Depth		24

Sensitivity
at 1 kHz

−1.74 dBFS/Pa

Maximum SPL
Relative to 0 dBFS overload

95.74 dBSPL

Signal-to-Noise Ratio
Ref. 94 dBSPL at 1 kHz

75.76 dB A-weighted

Latency
Does not include Dante latency

Direct outputs (Automatic coverage off)	15.9 ms
Automix output (Includes IntelliMix processing)	26.6 ms

Self Noise
18.24 dB SPL-A

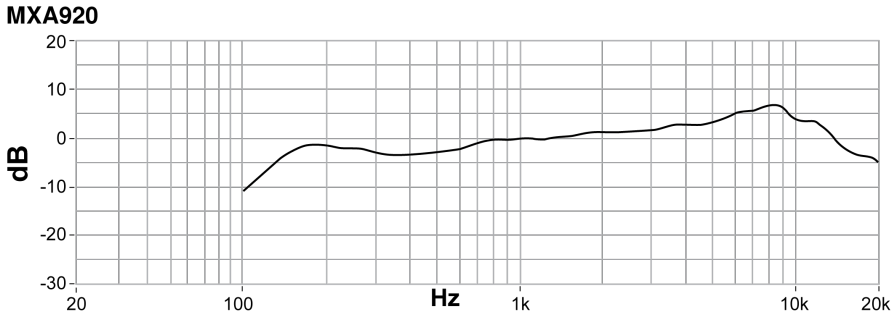
Dynamic Range
77.5 dB

Digital Signal Processing
Automatic mixing, acoustic echo cancellation (AEC), noise reduction, automatic gain control, compressor, delay, equalizer (4-band parametric), mute, gain (140 dB range)

Acoustic Echo Cancellation Tail Length
Up to 250 ms

Frequency Response
125 Hz to 20,000 Hz

MXA920 Frequency Response
Frequency response measured directly on-axis from a distance of 6 feet (1.83 m).



Dimensions

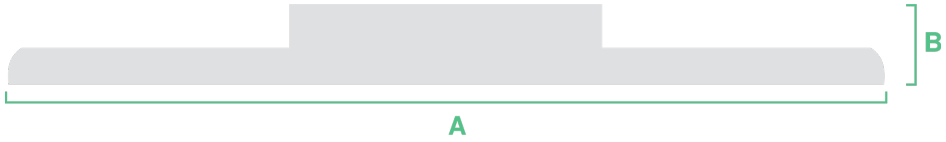
Weight

- MXA920-S: 11.8 lbs (5.4 kg)
- MXA920-R: 12.7 lbs (5.8 kg)

MXA920-S

- A (Microphone flange): 0.41 in. (10.5 mm)
- B (Edge to edge): 23.77 in. (603.8 mm)
- C (Height): 2.15 in. (54.69 mm)

MXA920-S-60CM



- A (Edge to edge): 23.38 in. (593.8 mm)
- B (Height): 2.15 in. (54.69 mm)

MXA920-R

- A (Height to top of eyelets): 2.4 in. (61.3 mm)
- B (Outer diameter): 25 in. (635.4 mm)

Q-SYS™

Integrated System Platform

Core 1000 | Core 3000 | Core 4000 | I/O Frame

Q-Sys™ is a complete integrated system that encompasses everything from the audio input to the output of the loudspeakers; it provides all the routing, processing, control and monitoring, while maintaining the audio quality and reliability QSC has come to be known for.

The Core and I/O Frame are the fundamental elements of a Q-Sys system. The Core is the brain of the system; it performs all the audio routing and processing and handles all control functions. The I/O Frames are the local inputs and outputs of a system; each Frame can house four I/O cards enabling up to 16 channels of input and/or output in a single unit. Combining QSC DataPort amplifiers with the DataPort output card enables complete end-to-end monitoring and control. Adding QSC loudspeakers to the mix provides greater control, heightened acoustic performance, and increased reliability by enabling functions such as automatic deployment of advanced processing and speaker fault detection.

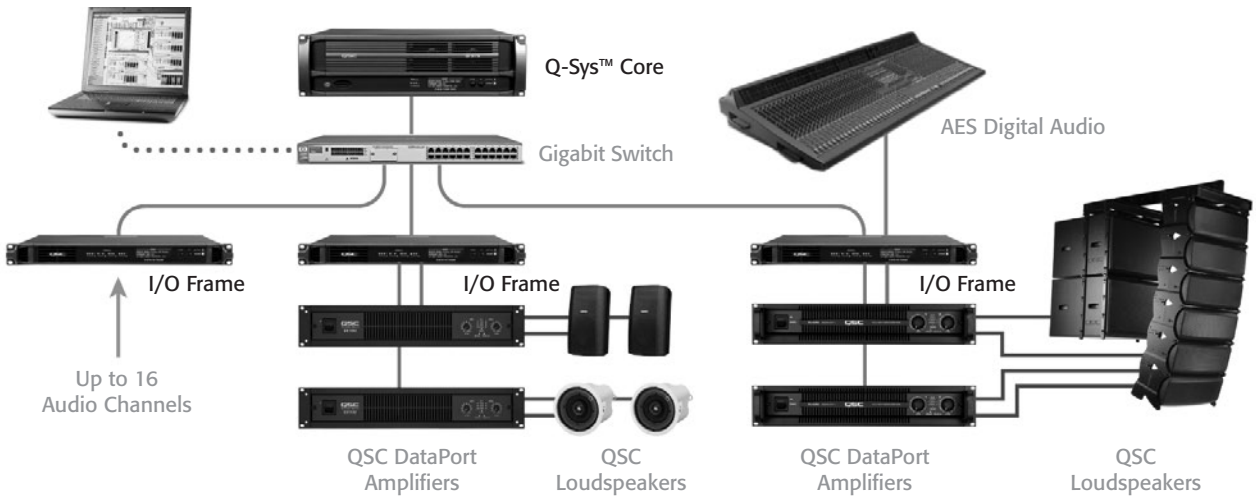
One of the primary development goals was to create a platform that had nearly unlimited resources; Q-Sys truly lives up to that goal with unrivaled processing breadth and depth. The design interface was created specifically to harness its unmatched power while remaining intuitive and easy to use. The processing tools are extensive and simple to apply. Once the system is designed, you will find that Q-Sys also offers a useful suite of trouble shooting and measurement tools.

Q-Sys provides extensive levels of system control which can be as simple or sophisticated as the application requires. Advanced control functions are easily created by simply connecting Control Functions in the Q-Sys Designer environment. Controls include an extensive selection of Functions and Scripts that may be used to define automated or user-initiated actions. These actions may be set to control internal Q-Sys parameters as well as external devices via (for example) GPIO. Snapshots of any or all controls can be created and recalled, or when a richer user interface is needed, custom control panels are easily created and published by the Core to any network device that supports browsers. Finally, IP-based external control protocol can be used in conjunction with 3rd party controllers for truly limitless control capabilities.

Q-Sys is a powerful and reliable unified system that features rock-solid performance backed by the unrivaled service and support QSC has built its reputation on. For more information please visit www.qscaudio.com/products/network/QSys.

Features

- Centralized processing architecture simplifies signal routing.
- Cores are available in three sizes based on channel capacity.
- Premium 24-bit AD and DA conversion used throughout.
- Abundant DSP capacity for the largest and most demanding installations.
- Intuitive and easy to use design GUI.
- Uses standard Gigabit Ethernet hardware for audio transport and control.
- System seamlessly integrates with QSC amplifiers and loudspeakers.
- Multiple levels of system redundancy are supported ranging from network-only to complete hardware redundancy including amplifiers.
- I/O Frames may be located with the Core or remotely – whichever best suits the needs of the installation.
- I/O Frames may be equipped with a variety of audio input and output cards.
- Q-Sys technical support is available 24/7 – worldwide. 24/7



Q-SYS™

Core and I/O Frame Specifications

System Hardware	Core 1000 | Core 3000 | Core 4000			I/O Frame
Description	System processor and control engine			System audio input and output device
Front Panel Controls	LCD page forward momentary switch Unit ID button momentary switch Clear settings momentary switch			LCD page forward momentary switch Unit ID button momentary switch Clear settings momentary switch
Front Panel Card Receptacle	SD (secure digital) standard size media			–
Front Panel Indicators	Power On: Blue LED Device Status: Tri-color LED Audio Signal: Five tri-color LEDs 240 x 64 monochrome LCD graphics display			Power On: Blue LED Device Status: Tri-color LED Audio Signal: Five tri-color LEDs/per I/O card slot 240 x 64 monochrome LCD graphics display
Rear Panel Connectors	RS-232: DE-9 (male 9-pin D shell connector) Video Out: HD-15 (female 15-pin D shell connector) Aux ports AUX A set: USB host x2, RJ45 10/100/1000 MBps Aux ports AUX B set: USB host x2, RJ45 10/100/1000 MBps GPIO A: DA-15 (female 15-pin D shell connector) GPIO B: DA-15 (female 15-pin D shell connector) Q-Sys Network LAN A: RJ45 1000 MBps only Q-Sys Network LAN B: RJ45 1000 MBps only			RS-232: DE-9 (male 9-pin D shell connector) GPIO A: DA-15 (female 15-pin D shell connector) Q-Sys Network LAN A: RJ45 1000 MBps only Q-Sys Network LAN B: RJ45 1000 MBps only
Capacity				
Network Audio Channels In	64	128	128 – 512[1]	–
Network Audio Channels Out	64	128	128 – 512[1]	–
Maximum Channels Out[2]	1024	2048	2048	–
End Node Capacity	128	256	512	–
Processing (Channels of 32-bit audio)	128	256	512	–
I/O Capacity	Up to 4 channels. Requires purchase of I/O cards			Up to 16 channels[3]. Requires purchase of I/O cards.
Line Voltage Requirements	100 VAC – 240 VAC, 50 – 60 Hz			100 VAC – 240 VAC, 50 – 60 Hz
Current Draw	2.3A (120V mains) | 2.8A (120V mains) | 2.8A (120V mains)			625mA (120V mains)
Thermal	785 BTU/h (typical) | 950 BTU/h (typical) | 950 BTU/h (typical)			205 BTU/h (typical)
Dimensions (HWD)	5.25" x 19" x 15" (133.35 mm x 482.6 mm x 381 mm)			1.75" x 19" x 15" (44.45 mm x 482.6 mm x 381 mm)
Accessories Included	6 ft UL/CSA/IEC line cord • User manual • Software CD • Optional audio I/O ship kit			6 ft UL/CSA/IEC line cord • User manual • Optional audio I/O ship kit

1) Up to 512 network audio channels when sending 8 or more channels per network audio stream.

2) Using maximum fan-out with 16-channel unidirectional I/O Frames.

3) The CAES4 card (AES-3 input/output) doubles the audio channel count of any slot in which it is used.

Minimum System Requirements for Q-Sys™ Designer

Software

- Microsoft® Windows® Vista® SP1
- Microsoft® Windows® XP® Professional Version 2002 SP3
- Microsoft® .NET Framework 3.5 SP1

Hardware

Windows Vista Home Premium / Business / Ultimate

- 1 GHz 32-bit (x86) or 64-bit (x64) processor
- 1 GB of system memory
- 40 GB hard drive with at least 15 GB of available space
- Support for DirectX 9 graphics with:
  - » WDDM Driver
  - » 128 MB of graphics memory (minimum)
  - » Pixel Shader 2.0 in hardware
  - » 32 bits per pixel
- CD-ROM or DVD drive
- Keyboard and Microsoft® Mouse or compatible pointing device

Windows XP Professional

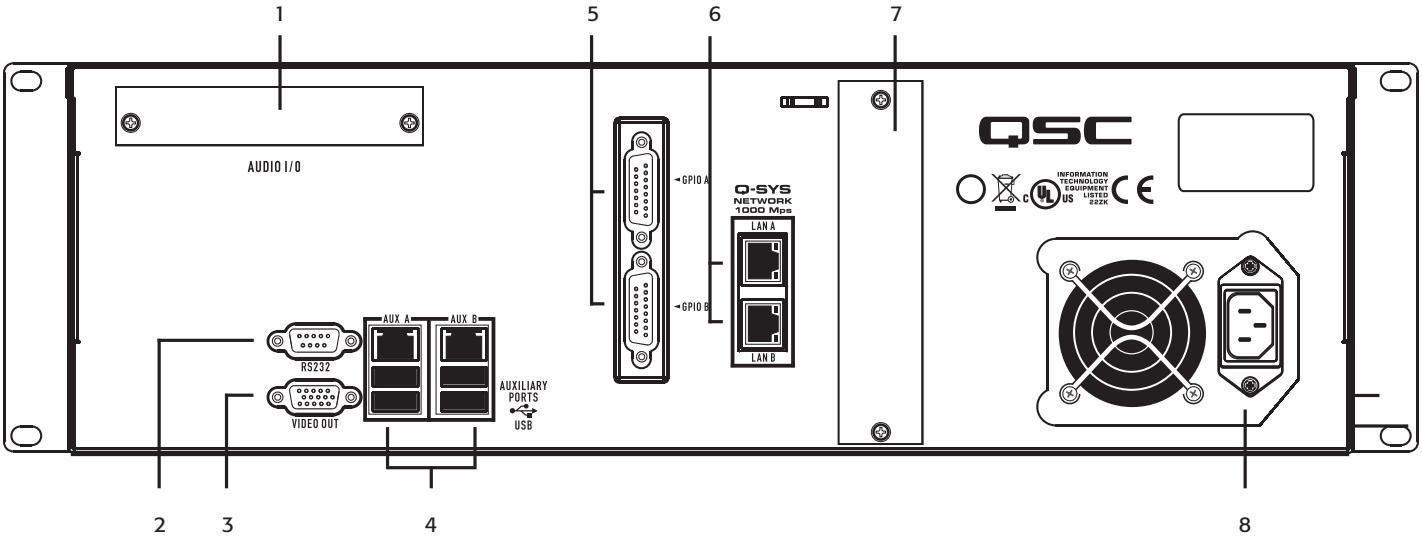
- PC with 300 megahertz or higher processor clock speed recommended; 233 MHz minimum required (single or dual processor system); Intel® Pentium®/Celeron® family, or AMD K6®/AMD Athlon®/AMD Duron® family, or compatible processor recommended.
- 128 megabytes (MB) of RAM or higher recommended (64 MB minimum supported; may limit performance and some features)
- 1.5 gigabytes (GB) of available hard disk space
- Super VGA (800 x 600) or higher-resolution video adapter and monitor
- CD-ROM or DVD drive
- Keyboard and Microsoft® Mouse or compatible pointing device

I/O Card Specifications

I/O Cards	Mic/Line Input CIML4	High-Performance Mic/Line Input CIML4-HP	Line Output COL4	DataPort Output CODP4	AES-3 Input/Output CAES4
Description	Four channels of microphone/line-level analog audio input with 48V phantom power	Four channels of microphone / line-level analog audio input with 48V phantom power and high performance pre-amplifiers and A/D converters	Four channels of balanced, line-level analog output	Four audio output channels (2 DataPorts) for connection to DataPort equipped QSC amplifiers	Four input and four output channels of AES-3 digital audio
Performance					
Dynamic Range Unweighted	> 105 dB	> 112 dB	> 112 dB	> 114 dB	–
Dynamic Range A-weighted	> 108 dB	> 115 dB	> 115 dB	> 117 dB	–
Distortion 20 Hz – 20 kHz +4 dBu (nominal input)	< 0.009% THD+N	< 0.004% THD+N	–	–	–
Distortion 20 Hz – 20 kHz 2 dB below clip (max)	< 0.08% THD+N	< 0.06% THD+N	< 0.004% THD+N	< 0.004% THD+N	–
Crosstalk 20 Hz – 20 kHz					
Inter-channel (max)	> 100 dB	> 110 dB	> 100 dB	> 95 dB	–
Inter-channel (typ)	> 110 dB	> 110 dB	> 110 dB	> 100 dB	–
Intra-channel (max)	> 100 dB	> 110 dB	> 100 dB	> 100 dB	–
Intra-channel (typ)	> 110 dB	> 110 dB	> 110 dB	> 110 dB	–
Frequency Response 20 Hz – 20 kHz (max)	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	–
Frequency Response 20 Hz – 20 kHz (typ)	± 0.2 dB	± 0.2 dB	± 0.2 dB	± 0.2 dB	± 0.2 dB
Input Impedance					
Balanced (nominal)	10 k ohms	10 k ohms	–	–	–
Unbalanced (nominal)	10 k ohms	10 k ohms	–	–	–
Common Mode Rejection 20 Hz – 20 kHz (max)	> 45 dB	> 45 dB	–	–	–
Common Mode Rejection 20 Hz – 20 kHz (typ)	> 50 dB	> 50 dB	–	–	–
Max Input Level	0.123, 2.25, 8.70, 17.35 Vrms -16, 10, 21, 27 dBu -18.2, 7.04, 18.8, 24.78 dBv (4 selections)	1.23 to 17.35 Vrms -56 to 27 dBu -58.2 to 24.8 dBv (continuously variable)	– – –	– – –	– – –
Mute	Infinite attenuation (via digital mute)	Infinite attenuation (via digital mute)	Infinite attenuation (via electro-mechanical relays)	Infinite attenuation (via electro-mechanical relays)	Infinite attenuation (via digital mute)
Audio Converters					
Analog to Digital Conversion (ADCs)	24-bit delta-sigma at 48 or 96 kHz sample rate	24-bit delta-sigma at 48 or 96 kHz sample rate	–	–	–
Digital to Analog Conversion (DACs)	–	–	24-bit delta-sigma at 48 or 96 kHz sample rate	24-bit delta-sigma at 48 or 96 kHz sample rate	–
Group Delay	< 13 FS (≈ 271 µs) at 48 kHz	< 13 FS (≈ 271 µs) at 48 kHz	< 10 FS (≈ 196 µs) at 48 kHz	< 13 FS (≈ 271 µs) at 48 kHz	< 37 FS (≈ 760 µs) at 48 kHz*
Connectors	Four 3-terminal Euro- style detachable terminal blocks	Four 3-terminal Euro-style detachable terminal blocks	Four 3-terminal Euro-style detachable terminal blocks	Two 15-pin HD15 connectors	Four 3-terminal Euro-style detachable terminal blocks
User-configurable Options (software enabled)					
Phantom Power	+48 V phantom power (meets IEC 1938 [1996] spec)	+48 V phantom power (meets IEC 1938 [1996] spec)	–	–	–
Output Trim					
Vrms (max)	–	–	8.7 V	–	–
dBu (max)	–	–	21 dBu	–	–
dBv (max)	–	–	18.8 dBv	–	–
Amplifier Standby	–	–	–	Set or clear amplifier in standby mode	–
Mute	–	–	–	Set or clear individual channel mutes	–
Enable Meters	–	–	–	Enable data collection of meters for each channel	–
Audio Output Levels	–	–	–	Adjust individual audio channel levels	–
Amplifier Model Support	–	–	–	CX, PowerLight™ 3 Series, DCA, and legacy V1 models	–

**Group Delay assumes that the sample rate converter is enabled.*

Core 1000 | Core 3000 | Core 4000



1. Audio I/O Bay – accepts optional Q-Sys audio I/O card
2. RS-232 – DE-9 male connector for serial communications
3. Video Out – HD-15 female connector accepts diagnostic VGA monitor
4. Auxiliary Ports

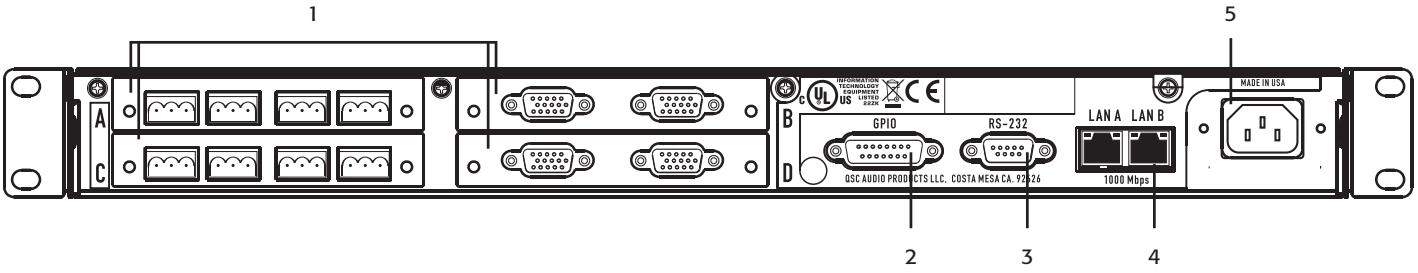
- AUX A Set – USB host connector x2, RJ45 10/100/1000 Mbps Ethernet
- AUX B Set – USB host connector x2, RJ45 10/100/1000 Mbps Ethernet

5. GPIO A and GPIO B – female DA-15 connectors for Q-Sys control I/O
6. Q-Sys Network Port

- LAN A – 1000 Mbps only, primary connection to Q-Sys gigabit network
- LAN B – 1000 Mbps only, backup connection to Q-Sys gigabit network

7. Reserved for Future Use
8. AC Main Inlet – IEC male connector

I/O Frame



1. Configurable Audio I/O Bays
2. GPIO Interface (control I/O)
3. RS-232 Serial Control Interface
4. Dual Gigabit Network Interfaces for Q-Sys LANs
5. AC Main Inlet – IEC male connector

please recycle

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qscaudio.com

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DATA SHEET

Thunderbolt™ 4 USB-C® Cable (40Gbps)

Deliver 4K video, data content at 40Gbps, and power between Thunderbolt 4 devices

OVERVIEW

This Thunderbolt 4 USB-C Cable brings lightning-speed data transfers, 4K video support, and power delivery up to 100W. Get more done with less hassle by carrying one cable for the simplest, most reliable, and fastest connectivity for video, data, and power.

Deliver up to 40Gbps to or from a Thunderbolt 3 or Thunderbolt 4 enabled port. This cable is an ideal solution to transfer large amounts of information, whether uploading or downloading data. It is so fast you can transfer a 5GB file in about a second over the cable.

Stream video and audio with full DisplayPort 2.1 and 'Alt' mode functionality, displaying up to 8K video on a single display or 4K video on two displays for low-latency gaming, immersive creation, and simplified productivity with fantastic contrast and color depth to see photos, videos, and text with unbelievable detail.

Deliver up to 100W of charging power to or from the connected device, like your phone, laptop, or tablet, and other compatible USB devices to charge them quickly.

Connect to a high-speed 10 Gigabit Ethernet network or connect two computers over a peer-to-peer network, allowing for the transfer of large volumes of data from one PC to another, which is ideal when upgrading to a new system.

Connect with confidence, knowing that this Thunderbolt 4 cable has been certified and tested to ensure broad compatibility across Mac®, Windows®, and Chrome OS™ devices.

FEATURES

- Supports a top data transfer speed of 40Gbps when connected to Thunderbolt 3 or Thunderbolt 4 devices
- Supports a single 8K 60Hz display or two 4K 60Hz displays
- Supports all 'Alt' mode features outputting full DisplayPort, including multi-streaming
- Capable of charging up to 100 watts and syncing USB-C mobile devices
- Backward compatible with Thunderbolt 3, USB 3.2, 3.0, and 2.0
- Thunderbolt Networking allows 10Gb Ethernet connection or peer-to-peer networking between two computers
- Daisy-chain up to five Thunderbolt 4 devices or six Thunderbolt 3 devices for flexible configurations
- Tested for quality, meeting Intel's required certification standards

ITEM	DESCRIPTION
C2G28885	1.5ft (0.5m) Thunderbolt™ 4 USB-C® Cable (40Gbps)
C2G28886	2.5ft (0.8m) Thunderbolt™ 4 USB-C® Cable (40Gbps)
C2G28887	6ft (2m) Thunderbolt™ 4 USB-C® Active Cable (40Gbps)

DATA SHEET

SIGNAL SPECIFICATIONS

- Resolutions up to 4K (4096 x 2160) at 60Hz
- Signal Bandwidth: 40Gbps Bidirectional

ELECTRICAL SPECIFICATIONS

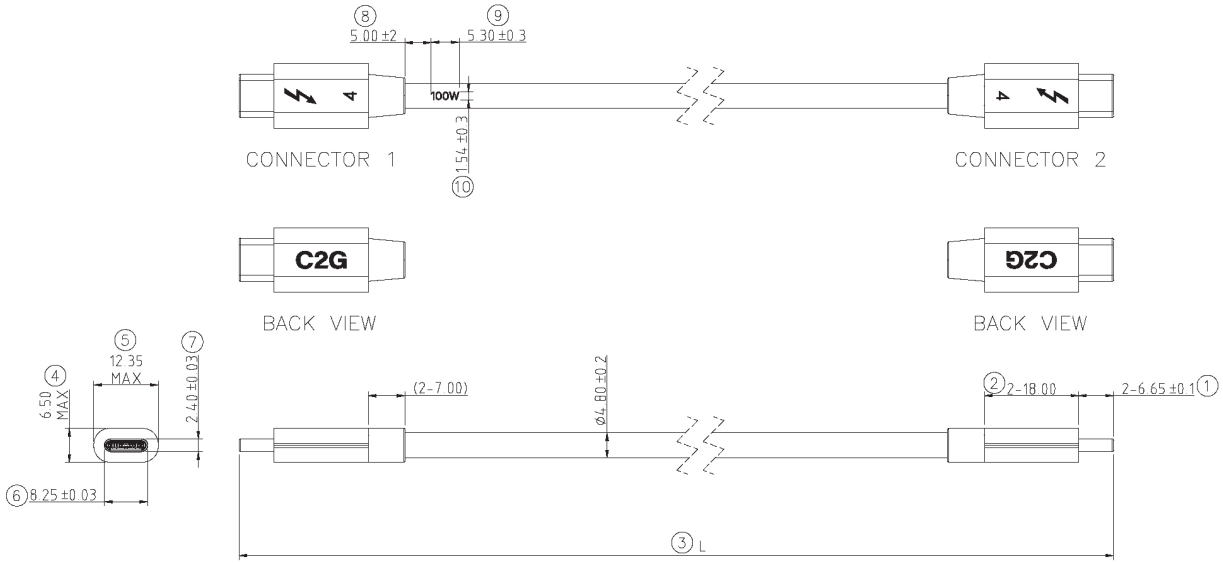
- Voltage Rating: 30V
- Temp Rating: 80°C
- Max Conductor Resistance at 20°C (OHMS/KM): 30AWG: 387; 32AWG: 588
- Insulation Resistance at 20°C (min): DC-500V 100 KOHM/KM
- Dielectric Strength (min): AC-750V/1 Sec.

PHYSICAL SPECIFICATIONS

- Operating Temperature: 0°C to 50°C; Ambient (Non-Condensing)
- Storage Temperature: 0°C to 70°C; Ambient (Non-Condensing)
- Operating Temperature (C2G28887 only): -20°C to 85°C; Ambient (Non-Condensing)
- Storage Temperature (C2G28887 only): 0°C to 40°C; Ambient (Non-Condensing)
- Minimum Bend Radius: 48mm

PHYSICAL CHARACTERISTICS

- Housing: LCP, Black
- Jacket: TPE
- Jacket OD: 4.8mm
- Shield Braid Coverage (Min): 80%
- Shield Braid Construction: 42AWG
- Connector: USB Type C Male; Contact: Special Copper; GND: Stainless Steel; Plug Shell: Stainless Steel; Plug EMI: Stainless Steel
- Shielding: Inner Shell Welding with Connector and Cable Braid
- Product is CE Marked and Conforms to 2011/65/EU ROHS 2



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LEGRAND | AV COMMERCIAL BRANDS
C2G | Chief | Da-Lite | Luxul | Middle Atlantic | Vaddio | Wiremold

SIMPLIFIED CONNECTIVITY

USA 800.506.9607 | c2g.com | legrandav.com | customer-service@c2g.com

EMEA +31 495 580 840 | c2g.com/uk | legrandav.com | c2g.emea@av.legrand.com

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DATA SHEET

6in USB-C® Female to USB-A Male SuperSpeed USB 5Gbps Adapter Converter

Adapt a USB-C device to a USB-A port on a laptop, desktop computer, or tablet

OVERVIEW

This USB-C Female to USB-A Male SuperSpeed USB 5Gbps Adapter Converter is the perfect solution for connecting a USB-C device to a laptop or desktop computer that does not have a USB-C port.

Simply connect the adapter converter into a USB-A port of a laptop or desktop computer and enjoy plug and play connectivity for USB-C devices. This adapter converter supports a data rate up to 5Gbps for data transfer and 900mA of power for device operation and charging. This adapter converter is compatible with earlier USB versions.

The USB-C connector has a symmetrical design which is identical on both sides, so no more worrying about whether it's upside-down or right-side-up. It will plug in the first time, every time—while preventing damage to the connector port from frequent plugging and unplugging.

FEATURES

- Small form factor for portability
- Plug and Play—no driver required
- Up to 5Gbps data transfer and 900mA of power
- Compatible with USB 3.0 specification and earlier versions
- Reversible, symmetrical USB-C connector

ITEM DESCRIPTION

54428	6in USB-C Female to USB-A Male SuperSpeed USB 5Gbps Adapter Converter

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DATA SHEET

SPECIFICATIONS:

6in USB-C Female to USB-A Male SuperSpeed USB 5Gbps Adapter Converter

ELECTRICAL SPECIFICATIONS:

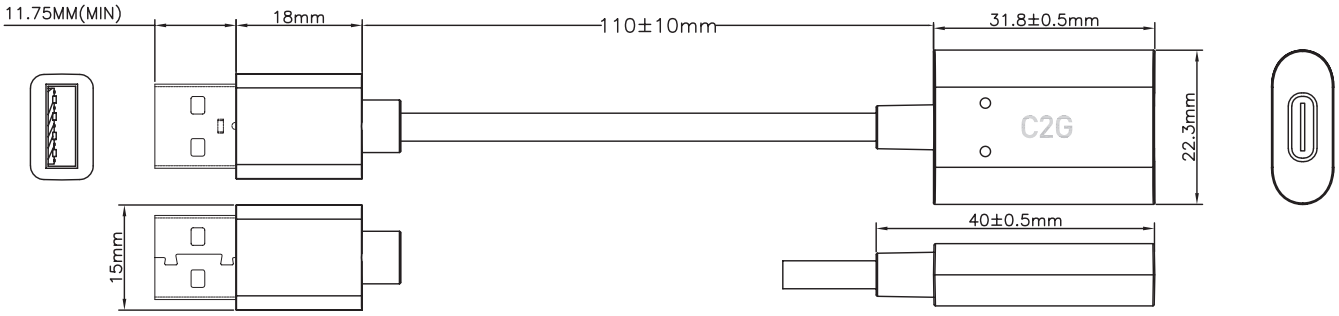
- Support USB 3.0 upstream (connect USB-A host PC), USB-C downstream (connect USB-C devices for data and power transmission)
- USB-C female supports reversible plug
- No driver is required, plug and play
- Compatible with USB 3.0 specification and lower versions
- USB-C female supports max 5Gbps downstream data and 900mA downstream power for the connected USB-C device
- Support all versions of the operating system

PHYSICAL SPECIFICATIONS:

- Operating Temperature: 0°C to 45°C
- Storage Temperature: -10°C to 70°C
- Operating Humidity: 10% to 85% RH
- Storage Humidity: 5% to 90% RH

PHYSICAL CHARACTERISTICS:

- 5P PVC RoHS Black
- Low pressure mold material, transparent color, hardness: 40-48D-UL94V-0
- USB 3.1 C Type Connector with USB 3.0 AM Pinboard~PCB+Paster



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6500 Poe Ave.
Dayton, OH 45414
Phone: 800.CABL.911
www.c2g.com

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DATA SHEET

C2G Performance Series Ultra Flexible High Speed HDMI® Cable - 4K 60Hz In-Wall, CMG (FT4) Rated

Extend HDMI signals over a high performance HDMI cable and support HDMI audio and video features including 4K Ultra HD

OVERVIEW

The C2G Performance Series Ultra Flexible High Speed HDMI Cable is perfect for connecting a wide variety of devices from computers to projectors and monitors, AV presentation furniture, or in-wall applications requiring high speed HDMI features and video resolutions up to 4k (4096 x 2160) at 60Hz — perfect for conference rooms, classrooms, churches, and other commercial installations.

This Ultra Flexible High Speed HDMI Cable was designed for installations in tight spaces and offers commercial grade connectors that feature compact overmolding for high density environments, integrated finger grips on the top, bottom, and sides, for easy insertion and removal, and the gripping connector shell has 2x greater port retention to keep your devices connected. The gold plated connectors on the cable allow for better shielding, increased electrical conductivity, and durability.

This Ultra Flexible High Speed HDMI Cable supports the updated library of Consumer Electronic Control (CEC) commands, allowing communication between devices connected through the HDMI ports. Lastly, this fully-functional, high bandwidth cable has been tested to perform at industry standards and is backed by a lifetime warranty.

FEATURES

- Supports all HDMI 2.0 features including resolutions up to 4K (4096 x 2160) at 60hz, which means higher quality video for viewing your screen content
- In-wall (CMG/FT4) rated jacket, so you can safely run the cable inside of a wall and have a clutter free, clean look
- Integrated finger grips on the connectors for easy insertion and removal
- Gripping connector shell for 2x greater port retention
- Gold plated connectors for increased electrical conductivity and enhanced durability
- Directional cable with source connector labeled and tagged to easily differentiate from the labeled display connector
- Supports CEC extensions for control of consumer electronics devices through a single control point
- Backed by a Lifetime Warranty for peace of mind

ITEM DESCRIPTION

C2G10373	1ft (0.3m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10374	18in (0.5m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10375	2ft (0.6m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10376	3ft (0.9m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10377	6ft (1.8m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated
C2G10378	10ft (3m) C2G Performance Series Ultra Flexible High Speed HDMI Cable - 4K 60Hz In-Wall, CMG (FT4) Rated

DATA SHEET

SIGNAL SPECIFICATIONS

- Supports HDMI Resolutions up to 4K 60Hz, 4:4:4, 18 Gbps
- Supports Full HD Blu-ray Disc and HD DVD Video
- Supports 3D Video
- Perceptual Quantizer (PQ HDR OETF (SMPTE ST 2084)
- Hybrid Log-Gamma (HLG) HDR OETF
- Static HDR Metadata (SMPTE ST 2086)
- DVD Audio, Super Audio CD (DSD)
- Dolby® True HD, DTS-HD Master Audio Bitstream Capable
- 4 Audio Streams
- Ethernet Channel: 100 Mbit/s
- Consumer Electronic Control (CEC), with Updated List of CEC Commands

ELECTRICAL SPECIFICATIONS

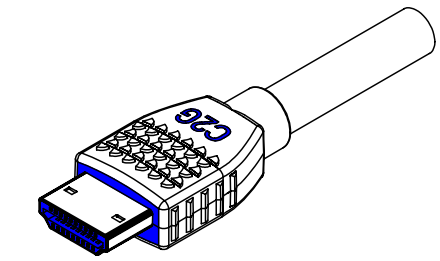
- Voltage Rating: 30V
- Temp: Connector: Temp Rating: 220°C
- Cable: Temp Rating: 75°C
- Conductor Resistance: 5Ω
- Insulation Resistance: 10MΩ
- Differential Data Input Voltage: 4.8V to 5.3V
- Differential Data Output Voltage: 4.7V to 5.3V

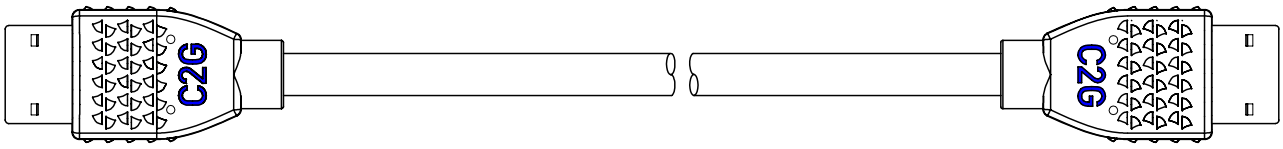
PHYSICAL SPECIFICATIONS

- Operating Temperature: -20°C to +75°C; 85% RH (Non-Condensing)
- Storage Temperature: -10°C to +55°C; 85% RH (Non-Condensing)
- Tensile Strength: 100N
- Minimum Bend Radius: 48
- Cable Jacket Ratings: CMG FT4
- Connector Gripping Force: HDMI Withdrawl Force: 3.12 to 3.28kgf (9.8N/1.0kgf Min; 39.2N/4.0kgf Max)
- Connector Gripping Force: HDMI Insertion Force: 2.54 to 2.61kgf (44.1N/4.5kgf Max)

PHYSICAL CHARACTERISTICS

- Material: Housing: PVC Molding
- SR-Mold: PVC, Color: Black
- Jacket Color: Black
- Connector Insulator: Blue; Front of the Housing: Blue; "C2G"
- Jacket OD: 6.00±0.20mm; Jacket Material: PVC; Jacket Thickness: 0.56mm (REF)
- Shield Drain: 7/0.10T (30AWG); Shield AL/Mylar: AL Face Inside; Shield Mylar; Transparent Mylar Tape
- Shield Filler: Filler; Shield Paper: Paper: Paper; Shield Consitution N/mm: 16/9/0.08; Shield Material: Tinned Copper; Shield Coverage %: 65%
- Connector: HDMI Type A Male Connector, Metal Shell Gold Plated, Electrical Contact Copper; Alloy Gold Plated 5u', Insulator Color: Blue
- Cable UL/CUL/CSA Rating: Type: (7/0.10T*1P+D+AL+MY) *5C+7/0.10T*3C+7/0.127T*1C+F+Paper+B16/9/0.08T OD: 6.00mm;
- Cable UL/CUL/CSA Rating: Print: High Speed HDMI Cable With Ethernet E468040 (UL) CL2 75°C 30AWG
- Product is CE Marked and Conforms to 2011/65/EU ROHS 2





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COMMERCIAL AV BRANDS

C2G | Chief | Da-Lite | Luxul | Middle Atlantic | Vaddio | Wiremold

KARL'S
EMPLOYEE OWNED

WATERTOWN
1801 9TH AVE.SOUTHEAST
WATERTOWN SD 57201
605 886-2017

Sales Quote
123242472

Estimated Date	Document Date
04/01/25	05/29/24

Quoted pricing good for 15 days from document date.

Sold To	Ship To
CITY OF WATERTOWN 23 2ND ST NE WATERTOWN, SD 57201 Work: 605 882-6203	CITY OF WATERTOWN NEW CITY HALL WATERTOWN, SD 57201

Customer Phone#	Sold To Cell#	Terms	Salesperson	Customer #	Store
Home: Work:605 882-6203		NET 30 DAYS	ERIC SCOTT	126203	12

Type	Comments
D - Delivery	

Ln#	Model / Brand	Description	Order	Price	Amount
1 D	70UQ7590P LGE	PTSM-70" UHD HDR SMART LED TV	6	$699.99	$4,199.94
2 D	55UR9000P LGE	PTSM-55" UHD ACTIVE HDR MM REM	4	$499.99	$1,999.96
3 D	PT300 KANTO	PTSM-32"-90" TILTING WALL MNT	4	$129.99	$519.96
4 D	PDX650 KANTO	PTSM-37"-75" MOTION WALL MOUNT	5	$199.99	$999.95
5 D	CM600G KANTO	SP/O-37"-70" LRG CEILING MOUNT	1	$319.99	$319.99
6 D	BIINSTALL SER 4 FLAT MOUNTED TVS	INSTALLATION	1	$260.00	$260.00

KARL'S
EMPLOYEE OWNED

WATERTOWN
1801 9TH AVE.SOUTHEAST
WATERTOWN SD 57201
605 886-2017

Sales Quote
123242472

Estimated Date	Document Date
04/01/25	05/29/24

Quoted pricing good for 15 days from document date.

Sold To

CITY OF WATERTOWN
23 2ND ST NE
WATERTOWN, SD 57201
Work: 605 882-6203

Ship To

CITY OF WATERTOWN
NEW CITY HALL
WATERTOWN, SD 57201

Customer Phone#	Sold To Cell#	Terms	Salesperson	Customer #	Store
Home: Work:605 882-6203		NET 30 DAYS	ERIC SCOTT	126203	12

Type	Comments
D - Delivery	

Ln#	Model / Brand	Description	Order	Price	Amount
7 D	BIINSTALL SER 5 ARTICULATING MOUNTED TVS	INSTALLATION	1	$400.00	$400.00
8 D	BIINSTALL SER 1 CEILING MOUNTED TV	INSTALLATION	1	$150.00	$150.00

Merchandise:	$8,849.80
Delivery Charge:	$75.00
Total Sales Quote:	**$8,924.80**

Bill:	City of Watertown	Remit:	Municipal Utilities
	Attn: Jennifer		901 4 Ave SW
	PO Box 910		Watertown, SD 57201
	Watertown, SD 57201		5/2/2024
Claim #:			
Re:	Installing fiber to New City Hall (Wells Fargo Building)		

City #	Material: QTY		Unit Price:		Extended:	
					$ -	
	725	48 Fiber Optic Cable	$1.08		$ 783.00	
	675	Boring Per Foot	$15.77		$ 10,644.75	
	725	Pulling Fiber in Inner Duct	$0.75		$ 543.75	
	1	Fiber Splicing	$1,738.00		$ 1,738.00	
					$ -	
					$ -	
					$ -	
		Total Materials			$ 13,709.50	
		State Sales Tax				
		City Sales Tax				
		Total Materials/Sales Tax				$ 13,709.50
	Labor:					
	0	hour - Line Forman	$63.79	per hour	$ -	
	0	hour - Journeyman Lineman	$58.68	per hour	$ -	
	0	hour - Electric Meter Foreman	$59.74	per hour	$ -	
	0	hour - Meter Person (Nightman)	$55.00	per hour	$ -	
	0	hour - Apprentice Meter Person	$50.00	per hour	$ -	
	0	hour - Apprentice Lineman	$53.66	per hour	$ -	
	0	hour - Locator	$0.00	per hour	$ -	
	0	hour - Part Time Helper	$0.00	per hour	$ -	
	0	hour - Installing pole for temp or rental lig	$100.00	per pole	$ -	
	OT Labor:					
	0	hour - Line Foreman	$85.78	per hour	$ -	
	0	hour - Journeyman Lineman	$78.09	per hour	$ -	
	0	hour - Electric Meter Foreman	$80.34	per hour	$ -	
	0	hour - Meter Person (Nightman)	$73.96	per hour	$ -	
	0	hour - Apprentice Meter Person	$67.24	per hour	$ -	
	0	hour - Apprentice Lineman	$72.17	per hour	$ -	
	0	hour - Locator	$0.00	per hour	$ -	
	0	hour - Part Time Helper	$0.00	per hour	$ -	
		Total Labor				$ -
	Equipment:					
	0	hour - Foreman Truck	$35.00	per hour	$ -	
	0	hour - Digger Derrick	$150.00	per hour	$ -	
	0	hour - Bucket Truck	$140.00	per hour	$ -	
	0	hour - Meter Department Van	$35.00	per hour	$ -	
	0	hour - Trencher (ride on)	$75.00	per hour	$ -	
	0	hour - Trencher/plow small	$50.00	per hour	$ -	
	0	hour - Trencher (three wheel)	$40.00	per hour	$ -	
	0	hour - Back Hoe	$80.00	per hour	$ -	
	0	hour - Small Dump Truck	$50.00	per hour	$ -	
	0	hour - Large Dump Truck	$100.00	per hour	$ -	
	0	hour - Fork Lift	$45.00	per hour	$ -	
	0	hour - Vacuum Unit	$65.00	per hour	$ -	
	0	hour - Skid Steer	$70.00	per hour	$ -	
	0	hour - Light tower/Generator	$20.00	per hour	$ -	
		Total Equipment				$ -
	Sub Total					$ 13,709.50
	Excise Tax					$ 279.81
	Total					$ 13,989.31

Proposal

Swiftel COMMUNICATIONS
415 4th St. Brookings, SD 57006

REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER BICSI

Date: 3/28/2024

Watertown City Hall

* Communications Cabling

Swiftel Contact Info:
Scott Mack
scott.mack@swiftel-bmu.com
605.697.8249 Office
605.868.7001 Mobile
605.697.8280 Fax

Scope of Work

- Provide, Install & Test Communications Cabling Infrastructure for Data, WAPs, Cameras & TV

- **Materials Included:**
- Cat 6, Plenum, Data
- Cat 6, Plenum, Camera
- Cat 6, Plenum, TV
- Cat 6A, Plenum, WAPs
- Cat 6 Data Jack
- Cat 6 Camera Jack
- Cat 6 TV Jack
- Cat 6A WAP Jack
- Faceplate, 2-port
- Floorplate, 106-2
- Surface Box, 1-port for WAPs
- 48-Port Panel (Data)
- 24-Port Panel (WAPs, Cameras & TV)
- Equipment Rack, 2-Post
- Vertical Management, 6"
- Vertical Management, 10"
- HDMI Cabling

Exclusions:

- Cable Tray (Provided by EC)
- Backboard, 3/4" AC Plywood, Painted (Provided by EC)

$ 47,660.00

Customer Signature:_____ **Date:**_____

Purchase Order #: _____

**** Please email or fax signed approval to above address***

Cart

Connecting Point
504 Jenson Ave SE
Address2,
Watertown, SD, 57201 U.S.A.
1-800-529-5500
onlinesales@connectingpoint.biz

CART #: 2493
Date: 05/29/2024

Billing Address

Peter Boyle
23 2nd St NE
Watertown, SD, 57201 U.S.A.
605-881-5234
pboyle@watertownsd.us

Shipping Address

Peter Boyle
23 2nd St NE
Watertown, SD, 57201 U.S.A.
605-881-5234
pboyle@watertownsd.us
Free Delivery

Customer Details

Watertown IT Dept.
Peter Boyle
605-881-5234
pboyle@watertownsd.us

Sales Associate

Bryan Waege
605-882-1555
varstreet@connectingpoint.biz

Item#	Mfr.Part	Description	Price	Qty	Amount
1	SMT2200RM2UC	APC by Schneider Electric Smart-UPS 2200VA LCD RM 2U 120V with SmartConnect - 2U Rack-mountable - 3 Hour Recharge - 6.60 Minute Stand-by - 120 V Input - 120 V AC Output - Sine Wave - 6 x NEMA 5-15R, 2 x NEMA 5-20R - 8 x Battery/Surge Outlet - TAA Compliance	$1,527.35	2	**$3,054.70**
2	SRCABLERINGVRT	Tripp Lite Rack Enclosure Cabinet 6ft Horizontal Cable Ring Flexible 6" - Cable Panel - Black - RoHS, TAA Compliance	$127.75	2	**$255.50**
3	SR4POST1224	Tripp Lite by Eaton 45U SmartRack 4-Post Open Frame Rack - Threaded 12-24 Mounting Holes - 45U Rack Height x 19" Rack Width - Black - Cold-rolled Steel (CRS) - 1000 lb Static/Stationary Weight Capacity - RoHS, TAA Compliance	$489.16	2	**$978.32**
4	SRCABLELADDER	Tripp Lite SmartRack 10-ft. x 1-ft. (3 m x 0.3 m) Cable Ladder 2 sections SRCABLETRAY/SRLADDERATTACH needed - Cable Ladder - TAA Compliance	$242.62	2	**$485.24**
5	SRLADDERATTACH	Tripp Lite Rack Roof Kit Connect SRCABLELADDER to Open Frame Racks and Wall - 1 - TAA Compliance	$38.25	2	**$76.50**

No. of item(s): 5	**Sub Total:**	**$4,850.26**
	Freight:	**$0.00**
	Order Total:	**$4,850.26**

Payment Details	**Shipping and Delivery Details**
Payment Method: Company PO	**Shipping Method:** Free Delivery

Terms and Conditions

Solution Proposal

57858

57858 .01

504 Jenson Ave SE
Watertown, SD 57201
P: 605.882.1555

3710 S Kiwanis Ave.
Sioux Falls, SD 57105
P: 605.361.8881

1680 East Capitol Ave Suite B
Bismarck, ND 58501
P: 701.258.6689

114 Main St. N Ste. 202F
Hutchinson, MN 55350
P: 320.582.0234

801 S 42nd Street, Suite G1
Grand Forks 58201

City of Watertown IT Dept. - Meraki MS130 & MR46 2025 Budget

May 28, 2024

Bill To:
City of Watertown IT Dept.
Peter Boyle
23 2nd St. NE
Watertown, SD 57201

Phone:
(605) 753-3558

Email: pboyle@watertownsd.us

Ship To:
City of Watertown IT Dept.
Peter Boyle
23 2nd St. NE
Watertown, SD 57201

Salesperson: Greg Richter

	Description	Price Each	Qty	Ext Price
Items				**$22,842.00**
1	**CISCO MERAKI MS130-24P-HW ETHERNET SWITCH** Cisco Meraki MS130-24P-HW Ethernet Switch - 24 Ports - Manageable - Gigabit Ethernet - 10/100/1000Base-T, 1000Base-X - 2 Layer Supported - 4 SFP Slots - 370 W PoE Budget - Optical Fiber, Twisted Pair - PoE Ports - Rack-mountab	$2,269.00	2	$4,538.00 ☒
2	**CISCO MERAKI ENTSUPP SUBLIC 5Y** Cisco Meraki Enterprise + Support - Subscription License - 1 License - 5 Year	$539.00	2	$1,078.00 ☒
3	**MERAKI MR46 WIRELESS AP** Meraki MR46 802.11ax 3.50 Gbit/s Wireless Access Point - 2.40 GHz, 5 GHz - MIMO Technology - 1 x Network (RJ-45) - 2.5 Gigabit Ethernet - Desktop, Ceiling Mountable, Wall Mountable, Rail-mountable AP	$1,309.00	9	$11,781.00 ☒
4	**MERAKI 5 YEAR SUPP ENTERPRISE** Meraki MR Enterprise Cloud Controller License, 5 Years - Meraki MR Series Access Point - Subscription License - 5 Year License Validation Period LICS AND SUP	$605.00	9	$5,445.00 ☒

Payment Terms:
Payment terms are established at the time of the order. We accept cash or check along with credit card, but our company policy is to limit credit card payment acceptance to $4,000.00 or less per account per month. We also offer leasing and other options to manage your purchase. Account setup time can take 1-2 business days to review and approve.

Return Policy:
Unopened items can be returned 15 days from date of delivery without restock fees. Items that have been opened will have a 15% restock fee and can be returned up to 30 days from date of purchase. There are no returns for SPECIAL ORDER, CUSTOM CONFIGURATIONS or Items that are older than 30 days from date of purchase.

Shipping Disclaimer:
Connecting Point is not responsible for any damages that occur during shipping. As the recipient, you are responsible for reporting damaged shipments and to inspect all boxes prior to signing for deliveries. You also have an option of refusing the shipment of any damaged goods. If not refused, take pictures of any damage and have the delivery driver sign off on shipping documentation. Any damage done from shipping must be brought to our attention immediately at time of receiving the product. Delayed reporting of any damages or missing parts may result in rejection of your claim. Hold all damaged goods and all original packing materials for inspection. Shipping insurance is available at and additional cost.

_____ By initialing here you are agreeing to accept these shipping terms.

Subtotal	$22,842.00
Tax	$0.00
Total	$22,842.00

Quoted by: _____

Accepted by: _____

ESEind, INC.
920 7th Ave
Brookings, SD 57006 US
+1 6056913265
matt@eseind.com

Proposal

ADDRESS

City of Watertown
PO Box 910
Watertown, SD 57021-0910

PROPOSAL # 1356
DATE 07/13/2021

ACTIVITY	QTY	RATE	AMOUNT
Sales City Hall Renovation (Video Surveillance):			
Sales Video Surveillance per the specifications listed on the project drawing ET101 dated 5/27/2021. Six (6) - Interior 5 mp IP camera Five (5) - Exterior 5 mp IP camera with mounting arms Two (2) 360 degree cameras (multi sensor) with mounting arms Thirteen (13) - Spectrum Recoding Licenses Network switches by others	1	12,900.00	12,900.00

TOTAL **$12,900.00**

Accepted By

Accepted Date

ESEind, INC.
920 7th Ave
Brookings, SD 57006 US
+1 6056913265
matt@eseind.com

Proposal

ADDRESS

City of Watertown
PO Box 910
Watertown, SD 57021-0910

PROPOSAL # 1355
DATE 07/13/2021

ACTIVITY	QTY	RATE	AMOUNT
Sales City Hall Renovation (Door Access):			
Sales Door access per the specifications listed on the project drawing ET101 dated 5/27/2021. ----------	1	27,150.00	27,150.00
Sales Add integrated alarm system - monitor three exterior doors, tunnel door and two garage doors. Four 360 motion sensors. Intergraded so when entering the building via the door access the system there will be no need to enter a pin on a keypad.			2,495.00

TOTAL **$29,645.00**

Accepted By

Accepted Date

Cart

Connecting Point
504 Jenson Ave SE
Address2,
Watertown, SD, 57201 U.S.A.
1-800-529-5500
onlinesales@connectingpoint.biz

CART #: 2492
Date: 05/28/2024

Billing Address

Peter Boyle
23 2nd St NE
Watertown, SD, 57201 U.S.A.
605-881-5234
pboyle@watertownsd.us

Shipping Address

Peter Boyle
23 2nd St NE
Watertown, SD, 57201 U.S.A.
605-881-5234
pboyle@watertownsd.us
Free Delivery

Customer Details

Watertown IT Dept.
Peter Boyle
605-881-5234
pboyle@watertownsd.us

Sales Associate

Bryan Waege
605-882-1555
varstreet@connectingpoint.biz

Item#	Mfr.Part	Description	Price	Qty	Amount
1	991-000478	Logitech Rally Bar Huddle + TAP IP Video Conference Equipment - For Huddle Space - 1280 x 800 Video (Live) - WXGA - 1 x Network (RJ-45) - 1 x HDMI In - 1 x HDMI Out - USB - Gigabit Ethernet - Wireless LAN - Internal Speaker(s) - Internal Microphone(s) - TAA Compliance	$2,395.56	3	**$7,186.68**

No. of item(s): 1

Sub Total:	**$7,186.68**
Freight:	**$0.00**
Order Total:	**$7,186.68**

Payment Details

Payment Method: Company PO

Shipping and Delivery Details

Shipping Method: Free Delivery

Terms and Conditions

Project Budget-Cost to Finish

Date: March 22, 2024

Project Name: Renovation and Addition for New City Hall
Project Address: Watertown, SD
Project Budget: Post Bid Estimate

DESCRIPTION		LEFT TO COMPLETE WF RENOVATION FOR NEW CITY HALL	REMARKS
CONSTRUCTION			
Base Bid (site work, renovation & addition)	$	3,944,370	Huff Construction
Alternate 1 - Enclose drive through structure	$	266,600	Huff Construction
Alternate 2 - Remove existing vault door	$	3,500	Huff Construction
Asbestos Abatement	$	31,850	Prairie Environmental
Owner Construction Contingency (2.5%)	$	55,361.75	Plus $50,000 Allowance in Bid
Total Proposed Construction Budget	**$**	**4,301,682**	
REMAINING COSTS BY CITY (ESTIMATED)			
A/V and Technology	$	400,000	Networking (cable, conduit, network racks, fiber, battery back-ups), Security/Door access, AV for Council and Basement Conference room, TVs/Digital Signage for conference rooms/offices
Furniture/Furnishings/Equipment	$	640,000	30 FTE, 3 meeting rooms, training room, council chambers: desks, chairs, tables, printers, file cabinets, cubicle walls, high density storage, safe
Interior Signage	$	20,000	Estimated
Construction Testing and Inspection	$	8,000	Budget-Geotek
	$	-	
Subtotal:	**$**	**1,068,000**	
Totals	**$**	**5,369,682**	