

**THIS FORM MUST BE INCLUDED WITH RFP PACKAGE; PLEASE CHECK OFF EACH ITEM INCLUDED WITH RFP PACKAGE AND SIGN BELOW TO COMPLETE SUBMITTAL / COMPLETION OF EACH REQUIRED ITEM.**

**RFP 2023-012**

**“Hybrid Audio/Video System for Juvenile Detention Center”**

- References Form
  
- Respondent’s Price Proposal
  
- Conflict of Interest Form (CIQ)
  
- Certification regarding Debarment (Form H2048)
  
- Certification regarding Federal lobbying (Form 2049)
  
- Code of Ethics Affidavit
  
- House Bill 89 Form
  
- Senate Bill 252 Form
  
- Proof of No Delinquent Tax Owed to Webb County

\_\_\_\_\_  
**Signature of Person Completing this Package**

\_\_\_\_\_  
**Date**



# HybridAudio/Video System for Juvenile Detention Center

## RFP 2023-012

Please find attached our quotations in response to the above RFP.

Given the supply chain problems that continue to dog our industry at the moment we cannot offer our normal delivery times. Although the situation seems to be improving in some sectors until orders are placed uncertainty remains; even firm delivery dates are still not being honored.

### Company Details

DUNS : 051041670

CAGE : 7P5D3

SIZE : Small Business

Address: 1983 Oxbow CT, Las Cruces, NM 88012

Phone: 575 201 3241

### Base System

Item	Qty	Description	Price EA	Total
0001	1 LOT	Supply and install systems described in attached technical proposal	\$44,940.90	\$44,940.90
<b>TOTAL</b>				<b>\$44,940.90</b>



# HybridAudio/Video System for Juvenile Detention Center

## RFP 2023-012

We are pleased to provide this proposal to provide the latest technology to refresh the AV system in the Webb County Juvenile Detention Center. Given that much of the existing equipment is very old and incompatible with modern practice we are proposing a solution replacing all the main control, audio and video distribution equipment with new with a five year warranty.

## Company credentials

Rhodes Research, based in Las Cruces NM, is a certified dealer for Crestron with staff certified to install and program these systems. Rhodes Research is proud to have been the first company to have staff fully certified by Crestron to design and deliver Simpl# Programs. Details of similar recent Government contracts are attached at the end. The company is a certified dealer for all the equipment offered.

## Approach

The proposed solution is fully netcentric with full use being made of a variety of network protocols including JP2000, and Dante/AES67. The system offered is basically identical for all rooms with software defined configuration to customize it for the specific characteristics of each. Block diagrams of the hardware installation for each room are appended. Particular features of the system offered are:

- Touch Panel with all volume controls on one screen along with real time VU meters.
- Integrated two way speech translation.
- Low power - typically 100W (excluding flat screen monitors and normal sound level)
- Open source programming
- Small footprint - only needs 3U rack space

# System Description

A block diagram for the room is appended below showing the main modules and how they are connected; it operates as a stand-alone network with its own switch.

## Video Transport

The system offered relies heavily on the Crestron NVX audio and video distribution technology. They family of devices chosen, uses JPG2000 encoding for video with resolutions up to 1080p 4:4:4 and AES67 for the audio over standard Gigabit Ethernet. It will be seen in the diagrams that Crestron DM-NVX-D10 decoders and DM-NVX-E10 encoders are used to variously collect and distribute the video traffic. Signals can be routed from any encoder to any number of decoders.

We recommend Netgear AVLine switches for this type of system as they are easy to manage and properly segregate the different types of traffic. The switch we are proposing the Netgear M4250-26G4F-PoE+ also provides POE power to all the devices.

## Monitors

Two Samsung QE85T commercial grade 85" monitors will be installed using the new Crimson RSA90 articulating mounts. Five LG 22BL450Y-B 22" monitors are also to be installed in the defined locations using the Ergotron LX desk monitor arm. All monitors are fed video from Crestron DM-NVX-D10 decoders.

## Document Camera

As far as we are aware the brand of document camera mentioned in the RFP is no longer available. Instead we are proposing to provide the Epson DC-13. This can provide a full HD image which is encoded using a Crestron DM-NVX-E10 and can be routed to any display (or VTC) like all other sources.

## Microphones

The system is designed to accommodate two classes of microphones, any combination of which are to be installed depending upon the particular requirements of a room.

- **Wired Microphones:** Up to ten phantom powered condenser microphones using an XLR connector can be accommodated<sup>1</sup> although, as specified, no room will require than eight; there is thus some room for expansion. Six Shure MX412/C gooseneck microphones will be installed.

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<sup>1</sup> The DSP offered has 12 analog inputs but two are needed to support the translator buds.

- **Wireless Microphones:** It is proposed to use the Shure MXW range of wireless microphones which use DECT transport. Four backpack (MXW1/O) with Lavalier (WL185) microphones and two handheld (MXW2) transmitters are offered. These communicate to the system using a transceiver (MXWAPT8) in the ceiling which transports the signals in a Dante stream to the DSP (described below). When not in use the microphones sit in a networked charging station (MXWNC8) which reports the charge state of the microphones to the control system. A single wireless boundary microphone (MXW6) is provided for the judge to speak directly to the court reporter without being overheard.

## Translator Buds

Translator buds are in-ear speakers/microphones connected via an application to a centralized AI interpretation system. A spoken sentence in one language is digitized and sent to the machine interpreter and after a short delay returned as a spoken sentence in the target language which then can be heard on the earbuds. The system is naturally one sentence behind so some discipline is needed to prevent confusion.

The prime market for these is a personal device for travelers and thus the focus is on inconspicuous in-ear transducers linked to a smart phone app, which in turn connects to the Internet using WiFi or the local cellular network. When this technology is deployed in the courtroom the emphasis is rather different as mobility is not required or even desirable.

- Standard earbuds are designed as personal items and sharing them is likely to be unpopular
- A smart phone, the typical target for the apps, is not designed to be integrated into other systems.

Our solution to the first point is to offer the WaverlyLabs Ambassador translation system which uses an over-the-ear form factor for hygienic sharing. The number of languages supported by this system is rather more limited than many others<sup>2</sup> but it is believed this will cover the majority of those likely to be encountered in the Webb County courts. The Ambassador system can accommodate up to four pairs of buds on a single app, although only one per courtroom is included in this offer.

The majority of these personal translation systems use an app running on IOS or Android. As part of our system we will be deploying an Android platform (Minix X35) which will host the Waverly Labs app communicating with the earbuds using Bluetooth. This platform is hardwired and powered from the the AV network, where its primary function is to drive the touch screen (see below); this network is not intended to have access to the Internet. However, the unit also has WiFi built in and it is planned to use the court's wireless system to reach the Internet and thence the language translator server.

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<sup>2</sup> 20 languages and 42 dialects: English, French, German, Italian, Portuguese, Spanish, Arabic, Greek, Russian, Hindi, Turkish, Polish, Chinese Mandarin, Japanese, Korean, Cantonese, Hebrew, Thai, Vietnamese and Dutch.

To integrate this into the system the audio ports on the platform are connected to the system DSP (see below) allowing the audio input from selected microphones and the user's response collected for replay on the room loudspeakers and the court reporter's console. The audio output could be used in a teleconference (see below) although careful management will be needed to accommodate the delays.

## Audio Signal processing

A Biamp TesiraForte DAN CI Digital signal processor (DSP) is provided to collect all microphone audio, variously ceiling arrays (using Dante), wireless devices (using DECT) or phantom powered condenser microphones. It also feeds an amplifier driving the loudspeakers collecting AES67/Dante audio from the network—a mix of the microphone inputs and any audio emanating from a selected computer; ducking can be applied if needed. The DSP uses the loudspeaker audio as a reference to apply Automatic Echo Compensation (AEC) to the microphone signals being used in a video teleconferencing session to prevent far end feedback. Note this only applies to fixed microphones, not roaming wireless units which are only intended for local speech reinforcement.

The DSP will also provide an audio output for the court reporter using a RDL DS-SH1 headphone amp with local volume control. The signals contributing to this output can be set separately from those feeding the loudspeakers including that from the judge's boundary microphone.

## Touch Panel

In a system such as this with numerous audio signals it is highly desirable to have a user interface that simultaneously shows all the audio sources, displays their signal level (VU) in real time and allows accurate adjustment of each gain. To that end we are proposing to install a 21" 16x9 touch screen mounted in a convenient position. This will allow a full mixer interface to be provided (inputs and output level to 1dB accuracy, along with mute and VU meter). In addition the other control functions such as video routing will also be available on the same panel. This monitor can also be used to preview the outgoing VTC image.

The panel we intend to use is the TSI Touch TSI21PDAVAZZZZ touch screen. This commercial grade unit uses a sealed PCAP touch interface so it can be easily wiped clean. It is driven from a VESA mounted Android processor (the same one as used for the translations buds). The UI uses web technologies programmed in SCSS and TypeScript and communicates with the processor over the network using web sockets.

## Video Teleconferencing

The RFP suggests that the court would like to have an OWL camera system to provide VTC video. These cameras provide video using USB along with UVC control. It also has a WIFI interface which can be used to download updates.

The OWL unit also has built-in microphones and speakers which interchange audio using the USB channel. If desired the OWL can be used standalone without using any of the room's resources but otherwise it has to be treated as a simple video source without audio. An Inogeni CAM230 multi camera switcher is used to switch between this USB input and a Crestron DM-NVX-D10 connected the HDMI port. The DM-NVX-D10 can collect video from any of the sources (PCs, laptops or document camera) and insert a mixed audio signal from selected microphones. The switcher can then be commanded to route either of these video signals to a USB input on the PC along with the audio signal.

The switcher has an HDMI output which mirrors the USB signal which can be used for a preview either on the Touch Panel or another monitor. There is also a second USB port which can be used for another UVC camera.

The output from the PC is encoded using a Crestron DM-NVX-E10 so the video can be routed the room monitors; the audio is routed to the DSP using a AES67 stream for playing over the speakers.

The CAM230 is managed by the control system and can be used to control the PTZ settings.

## System Control

All of the components in the system are managed from a central Linux based server. A feature of the Crestron NVX range is that as well as supporting the proprietary CIP control format they also provide an open REST-API using web sockets. This is much faster and potentially more resilient. Similarly the DSP uses an open SSH control format. The touch panel communicates with the control system using web sockets and is programmed using SCSS and TypeScript. There is thus no proprietary or licensed software required so maintenance can be carried out by any properly trained software engineer.

## Availability

Although designed to run 24/7 the system can be safely powered off when not in use to save power. It will take about five minutes to restart; as all the critical items draw power from the network switch this has to complete its boot cycle before the other units can start.

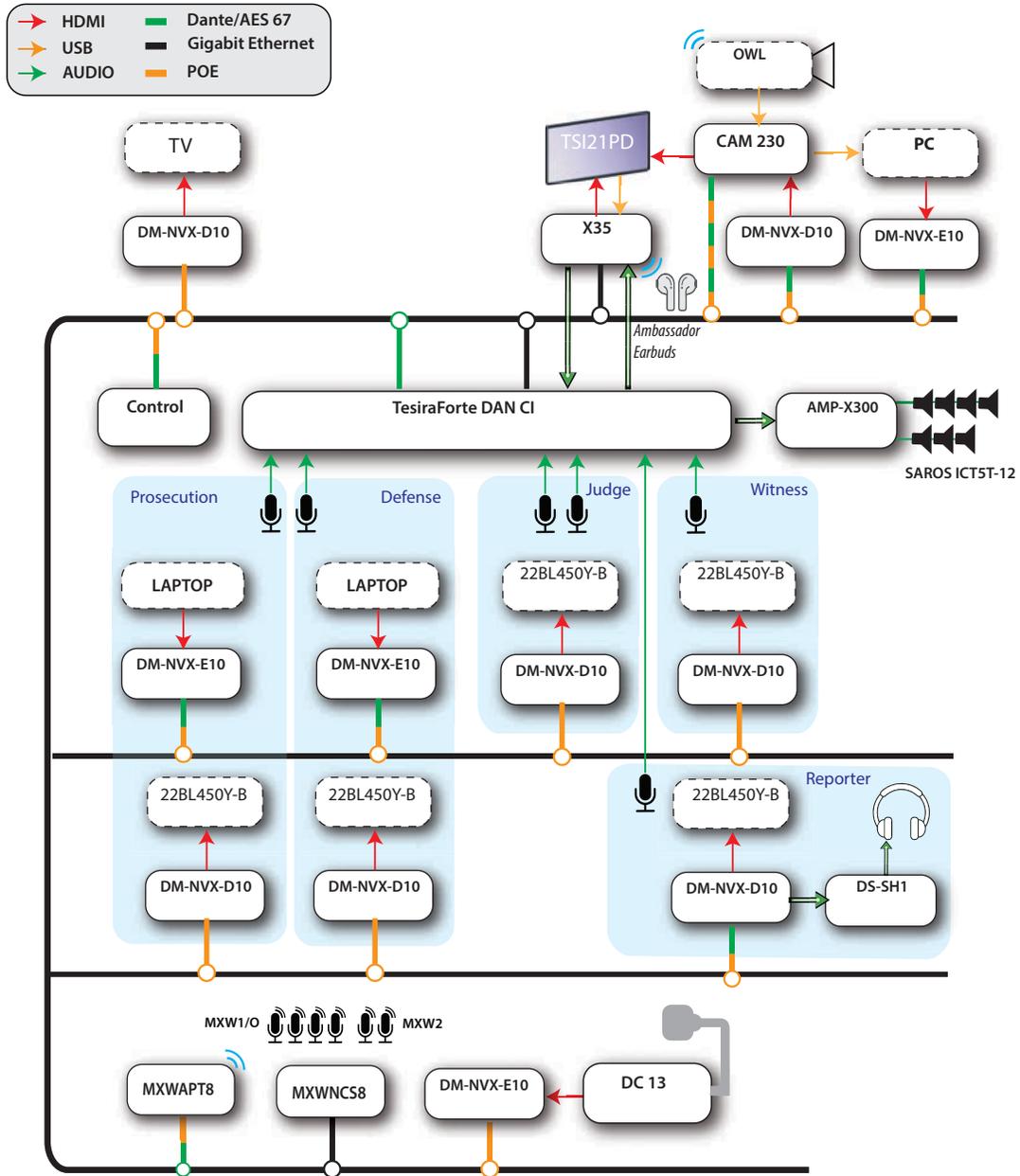
# Installation

There will no attempt to reuse any of the existing rack equipment unless specially requested so it will be stripped out and turned over for disposal. We will only need 3U of rack space (the DSP, amplifier and network switch) so perhaps something smaller than the existing rack should be considered. No cooling is required as the overall power consumption is less than 100W.

Otherwise we expect to be able to leverage much of the exiting cabling but any that is damaged will be replaced as needed.

The RFP gives no guidance on the need for power conditioning or UPS backup so nothing is offered. After a power outage the system will automatically recover and be fully operational in four to five minutes.

# Block Diagram



# Warranty and Maintenance

## Manufacturer's warranty

All the major hardware components come with a five year manufacture's warranty with the exception of the network switches which enjoys lifetime cover.

We warrant our software and installation for one year after acceptance..

## Maintenance and Service

No regular maintenance is needed and there is no need to frequently revise firmware builds if no problems are being encountered. Training is available to equip court staff with the basic knowledge of how the various parts function and simple test strategies.

# Equipment List

The list of major items to be installed is shown in the following table. Small items and cabling will be provided as needed.

Item No	Description	Part No	Manufacturer	QTY
0001	Digital Signal Processor	DAN-CI	Biamp	1
0002	Decoder	DM-NVX-D10	Crestron	8
0003	Encoder	DM-NVX-E10	Crestron	4
0004	Amplifier	AMP-X300	Crestron	1
0005	Headphone amp	DS-SH1	RDL	1
0006	Wireless Transceiver	MXWAPT8--Z10	Shure	1
0007	8port Charging Station	MXWNCS8	Shure	1
0008	Beltpack Microphone	MXW1/O--Z10	Shure	4
0009	Lavelier Microphone	WL185	Shure	4
0010	Handheld Microphone	MXW2/SM58--Z10	Shure	2
0011	Monitor	TSI21PDAVAZZZZ	TSI Touch	1
0012	Android Processor	X35	Minix	1
0013	Control Processor	RR-Proc		1
0014	Camera Switcher	CAM230	Inogeni	1
0015	Network Switch.	M4250-26G4F-PoE+	Netgear	1
0016	Translator Buds	Ambassador	Waverly Labs	1
0017	Document Camera	DC-13	Epson	1
0018	85" TV	QE85T	Samsung	1
0019	Articulating mount	RSA90	CrimsonAV	1
0020	Camera	OWL Conference	OWL	1
0021	22" Monitor	22BL450Y-B	LG	5
0022	Desk monitor arm	LX	Ergotron	5
0023	Boundary Microphone	MXW6/C--Z10	Shure	1
0024	Gooseneck Microphone	MX412/C	Shure	6
0025	Ceiling speakers	SAROS ICT5T-12	Crestron	8

# Past performance

Recent Federal/State Government contracts similar in scope based on Crestron technology in the last five years are shown below..

- Joint Base Lewis McCord Theater AV Update
  - ◆ Contract W9111S2-18-P1524
- Utah National Guard RTI AV System
  - ◆ Contract W911YP-18-F0082
- McConnell AFB Conference rooms/Auditoriums AV Upgrade
  - ◆ Contract FA4621-18-P0077
- Arnold AFB Commanders Conference Room AV Replacement
  - ◆ Contract FA9101-19-P-0061
- JB Lewis McCord Executive Conference Room Upgrade
  - ◆ Contract W911S2-19-P0840
- Arnold AFB PMO Conference Room Install
  - ◆ Contract FA9101-19-P-0068
- Arnold AFB PMO Engineering ADEC Refresh
  - ◆ Contract FA9101-19-P-0069
- Tennessee ANG Spruance Auditorium AV Upgrade
  - ◆ Contract W912L7-19-P-7008
- Fort Rucker Courtroom Refit
  - ◆ Contract W9124G-19-P0038
- Marine Corps MTOG Classrooms Video Wall
  - ◆ Contract M67399-19-0130
- JB Lewis McCord Cassidy Auditorium Video Wall
  - ◆ Contract W911S2-20-P0625
- Phoenix VA Healthcare System Quad Conference Room Refit
  - ◆ Contract 36C258-20-P0211
- White Sands Missile Range NOC video switcher
  - ◆ Contract W911S2-20-P1311
- Marine Corps Comm/Elect School Classrooms interactive video system
  - ◆ Contract M67399-20-Q0038
- Simulation Lab Audio Visual Equipment
  - ◆ Contract FM485-20-1350050

- JB Lewis McCord Cassidy Auditorium Video Wall (2)
  - ◆ Contract W911S2-20-P1514
- Arnold AFB Auditorium refit and VTC rooms
  - ◆ Contract FA910120P0046
- Tinker AFB 76 SWEG conference rooms AV system
  - ◆ Contract FA486120P0168
- Malstrom AFB WOC Refit
  - ◆ Contract FA462620P0058
- Holloman AFB comm equipment & Classroom refit
  - ◆ Contract FA480121P0059
- WADS C-Level Conference Room VTC A/V Upgrade
  - ◆ Contract W50S9E-21-P0008
- WAANG Conference Room VTC Upgrade
  - ◆ Contract W50S9E-21-P0009
- USGS Central Energy VTC Conference Room
  - ◆ Order 140G0221P0284
- Utah Air Guard DFAC AV replacement
  - ◆ Contract W50S9A-21-P0007
- Yuma Proving Ground Video Wall
  - ◆ Contract W911S2-22-P-0435
- Marshal Service Tucson, Conference room
  - ◆ Contract 15M10222PA4700395
- Luke AFB, Conference room
  - ◆ Contract FA488722P0107
- USGS Denver Learning Center Classrooms
  - ◆ Contract 140G0122P0256
- USGS National Earthquake Center
  - ◆ Contract 140G0222P0240
- WAANG Intelligence SCIF AV upgrade
  - ◆ Contract W50S9E22P5008

**#CONNECTBETTER**

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# About AVer

AVer is an award-winning provider of video and collaboration solutions that improve productivity and enrich lives. Our Pro AV product portfolio includes cutting-edge auto tracking cameras and PTZ cameras to serve any presentation, training or lecture environments. We strive to provide industry leading product quality, service and support that exceeds our customer's expectations. We are also deeply committed to our community, the environment and employ stringent green processes in all we do. Learn more at [pro.averusa.com](http://pro.averusa.com).





# Why AVer

From the moment you meet AVer we want to make sure that your experience with us is easy, enjoyable and satisfying. From our sales, operations, accounting to our warehousing and technical support teams, we strive to go above and beyond what's expected every step of the way. With our free US based, live phone email and chat technical support, free product training and unrivaled warranties, AVer serves as your partner rather than simply your vendor.

### AVerCare Warranty Protection

AVerCare delivers industry-leading 3 year advance replacement warranty with free RMA shipping and 24 hour turnaround time. We strive to provide industry leading product quality, service and support so you're always up and running!



\*2-Year Warranty Extension Available

### TAA and NDAA Compliant

AVer Pro AV cameras and accessories that are TAA and NDAA Compliant include the models MD330 Series, TR333V2, TR323NV2, TR313V2, TR311HWV2, TR530+, TR530, TR320, PTZ310UNV2, PTZ310UV2, PTZ330UNV2, PTZ330UV2, PTZ330, PTZ330W, PTZ330N, PTZ310, PTZ310W, PTZ310N, and MT300N. TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. AVer PTZ and TR cameras are designed for use as part of video systems which comply with NDAA 2019, Section 889. We can provide full Certificate of Origin information for any of our products.



### Pro Evaluation Program

Buying a professional video system is no small task. Let us make evaluating our Auto Tracking and PTZ cameras a little easier. Our no risk 30 day Pro Evaluation Program allows you to try out any of our Pro AV cameras before you buy. If you wish to purchase we will work with a partner to fulfill your order. If not, we provide return shipping at no cost.



# AUTO TRACKING CAMERAS

AVer Professional Auto Tracking Cameras support IP streaming and deliver professional video broadcasts without the need for a videographer to track your target!



# TR333V2

30X 4K AI  
Auto Tracking Camera

Windows, Mac OS

3 Auto Tracking Modes

Voice Tracking\* and Gesture Control

30X Optical Zoom

4K Ultra HD

3G-SDI/HDMI/IP/USB Output

Supports PoE+

Tracking Modes 	Optical Zoom 	Outputs 
Resolution 	Supports PoE+ 	WDR 



\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



Aver SKU: PATR333V2

# TR323NV2

21X 4K NDI AI  
Auto Tracking Camera

Windows, Mac OS

3 Auto Tracking Modes

Voice Tracking\* and Gesture Control

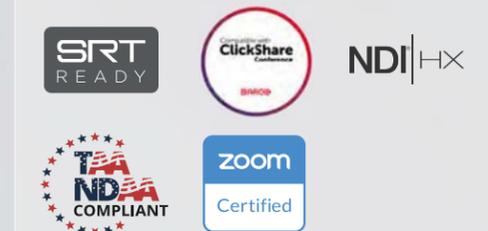
21X Optical Zoom

4K Ultra HD

3G-SDI/HDMI/IP/USB Output

Supports NDI/HX2 and SRT Protocol

Tracking Modes 	Optical Zoom 	Outputs 
Resolution 	Supports PoE+ 	WDR 



\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



Aver SKU: PATR323NV2

# TR313V2

12X 4K AI  
Auto Tracking Camera

AVer SKU: PATR313V2

## Windows, Mac OS

- 3 Auto Tracking Modes
- Vocie Tracking\* and Gesture Control
- 12X Optical Zoom
- 4K Ultra HD
- 3G-SDI/HDMI/IP/USB Output
- Supports PoE+

<b>Tracking Modes</b> 3	<b>Optical Zoom</b> 12X+ OPTICAL	<b>Outputs</b> HDMI 3G-SDI IP USB
<b>Resolution</b> Ultra HD 4K	<b>Supports PoE+</b>	<b>WDR</b>

<b>SRT</b> READY	<b>ClickShare</b> CONFERENCE	<b>NDI HX</b> Upgradable
<b>NDI HX</b> COMPLIANT	<b>zoom</b> Certified	<b>Certified for Microsoft Teams</b>

\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



AVer SKU: PVTR3HWV2

# TR311HWV2

12X HD AI  
Auto Tracking Camera

## Windows, Mac OS

- 3 Auto Tracking Modes
- Voice Tracking\* and Gesture Control
- 12X Optical Zoom
- Full HD 1080p60
- HDMI/IP/USB Output
- Supports PoE+

<b>Tracking Modes</b> 3	<b>Optical Zoom</b> 12X+ OPTICAL	<b>Outputs</b> HDMI USB IP
<b>Resolution</b> Full HD 1080p60	<b>Supports PoE+</b>	<b>WDR</b>

<b>SRT</b> READY	<b>ClickShare</b> CONFERENCE	<b>NDI HX</b> Upgradable
<b>NDI HX</b> COMPLIANT	<b>zoom</b> Certified	

\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones

# TR530+

30X Dual Lens  
Auto Tracking Camera

## Windows, Mac OS

3 Unique Tracking Modes

Voice Tracking\*

30X Optical Zoom

Secondary 120° FOV Panoramic  
Camera

3G-SDI/HDMI/IP/USB 2.0 Type B Output

Supports PoE+

Tracking Modes



Optical Zoom



Outputs



Resolution



FOV



Supports PoE+



\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



Aver SKU: PAVTR530P

# PTZ CAMERAS

AVer Professional PTZ Cameras support IP streaming and empower users to easily create excellent quality video from setup to showtime.

# PTZ330UNV2

30X 4K AI NDI PTZ Camera

## Windows, Mac OS

- Advanced Preset Tracking
- Voice Tracking\*
- 30X Optical Zoom
- 4Kp60
- HDMI/IP/NDI HX2/USB/3G-SDI Output
- Supports PoE+

 PTZ	 Optical Zoom 30X+ OPTICAL	 Outputs 5 Output
 Resolution Ultra HD 4K	 IP Streaming	 Supports PoE+

\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



Aver SKU: PT330UNV2

# PTZ330UV2

30X 4K AI PTZ Camera

## Windows, Mac OS

- Advanced Preset Tracking
- Voice Tracking\*
- 30X Optical Zoom
- 4Kp60
- HDMI/IP/USB/3G-SDI Output
- Supports PoE+

 PTZ	 Optical Zoom 30X+ OPTICAL	 Outputs 5 Output
 Resolution Ultra HD 4K	 IP Streaming	 Supports PoE+

		
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\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



Aver SKU: PTZ330UV2

# PTZ310UNV2

12X 4K AI NDI PTZ Camera

## Windows, Mac OS

- Advanced Preset Tracking
- Voice Tracking\*
- 12X Optical Zoom
- 4Kp60
- HDMI/IP/NDI HX2/USB/3G-SDI Output
- Supports PoE+

PTZ 	Optical Zoom 12X+ OPTICAL	Outputs 5 Output
Resolution Ultra HD 4K	IP Streaming 	Supports PoE+ 

		NDI HX3
		

\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



# PTZ310UV2

12X 4K AI PTZ Camera

## Windows, Mac OS

- Advanced Preset Tracking
- Voice Tracking\*
- 12X Optical Zoom
- 4Kp60
- HDMI/IP/USB/3G-SDI Output
- Supports PoE+

PTZ 	Optical Zoom 12X+ OPTICAL	Outputs 5 Output
Resolution Ultra HD 4K	IP Streaming 	Supports PoE+ 

		
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\* With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



# PTZ330W

Professional 30X PTZ Camera

## Windows, Mac OS

Preset Zone Motion Tracking

Voice Tracking\*

30X Optical Zoom

Full HD 1080p60

3G-SDI/HDMI/IP/USB Output

Supports PoE+

PTZ



Optical Zoom



Outputs



Resolution



IP Streaming



Supports PoE+



Upgradable



\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones

AVer SKU: PAPTZ330W



# PTZ310W

Professional 12X PTZ Camera

## Windows, Mac OS

Preset Zone Motion Tracking

Voice Tracking\*

12X Optical Zoom

Full HD 1080p60

3G-SDI/HDMI/IP/USB Output

Supports PoE+

PTZ



Optical Zoom



Outputs



Resolution



IP Streaming



Supports PoE+



Upgradable



\* With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones

AVer SKU: PAPTZ310W



# PTZ330N

30X NDI PTZ Live Streaming Camera

## Windows, Mac OS

Preset Zone Motion Tracking
Voice Tracking*
30X Optical Zoom
Full HD 1080p60
HDMI/SDI/NDI-IP/USB Output
Supports NDI/HX2 & SRT Protocol

 PTZ	 Optical Zoom	 Outputs
 Resolution	 IP Streaming	 Supports PoE+



\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones



AVer SKU: PAPTZ330N



AVer SKU: PAPTZ310N

# PTZ310N

12X NDI PTZ Live Streaming Camera

## Windows, Mac OS

Preset Zone Motion Tracking
Voice Tracking*
12X Optical Zoom
Full HD 1080p60
HDMI/SDI/NDI-IP/USB Output
Supports NDI/HX2 & SRT Protocol

 PTZ	 Optical Zoom	 Outputs
 Resolution	 IP Streaming	 Supports PoE+

\*With PTZ Link and select Shure, Sennheiser, Yamaha, Nureva, ClearOne and Audio-Technica microphones

# MD330U

Medical Grade PTZ Camera with LED 30X 4K Detachable Head with Embedded Audio

Windows, Mac OS

30X Optical Zoom
4K Ultra HD
Handheld LCamera Head
One-click Pan-Tilt
One-button Snapshot
LED for Illumination

Optical Zoom 30X+ OPTICAL	Handheld Head	One-Click Pan-Tilt
Resolution Ultra HD 4K	One-button Snapshot	Illumination

TD COMPLIANT	IEC	FROST & SULLIVAN BEST PRACTICES AWARD 2022
2022 BEST OF SHOW WINNER	NABSHOW PRODUCT of the YEAR 2022 WINNER	Medical Grade



Versatile medical grade cameras (EN60601-1-2) for patient monitoring and telehealth conferencing.



# MD330UI

Medical Grade PTZ Camera with Infrared 30X 4K Detachable Head with Embedded Audio

Windows, Mac OS

30X Optical Zoom
4K Ultra HD
Handheld Camera Head
One-click Pan-Tilt
IR for Night View

Optical Zoom 30X+ OPTICAL	Handheld Head	One-Click Pan-Tilt
Resolution Ultra HD 4K	IR for Night View	

TD COMPLIANT	IEC	FROST & SULLIVAN BEST PRACTICES AWARD 2022
2022 BEST OF SHOW WINNER	NABSHOW PRODUCT of the YEAR 2022 WINNER	Medical Grade



AVer SKU: PTCAMCTRL

# CL01

## PTZ Professional Camera Controller

- Pan/Tilt/Zoom Speed Control
- Operate 255 PTZ Cameras
- 3 Infinite Rotation Knobs
- Supports RS-422/RS-485/RS-232/IP Control
- Built-in VISCA, SONY VISCA, Pelco P/D, UDP Protocols
- 1 Year Warranty

<b>Speed Control</b> 	<b>Quick Access</b> 	<b>Rotation Knobs</b> 
<b>Control Interfaces</b> RS-232 RS-422 RS-485 IP	<b>VISCA Pelco-D/P</b> VISCA Pelco-D Pelco-P	<b>Warranty</b> 

# MT300N

NDI® Matrix Tracking Box

Integrated Voice Tracking

Multi-Camera Switching

2 HDMI & 2 USB Type B

Supports NDI | HX2 Protocol

Built-in PTZ Link Premium

Supports PoE+

Voice Tracking    Camera Switching    2HDMI & 2USB-B



Support NDI | HX2



Built-in

PTZ Link  
Premium

Supports PoE+



Aver SKU: PATMT300N



# PTZ Management

Easy to Use and Efficient Central Management Tool

Windows 10, Windows 11

Control up to 256 Cameras

User-Friendly Interface

Remote Camera Management

Easily Update Devices

Works with All AVer PTZ and TR Cameras



# CaptureShare

Easily Record Video, Livestream, and Capture Still Images

## Windows & MAC

Annotate, Record Video, Live Stream, and Capture Images

Manage Camera Controls via USB

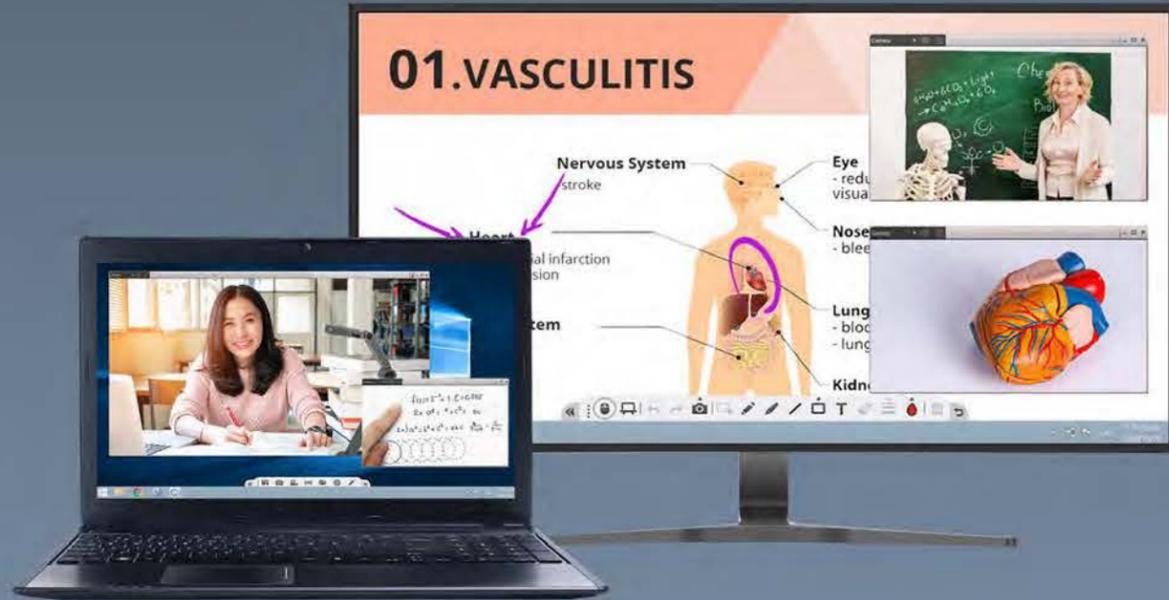
Works with AVer PTZ and Select TR Cameras

Works with Select AVer Document Cameras



**Premium Version Available!**

AVer SKU: PTLINKPRE



# PTZ Control Panel

Use iPad or iPhone to Control AVer PTZ Cameras Through the Network

## iOS® v9 or above, iPadOS® v11 or above

Control Common PTZ and Focus Functions Over Network

Enable and Disable Tracking

Instantly Find and Connect to AVer TR and PTZ Cameras

Save and Call Up to 256 Preset Points

Capture Camera Images and Save to The Album



# PTZ Link

Easily Add Voice Tracking Functionality  
Premium Version Available!

## Windows & MAC

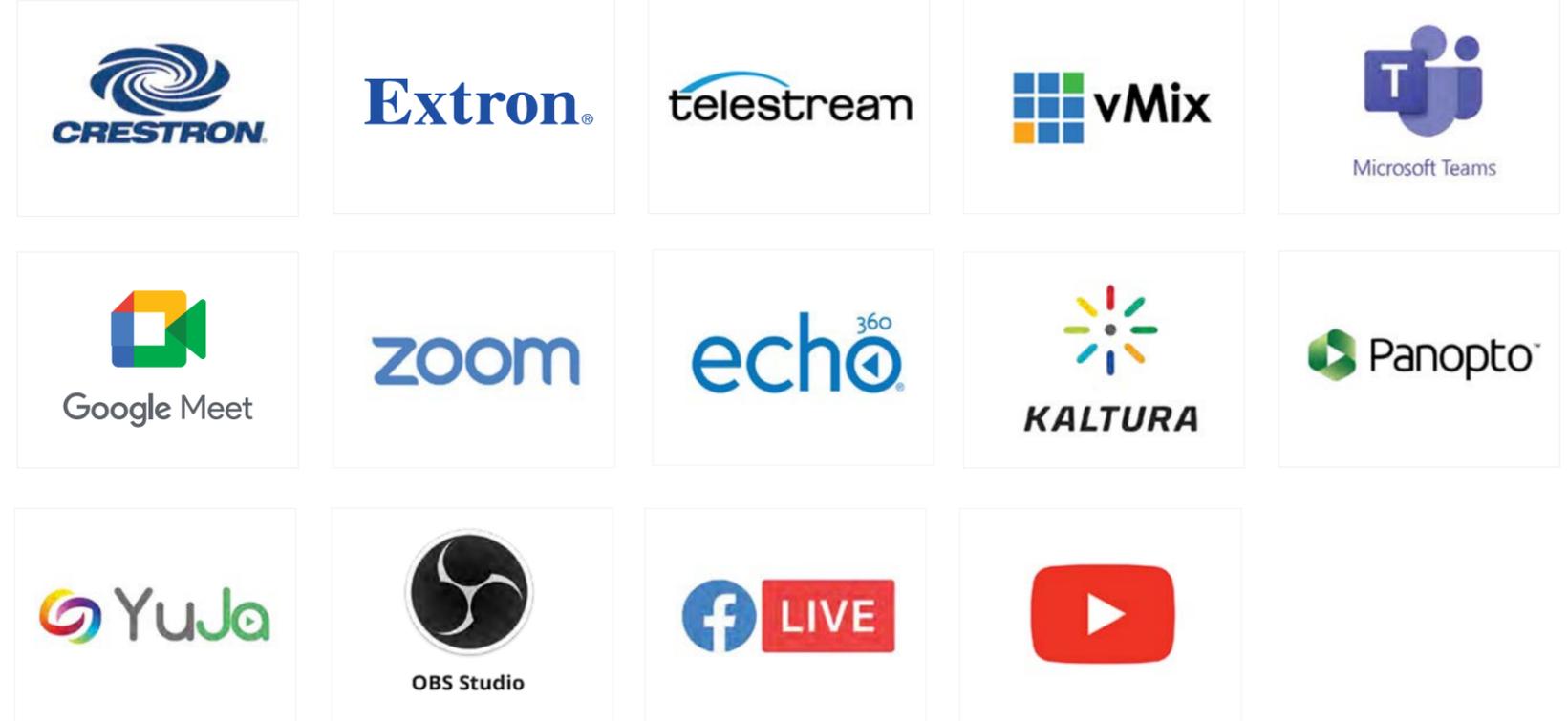
Voice Tracking to Preset
IP Based Control
Multi-Camera Switching (Premium on Windows )
USB Auto Switching
Windows and Mac laptops and desktops



Combine AVer Pro AV cameras, PTZ Link software and select audio systems from these leading brands for voice tracking!



# AVer Cameras Are Compatible with Popular Streaming Platforms



# Specifications

		TR333V2	TR323NV2	TR313V2	TR311HWV2
<b>Part Number</b>		PATR333V2	PTR323NV2	PATR313V2	PATR3HWV2
<b>PTZ Camera</b>	Effective Picture Elements	8 Megapixels	8 Megapixels	8 Megapixels	2 Megapixels
	Output Resolution	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/25	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/26	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/25	Resolution: 1080P/720P Frame Rate: 60/59.94/50/30/29.97/25
	Optical Zoom	30X	21X	12X	12X
	HFOV (Wide)~(Tele)	65.1° ~ 2.34°	65.1° ~ 2.34°	70° ~ 6°	70° ~ 6°
<b>Panoramic Camera</b>	Effective Picture Elements	—	—	—	—
	Output Resolution	—	—	—	—
	HFOV	—	—	—	—
<b>Camera</b>	Pan/Tilt Rotation	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)
	Pan/Tilt Speed	0.1° ~ 100°/Sec	0.1° ~ 100°/Sec	0.1° ~ 100°/Sec	0.1°~100° / sec
	Preset Speed	200° / Sec	200° / Sec	200° / Sec	200° / Sec
	Output Interface	3G-SDI, HDMI, IP, USB	3G-SDI, HDMI, IP, USB	3G-SDI, HDMI, IP, USB	HDMI, IP, USB
	USB Video Format	MJPEG, YUV	MJPEG, YUV	MJPEG, YUV	MJPEG, YUY2
	UVC	UVC1.1	UVC1.1	UVC1.1	UVC1.1
	UAC	UAC1.0	UAC1.0	UAC1.0	UAC1.0
	Control Interface	RS232, RS422, IP	RS232, RS422, IP	RS232, RS422, IP	RS232, RS422, Ethernet
	Network Protocol	IPv6, IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, RTMP, VISCA over IP	IPv6, IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, RTMP, VISCA over IP	IPv6, IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTP, DHCP, RTP/RTCP, RTSP, RTMP, VISCA over IP	IPv6, IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, RTMP, VISCA over IP
	Control Protocol	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)
<b>Auto Tracking Functions</b>	People Tracking (half or full body), Zone Tracking, Hybrid Tracking, Voice Tracking, Gesture Control	People Tracking (half or full body), Zone Tracking, Hybrid Tracking, Voice Tracking, Gesture Control	People Tracking (half or full body), Zone Tracking, Hybrid Tracking, Voice Tracking, Gesture Control	People Tracking (half or full body), Zone Tracking, Hybrid Tracking, Voice Tracking, Gesture Control	
<b>Package Contents</b>	IR Remote Control, 12V/5A Power Adapter, Power Cable, Din8 to D-Sub9 Cable, RS232 In/Out Cable, Quick Guide	IR Remote Control, 12V/5A Power Adapter, Power Cable, Din8 to D-Sub9 Cable, RS232 In/Out Cable, Quick Guide	IR Remote Control, 12V/5A Power Adapter, Power Cable, Din8 to D-Sub9 Cable, RS232 In/Out Cable, Quick Guide	IR Remote Control, 12V/5A Power Adapter, Din8 to D-Sub9 Cable, RS232 in/out Cable, Quick Guide	
<b>Software</b>	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	
<b>PoE+</b>	PoE+(IEEE 802.3at)	PoE+(IEEE 802.3at)	PoE+(IEEE 802.3at)	PoE+(IEEE 802.3at)	
<b>NDI Protocol</b>	Upgradable	Yes	Upgradable	Upgradable	
<b>SRT Protocol</b>	Yes	Yes	Yes	Yes	

TR530+	PTZ330W	PTZ310W	PTZ330N	PTZ310N	MD330U/MD330UI
PAVPTR530P	PAPTZ330W	PAPTZ310W	PAPTZ330N	PAPTZ310N	PATMD330U, PAMD330UI
2 Megapixels	2 Megapixels	2 Megapixels	2 Megapixels	2 Megapixels	8 Megapixels
Up to Full HD 1080P at 60fps	Up to Full HD1080P at 60fps	Up to Full HD1080P at 60fps	Up to Full HD1080P at 60fps	Up to Full HD1080P at 60fps	4K/30(IP/UVC); 1080P/60,59.94,50,30, 29.97,25; 1080i/60,50; 720P/60,59.94,50
30X	30X	12X	30X	12X	30X
67° ~ 2.3°	67° ~ 2.7°	72.1° ~ 6.6°	67° ~ 2.7°	72.1° ~ 6.6°	65.1° ~ 2.34°
2 Megapixel CMOS	—	—	—	—	—
Up to Full HD1080P at 60fps	—	—	—	—	—
110°	—	—	—	—	—
Pan: -175° (Left), +175° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: ±170° Tilt: +90° / -35°
2°~50° / sec	0.1°~100° / Sec	0.1°~100° / Sec	0.1°~100° / Sec	0.1°~100° / Sec	0.1°~100° / Sec
160° / Sec	200° / Sec	200° / Sec	200° / Sec	200° / Sec	200° / Sec
3G-SDI*1, HDMI*1, IP(RJ45), USB*1	3G-SDI, HDMI, IP, USB	HDMI, IP, USB			
—	MJPEG, YUV	MJPEG, YUV	MJPEG, YUV	MJPEG, YUV	MJPEG, YUY2
—	UVC1.1	UVC1.1	UVC1.1	UVC1.1	UVC1.1
—	UAC1.0	UAC1.0	UAC1.0	UAC1.0	UAC1.0
RS232, IP(RJ45)	RS232, RS422, IP	RS232, RS422, IP	RS232, RS422, IP	RS232, RS422, IP	RS232, IP
RTSP, RTMP, ONVIF	IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, VISCA over IP	IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, VISCA over IP	IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, VISCA over IP	IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTPS, HTTP, DHCP, RTP/RTCP, RTSP, VISCA over IP	IPv4, TCP, UDP, ARP, IMCP, IGMP, HTTP, DHCP, RTP/RTCP, RTSP, RTMP, VISCA over IP
VISCA, Pelco-D, Pelco-P	VISCA, Pelco-D, Pelco-P, CGI	VISCA, Pelco-D, Pelco-P, CGI	VISCA, Pelco-D, Pelco-P, CGI, CGI(IP)	VISCA, Pelco-D, Pelco-P, CGI, CGI(IP)	VISCA(RS-232/IP), Pelco-D & Pelco-P(RS-232), CGI(IP)
Wide Area Tracking, Stage Tracking, Segment Tracking, Voice Tracking	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	SmartFrame
IR Remote Control, 12V/5A Power Adapter, DB9 to DIN6/DIN8 Adapter, Quick Guide	IR Remote Control, 12V/5A Power Adapter, DB9 to DIN6/DIN8 Adapter, Quick Guide, HDMI Cable	IR Remote Control, 12V/5A Power Adapter, DB9 to DIN6/DIN8 Adapter, Quick Guide, HDMI Cable	IR Remote Control, 12V/5A Power Adapter, DB9 to DIN6/DIN8 Adapter, Quick Guide, HDMI Cable	IR Remote Control, 12V/5A Power Adapter, DB9 to DIN6/DIN8 Adapter, Quick Guide, HDMI Cable	Remote Control, Power Adapter, Power Cord, Screws(x2), USB Cable, Quick Guide
CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link
PoE+(IEEE 802.3at)	PoE+(IEEE 802.3at), Class 4	No			
No	Upgradable	Upgradable	Yes	Yes	No
No	Yes	Yes	Yes	Yes	No

		PTZ330UNV2	PTZ330UV2
<b>Part Number</b>		PT330UNV2	PTZ330UV2
<b>PTZ Camera</b>	Effective Picture Elements	8 Megapixels	8 Megapixels
	Output Resolution	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/25	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/25
	Optical Zoom	30X	30X
	HFOV (Wide)~(Tele)	62.3° ~ 2.5°	62.3° ~ 2.5°
<b>Panoramic Camera</b>	Effective Picture Elements	—	—
	Output Resolution	—	—
	HFOV	—	—
<b>Camera</b>	Pan/Tilt Rotation	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)
	Pan/Tilt Speed	0.1° ~ 100°/Sec	0.1° ~ 100°/Sec
	Preset Speed	200° / Sec	200° / Sec
	Output Interface	3G-SDI, HDMI, IP, USB	3G-SDI, HDMI, IP, USB
	USB Video Format	MJPEG, YUV2	MJPEG, YUY2
	UVC	UVC1.1	UVC1.1
	UAC	UAC1.0	UAC1.0
	Control Interface	RS232, RS422, PELCO-P, IP	RS232, RS422, PELCO-P, IP
	Network Protocol	IPv4, TCP, UDP, ARP, ICMP, IGMP, HTTP, HTTPS, DHCP, RTP / RTCP, RTSP, RTMP, SRT, HLS, NDI, LLDP, VISCA over IP	IPv4, TCP, UDP, ARP, ICMP, IGMP, HTTP, HTTPS, DHCP, RTP / RTCP, RTSP, RTMP, SRT, HLS, NDI, LLDP, VISCA over IP
	Control Protocol	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)
<b>Auto Tracking Functions</b>	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	
<b>Package Contents</b>	Drilling Paper, Ceiling Mount Bracket, Quick Start Guide, Cable Fixing Plate, M2x4 mm Screws, Power Adapter & Power Cord, 1/4"-20 L=6.5 mm Screws, Remote Control, M3x6 mm Screws, DIN 8 to D-Sub 9 Cable, RS-232 In/Out Y Cable, Cable Ties	Drilling Paper, Ceiling Mount Bracket, Quick Start Guide, Cable Fixing Plate, M2x4 mm Screws, Power Adapter & Power Cord, 1/4"-20 L=6.5 mm Screws, Remote Control, M3x6 mm Screws, DIN 8 to D-Sub 9 Cable, RS-232 In/Out Y Cable, Cable Ties	
<b>Software</b>	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	
<b>PoE+</b>	PoE+(IEEE 802.3at)	PoE+(IEEE 802.3at)	
<b>NDI Protocol</b>	Yes	No	
<b>SRT Protocol</b>	Yes	Yes	

		PTZ310UNV2	PTZ310UV2
<b>Part Number</b>		PT310UNV2	PTZ310UV2
<b>PTZ Camera</b>	Effective Picture Elements	8 Megapixels	8 Megapixels
	Output Resolution	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/25	Resolution: 4K*/1080P/720P Frame Rate: 60/59.94/50/30/29.97/25
	Optical Zoom	12X	12X
	HFOV (Wide)~(Tele)	72.1° ~ 6.3°	72.1° ~ 6.3°
<b>Panoramic Camera</b>	Effective Picture Elements	—	—
	Output Resolution	—	—
	HFOV	—	—
<b>Camera</b>	Pan/Tilt Rotation	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)	Pan: -170° (Left), +170° (Right); Tilt: -30° (Down), +90° (Up)
	Pan/Tilt Speed	0.1° ~ 100°/Sec	0.1° ~ 100°/Sec
	Preset Speed	200° / Sec	200° / Sec
	Output Interface	3G-SDI, HDMI, IP, USB	3G-SDI, HDMI, IP, USB
	USB Video Format	MJPEG, YUY2	MJPEG, YUY2
	UVC	UVC1.1	UVC1.1
	UAC	UAC1.0	UAC1.0
	Control Interface	RS232, RS422, PELCO-P, IP	RS232, RS422, PELCO-P, IP
	Network Protocol	IPv4, TCP, UDP, ARP, ICMP, IGMP, HTTP, HTTPS, DHCP, RTP / RTCP, RTSP, RTMP, SRT, HLS, NDI, LLDP, VISCA over IP	IPv4, TCP, UDP, ARP, ICMP, IGMP, HTTP, HTTPS, DHCP, RTP / RTCP, RTSP, RTMP, SRT, HLS, NDI, LLDP, VISCA over IP
	Control Protocol	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)	VISCA/Pelco-D(RS232/RS422/IP), CGI(IP)
<b>Auto Tracking Functions</b>	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	SmartFrame, SmartShoot(Zone Tracking), Voice Tracking	
<b>Package Contents</b>	Drilling Paper, Ceiling Mount Bracket, Quick Start Guide, Cable Fixing Plate, M2x4 mm Screws, Power Adapter & Power Cord, 1/4"-20 L=6.5 mm Screws, Remote Control, M3x6 mm Screws, DIN 8 to D-Sub 9 Cable, RS-232 In/Out Y Cable, Cable Ties	Drilling Paper, Ceiling Mount Bracket, Quick Start Guide, Cable Fixing Plate, M2x4 mm Screws, Power Adapter & Power Cord, 1/4"-20 L=6.5 mm Screws, Remote Control, M3x6 mm Screws, DIN 8 to D-Sub 9 Cable, RS-232 In/Out Y Cable, Cable Ties	
<b>Software</b>	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	CaptureShare, PTZ Management, PTZ Control Panel, PTZ Link	
<b>PoE+</b>	PoE+(IEEE 802.3at)	PoE+(IEEE 802.3at)	
<b>NDI Protocol</b>	Yes	No	
<b>SRT Protocol</b>	Yes	Yes	



To learn more, visit [pro.averusa.com](https://pro.averusa.com)



# DATA SHEET

## TESIRAFORTÉ® DAN CI

### FIXED I/O DSP



TesiraFORTÉ® DAN CI is a fixed I/O DSP with 32 bi-directional channels of Dante™ digital audio, 12 analog inputs with Acoustic Echo Cancellation (AEC), and 8 analog outputs. It also includes up to 8 channels of configurable USB audio. USB audio allows TesiraFORTÉ to interface directly with USB audio hosts, as well as to take advantage of modern conferencing solutions. TesiraFORTÉ DAN CI provides extensive audio processing, including but not limited to: signal routing and mixing, equalization, filtering, dynamics, and delay; as well as control, monitoring, and diagnostic tools; all configured through the Tesira configuration software. TesiraFORTÉ DAN CI is best-suited for small- to medium-sized rooms that require high-quality audio solutions using AEC, voice lift, and mix-minus, such as conference rooms or distance learning environments.

#### FEATURES

- 32 x 32 channels of digital audio networking via the Dante protocol
- AES67-enabled Dante endpoint
- 12 mic/line level inputs with AEC, 8 mic/line level outputs
- 2 Gigabit Ethernet ports: Dante digital audio and Tesira control
- Up to 8 channels of configurable USB audio
- RS-232 serial port
- 4-pin GPIO
- 2-line OLED display with capacitive-touch navigation
- Supports port authentication via IEEE 802.1X
- Rack mountable (1RU)
- System configuration and control via Ethernet
- Internal universal power supply
- Signal processing via intuitive software allows configuration and control for signal routing, mixing, equalization, filtering, delay and much more
- CE marked, UL listed, and RoHS compliant
- Covered by Biamp Systems' 5-year warranty

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**biamp.**

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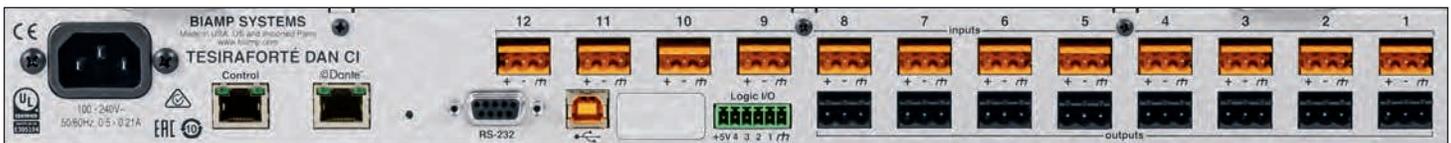
## ARCHITECTS & ENGINEERS SPECIFICATION

The fixed I/O DSP shall be designed exclusively for use with Tesira® systems. The fixed I/O DSP shall support Dante™ digital audio networking that shall allow up to 32 x 32 channels. The Dante networking connection shall be implemented on a RJ-45 connector. The fixed I/O DSP shall be interoperable in accordance with the AES67 standard. The fixed I/O DSP shall support Ethernet connection for programming and control on a RJ-45 connector. The fixed I/O DSP shall have internal DSP processing. The fixed I/O DSP shall include 4 channels of General Purpose Input and Output connection (GPIO) for sending or receiving logic signals. The programming of the GPIO ports shall be software configurable. The fixed I/O DSP shall include a RS-232 connection for control data transmission into or out of the fixed I/O DSP and such operation shall be software programmable. The fixed I/O DSP shall include a Universal Serial Bus (USB) connection on a standard USB-B type connector. The fixed I/O DSP shall be software configurable to stream up to 8 channels of digital USB Class 1 Audio transmission either into or out of the fixed I/O DSP or simultaneous input and output. The fixed I/O DSP shall support port authentication via IEEE 802.1X. The fixed I/O DSP shall provide 12 balanced input connections for receiving of microphone or line level analog audio signals on screw-down, removable connectors. The input connections shall include Acoustic Echo Cancellation (AEC) hardware and firmware, the parameters, routing and operation of which shall be software programmable. The fixed I/O DSP shall provide 8 balanced output channels for the transmission of microphone or line level analog audio signals on screw-down, removable connectors. Each individual channel shall have its own dedicated connection. The fixed I/O DSP shall provide front panel OLED identification of device power, status, alarm, and activity as well as system-wide alarm. The fixed I/O DSP shall be rack mountable (1RU) and feature software-configurable signal processing, including but not limited to: signal routing and mixing, equalization, filtering, dynamics, and delay, as well as control, monitoring, and diagnostic tools. The fixed I/O DSP shall be CE marked, UL listed, and shall be compliant with the RoHS directive. Warranty shall be five years. The fixed I/O DSP shall be TesiraFORTÉ® DAN CI.

## TESIRAFORTÉ DAN CI SPECIFICATIONS

<b>Frequency Response:</b> 20Hz to 20kHz, +4dBu output: +0.25 dB/-0.5 dB <b>THD+N (22Hz to 22kHz):</b> 0dB gain, +4dBu input: < 0.006% 54dB gain, -50dBu input: < 0.040% <b>EIN (no weighting, 22Hz to 22kHz):</b> < -125dBu <b>Dynamic Range (in presence of signal)</b> 22Hz to 22kHz, 0dB gain: > 108dB <b>Input Impedance (balanced):</b> 8kΩ <b>Output Impedance (balanced):</b> 207Ω <b>Maximum Input:</b> +24dBu <b>Maximum Output (selectable):</b> +24dBu, +18dBu, +12dBu, +6dBu, 0dBu, -31dBu <b>Input Gain Range (6dB steps):</b> 0-66dB <b>Overall Dimensions:</b> Height: 1.75 inches (44 mm) Width: 19.0 inches (483 mm) Depth: 10.5 inches (267 mm) Weight: 8 lbs (3.63 kg) <b>Phantom Power:</b> +48VDC (7mA/input)	<b>Crosstalk, channel to channel, 1 kHz:</b> 0dB gain, +4dBu input: < -85dB 54dB gain, -50dBu input: < -75dB <b>Sampling Rate:</b> 48kHz <b>A/D - D/A Converters:</b> 24-bit <b>Power Consumption:</b> 100-240VAC 50/60Hz: < 35W <b>USB:</b> Bit Depth: 16- or 24-bit Number of Channels: up to 8 Sample Rate: 48kHz <b>Environment:</b> Ambient Operating Temperature Range: 32-104° F (0-40° C) Humidity: 0-98%, non-condensing Altitude: 0-6,600 feet (0-2000 Meters) MSL <b>Compliance:</b> FCC Part 15B (USA) CE marked (Europe) UL und C-UL listed (USA and Canada) RCM (Australia) RoHS Directive (Europe)
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## TESIRAFORTÉ DAN CI BACK PANEL





**RDL**<sup>®</sup>  
Radio Design Labs

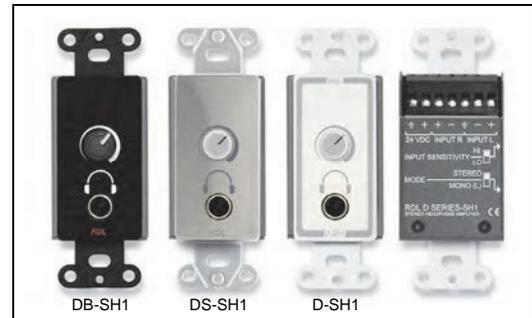
SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

## ACCESSORIES

Models **D-SH1, DB-SH1, DS-SH1**  
**Stereophonic Headphone Amplifier**  
1/4" (6.3mm) Jack

Models **D-SH1M, DB-SH1M, DS-SH1M**  
**Stereophonic Headphone Amplifier**  
1/8" (3.5mm) Jack

- Integral Long-Life VCA Stereo Level Control
- Balanced or Unbalanced Inputs
- Switch-Selectable Input Sensitivity
- Switch-Selectable Mono (Left) or Stereo Operation
- Amplifier To Drive High or Low Impedance Headsets
- Output: 1/4" (6.3 mm) standard headphone jack (-SH1)
- Output: 1/8" (3.5 mm) mini jack (-SH1M)
- Convenience of Decora® Mounting Possibilities



The D SERIES-SH1/M is a Decora-compatible stereophonic headphone amplifier from Radio Design Labs. All metal enclosures are attractively finished in white, black or brushed stainless steel to complement the decor encountered in commercial environments. Custom labeling is available at [www.rdl.net.com](http://www.rdl.net.com).

**APPLICATION:** The D SERIES-SH1/M is used in applications requiring headphones of any impedance to be driven from consumer or professional audio sources. The -SH1/M is ideally suited to applications as diverse as language translation, museums, interview studios and music stores.

The -SH1/M is a dual channel headphone amplifier with balanced/unbalanced left (**INPUT L**) and right (**INPUT R**) inputs. Each input accepts operating levels between -20 dBV and +20 dBu. Two recessed slide switches located on the side of the rear enclosure are set prior to mounting the module. One switch is provided for setting the **INPUT SENSITIVITY**. The **MODE** switch selects between stereo and mono operation. In the **MONO (L)** position, the left input is used to drive both output channels. When the module is used in a monaural system, only the left channel input must be wired. The front panel level control is a long-life potentiometer controlling matched VCAs. Audio does not pass through this control, assuring years of noise-free level adjustment. The output amplifiers deliver more than 50 mW into either high or low impedance headphones through a durable, metal 1/4" (6.3 mm) standard headphone jack (-SH1) or a 1/8" (3.5 mm) mini jack (-SH1M).

Module operation is from a 24 Vdc ground-referenced power supply. It can also operate from a 12 Vdc supply with a 6 dB reduction in headroom and a maximum output power of 10 mW.

The versatile input level range, low distortion, audio clarity and excellent crosstalk performance make this module ideally suited to a wide variety of audio applications. Use this module in conjunction with other RDL modules as part of a high quality, flexible audio/video system.

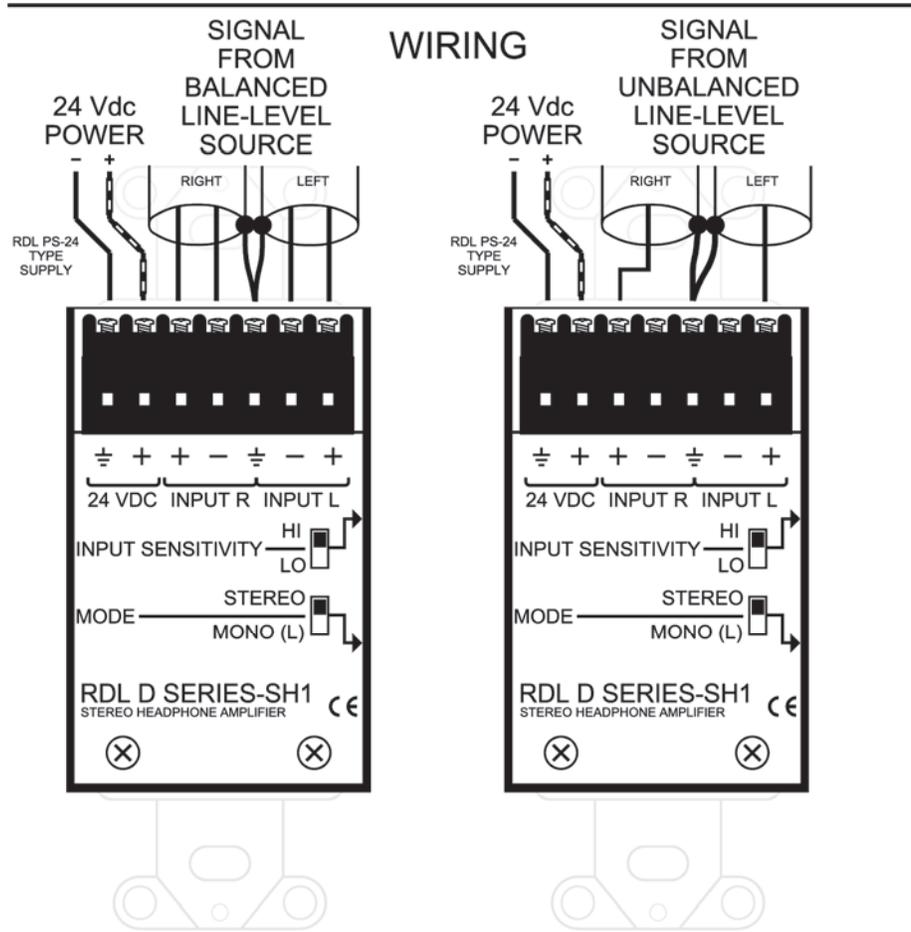
# Accessories

## Models D-SH1/M, DB-SH1/M, DS-SH1/M

### Stereophonic Headphone Amp

## Installation/Operation

Declaration of Conformity available from [rdlnet.com](http://rdlnet.com).  
Sole EMC specifications provided on product package.  
Specifications are subject to change without notice.



### TYPICAL PERFORMANCE

Inputs (2):	10 k $\Omega$ balanced or unbalanced bridging
Input Level:	+4 dBu nominal (Low input sensitivity) balanced; -15 dBV nominal (High input sensitivity) unbalanced
Maximum Input Level:	+21 dBu (Low input sensitivity) balanced; +3 dBV (High input sensitivity) unbalanced
Output Signal (normal rated):	10 mW into 100 $\Omega$
Output Signal (maximum):	50 mW into 100 $\Omega$
THD+N:	< 0.5% @ 1 kHz
Frequency Response:	30 Hz to 20 kHz ( $\pm$ 2 dB)
Noise:	< -70 dB below normal operating level
Gain:	User-adjustable on front panel; 18.5 dB (maximum, High input sensitivity); Unity (maximum, Low input sensitivity)
CMRR:	> 60 dB (50 to 120 Hz)
Crosstalk:	Below noise floor (20 Hz to 20 kHz)
Ambient Operating Environment:	0° C to 55° C
Power Requirement:	24 Vdc @ 50 mA, Ground referenced

Radio Design Labs Technical Support Centers

U.S.A. (800) 933-1780, (928) 778-3554; Fax: (928) 778-3506

Europe [NH Amsterdam] (+31) 20-6238 983; Fax: (+31) 20-6225-287

# CAM230

3 VIDEO SOURCES / USB & HDMI SWITCHER

INOGENI

NEW

FAST & SEAMLESS  
VIDEO SWITCHER



Presenter  
HDMI camera 1



Audience interaction  
AI USB camera 2



Whiteboard  
AI USB camera 3



## ACHIEVE MEETING EQUITY & STELLAR EXPERIENCES EVERY TIME

Introducing INOGENI's CAM230: The most cost-effective, versatile, and easy-to-use USB & HDMI multi-camera switcher that improves equity in virtual meetings.

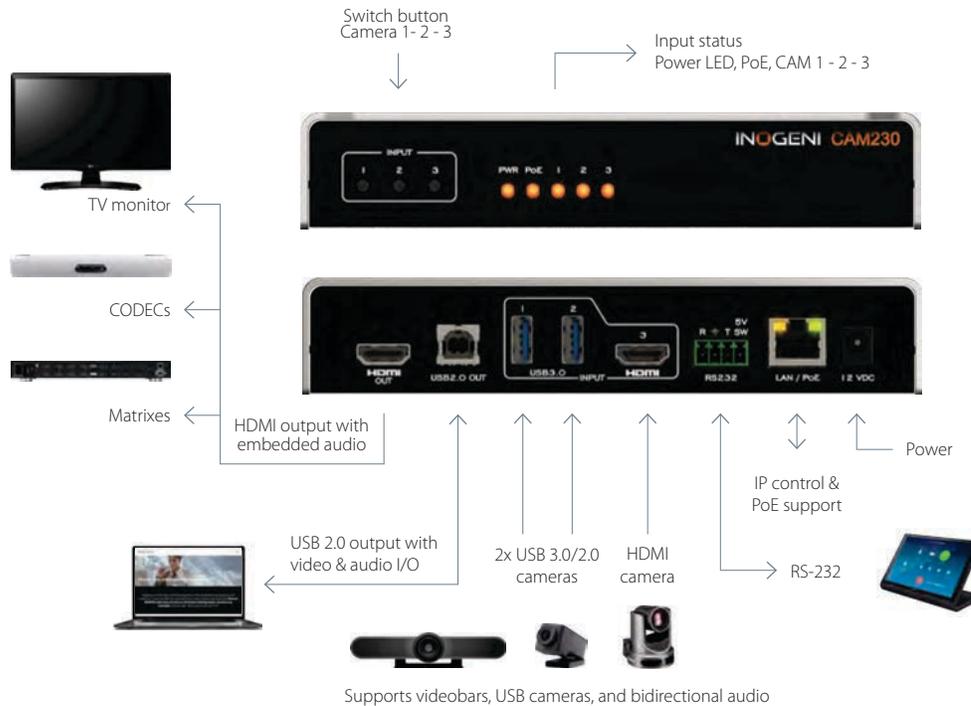
- 2 x USBs and 1x HDMI video sources for fast and seamless video camera switching in a single video flow
- Change camera and video configurations without interrupting the presentation
- Ideal for remote education, collaborative meetings, webinars, and live streaming

> [View the product web page](#)  
> [Technical specifications](#)  
More details coming soon

MSRP \$895 USD  
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**FOR DELIVERY IN JUNE 2023**  
[sales@inogeni.com](mailto:sales@inogeni.com)

## Enjoy a smooth multi-camera experience

with the ultimate solution for seamlessly switching between 2 USB and 1 HDMI cameras.



### Multi-camera switcher for

CODECs / Matrixes / Monitors / Laptops / PC rooms



### Plug and play without any drivers

Fully compatible with videoconferencing systems and all USB and HDMI cameras, including professional-caliber equipment, such as Vaddio, Huddly, HuddleCamHD, Aver, Jabra, Logitech, Marshall cameras, and web cameras.

Ensure a dynamic presentation with effortless camera switching

### The most cost-effective, versatile, and ease-to-use camera switcher

#### INPUT (3 video sources):

- 2 x USBs (3.0/2.0 or MJPEG)
- 1 x HDMI (1080p60)

#### OUTPUT switch into a single interface:

- HDMI 2.0 output with audio for CODECs, matrixes and monitors
- USB 2.0 MJPEG – 1080p30 for laptops, PC rooms or CODECs

#### SWITCHING CONTROL:

- RS-232 and IP control
- Easy push button

#### SUPPORT:

- Bidirectional audio for videobars, such as Cisco, Poly, Logitech and Bose
- PoE LAN
- Multiple mounting options
- Visual LED status
- Designed and manufactured in Canada
- TAA-compliant



### 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

Model Name	Form-Factor	Switching Fabric	REAR (REVERSIBLE)*					PSU	LEDs	MANAGEMENT	Model Number
			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					
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+ 1G, 10G	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

Model Name	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			Model Number
	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	
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	25°C	S1<= 41°C S2<= 46°C	45W	8 ports PoE (no SFP+)	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

Model Name	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			Model Number
	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	
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	<2.15µs 1G	Quad-Core Cortex-A57 ARMv8 1.8Ghz 64-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	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														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	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	<2.84µs 1G <6.02µs 2.5G <0.81µs 10G																					ARM A9 1.25Ghz 32-Bit 2GB RAM
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](mailto:ProAVDesign@netgear.com) to get started!

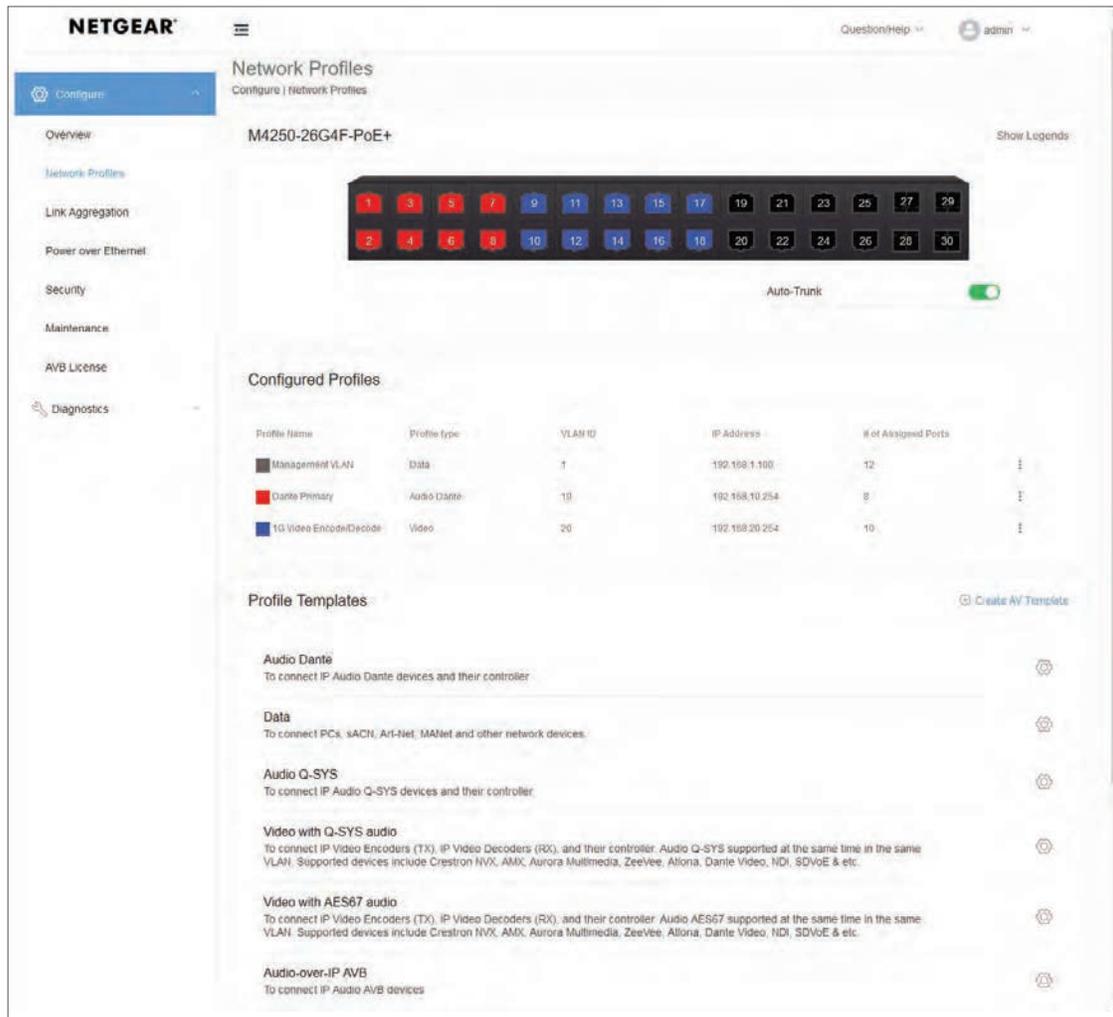


## Features highlights

### 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 environments

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 transitioning 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 PTPv2 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 igmpsnoping 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 FQTS, 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 across 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 minimum-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 inhibit 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

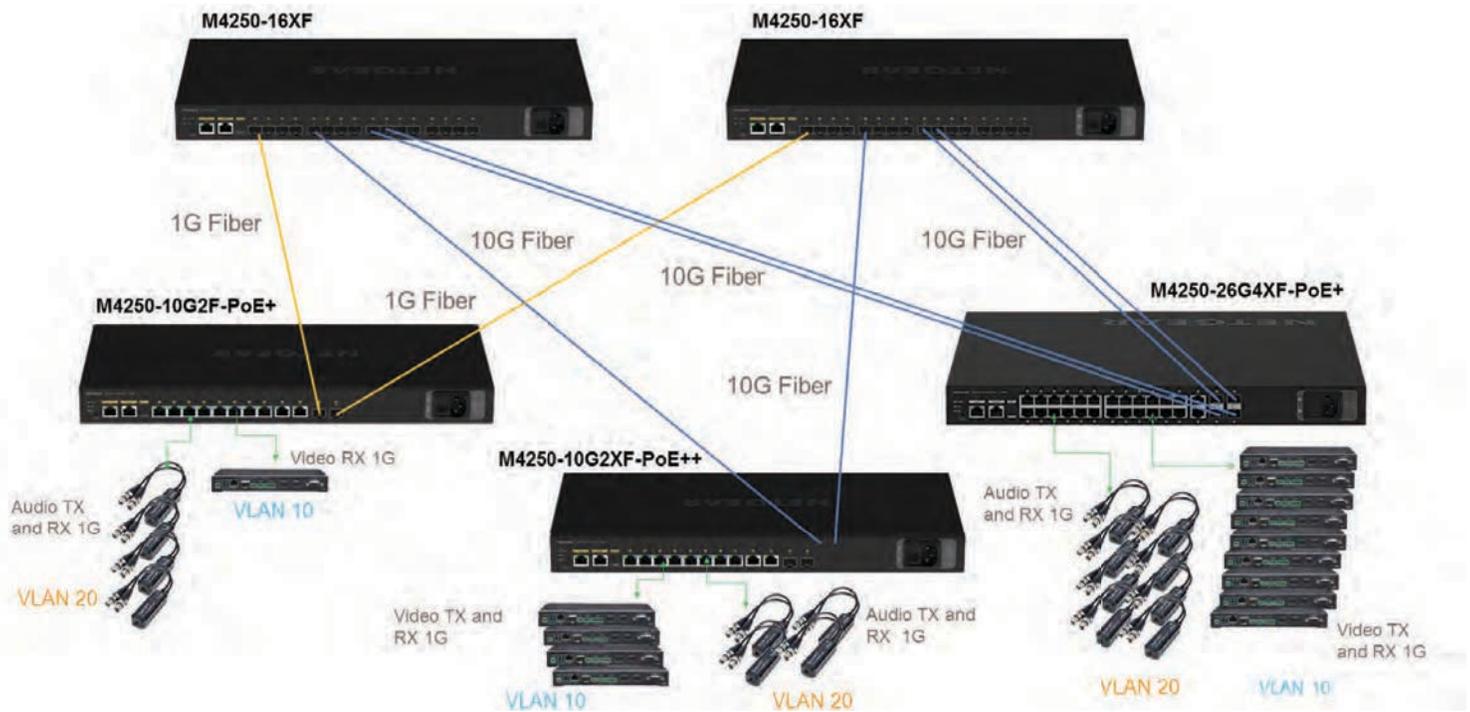
#### UDLD Support

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.

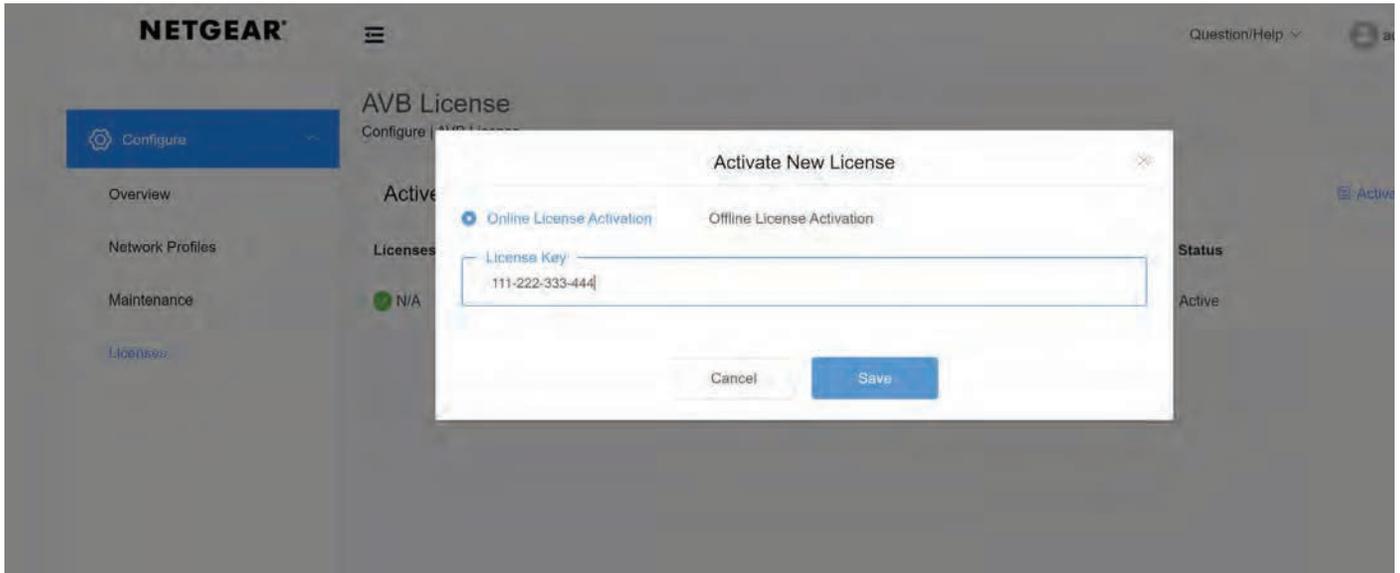
NETGEAR has enhanced the experience for AV professionals by including a new user interface designed from the ground up. Pro AV customers don't have to settle for an IT-centric interface with settings and IT-specific functionality they will never need. The new M4250 AV interface presents the common AV 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 separately)

- 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 1000/10GBASE-X (SFP+)
- 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 <ul style="list-style-type: none"> <li>Worldwide: see table below</li> <li>Warranty: 5 years</li> </ul>	Multimode Fiber (MMF)		Single mode Fiber (SMF)
	OM1 or OM2 62.5/125µm	OM3 or OM4 50/125µm	9/125µm
<p><b>10 Gigabit SFP+</b></p>  <ul style="list-style-type: none"> <li>Fits into M4250 SFP+ interfaces</li> </ul>	<p><b>AXM763</b></p> <p>10GBase-LRM long reach multimode 802.3aq - LC duplex connector up to 220m (722 ft)</p> <p><b>AXM763-10000S (1 unit)</b></p>	<p><b>AXM763</b></p> <p>10GBase-LRM long reach multimode 802.3aq - LC duplex connector up to 260m (853 ft)</p> <p><b>AXM763-10000S (1 unit)</b></p> <p><b>AXM761</b></p> <p>10GBase-SR short reach multimode LC duplex connector up to 300m (984 ft)</p> <p><b>AXM761-10000S (1 unit)</b> <b>AXM761P10-10000S (pack of 10 units)</b></p>	<p><b>AXM762</b></p> <p>10GBase-LR long reach single mode LC duplex connector up to 10km (6.2 miles)</p> <p><b>AXM762-10000S (1 unit)</b> <b>AXM762P10-10000S (pack of 10 units)</b></p> <p><b>AXM764</b></p> <p>10GBase-LR LITE single mode LC duplex connector up to 2km (1.2 mile)</p> <p><b>AXM764-10000S (1 unit)</b></p>
<p><b>Gigabit SFP</b></p>  <ul style="list-style-type: none"> <li>Fits into M4250 SFP+ and SFP interfaces</li> </ul>	<p><b>AGM731F</b></p> <p>1000Base-SX short range multimode LC duplex connector up to 275m (902 ft)</p> <p><b>AGM731F (1 unit)</b></p>	<p><b>AGM731F</b></p> <p>1000Base-SX short range multimode LC duplex connector OM3: up to 550m (1,804 ft) OM4: up to 1,000m (3,280 ft)</p> <p><b>AGM731F (1 unit)</b></p>	<p><b>AGM732F</b></p> <p>1000Base-LX long range single mode LC duplex connector up to 10km (6.2 miles)</p> <p><b>AGM732F (1 unit)</b></p>

<p><b>AGM734</b> <b>1000BASE-T RJ45 SFP (Gigabit)</b></p>	<p>Ordering information</p> <ul style="list-style-type: none"> <li>Worldwide: AGM734-10000S</li> <li>Warranty: 5 years</li> </ul>		<ul style="list-style-type: none"> <li>Fits into M4250 SFP+ and SFP interfaces</li> <li>1 port Gigabit RJ45</li> <li>Supports only 1000Mbps full-duplex mode</li> <li>Up to 100m (328 ft) with Cat5 RJ45 or better</li> <li>Conveniently adds 1G copper connectivity to M4250 fiber interfaces</li> <li>M4250-16XF (XSM4216F) supports AGM734 on its ports 1 to 12 only</li> </ul>
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<p><b>AXM765</b> <b>10GBASE-T RJ45 SFP+ (10 Gigabit)</b></p>	<p>Ordering information</p> <ul style="list-style-type: none"> <li>Worldwide: AXM765-10000S</li> <li>Warranty: 5 years</li> </ul>		<ul style="list-style-type: none"> <li>Fits into M4250 SFP+ interfaces</li> <li>1 port 10GBASE-T RJ45</li> <li>Copper connectivity up to 30 m (98 feet) distance</li> <li>CAT6a or better wiring required for 10GBASE-T up to 30 meters</li> <li>Conveniently adds 10G copper connectivity to M4250 fiber interfaces</li> </ul>
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### Direct Attach Cables for M4250 series

Ordering information	SFP+ to SFP+		
	1 meter (3.3 ft)	3 meters (9.8 ft)	5 meters (16.4 ft)
<p><b>10 Gigabit DAC</b></p>    <p>• Fits into M4250 SFP+ interfaces</p>	<p><b>AXC761</b></p> <p>10GSFP+ Cu (passive) SFP+ connectors</p> <p><b>AXC761-10000S (1 unit)</b></p>	<p><b>AXC763</b></p> <p>10GSFP+ Cu (passive) SFP+ connectors</p> <p><b>AXC763-10000S (1 unit)</b></p>	<p><b>AXC765</b></p> <p>10GSFP+ Cu (active) SFP+ connectors</p> <p><b>AXC765-10000S (1 unit)</b></p>
	7 meters (23.0 ft)	10 meters (32.8 ft)	15 meters (49.2 ft)
	<p><b>AXC767</b></p> <p>10GSFP+ Cu (active) SFP+ connectors</p> <p><b>AXC767-10000S (1 unit)</b></p>	<p><b>AXC7610</b></p> <p>10GSFP+ Cu (active) SFP+ connectors</p> <p><b>AXC7610-10000S (1 unit)</b></p>	<p><b>AXC7615</b></p> <p>10GSFP+ (duplex fiber optic) SFP+ connectors</p> <p><b>AXC7615-10000S (1 unit)</b></p>
	20 meters (65.6 ft)		
	<p><b>AXC7620</b></p> <p>10GSFP+ (duplex fiber optic) SFP+ connectors</p> <p><b>AXC7620-10000S (1 unit)</b></p>		

## 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 16x1G/10G 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

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 (802.3af)	Ultra90 PoE++ Ports (802.3bt)	
M4250-10G2F-PoE+	8	-	Ultra90 PoE++ 802.3bt is compatible with: 802.3af PoE (15.4W), 802.3af 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	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					SDM (System Data Management, or switch database) templates allow for granular system resources distribution depending on IPv4 or IPv6 applications
IPv4	894 IPv4 Unicast Routes in Default IPv4 Basic SDM Template				
IPv6	126 IPv6 Unicast Routes in Default IPv4 Basic SDM Template				
Number of static routes					
IPv4	64				
IPv6	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	PoE Power Load	Internal Sensors	Case Temperature (Top)	Fan Duty	Acoustic Noise
@ 25° C ambient (77° F)					
Maximum Conditions:					
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			
Per port Flow Control	Yes	Asymmetric and Symmetric Flow Control		
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	
<b>L2 Services - Multicast Filtering</b>		
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	
<b>L3 Services - Multicast Routing</b>		
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	
<b>L3 Services - DHCP</b>		
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	
<b>L3 Services - Routing</b>		
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	
<b>Network Monitoring and Discovery Services</b>		
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)	
<b>Security</b>		
<b>Network Storm Protection, DoS</b>		
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 TCPPOINT	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			
<b>Management</b>					
Management ACL (MACAL) Max Rules	Yes 64	Protects management CPU access through the LAN			
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			
<b>Network Traffic</b>					
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			
<b>Quality of Service (QoS) - Summary</b>					
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
<b>QoS - ACL Feature Support</b>	
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
<b>QoS - COS Feature Support</b>	
COS Support	Yes
Supports LAG interfaces	Yes
COS Mapping Config	
Configurable per-interface	Yes
IP DSCP Mapping	Yes
COS Queue Config	
Queue Params configurable per-interface	Yes
Drop Params 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
<b>PTP - PTPv2 Feature Support</b>	
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 PTPv2 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; RSVP/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
- Command completion
- Context-sensitive help
- Optional user password encryption
- Multisession Telnet server
- Auto Image Upgrade

#### Core Switching

IEEE 802.1AB – Link level discovery protocol	IEEE 802.1BA-2011, 802.1AS-2011 gPTP, 802.1Qav-2009 FQTS, 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/VLAN 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 2886bis – 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



#### 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	
<b>User Admin Management</b>		
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
<b>M4250 series - Platform Constants</b>	
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

CE: EN 55032:2012+AC:2013/CISPR 32:2012, EN 61000-3-2:2014, EN 60950-1, EN 62368-1 Class A, EN 61000-3-3:2013, EN 55024:2010

VCCI : VCCI-CISPR 32:2016, Class A

RCM: AS/NZS CISPR 32:2013 Class A

CCC: GB4943.1-2011; YD/T993-1998; GB/T9254-2008 (Class A)

FCC: 47 CFR FCC Part 15, Class A, ANSI C63.4:2014

ISED: ICES-003:2016 Issue 6, Class A, ANSI C63.4:2014

BSMI: CNS 13438 Class A

Safety	
Certifications	CB report / certificate IEC 62368-1, IEC 60950-1:2005 (ed.2)+A1:2009+A2:2013 UL listed (UL 1950)/cUL IEC 950/EN 60950 CE LVD: EN 60950-1: 2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 RCM (AS/NZS) 60950.1:2015 CCC (China Compulsory Certificate): GB4943.1-2011; YD/T993-1998; GB/T9254-2008 (Class A) 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, 260m OM4/OM3 50/125µm, 220m 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 (30m)	AXM765-10000S

### 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 Ultra90 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 16x1G/10G Fiber SFP+ 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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**SHURE**

# MICROFLEX<sup>®</sup> MICROPHONES



## THERE'S NEVER BEEN A MORE FLEXIBLE CHOICE.

Work a room in more ways than ever with Shure Microflex microphones. Combining sleek, low profile aesthetics and a complete selection of microphones and mounting options, the Microflex line offers the highest standard of quality and efficiency for installed audio applications.

### MICROFLEX GOOSENECK MICROPHONES

- Models in lengths from 12-62 cm (5-24 inches) fit a wide variety of applications from the podium to the conference table
- Interchangeable condenser cartridges with superior audio quality

### MICROFLEX BOUNDARY MICROPHONES

- Multi-element, low-profile, or wireless microphone styles available
- Extremely versatile range of placement options for easy configuration and installation

### MICROFLEX OVERHEAD MICROPHONES

- Compact and adjustable 10 cm (4") gooseneck
- Interchangeable condenser cartridges for accurate sound reproduction in any setting

### MICROFLEX LAVALIER AND EARSET MICROPHONES

- For applications requiring low-profile discreet placement
- Use in wired or wireless applications

## APPLICATIONS

Conference Rooms

Seminars

Houses of Worship

Theaters

Courtrooms

Lecterns

## PRODUCT HIGHLIGHTS

Wide selection for customized installations

Wired or wireless models available

Superior audio quality

CommShield™ Technology for improved RF resistance

Sleek, low-profile designs

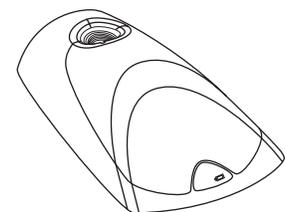
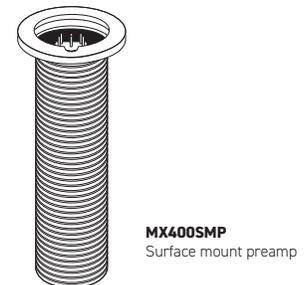
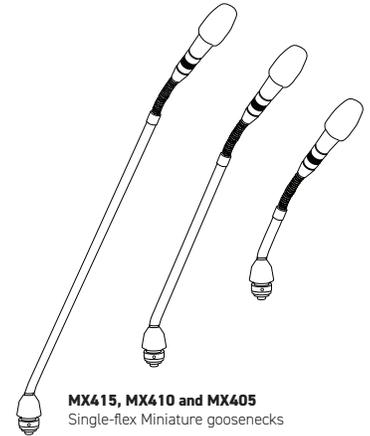
# MX405, MX410, MX415 MODULAR GOOSENECK MICROPHONES

Flexible in more ways than one, Microflex Modular Gooseneck Microphones deliver unsurpassed style and performance for conference rooms and similar applications. Offering desktop or mounted bases, wired or wireless options, and even interchangeable cartridges, it's easy to get the perfect fit for your application. Fully compatible with Microflex Wireless Systems and ULX-D Systems.

## Specifications

<b>Type</b>	Condenser (electret bias)
<b>Frequency Response</b>	50 Hz - 17 kHz
<b>Polar Pattern</b>	MX405/C, MX410/C, MX415/C: Cardioid MX405/S, MX410/S, MX415/S: Supercardioid MX405/MS Lobar Mini-Shotgun
<b>Output Impedance</b>	EIA rated at 150 Ω (170 Ω actual)
<b>Output Configuration</b>	Active balanced
<b>Sensitivity</b> at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL	Cardioid: -35 dBV/Pa (18 mV) Supercardioid: -34 dBV/Pa (21 mV) Lobar: -33 dBV/Pa (22 mV)a
<b>Maximum SPL</b> 1 kHz at 1% THD, 1 kΩ load	Cardioid: 121 dB Supercardioid: 120 dB Lobar: 121 dB SPL
<b>Equivalent Output Noise A-weighted</b>	Cardioid: 28 dB SPL Supercardioid: 27 dB SPL Lobar: 36 dB
<b>Signal-to-Noise Ratio</b> referenced at 94 dB SPL at 1 kHz	Cardioid: 66 dB Supercardioid: 67 dB Lobar: 68 dB
<b>Dynamic Range</b> 1 kΩ load at 1 kHz	93 dB
<b>Common Mode Rejection</b> 10 Hz to 100 kHz	45 dB minimum
<b>Preamplifier Output Clipping Level</b> 1% THD	-8 dBV (0.4 V)
<b>Polarity</b>	3-Pin XLR: Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector. 5-Pin XLR: Positive sound pressure on diaphragm produces positive voltage on pin 4 relative to pin 2 of output XLR connector.
<b>Weight</b>	MX405: 54 g MX410: 68 g MX415: 70 g MX400DP: 516 g MX400SMP (w/ Kit): 125 g
<b>Logic Connections</b>	LED IN: Active low (≤1.0 V), TTL compatible. Absolute maximum voltage: -0.7 V to 50 V. LOGIC OUT: Active low (≤1.0 V), sinks up to 20 mA, TTL compatible. Absolute maximum voltage: -0.7 V to 50 V (up to 50 V through 3 kΩ).
<b>Mute Switch Attenuation</b>	-50 dB minimum
<b>Cable</b>	MX400DP: 6 m attached cable with shielded audio pair terminated at a 3-pin male XLR and three unterminated conductors for logic control
<b>Environmental Conditions</b>	Operating temperature: -18 - 57 °C Storage temperature: -29 - 74 °C Relative humidity: 0 - 95%
<b>Power Requirements</b>	48 - 52 Vdc phantom, 8.0 mA

\*for detailed dimensions please reference MX405/410/415 user guide



## Available Models

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge, MS = Lobar

<b>MX405/N, MX405/C, MX405/S, MX405/MS</b>	127 mm (5 inch) gooseneck, bi-color status indicator, includes surface mount preamp
<b>MX405R/N, /C, /S, /MS</b>	127 mm (5 inch) gooseneck, light ring, includes surface mount preamp
<b>MX410/C, /S</b>	254 mm (10 inch) gooseneck, bi-color status indicator, includes surface mount preamp
<b>MX410R/N</b>	254 mm (10 inch) gooseneck, light ring, includes surface mount preamp
<b>MX415/C, /S</b>	381 mm (15 inch) gooseneck, bi-color status indicator, includes surface mount preamp
<b>MX415R/N</b>	381 mm (15 inch) gooseneck, light ring, includes surface mount preamp
<b>MX405LP/N, /C, /S, /MS</b>	127 mm (5 inch) gooseneck, bi-color status indicator, less preamp
<b>MX405RNP/N, /C, /S, /MS</b>	127 mm (5 inch) gooseneck, light ring, less preamp
<b>MX405WLP/N</b>	127 mm (5 inch) gooseneck, bi-color status indicator, less preamp, white
<b>MX405WRNP/N</b>	127 mm (5 inch) gooseneck, light ring, less preamp, white
<b>MX410LP/C, /S</b>	254 mm (10 inch) gooseneck, cardioid, bi-color status indicator, less preamp
<b>MX410RNP/N</b>	254 mm (10 inch) gooseneck, light ring, less preamp
<b>MX410LPDF/C, /S</b>	254 mm (10 inch) gooseneck, bi-color status indicator, less preamp, dualflex
<b>MX410RNPDF/C, /S</b>	254 mm (10 inch) gooseneck, light ring, less preamp, dualflex

# MX405, MX410, MX415 MODULAR GOOSENECK MICROPHONES

## Available Models (Continued)

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge, MS = Lobar

<b>MX410RLPDF/N</b>	254 mm (10 inch) gooseneck, light ring, less preamp, dualflex
<b>MX410WLP/N</b>	254 mm (10 inch) gooseneck, light ring, less preamp, Dualflex, white
<b>MX415LP/C, /S</b>	381 mm (15 inch) gooseneck, cardioid, bi-color status indicator, less preamp
<b>MX415RLP/N</b>	381 mm (15 inch) gooseneck, light ring, less preamp
<b>MX415LPDF/C, /S</b>	381 mm (15 inch) gooseneck, bi-color status indicator, less preamp, dualflex
<b>MX415RLPDF/C, /S</b>	381 mm (15 inch) gooseneck, light ring, less preamp, dualflex
<b>MX415RLPDF/N</b>	381 mm (15 inch) gooseneck, light ring, less preamp, dualflex

## Optional Accessories and Replacement Parts

<b>MX400SMP</b>	Surface mount preamp	<b>R185B</b>	Black cardioid cartridge for all Microflex models	<b>A412MWS</b>	Metal locking windscreen
<b>MX400DP</b>	Wired desktop base. Includes 6.1 m attached cable	<b>R184B</b>	Black supercardioid cartridge for all Microflex models	<b>95A2487</b>	Tapered windscreen
<b>R185W-A</b>	White cardioid cartridge for all white Microflex models	<b>R183B</b>	Black Omnidirectional cartridge for all Microflex models	<b>R189B</b>	Black lobar mini-shotgun cartridge for black Microflex models
<b>R189W-A</b>	White Lobar cartridge for all white Microflex models	<b>R184W-A</b>	White Supercardioid cartridge for all white Microflex models	<b>R183W-A</b>	White Omnidirectional cartridge for all white Microflex models

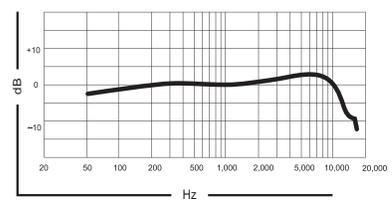
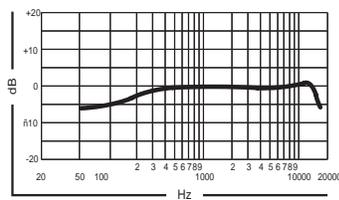
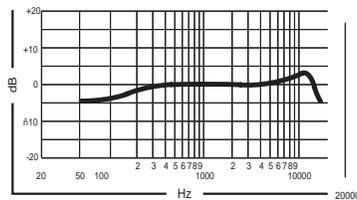
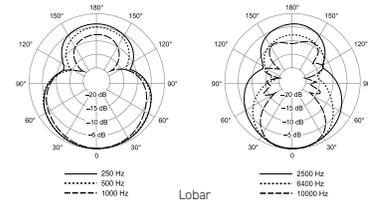
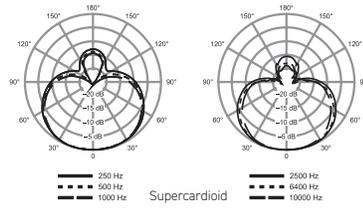
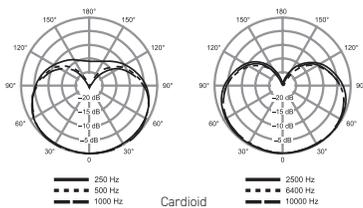
## Furnished Accessories

### Models with included Preamp

<b>MX400SMP</b>	Surface mount preamp
<b>65A405</b>	Rubber isolation rings
<b>65A2190</b>	Wing nut
<b>95A2529</b>	5-pin XLR-F
<b>65A2166</b>	Cap

### All Models

<b>RK513WS</b>	Black snap-fit foam windscreen (4 pcs.)	<b>A189WWS-A</b>	White flocked snap-fit foam minishotgun windscreen
<b>RK514</b>	White snap-fit foam windscreen (4 pcs.)	<b>A189BWS</b>	Black minishotgun windscreen
<b>A410WWS-A</b>	White flocked snap-fit foam windscreen	<b>A189WWS</b>	White mini-shotgun windscreen



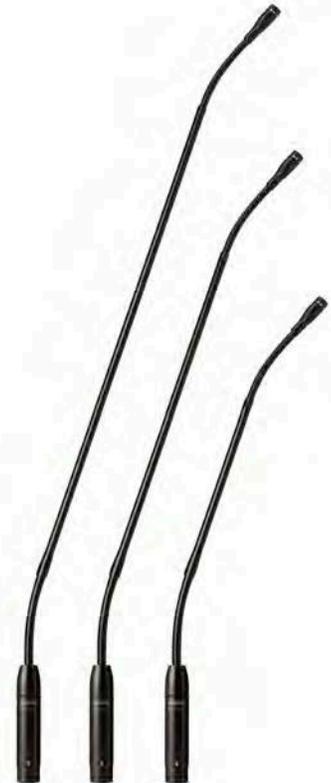
# MX412, MX418, MX424 STANDARD GOOSENECK MICROPHONES

Microflex Standard Gooseneck Microphones provide the added length and flexibility needed for speakers in environments like lecterns, pulpits, and courtrooms. Available in four models with a variety of lengths and mounting styles to choose from, Microflex Gooseneck microphones feature high sensitivity and balanced, transformerless output for maximum resistance to electromagnetic hum and RF interference, even over long cable runs.

## Specifications

<b>Type</b>	Condenser (electret bias)
<b>Frequency Response</b>	50 Hz – 17 kHz
<b>Polar Pattern</b>	MX412/C, MX418/C, MX424/C: Cardioid MX412/S, MX418/S, MX424/S: Supercardioid Omnidirectional cartridge available separately
<b>Output Impedance</b>	EIA rated at 150 Ω (170 Ω actual)
<b>Sensitivity</b> at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL	Cardioid: -35 dBV/Pa (17.8 mV) Supercardioid: -33.5 dBV/Pa (21.1 mV) Omnidirectional: -27.5 (42.2 mV)
<b>Maximum SPL</b> 1 kHz at 1% THD, 1 kΩ load	Cardioid: 124.2 dB Supercardioid: 122.7 dB Omnidirectional: 116.7 dB
<b>Equivalent Output Noise</b> A-weighted	Cardioid: 28 dB SPL Supercardioid: 26.5 dB SPL Omnidirectional: 20.5 dB SPL
<b>Signal-to-Noise Ratio</b> referenced at 94 dB SPL at 1 kHz	Cardioid: 66 dB Supercardioid: 67.5 dB Omnidirectional: 73.5 dB
<b>Dynamic Range</b> 1 kΩ load at 1 kHz	96.2 dB 100 dB at 0 gain (internal modification)
<b>Common Mode Rejection</b>	45 dB minimum (10 Hz – 100 kHz)
<b>Preamplifier Output Clipping Level</b> 1% THD	-6 dBV (0.5 V)
<b>Polarity</b>	Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector.
<b>Mute Switch Attenuation</b>	-50 dB minimum
<b>Cable</b>	MX412D and MX418D: The 3 m attached custom cable contains a shielded audio pair and three unshielded conductors for logic control. Overall diameter = 4 mm
<b>Environmental Conditions</b>	Operating temperature range: -18° – 57° C Relative humidity: 0 – 95%
<b>Power Requirements</b>	11 – 52 Vdc phantom, 8.0 mA

\*for detailed dimensions please reference MX412/418/424 user guides



**MX412, MX418 and MX424**  
Standard Gooseneck Microphones

## Available Models

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge

<b>MX412/C, MX412/S, MX412/N</b>	331 mm (13 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen
<b>MX418/C, MX418/S, MX418/N</b>	473 mm (19 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen
<b>MX412S/C, MX412S/S, MX412S/N</b>	334 mm (13 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen, mute switch, LED Indicator
<b>MX418S/C, MX418S/S, MX418S/N</b>	473 mm (19 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen, mute switch, LED indicator
<b>MX412SE/C, MX412SE/S, MX412SE/N</b>	305 mm (12 inch) gooseneck, in-line preamp, shock mount, flange mount, 3 m side-exit (or bottom-exit) cable, snap-fit foam windscreen
<b>MX418SE/C, MX418SE/S, MX418SE/N</b>	457 mm (18 inch) gooseneck, in-line preamp, shock mount, flange mount, 3 m side-exit (or bottom-exit) cable, snap-fit foam windscreen
<b>MX412D/C, MX412D/S, MX412D/N</b>	305 mm (12 inch) gooseneck, desktop base with 3 m cable, logic functions, programmable switch and LED indicator, snap-fit foam windscreen
<b>MX418D/C, MX418D/S, MX418D/N</b>	457 mm (18 inch) gooseneck, desktop base with 3 m cable, logic functions, programmable switch and LED indicator, snap-fit foam windscreen
<b>MX424/C, MX424/S, MX424/N</b>	623 mm (25 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen

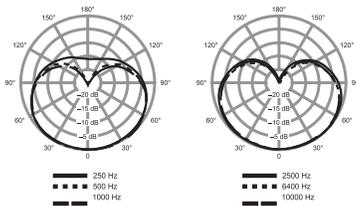
# MX412, MX418, MX424 STANDARD GOOSENECK MICROPHONES

## Furnished Accessories

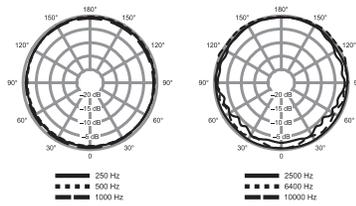
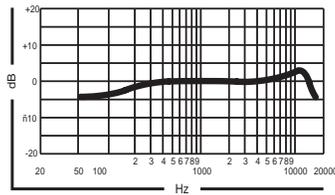
MX412, MX418, MX412S, MX418S, MX424 Models		MX412SE, MX418SE Models		MX412D, MX418D Models	
<b>65B8264</b>	Flange	<b>A12C</b>	Flange and nut	<b>RK412WS</b>	Snap-fit foam windscreen (1 furnished, 4 in replacement pack)
<b>65B8265</b>	Retainer	<b>80A476</b>	Clamp		
<b>80A439</b>	Isolation ring	<b>A400SM</b>	Shock mount		
<b>RK412WS</b>	Snap-fit foam windscreen (1 furnished, 4 in replacement pack)	<b>RK412WS</b>	Snap-fit foam windscreen (1 furnished, 4 in replacement pack)		
<b>A400SM</b>	Shock mount	<b>31B1762A</b>	Shock mount adapter		
<b>80A67</b>	Hex wrench #4				

## Optional Accessories and Replacement Parts

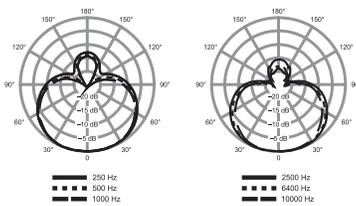
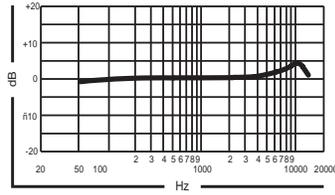
<b>A412B</b>	Desktop base	<b>C130</b>	Custom logic cable (specify length)	<b>R185B</b>	Black cardioid cartridge for all Microflex models
<b>A412MWS</b>	Metal locking windscreen	<b>RK100PK</b>	Replacement in-line preamplifier (SE models)	<b>R189B</b>	Black lobar mini-shotgun cartridge for Microflex models
<b>A99WS</b>	Foam ball windscreen	<b>R183B</b>	Black omnidirectional cartridge for all Microflex models		
<b>A57F</b>	Stand adapter	<b>R184B</b>	Black supercardioid cartridge for all Microflex models		



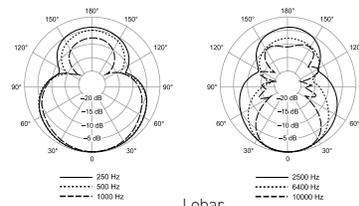
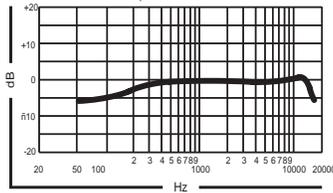
Cardioid



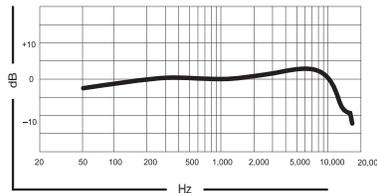
Omnidirectional



Supercardioid



Lobar



# MX396 MULTI-ELEMENT BOUNDARY MICROPHONES

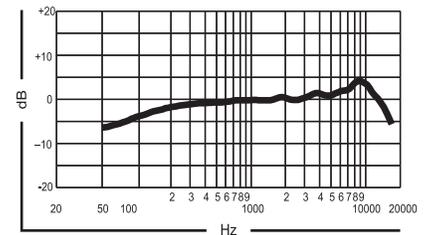
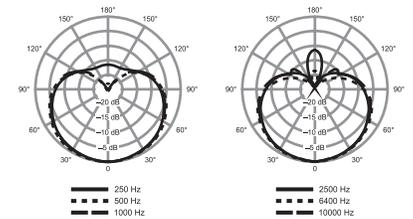
Microflex Multi-Element Boundary Microphones deliver a unique and versatile tool for conference room installations. Clean and simple in appearance, Multi-Element Boundary mics come in two or three element configurations, combining the coverage of multiple microphones into one small, compact package.

## Specifications

<b>Type</b>	Condenser (electret bias)
<b>Frequency Response</b>	50 Hz – 17 kHz
<b>Output Impedance</b>	EIA rated at 150 Ω (170 Ω actual)
<b>Output Configuration</b>	Active balanced
<b>Sensitivity</b> at 1 kHz, open circuit voltage; 1 Pa = 94 dB SPL	-35 dBV/Pa (18 mV)
<b>Maximum SPL</b> 1 kHz at 1% THD, 1 kΩ load	122 dB
<b>Equivalent Output Noise</b> A-weighted	28 dB SPL
<b>Signal-to-Noise Ratio</b> referenced at 94 dB SPL at 1 kHz	66 dB
<b>Dynamic Range</b> 1 kΩ load at 1 kHz	94 dB
<b>Common Mode Rejection</b> 10 Hz to 100 kHz	45 dB minimum
<b>Preamplifier Output Clipping Level</b> 1% THD	-6 dBV (0.5 V)
<b>Weight</b>	Net: 587 g Packaged: 816 g
<b>Logic Connections</b>	LED IN: Active low (<math>\leq 1.0\text{ V}</math>), sinks up to 20 mA, TTL compatible. Absolute maximum voltage: -0.7 V to 50 V (up to 50 V through 3 kΩ). LOGIC OUT: Active low (<math>\leq 1.0\text{ V}</math>), sinks up to 20 mA, TTL compatible. Absolute maximum voltage: -0.7 V to 50 V (up to 50 V through 3 kΩ).
<b>Mute Switch Attenuation</b>	-50 dB minimum
<b>Cable</b>	6 m attached unterminated cable with three shielded audio pairs and three shielded conductors for logic control.
<b>Environmental Conditions</b>	Operating temperature: -18 – 57 °C Storage temperature: -29 – 74 °C Relative humidity: 0 – 95%
<b>Power Requirements</b>	MX396/C-DUAL: 48 – 52 Vdc phantom, 10.0 mA MX396/C-TRI: 48 – 52 Vdc phantom, 12.0 mA



MX396 Multi-Element boundary microphone

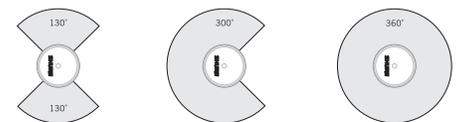


## Available Models

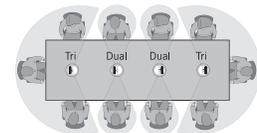
<b>MX396/C-DUAL</b>	Dual-Element 0-180 degrees, back or bottom exit cable, mute output, LED input
<b>MX396/C-TRI</b>	Tri-Element 90-0-90 mic, adjustable to 120-120-120 degrees, back or bottom exit cable, mute output, LED input

## Furnished Accessories and Replacement Parts

<b>65A2190</b>	Fastening wingnut	<b>R185B</b>	Cardioid replacement cartridge (x 1)
<b>31A2165</b>	Fastening tube	<b>65A405</b>	Rubber isolation rings



Example of Boardroom Table Mic Placement Coverage

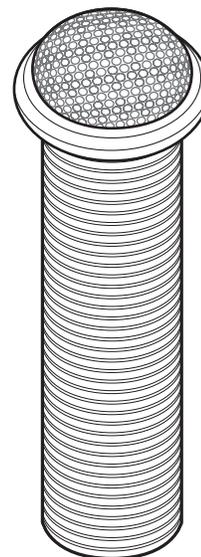


# MX395 LOW PROFILE BOUNDARY MICROPHONES

The Microflex Low Profile Boundary Microphone is an ideal table microphone when minimal presence is of high priority. Perfect for meeting rooms, these microphones deliver exceptional sound pickup while barely being noticed. Choose from a selection of colors and pickup patterns for customized table and ceiling installations.

## Specifications

<b>Type</b>	Condenser (electret bias)
<b>Frequency Response</b>	50 Hz – 17 kHz
<b>Polar Pattern</b>	MX395/O: Omnidirectional MX395/C: Cardioid MX395/BI: Bidirectional
<b>Output Impedance</b>	EIA rated at 150 Ω (170 Ω actual)
<b>Output Configuration</b>	Active balanced
<b>Sensitivity</b> at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL	Cardioid: -35 dBV/Pa (18 mV) Omnidirectional: -28 dBV/Pa (42 mV) Bidirectional: -37 dBV/Pa (14 mV)
<b>Maximum SPL</b> 1 kHz at 1% THD, 1 kΩ load	Cardioid: 121 dB Omnidirectional: 114 dB Bidirectional: 123 dB
<b>Equivalent Output Noise</b> A-weighted	Cardioid: 28 dB SPL Omnidirectional: 21 dB SPL Bidirectional: 29 dB
<b>Signal-to-Noise Ratio</b> referenced at 94 dB SPL at 1 kHz	Cardioid: 66 dB Omnidirectional: 73 dB Bidirectional: 65 dB
<b>Dynamic Range</b> 1 kΩ load at 1 kHz	Cardioid: 93 dB Omnidirectional: 93 dB Bidirectional: 94 dB
<b>Common Mode Rejection</b>	45 dB minimum 10 Hz to 100 kHz
<b>Preamplifier Output Clipping Level</b> 1% THD	-8 dBV (0.4 V)
<b>Polarity</b>	3-pin XLR: Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector. 5-pin XLR: Positive sound pressure on diaphragm produces positive voltage on pin 4 relative to pin 2 of output XLR connector.
<b>Weight</b>	Net: 136 g; Packaged: 374 g
<b>Logic Connections</b>	LED IN: Active low (≤ 1.0 V), TTL compatible. Absolute maximum voltage: -0.7 V to 50 V.
<b>Environmental Conditions</b>	Operating temperature: -18 – 57 °C Storage temperature: -29 – 74 °C Relative humidity: 0 – 95%
<b>Power Requirements</b>	MX395: 11 – 52 Vdc phantom, 2.0 mA MX395-LED: 48 – 52 Vdc phantom, 8.0 mA



**MX395**  
Low Profile  
Boundary Mic

## Available Models

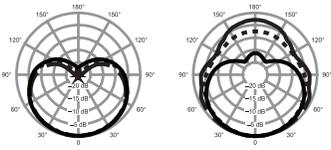
The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, O = Omnidirectional, BI = Bidirectional

<b>MX395B/C, MX395B/BI, MX395B/O</b>	Black, 3-pin XLR
<b>MX395AL/C, MX395AL/BI, MX395AL/O</b>	Aluminum, 3-pin XLR
<b>MX395W/C, MX395W/BI, MX395W/O</b>	White, 3-pin XLR
<b>MX395B/C-LED, MX395B/BI-LED, MX395B/O-LED</b>	Black, 5-pin XLR, LED, bi-color status indicator
<b>MX395AL/C-LED, MX395AL/BI-LED, MX395AL/O-LED</b>	Aluminum, 5-pin XLR, LED, bi-color status indicator
<b>MX395W/C-LED, MX395W/BI-LED, MX395W/O-LED</b>	White, 5-pin XLR, LED, bi-color status indicator

## Furnished Accessories

<b>65A405</b>	Rubber isolation rings
<b>95A1118 (LED Models only)</b>	5-pin XLR-female connector
<b>65A2190</b>	Wing nut

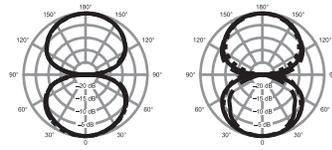
# MX395 LOW PROFILE BOUNDARY MICROPHONES



250 Hz  
 500 Hz  
 1000 Hz

2500 Hz  
 5000 Hz  
 10000 Hz

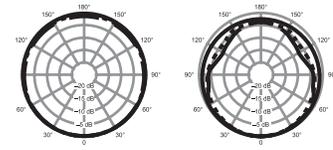
**Cardiod**



250 Hz  
 500 Hz  
 1000 Hz

2500 Hz  
 5000 Hz  
 10000 Hz

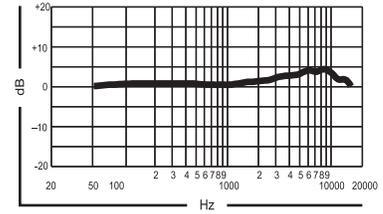
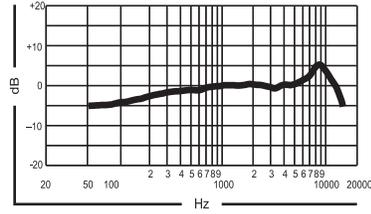
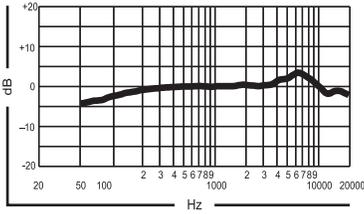
**Bidirectional**



250 Hz  
 500 Hz  
 1000 Hz

2500 Hz  
 5000 Hz  
 10000 Hz

**Omnidirectional**

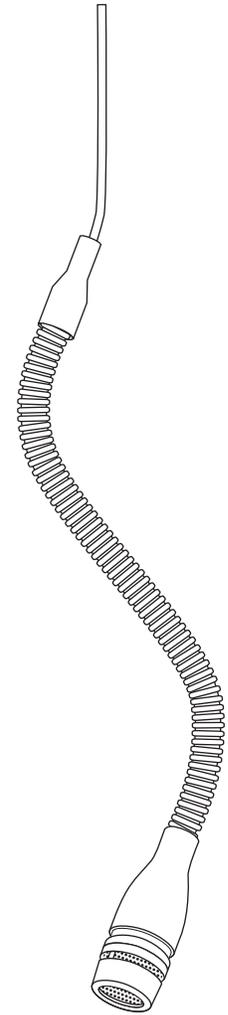


# MX202 OVERHEAD MICROPHONES

Easily hung from ceilings, Microflex Overhead Microphones capture sound from speakers, choirs, stages, and more conveniently and unobtrusively from above. Compact and flexible, overhead microphones each feature a 10 cm (4") gooseneck, multiple preamp options for easy installation into ceilings or microphone stands, and versatile condenser cartridges for accurate sound reproduction in any setting.

## Specifications

<b>Type</b>	Condenser (electret bias)
<b>Frequency Response</b>	50 Hz – 17 kHz
<b>Polar Pattern</b>	MX202/C: Cardioid MX202/O: Omnidirectional MX202/S: Supercardioid MX202/MS Lobar mini-shotgun
<b>Output Impedance</b>	150 Ω rated at EIA (180 Ω actual)
<b>Sensitivity</b> (at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL)	Cardioid: -35.0 dBV/Pa (17.8 mV) Supercardioid: -33.5 dBV/Pa (21.1 mV) Omnidirectional: -27.5 dBV/Pa (42.2 mV) Lobar: -33 dBV/Pa (22 mV)a
<b>Maximum SPL</b> (1 kHz at 1% THD, 1 kΩ load; All values +6 dB at 0 gain)	Cardioid: 124.2 dB Supercardioid: 122.7 dB Omnidirectional: 116.7 dB Lobar: 121 dB SPL
<b>Equivalent Output Noise</b> A-weighted	Cardioid: 28.0 dB SPL Supercardioid: 26.5 dB SPL Omnidirectional: 20.5 dB SPL Lobar: 36 dB
<b>Signal to Noise Ratio</b> (referenced at 94 dB SPL)	Cardioid: 66.0 dB Supercardioid: 67.5 dB Omnidirectional: 73.5 dB Lobar: 68 dB
<b>Dynamic Range</b> 1 kΩ load at 1 kHz	96.2 dB 100 dB at 0 gain (internal modification)
<b>Common Mode Rejection</b> 10 Hz to 100 kHz	45 dB minimum
<b>Preamplifier Output Clipping Level</b> 1% THD	-6 dBV (0.5 V)
<b>Polarity</b>	Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output connector.
<b>Power Requirements</b>	11 – 52 Vdc phantom, 2.0 mA
<b>Environmental Requirements</b>	Operating temperature range: -18° C – 57° C Relative humidity: 0 – 95%
<b>Cable Length</b>	30 feet (9.1 m)
<b>Termination</b>	TA4F 4-socket female (in-line preamp models); bare ends (plate-mounted preamp models)



**MX202**  
Overhead Microphone

## Available Models

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge, MS = Lobar

<b>MX202B/C, /S, /N, /MS</b>	Black mini-condenser microphone; includes cable, in-line preamplifier, and stand adapter
<b>MX202W-A/C, /S, /N, /MS</b>	Bright white mini-condenser microphone; includes cable, in-line preamplifier, and stand adapter
<b>MX202BP/C, /S, /N, /MS</b>	Black mini-condenser microphone; includes cable and plate-mounted preamplifier
<b>MX202WP-A/C, /S, /N, /MS</b>	Bright white mini-condenser microphone; includes cable and plate-mounted preamplifier

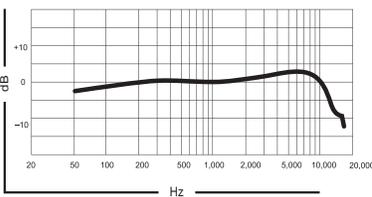
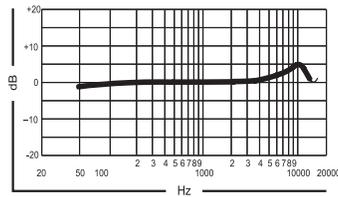
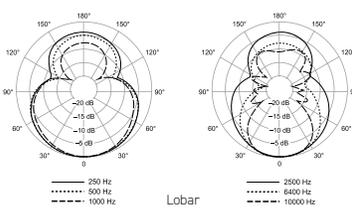
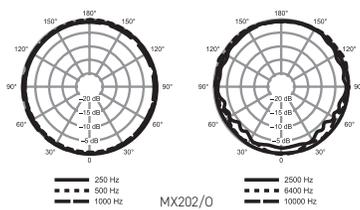
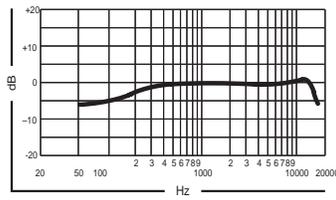
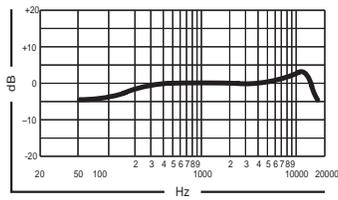
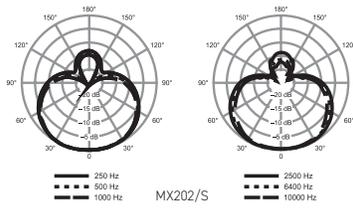
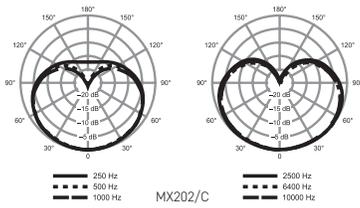
# MX202 OVERHEAD MICROPHONES

## Furnished Accessories

<b>RK183WS (Black)</b> <b>95B2064 (White)</b>	Black snap-fit foam windscreen White snap-fit foam windscreen	<b>65B1752</b>	Stand adapter (MX202B)
<b>RK202PK</b>	Preamplifier kit, plate mounted, White (MX202BP & MX202WP)	<b>RK100PK/ RK100PKW</b>	In-line preamplifier (MX202W & MX202B)
<b>80A476</b>	Clamp (MX202B & MX202WP)	<b>80B489</b>	Hang clip
<b>A189BWS</b>	Black snap fit windscreen for R189	<b>A189WWS</b>	Bright white snap fit windscreen for R189

## Optional Accessories and Replacement Parts

<b>A202BB</b>	Desk stand	<b>R184B (Black)</b> <b>R184W-A (White)</b>	Supercardioid cartridge for all Microflex models
<b>80A479</b>	Strain relief (MX202BP & MX202WP)	<b>R185B (Black)</b> <b>R185-A (White)</b>	Cardioid cartridge for all Microflex models
<b>R189B</b>	(Black) mini-shotgun cartridge for all Microflex Models	<b>R189W</b>	(White) mini-shotgun cartridge for all Microflex Models
<b>R183B (Black)</b> <b>R183W-A (White)</b>	Omnidirectional cartridge for all Microflex models		

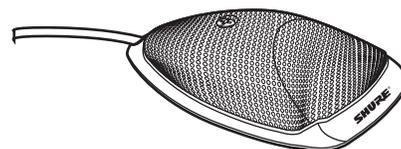


# MX391, MX392, MX393 BOUNDARY MICROPHONES

With slim design and superior audio reproduction, Microflex Boundary Microphones are the ideal conference room solution. Equipped with features like programmable, silent membrane switches, interchangeable cartridges, logic inputs and outputs, and LED indicators, Microflex Boundary microphones provide high-quality sound for a wide range of applications.

## Specifications

<b>Type</b>	Condenser (electret bias)	
<b>Frequency Response</b>	50 Hz – 17 kHz	
<b>Polar Pattern</b>	MX391/C, MX392/C, MX392BE/C, MX393/C: Cardioid MX391/S, MX392BE/S, MX392/S, MX393/S: Supercardioid MX391/O, MX392/O, MX392BE/O, MX393/O: Omnidirectional	
<b>Output Impedance</b>	EIA rated at 150 Ω (180 Ω actual)	
<b>Logic Connections</b> (MX392 Only)	LED IN: Active low ( $\leq 1.0$ V), TTL compatible. Absolute maximum voltage: $-0.7$ V to 50 V. SWITCH OUT: Active low ( $\leq 0.5$ V), sinks up to 20 mA, TTL compatible. Absolute maximum voltage: $-0.7$ V to 50 V (up to 50 V through 3 kΩ).	
<b>Environmental Conditions</b>	Operating temperature range: $-18^{\circ}$ C – $57^{\circ}$ C Relative Humidity: 0 – 95%	
<b>Power Requirements</b>	11 – 52 Vdc phantom, 2.0 mA	
	<b>MX391</b>	<b>MX392/MX393</b>
<b>Sensitivity</b> (at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL); All settings -12 dB at 0 gain (internal modification)	Cardioid -29.5 dB (33.5 mV) Supercardioid -28.3 dB (38.5 mV) Omnidirectional -21.8 dB (81.4 mV)	Cardioid: -27.5 dBV/Pa (42.2 mV) Supercardioid: -26.5 dBV/Pa (47.3 mV) Omnidirectional: -22.0 dBV/Pa (79.4 mV)
<b>Maximum SPL</b> 1 kHz at 1% THD, 1 kΩ load; All settings +6 dB at 0 gain (internal modification)	Cardioid: 118.8 dB Supercardioid: 117.5 dB Omnidirectional: 110.7 dB	Cardioid: 117.0 dB Supercardioid: 116.0 dB Omnidirectional: 111.5 dB
<b>Equivalent Output Noise</b> A-weighted	Cardioid: 22.6 dB SPL Supercardioid: 21.3 dB SPL Omnidirectional: 14.5 dB SPL	Cardioid: 23.0 dB Supercardioid: 22.0 dB Omnidirectional: 17.5 dB
<b>Signal-to-Noise Ratio</b> referenced at 94 dB SPL at 1 kHz	Cardioid: 71.4 dB Supercardioid: 72.7 dB Omnidirectional: 79.5 dB	Cardioid: 71.0 dB Supercardioid: 72.0 dB Omnidirectional: 76.5 dB
<b>Dynamic Range</b> 1 kΩ load at 1 kHz	96.2 dB	94.0 dB
<b>Common Mode Rejection</b> 10 Hz to 100 kHz	45 dB minimum, 10 Hz to 100 kHz	45 dB minimum, 10 Hz to 100 kHz
<b>Preamplifier Output Clipping Level</b> 1% THD	-6 dBV (0.5 V)	-6 dBV (0.5 V)
<b>Polarity</b>	Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of the preamplifier XLR output	Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output connector (MX393) or red wire relative to black wire (MX392).



**MX391**  
Boundary Microphone



**MX393**  
Boundary Microphone with LED and switch

## Available Models

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, O = Omnidirectional, S = Supercardioid

<b>MX391/C, MX391/S, MX391/O</b>	Black surface-mount microphone, attached 3.7 m cable terminated, 4-pin mini connector, separate preamplifier
<b>MX391W-A/C, /S, /O</b>	Bright white surface-mount microphone, attached 3.7 m cable terminated, 4-pin mini connector, separate preamplifier
<b>MX392/C, MX392/S, MX392/O</b>	Surface-mount microphone, programmable membrane on/off switch, logic input/output terminals, on/off indicator LED, screw terminal connections, attached 3.7 m unterminated cable, rear exit
<b>MX393/C, MX393/S, MX393/O</b>	Surface-mount microphone, programmable membrane on/off switch, on/off indicator LED, miniature three pin connector, and detachable 3.7 m cable.
<b>MX392BE/C, MX392BE/S, MX392BE/O</b>	Surface-mount microphone, programmable membrane on/off switch, logic input/output terminals, on/off indicator LED, screw terminal connections, attached 3.7m unterminated cable, bottom exit

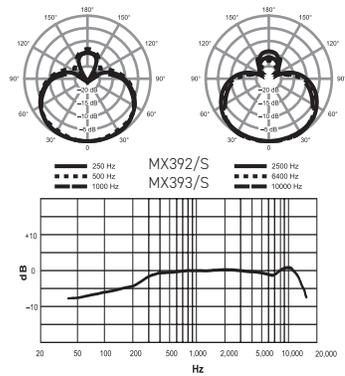
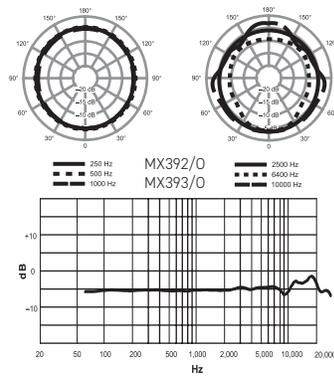
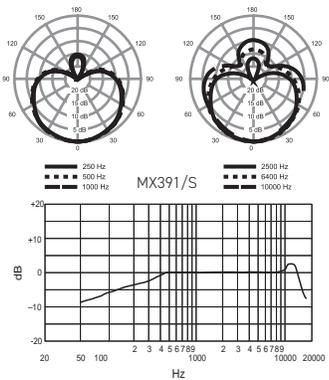
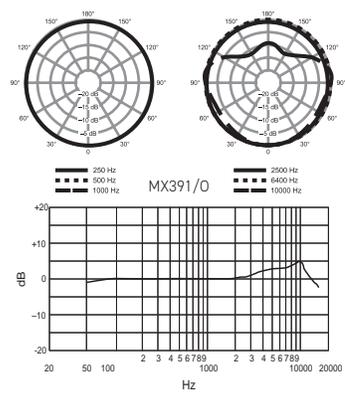
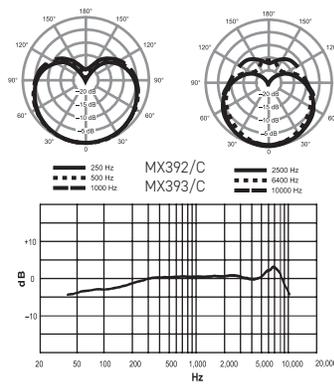
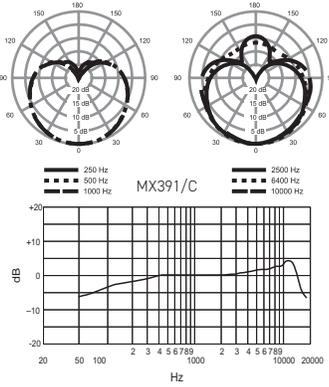
# MX391, MX392, MX393 BOUNDARY MICROPHONES

## Furnished Accessories

<b>95B2313</b>	Zipper bag	<b>80A541</b>	Switch paint mask (MX392/MX393)
<b>80C514</b>	Paint mask (MX392/MX393)	<b>36A664</b>	Paint plug (MX392/MX393)
<b>RK100PK</b>	In-line preamp (MX391/MX391W)		

## Optional Accessories and Replacement Parts

<b>R183B</b>	Omnidirectional cartridge for all Microflex models	<b>C129</b>	3,7 m cable 3-pin miniature connector (TA3F) to male XLR (MX393)
<b>R184B</b>	Supercardioid cartridge for all Microflex models	<b>C130</b>	Custom-logic cable with threaded adapter
<b>R185B</b>	Cardioid cartridge for all Microflex models	<b>15A525</b>	Custom logic cable (specify length)

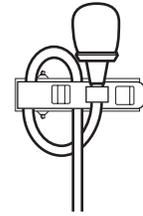


# MX150 SUBMINIATURE CONDENSER LAVALIER MICROPHONE

The Shure Microflex MX150 is a professional subminiature electret condenser lavalier microphone ideal for use in speech and other applications requiring low profile, discreet placement. Available with cardioid or omnidirectional patterns, the MX150 provides uncompromised sound quality and high reliability with minimal visibility for use in television broadcasting, corporate and educational lectures, A/V teleconferencing, and sound reinforcement.

## Features

- Available in cardioid or omnidirectional polar patterns and TQG/TA4F (for use in Shure bodypacks) or wired XLR variations
- CommShield® technology guards against interference from cellular RF devices and digital bodypack transmitters
- Matte black, sleek, low-profile, design for inconspicuous placement
- Multi-position tie clip allows for a variety of placement options and features an integrated cable management system for convenient cable dress with minimized handling noise.
- Kevlar-reinforced soft-flex cable design further reduces handling noise while providing superior flexibility for routing and placement
- User-changeable equalization caps for response shaping (omnidirectional only)
- Snap-fit, concise windscreen provides protection from plosives and wind noise with minimal visibility
- Legendary Shure quality, ruggedness, and reliability



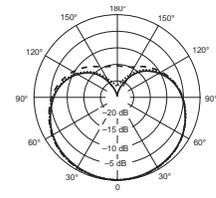
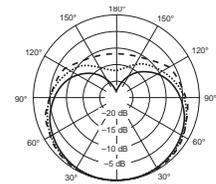
MX150 with tie clip and windscreen

## Available Models

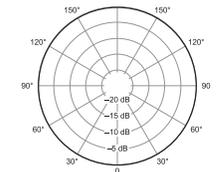
<b>MX150B/O-TQG</b>	Microflex subminiature condenser lavalier microphone, omnidirectional, TQG connector
<b>MX150B/C-TQG</b>	Microflex subminiature condenser lavalier microphone, cardioid, TQG connector
<b>MX150B/O-XLR</b>	Microflex subminiature condenser lavalier microphone, omnidirectional, XLR connector
<b>MX150B/C-XLR</b>	Microflex subminiature condenser lavalier microphone, cardioid, XLR connector

## Specifications

	MX150/C	MX150/O
<b>Transducer Type</b>	Electret condenser	Electret condenser
<b>Polar Pattern</b>	Cardioid	Omnidirectional
<b>Frequency Response</b>	20 – 20 kHz	20 – 20 kHz
<b>Output Impedance</b>	TQG: N/A, XLR: 165.5 Ω	TQG: N/A, XLR: 165.0 Ω
<b>Sensitivity</b> open circuit voltage, @ 1 kHz, typical	TQG: -51.0 dBV/Pa (3.0 mV) XLR: -39.0 dBV/Pa (11.0 mV)	TQG: -46.5 dBV/Pa (4.5 mV) XLR: -34.5 dBV/Pa (19.0 mV)
<b>Maximum SPL</b> 1 kHz at 1% THD, 2500 Ω Load	TQG: 147.5 dB SPL XLR: 134.5 dB SPL	TQG: 143.0 dB SPL XLR: 130 dB SPL
<b>Signal-to-Noise Ratio</b>	TQG: 57.5 dB XLR: 57.0 dB	TQG: 60.0 dB XLR: 59.5 dB
<b>Clipping Level</b> 1 kHz at 1% THD, 2500 Ω Load	TQG: 2.0 dBV XLR: 1.0 dBV	TQG: 2.0 dBV XLR: 1.0 dBV
<b>Common Mode Rejection</b> 20 Hz – 20 kHz	TQG: N/A XLR: >60 dB	TQG: N/A XLR: >60 dB
<b>Dynamic Range</b> @ 1 kHz, 2500 Ω Load	TQG: 111.0 dB SPL XLR: 97.5 dB SPL	TQG: 109.0 dB SPL XLR: 95.5 dB SPL
<b>Self Noise</b> equivalent SPL, A-weighted, typical	TQG: 36.5 dB XLR: 37.0 dB	TQG: 34.0 dB XLR: 34.5 dB
<b>Operating Temperature Range</b>	-18°C to 57°C	-18°C to 57°C
<b>Polarity</b>	TQG: Positive pressure on diaphragm produces positive voltage on pin 3 with respect to pin 1 XLR: Positive pressure on diaphragm produces positive voltage on pin 2 with respect to pin 3	
<b>Power Requirements</b>	TQG: 5 V DC (0.04 – 0.18 mA) XLR: 11-52 V DC phantom power (IEC-61938), < 2.2 mA	TQG: 5 V DC (0.04 – 0.18 mA) XLR: 11-52 V DC phantom power (IEC-61938), < 2.2 mA
<b>Cable Length</b>	1.52 m	1.52 m
<b>Weight</b>	TQG: 21 g XLR: 121 g	TQG: 21 g XLR: 121 g



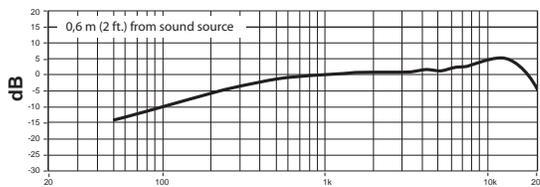
MX150/C Polar Pattern



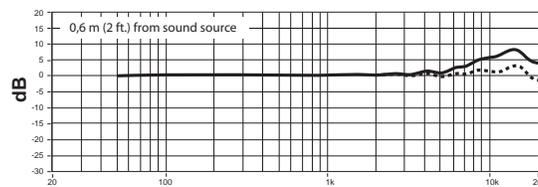
MX150/O Polar Pattern

## Accessories

<b>WA150</b>	Storage pouch for MX150
<b>WA330</b>	TQG/TA4F 4 pin connector
<b>RK100PK</b>	XLR preamp



MX150/C Frequency Response



MX150/O Frequency Response

Boost Cap  
Normal Cap



# MX153 EARSET HEADWORN MICROPHONE

The Shure Microflex MX153 is a professional subminiature earset microphone ideal for speech and other applications requiring low-profile discreet placement where improved gain before feedback over lavalier microphones is desired. Delivering exceptional speech clarity, the MX153 is ideal for corporate and educational presentations, A/V conferencing and live sound reinforcement. Available in three color options and direct TA4F connectivity to Shure bodypacks, the MX153 provides outstanding clarity in an extremely comfortable, over the ear design.

## Features

- Subminiature, omnidirectional cartridge offers superior speech clarity and enhanced plosive protection with no proximity effect
- Terminated with TQG/TA4F connector for direct connectivity to Shure wireless bodypack transmitters
- Ultra-lightweight, comfortable, flexible design is stable and easy to place over either ear
- CommShield™ technology guards against interference from cellular RF devices and digital bodypack transmitters
- Kevlar reinforced, attached soft-flex cable
- Matte black, tan, and cocoa color options available
- Includes protective storage pouch, 3 windscreens, and collar clip

## Available Models

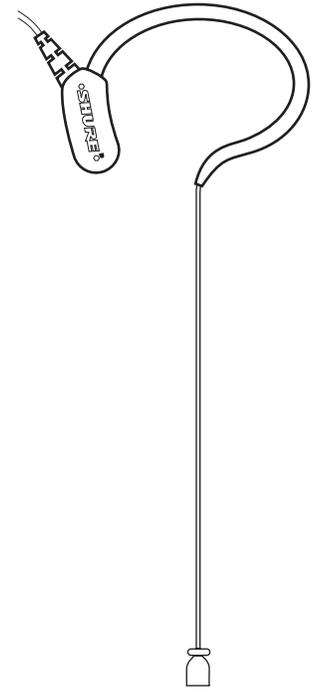
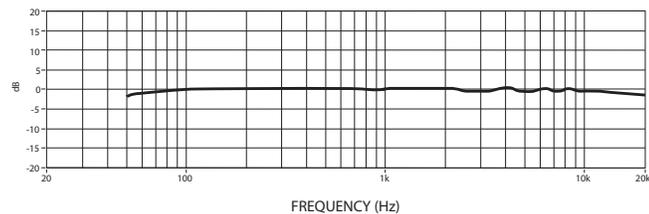
<b>MX153B/O-TQG</b>	Microflex earset headworn condenser microphone, omnidirectional, TQG connector, black
<b>MX153T/O-TQG</b>	Microflex earset headworn condenser microphone, omnidirectional, TQG connector, tan
<b>MX153C/O-TQG</b>	Microflex earset headworn condenser microphone, omnidirectional, TQG connector, cocoa

## Specifications

	<b>MX153</b>
<b>Transducer Type</b>	Electret condenser
<b>Polar Pattern</b>	Omnidirectional
<b>Frequency Response</b>	20 Hz – 20 kHz
<b>Output Impedance</b>	N/A
<b>Sensitivity</b> open circuit voltage, @ 1 kHz, typical	-41 dBV/Pa (9 mV)
<b>Maximum SPL</b> 1 kHz at 1% THD	2500 Ω load: 107 dB SPL 1000 Ω load: 107 dB SPL
<b>Signal-to-Noise Ratio</b>	60 dB
<b>Dynamic Range</b> @ 1 kHz	2500 Ω load: 73 dB 1000 Ω load: 73 dB
<b>Common Mode Rejection</b> 20 Hz – 20 kHz	N/A
<b>Self Noise</b> equivalent SPL, A-weighted, typical	34 dB
<b>Operating Temperature Range</b>	-18°C – 57°C
<b>Polarity</b>	Positive pressure on diaphragm produces negative voltage on pin 3 with respect to pin 1
<b>Power Requirements</b>	+1-5 V DC (500 µA maximum)
<b>Weight</b>	19.8 g

## Accessories

<b>WA150</b>	Storage pouch for MX150
<b>WA330</b>	TQG/TA4F 4 pin connector
<b>RK100PK</b>	XLR preamp



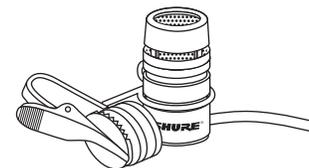
**MX153** Earset  
Headworn Microphone

# MX183, MX184, MX185 LAVALIER MICROPHONES

Attached to a tie or lapel, Microflex Lavalier Microphones offer freedom of movement to any situation involving voice reproduction. As stylish as they are convenient, Lavaliers are available in different directional patterns, come with multiple clip options, and are compatible with all Shure wireless platforms.

## Specifications

<b>Type</b>	Condenser (electret bias)
<b>Frequency Response</b>	50 Hz – 17 kHz
<b>Polar Pattern</b>	MX183: Omnidirectional MX184: Supercardioid MX185: Cardioid
<b>Output Impedance</b>	EIA rated at 150 $\Omega$ (170 $\Omega$ actual)
<b>Sensitivity</b> (at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL; all settings -12 dB at 0 gain)	MX183: -27.5 dB (42.2 mV) MX184: -33.5 dB (21.1 mV) MX185: -35.4 dB (17.0 mV)
<b>Maximum SPL</b> (1 kHz at 1% THD, 1 k $\Omega$ load; all settings +6 dB at 0 gain)	MX183: 116.7 dB MX184: 122.7 dB MX185: 124.2 dB
<b>Equivalent Output Noise</b> A-weighted	MX183: 20.5 dB MX184: 26.5 dB MX185: 28.0 dB
<b>Signal-to-Noise Ratio</b> referenced at 94 dB SPL at 1 kHz	MX183: 73.5 dB MX184: 67.5 dB MX185: 66.0 dB
<b>Dynamic Range</b> 1 k $\Omega$ load at 1 kHz	96.2 dB 100 dB at 0 gain (internal modification)
<b>Common Mode Rejection</b> 10 Hz to 100 kHz	45 dB minimum
<b>Polarity</b>	Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector.
<b>Environmental Conditions</b>	Operating temperature range: -18° - 57° C Storage temperature range: -29° - 74° C
<b>Power Requirements</b>	11 – 52 Vdc phantom, 2.0 mA
<b>Cable</b>	Shielded 1.2 m cable terminated with a 4-pin female mini connector (TA4F)



**MX183/ MX184/ MX185**  
Lavalier microphone

## Available Models

<b>MX183</b>	Omnidirectional, includes belt-clip preamp, rotatable tie clip, dual tie clip, snap-fit windscreen
<b>MX184</b>	Supercardioid, includes belt-clip preamp, rotatable tie clip, dual tie clip, snap-fit windscreen
<b>MX185</b>	Cardioid, includes belt-clip preamp, rotatable tie clip, dual tie clip, snap-fit windscreen

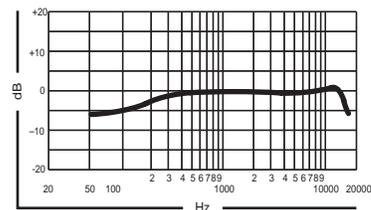
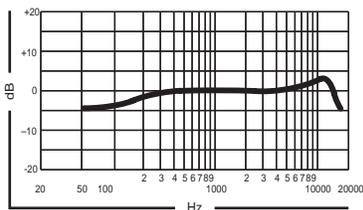
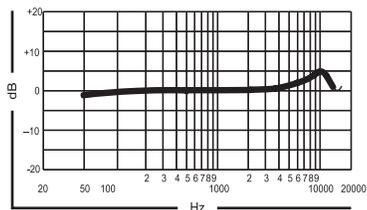
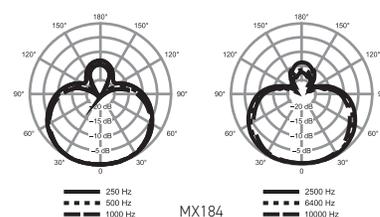
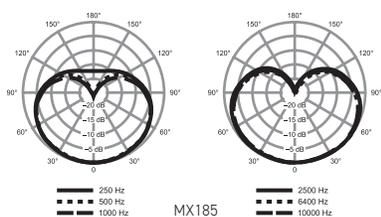
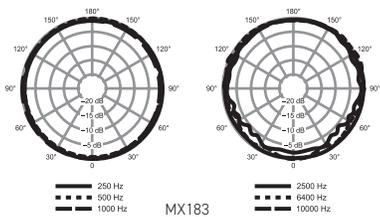
# MX183, MX184, MX185 LAVALIER MICROPHONES

## Furnished Accessories

<b>26A13</b>	Zipper bag	<b>RK183T1</b>	Tie clip
<b>RK261BWS</b>	Foam windscreen	<b>RK183T2</b>	Dual tie clip
<b>RK183WS</b>	Snap-fit windscreen	<b>RK100PK</b>	In-line preamp
<b>80A67</b>	Hex wrench #4		

## Optional Accessories and Replacement Parts

<b>R183B</b>	(Black) Omnidirectional cartridge for all Microflex models	<b>R184B</b>	(Black) Supercardioid cartridge for all Microflex models
<b>R185B</b>	(Black) Cardioid cartridge for all Microflex models	<b>MX1BP</b>	Battery powered preamp
<b>53A2133A</b>	Belt clip for in-line preamp	<b>WA333</b>	4-pin female mini connector (TA4F)
<b>C133</b>	Replacement cable, Microphone to preamp		





PREMIUM AUDIO FOR AV CONFERENCING

# PREMIUM AUDIO FOR AV CONFERENCING

MICROFLEX® ADVANCE™

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## WHY CHOOSE SHURE?

Shure is uniquely positioned as a leading audio equipment manufacturer serving corporate, education, government, broadcast/TV/film, and independent content creators. By choosing Shure, you will enjoy a range of benefits:

- + Nearly 100-year heritage of technical leadership in high-quality audio, acoustics, wireless, DSP, software, and audio networking technologies.
- + Broad product selection that can be customized to meet the needs of any user, space, or application – from simple to complex, small to large.
- + Compatibility and certification with leading software and hardware collaboration platforms; compliance with international regulatory standards.
- + Award-winning global support infrastructure.

**SHURE**

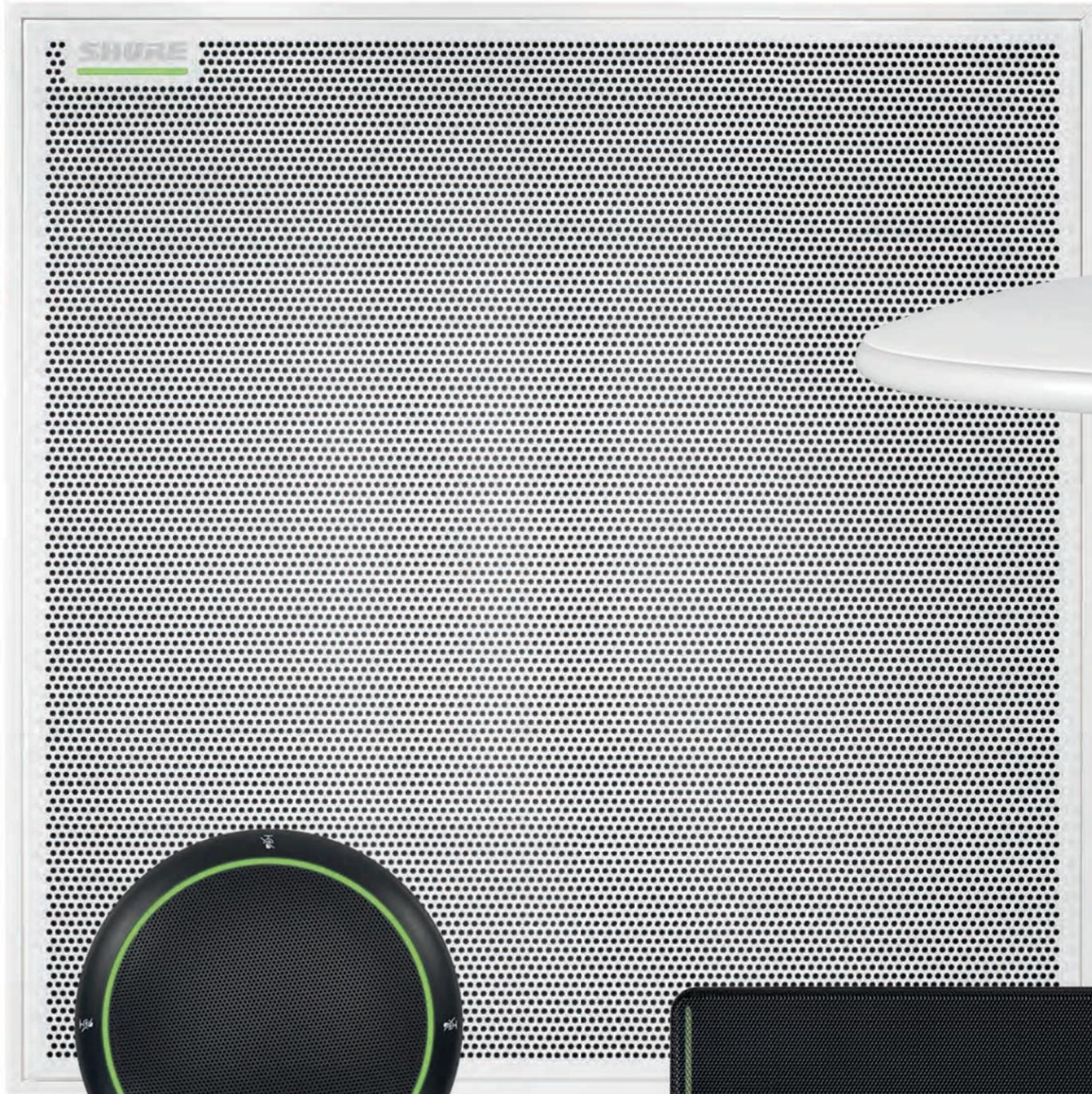
AV conferencing has become an essential tool for communication. But it's easy to forget that the most important content is often carried by the audio, not the video. If the video fails, the meeting can go on; but if the audio fails, the meeting is over.

Poor audio inhibits productivity and fatigues meeting participants. Superior audio can transform your meetings from an exhausting struggle into a forum that supports creativity and productive teamwork.

ADVANTAGES

ADVANTAGES

MXA920 CEILING ARRAY MICROPHONE +



## SUPERIOR PERFORMANCE. UNMATCHED AESTHETICS.

Since their introduction, Microflex® Advance™ Networked Array Microphones have been the premier choice for audio in the most challenging environments. They capture voice naturally, fit harmoniously with the room's appearance, and make it effortless to connect people for the world's leading enterprises. The industry-leading Microflex® Advance™ microphones have revolutionized versatile and elegant AV conferencing solutions that discreetly and precisely capture every word.

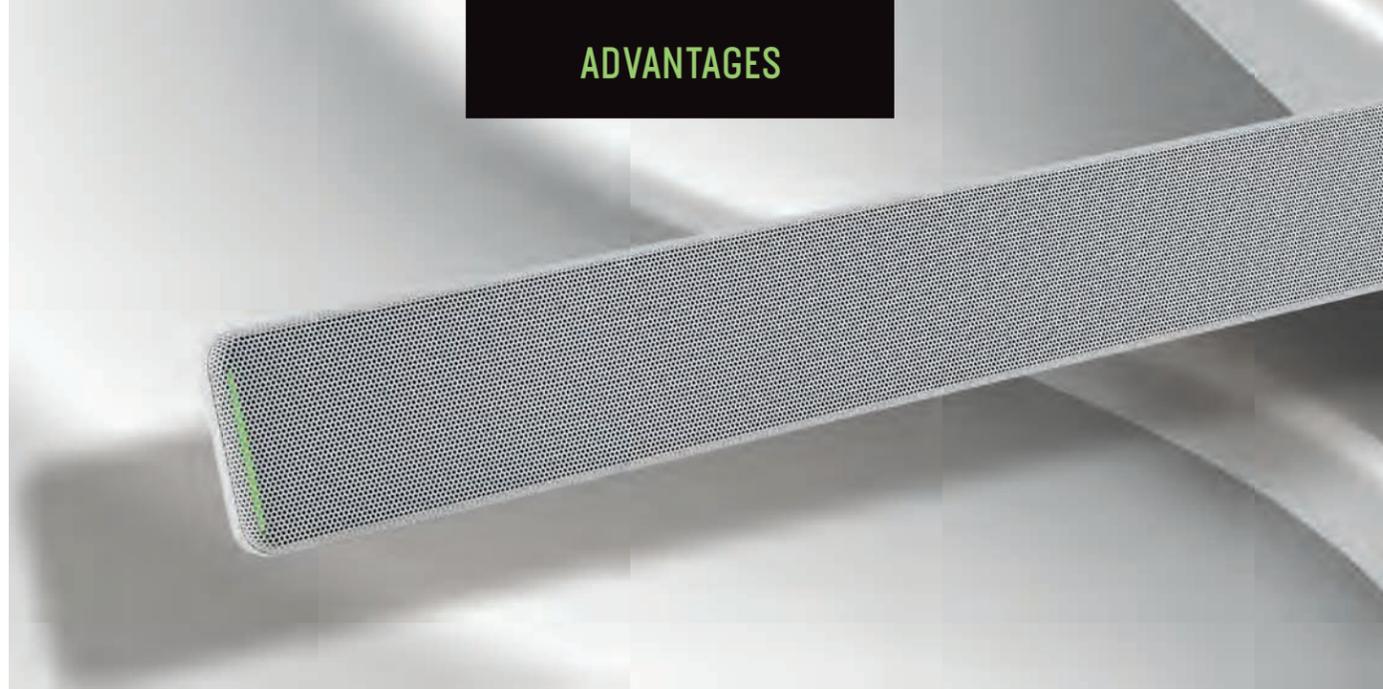


+ MXA310 TABLE ARRAY MICROPHONE



+ MXA710 LINEAR ARRAY MICROPHONE

ADVANTAGES



# YOUR MXA ADVANTAGE

## ARCHITECT / INTERIOR DESIGNER

Microflex Advance enables architects and interior designers to create visually stunning workspaces without sacrificing sound quality.

## USERS

Microflex Advance allows users to be more productive and creative. It enhances communication by allowing everyone to hear and be heard clearly, without distracting noise and echo.

## C-LEVEL EXECUTIVES

Teams work more effectively when communication is natural and effortless. Microflex Advance makes poor audio a thing of the past.

## SYSTEM INTEGRATOR

The complete Shure networked systems ecosystem, from microphone to DSP to loudspeaker, enables your teams to deliver great AV solutions quickly and efficiently.

## IT MANAGER / ADMIN

Microflex Advance integrates into your existing IT infrastructure, without affecting network performance. Scalable to any size, it makes AV/IT support less time consuming.

## CFO / FINANCE DIRECTOR

Microflex Advance is a cost-effective audio solution that can be deployed across your organization, providing a consistent user experience backed by industry-leading support and reliability.

ADVANTAGES

# MXA ARRAY TECHNOLOGY

Microflex Advance networked array microphones rely on a suite of advanced technologies to deliver accurate audio in any environment.

## PRECISE COVERAGE

Controlling which sounds are picked up is the foundation of good audio. The MXA920 features Automatic Coverage™ technology that captures talkers in defined areas automatically. The MXA710 and MXA310 use Steerable Coverage™ technology that allows pickup lobes to be aimed where needed.

## POWERFUL DSP

Digital signal processing blends microphone signals into a harmonious mix. The MXA920 and MXA710 feature IntelliMix DSP that controls levels and eliminates noise and echo. The MXA310 includes automatic mixing and per-channel EQ for improved clarity.

## FLEXIBLE NETWORKING

Digital audio, power, and control data use Dante or AES67 to coexist on the same network as enterprise applications. Command strings enable integration with third-party systems for camera tracking or room control.



## CEILING ARRAY MICROPHONE

Certified for  
Microsoft Teams



## CEILING ARRAY MICROPHONE



### + MXA920 CEILING ARRAY MICROPHONE

# NOW, PRISTINE AUDIO IS AUTOMATIC.

The MXA920 is the premier ceiling array microphone for contemporary meeting spaces. Automatic Coverage™ technology covers up to a 30 x 30 ft (9 x 9 m) area automatically, or place coverage in specific areas for more precise control of audio capture. With next generation array architecture for enhanced directional pickup and more natural speech, the MXA920 is even easier to use and faster to deploy than the MXA910 for AV conferencing, camera tracking, voice lift, or sound reinforcement.

#### COVERAGE WHERE YOU WANT IT

Automatic Coverage™ technology captures up to a 30 x 30 foot (9 x 9 m) area automatically for great sound out of the box.

You can also place coverage areas in specific locations to limit audio capture to seating areas, a podium, or whiteboard.

#### SEAMLESS INTEGRATION

Next-generation array architecture delivers more directional pickup at low frequencies for more natural sounding voice.

Onboard IntelliMix DSP with automatic mixing, echo cancellation, noise reduction, and automatic gain control provides a pristine audio mix.

#### FITS YOUR ROOM DESIGN

Square or round form factors suit your interior design. Choose white, black, or aluminum finish (square available in white only), or paint to match room aesthetics.

Versatile hardware options support in-ceiling, on-ceiling, pole, or wire-rope mounting.

#### READY FOR ANYTHING

##### Camera Tracking

Precise talker localization reports the position of simultaneous talkers for more accurate camera tracking.

##### Voice Lift

Highly directional pickup allows audience members across the room to interact without the need for roving microphones.

##### Sound Reinforcement

Precise coverage control enables presenters to be amplified without lavalier or gooseneck microphones.

#### AVAILABLE MODELS

MXA920AL-R	Round Ceiling Array Microphone, 25-inch (aluminum)
MXA920B-R	Round Ceiling Array Microphone, 25-inch (black)
MXA920W-R	Round Ceiling Array Microphone, 25-inch (white)
MXA920W-S	Square Ceiling Array Microphone, 24-inch (white)
MXA920W-S-60CM	Square Ceiling Array Microphone, 60 cm (white)

#### ACCESSORIES

MXA-MUTE Network Mute Button	Touch-sensitive mute button with programmable switch and LED can control one or multiple MXA microphones or DSP units
A900-PM Pole Mounting Kit	Allows MXA910/920 microphones to be suspended using threaded rod or NPT pole
A900-GM Gripple Mounting Kit	Allows MXA910/920 microphones to be suspended from the ceiling using Gripple fittings
A910-HCM Hard Ceiling Mount	Allows MXA910/MXA920-S to be mounted flush in a hard or drywall ceiling
A910-JB Junction Box Adapter	Allows MXA910/MXA920-S to be connected to wiring in electrical conduit

LINEAR ARRAY MICROPHONE

LINEAR ARRAY MICROPHONE



Certified for  
Microsoft Teams



**+ MXA710 LINEAR ARRAY MICROPHONE**

# THE SLIM ALTERNATIVE WHERE SPACE IS LIMITED.

The MXA710's sleek, linear form factor allows for placement virtually anywhere in a meeting space — on a ceiling or wall, around a display, or recessed into the table. Steerable Coverage™ technology allows pickup lobes to be easily adjusted to capture talkers around the room. Available in two lengths and three colors to suit different interior designs and mounting configurations. Onboard IntelliMix DSP provides all the signal processing needed for echo- and noise-free audio.

### COVERAGE WHERE YOU WANT IT

Steerable Coverage technology allows you to configure 4 or 8 pickup lobes that can be easily adjusted to capture talkers around the room.

Patent-pending Autofocus™ technology fine-tunes audio pickup in real time, for consistent sound even if participants shift in their seats.

### SEAMLESS INTEGRATION

Onboard IntelliMix DSP with automatic mixing, echo cancellation, noise reduction, and automatic gain control provides a pristine audio mix.

Programming-free LED mute sync with popular software codecs when connected to IntelliMix P300 or ANIUSB-MATRIX.

### FITS YOUR ROOM DESIGN

Sleek linear form factor allows for placement virtually anywhere — on the ceiling or wall, around a display, or recessed into the table.

Choose white, black, or aluminum finish. Wall mounting bracket included; other mounting options available.

#### AVAILABLE MODELS

MXA710-2FT	Linear Array Microphone, 2 foot / 60 cm (aluminum, black, white)	MXA710-4FT	Linear Array Microphone, 4 foot / 120 cm (aluminum, black, white)
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#### ACCESSORIES

MXA-MUTE Network Mute Button	Touch-sensitive mute button with programmable switch and LED can control one or multiple MXA microphones or DSP units
A710-TB Tile Bridge Ceiling and Suspension Mount Kit	Mounts MXA710 directly to ceiling tiles or suspended from ceiling grids; use one for MXA710-2FT or two for MXA710-4FT
A710-FM Flush Mount	Mounts MXA710 flush within a table, wall or hard ceiling surface
A710-DS Desk Stand	Mounts MXA710 to desk, credenza, or table
A710-MSA Mic Stand Adapter	Mounts MXA710 to any microphone stand in horizontal or vertical orientation

TABLE ARRAY MICROPHONE

TABLE ARRAY MICROPHONE



+ MXA310 TABLE ARRAY MICROPHONE

PREMIUM SOUND WITHIN YOUR REACH.

The MXA310 is the ideal solution when great sound needs to be close at hand. Steerable Coverage™ technology allows up to four separate polar patterns to be easily adjusted to capture multiple talkers around the table. A unique toroid polar pattern rejects overhead noise while picking up talkers all around the table. Built-in Shure DSP utilities optimize voice quality, integrated mute buttons place controls within easy reach.

COVERAGE WHERE YOU WANT IT

Steerable Coverage technology allows you to configure 4 polar patterns to capture talkers around the table.

Unique toroid pattern picks up a 360-degree circle but rejects sound from overhead noise.

NATURAL SOUND

Integrated automix output improves clarity by activating only mics being addressed.

Per-channel parametric EQ reduces noise pickup in rooms with poor acoustics.

FITS YOUR ROOM DESIGN

Programmable touch-sensitive mute buttons can control one mic, all mics, or external devices.

Discreet design with side or bottom cable exit installs on top of table or flush-mounted.



AVAILABLE MODELS

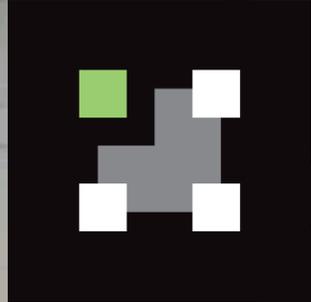
MXA310AL	Table Array Microphone (aluminum)
MXA310B	Table Array Microphone (black)
MXA310W	Table Array Microphone (white)

ACCESSORIES

A310-FM	Flush Mount
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SOFTWARE



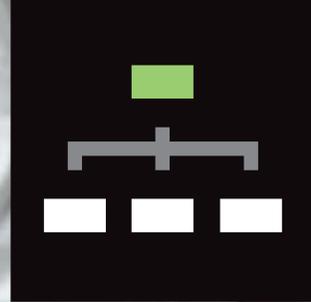
**+ DESIGNER SYSTEM CONFIGURATION SOFTWARE**

## PLAN AMAZING AUDIO.

Simply set-up your Shure Audio Ecosystem with this free software. Deploy more rooms in less time enabling you with more efficiency and consistency. Design projects online and offline.

-  **PRE-CONFIGURED SETTINGS**  
Configure the Shure Audio Ecosystem for conferencing
-  **STEP AND REPEAT**  
Create templates based on common floor plans.
-  **PASS IT ON**  
Room configurations can be saved and shared with colleagues.
-  **SINGLE HUB**  
Firmware updating and Dante™ audio routing.

SOFTWARE



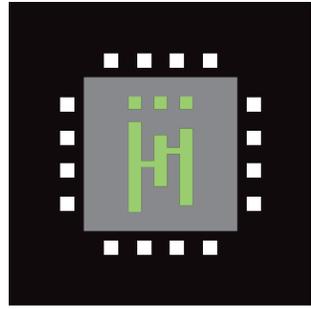
**+ SYSTEMON® AUDIO ASSET MANAGEMENT SOFTWARE**

## CONQUER COMPLEXITY AND SCALE.

You can't be everywhere at once but everywhere can be with you. Update and monitor your Shure Audio Ecosystem remotely. From managing inventory and battery health in real-time and troubleshoot on the go.

-  **PEACE OF MIND**  
Stay one step ahead with text and email alerts for potential issues before they happen.
-  **TIME SAVING**  
Maximize control of your organization's audio and update firmware on the go.
-  **SECURE SYSTEM**  
Customize access and permissions for a tailored user experience

SOFTWARE



+ INTELLIMIX ROOM®

# AV THAT SPEAKS IT.

IntelliMix® Room, the first audio processing software fully optimized for Shure conferencing microphones. Simply download and deploy to in-room Windows 10 devices, and bring conferencing into the future. No custom setups or special hardware needed to enjoy crystal-clear audio on all video conference calls.

**THE HARDWARE'S ALREADY THERE.**  
IntelliMix® Room effectively turns the in-room PC into a Shure device. All configuration is managed in our Designer software and replicable through easy-to-use templates.

**DANTE ONBOARD.**  
Once the PC has IntelliMix Room onboard, it has Dante audio networking too. No other software license is needed to route audio to or from that PC.

**ELIMINATE DISTRACTING SOUNDS.**  
Version 3.1 includes the AI Denoiser audio processor - a powerful algorithm that eliminates the random noises that disrupt meetings, with virtually no audible effect on the speech.

**NO COMPLICATED AUDIO ROUTING.**  
IntelliMix Room installs with its own audio driver. Once selected from the Audio Device dropdown in the Soft Codec of choice, the client is ready to talk.

**ENTERPRISE-WIDE LICENSING.**  
A centrally managed license lets clients easily and effectively deploy the software through their global corporate network.

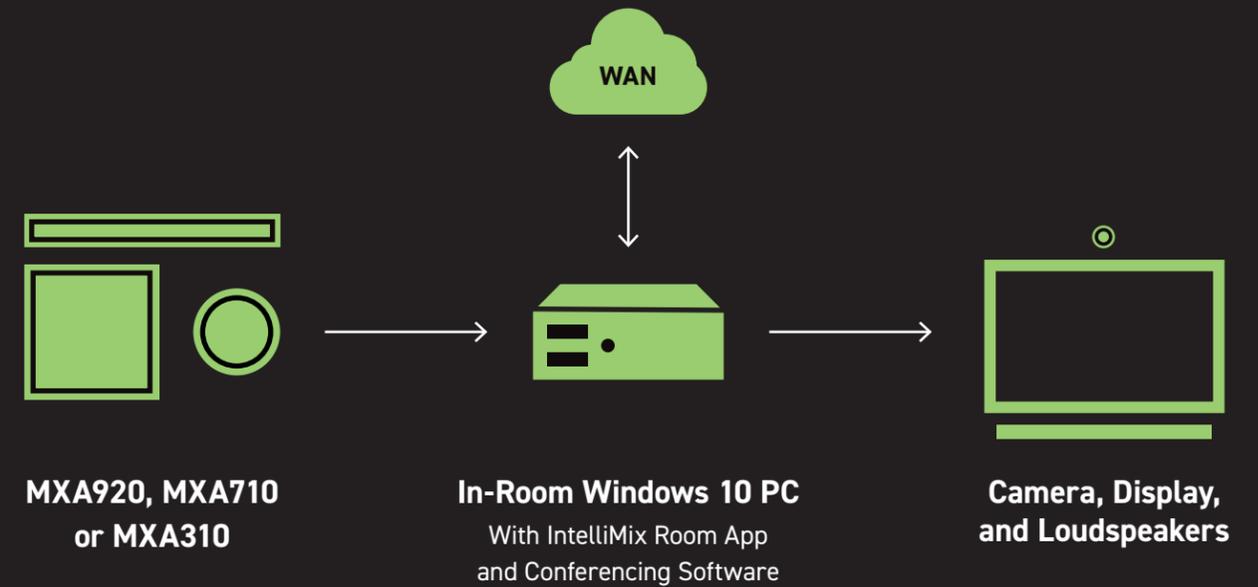
**PUT A STOP TO EAVESDROP.**  
All connected Shure devices feature Shure Audio Encryption, so the only ones to hear it are the ones on the call.



SOFTWARE

## MAKE SIMPLE THE NEW STANDARD.

Now all it takes to optimize audio is award-winning Shure MXA mics and a PC running a conferencing application and IntelliMix® Room.



# APPLICATION FLEXIBILITY

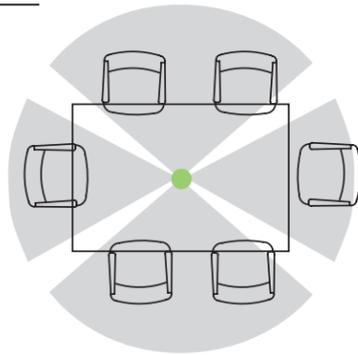
Match single or multiple arrays to the AV conferencing needs of rooms of any size, configuration or activity: formal presentations, intimate discussions, distance learning or collaborative work.

## + TABLE ARRAY COVERAGE MAPS

**+ Small Rectangular Table**  
1 Table Array

Profile  
6 Chairs  
1 Rectangular Table

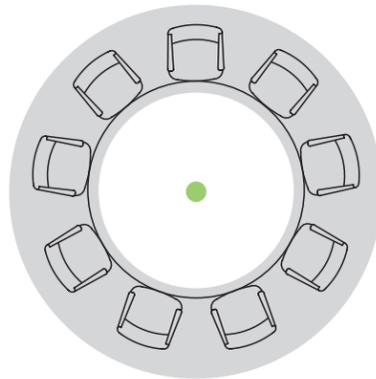
**1 Bi-Directional Pattern**  
**2 Cardioid Patterns**



**+ Medium Round Table**  
1 Table Array

Profile  
9 Chairs  
1 Round Table

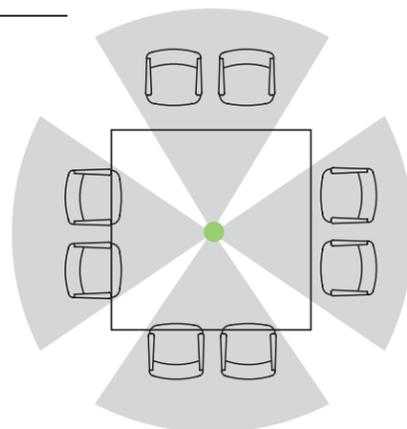
**1 Toroid Pattern**



**+ Square Table**  
1 Table Array

Profile  
8 Chairs  
1 Square Table

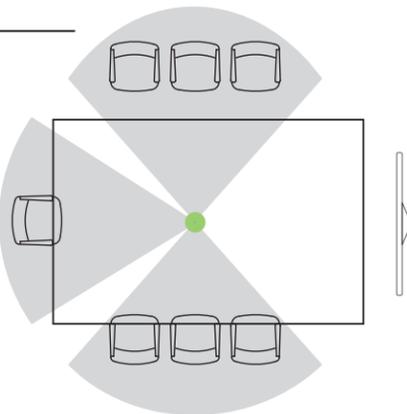
**4 Supercardioid Patterns**



**+ Rectangular Table**  
1 Table Array

Profile  
5 Chairs  
1 Rectangular Table

**1 Supercardioid Pattern**  
**2 Cardioid Patterns**

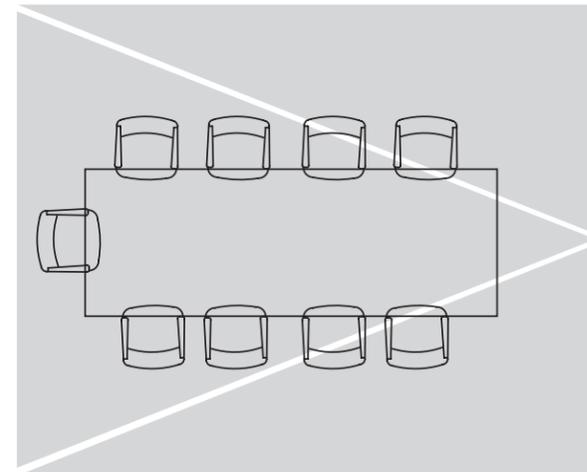


## + LINEAR ARRAY COVERAGE MAPS

**+ Small Rectangular Table**  
MXA710-2FT  
Coverage Distance: Up to 16 ft  
Channels used: 3 of 4  
Mic Coverage: Default

Horizontal Wall Installation

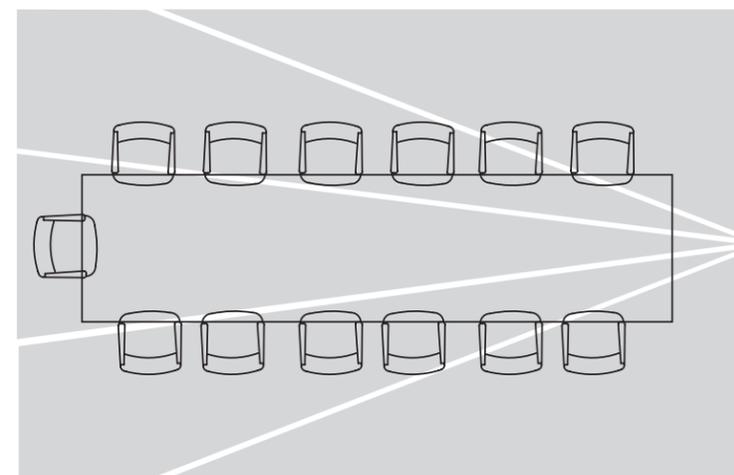
Profile  
9 Chairs  
1 Rectangular Table



**+ Large Rectangular Table**  
MXA710-4FT  
Coverage Distance: Up to 20 ft  
Channels used: 5 of 8  
Mic Coverage: Custom/Optimized

Horizontal Wall Installation

Profile  
13 Chairs  
1 Rectangular Table

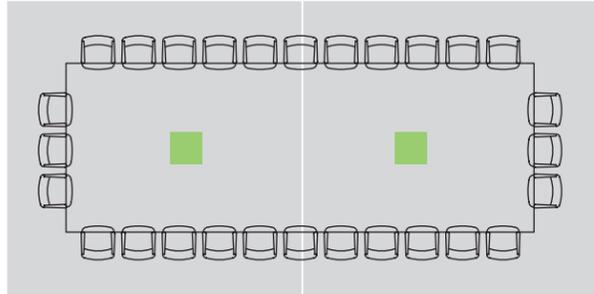


## + CEILING ARRAY COVERAGE MAPS \*

### + Large Conference Room 2 Ceiling Arrays

Profile  
28 Chairs  
1 Rectangular Table

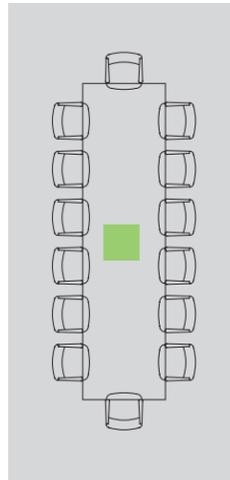
2 Coverage Areas



### + Medium Conference Room 1 Ceiling Array

Profile  
14 Chairs  
1 Rectangular Table

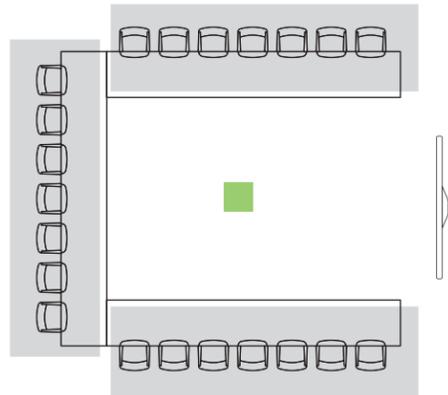
1 Coverage Area



### + Videoconference Room 1 Ceiling Array

Profile  
21 Chairs  
3 Rectangular Tables

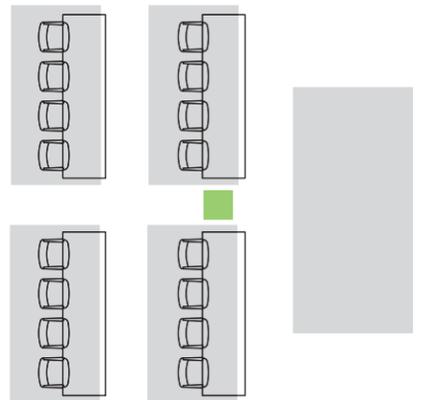
3 Coverage Areas



### + Classroom / Presentation Room 1 Ceiling Array

Profile  
16 Chairs  
4 Rectangular Tables

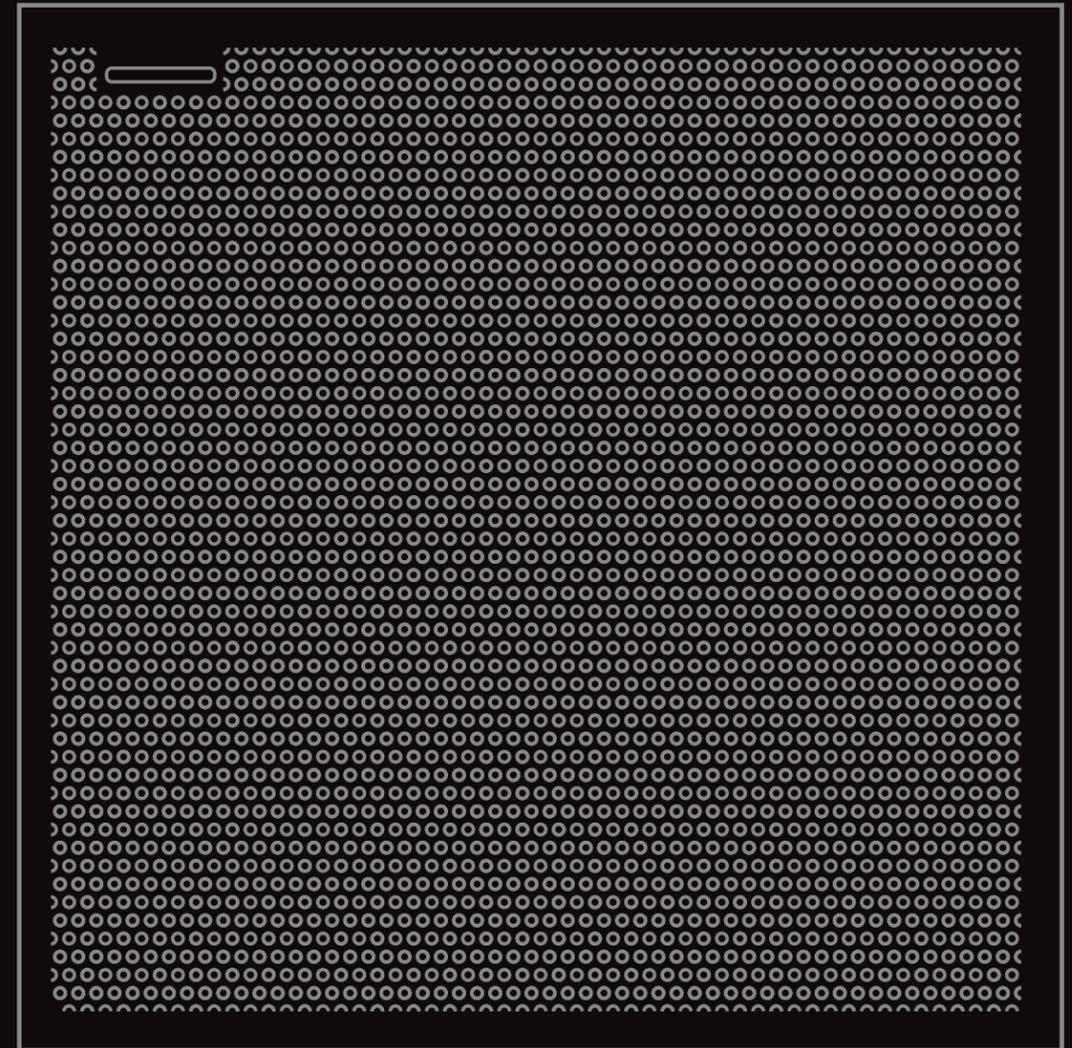
5 Coverage Areas



\* Coverage Capabilities  
Installed at a height of 3 meters (ten feet),  
Ceiling Arrays capture audio from seated  
participants to a recommended area of  
9 meters (30 feet) in diameter, meeting the STIPA "A"  
intelligibility rating.

\*\* Note:  
Ceiling Arrays are capable of picking up participants  
beyond 9 meters (30 feet).

\*\* Room conditions:  
RT60 (reverb time)  
= 500 ms @ 1kHz, weighted room noise  
= 40dB SPL(A). IEC-60268-16.



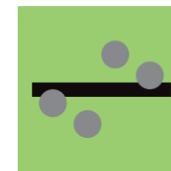
# BETTER TOGETHER.

Shure Networked Audio Processors and Interfaces quickly and easily integrate with Microflex Advance providing high-quality audio conferencing solution with extremely intelligible meeting sound.

## + INTELLIMIX® P300 AUDIO CONFERENCING PROCESSOR

The IntelliMix P300 Audio Conferencing Processor offers DSP algorithms optimized for AV conferencing applications with Microflex Advance microphones. Featuring acoustic echo cancellation, noise reduction and automatic gain control for up to 8 Dante channels, the P300-IMX helps to ensure echo- and noise-free conference room audio that facilitates communication and collaboration. Easy to install and configure using Designer System Configuration software, the P300 provides Dante, analog, USB and mobile connectivity options that make joining room systems and collaborating with laptops and mobile devices easier than ever.

- Features**
- IntelliMix® DSP
  - 10 Dante input channels, 8 output channels
  - 2 analog audio inputs / 2 outputs
  - USB 2.0
  - 15 x 12 Matrix Mixer
  - 3.5mm Mobile input (1/8")
  - Easy deployment with Designer System Configuration software
  - Single Ethernet connectivity
  - 10 configuration presets
  - Third-party control system compatible
  - Dante Domain Manager ready
  - Power over Ethernet plus (PoE+)
  - 8 Channels of Acoustic Echo Cancellation



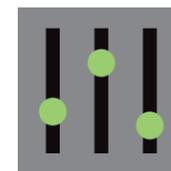
### AUDIO PERFORMANCE

Enhanced meeting room audio for natural communication and better interaction in AV conferences with remote team members.



### INTUITIVE CONNECTIONS

Industry-first mute sync functionality when MXA microphones are connected to the P300 for better operation with leading third-party software codecs.



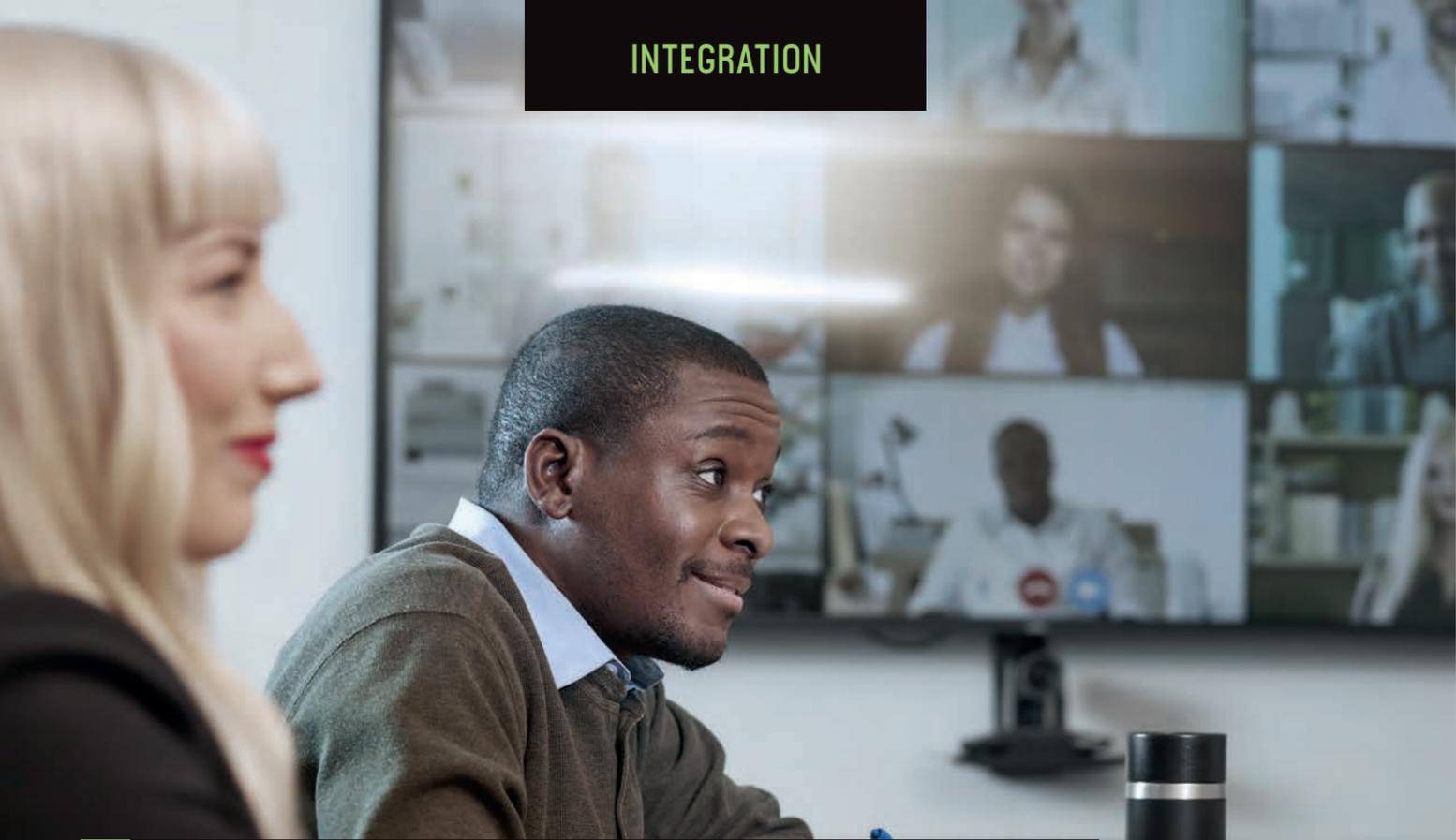
### SIMPLICITY

Pre-defined templates for system configuration reduce programming time, and allow installation within seconds.



### SHURE AUDIO ENCRYPTION

When using Microflex Advance together with the IntelliMix P300 Audio Conferencing Processor and selected Shure Audio Network Interfaces, Shure Audio Encryption with AES-256 encryption technology can help protect confidential content.

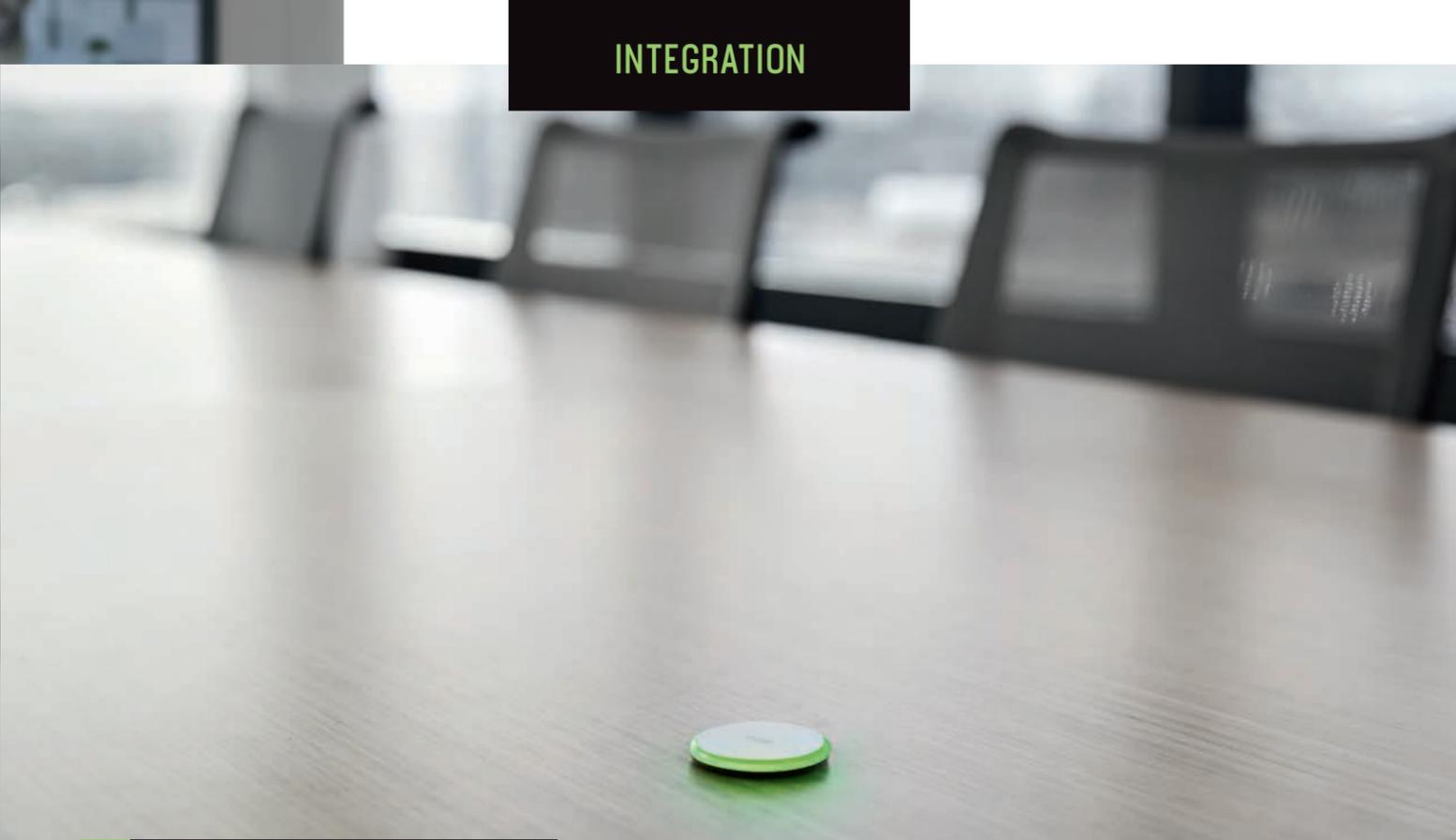
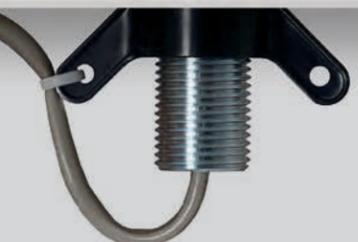


**+ ANIUSB-MATRIX USB AUDIO NETWORK INTERFACE WITH MATRIX MIXING**

The ANIUSB-MATRIX Audio Network Interface provides a versatile hub for collaboration in small to medium-size meeting rooms, suitable for both room video conference systems and soft codec solutions. The device presents a budget-friendly companion to Microflex Advance microphones, for AV conferencing applications that leverage the integrated processing functionality of existing video codecs in the room.

**Features**

- 4 Dante audio inputs / 2 outputs
- 1 analog audio input / 1 output
- USB 2.0
- 6 X 4 Matrix Mixer
- Per channel Equalizer, Mute, Limiter, Gain
- Easy deployment with Designer System Configuration software
- Single Ethernet connectivity
- 10 configuration presets
- Dante Domain Manager ready
- Third-party control system compatible
- Power over Ethernet (PoE)



**+ MXA NETWORK MUTE BUTTON**

The MXA Network Mute Button is a configurable PoE-powered mute button accessory designed for Shure networked audio products, including Microflex® Advance™ Array Microphones as well as the IntelliMix® P300 and IntelliMix Room DSPs, and ANIUSB-MATRIX. One or many of the low-profile touch sensitive mute buttons can be configured to mute one or multiple microphones, depending on user needs or room configurations.

**Features**

- Designer System Configuration software for easy setup and configuration
- SystemOn™ Asset Management for remote management & troubleshooting
- PoE powered
- Compatible with third party control systems via programmable control strings
- LED status ring with configurable colors and brightness
- Configurable as toggle, push to talk and push to mute functionality
- IP1X rated
- Easy table installation in 1" (25mm) or 7/8" (22mm) holes



## INSTALLATION



**SHURE**

# INSTALLATION SOLUTIONS

MXA920 Ceiling Array Microphones are designed for suspension, pole and flush mounting in metric or imperial formats. The sleek, linear form factor of the MXA710 allows for placement virtually anywhere in a meeting space, including on a wall, around a display, ceiling, or into a conference room table. MXA310 Table Array Microphones feature through-the-table mounting kits. The A310-FM mounting accessory also allows flush mounting in a table.



## INSTALLATION

### MXA920 CEILING ARRAY MOUNTING OPTIONS

#### Integrated Vibration Isolation

Prevents transmission of mechanical noise through the microphone.

#### Plenum-Rated

UL 2043 suitable for air handling spaces and plenum compliant when

#### Dust Protection

IEC 60529 IP5X Dust Protected

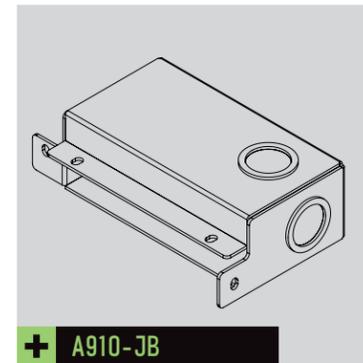


**+ CEILING GRID**

MXA920W-S installation shown



**+ SUSPENSION MOUNT**



**+ A910-JB**

Allows the Ethernet cable connected to the array to be installed inside flex conduit.

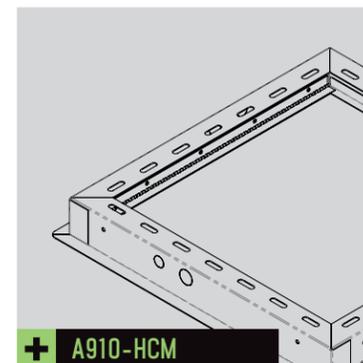


**+ VESA POLE MOUNT**



**+ HARD CEILING**

Requires A910-HCM accessory



**+ A910-HCM**

Hard Ceiling Mount  
Can be pre-installed in the ceiling and the MXA920 installed later using the access door. Provides knockouts for conduit connections.



**+ VESA POLE MOUNT**



**+ SUSPENSION MOUNT**

## MXA310 TABLE ARRAY MOUNTING OPTIONS

### + TABLE ARRAY MOUNTING KIT (INCLUDED)

Cable management solutions for on-the-table or through-the-table applications; includes mounting tube/wingnut.

MXA310 retrofits existing Shure table mounted MX395, MX396, MX392 boundary microphones.



### + A310-FM FLUSH MOUNT (OPTIONAL)

Allows MXA310 Table Array to be mounted flush in the table; includes rubber isolation to prevent mechanical vibrations.

Available in black and aluminum finishes; paintable to match table surface.

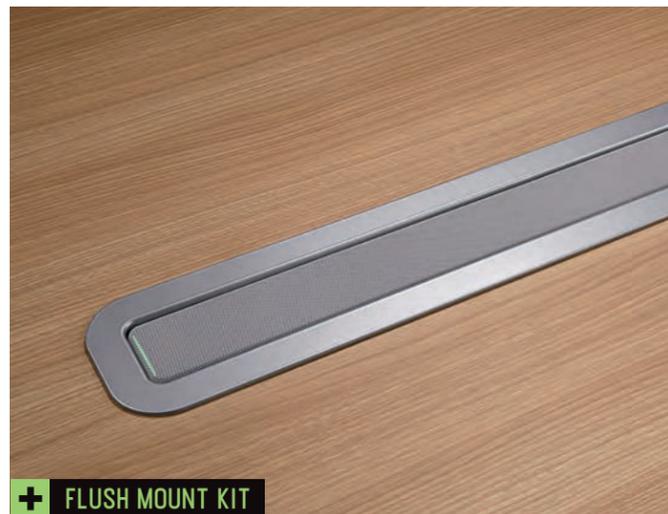
## MXA710 LINEAR ARRAY MOUNTING OPTIONS



+ SUSPENSION MOUNT



+ BELOW DISPLAY WITH THIRD-PARTY MOUNT



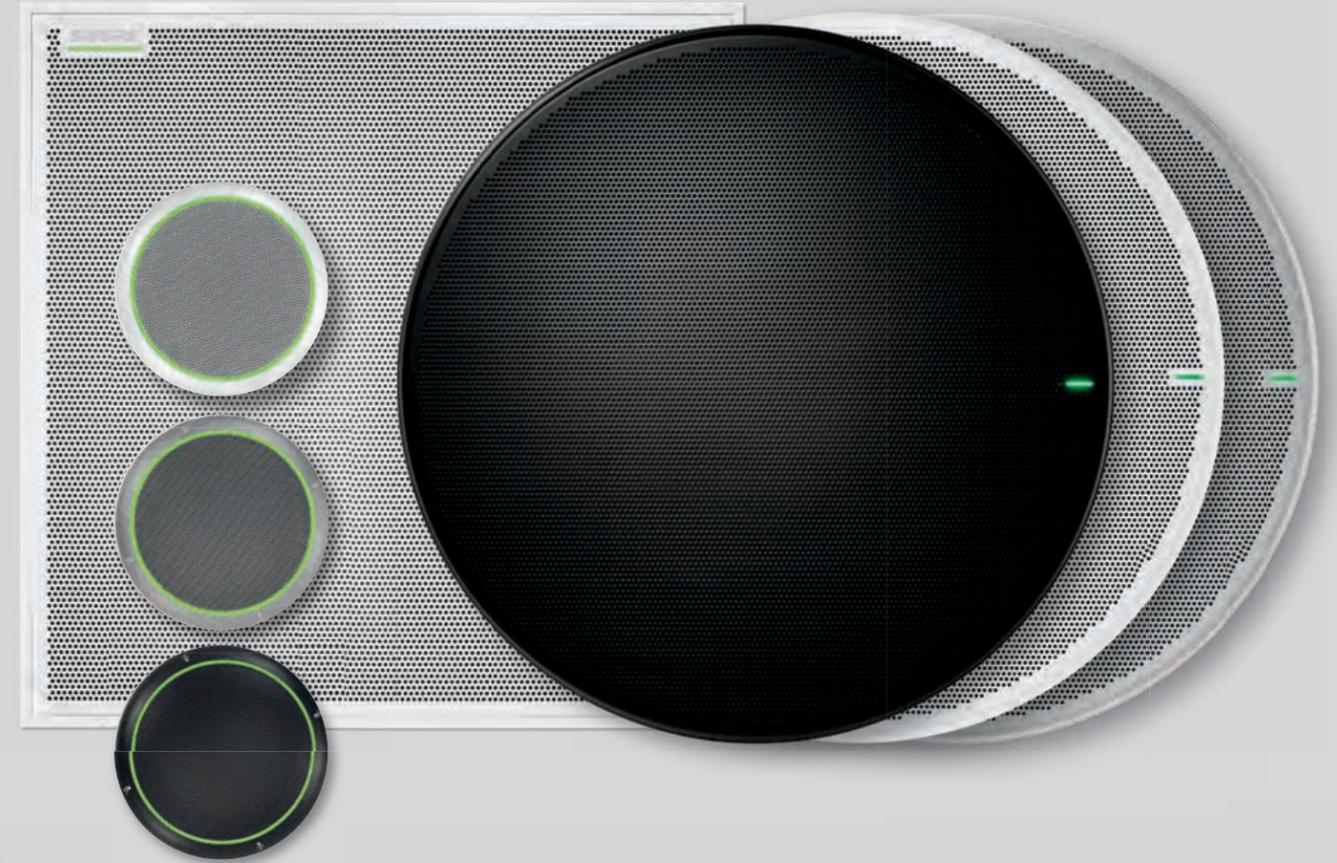
+ FLUSH MOUNT KIT



+ WITH A710-DS DESKTOP STAND

## EXPRESSIVE FINISHES

Ceiling and Table Array microphones are available in black, white and aluminum finishes to match room aesthetics or the finishes of other AV system components. The Ceiling Array microphone can also be custom-painted to fit your environment.



# MICROFLEX®

# WIRELESS SYSTEMS



Microflex® Wireless microphone systems bring modern design and vivid, lifelike sound to signature boardrooms and AV conferencing environments. This enterprise-scale platform encompasses a system of advanced conferencing products that includes intelligent rechargeable microphone transmitters and charging stations, discreet wireless access point transceivers, flexible audio network interfaces, and comprehensive software tools for remote adjustment and monitoring of system settings.

## PREMIUM CONFERENCING AUDIO FOR ELITE BOARDROOMS

Vivid Lifelike Sound, Versatile Microphone Selection, Discreet Designs, Scalable Solutions

## NETWORKED DIGITAL WIRELESS FOR ENTERPRISE-SCALE ENVIRONMENTS

Dante™ Digital Audio Networking, Ethernet Connectivity, Control System Compatible, Microflex Wireless Control Software

## INTELLIGENT PERFORMANCE, SIMPLIFIED SETUP & OPERATION

Advanced Rechargeable Power Management, Automated Frequency Coordination, Encrypted Wireless, Assignable RF output power

## TRUSTED SHURE EXPERIENCE

Wireless Expertise, Signature Audio, Reliable Product Support

## APPLICATIONS

Boardrooms

Corporate Theaters

AV Conferencing Spaces

Training/Seminar Centers

## PRODUCT HIGHLIGHTS

Vivid, lifelike sound

Stylish, versatile wireless microphone options

Digital audio networking over Ethernet

Boundary and Gooseneck Base Transmitters are available in black and white color options

Compatible with SystemOn Asset Management Software for enterprise-wide remote management

AES256 encryption



CommShield®  
Technology

**SHURE**

# MICROFLEX® WIRELESS SYSTEMS

## FEATURES

- Vivid, lifelike sound: Performance-tested Microflex® microphone elements flawlessly capture full range audio for clear, detailed communication
- Versatile microphone selection: Wireless boundary, gooseneck, bodypack, and handheld models are available to fit any conferencing application
- Discreet designs: With elegant aesthetics and a low-profile footprint, Microflex Wireless systems are designed to install easily and disappear into AV environments (MXW6 boundary and MXW8 gooseneck base transmitters available in black and white color options)
- Scalable solutions: 2, 4 and 8 channel systems can be combined support configurations of up to 40 compatible channels in High Density Mode (80 in Europe and select countries). Adjustable power limits enable additional channels to operate in separate rooms
- Pair-A-Spare: Quickly and easily deploy already linked replacement presenter microphone transmitters when needed
- Dante™ and AES67 digital audio networking compatible: Integrated solution for transporting low latency, uncompressed audio over standard Ethernet networks
- Ethernet connectivity: All Microflex Wireless networking components connect via Cat5e cable for simplified installation
- SystemOn™ Audio Asset Management Software: Provides a comprehensive solution for managing large-scale Microflex Wireless deployments, enabling AV / IT administrators to support campus-wide installations from one central platform
- Microflex Wireless Control Software: Browser-based control software that offers comprehensive remote monitoring and control of all settings and status parameters over the web, a corporate network or an AV local area network
- Seamless integration: Quick and easy connectivity to the Shure IntelliMix P300 Audio Processor with included Microflex Wireless preset templates
- Control system compatible: Third party control and automation systems (AMX®, Crestron®) are fully compatible with Microflex Wireless, enabling the creation of custom interfaces on touchscreen panels
- Advanced rechargeable power management: Smart lithium-ion rechargeable batteries deliver up to 9 hours of continuous use, enable remote status monitoring while in the charger and provide remaining runtime in hours and minutes while in use via networked control systems
- Automated frequency coordination: Microflex Wireless systems actively scan the available spectrum and coordinate clean, compatible frequencies for every microphone channel. While in use, systems automatically move away from unexpected interference
- Encrypted wireless: Audio transmission is protected by AES-256 encryption
- Selectable transmit power: Select the appropriate wireless output power per room to optimize spectrum usage, range, and battery life



## SPECIFICATIONS (SUBJECT TO CHANGE)

<b>RF Carrier Frequency Range</b>	USA, Canada, Mexico: 1920–1930 MHz Europe, Asia, Middle East: 1880–1900 MHz
<b>Working Range</b>	50 m (160 ft) Note: Actual range depends on RF power setting and signal absorption, reflection and interference.
<b>Audio Frequency Response</b>	50 Hz – 20 kHz (+1, -3 dB) Note: Dependent on microphone type
<b>Dynamic Range</b>	>99 dB, A-weighted
<b>System Gain (Mic gain @ 0dB to line level output on MXWANI through Dante)</b>	+50 dB
<b>Latency</b>	18 ms, nominal
<b>System Audio Polarity</b>	Positive pressure on microphone diaphragm (or positive voltage on pin 3 of TA4M connector) produces a positive voltage on pin 2 of the ANI (with respect to pin 3 of the low-impedance output).
<b>Radio Transmission</b>	Time Division Multiple Access (TDMA), Gaussian Frequency Shift Keying (GFSK), 365 kHz max. deviation
<b>RF Sensitivity</b>	-87 dBm, minimum
<b>Power</b>	19 dBm (80 mW) maximum, See Frequency Range and Output Power table
<b>Cable Requirements</b>	Cat 5e or higher, shielded, 100 m maximum between network devices
<b>Network Addressing Capability</b>	DHCP, link-local, static
<b>Operating Temperature Range</b>	0°C (32°F) to 49°C (120°F)
<b>Storage Temperature Range</b>	-29°C (-20°F) to 74°C (165°F)

### FREQUENCY RANGE AND MICROPHONE TRANSMITTER OUTPUT POWER

BAND	FREQUENCY RANGE (MHz)	REGION	POWER (mW)
Z10	1920 to 1930	USA, Canada, Mexico	Low = 0.63 Medium = 3.16 High = 15.85 Maximum = 79.43
Z11	1880 to 1900	Europe, Asia, Middle East	Low = 0.63 Medium = 3.16 High = 15.85 Maximum = 79.43

# MXW1 BODYPACK TRANSMITTER

## OVERVIEW

The MXW1 is a hybrid bodypack transmitter compatible with Microflex® Wireless systems. It offers both an integrated omnidirectional microphone and an input jack for connecting an ear-worn or lavalier style microphone. The integrated microphone is perfect for picking up speech while the bodypack is on a lanyard or tucked into a shirt pocket, and a belt clip is included for attachment to clothing.

## FEATURES

- Compact, low-profile design: Fits comfortably into a shirt pocket or attached to clothing
- Integrated omnidirectional mic: Clearly captures full range audio without connecting an external microphone
- External microphone input: For connecting multiple styles of ear-worn or lavalier condenser microphones
- Bi-directional wireless: Enables return channel audio and real time remote control of all wireless microphone settings
- Earphone output: Listen to audio from a return channel for translation, cueing, or program material
- Programmable mute button: Customize local or remote muting behavior per application, with options including push-to-talk, push-to-mute, and external control.
- Standby mode: Enabled remotely during breaks or periods of inactivity to significantly extend battery life when not in use
- Wide working range: Reliable wireless coverage extends up to 160 feet (50 meters)
- Out of range alert: Emits beeping sound when range limit is exceeded
- Wide frequency response: Captures full range audio for clear voice transmission
- Easy transmitter linking: Assign the microphone to an Access Point channel by simply docking it into a Networked Charging Station and pressing "link"
- Encrypted wireless: AES 256-bit encryption for secure transmission.
- Advanced Li-ion batteries: Smart lithium-ion internal batteries provide up to 9 hours of continuous use, charge to full in 2 hours, and enable remote monitoring over the network of remaining runtime and charge status in hours and minutes
- USB charging: Connects to any standard USB power source for "always on" usage



**MXW1**  
Bodypack Transmitter

## SPECIFICATIONS (SUBJECT TO CHANGE)

<b>Gain Adjustment Range</b>	-25 to +15 dB (in 1 dB steps)
<b>Maximum Input Level (Mic gain @ -16 dB)</b>	-9 dBV
<b>Headphone Output</b>	3.5 mm (1/8"), dual mono (will drive stereo phones)
<b>Maximum Headphone Output Power (1kHz @ 1% distortion, peak power, @16Ω)</b>	17.5 mW
<b>Antenna Type</b>	Internal, Spacial Diversity, Linear Polarization
<b>Battery Type</b>	Rechargeable Li-Ion
<b>Battery Life</b>	Up to 9 hours Calculated with a new battery. Runtimes vary depending on battery health.
<b>Charge Connector</b>	USB 3.0 Type A
<b>Housing</b>	Molded Plastic
<b>Recommended Storage Temperature Range</b>	0 °C (32 °F) to 25 °C (77 °F)
<b>Microphone Connector</b>	4-Pin male mini connector (TA4M). See drawing for details
<b>Input Impedance (@ 1 kHz)</b>	>20 kΩ
<b>Internal Microphone</b>	Omnidirectional (20 Hz - 20 kHz)
<b>Dimensions</b>	22 mm × 45 mm × 99 mm (0.9 in. × 1.8 in. × 3.9 in.) H × W × D
<b>Weight</b>	85 g (3.0 oz.) with batteries, without microphone

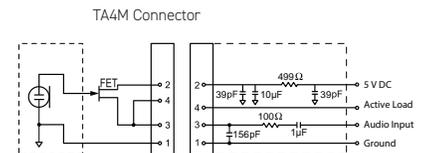
*Data subject to change without notice in interest of product improvements.*

## AVAILABLE MODELS

<b>MXW1/0</b>	MXW bodypack transmitter (without lavalier microphone)
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### OPTIONAL ACCESSORIES

<b>SBC-USB</b>	USB Plug-in Charger
<b>SB901A</b>	Replacement Battery for MXW1, MXW6, and MXW8 Transmitters
<b>See table on right</b>	Lavalier microphone



Top view of bodypack



### LAVALIER OPTIONS

<b>MX150B/0-TQG</b>	Microflex 5mm Subminiature Lavalier, Omnidirectional, Black
<b>MX150B/C-TQG</b>	Microflex 5mm Subminiature Lavalier, Cardioid, Black
<b>MX153B/0-TQG</b>	Microflex Omnidirectional Subminiature Earset, Black
<b>MX153T/0-TQG</b>	Microflex Omnidirectional Subminiature Earset, Tan
<b>MX153C/0-TQG</b>	Microflex Omnidirectional Subminiature Earset, Cocoa
<b>WL183</b>	Microflex 1cm Omnidirectional Lavalier, Black
<b>WL184</b>	Microflex 1cm Supercardioid Lavalier, Black
<b>WL185</b>	Microflex 1cm Cardioid Lavalier, Black
<b>WL93</b>	Omnidirectional Condenser Miniature Lavalier, Black
<b>WCB6B</b>	Countryman, 3mm Subminiature Omnidirectional Lavalier, Black
<b>WCE6B</b>	Countryman, Omnidirectional Rigid Earset Microphone, Black
<b>WCE6T</b>	Countryman, Omnidirectional Rigid Earset Microphone, Tan



# MXW2 HANDHELD TRANSMITTER

## OVERVIEW

The MXW2 is a handheld transmitter compatible with Microflex® Wireless Systems. With lightweight but durable construction and integrated diversity antennas, the MXW2 delivers vivid lifelike sound, intelligent wireless performance, encrypted transmission, and advanced rechargeability for presentation and conferencing applications. Available with trusted Shure microphone cartridges, including the legendary SM58®.

## FEATURES

- Interchangeable microphone cartridges: Available with the SM58®, SM86, Beta® 58A and VP68 signature Shure microphones
- Dual transmit antennas: Maximizes transmission strength depending on hand placement
- Bi-directional wireless: Enables real time remote control of all wireless microphone settings
- Programmable mute button: Customize local or remote muting behavior per application, with options including push-to-talk, push-to-mute, and external control.
- Standby mode: Enabled remotely during breaks or periods of inactivity to significantly extend battery life when not in use.
- Wide working range: Reliable wireless coverage extends up to 160 feet (50 meters)
- Range warning alert: Emits beeping sound when range limit is exceeded
- Easy transmitter linking: Assign the microphone to an Access Point channel by simply docking it into a Networked Charging Station and pressing "link"
- Encrypted wireless: AES 256-bit encryption for secure transmission.
- Advanced Li-ion batteries: Smart lithium-ion internal batteries provide up to 15 hours of continuous use, charge to full in 3 hours, and enable remote monitoring over the network of remaining runtime and charge status in hours and minutes
- USB charging: Connects to any standard USB power source for "always on" usage.



**MXW2**  
Handheld Transmitter

## SPECIFICATIONS (SUBJECT TO CHANGE)

Gain Adjustment Range	-25 to +15 dB (in 1 dB steps)
Maximum Input Level (Mic gain @ -16 dB)	-9 dBV
Antenna Type	Internal, Spacial Diversity, Linear Polarization
Battery Type	Rechargeable Li-Ion
Battery Life	Up to 15 hours Calculated with a new battery. Runtimes vary depending on battery health
Charge Connector	USB 3.0 Type A
Housing	Molded Plastic
Recommended Storage Temperature Range	0 °C (32 °F) to 25 °C (77 °F)
Microphone Capsule	SM58®, SM86, Beta® 58A, VP68
Configuration	Unbalanced
Input Impedance (@ 1 kHz)	>20 kΩ
Dimensions	226 mm × 51 mm (8.9 in. × 2.0 in.) L × Dia. including SM58 microphone capsule
Weight	323 g (11.4 oz.) with batteries, including SM58 microphone capsule

*Data subject to change without notice in interest of product improvements.*

## AVAILABLE MODELS

MXW2/SM58	Wireless Handheld Transmitter with SM58® Microphone
MXW2/SM86	Wireless Handheld Transmitter with SM86 Microphone
MXW2/BETA58	Wireless Handheld Transmitter with Beta® 58A Microphone
MXW2/VP868	Wireless Handheld Transmitter with VP68 Microphone

## OPTIONAL ACCESSORIES

RPW112	Cartridge, Housing Assembly and Matte Grille for Wireless SM58®
RPW114	Cartridge, Housing Assembly and Matte Grille for Wireless SM86
RPW118	Cartridge, Housing Assembly and Matte Grille for Wireless Beta® 58A
RPW124/VP68	Cartridge, Housing Assembly and Matte Grille for Wireless VP68
SBC-USB	USB Plug-in Charger
SB902	Replacement Battery for MXW2 Transmitter

# MXW6 BOUNDARY TRANSMITTER

## OVERVIEW

The Shure MXW6 is a boundary microphone transmitter compatible with Microflex® Wireless Systems. With a low-profile design and cardioid or omnidirectional polar pattern options, the MXW6 allows flexible placement with excellent audio capture on any surface in front of one or multiple speakers. All Microflex Wireless transmitters deliver pristine audio quality, intelligent wireless performance, encrypted transmission, and advanced rechargeability for conferencing and presentation applications.

## FEATURES

- Coverage options: Available in cardioid or omnidirectional polar patterns
- Color options: available in black or white
- Wide frequency response: Full range audio for clear voice transmission
- Microflex capsules: Well known and trusted Microflex sound signature
- Bi-directional wireless: Enables return channel audio and real time remote control of all wireless microphone settings
- Earphone output: Listen to audio from a return channel for translation, cueing, or program material
- Concealed power switch: Prevents accidental powering off
- Programmable mute button: Customize local or remote muting behavior per application, with options including push-to-talk, push-to-mute, and external control
- Encrypted wireless: AES 256-bit encryption for secure transmission
- Wide working range: Reliable wireless coverage extends up to 160 feet (50 meters)
- Out of range alert: Emits beeping sound when range limit is exceeded
- Easy wireless linking: Assign the microphone to an Access Point channel by simply docking it in a Networked Charging Station and pressing "link"
- Advanced Li-ion batteries: Smart lithium-ion internal batteries provide up to 9 hours of continuous use, charge to full in 2 hours, and enable remote monitoring over the network of remaining runtime and charge status in hours and minutes
- Standby mode: Enabled remotely during periods of inactivity to significantly extend battery life when not in use
- Low-battery LED: Visually alerts when there is 30 minutes of charge remaining
- USB charging: Connects to any standard USB power source for "always on" usage



**MXW6**  
Boundary Transmitter



**MXW6W**  
Boundary Transmitter

## SPECIFICATIONS (SUBJECT TO CHANGE)

Gain Adjustment Range	-25 to +15 dB (in 1 dB steps)
Maximum Input Level (Mic gain @ -16 dB)	-9 dBV
Headphone Output	3.5 mm (1/8"), dual mono (will drive stereo phones)
Maximum Headphone Output Power (1kHz @ 1% distortion, peak power, @16Ω)	17.5 mW
Antenna Type	Internal, Spacial Diversity, Linear Polarization
Battery Type	Rechargeable Li-Ion
Battery Life	Up to 9 hours Calculated with a new battery. Runtimes vary depending on battery health
Charge Connector	USB 3.0 Type A
Housing	Molded Plastic
Recommended Storage Temperature Range	0 °C (32 °F) to 25 °C (77 °F)
Microphone Capsule	MXW6/O, MXW6W/O: R183B MXW6/C, MXW6W/C: R185B
Dimensions	23 mm × 44 mm × 114 mm (0.9 in. × 1.75 in. × 4.5 in.) H × W × D
Weight	108 g (3.8 oz.) with batteries

Data subject to change without notice in interest of product improvements.

## AVAILABLE MODELS

MXW6/O	Wireless Boundary Transmitter, Omnidirectional
MXW6/C	Wireless Boundary Transmitter, Cardioid
MXW6W/O	Wireless Boundary Transmitter, White, Omnidirectional
MXW6W/C	Wireless Boundary Transmitter, White, Cardioid

## OPTIONAL ACCESSORIES

SBC-USB	USB Plug-in Charger
SB901A	Replacement Battery for MXW1, MXW6, and MXW8 Transmitters

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# MXW8 GOOSENECK BASE TRANSMITTER

## OVERVIEW

The MXW8 is a gooseneck base transmitter compatible with Microflex® Wireless Systems. With a stylish, contoured design and minimal footprint it complements any conference setting. The MXW8 accepts Microflex gooseneck microphones available in multiple lengths with polar pattern and LED options. All Microflex Wireless transmitters deliver pristine audio quality, intelligent wireless performance, encrypted transmission, and advanced rechargeability for conferencing and presentation applications.

## FEATURES

- Gooseneck options: Compatible with a wide variety of length, LED light ring, and polar pattern variations of Microflex Gooseneck Microphones
- Color options: Available in black or white
- Wide frequency response: Full range audio for clear voice transmission
- Concealed power switch: Prevents accidental powering off
- Bi-directional wireless: Enables return channel audio and real time remote control of all wireless microphone settings including light ring indication
- Earphone output: Listen to audio from a return channel for translation, cueing, or program material
- Programmable mute button: Customize local or remote muting behavior per application, with options including push-to-talk, push-to-mute, and external control
- Encrypted wireless: AES 256-bit encryption for secure wireless transmission
- Wide working range: Reliable wireless coverage extends up to 160 feet (50 meters)
- Out of range alert: Emits beeping sound when range limit is exceeded
- Easy wireless linking: Assign the microphone to an Access Point channel by simply docking it in a Networked Charging Station and pressing "link"
- Advanced Li-ion batteries: Smart lithium-ion internal batteries provide up to 9 hours of continuous use, charge to full in 2 hours, and enable remote monitoring over the network of remaining runtime and charge status in hours and minutes
- Standby mode: Enabled remotely during periods of inactivity to significantly extend battery life when not in use
- Low-battery LED: Visually alerts when there is 30 minutes of charge remaining
- USB charging: Connects to any standard USB power source for "always on" usage

## SPECIFICATIONS (SUBJECT TO CHANGE)

Gain Adjustment Range	-25 to +15 dB (in 1 dB steps)
Maximum Input Level (Mic gain @ -16 dB)	-9 dBV
Headphone Output	3.5 mm (1/8"), dual mono (will drive stereo phones)
Maximum Headphone Output Power (1kHz @ 1% distortion, peak power, @16Ω)	17.5 mW
Antenna Type	Internal, Spacial Diversity, Linear Polarization
Battery Type	Rechargeable Li-Ion
Battery Life	Up to 9 hours Calculated with a new battery. Runtimes vary depending on battery health
Charge Connector	USB 3.0 Type A
Housing	Molded Plastic
Recommended Storage Temperature Range	0 °C (32 °F) to 25 °C (77 °F)
Microphone Connector	6-pin connector for Shure MX405/10/15
Configuration	Unbalanced
Input Impedance (@ 1 kHz)	>20 kΩ
Gooseneck Options	See accessories list
Dimensions	36 mm × 71 mm × 124 mm (1.4 in. × 2.8 in. × 4.9 in.) H × W × D
Weight	193 g (6.8 oz.) with batteries, without microphone

Data subject to change without notice in interest of product improvements.

## AVAILABLE MODELS

MXW8	MXW gooseneck base transmitter (without gooseneck microphone)
MXW8W	MXW gooseneck base transmitter, white (without gooseneck microphone)

## OPTIONAL ACCESSORIES

SBC-USB	USB Plug-in Charger
SB901A	Replacement Battery for MXW1, MXW6, and MXW8 Transmitters
See table on right	Gooseneck microphone

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MXW8  
Gooseneck Base Transmitter

MXW8W  
Gooseneck Base Transmitter

## GOOSENECK MICROPHONE OPTIONS

MX405LP/C	Cardioid, 5" (12.7 cm), bi-color status indicator, less preamp
MX405LP/S	Supercardioid, 5" (12.7 cm), bi-color status indicator, less preamp
MX405RLP/N	No microphone cartridge, 5" (12.7 cm), light ring, less preamp
MX410LP/C	Cardioid, 10" (25.4 cm), bi-color status indicator, less preamp
MX410LP/S	Supercardioid, 10" (25.4 cm), bi-color status indicator, less preamp
MX410RLP/N	No microphone cartridge, 10" (25.4 cm), light ring, less preamp
MX415LP/C	Cardioid, 15" (38.1 cm), bi-color status indicator, less preamp
MX415LP/S	Supercardioid, 15" (38.1 cm), bi-color status indicator, less preamp
MX415RLP/N	No microphone cartridge, 15" (38.1 cm), light ring, less preamp
MX405WLP/N	No microphone cartridge, 5" (12.7cm) Gooseneck, bi-color status indicator, less preamp, white
MX405WRLP/N	No microphone cartridge, 5" (12.7cm) Gooseneck, light ring, less preamp, white
MX410WLP/N	No microphone cartridge, 10" (25.4cm) Gooseneck, bi-color status indicator, less preamp, white
MX410WRLP/N	No microphone cartridge, 10" (25.4cm) Gooseneck, light ring, less preamp, white
MX415WLP/N	No microphone cartridge, 15" (38.1cm) Gooseneck, bi-color status indicator, less preamp, white
MX415WRLP/N	No microphone cartridge, 15" (38.1cm) Gooseneck, light ring, less preamp, white
MX410WLPDF/N	No microphone cartridge, 10" (25.4cm) Dual Flex Gooseneck, bi-color status indicator, less preamp, white
MX410WRLPDF/N	No microphone cartridge, 10" (25.4cm) Dual Flex Gooseneck, light ring, less preamp, white
MX415WLPDF/N	No microphone cartridge, 15" (38.1cm) Dual Flex Gooseneck, bi-color status indicator, less preamp, white
MX415WRLPDF/N	No microphone cartridge, 15" (38.1cm) Dual Flex Gooseneck, light ring, less preamp, white



# MXWAPT2, MXWAPT4, MXWAPT8 ACCESS POINT TRANSCEIVERS

## OVERVIEW

The MXWAPT is a 2- 4- or 8-channel wireless access point compatible with Microflex® Wireless microphone systems. It uses automated frequency coordination to assign clean frequencies to wireless microphones and manages two-way wireless transmission of encrypted audio and control signals. Power to the unit (via PoE) and Dante digital networked audio are both supplied over a single Ethernet cable to simplify installation, and the supplied mounting plate and paintable cover allow discreet placement in boardrooms and conference rooms where low visibility is preferred.

## FEATURES

- Slim profile: Lightweight, discreet unit with paintable cover to match interior room colors and blend into AV environments
- Easy installation: Includes wall/ceiling mounting plate and connects to the system over single Ethernet cable (PoE compatible)
- Plenum rated: Meets rigorous fire safety test standards for installation above drop ceiling tiles
- Scalable configurations: Available in 2, 4 or 8 channel models to fit varying channel count requirements, and multiple units can be combined support configurations of up to 40 compatible channels (80 in Europe and select countries)
- Bi-directional wireless: Provides return channel audio to wireless transmitters and enables real time remote control of all wireless microphone settings
- Automated frequency coordination: Automatically scans available spectrum, coordinates clean frequency assignments, and moves channels away from unexpected interference
- Dante™ and AES67 digital networked audio: Transports low latency digital audio received from wireless microphones over Cat5e cable to any other Dante-equipped device
- Encrypted wireless: AES 256-bit encryption for secure transmission
- Selectable output power: Optimize spectrum usage by selecting the appropriate wireless output power for the desired operating range
- Diagnostic LEDs: Provide easy visual reference to system activity and indicate power, wireless connection, and network audio status



**MXWAPT**  
Access Point Transceiver

## SPECIFICATIONS (SUBJECT TO CHANGE)

<b>Network Interface</b>	RJ45: Gigabit Ethernet, Dante digital audio
<b>Plenum Rating</b>	UL 2043
<b>Power Requirement</b>	Power over Ethernet (PoE) Class 0, 6.5W
<b>Antenna Type</b>	Internal, Spacial Diversity, Circular Polarization
<b>Housing</b>	Molded Plastic, Cast Zinc
<b>Dimensions</b>	24 mm × 170 mm × 170 mm (1.35 in. × 6.7 in. × 6.7 in.), H × W × D Without mounting plate or cover
<b>Weight</b>	APT8 856 g (1.9 lbs) APT4 845 g (1.9 lbs) APT2 845 g (1.9 lbs) Paintable Cover 85 g (0.2 lbs) Mounting Bracket 68 g (0.15 lbs)

*Data subject to change without notice in interest of product improvements.*

## AVAILABLE MODELS

<b>MXWAPT8</b>	8-Channel Access Point Transceiver
<b>MXWAPT4</b>	4-Channel Access Point Transceiver
<b>MXWAPT2</b>	2-Channel Access Point Transceiver

# MXWANI4, MXWANI8 AUDIO NETWORK INTERFACE

## OVERVIEW

The MXWANI is a 4- or 8-channel Audio Network Interface compatible with Microflex™ Wireless microphone systems that enables easy out-of-the-box system setup with no additional networking hardware required. With per channel analog outputs and a versatile 4-port gigabit switch, it is the central point for connecting and distributing Microflex Wireless systems to conference room AV networks. Front panel controls offer quick adjustments locally, or adjust system settings remotely from a networked PC or Mac through the Microflex Wireless Control Software.

## FEATURES

- Analog connections: 4 or 8 block connector channel outputs, with 1 or 2 block connector inputs (model dependent)
- Four port gigabit switch: Optimized port configurations for connection to the Access Point Transceiver and Networked Charging Stations, third party control systems, and corporate networks
- Ethernet connectivity: Send audio and control signals over long cable runs of up to 300 feet or anywhere over a corporate network
- Power over Ethernet: Port 1 of the rear panel switch supplies power over Ethernet to the Access Point Transceiver for simplified installation
- Corporate uplink mode: Link to the corporate network for remote control of system settings while keeping audio off the network for security and to reduce bandwidth
- Front panel controls: Mute or solo channels and set input/output levels easily from the front panel
- PC/Mac software control: Access the Microflex Wireless Control Software from a networked computer for input/output levels and port configuration
- Dante™ and AES67 networking: Transports low latency digital audio received from wireless microphones over Ethernet to any other Dante-equipped device
- Headphone output: Solo audio signal on any channel



**MXWANI4**  
Audio Network Interface Front Panel



**MXWANI4**  
Audio Network Interface Rear Panel



**MXWANI8**  
Audio Network Interface Front Panel



**MXWANI8**  
Audio Network Interface Rear Panel

# MXWANI4, MXWANI8 AUDIO NETWORK INTERFACE

## SPECIFICATIONS (SUBJECT TO CHANGE)

Audio Frequency Response	20 Hz to 20 kHz (+1, -1.5 dB)
Dynamic Range (20 Hz to 20 kHz, A-weighted, typical)	Analog-to-Dante: 113 dB Dante-to-Analog: 110 dB
Output Noise (20 Hz to 20 kHz, A-Weighted, typical)	Line: -84.5 dBV Aux: -95.2 dBV Mic: -106.5 dBV
THD+N (20 Hz to 20 kHz@ +4dBu analog input, -10 dBFS digital input)	<0.05%
Polarity	Non-inverting, any input to any output
Dimensions	44 mm × 483 mm × 366 mm (1.7 in. × 19.0 in. × 14.4 in.), H × W × D
Weight	MXWANI4 3.1 kg (6.9 lbs) MXWANI8 3.2 kg (7.1 lbs)
Housing	Steel; Extruded aluminum
Power Requirements	100 to 240 V AC, 50-60 Hz, 1 A
Operating Temperature Range	-18°C (0°F) to 63°C (145°F)
Storage Temperature Range	-29°C (-20°F) to 74°C (165°F)

## ANALOG CONNECTIONS - OUTPUTS

Configuration	Active Balanced
Impedance	310 Ω
Clipping Level (minimum)	Line: +26.2 dBV Aux: +16.2 dBV Mic: -3.8 dBV

## ANALOG CONNECTIONS - INPUT(S)

Configuration	Active Balanced
Impedance	10.6 kΩ
Clipping Level (minimum)	Line: +23.8 dBV Aux: +10.8 dBV
Headphone Output	6.35 mm (1/4") TRS, 100 mW, 350 Ω, dual mono (will drive stereo phones)
	0 dBV=1 V RMS    0 dBu=0.775 V RMS    0 dBV=2.2 dBu

## DIGITAL SIGNAL PROCESSING

AD/DA Converter	24-bit, 48 kHz
Latency (Estimated Nominal, ±0.1 ms)	Analog-to-Dante: 0.21 ms Dante-to-Analog: 0.24 ms + TN TN = Network latency in milliseconds, as set in Dante Controller. Note: Dante network latency is typically associated with the receiving device.

## NETWORKING

Network Interface	Four-Port Gigabit Ethernet Switch, Dante digital audio
Uplink Port (Port 4)	Selectable, blocks multicast traffic
Power over Ethernet (PoE)	Provided on Port 1 to power MXWAPT
Cable Requirements	Cat 5e or higher, shielded, 100 m maximum between network devices
Network Addressing Capability	DHCP, link-local, static

## AVAILABLE MODELS

MXWANI8	8-Channel Audio Network Interface
MXWANI4	4-Channel Audio Network Interface

## OPTIONAL ACCESSORIES

90A20082	Hardware Kit
95B8389	IEC Cable



# MXWNCS2, MXWNCS4, MXWNCS8 NETWORKED CHARGING STATION

## OVERVIEW

The MXWNCS is a 2, 4 or 8 port Networked Charging Station compatible with Microflex® Wireless microphone systems. Designed to complement boardroom aesthetics, Networked Charging Stations easily connect between conference room credenzas and AV rack closets over Ethernet via a single Cat5e cable. The front panel displays battery charge in 5 segment LED's, and remaining runtime and charge levels in hours and minutes can be monitored from any networked computer via the control software. Handheld, bodypack and boundary transmitter styles each occupy one docking space while gooseneck bases require two spaces to dock.

## FEATURES

- Versatile microphone docking: Each station accepts all Microflex Wireless transmitters
- Charge status indicators: 5-segment LED's on the unit display charge status individually for every docked microphone
- Remote charge status monitoring: Ethernet connection to the system enables remote monitoring of battery charge status in hours and minutes via the control software or third party control systems
- Easy transmitter linking: Assign docked wireless microphones to channels on an Access Point Transceiver by simply pressing "link"
- Rapid charge times: Reaches 50% charge in one hour and fully charges transmitters in two hours
- Overcharge protection: Smart recharging circuitry safeguards against battery damage and extends life cycles

## SPECIFICATIONS (SUBJECT TO CHANGE)

<b>Charge Time</b>	MXW1, MXW6, MXW8: 50%=1 hour; 100%=2 hours
	MXW2: 50%=1.5 hour; 100%=3 hours
<b>Network Interface</b>	10/100 Mbps Ethernet
<b>Power Requirement</b>	15 V DC @ 3.3 A maximum, supplied by external power supply (tip positive)
<b>Housing</b>	Molded Plastic, Cast Zinc
<b>Dimensions</b>	NCS8: 68 mm × 343 mm × 184 mm (2.7 in. × 13.5 in. × 7.25 in.), H × W × D NCS4: 68 mm × 191 mm × 184 mm (2.7 in. × 7.5 in. × 7.25 in.), H × W × D NCS2: 48 mm × 102 mm × 154 mm (1.9 in. × 4.0 in. × 6.1 in.), H × W × D
<b>Weight</b>	NCS8 2.9 kg (6.4 lbs) NCS4 1.7 kg (3.7 lbs) NCS2 0.8 kg (1.8 lbs)

## AVAILABLE MODELS

<b>MXWNCS8</b>	Networked Charging Station, 8 Port
<b>MXWNCS4</b>	Networked Charging Station, 4 Port
<b>MXWNCS2</b>	Networked Charging Station, 2 Port



**MXWNCS2**  
Networked Charging Station shown  
with MXW2/SM58 and MXW6



**MXWNCS4**  
Networked Charging Station



**MXWNCS8**  
Networked Charging Station

# AMP-X300

## X-Series Amplifier



- *ENERGY STAR® certified power amplifier*
- *1 RU high design is surface or rack mountable*
- *Half-rack width form factor, gangable with other next generation half-rack width form factor products*
- *Configurable for either LoZ (4/8 Ω) or Hi-Z (70V or 100V) operation*
- *Configurable for 4 x up to 75 W output, 2 x up to 150 W output, 1 x up to 300 W (bridged) output, and 2 x up to 75 W + 1 x up to 150 W (bridged) output*
- *Low noise, low distortion, and high headroom*
- *Comprehensive fault and speaker protection*
- *Captive speaker connectors for secure and robust connectivity*
- *Balanced and unbalanced inputs*
- *Standby feature instantly turns on amplifier when input sensing circuitry detects an audio signal*
- *Always On feature allows constant on connection with very low power consumption*
- *Remote standby feature allows for instant on/off control over amplifier outputs via a simple contact closure input*
- *Front panel power/standby, fault, and signal/clip indicators*
- *Internal universal 100-240V power supply*

The Crestron® AMP-X300 is a high performance, space saving, energy efficient, professional grade amplifier solution that is totally configurable, yet simple to use. Whether you need a stereo amp that mounts on a wall or under a table, or a multichannel rack mount amp with multiple output types and power levels, the AMP-X300 is simple to specify and install in any configuration.

### LoZ (4/8 Ω) and Hi-Z (70V or 100V) Output

The AMP-X300 is a 4-channel amplifier (up to 75 W per channel) which can also be configured for 3-channel bridged operation (up to 75 W per single ended channel and up to 150 W for the bridged channel), or 2-channel bridged operation (up to 150 W per channel), or 1 channel bridged operation (up to 300 W), with a choice of "LoZ" outputs to drive 4- or 8-Ω speakers, or "Hi-Z" outputs to drive a distributed speaker system (70V or 100V). Balanced and unbalanced inputs are provided for connection to two stereo or four mono source(s) via detachable terminal blocks or RCA connectors.

**NOTE:** Each configuration can output up to its respective power rating.

### Solid & Efficient Performance

The AMP-X300 is engineered to deliver exceptional performance and reliability with low distortion, low noise, and high power headroom. Advanced Class D technology maximizes efficiency to reduce power consumption and heat dissipation. An internal universal power supply ensures consistent performance at varying line voltages.

### Convection Cooling

The efficient design ensures cool running operation and long-term reliability. The AMP-X300 is high-density stackable with other Crestron modular amps, allowing multiple units to be installed vertically in an equipment rack without needing extra ventilation space.

### Modular Design

The AMP-X300 is housed in a half-width rack-mountable form factor that can be installed individually or ganged together in a single rack space. The amplifier ships complete with all the hardware required for installation. Rack and surface mount parts are included, so no additional mounting accessories or rack shelves are required.

Whether mounting in a rack, attaching to a flat surface, or placing on a shelf, it is easy to combine two amplifiers into a single assembly.

### Fully Protected

The AMP-X300 features protection against overheating, shorted or overloaded speaker lines, excessive input signals, and other faults. In the case of a shorted speaker line or overheating condition, both outputs mute automatically until the fault condition is resolved. In the event of a prolonged fault, such as an internal component failure, the outputs mute instantly and the amplifier shuts down.

### ENERGY STAR® Certified

An energy-efficient design enables the AMP-X300 to meet demanding ENERGY STAR requirements. In addition to its high efficiency under operation, the AMP-X300 draws no added inrush current during power-up, thereby reducing AC circuit requirements and allowing multiple units to be connected to a single switched circuit. To reduce energy usage further, the AMP-X300 can be configured to enter a low-power standby state if no input signal is detected on either channel for 25 minutes. Signal detection has been optimized for sensitivity to improve response time when triggering the amplifier to the "on" state, allowing it to return to full operation within a half-second the instant an input signal is detected. A remote input can be connected to a contact closure to place the amplifier outputs in controlled standby mode.

# AMP-X300

## X-Series Amplifier

### Specifications

#### Audio

**Input Signal Types** Balanced or unbalanced analog line-level

#### Output Power

Mode	1 Channel Driven	2 Channels Driven	3 Channels Driven	4 Channels Driven
LoZ, 8 $\Omega$ (single ended)	150 W	150 W	75 W <sup>1</sup>	75 W
LoZ, 4 $\Omega$ (single ended)	200 W	150 W	75 W <sup>1</sup>	75 W
LoZ, 8 $\Omega$ Bridged	300 W	150 W	150 W <sup>1</sup>	N/A
Hi-Z 70V	300 W	150 W	N/A	N/A
Hi-Z 100V	300 W	150 W	N/A	N/A

#### NOTES:

- Total output power from all channels combined (simultaneously) is up to 300 W.
- Each mode will output power in watts up to the value listed in the table.

<b>Frequency Response</b>	20 Hz to 20 kHz $\pm$ 0.5 dB at 1 W
<b>High-Pass Filter (70V and 100V operation only)</b>	-3 dB @ 80 Hz, -12 dB/octave
<b>THD+N</b>	<0.1% at 1 kHz @ -3 dB full rated output power
<b>S/N Ratio</b>	>103 dBA, 20 Hz to 20 kHz, balanced
<b>Crosstalk</b>	-75 dB at 1 kHz
<b>Input Sensitivity</b>	1.23 Vrms, +4 dBu balanced; 0.316 Vrms, -10 dBV unbalanced; For 150 W (8 $\Omega$ ), 300 W (8 $\Omega$ Bridged), 300 W (70V/100V)
<b>Gain</b>	29 dB @ 8 $\Omega$
<b>Protection</b>	Over current, under voltage, over temperature, DC offset, extreme high frequency

**Go to Sleep Time** 25 minutes with no signal present (when set to POWER SAVER)

**Wake Time** 0.5 s typical

**Wake Threshold** 0.44 mV typical

#### Connectors

**CH1-CH4** (2) 4-pin 5.08 mm pitch, 12A plug with screw locking retainers; Power amplifier output; Wire Size: Terminals accept up to 12 AWG (3.31 mm<sup>2</sup>)

**NOTE:** Output is direct-coupled, not transformer isolated.

**AUDIO IN (UNBALANCED)** (4) RCA connectors, female; Unbalanced line-level audio inputs (Summing on channels 1 + 2 and channels 3 + 4); Maximum Input Level: 2.24 Vrms, +7 dBV (+9.2 dBu)

**AUDIO IN (BALANCED)** (4) 3-pin 3.5 mm detachable terminal block; Balanced line-level audio inputs; Channel pairs 1 - 2 and 3 - 4 can each be configured to operate as stereo channels or a downmixed mono channel; Maximum Input Level: 7.75 Vrms, +20 dBu; Input Impedance: 20k  $\Omega$

**REMOTE** (1) 2 pin 3.5 mm detachable terminal block; Connect to dry contact closure to place amplifier in standby mode.

**G** (1) 6-32 screw; Chassis ground lug

**100-240V~ 1.2-0.6A 50/60 Hz** (1) IEC 60320 C14 main power inlet; Mates with removable power cord, included

#### Controls & Indicators

**PWR** (1) White/Red LED; White indicates amplifier is on and ready for use; Red indicates amplifier is in standby

**HI-Z** (1) White LED; Indicates when Hi-Z mode is enabled (70V or 100V); Channels 1 - 2 and 3 - 4 are bridged and set to 70V or 100V operation

**SIGNAL** (4) White LEDs (one per input); Indicates when an active input signal is present

# AMP-X300

## X-Series Amplifier

<b>FAULT</b>	(4) Red LEDs (one per input); Indicates that the input channel is faulted or clipping
<b>GAIN 1-4</b>	(4) Screwdriver-adjustable rotary controls, one per input channel; Adjusts the input attenuation level for the corresponding input channel
<b>LoZ Modes</b>	(2) Slide switches, one switch controlling channels 1 and 2, and one switch controlling channels 3 and 4; Selects stereo, summed, or bridged operation <ul style="list-style-type: none"><li>• <b>STEREO:</b> The input signal received on each channel is sent to its respective output for use in applications where left and right channel separation is required. The four GAIN controls are independently adjustable.</li><li>• <b>SUM:</b> The input signals sent to a channel pair (1 + 2 or 3 + 4) are summed and sent to their respective individual outputs. The four GAIN controls are independently adjustable.</li><li>• <b>BRIDGE:</b> The input signals sent to a channel pair (1 + 2 or 3 + 4) are summed and sent to a bridged output (1 + 2 or 3 + 4) for use in high-power applications. The GAIN 1 control adjusts the bridged 1 + 2 output, and the GAIN 3 control adjusts the bridged 3 + 4 output.</li></ul>
<b>Operations Mode</b>	(1) Slide switch; Sets the amplifier for LoZ (4 or 8 $\Omega$ ) or Hi-Z operation (70V or 100V)
<b>Power Mode</b>	(1) Slide switch; Selects "Power Saver" or "Always On" operation

### Power

<b>Main Power</b>	1.2-0.6A @ 100-240VAC, 50/60 Hz
<b>Power Consumption</b>	75 W, (4 channels driven at 1/8th output power, 4 $\Omega$ ); 16 W, idle (Hi-Z mode); 0.365 W, power saver (230VAC/50 Hz)

### Environmental

<b>Temperature</b>	41 to 104°F (5° to 40°C)
<b>Humidity</b>	10% to 90% RH (non-condensing)

<b>Heat Dissipation</b>	107 BTU/hr @ 4 $\Omega$ , all channels driven at 1/8th output power; 55 BTU/hr, all channels idle (Hi-Z mode); 1.2 BTU/hr in standby
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### Construction

<b>Chassis</b>	Metal, convection cooled (fanless)
<b>Front Panel</b>	Metal, black finish with polycarbonate label overlay
<b>Mounting</b>	Freestanding, surface mount, or 1/2 width 1 RU 19 in. rack mountable; Gangable with other Crestron modular AMP series products (adhesive feet, surface mounting, rack mounting, and ganging hardware all included)

### Dimensions

<b>Height</b>	1.75 in. (44 mm) without feet; 1.83 in. (46 mm) with feet
<b>Width</b>	8.67 in. (220 mm) without mounting brackets 19.00 in. (483 mm) with mounting brackets
<b>Depth</b>	11.04 in. (280 mm)

### Weight

5.3 lb (2.4 kg)

### Compliance

ENERGY STAR, ErP (1275/2008/EC), UL® 62368, FCC Class B residential use

### Model

**AMP-X300**  
Modular Amplifier

### Available Accessories

For a list of available accessories, visit the [AMP-X300](#) product page.

Note:

1. 3 channel operation requires two single ended loads and one bridged load.

# AMP-X300

## X-Series Amplifier

This product may be purchased from select authorized Crestron dealers and distributors. To find a dealer or distributor, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/How-To-Buy/Find-a-Representative](http://www.crestron.com/How-To-Buy/Find-a-Representative) or by calling 855-263-8754.

This product is covered under the Crestron standard limited warranty. Refer to [www.crestron.com/warranty](http://www.crestron.com/warranty) for full details.

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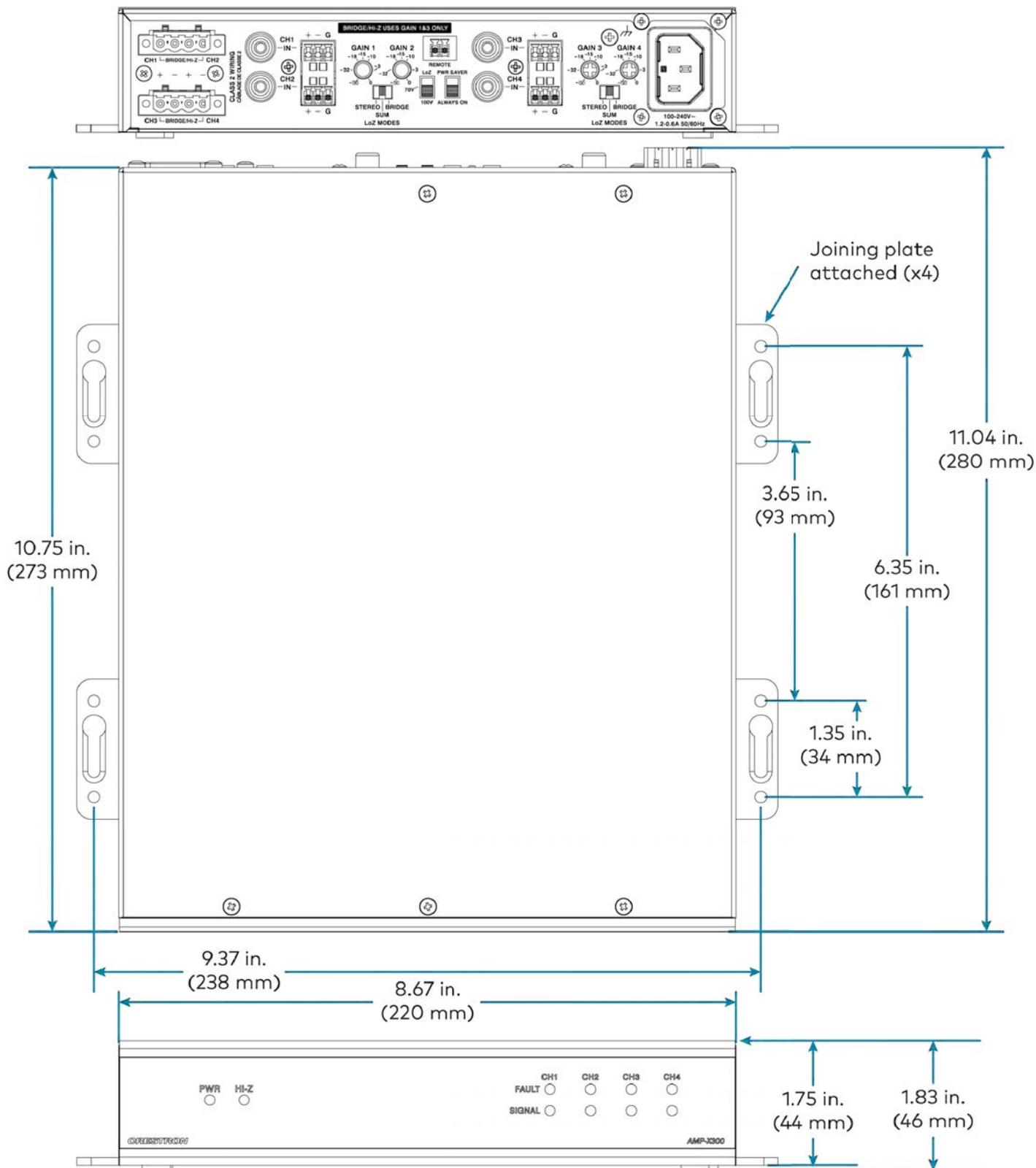
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Rev 11/19/21

# AMP-X300

## X-Series Amplifier



## DM NVX® 1080p60 4:4:4 Network AV Decoder



- Support of video resolutions up to 1080p 4:4:4 over standard Gigabit Ethernet
- Real-time video performance over the network
- Enterprise-grade security including 802.1X, Active Directory® credential management, TLS, and AES-128
- HDCP 1.4 compliance
- Decoder functionality designed for use with the DM-NVX-E10 encoder and support for other DM NVX® products that can function as encoders
- One HDMI® output
- Analog audio de-embedding
- 7.1 surround sound audio
- AES67 audio embedding and de-embedding
- Copper Ethernet connectivity with PoE support
- Automatic point-to-point connectivity with the DM-NVX-E10
- Device control via RS-232, IR, and CEC
- Easy setup using built-in web pages
- Compatibility with Crestron® 3-Series® or later control systems
- Streamlined management using DM NVX Director® virtual switching appliances
- .AV Framework™ technology support
- XiO Cloud® service support
- Crestron Home® OS support
- API for full control of the DM-NVX-D10
- Compact, surface-mountable design
- Powered via PoE or optional power pack (sold separately)

The DM-NVX-D10 is a compact AV-over-IP decoder designed to receive video with resolutions up to 1080p 4:4:4 over standard Gigabit Ethernet. Featuring secure web-based control and management, an HDMI® output, an analog audio output, AES67 transmit and receive capability, and copper Ethernet connectivity with PoE support, the DM-NVX-D10 provides a decoder solution that offers price and performance optimization in a DM NVX® network AV installation of any size.<sup>1</sup>

### Real-Time 1080p60 Video Performance

Engineered for demanding conference room and classroom applications, the DM-NVX-D10 ensures real-time, full-motion 1080p60 video performance for the presentation of multimedia, videoconferencing, and live camera images. Interactive functions such as gameplay and the use of a mouse are fluid and natural.

A DM NVX system is engineered for stability and ultimate reliability. Line-synchronized outputs ensure perfect synchronization of content across multiple displays for applications such as digital signage. Variable Multicast TTL (Time To Live) enables traversing multiple network routers for optimal flexibility.

### Enterprise-Grade Security

Using advanced security features and protocols such as 802.1X authentication, Active Directory® credential management, AES-128 content encryption, PKI authentication, TLS, SSH, and HTTPS, a DM NVX system delivers a true enterprise-grade network AV solution engineered to fulfill demanding IT policies.

### Decoder Functionality

The DM-NVX-D10 provides decoder functionality designed for use with the DM-NVX-E10 encoder. Both the DM-NVX-D10 and DM-NVX-E10 support resolutions up to 1080p60. The DM-NVX-D10 receives a signal from the DM-NVX-E10 and feeds it to a local display device via the HDMI output.

In addition to the DM-NVX-E10, the DM-NVX-D10 is also interoperable with other DM NVX products that can function as encoders. The resolution of the encoder must be configured so that it does not exceed the maximum resolution of the DM-NVX-D10. If the DM-NVX-D10 is used with a DM NVX encoder other than the DM-NVX-E10 or DM-NVX-E20 Series, the stream type of the encoder must also be configured to interoperate with the DM-NVX-D10. Configuration of the encoder is accomplished by using the web interface or a control system.

**NOTE:** It is recommended that the DM-NVX-D10 not be used with 4K60 4:4:4 encoders (for example, the DM-NVX-36x[C] Series) or the 4K60 4:2:0 encoders (DM-NVX-E20 Series) in order to maintain the higher resolutions supported by the 4K60 4:4:4 and 4:2:0 encoders.

**NOTE:** The HDMI output does not support video scaling.

### Analog Audio De-embedding

The analog audio output provides a stereo line-level signal to feed a local sound system or sound bar. The output volume can be adjusted by using the web interface or a control system.<sup>2</sup>

### 7.1 Surround Sound Audio

DM NVX technology supports the lossless transport of 7.1 surround sound audio signals, including Dolby® TrueHD, Dolby Atmos®, DTS HD®, DTS:X®, and uncompressed linear PCM.

## DM NVX® 1080p60 4:4:4 Network AV Decoder

**AES67 Audio Embedding and De-embedding**

AES67 support enables the selected audio source to be transmitted as a 2-channel AES67 audio stream while another 2-channel AES67 audio stream is received from a Crestron DSP or other third-party device. The AES67 audio stream that is received can be combined with the video signal and then output via the HDMI output and analog audio output.

**NOTE:** An AES67 audio stream that is received by a DM NVX endpoint cannot be transmitted from that endpoint.

**Copper Ethernet Connectivity**

The DM-NVX-D10 includes one RJ-45 1000BASE-T Ethernet port.<sup>1</sup> The port is PoE compliant, enabling the device to be powered via a PoE Ethernet switch.<sup>3</sup> For information about network requirements and guidelines, refer to the [DM NVX AV-over-IP System Design Guide](#).

**Automatic Point-to-Point Connectivity with the DM-NVX-E10**

Point-to-point connectivity enables the DM-NVX-D10 to be connected directly to a DM-NVX-E10 to stream video and audio. Rather than being connected to an Ethernet switch, the 1000BASE-T Ethernet port of the DM-NVX-D10 is connected directly to the 1000BASE-T port of the DM-NVX-E10. By default, point-to-point mode automatically detects whether a DM-NVX-D10 is connected directly to the DM-NVX-E10 or to a 1000BASE-T switch. When a direct connection between the DM-NVX-D10 and DM-NVX-E10 is detected, the devices operate in point-to-point mode without the need for additional configuration. The web interface or a control system can be used to disable point-to-point mode or to enable automatic detection of point-to-point connectivity.

**Device Control via RS-232, IR, and CEC**

The DM-NVX-D10 includes built-in COM (RS-232) and IR ports for control of devices under the management of a control system. Additional control capability is provided by CEC (Consumer Electronics Control) over the HDMI connection. Under the management of a control system, the DM-NVX-D10 can control the display device via CEC, potentially eliminating the need for dedicated serial cables or IR emitters.

The COM port, IR port, and CEC over the HDMI output can also enable the display device to be turned on or off automatically without the use of a control system.

**Web-Based Setup**

Setup of the DM-NVX-D10 is accomplished by using a web browser. Full control and monitoring of the device is enabled through integration with a control system or with a DM NVX Director® virtual switching appliance.

**Streamlined Management Using DM NVX Director Virtual Switching Appliances**

Use of a DM NVX Director virtual switching appliance ([DM-NVX-DIR-80](#), [DM-NVX-DIR-160](#), or [DM-NVX-DIR-ENT](#)) streamlines the entire configuration and control process. A DM NVX Director appliance provides a central point of management and enables the creation of multiple virtual matrix switchers through one easy-to-use web-based portal.

**Compact Surface-Mountable Design**

The DM-NVX-D10 mounts conveniently to a flat surface or rack rail and fits easily behind a flat panel display, above a ceiling-mounted projector, or inside an AV cart or equipment cabinet. All connectors and LED indicators are positioned on the front and rear of the device, offering optimal access and visibility for a clean, serviceable installation. Power is provided via or an optional power pack (sold separately).<sup>3</sup>

*For additional information about DM NVX technology and the DM NVX product family, refer to the DM NVX web page at [www.crestron.com/nvx](http://www.crestron.com/nvx).*

## DM NVX® 1080p60 4:4:4 Network AV Decoder

## Specifications

## Decoding

<b>Stream Type</b>	Default support for DM-NVX-E10/E20 Series; Support available for 4K60 4:4:4 encoders when using DM-NVX-D10 supported resolutions
<b>Video Resolutions</b>	Up to 1920x1080@60Hz (1080p), 4:4:4 color sampling, and Deep Color support
<b>Audio Formats</b>	Multichannel (up to 8-channel LPCM or encoded HBR 7.1 surround sound)
<b>Bit Rates</b>	Based on the stream received from the encoder
<b>Streaming Protocols</b>	RTP, SDP
<b>Container</b>	MPEG-2 transport stream (.ts)
<b>Session Initiation</b>	Multicast via secure RTSP
<b>Copy Protection</b>	HDCP 1.4, AES-128, PKI

## Video

<b>Output Signal Types</b>	HDMI with Deep Color and 1080p60 support (DVI compatible) <sup>4</sup>
<b>Copy Protection</b>	HDCP 1.4
<b>Resolutions, Progressive</b>	640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60Hz, 1024x852@60Hz, 1024x1024@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz, plus any other resolution allowed by HDMI up to 165MHz pixel clock

## Audio

<b>Output Signal Types</b>	HDMI, analog stereo
<b>Digital Formats</b>	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
<b>Analog Formats</b>	Stereo 2-channel
<b>Digital-To-Analog Conversion</b>	24-bit 48 kHz
<b>AES67</b>	24-bit 48 kHz
<b>Analog Performance</b>	Frequency Response: 20 Hz to 20 kHz ±0.5 dB S/N Ratio: >95 dB 20 Hz to 20 kHz A-weighted THD+N: <0.0005% @ 1 kHz Stereo Separation: >90 dB
<b>Analog Output Volume Adjustment</b>	-80 to +20 dB

## Communications

<b>Ethernet</b>	100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, secure CIP, DHCP, SSL, TLS, SSH, SFTP (SSH File Transfer Protocol), IEEE 802.1X, IPv4 only or both IPv4 and IPv6, Active Directory authentication, variable Multicast TTL, HTTPS web browser setup and control, Crestron 3-Series or later control system integration
<b>RS-232</b>	2-way device control and monitoring up to 115.2k baud
<b>IR/Serial</b>	1-way device control via infrared up to 1.1 MHz or serial TTL/RS-232 (0-5 V) up to 19.2k baud (via control system)
<b>HDMI</b>	HDCP 1.4, EDID, CEC
<b>DM NVX (via Ethernet)</b>	HDCP 1.4, AES-128 AV content encryption with PKI authentication, RTP, secure RTSP, SDP, ONVIF, IGMPv2, IGMPv3, SMPTE 2022

## DM NVX® 1080p60 4:4:4 Network AV Decoder

**Connectors**

<b>Ethernet</b>	(1) 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port; <sup>1</sup> PoE PD (powered device) port; IEEE 802.3af Type 1 PoE Class 3 (12.95 W) compliant; Compatible with PoE compliant Ethernet switch or third-party PoE PSE <sup>3</sup>
<b>HDMI OUTPUT</b>	(1) HDMI Type A connector, female; HDMI digital video/audio output (DVI compatible) <sup>4</sup>
<b>AUDIO OUT</b>	(1) 3-pin 3.5 mm detachable terminal block; Unbalanced stereo line level audio output; <sup>2</sup> Output Impedance: 100 Ohms unbalanced; Maximum Output Level: 2 Vrms unbalanced
<b>IR</b>	(1) 2-pin 3.5 mm detachable terminal block; IR/Serial port; IR output up to 60kHz; 1-way serial TTL/RS-232 (0-5 V) up to 19200 baud; <a href="#">IRP2</a> emitter sold separately
<b>COM</b>	(1) 3-pin 3.5 mm detachable terminal block; Bidirectional RS-232 port; Up to 115.2k baud
<b>24V 0.75A</b>	(1) 2.1 x 5.5 mm DC power connector; 24 VDC power input; <a href="#">PW-2407WU</a> power pack (sold separately)
<b>G</b>	(1) 6-32 screw; Chassis ground lug

**Controls and Indicators**

<b>Ethernet</b>	(2) LEDs, green indicates Ethernet link status, amber indicates Ethernet activity
<b>HDMI OUTPUT</b>	(1) Green LED, indicates video signal transmission at the HDMI output
<b>PWR</b>	(1) Bi-color green/amber LED, indicates operating power supplied via PoE or optional power pack (sold separately), lights amber while the device is booting and green when the device is operational
<b>SETUP</b>	(1) Red LED and (1) push button
<b>RESET</b>	(1) Recessed push button, reboots the device

**Power**

<b>PoE</b>	IEEE 802.3af Type 1 Class 3 (12.95 W) compliant; Compatible with IEEE 802.3af compliant Ethernet switch or third-party PoE compliant PSE
<b>Power Pack (Optional)</b>	Input: 100-240 VAC, 50/60 Hz Output: 0.75 A @ 24 VDC Model: <a href="#">PW-2407WU</a> (sold separately)
<b>Power Consumption</b>	8.6 W typical

**Environmental**

<b>Temperature</b>	32° to 104° F (0° to 40° C)
<b>Humidity</b>	10% to 95% RH (non-condensing)
<b>Heat Dissipation</b>	29 BTU/hr
<b>Acoustic Noise</b>	None (fanless)

**Enclosure**

<b>Chassis</b>	Metal, black finish, vented top, front, rear, and sides
<b>Mounting</b>	Freestanding, surface mountable, or attachment to a single rack rail (mounting flanges included)

**Dimensions**

<b>Height</b>	5.04 in. (128 mm)
<b>Width</b>	9.05 in. (230 mm)
<b>Depth</b>	1.00 in. (26 mm)

**Weight**

1.32 lb (0.60 kg)

**Compliance****Regulatory Model: M202028003**

Bureau Veritas Listed for US and Canada, IC, CE, FCC Part 15 Class B digital device

**Model**DM-NVX-D10  
DM NVX® 1080p60 4:4:4 Network AV Decoder

## DM NVX® 1080p60 4:4:4 Network AV Decoder

### Management Tools

#### DM-NVX-DIR-80

DM NVX Director Virtual Switching Appliance,  
80 Endpoints

#### DM-NVX-DIR-160

DM NVX Director Virtual Switching Appliance,  
160 Endpoints

#### DM-NVX-DIR-ENT

DM NVX Director Virtual Switching Appliance,  
1000 Endpoints

### HDMI

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### Accessories

For a list of accessories, visit the [DM-NVX-D10](#) product page.

#### Notes:

1. The minimum cable required for DM NVX AV over 1000BASE-T Ethernet (copper) is unshielded CAT5e. The Ethernet port on the DM-NVX-D10 is provided for connection to an Ethernet network or device—the port cannot be connected to the DM® port of other Crestron devices.  
A nonblocking network is required for DM NVX devices.
2. The analog audio output is functional only when the DM-NVX-D10 is receiving a 2-channel stereo input signal.
3. In order for the Ethernet port to receive PoE, the port must be connected to a PoE compliant Ethernet switch or other equipment that has a PoE power sourcing equipment (PSE) port. Cabling that is connected to a PoE PSE port is designed for intrabuilding use only.
4. HDMI connections require an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cables are available separately.

This product may be purchased from select authorized Crestron dealers and distributors. To find a dealer or distributor, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/How-To-Buy/Find-a-Representative](http://www.crestron.com/How-To-Buy/Find-a-Representative) or contact us for additional information by visiting [www.crestron.com/contact/our-locations](http://www.crestron.com/contact/our-locations) for your local contact.

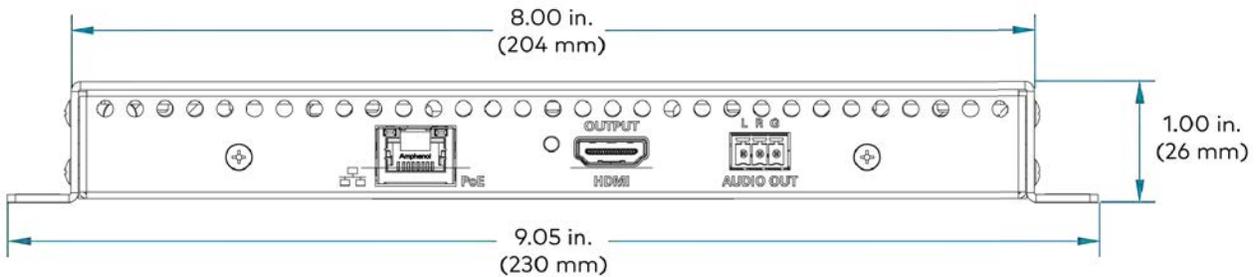
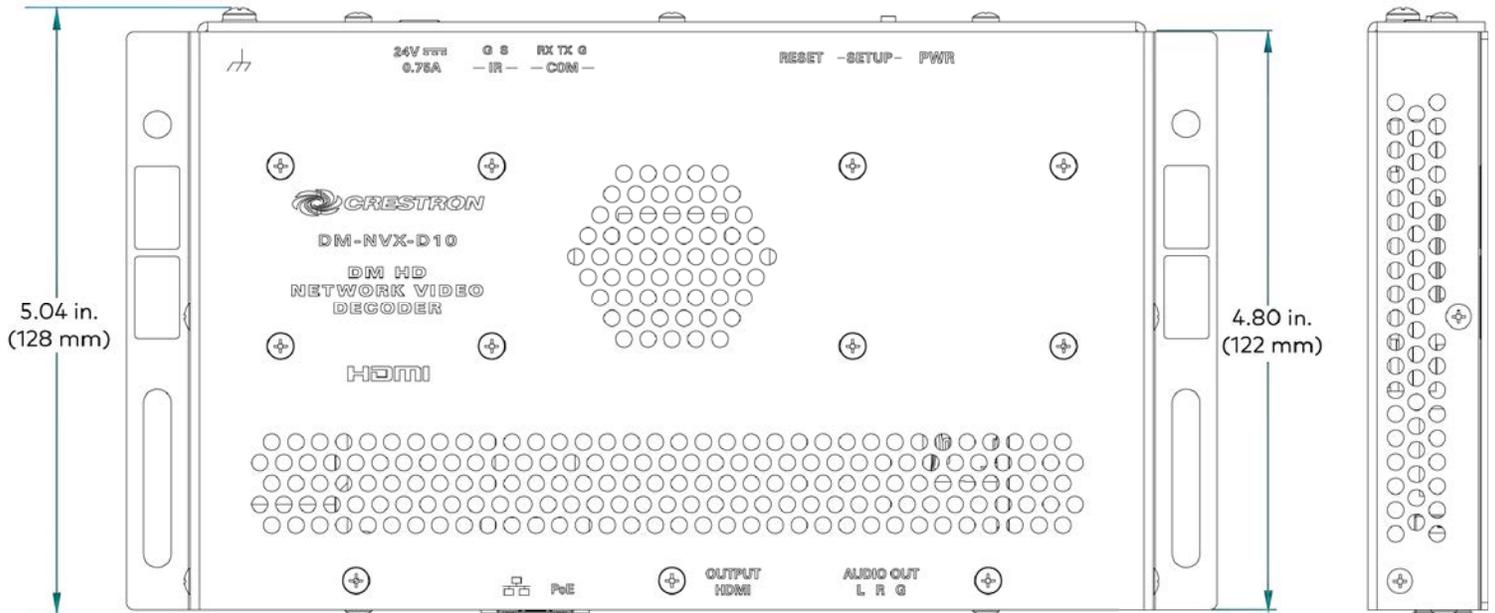
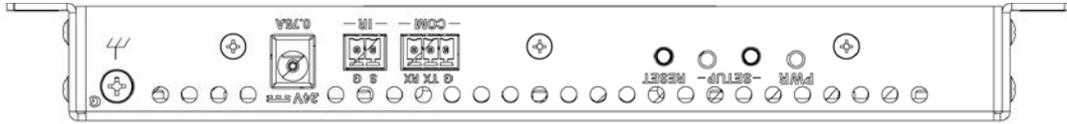
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The specific patents that cover Crestron products are listed online at [patents.crestron.com](http://patents.crestron.com).

Certain Crestron products contain open source software. For specific information, please visit [www.crestron.com/opensource](http://www.crestron.com/opensource).

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## DM NVX® 1080p60 4:4:4 Network AV Decoder



## DM NVX® 1080p60 4:4:4 Network AV Encoder



- Support of video resolutions up to 1080p 4:4:4 over standard Gigabit Ethernet
- Real-time video performance over the network
- Enterprise-grade security including 802.1X, Active Directory® credential management, TLS, and AES-128
- HDCP 1.4 compliance
- Encoder functionality for use with the DM-NVX-D10 or other DM NVX® products that can function as decoders
- One HDMI® input
- Fixed or adaptive bit rate
- Analog audio de-embedding
- 7.1 surround sound audio
- AES67 audio embedding and de-embedding
- Copper Ethernet connectivity with PoE support
- Automatic point-to-point connectivity with the DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200
- Device control via RS-232, IR, and CEC
- Easy setup using built-in web pages
- Compatibility with Crestron® 3-Series® or later control systems
- Streamlined management using DM NVX Director® virtual switching appliances
- .AV Framework™ technology support
- XiO Cloud® service support
- Crestron Home® OS support
- API for full control of the DM-NVX-E10
- Compact, surface-mountable design
- Powered via PoE or optional power pack (sold separately)

The DM-NVX-E10 is a compact AV-over-IP encoder designed to transmit video with resolutions up to 1080p 4:4:4 over standard Gigabit Ethernet. Featuring secure web-based control and management, an HDMI® input, an analog audio output, AES67 transmit and receive capability, and copper Ethernet connectivity with PoE support, the DM-NVX-E10 provides an encoder solution that offers price and performance optimization in a DM NVX® network AV installation of any size.<sup>1</sup>

### Real-Time 1080p60 Video Performance

Engineered for demanding conference room and classroom applications, the DM-NVX-E10 ensures real-time, full-motion 1080p60 video performance for the presentation of multimedia, videoconferencing, and live camera images. Interactive functions such as gameplay and the use of a mouse are fluid and natural.

A DM NVX system is engineered for stability and ultimate reliability. Line-synchronized outputs ensure perfect synchronization of content across multiple displays for applications such as digital signage. Variable Multicast TTL (Time To Live) enables traversing multiple network routers for optimal flexibility.

### Enterprise-Grade Security

Using advanced security features and protocols such as 802.1X authentication, Active Directory® credential management, AES-128 content encryption, PKI authentication, TLS, SSH, and HTTPS, a DM NVX system delivers a true enterprise-grade network AV solution engineered to fulfill demanding IT policies.

### Encoder Functionality

The DM-NVX-E10 encoder provides one HDMI input that enables a laptop computer, camera, or other media source to be connected via an HDMI cable and then transmitted over the network to one or many decoders.<sup>1</sup> Compatible with the DM-NVX-D10 and other DM NVX products that can function as decoders, the DM-NVX-E10 can be used in any DM NVX network AV design.

### Fixed or Adaptive Bit Rate

The bit rate of a stream can be set to a fixed or adaptive bit rate. A fixed bit rate, also referred to as Constant Bit Rate (CBR), is user specified and can be set to a value ranging from 200 Mbps to 950 Mbps.

Adaptive bit rate (ABR) enables the encoder to automatically set a fixed bit rate based on the input resolution of the stream. For example, the adaptive bit rate for a common resolution such as 1920x1080p@60Hz (1080p60) would automatically be set to 400 Mbps. Adaptive bit rate makes better use of the available bandwidth than a user-specified fixed bit rate.

The web interface or a control system can be used to set a fixed bit rate or to enable adaptive bit rate functionality.

# DM NVX® 1080p60 4:4:4 Network AV Encoder

## Analog Audio De-embedding

The analog audio output provides a stereo line-level signal to feed a local sound system or sound bar. The output volume can be adjusted by using the web interface or a control system.<sup>2</sup>

## 7.1 Surround Sound Audio

DM NVX technology supports the lossless transport of 7.1 surround sound audio signals, including Dolby® TrueHD, Dolby Atmos®, DTS HD®, DTS:X®, and uncompressed linear PCM.

## AES67 Audio Embedding and De-embedding

AES67 support enables the selected audio source to be transmitted as a 2-channel AES67 audio stream while another 2-channel AES67 audio stream is received from a Crestron DSP or other third-party device. The AES67 audio stream that is received can be output via the analog audio output.

**NOTE:** An AES67 audio stream that is received by a DM NVX endpoint cannot be transmitted from that endpoint.

## Copper Ethernet Connectivity

The DM-NVX-E10 includes one RJ-45 1000BASE-T Ethernet port.<sup>1</sup> The port is PoE compliant, enabling the device to be powered via a PoE Ethernet switch.<sup>3</sup> For information about network requirements and guidelines, refer to the [DM NVX AV-over-IP System Design Guide](#).

## Automatic Point-to-Point Connectivity

Point-to-point connectivity enables the DM-NVX-E10 to be connected directly to the DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200 in order to stream video and audio. Rather than being connected to an Ethernet switch, the 1000BASE-T Ethernet port of the DM-NVX-E10 is connected directly to a 1000BASE-T port of the decoder. By default, point-to-point mode automatically detects whether the DM-NVX-E10 is connected directly to a decoder or to a 1000BASE-T switch. When a direct connection between the DM-NVX-E10 and the decoder is detected, the devices operate in point-to-point mode without the need for additional configuration. The web interface or a control system can be used to disable point-to-point mode or to enable automatic detection of point-to-point connectivity.

## Device Control via RS-232, IR, and CEC

The DM-NVX-E10 includes built-in COM (RS-232) and IR ports for control of source devices under the management of a control system. Additional control capability is provided by CEC (Consumer Electronics Control) over the HDMI connection. Under the management of a control system, the DM-NVX-E10 can control a source device via CEC, potentially eliminating the need for dedicated serial cables or IR emitters.

## Web-Based Setup

Setup of the DM-NVX-E10 is accomplished by using a web browser. Full control and monitoring of the device is enabled through integration with a control system or with a DM NVX Director® virtual switching appliance.

## Streamlined Management Using DM NVX Director Virtual Switching Appliances

Use of a DM NVX Director virtual switching appliance ([DM-NVX-DIR-80](#), [DM-NVX-DIR-160](#), or [DM-NVX-DIR-ENT](#)) streamlines the entire configuration and control process. A DM NVX Director appliance provides a central point of management and enables the creation of multiple virtual matrix switchers through one easy-to-use web-based portal.

## Compact Surface-Mountable Design

The DM-NVX-E10 mounts conveniently to a flat surface or rack rail and fits easily beneath a tabletop or inside a lectern, AV cart, or equipment cabinet. All connectors and LED indicators are positioned on the front and rear of the device, offering optimal access and visibility for a clean, serviceable installation. Power is provided via PoE or an optional power pack (sold separately).<sup>3</sup>

*For additional information about DM NVX technology and the DM NVX product family, refer to the DM NVX web page at [www.crestron.com/nvx](http://www.crestron.com/nvx).*

## DM NVX® 1080p60 4:4:4 Network AV Encoder

## Specifications

## Encoding

<b>Video Resolutions</b>	Up to 1920x1080@60Hz (1080p), 4:4:4 color sampling, and Deep Color support
<b>Audio Formats</b>	Multichannel (up to 8-channel LPCM or encoded HBR 7.1 surround sound)
<b>Bit Rates</b>	Fixed: 200 to 950 Mbps Adaptive: Based on input resolution of the stream
<b>Streaming Protocols</b>	RTP, SDP
<b>Container</b>	MPEG-2 transport stream (.ts)
<b>Session Initiation</b>	Multicast via secure RTSP
<b>Copy Protection</b>	HDCP 1.4, AES-128, PKI

## Video

<b>Input Signal Types</b>	HDMI with Deep Color and 1080p60 support <sup>4</sup> (Dual-Mode DisplayPort™ interface and DVI compatible <sup>5</sup> )
<b>Copy Protection</b>	HDCP 1.4
<b>Resolutions, Progressive</b>	640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60Hz, 1024x852@60Hz, 1024x1024@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz, plus any other resolution allowed by HDMI up to 165MHz pixel clock

## Audio

<b>Input Signal Types</b>	HDMI (Dual-Mode DisplayPort interface compatible) <sup>5</sup>
<b>Digital Formats</b>	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
<b>Analog Formats</b>	Stereo 2-channel
<b>Digital-To-Analog Conversion</b>	24-bit 48 kHz
<b>AES67</b>	24-bit 48 kHz
<b>Analog Performance</b>	Frequency Response: 20 Hz to 20 kHz ±0.5 dB S/N Ratio: >95 dB 20 Hz to 20 kHz A-weighted THD+N: <0.0005% @ 1 kHz Stereo Separation: >90 dB
<b>Analog Output Volume Adjustment</b>	-80 to +20 dB

## Communications

<b>Ethernet</b>	100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, secure CIP, DHCP, SSL, TLS, SSH, SFTP (SSH File Transfer Protocol), IEEE 802.1X, IPv4 only or both IPv4 and IPv6, Active Directory authentication, variable Multicast TTL, HTTPS web browser setup and control, Crestron 3-Series or later control system integration
<b>RS-232</b>	2-way device control and monitoring up to 115.2k baud
<b>IR/Serial</b>	1-way device control via infrared up to 1.1 MHz or serial TTL/RS-232 (0-5 V) up to 19.2k baud (via control system)
<b>HDMI</b>	HDCP 1.4, EDID, CEC
<b>DM NVX (via Ethernet)</b>	HDCP 1.4, AES-128 AV content encryption with PKI authentication, RTP, secure RTSP, SDP, ONVIF, IGMPv2, IGMPv3, SMPTE 2022

## DM NVX® 1080p60 4:4:4 Network AV Encoder

**Connectors**

<b>Ethernet</b>	(1) 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port; <sup>1</sup> PoE PD (powered device) port; IEEE 802.3af Type 1 PoE Class 3 (12.95 W) compliant; Compatible with PoE compliant Ethernet switch or third-party PoE PSE <sup>3</sup>
<b>HDMI INPUT</b>	(1) HDMI Type A connector, female; HDMI digital video/audio input (DVI and Dual-Mode DisplayPort interface compatible) <sup>5</sup>
<b>AUDIO OUT</b>	(1) 3-pin 3.5 mm detachable terminal block; Unbalanced stereo line level audio output; <sup>2</sup> Output Impedance: 100 Ohms unbalanced; Maximum Output Level: 2 Vrms unbalanced
<b>IR</b>	(1) 2-pin 3.5 mm detachable terminal block; IR/Serial port; IR output up to 60kHz; 1-way serial TTL/RS-232 (0-5 V) up to 19200 baud; <a href="#">IRP2</a> emitter sold separately
<b>COM</b>	(1) 3-pin 3.5 mm detachable terminal block; Bidirectional RS-232 port; Up to 115.2k baud
<b>24V 0.75A</b>	(1) 2.1 x 5.5 mm DC power connector; 24 VDC power input; <a href="#">PW-2407WU</a> power pack (sold separately)
<b>G</b>	(1) 6-32 screw; Chassis ground lug

**Controls and Indicators**

<b>Ethernet</b>	(2) LEDs, green indicates Ethernet link status, amber indicates Ethernet activity
<b>HDMI INPUT</b>	(1) Green LED, indicates sync detection at the HDMI input
<b>PWR</b>	(1) Bi-color green/amber LED, indicates operating power supplied via PoE or optional power pack (sold separately), lights amber while the device is booting and green when the device is operational
<b>SETUP</b>	(1) Red LED and (1) push button
<b>RESET</b>	(1) Recessed push button, reboots the device

**Power**

<b>PoE</b>	IEEE 802.3af Type 1 Class 3 (12.95 W) compliant; Compatible with IEEE 802.3af compliant Ethernet switch or third-party PoE compliant PSE
<b>Power Pack (Optional)</b>	Input: 100-240 VAC, 50/60 Hz Output: 0.75 A @ 24 VDC Model: <a href="#">PW-2407WU</a> (sold separately)
<b>Power Consumption</b>	8.6 W typical

**Environmental**

<b>Temperature</b>	32° to 104° F (0° to 40° C)
<b>Humidity</b>	10% to 95% RH (non-condensing)
<b>Heat Dissipation</b>	29 BTU/hr
<b>Acoustic Noise</b>	None (fanless)

**Enclosure**

<b>Chassis</b>	Metal, black finish, vented top, front, rear, and sides
<b>Mounting</b>	Freestanding, surface mountable, or attachment to a single rack rail (mounting flanges included)

**Dimensions**

<b>Height</b>	5.04 in. (128 mm)
<b>Width</b>	9.05 in. (230 mm)
<b>Depth</b>	1.00 in. (26 mm)

**Weight**

1.32 lb (0.60 kg)

**Compliance****Regulatory Model: M202028003**

Bureau Veritas Listed for US and Canada, IC, CE, FCC Part 15 Class B digital device

**Model**DM-NVX-E10  
DM NVX® 1080p60 4:4:4 Network AV Encoder

# DM NVX® 1080p60 4:4:4 Network AV Encoder

## Management Tools

### DM-NVX-DIR-80

DM NVX Director Virtual Switching Appliance,  
80 Endpoints

### DM-NVX-DIR-160

DM NVX Director Virtual Switching Appliance,  
160 Endpoints

### DM-NVX-DIR-ENT

DM NVX Director Virtual Switching Appliance,  
1000 Endpoints

## Accessories

For a list of accessories, visit the [DM-NVX-E10](#) product page.

### Notes:

1. The minimum cable required for DM NVX AV over 1000BASE-T Ethernet (copper) is unshielded CAT5e. The Ethernet port on the DM-NVX-E10 is provided for connection to an Ethernet network or device—the port cannot be connected to the DM® port of other Crestron devices.  
A nonblocking network is required for DM NVX devices.
2. The analog audio output is functional only when the DM-NVX-E10 is receiving a 2-channel stereo input signal.
3. In order for the Ethernet port to receive PoE, the port must be connected to a PoE compliant Ethernet switch or other equipment that has a PoE power sourcing equipment (PSE) port. Cabling that is connected to a PoE PSE port is designed for intrabuilding use only.
4. 3D formats are not supported.
5. HDMI connections require 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 select authorized Crestron dealers and distributors. To find a dealer or distributor, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/How-To-Buy/Find-a-Representative](http://www.crestron.com/How-To-Buy/Find-a-Representative) or contact us for additional information by visiting [www.crestron.com/contact/our-locations](http://www.crestron.com/contact/our-locations) for your local contact.

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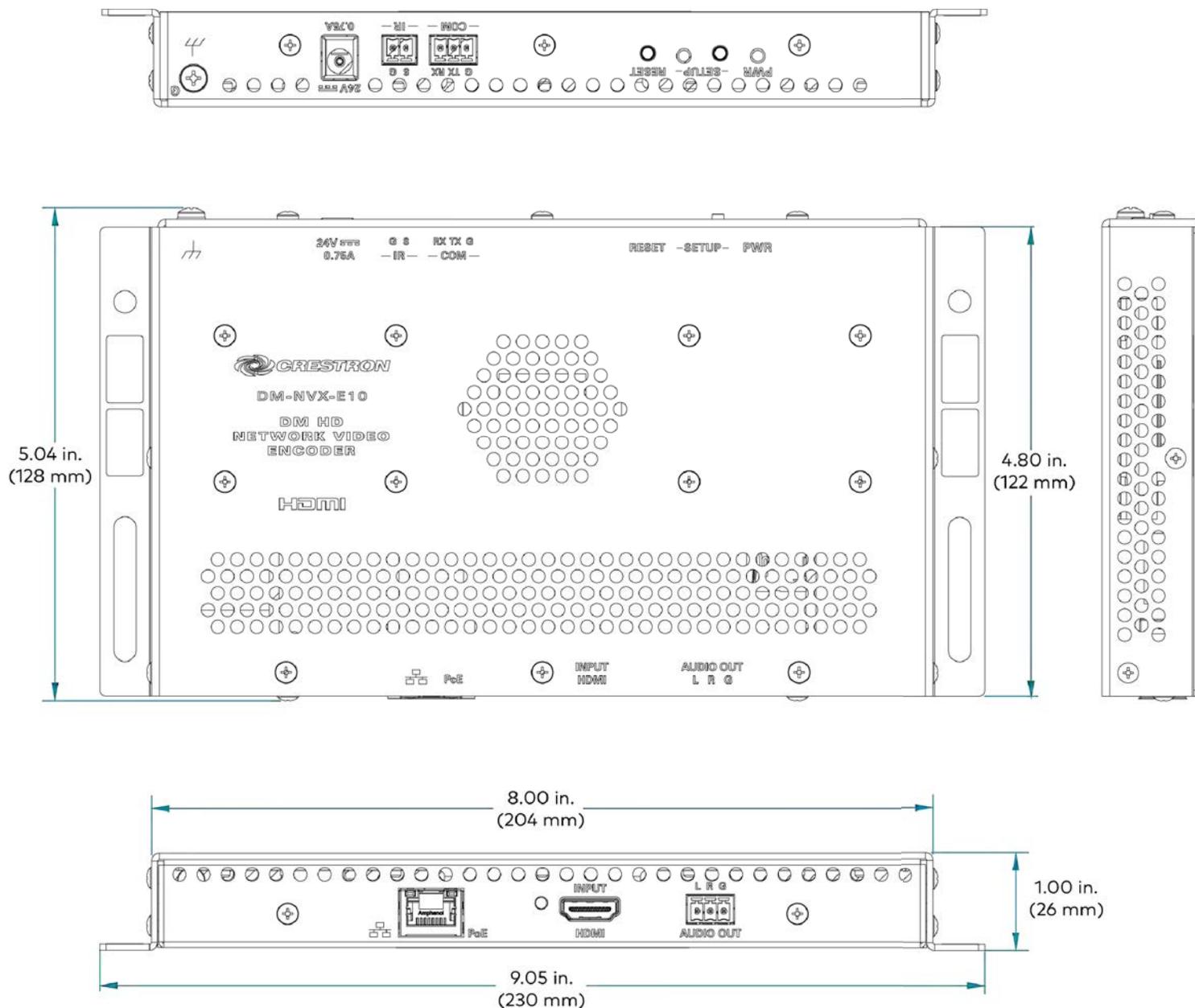
## HDMI

Specifications are subject to change without notice.

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Rev 09/21/22

## DM NVX® 1080p60 4:4:4 Network AV Encoder



# Saros ICT5T-22

## Saros® In-Ceiling Tile Loudspeaker



Saros® speakers by Crestron® deliver professional grade performance and flexible installation in a range of popular sizes for demanding commercial applications. Solid construction, easy installation, and high-end components are hallmarks of the Saros speaker line. Ideal for use in background or foreground music, paging, and sound reinforcement systems, Saros speakers are engineered to achieve smooth, even coverage, high output, and clear, natural sound quality through the employment of horn-loaded titanium dome tweeters, high-efficiency damped cone woofers, and precisely tuned crossovers.

The Saros ICT5T-22 is a 2 ft x 2 ft ceiling mount loudspeaker designed for multimedia presentation and speech reinforcement in classrooms, meeting spaces, and most indoor distributed sound system applications. It features a coaxial 5 in. two-way driver in a low profile enclosure that's ideal for use in plenum spaces that are packed with preexisting systems and utilities, leaving limited space for ceiling loudspeakers. A built-in 16 W multi-tap transformer allows for use with 70 and 100 V distributed speaker systems. Drop-in simplicity affords fast and easy installation in a typical 2x2 or 2x4 ft suspended ceiling grid with 15/16 in. face profile.

The Saros ICT5T delivers exceptional sound quality with wide dispersion for the greatest area of coverage. The coaxial two-way loudspeaker delivers exceptional intelligibility through the voice band. Announcements will be clear and natural sounding, and will cut through typical background noise in busy environments. Applications requiring music program will deliver full-bodied sound. The high power handling enables the loudspeaker to be mounted into tall suspended ceilings where greater volume levels are required to reach the target SPL for the listeners.

Saros ICT5T speakers are UL® 1480A and UL 2043 listed<sup>1</sup> for use in plenum air return spaces. Saros ICT5T speakers are priced individually and sold in pairs.

- Full-range 5 in. suspended ceiling mount loudspeaker
- 4 in. low profile height can be installed in a crowded plenum space
- Easy drop-in installation for 2x2 and 2x4 ft ceiling grids
- Fully-enclosed plenum-rated housing
- Finely-perforated white metal grille
- Cross tee accessory provided for 2x2 and 2x4 ft applications
- Five seismic attachment points
- 30 W power handling in low impedance mode
- 70 Hz to 18 kHz frequency response
- Built-in 70/100V multi-tap transformer, with 8-ohm bypass

# Saros ICT5T-22

## Saros® In-Ceiling Tile Loudspeaker

### Specifications

#### Performance

<b>Transducers</b>	5 in. woofer with dome tweeter
<b>Beamwidth</b>	120°
<b>Impedance</b>	8 Ohms nominal with transformer bypass
<b>Frequency Range</b>	70 Hz to 18 kHz (+3/-10 dB)
<b>Transformer Taps</b>	1 W, 2 W, 4 W, 8 W, 16 W @ 70 V; 2 W, 4 W, 8 W, 16 W @ 100 V; Selectable with rotary knob
<b>Power Handling</b>	30 W for LoZ operation
<b>Nominal Sensitivity</b>	90 dB at 1 W/ 1 m

#### Connections

<b>Input</b>	(1) 4-pin 5 mm detachable terminal block; Speaker input with parallel pass-through; Maximum Wire Size: 12 AWG
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#### Controls

<b>Transformer Tap</b>	(1) Rotary knob on plenum side of the loudspeaker enclosure; Used to select 70/100 V tap or 8 Ohms (bypass)
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#### Environmental

For indoor use only

#### Construction

<b>Enclosure</b>	Steel, painted black with 5 tether attachment points
<b>Baffle</b>	Steel, painted black
<b>Grille</b>	Steel, painted white
<b>Installation</b>	Lays onto suspended ceiling grid; Ships with 1 cross tee accessory per loudspeaker, 24 in. length, 15/16 in. face profile, staked-on end clips. Two cross tees per box.

#### Dimensions

<b>Height</b>	4.00 in.
<b>Width</b>	23.75 in.
<b>Depth</b>	23.75 in.

#### Weight

12.45 lb (5.6 kg)

#### Compliance

UL 1480A, UL 2043<sup>1</sup>

#### Model

SAROS ICT5T-22-W-T-EACH+

#### Available Accessory

**SPKA-ST-15**  
Safety Tether/Tie Down Kits, 10 Sets

#### Notes:

1. UL 1480A speakers for fire alarm and signaling systems in the United States, in accordance with the National Electrical Code, NFPA 70, and the National Fire Alarm and Signaling Code, NFPA 72. In Canada, in accordance with CSA C22.1, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations; and with CAN/ULC S524, Standard for Installation of Fire Alarm Systems. UL 2043 in accordance with the Standards for Fire Test for Heat and Visible Smoke Release for Discrete Products and Accessories Installed in Air-Handling Spaces, UL 2043 and ULC ORD-C2043.

This product may be purchased from select authorized Crestron dealers and distributors. To find a dealer or distributor, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/How-To-Buy/Find-a-Representative](http://www.crestron.com/How-To-Buy/Find-a-Representative) or by calling 855-263-8754.

This product is covered under the Crestron standard limited warranty. Refer to [www.crestron.com/warranty](http://www.crestron.com/warranty) for full details.

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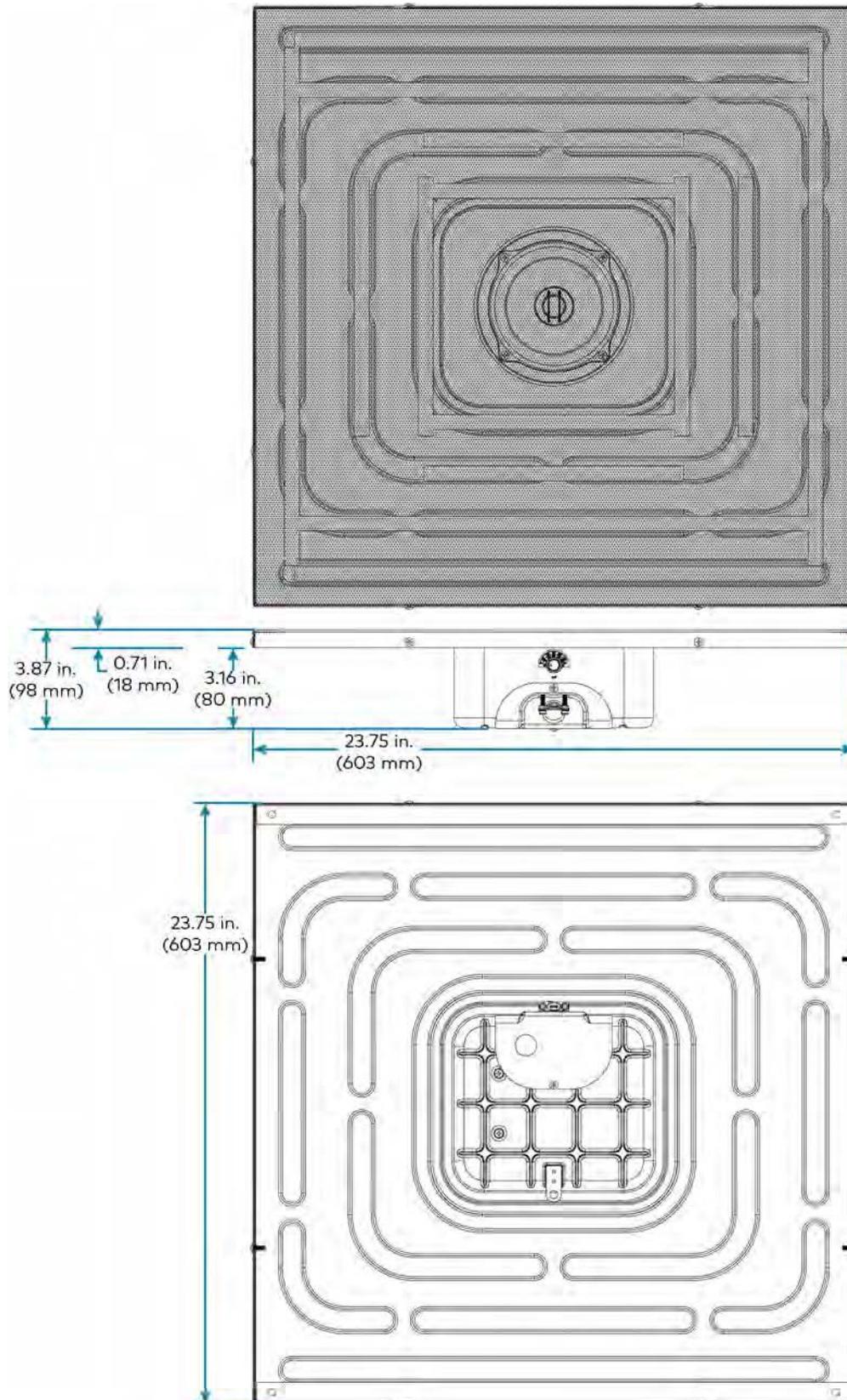
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Rev 10/16/19

# Saros ICT5T-22

## Saros® In-Ceiling Tile Loudspeaker





# SMALL FORMAT SERIES

## 21.5", 23.8", and 27" PCAP Touchscreen Displays

TSI Touch's Projective Capacitive (PCAP) Small Format Displays allow for a highly accurate and secure interactive experience. These displays are engineered specifically for customers seeking a touchscreen display designed for the rigors of commercial use without having to sacrifice image quality or aesthetics. The product can easily be wiped clean, making it both a sleek and sanitary design.

### Key Features:

- Compliant with the Trade Agreement Act (TAA)
- Industrial grade display designed for high-traffic and public spaces
- Products are engineered for long lifecycles (3+ years)
- All displays are backed by a three-year warranty from TSI Touch



SPECIFICATION	DETAIL		
Screen Size	21.5"	23.8"	27"
Part Number	TSI21PDAAVAZZZZ	TSI24PDABVAZZZZ	TSI27PDADVAZZZZ
Display Resolution	1920x1080	1920x1080	1920x1080
Display Area (mm)	476.06 x 267.79	527.04 x 296.46	597.6 x 336.1
Pixel Pitch (mm)	0.247 x 0.247	0.274 x 0.274	0.311 x 0.311
Viewing Angle	178/178	178/178	178/178
Response Time (ms)	22 (On/Off)	16 (On/Off)	12 (On/Off)
Brightness	250 nit	250 nit	300 nit
Contrast Ratio	1,000:1	3000:1	3000: 1
Color Depth	8 bit	8 bit	8 bit
Orientation Compatibility	Landscape/Portrait/Flat	Landscape/Portrait/Flat	Landscape/Portrait/Flat
DP	DP1.2 (1)	DP1.2 (1)	DP1.2 (1)
VGA	D-Sub15 (1)	D-Sub15 (1)	D-Sub15 (1)
HMDI	HDMI 1.4 (1)	HDMI 1.4 (1)	HDMI 1.4 (1)
USB Hub	USB Type A (2)	USB Type A (2)	N/A
Audio	3.5mm - In (1)/Out (1)	3.5mm - In (1)/Out (1)	3.5mm - In (1)/Out (1)
Touchscreen Type	Projected Capacitive	Projected Capacitive	Projected Capacitive
Touch Points	10 Point	10 Point	10 Point
Screen Printing	Black	Black	Black
Glass Coating	Anti-Glare	Anti-Glare	Clear
Interface	USB	USB	Combo(USB/RS232)
Color Temperature	Neutral/Warm/Cool/User	Neutral/Warm/Cool/User	Neutral/Warm/Cool/User

<i>OSD Languages</i>	English/French/German/ Italian/Polish/Spanish/ Dutch/Czech/Russian/ Japanese/Simplified Chinese	English/French/German/ Italian/Polish/Spanish/ Dutch/Czech/Russian/ Japanese/Simplified Chinese	English/French/German/ Italian/Spanish/Japanese
<i>Scaling Mode</i>	Full Screen/Aspect Ratio	Full Screen/Aspect Ratio	Full/5:4/4:3/16:9/1:1
<i>Speaker</i>	2W Speaker	2W Speaker	2W Speaker
<i>Convenience</i>	Kensington-lock™ prepared	Kensington-lock™ prepared	Kensington-lock™ prepared
<i>Additional Features</i>	ECO Mode/Blue Light Reducer	ECO Mode/Blue Light Reducer	N/A
<i>Power Supply</i>	AC 100~240V	AC 100~240V	DC 12V
<i>Power Consumption (W)</i>	35 (Max)	35 (Max)	40 (Max)
<i>Dimensions (mm)</i>	537 x 387 x 175 (with Stand) 537 x 339 x 69 (w/o Stand)	581 x 400 x 175 (with Stand) 581 x 360 x 69 (w/o Stand)	651 x 441x175 (with Stand) 651 x 402 x 69 (w/o Stand)
<i>VESA Mounting (mm)</i>	100 x 100	100 x 100	100 x 100
<i>Weight (kg)</i>	8.2 (with Stand) 6.5 (w/o Stand)	9.5 (with Stand) 7.7 (w/o Stand)	10.3 (with Stand) 8.4 (w/o Stand)
<i>Enclosure Color</i>	Black	Black	Black
<i>Front Face Design</i>	Sealed Front Face	Sealed Front Face	Sealed Front Face
<i>Tilt Range</i>	0°~+30°	0°~+30°	0°~+30°
<i>Operating Temperature</i>	10° - 40° C	10° - 40° C	10° - 40° C
<i>Operating Humidity</i>	30% - 75%	30% - 75%	30% - 75%
<i>Storage Temperature</i>	-20° - 60° C	-20° - 60° C	-20° - 60° C
<i>Storage Humidity</i>	10% - 90%	10% - 90%	10% - 90%
<i>Certifications and Compliances</i>	cULus(UL 62368-1;CAN/CSA-C22.2 62368-1-14), CB(IEC 62368-1), CE(EN55032;EN55035;EN 62368- 1),FCC Part 15,ROHS,WEEE	cULus(UL 62368-1;CAN/CSA-C22.2 62368-1-14), CB(IEC 62368-1), CE(EN55032;EN55035;EN 62368- 1),FCC Part 15,ROHS,WEEE	cTUVus(UL 62368-1;CAN/ CSA-C22.2 62368-1),CB(IEC 62368- 1),CE (EN55032; EN55024;EN 62368-1),FCC Part 15,ROHS, WEEE



For more information, please visit  
[www.tsitouch.com](http://www.tsitouch.com),  
email [sales@tsitouch.com](mailto:sales@tsitouch.com),  
or call 802-874-0123

Specifications are subject  
to change without notice.

2/24/2023 v. 1.3

# DC-13 Document Camera

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 **Contact**

**Us** 800.463.7766

Mon-Fri 7am-4pm  
PT



Image Hot  
Spots



Features

 **ZOOM IN**



**The document camera that engages every student with amazing HD quality.**

Add new life to any lesson with the high-performance Epson® DC-13 document camera. This portable performer makes it easy to capture and display books and experiments with clarity, thanks to a large imaging sensor and 16x digital zoom. Hi-def lessons are simple, with HDMI® digital connectivity and HD 1080p resolution. Share magnified images with the microscope adapter. Or, record audio with video using the built-in microphone. At 30 fps, video playback is seamless. And, there are convenient Freeze and Capture buttons. You can even save lessons on an SD card<sup>1</sup> or computer.

- HD 1080p resolution
- 16x digital zoom
- HDMI digital connectivity for hi-def video
- Microscope adapter included
- Built-in microphone; record lessons

### DC-13 SPECIFICATION SHEET ►

**Model:** V12H757020

OUR PRICE :

**\$499.00**



### Protect Your Product

Add a plan with your new product now.

Show More Plans



- **Astounding clarity and remarkable detail** — HD 1080p output resolution and 16x digital zoom
- **Versatile connectivity** — HDMI digital connectivity for high-definition video
- **Share magnified images** — microscope adapter included; supports many standard microscopes
- **Record and share audio/video lessons** — built-in microphone and included software; one-touch A/V recording
- **Ultra smooth video performance** — 30 frames per second (fps)
- **Capture, save and present images** — supports SD cards<sup>1</sup> and computers
- **Convenient Freeze and Capture buttons** — easily pause and/or resume the image

- **Large image capture area** — display items up to 11.7" x 20.7"

## Eco Features

- RoHS compliant
- Recyclable product<sup>2</sup>
- Epson America, Inc. is a SmartWay<sup>SM</sup> Transport Partner<sup>3</sup>

### **IMPORTANT SAFETY INFORMATION ABOUT USAGE ENVIRONMENTS FOR MOUNTED PROJECTORS ►**

### **What's In The Box:**

---

- DC-13 Document Camera
- AC power adapter with cord
- Application software CD
- Remote control
- AA batteries x 2
- VGA cable
- Microscope adapter
- User's Guide CD
- Quick Start Guide
- Warranty card
- Soft Carrying Case
- USB Cable

## **Epson<sup>®</sup> DC-13 Document Camera**

With HDMI<sup>®</sup>, 16x digital zoom and 1080p resolution

Microscope not included. Projected image simulated.

## Ultra smooth video performance

30 frames per second (fps)

Projected images simulated.



# Disclaimer

1 SD card not included. Not all SD cards are supported.

## Camera:

---

### Output Signals / Resolution:

- VGA: SXGA (1280 x 1024), XGA (1024 x 768), WXGA (1280 x 800), HD (1360 x 768), 1080p (1920 x 1080)
- USB: VGA, SVGA, XGA, SXGA, WXGA, 720p, 1080p
- HDMI: 480p/720p/1080p

### Frame Rate:

30 fps max.

### Lighting Source:

White LED x 2

## Optics:

---

### Lens:

F-number: 2

### Capture Area:

11.7" x 20.7" (at 1080p)

### Zoom:

16x digital zoom

### Focus:

Automatically with one-touch button

## Functions:

---

### Image Rotation:

±90 degrees (Horizontal/Vertical)

### User Functions:

Zoom, Freeze, Auto Focus, Focus Lock, LED, Brightness, Contrast, Negative, Black and White, Split Screen, Play back, Video Capture, Digital Scroll (pan/tilt), Flicker Reduction, Image Rotation, Source (PC/ DC), Auto-detect Aspect, Video Recording, Video Playing

## Interface:

---

### Input Terminal:

- HDMI
- Computer In (VGA)
- Display Out (VGA)
- USB-B (for connection to PC/Mac®)
- SD Card Slot<sup>1</sup>

## Application Software:

---

### Language:

13 languages

### Functions:

Rotation, Zoom (+, -, selectable, x1), Auto Focus, Freeze, Record, Time-lapse, Picture Control (Brightness, Contrast, White Balance, Auto White Balance)

### Saving Format:

- Still Image: JPG, BMP, PNG
- Video (Windows): AVI
- Video (Mac): MOV
- Other: PDF, EIT

## General:

---

### Operating Systems:

- Windows® 7, Windows 8, Windows 10, Windows Vista®
- Mac OS® X 10.7.x, 10.8.x, 10.9.x, 10.10.x, 10.11.x

### Temperature:

41 ° to 95 °F (5 ° to 35 °C)

### Humidity:

20 – 80%

## Dimensions -Doc Camera:

---

### Open / Unfolded:

10.6" x 17.6" x 12.5" (W x D x H)

### Closed / Folded:

14.4" x 4.7" x 4.8" (W x D x H)

## Power:

---

### Power Supply Voltage:

100 – 240 V AC

### Power Consumption:

13 W



Cables



Service Agreements

---

## **Meeting Room Projectors For Work**

PowerLite L770U 3LCD Laser Projector with 4K Enhancement

PowerLite L775U 3LCD Laser Projector with 4K Enhancement

PowerLite L570U 3LCD Laser Projector with 4K Enhancement

PowerLite L630U Full HD WUXGA 3LCD Laser Projector

PowerLite L730U Full HD WUXGA 3LCD Laser Projector

PowerLite L520U Full HD WUXGA 3LCD Long-throw Laser Projector

PowerLite L520W WXGA 3LCD Laser Projector

PowerLite L530U Full HD WUXGA 3LCD Laser Projector

PowerLite 1288 Full HD 1080p Meeting Room Projector with Built-in Wireless and Miracast

## **Interactive Projectors & Collaboration Tools**

BrightLink 760Wi WXGA 3LCD Interactive Lamp-Free Laser Display

BrightLink 770Fi 1080p 3LCD Interactive Ultra Short Throw Lamp-Free Laser Display

BrightLink 725Wi WXGA 3LCD Interactive Laser Display

BrightLink 735Fi 1080p 3LCD Interactive Laser Display

BrightLink 1480Fi 1080p 3LCD Interactive Laser Display

BrightLink 1485Fi 1080p 3LCD Interactive Laser Display

## **Classroom Projectors**

PowerLite 810E 3LCD Extreme Short Throw Lamp-free Laser Display with 4K Enhancement

PowerLite L210W WXGA 3LCD Lamp-Free Laser Display with Built-In Wireless

PowerLite L260F 1080p 3LCD Lamp-Free Laser Display with Built-In Wireless

PowerLite L265F 1080p 3LCD Lamp-Free Laser Display with Built-In Wireless

PowerLite 775F 1080p 3LCD Ultra Short Throw Lamp-Free Laser Display

PowerLite L210SF Wireless 1080p 3LCD Short Throw Lamp-Free Laser Display

PowerLite L210SW Wireless WXGA 3LCD Short Throw Lamp-Free Laser Display

PowerLite 760W Wireless WXGA 3LCD Ultra Short Throw Lamp-Free Laser Display

PowerLite 770F 1080p 3LCD Ultra Short Throw Lamp-Free Laser Display

## **Digital Signage**

PowerLite L630SU Full HD WUXGA Short-throw Laser Projector

PowerLite L635SU Full HD WUXGA Short-throw Laser Projector

PowerLite L735U Full HD WUXGA 3LCD Laser Projector

PowerLite 805F Full HD 1080p Ultra Short-throw Laser Projector for Digital Signage

## Need Support?

Get the latest drivers, FAQs, manuals and more for your Epson product.

### **Recommended Links:**

[Drivers & Downloads](#)

[FAQs](#)

[Manuals and Warranty](#)

[Registration](#)

[Contact Support](#)

### **Notes:**

<sup>1</sup> SD card not included. Not all SD cards are supported.

<sup>2</sup> For convenient and reasonable recycling options, visit [www.epson.com/recycle](http://www.epson.com/recycle)

<sup>3</sup> SmartWay is an innovative partnership of the U.S. Environmental Protection Agency that reduces greenhouse gases and other air pollutants and improves fuel efficiency.

Specifications Notes:

<sup>1</sup> SD card not included. Not all SD cards are supported.

**IMPORTANT SAFETY INFORMATION ABOUT USAGE ENVIRONMENTS FOR MOUNTED PROJECTORS ►**

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**Offeror: Complete & Return this Form with Response Submission.**

**House Bill 89 Verification**

I, Stephenne Rhodes, the undersigned representative of (company or business name) Rhodes Research (heretofore referred to as company) being an adult over the age of eighteen (18) years of age, after being duly sworn by the undersigned notary, do hereby depose and verify under oath that the company named above, under the provisions of Subtitle F, Title 10, Government Code Chapter 2270:

- 1. Does not boycott Israel currently; and
- 2. Will not boycott Israel during the term of the contract.

Pursuant to Section 2270.001, Texas Government Code:

- 1. "Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made ordinary business purposes; and
- 2. "Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or an limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business association that exist to make a profit.

[Signature]  
Signature of Company Representative

8/7/2023  
Date

On this 7<sup>th</sup> day of August, 2023, personally appeared Stephenne Rhodes, the above named person, who after by me being duly sworn, did swear and confirm that the above is true and correct.

Notary Seal [Signature]  
Notary Signature  
8/7/23  
Date



**Offeror: Complete & Return this Form with Response Submission.  
Senate Bill 252 Certification**

SB 252 CHAPTER 2252 CERTIFICATION I, \_\_\_\_\_, the undersigned representative of \_\_\_\_\_ (Company or business name) being an adult over the age of eighteen (18) years of age, pursuant to Texas Government Code, Chapter 2252, Section 2252.152 and Section 2252.153, certify that the company named above is not listed on the website of the Comptroller of the State of Texas concerning the listing of companies that are identified under Section 806.051, Section 807.051 or Section 2253.153. I further certify that should the above-named company enter into a contract that is on said listing of companies on the website of the Comptroller of the State of Texas which do business with Iran, Sudan or any Foreign Terrorist Organization, I will immediately notify Mr. Jose Angel Lopez III, Webb County Purchasing Agent at (956) 523-4125 or via email at [joel@webbcountytx.gov](mailto:joel@webbcountytx.gov)

\_\_\_\_\_ Name of Company Representative (Print)

\_\_\_\_\_ Signature of Company Representative

\_\_\_\_\_ Date

ADDENDUM No. 1 TO THE RFP DOCUMENTS

Addendum Date: August 3, 2023

RFP DOCUMENT NUMBER RFP 2023-012

“Hybrid Audio Video System for Juvenile Detention Center”

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A. This Addendum shall be considered part of the RFP documents for the above-mentioned project as though it had been issued at the same time and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence. **RESPONDENTS MUST SIGN THE ADDENDUM AND SUBMIT IT WITH THEIR BIDS/PROPOSALS.**

B. Respondent are hereby notified that they shall make any necessary adjustments in their estimates as a result of this Addendum. It will be construed that each bidder's proposal is submitted with full knowledge of all modifications and supplemental data specified herein.

---

Except as described below, the original RFP document remains unchanged. The RFP documents are modified and/or clarified, as follows:

- **The RFP Question Deadline has been extended from Wednesday August 2, 2023 to Wednesday August 9, 2023 at 5 pm.**
- **The RFP due date has been extended from Friday August 11, 2023 to Friday August 18, 2023 at 10am.**

**RESPONDENT MUST ACKNOWLEDGE THIS ADDENDUM BY  
SIGNING BELOW AND ATTACHING THE SIGNED ADDENDUM TO  
THE PROPOSAL FORM(S):**

Firm/Company Name \_\_\_\_\_

Authorized Contact Person \_\_\_\_\_

Signature of Authorized Person \_\_\_\_\_

Date \_\_\_\_\_

**THIS CONCLUDES ADDENDUM NO. 1 IN ITS ENTIRETY.**

This Addendum is being transmitted electronically via our E-Bid site @ <https://webbcountybid.ionwave.net/Login.aspx> . If you have any questions, please direct them to; Juan Guerrero Jr. (956) 523-4149 or email at [juguerrero@webbcountytx.gov](mailto:juguerrero@webbcountytx.gov) .

# CONFLICT OF INTEREST QUESTIONNAIRE

## FORM CIQ

For vendor doing business with local governmental entity

### OFFICE USE ONLY

Date Received

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

**1** Name of vendor who has a business relationship with local governmental entity.

**2**  Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

**3** Name of local government officer about whom the information is being disclosed.

\_\_\_\_\_  
Name of Officer

**4** Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes       No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

Yes       No

**5** Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

**6**  Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

**7**

\_\_\_\_\_  
Signature of vendor doing business with the governmental entity

\_\_\_\_\_  
Date

## **CONFLICT OF INTEREST QUESTIONNAIRE**

### **For vendor doing business with local governmental entity**

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

**Local Government Code § 176.001(1-a):** "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

**Local Government Code § 176.003(a)(2)(A) and (B):**

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

\*\*\*

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

**Local Government Code § 176.006(a) and (a-1)**

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.

**WEBB COUNTY PURCHASING DEPT.  
QUALIFIED PARTICIPATING VENDOR CODE OF ETHICS  
AFFIDAVIT FORM**

STATE OF TEXAS \*

KNOW ALL MEN BY THESE PRESENTS:

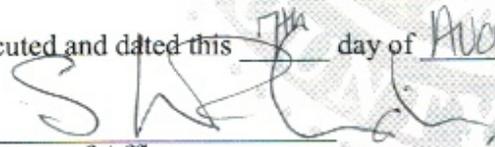
COUNTY OF WEBB \*

BEFORE ME the undersigned Notary Public, appeared Stephenne Rhodes, the herein-named "Affiant", who is a resident of Dona Ana County, State of New Mexico, and upon his/her respective oath, either individually and/or behalf of their respective company/entity, do hereby state that I have personal knowledge of the following facts, statements, matters, and/or other matters set forth herein are true and correct to the best of my knowledge.

*I personally, and/or in my respective authority/capacity on behalf of my company/entity do hereby confirm that I have reviewed and agree to fully comply with all the terms, duties, ethical policy obligations and/or conditions as required to be a qualified participating vendor with Webb County, Texas as set forth in the Webb County Purchasing Code of Ethics Policy posted at the following address: <http://www.webbcountytx.gov/PurchasingAgent/PurchasingEthicsPolicy.pdf>*

*I personally, and/or in my respective authority/capacity on behalf of my company/entity do hereby further acknowledge, agree and understand that as a participating vendor with Webb County, Texas on any active solicitation/proposal/qualification that I and/or my company/entity failure to comply with the Code of Ethics policy may result in my and/or my company/entity disqualification, debarment or make void my contract awarded to me, my company/entity by Webb County. I agree to communicate with the Purchasing Agent or his designees should I have questions or concerns regarding this policy to ensure full compliance by contacting the Webb County Purchasing Dept. via telephone at (956) 523-4125 or e-mail to the Webb County Purchasing Agent to [joel@webbcountytx.gov](mailto:joel@webbcountytx.gov).*

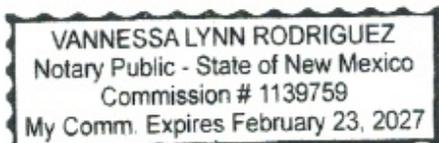
Executed and dated this 7<sup>th</sup> day of August, 2023.

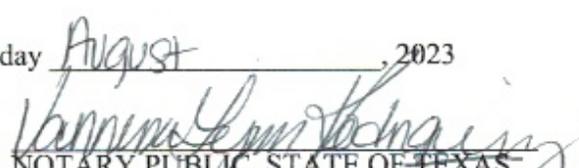
  
Signature of Affiant

**Rhodes Research**

Printed Name of Affiant/Company/Entity

SWORN to and subscribed before me, this 7<sup>th</sup> day August, 2023



  
NOTARY PUBLIC, STATE OF TEXAS

New Mexico

**CERTIFICATION**  
REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY  
EXCLUSION FOR COVERED CONTRACTS

**PART A.**

Federal Executive Orders 12549 and 12689 require the Texas Department of Agriculture (TDA) to screen each covered potential contractor to determine whether each has a right to obtain a contract in accordance with federal regulations on debarment, suspension, ineligibility, and voluntary exclusion. Each covered contractor must also screen each of its covered subcontractors.

In this certification "contractor" refers to both contractor and subcontractor; "contract" refers to both contract and subcontract.

By signing and submitting this certification the potential contractor accepts the following terms:

1. The certification herein below is a material representation of fact upon which reliance was placed when this contract was entered into. If it is later determined that the potential contractor knowingly rendered an erroneous certification, in addition to other remedies available to the federal government, the Department of Health and Human Services, United States Department of Agriculture or other federal department or agency, or the TDA may pursue available remedies, including suspension and/or debarment.
2. The potential contractor will provide immediate written notice to the person to which this certification is submitted if at any time the potential contractor learns that the certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
3. The words "covered contract", "debarred", "suspended", "ineligible", "participant", "person", "principal", "proposal", and "voluntarily excluded", as used in this certification have meanings based upon materials in the Definitions and Coverage sections of federal rules implementing Executive Order 12549. Usage is as defined in the attachment.
4. The potential contractor agrees by submitting this certification that, should the proposed covered contract be entered into, it will not knowingly enter into any subcontract with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the Department of Health and Human Services, United States Department of Agriculture or other federal department or agency, and/or the TDA, as applicable.

Do you have or do you anticipate having subcontractors under this proposed contract?

Yes

No

5. The potential contractor further agrees by submitting this certification that it will include this certification titled "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion for Covered Contracts" without modification, in all covered subcontracts and in solicitations for all covered subcontracts.
6. A contractor may rely upon a certification of a potential subcontractor that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered contract, unless it knows that the certification is erroneous. A contractor must, at a minimum, obtain certifications from its covered subcontractors upon each subcontract's initiation and upon each renewal.
7. Nothing contained in all the foregoing will be construed to require establishment of a system of records in order to render in good faith the certification required by this certification document. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
8. Except for contracts authorized under paragraph 4 of these terms, if a contractor in a covered contract knowingly enters into a covered subcontract with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the federal government, Department of Health and Human Services, United States Department of Agriculture, or other federal department or agency, as applicable, and/or the TDA may pursue available remedies, including suspension and/or debarment.

**PART B. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION FOR COVERED CONTRACTS**

Indicate in the appropriate box which statement applies to the covered potential contractor:

- The potential contractor certifies, by submission of this certification, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this contract by any federal department or agency or by the State of Texas.
- The potential contractor is unable to certify to one or more of the terms in this certification. In this instance, the potential contractor must attach an explanation for each of the above terms to which he is unable to make certification. Attach the explanation(s) to this certification.

Name of Contractor	Vendor ID No. or Social Security No.	Program No.

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed/Typed Name and Title of  
Authorized Representative

**CERTIFICATION REGARDING FEDERAL LOBBYING**  
**(Certification for Contracts, Grants, Loans, and Cooperative Agreements)**

**PART A. PREAMBLE**

Federal legislation, Section 319 of Public Law 101-121 generally prohibits entities from using federally appropriated funds to lobby the executive or legislative branches of the federal government. Section 319 specifically requires disclosure of certain lobbying activities. A federal government-wide rule, "New Restrictions on Lobbying", published in the Federal Register, February 26, 1990, requires certification and disclosure in specific instances.

**PART B. CERTIFICATION**

This certification applies only to the instant federal action for which the certification is being obtained and is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$100,000 for each such failure.

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No federally appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, or the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
2. If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with these federally funded contract, subcontract, subgrant, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions. (If needed, contact the Texas Department of Agriculture to obtain a copy of Standard Form-LLL.)

3. The undersigned shall require that the language of this certification be included in the award documents for all covered subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all covered subrecipients will certify and disclose accordingly.

Do you have or do you anticipate having covered subawards under this transaction?

- Yes
- No

<b>Name of Contractor/Potential Contractor</b>	<b>Vendor ID No. or Social Security No.</b>	<b>Program No.</b>

<b>Name of Authorized Representative</b>	<b>Title</b>

\_\_\_\_\_  
Signature – Authorized Representative

\_\_\_\_\_  
Date

PROOF OF NO DELINQUENT TAXES OWED TO WEBB COUNTY

Name Stephenne Rhodes owes no delinquent property taxes to Webb County.

Rhodes Research owes no property taxes as a business in Webb County.  
(Business Name)

Stephenne Rhodes owes no property taxes as a resident of Webb County.  
(Business Owner)

Stephenne Rhodes

Person who can attest to the above information

**\* SIGNED NOTORIZED DOCUMENT AND PROOF OF NO DELINQUENT TAXES TO WEBB COUNTY.**

The State of Texas  
County of Webb

Before me, a Notary Public, on this day personally appeared Stephenne Rhodes, know to me (or proved to me on the oath of Stephenne Rhodes to be the person whose name is subscribed to the forgoing instrument and acknowledged to me that he executed the same for the purpose and consideration therein expressed.

Given under my hand and seal of office this 7<sup>th</sup> day of August 2023

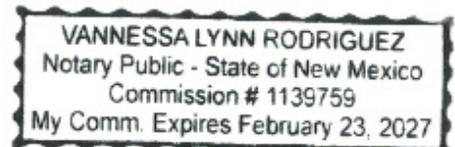
Notary Public, State of ~~Texas~~

New Mexico

Vannessa Lynn Rodriguez

(Print name of Notary Public here)

My commission expires the 23<sup>rd</sup> day of February 2023



## References Form

Please list at minimum five (5) local governmental entities where similar scope of services were provided.

**THIS FORM MUST BE RETURNED WITH YOUR OFFER.**

### REFERENCE ONE

Government/Company Name: United States Army

Address: U.S. Army Aviation Center of Excellence & Fort Rucker, FT RUCKER, AL 36362

Contact Person and Title: Margot L. Marstrell

Phone: (334) 255-2323 Fax: \_\_\_\_\_

Email Address: margot.l.marstrell.mil@mail.mil Contract Period: GFY 2021

Description of Goods / Services Provided: \_\_\_\_\_

Refit of courtroom in Fort Rucker including interactive annotation

### REFERENCE TWO

Government/Company Name: US Air Force

Address: 100 Kindel Drive, ARNOLD AFB , TN 37389-2212

Contact Person and Title: Richard Fraley

Phone: 931-454-4460 Fax: \_\_\_\_\_

Email Address: richard.fraley.1@us.af.mil Contract Period: GFY 2021

Description of Goods / Services Provided: \_\_\_\_\_

Replace AV system in base auditorium

Refit two secure video conference rooms

REFERENCE THREE

Government/Company Name: United States Geographical Survey

Address: Denver Federal Center, Lakewood, CO USA

Contact Person and Title: Donald Downey

Phone: 303 236-933 Fax: \_\_\_\_\_

Email Address: ddowney@usgs.gov Contract Period: GFY 2022

Description of Goods / Services Provided: \_\_\_\_\_

Update and install VTC system in Central Energy Conference Room

REFERENCE Four

Government/Company Name: United States Air Fforce

Address: 341st Wing Operations Center / 341st MW Malmstrom AFB, MT

Contact Person and Title: Shawn Scrivener

Phone: 406 731 3190 Fax: \_\_\_\_\_

Email Address: shawn.scrivener@us.af.mil Contract Period: GFY 2022

Description of Goods / Services Provided: \_\_\_\_\_

Design and build AV system in Weapons Operation Center

REFERENCE Five

Government/Company Name: Washington National Guard

Address: Western Air Defense Sector Bldg 852 Lincoln Blvd, JBLM, WA 98438

Contact Person and Title: Justin Scherer,

Phone: : 253-512-2178 Fax: \_\_\_\_\_

Email Address: justin.scherer.1@us.af.mil Contract Period: GFY 2023

Description of Goods / Services Provided: \_\_\_\_\_

Update AV system in Level C conference room

Provide multi classification VTC system

- **\*\*Additional pages are permitted if more space is required\*\***

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