

July 15, 2015

Mr. Mark Ketchum  
City of Broken Arrow  
2302 S 1st Place  
Broken Arrow, OK 74012

Dear Mr. Ketchum:

Ford Audio-Video Systems, LLC (Ford AV) respectfully submits for your consideration the attached proposal, which covers the details of the system requirements in the following outline:

- A. Introduction
- B. Description of Work
- C. Installation Schedule
- D. Equipment List
- E. Cost Summary and Terms
- F. Guarantees and Limitations of Warranty
- G. Training and Documentation
- H. Building Construction, Installation and Responsibilities
- I. Discussion of Technology
- J. Acceptance

The proposed systems are based upon our understanding of your requirements as communicated to us during our meetings and conversations. If there are any changes that need to be made, please let us know. We invite you to compare our systems with any other; in quality, price, and professionalism of installation, we are second to none.

This proposal contains confidential pricing, design, and installation information that is proprietary to Ford AV. It is provided for your private use, and is not to be disclosed, in part or in whole, without the express, written authorization of Ford AV. Please let me know if any questions arise. I look forward to serving you.

Sincerely,

FORD AUDIO-VIDEO SYSTEMS, LLC



Daniel Berg

Senior Account Manager

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FORD AUDIO-VIDEO SYSTEMS, LLC



Bryan Burdick, CTS  
Vice President

**Proposal**  
**For**  
**City of Broken Arrow, Broken Arrow, OK**

A. INTRODUCTION

This proposal provides a description of the technology incorporated into the systems, lists the major equipment and components, and states the terms, conditions, and responsibilities. Individual components and quantities may be changed, deleted, added, or designated as optional to be added to the system at a future date.

B. DESCRIPTION OF WORK

Ford Audio Video Systems, LLC (Ford AV) shall provide and install the following video and broadcast lighting/dimming system for the City Council Meeting Room located in the City of Broken Arrow's City Hall, Broken Arrow, OK (Customer). The equipment for these systems shall include:

1. High Definition (HD) Video Projection System:

- a. Ford AV shall provide and install two (2) main HD laser projectors, which shall be mounted from the ceiling and located towards the front of the meeting room on the left and right side, respectively. These HD laser projectors shall provide the ability to project an image from two (2) owner furnished equipment (OFE) Microsoft Surface Pro 3 computers, one (1) OFE desktop computer, two (2) HD document cameras, one (1) Blu-Ray DVD player, and one (1) HD cable TV tuner onto two (2) projection screens, which shall be located on the front wall, flanking the left and right sides of the City Broken Arrow emblem. These HD projectors shall be controlled by the proposed control system.
- b. Ford AV shall provide and install one (1) rear HD laser projector, which shall be mounted from the ceiling and located towards the rear of the meeting room in the center of the room. This HD laser projector shall provide the ability for the council members (sitting at the Dais) to see the same image that is being displayed on the two (2) front HD projectors. This HD projector shall be controlled by the proposed control system.
- c. Ford AV shall provide and install two (2) main HD motorized projection screens, which shall be located on the front wall, flanking the left and right sides of the City Broken Arrow emblem. These projection screen shall be positioned so that when they are deployed, they are closer towards the ceiling. This will provide a better viewing angle to the general seating audience as well as be higher up so that the light from the broadcast fixtures would be less prone to washing the projected image out onto both screens. The exact mounting method for these screens is to-be-determined. These HD projection screens shall be controlled by the proposed control system.
- d. Ford AV shall provide and install one (1) rear HD motorized projection screen, which shall be located above the ceiling soffit, on the rear wall, centered to the meeting room.

The exact mounting method for this screen is to-be-determined. This HD projection screen shall be controlled by the proposed control system.

2. Audience LED Displays:
  - a. Ford AV shall provide and install two (2) audience HD 55” LED displays, which shall be wall-mounted in the same locations as the existing LCD display locations, replacing the existing LCD displays. These LED displays shall display the same image that is being displayed on the two (2) front HD projectors and one (1) rear HD projector. These HD LED displays shall be controlled by the proposed control system.
3. Annotation LED Display:
  - a. Ford AV shall provide and install one (1) HD 55” LED interactive LED display, which shall provide the user the ability to annotate over any of the sources being displayed over the multimedia system. This LED display shall be located on the south side wall of the meeting room, at a height that shall allow a user who is standing to annotate on this display. This HD LED display shall be controlled by the proposed control system.
  - b. Ford AV shall provide and install one (1) hanging microphone, which shall be mounted from the ceiling directly in front of the annotation LED displays. This microphone shall be used to capture the audio of any user who is standing in front of the annotation LED display.
4. Conference Room “Overflow” Feed:
  - a. Ford AV shall provide and install one (1) mono audio and video feed from City Council Meeting Room to existing executive conference room’s multimedia system.
  - b. Ford AV shall provide and install programming of existing executive conference room's control system to add audio/video switching capability to add City Council Meeting Room multimedia system as selectable source.
5. OFE Video Production System Feed:
  - a. Ford AV shall provide and install one (1) mono audio and video feed from City Council Meeting Room’s multimedia system to the City’s OFE video production system.
  - b. Ford AV shall provide and install one (1) mono audio and video feed from the City’s OFE video production system to the City Council Meeting Room’s multimedia system. This shall provide the ability to display output of the OFE video production switcher onto all of the displays within the City Council Meeting Room.
6. HD Video Scalers:
  - a. Every display source to be provided by Ford AV that is referenced in this proposal shall be scaled to its native resolution. These scalers shall be mounted in to-be-determined locations.

7. Digital Audio/Video Transmitters/Receivers:
  - a. Every display source to be provided by Ford AV that is referenced in this proposal shall have a digital audio/video transmitter/receiver to be used for the signal transmission from the video switcher to each display source. These digital audio/video transmitters/receivers shall be mounted in to-be-determined locations.
  
8. Digital Audio/Video Matrix Switcher:
  - a. Ford AV shall provide and install one (1) Crestron Digital Media Matrix Switcher, which shall be used to switch between all of the audio/video sources to all of the displays sources referenced within this proposal. This matrix switcher shall be mounted in an OFE equipment to be provided by Ford AV.
  
9. Audio/Video Sources:
  - a. Ford AV shall provide and install two (2) interfaces for OFE portable computers, which shall be located at the administration seating station (located on the right [or south] side of the meeting room). These interfaces for OFE portable computers shall be used to connect the audio/video signal outputs from two (2) OFE Microsoft Surface Pro 3 computers to the multimedia system. In addition, each computer interface shall also allow the ability to connect one (1) OFE portable computer with VGA connectivity to the multimedia system. At each interface, only one (1) type of computer connectivity can be used at a time. These interfaces shall be mounted in to-be-determined locations at the administration's seating station.
  - b. Ford AV shall provide and install one (1) interface for an OFE desktop computer, which shall be located in the video production room (located on the left [or north] side of the meeting room). This computer interface shall be used to connect the audio/video signal output from one (1) OFE desktop computer to the multimedia system. In addition, this computer interface shall also allow the ability to connect one (1) OFE desktop computer with VGA connectivity to the multimedia system. Only one (1) type of computer connectivity can be used at a time with this interface. This interface shall be mounted in to-be-determined location in the video production room.
  - c. Ford AV shall provide and install two (2) HD document cameras, which one (1) HD document camera shall be located at the administration's seat station and the other to be located in the video production room. Each document camera's primary functions shall be controlled by the proposed control system.
  - d. Ford AV shall provide and install one (1) Blu-Ray DVD player, which shall be located in the video production room (located on the left [or north] side of the meeting room). This DVD player shall be used to playback a Blu-Ray DVD and/or standard definition DVD over the multimedia system. This Blu-Ray DVD player's primary functions shall be controlled by the proposed control system. This Blu-Ray DVD player shall be located in a to-be-determined location within the video production room.
  - e. Ford AV shall provide and install one (1) LCD preview monitor, which shall be located in the video production room (located on the left [or north] side of the meeting room). This LCD preview monitor shall be used to cue up the Blu-Ray DVD player prior to



displaying the DVD content over the multimedia system. This LCD preview monitor shall be located in a to-be-determined location within the video production room.

- f. Ford AV shall provide and install one (1) HD cable television tuner, which shall be located in an equipment rack to be provided by Ford AV. This HD cable television tuner shall be used to playback a cable television channel over the multimedia system. This HD cable television tuner's primary functions shall be controlled by the proposed control system. Please note: The City of Broken Arrow shall be responsible for providing the cable television service to the HD cable television tuner.

#### 10. Architectural/Broadcast Lighting System Dimming System:

- a. Ford AV shall provide and install one (1) ETC lighting control dimming module, which shall be used to control the current OFE architectural lighting fixtures and the new broadcast fixtures.

Please note: The City of Broken Arrow's electrical contractor shall be responsible for removing the existing lighting dimmer system, installing the new ETC lighting dimmer panel, providing any necessary electrical AC conduit, and connecting AC power to the new dimmer system.

- b. The OFE architectural and broadcast lighting zone presets shall be recalled via the Crestron control system's touch panels as well as lighting control panels to be located at the two (2) front entrances and the two (2) rear entrances. The exact locations of the four (4) lighting control panels are to-be-determined.

#### 11. Broadcast Lighting System

- a. Ford AV shall provide and install eight (8) broadcast lighting fixtures that shall be installed from the ceiling of the meeting room. These broadcast fixtures shall replace the existing "arc" of hanging fixtures located above the council member dais. These broadcast fixtures shall be used to provide additional lighting to the city council member dais during video broadcasts. These broadcast lighting fixtures shall be controlled via the proposed Crestron control system's touch panel(s).

Please note: The City of Broken Arrow shall be responsible for removing the existing "arc" of hanging fixtures located above the council member dais. In addition, the City's electrical contractor shall be responsible for connect AC power to the broadcast lighting fixtures.

#### 12. Control System:

- a. Ford AV shall provide and install one (1) wired 10" Crestron LCD touch panel with table-top base. This touch panel shall reside in video production room. Please note: This 10" Crestron LCD touch panel is in addition to the other existing 10" Crestron LCD touch panel located at the administration seating station. Both touch panel's graphical user interface shall mirror one another.
- b. The 10" LCD touch panels shall provide the following video and lighting system functions:

- 1) Volume Control: Volume control of the audio/video sources specified within this proposal.
  - 2) Source selection of the audio/video sources specified within this proposal.
  - 3) Blu-Ray DVD player transport control.
  - 4) HD document cameras transport controls.
  - 5) HD cable television tuner transport controls.
  - 6) Power on/off control of the three (3) HD Laser projectors specified within this proposal.
  - 7) Up/down control of the three (3) HD motorized projection screens.
  - 8) Power on/off control of the two (2) audience LED displays.
  - 9) Power on/off control of the one (1) annotation LED display.
  - 10) The ability to switch to a "Standard User Mode," which when activated, shall provide a graphical user interface that has streamlined functionality of the multimedia system. This "streamlined" graphical user interface shall be determined and customized by the City of Broken Arrow and Ford AV working together.
  - 11) The ability to switch to an "Administration Mode," which when activated, shall provide every functionality of the control system to the user on the graphical user interface.
  - 12) The ability to switch to an "Executive Mode," which when activated, shall automatically mute all audio and video signals going out to the OFE audio recorder, the OFE video production switcher, the OFE audio production digital mixer, and the auxiliary conference room feed. In addition, the portions of the graphical user interface controlling these aspects of the multimedia system shall "disappear" from the touch panel graphics when this mode is activated.
  - 13) On/off LED light indicator for when the "executive mode" is engaged.
  - 14) Locking/unlocking of existing magnetic lock main exterior entrance doors. (Please note: City of Broken Arrow shall be responsible for providing OFE cable from magnetic locking system to the equipment rack to be provide and installed by Ford AV.)
  - 15) Recall of presets for architectural lighting.
  - 16) Recall of presets for broadcast lighting.
  - 17) System power on/off
  - 18) Password-protected with user having the ability to change password.
  - 19) Color schemes, button/page layout must be approved by City of Broken Arrow prior to integration.
  - 20) City of Broken Arrow logo to be incorporated into panel graphics.
- c. Ford AV shall provide and install one (1) wired 2.8" LCD touch panel, which shall be used as a chairperson override control - mute all/un-mute all/mute all except chairperson. This touch panel shall reside on the city council member dais at the chairperson location.
- d. System auto-shut down at 2:00am and reset back to default setting every night.
- e. Please note: This control system shall only control the equipment referenced within this proposal. Ford AV can add additional control of OFE equipment (depending on manufacturer, model, and type of equipment) for an additional charge, which is not included within this proposal.

- f. The ability to operate the control system using a web browser on a PC or laptop system (computer to be provided by customer) that is connected to customer's computer network. This functionality shall require the control system processor to also be connected to customer's computer network. This functionality shall not be available unless the customer provides connection to the network. The connection is the responsibility of the customer.
13. "Executive" Mode LED Light Indicator:
- a. Ford AV shall provide and install one (1) LED light to be installed in a to-be-determined location within the meeting room and the video production room. This LED light shall be used to indicate when a meeting is in "executive" mode.
14. Equipment Rack
- a. Ford AV shall provide and install one (1) 10-space table-top equipment rack into the video production room. This rack would house the Blu-Ray DVD player and the audio recorder (referenced in Ford AV audio system proposal for City Council Meeting Room).
  - b. Ford AV shall use the equipment rack (referenced in Ford AV audio system proposal for City Council Meeting Room) to house the control system, video switching, and cable television tuner components.
15. PREVENTATIVE MAINTENANCE
- a. Ford AV shall perform one (1) pre-scheduled service call, prior to the end of the warranty period, for the purpose of conducting routine preventative maintenance (PM) to check the general operation of equipment. This PM service call shall be scheduled in advance with the Customer, between 8:00 am and 5:00 pm Monday through Friday, excluding holidays, and does not include expendable materials used (e.g., light bulbs, lamps, light fixture lamps, fuses, batteries, portable connection cables, etc.) or system programming. This service is renewable up to three (3) years.
  - b. The Customer will provide a contact person that is authorized to answer questions and obligate the Customer if additional services are requested. The contact will be personally available to meet with the Ford AV technician and have knowledge of the equipment and systems to be inspected. The contact person will provide access to all areas and equipment rooms requiring inspection.

## C. INSTALLATION SCHEDULE

1. Ford AV estimates that the actual on-site installation, test out and commissioning of this project will take twelve (12) days. In addition to the installation, Ford AV shall prepare system drawings, purchase the equipment, assemble the equipment in our shop, program control software as required and do in-shop testing. This work will take approximately eight (8) to ten (10) weeks prior to the beginning of actual installation at your facility. The total time required to complete the project shall be approximately eleven (11) weeks. The completion of Ford AV's work depends upon the facility being secure, dust-free, air-conditioned, and quiet.
2. Please note that Ford AV must receive the signed contract and down payment prior to beginning any work on this project, including engineering, purchasing of equipment, and the scheduling of

the installation. For Ford AV to meet the above completion schedule, it is important that the Customer ensures the job site is available for Ford AV personnel, and there are no interruptions in the availability of the job site and the ability of Ford AV to do the work. Ford AV schedules its work force weeks in advance in order to meet the installation completion dates of all of its customers. As a consequence, it is vital that the Customer notify Ford AV's Project Manager in the event that the Customer changes the schedule or the Customer's other contractors fall behind in completing their portion of the work.

D. EQUIPMENT LIST

VIDEO EQUIPMENT

Quantity	Description	
3.00	DALI.70137LS ADVANTAGE,137D 72.5X116HCMW	
3.00	CHRI.1400071080 PROJ,WUXGA,5,000 LUMEN,LASER	
3.00	CHRI.1401021041 LENS,LENS 1.52-2.89 ZOOM G	
3.00	CHIE.CMS440 MOUN,8" CEILING W/ONE SLOT	
3.00	CHIE.RPMAUW MOUN,UNIV. RPMA W/Q-LOCK WHITE	
3.00	SAMS.DB55D DISP.MON,55",LED,1080P,350 NIT	
3.00	CHIE.MSM1U MOUN,MEDIUM FUSION MICRO WALL	
1.00	SAMS.CYTD55LDAH ACCE,10 PT TOUCH OVERLAY, 55"	
6.00	DVIG.DVI-7525 TRAN, HDBASET TX/RX SET 100M	
2.00	CRES.HDDA44KE AMP.DA 1 TO 4 4K HDMI DA	
3.00	CRES.HDSCALERHD HD VIDEO SCALER, HDMI	
1.00	CRES.DMRMCSCALE RECE, DM, 8G+, W/ SCALER	
1.00	ATLO.AT-HD420 ADAP,HDMI TO VGA CONVERTER	
1.00	DATA.DAC-70 ANALOG VIDEO/VGA TO SDI CONVER	
1.00	CRES.CAPTUREHDP RECO,HD RECORDER W/HD CAM INPU	
1.00	CRES.USB-EXT AV,USB OVER TWISTED PAIR EXTEN	
1.00	EXTR.60-1316-01 AV,ANNOTATOR 300,HDCP W/ DTP	
1.00	CRES.DM-MD8X8 AV,DM,MEDIA DISTRIBUTION CTR	
1.00	CRES.DMC4KCOHD CARD,DM OUTPUT,2CH 4K 8G+ CAT	
3.00	CRES.DMC-HDO CARD,DM OUTPUT,2 CH HDMI W/AUD	
2.00	CRES.DMC-4K-C CARD,DM,IN: 1 DM,1 HDMI,1 POE	
4.00	CRES.DMC-4K-HD CARD,INPUT CARD,4K HDMI	
1.00	CRES.HDMD4X14KE SWIT,4X1 4K HDMI SWITCHER	
2.00	CRES.DMTX201C TRAN,DM,HDMI + RGB INPUTS	
1.00	DENO.DBT1713UDP AV,BLUE RAY,DVD PLAYER	
1.00	NEC.AS222WM-BK DISP.MON.22".LCD.ACCUSYNC.WIDE	
2.00	WOLF.VZ-8PLUS4 CMOS 1080P DESKTOP VISUALIZER	
1.00	CRES.DMC-SDI CARD,SDI INPUT FOR DM SWITCHER	
		Sub Total 75,229.78

CONTROL EQUIPMENT

Quantity	Description
1.00	CRES.TSW1050BS DISP,TOU,10" BLACK, SMOOTH

1.00	CRES.TSW1050TKB ACCE,DOCK STATION TABLE TOP KI		
1.00	CRES.C3COM-3 3-SERIES™ CONTROL CARD – 3 COM		
1.00	SWITCH UPGRADE ALLOWANCE		
2.00	SONI.LD-40F1CM ACCE, LIGHTED SIGN		
		Sub Total	3,614.30

EQUIPMENT RACK

Quantity	Description		
1.00	MIDD.BRK10 RACK,BLACK,10SP(17.5"),18"DEEP		
1.00	MIDD.RK-RR10 ACCE,KIT,10 SPACE ADD RAIL		
1.00	MIDD.UD2 RACK,2 SPACE (3 1/2") UTILITY		
1.00	MIDD.UPS1000R8 100VA/750W UPS,IND.OUT		
		Sub Total	1,068.49

CABLES AND HARDWARE

Quantity	Description		
2,000.00	CRES.DMCBL8GPSP CABL,24/8 STP,8G,PLENUM,		
27.00	CRES.CBL-HD-6 CABL, HDMI, 6'		
20.00	C2G.03983 CABL,BLK,CAT6,6',SNAGLESS		
1.00	CRIMPS, TIES, & LABELS		
1.00	CABLES & CONNECTORS		
1.00	RACK HARDWARE		
1.00	MOUNTING HARDWARE		
		Sub Total	5,994.00

INTEGRATION SERVICES

Quantity	Description		
	DESIGN, ENGINEERING, FABRICATION, PROJECT MANAGEMENT INSTALLATION, COMMISSIONING, TRAINING AND WARRANTY		
		Sub Total	39,880.00
		Merchandise:	85,906.57
		Integration:	39,880.00
		Freight:	.00
		Sales Tax*:	.00
		Total Amount:	125,786.57

**LIGHTING EQUIPMENT**

Quantity	Description		
1.00	ETC.CUSTOM1 CUSTOM LIGHITNG CTRL & DIMMING		
1.00	BRIG.CUSTOM1 LED LIGHTING PACKAGE		
<b>Sub Total</b>			<b>33,434.67</b>

**CABLES AND HARDWARE**

Quantity	Description		
1,000.00	WEST.25225B WIRE,2C,16G,PENUM,GRAY		
1,000.00	WEST.254245 WIRE,CAT5,PENUM,LAN		
1,000.00	WEST.DA252402 2PR,24,STND,SHLD,CMP,TIND,AES/		
1.00	CRIMPS, TIES, & LABELS		
1.00	CABLES & CONNECTORS		
1.00	MOUNTING HARDWARE		
<b>Sub Total</b>			<b>2,680.00</b>

**INTEGRATION SERVICES**

Quantity	Description		
	DESIGN, ENGINEERING, FABRICATION, PROJECT MANAGEMENT INSTALLATION, COMMISSIONING, TRAINING AND WARRANTY		
<b>Sub Total</b>			<b>19,165.00</b>
Merchandise:			36,114.67
Integration:			19,165.00
Freight:			.00
Sales Tax*:			.00
<b>Total Amount:</b>			<b>55,279.67</b>

**E. COST SUMMARY AND TERMS**

**PROPOSED TOTALS**

<b>VIDEO SYSTEM:</b>	<b>\$125,786.57</b>
Preventative Maintenance:	\$960.00
<b>LIGHTING SYSTEM:</b>	<b>\$55,279.67</b>
Preventative Maintenance:	\$612.00

**\*TAXES:** All taxes are the responsibility of the Customer. If a tax is charged to Ford AV, the Customer will be responsible for reimbursing Ford AV for the cost.

**TERMS:**

1. Customer shall issue a purchase order for the full amount of the agreement.
2. 100% of agreement is due upon completion.

All invoices are due Net 30.

**CC:** Unless otherwise prohibited by law, a 3% bank interchange fee will be charged for using a credit card for payment.

**PRICE:** The price stated above for this project is based upon the complete system being purchased and installed at one time. In the event the Customer selects to purchase less than the total project, delays purchase of any portion of the system, requires that the system be installed in phases, or delays the installation, Ford AV reserves the right to charge for additional labor, travel, and overhead. The price is valid for thirty (30) days from the date of this proposal.

**COMMENCEMENT OF WORK:**

Ford AV must receive the signed contract and down payment prior to the contract being initiated by Ford AV. Without the signed contract and down payment being received by Ford AV, no work on the contract will be taken, including engineering the system, purchasing the equipment and scheduling the work crews for installation. In the event the Customer fails to pay Ford AV within the terms above, Ford AV reserves the right to stop work on the project until all payments are received by Ford AV in accordance with the terms.

**CREDIT:** This proposal shall not be deemed as accepted by Ford AV until the executed contract is returned to Ford AV's credit center for final review and acceptance.

**CHANGES:** Any Customer Change Orders (CCO) must be approved in writing by the Customer prior to execution by Ford AV and are subject to the credit terms of this agreement.

**NON-HIRE:** The Customer and Ford AV mutually agree, because of the high cost of training an employee, that neither party shall solicit the employment of any employee of the other party, and shall not employ any employee or any person who was an employee of the other party at any time during the relationship between the parties or for a period of one (1) year following the termination of any relationship between the parties. In the event of a breach of this section, the breaching party agrees to pay the other party an amount equal to the hired employee's annual wages as an agreed upon cost to replace the employee.

**F. GUARANTEES AND LIMITATIONS OF WARRANTIES**

**1. FORD AV GUARANTEES THE FOLLOWING:**

- a. Equipment will be new, unless noted otherwise.
- b. All workmanship provided by Ford AV will be free of deficiencies and defects, and will be repaired, free of charge, for a period of one (1) year from the date of substantial completion or the first date of beneficial use of the system, whichever date occurs first.

Substantial completion shall be defined as the point where the work, or designated portion thereof, is sufficiently complete so that the system can be used for its intended purpose.

- c. All equipment and materials provided by Ford AV that were manufactured by other companies will be warranted under the standard warranty terms of the original manufacturer.
- d. If any questions arise now or in the future about the installation or operation of the system, a Ford AV engineer will be available to assist and answer any questions by phone.
- e. The warranty does not include nor cover expendable materials used with the system installation (e.g., light bulbs, lamps, light fixture lamps, fuses, batteries, portable connection cables, etc.).
- f. Ford AV is not responsible for the reliability of systems that communicate using wireless technology. The performance of equipment utilizing wireless communications is inherently unreliable and will experience "drop outs", distortion and loss of connectivity from time to time. Interference from other forms of radio frequency transmissions, such as radio and television broadcasts, cell phones, and computer wireless networks, is probable and should be expected.
- g. Ford AV is not responsible for the performance, testing, or configuration of owner-furnished data networks that are used to transmit audio, video, and lighting program data and control signal data. IP-based videoconferencing systems rely upon data networks that can provide consistent bandwidth for the transmission. Videoconferencing that is transmitted over the Internet is subject to the intermittent and unreliable nature of the public network. In the event that the Customer's network is found to be the cause of defects in the quality of the audio/video signals, is unreliable, or has insufficient bandwidth to support the A/V/L system and Ford AV's network engineers are required to troubleshoot or configure the Customer's network, the cost of this service will be invoiced to the Customer.
- h. The term "Software" as used in this document includes all editable source files, un-editable compiled files, graphical user interface files and functionality, audio digital signal processor (DSP) files, in whole and in part, produced under the terms of this agreement.

Unless otherwise expressly agreed in writing, all Software remains the property of Ford AV, and the Customer is hereby provided a license to use the Software for this project only. The Software may not be used on any other project, nor used for any purposes outside of this project, nor shared nor disclosed to anyone who is not an employee of the Customer's company.

- i. Any adjustments made by the Customer or the Customer's agent(s), other than routine operational adjustments, shall not be covered under this warranty statement. Re-calibration of settings shall be considered by Ford AV to be billable time to the Customer at Ford AV's standard engineering rates.



- j. Procedures such as routine preventative maintenance functions (e.g., keeping filters clean, keeping system environment free from foreign materials, etc.) are the responsibility of the Customer and is not included within this warranty agreement. Failure on the part of the Customer to perform these routine maintenance functions shall void this warranty.
  - k. If warranty work is necessary within the warranty period, Ford AV will, at its option, repair the defective equipment or return it to the manufacturer for repair.
  - l. Repairs, modifications, or other work performed by personnel not authorized by Ford AV during the period of warranty on any equipment of the system may invalidate the warranty.
  - m. Ford AV will not be responsible for damages or cost of repairs due to modifications, adjustments, or additions to the system performed by personnel not authorized by Ford AV prior to acceptance of the system by the Customer.
  - n. Ford AV may withhold warranty service in the event that the Customer has an unpaid balance due to be paid to Ford AV.
2. OWNER-FURNISHED EQUIPMENT (OFE):
- a. Ford AV's intent is to provide a complete system, which includes providing all the equipment. In some cases, the Customer may own equipment that they desire to be included with the Ford AV installation. Ford AV reserves the right to accept or reject equipment provided by the Customer and to charge a service fee due to the problems encountered with using equipment that is of unknown origin, service history, software revision, etc. Ford AV will not accept OFE that is purchased by the Customer to replace equipment that is specified in this proposal.
  - b. Materials or equipment provided by the Customer/Owner, if any, to be included within the work, shall be done with no warranty or guarantee by Ford AV. Use of OFE is solely for the convenience and benefit of the Customer.
  - c. The existing equipment, removed as a courtesy by Ford AV, that is not being reused, shall be returned to the Customer. Ford AV is not responsible for the existing equipment or its condition when received by the Customer.
  - d. Ford AV shall take reasonable care in handling OFE and shall install it according to standard industry practices; however, Ford AV takes no responsibility for the operation, performance, appearance, or effects of OFE before, during, or after its integration into the system.
  - e. The Customer is responsible for installation and registration of all software on OFE computers. Ford AV will provide the Customer with system requirements for Ford AV-provided software, but the Customer is responsible for installing it on the OFE PCs and/or OFE Network. All software-related customer support shall be directly provided by the software manufacturer.

- f. The Customer agrees to reimburse Ford AV for all work related to the service and/or troubleshooting of OFE with the provision that the Customer authorizes Ford AV to proceed with malfunction evaluation and repairs.
- g. In the event that OFE does not function properly, Ford AV shall notify the Customer. The Customer will determine if the OFE is to be a) repaired, b) an alternate unit provided by the Customer, c) the unit is not to be used, or d) Ford AV is to provide a new unit. Ford AV shall provide a cost to the Customer for the work to be done. The Customer will authorize any additional costs to the job.

## G. TRAINING AND DOCUMENTATION

### 1. TRAINING INCLUDED:

- a. Ford AV will host a training session near the completion of installation. All system users and interested persons should attend this training so that all questions can be answered during this training.
- b. During the training, if requested, Ford AV personnel will attend the initial first use of the system and assist the Customer's operators and users in the operation of the Ford AV-installed system.
- c. Ford AV shall provide a quick start guide (QSG) for each room type. The QSG is a generic, brief description, of how to operate the system. Two (2) copies of a laminated document, for each room type, shall be provided to the Customer.

### 2. ADVANCED TRAINING - OPTIONAL:

Ford AV is committed to providing the highest quality and most modern training experience possible to its Customers. In addition to the training included with this project, for an additional fee, Ford AV offers multiple, customizable options to fit the needs of any Customer. The possible programs include:

- a. Ford AV shall supply a training video consisting of a visual tutorial or tutorials, if multiple room type videos are purchased, that will explain how to operate specific AV systems. This training tutorial, narrated by a Ford AV trainer, is a self-paced, always-available, online video, viewable on any mobile device which give the learner a step-by-step process on how to use the technology.
- b. In consultation with the Customer, Ford AV will develop and execute a custom curriculum and curriculum schedule.
- c. Ford AV will provide in-person presentation(s), as needed, including presentation materials such as PowerPoint or Prezi presentation.
- d. Ford AV will develop a custom Orientation & Operations Handbook, which shall include detailed, user-friendly information on solutions, functionality, troubleshooting, curriculum, and other useful reference materials.

- e. The Ford AV Training Center also highly recommends follow-up training sessions six months to a year following the initial session(s) to ensure that all concepts are anchored and being employed by each user as well as providing opportunities for new employees to receive the same level and style of training existing employees received. The Ford AV Training Center will work with customers to develop a long-term training strategy and/or ongoing training curriculum.
- f. Additional materials include documents in electronic format, additional hard and/or laminated copies of Quick-Start Guides and Orientation & Operations Handbooks, as well as CDs or DVDs of these curriculum materials.
- g. All training curriculum and components will be developed and executed by a Ford AV Master Trainer.
- h. The components of the optional training are to be determined by the Customer, Account Manager, and Ford AV Master Trainer to best meet the needs of the Customer. The cost of the additional materials and training is based on the desired program.
- i. Please contact Ford AV to receive a customized price quote on the Advanced Training Program option.

## H. BUILDING CONSTRUCTION, SYSTEM INSTALLATION, AND RESPONSIBILITIES

### 1. VISUAL INSPECTION:

- a. This proposal is based upon a visual inspection of the site conditions. It is agreed that some buildings may have inherent design and/or construction that is not visibly recognizable and is outside of normal standard and customary building procedures. If the walls, floors or ceiling are found to be constructed in a manner that wire cannot be pulled or equipment cannot be mounted or otherwise installed without labor or materials in excess of those anticipated by both parties and proposed herein, the Customer agrees to be responsible for any adjustments in the labor and materials required to perform the installation.

### 2. THE CUSTOMER SHALL BE RESPONSIBLE FOR:

- a. The Customer shall have a representative (one [1] person selected by the Customer) available throughout the installation to make decisions on behalf of the Customer concerning the installation. The purpose is to ensure that communication between the Customer and Ford AV is accurate and responsive in the event of questions or problems that may arise during installation.
- b. The Customer shall clear the facility, auditorium, or other rooms involved in the installation of all activities during the periods of installation. Ford AV will work with the Customer to schedule the installation. Hours or days of work lost by the installation crew due to the inability to work as planned will be charged to the Customer based on the extra labor and expenses required.
- c. The Customer shall provide a facility that is prepared for the installation of electronic equipment. This includes a clean, dust-free and air-conditioned environment that is

secure and quiet. The Customer is responsible for providing a secure job site and for the cost of loss or damage to audio, video, and lighting equipment delivered by Ford AV to the job site.

d. Electrical AC Power:

In the event that AC electrical power is required to be installed or conduit systems are required to support the audio/video systems, it is the responsibility of the Customer, at their expense, to provide complete and adequate electrical power.

e. Lighting System Requirements:

The Customer's electrical contractor shall install a complete lighting system including dimmer racks, lighting fixtures, control panels, distribution equipment, and control and AC wiring including the following:

- 1) Provide and install the main A.C. service power feed and safety disconnect to the dimmer cabinet.
- 2) Mounting the dimmer cabinet.
- 3) Installation of outputs circuits between the dimmers and the lighting fixtures.
- 4) Provision and installation of lighting bars to the building structure.
- 5) Mounting of lighting fixtures.
- 6) Installation and provision of control cables between dimmers, console, and remote control stations.
- 7) Ford AV and the lighting manufacturer must inspect and approve all electrical work prior to energizing the system. This is necessary to validate the warranty of the equipment. It will take approximately three weeks to schedule the manufacturer's representative to turn-on the system after the Customer or the electrical contractor has notified Ford AV the system has been installed and is ready.
- 8) Lighting systems require 120/208 Volt 5 wire AC service. If the existing AC service is not 120/208 volt, the Customer or electrical contractor shall notify Ford AV so that the Dimmer Rack may be changed to the appropriate voltage. This should be done at the beginning of the project.
- 9) All wiring between the output of the dimmers and the lighting instruments should be three wire with a separate conductor for hot, neutral, and ground. Shared or degraded neutrals are not acceptable and will void the warranty.

f. Providing and preparing adequate space for the location of equipment, lighting equipment, video monitors, video projectors, projection screens, and equipment racks included in system. In the event floors are sloped or not level, the Customer is responsible for making the floor level under consoles and equipment racks. In the event a

projection screen is recessed in a finished ceiling, the Customer is responsible for refinishing the ceiling.

- g. Providing a clear area with adequate ventilation and air conditioning that maintains a room temperature not exceeding 75 degrees Fahrenheit in all rooms that are occupied by sound/audio/video/lighting equipment racks. Sound, audio, video and lighting equipment produces heat which must be dissipated by ventilation or air conditioning. Prolonged operation at room temperatures above 75 degrees Fahrenheit will shorten the life of electronic equipment, leading to premature failure of components.
  - h. Ford AV is not licensed for and does not perform any AC electrical, carpentry, painting, masonry, or carpet laying work.
3. FORD AV SHALL BE RESPONSIBLE FOR:
- a. Providing line drawings for systems and equipment manuals electronically at no cost
  - b. Fabrication and installation of video systems
  - c. Providing recommendations for electrical power and conduits, to be provided and installed by the electrical contractor, for the video/control systems
  - d. Installation of low voltage video wiring for systems
  - e. Testing and alignment of video systems
  - f. Training
  - g. Warranty service
  - h. Providing as-built drawings with wire numbers and labels

I. ACCEPTANCE

1. The Customer's personnel will be notified by Ford AV upon completion of the installation.
2. Demonstration of system performance will be during the training session.
3. Participants at the performance demonstration shall include personnel representing Ford AV and personnel representing the City of Broken Arrow who are authorized to accept the system as complete and make final payment.

This proposal shall not be deemed as accepted by Ford AV until the executed contract is returned to Ford AV's credit department for final review and acceptance. If a purchase order is required by the Customer, it must be transmitted with the signed install agreement for review and acceptance.

This proposal contains confidential pricing, design, engineering, and installation information that is proprietary to Ford AV. It is provided for your private use, and is not to be disclosed, in part or in whole, without the express, written authorization of Ford AV.

We appreciate the opportunity to work with you on this project. If you have any questions or need additional information, please contact me at 918-664-2420.

Sincerely,

FORD AUDIO-VIDEO SYSTEMS, LLC



Daniel Berg  
Senior Account Manager

Voice: 918-664-2420  
E-mail: [bergd@fordav.com](mailto:bergd@fordav.com)  
Website: [www.fordav.com](http://www.fordav.com)

**SYSTEM INSTALLATION AGREEMENT**

**Between**

**THE CITY OF BROKEN ARROW**

**and**

**FORD AUDIO-VIDEO SYSTEMS, LLC**

This is to signify that the City of Broken Arrow and Ford Audio-Video Systems, LLC have entered into a contract, in the amount listed below, for the purchase and installation of equipment and services described in the attached proposal.

VIDEO SYSTEM:	\$125,786.57	_____
Preventative Maintenance:	\$960.00	_____
LIGHTING SYSTEM:	\$55,279.67	_____
Preventative Maintenance:	\$612.00	_____

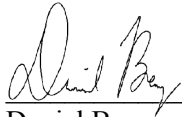
Customer Accepts  
Customer Accepts  
Customer Accepts  
Customer Accepts

The City of Broken Arrow and Ford Audio-Video Systems, LLC, by and through their respective signatories to the agreement, each represent to the other that they are authorized to enter into this agreement.

We do both agree to abide by the terms and conditions of this agreement.

FORD AUDIO-VIDEO SYSTEMS, LLC

CITY OF BROKEN ARROW



\_\_\_\_\_  
Daniel Berg  
Senior Account Manager

\_\_\_\_\_  
Authorized Signature



\_\_\_\_\_  
Bryan Burdick, CTS  
Vice President

\_\_\_\_\_  
Printed Name and Title

July 15, 2015

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

Ford AV Workers Compensation Experience Modification Rate ([EMR](#))

2013 = .85  
2012 = .81  
2011 = .94  
2010 = .90

**OSHA Log:**

DESCRIPTION:	2013	2012	2011	2010
A. Total Recordable Incidents	6	10	4	7
B. Lost Work Day Cases (lost time)	2	4	0	2
C. Actual Lost Workdays:	81	40	0	134
D. Total Employee Hours Worked	672,764	610,937	518,534	515,009
E. Number of Fatalities	0	0	0	0
F. Average Number of Employees	318	294	249	248

**Incident Rate for [Lost Work Day Cases](#):**

2013: 1.19    2012: 1.31                    2011: 0                    2010: .78

**Incident Rate for [Restricted Work Day Cases](#):**

2013: 0.59    2012: 1.64                    2011: .77                    2010: 1.55

**Incident Rate for [All Recordable Injury Cases](#):**

2013: 1.78    2012: 3.27                    2011: 1.54                    2010: 2.7

**Frequently Asked Questions:**

**Question:**        Have you ever had a fatality at Ford AV?

**Answer:**            No

**Question:**        Do you hold safety meetings/safety inspections/tool box meetings?

**Answer:**            *We hold a company-wide safety meeting every Monday morning at 8:30 a.m. CST. The audio and video of the safety meeting is recorded and archived on our computer server so that it can be viewed by employees that were not able to attend the meeting. On jobsites, the Job Superintendents hold safety meetings/tool box meetings regularly.*

**Question:**        Do you have an instruction program in place for new hires and/or foremen? (or "Do you have a Safety Program? Or "Do you have a Safety Incentive Program?")

**Answer:**            Yes – (the "Ford AV Safety and Health Program" is located under "T/Std/HRC.NE.JC Safety and Health Program.doc")

**Question:**        Who is your Safety Officer?

**Answer:**            *Tim Popowsky: Field Operations Manager, Safety Officer  
Day Phone: (405) 946-9966, x. 2064  
Night Phone: (405) 313-8287  
Email: popot@fordav.com*





# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
12/31/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis of Oklahoma, Inc. c/o 26 Century Blvd P.O. Box 305191 Nashville, TN 372305191 USA	CONTACT NAME:	INSURER(S) AFFORDING COVERAGE	NAIC #
	PHONE (A/C, No. Ext): 1-877-945-7378		
	E-MAIL ADDRESS: certificates@willis.com		
INSURED Ford Audio-Video Systems, LLC 4800 West Interstate 40 Oklahoma City, OK 731285425	INSURER A: Valley Forge Insurance Company		20508
	INSURER B: Continental Insurance Company		35289
	INSURER C: Continental Casualty Company		20443
	INSURER D:		
	INSURER E:		
	INSURER F:		

**COVERAGES**

CERTIFICATE NUMBER: W713105


REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC <input type="checkbox"/> OTHER:			6016746553	12/31/2014	12/31/2015	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
B	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS			6016746522	12/31/2014	12/31/2015	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$10,000			6016746519	12/31/2014	12/31/2015	EACH OCCURRENCE \$ 10,000,000 AGGREGATE \$ 10,000,000 \$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	6016746536	12/31/2014	12/31/2015	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

**CERTIFICATE HOLDER****CANCELLATION**

For Information Only	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE 

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ACORD 25 (2014/01)

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SR ID:8101557

BATCH:Batch #: 103501



**State of Oklahoma  
Office of Management and Enterprise Services  
Central Purchasing Division**

**Statement of Work (SOW)**

The undersigned hereby certify to the parties' agreement for the vendor named herein to perform the services outlined in the attached Statement of Work, in accordance with the terms of this contract.

**Project Scope Summary** (a general narrative of the needs and scope of the project):

Replace current council chambers audio system with a new up to date audio system.

**General Requirements** (define the specific requirements to be met by this project)

Please see the attached requirement/specifications

**Deliverables** (define the products or work plan to be delivered):

**Please see requirements/specifications**

**Schedule of Deliverables** (indicate sequence of deliverables):

**This will be discussed or worked out with the successful bidder.**

**Timeline** (indicate anticipated completion timeline):

**2 Weeks once all materials have been received (Note\*\* The work will have to be completed between the city council meetings.**

**Costs** (define how costs are to be provided, i.e. "turnkey" and/or "hourly by skill set" and/or deliverables and/or milestones)

**Turnkey**

**The contractor's response shall include:**

1. A written narrative addressing their understanding and approach to address the Project Scope, Deliverables; Schedule; and Timeline.
2. The skill sets and hours required of each to complete project.
3. Resumes from associates to be assigned to this project.
4. Provide a detailed list of costs – costs may be either "total project turnkey" costs or hourly costs by skill set required as defined by the SOW.

**NOTE:** Upon satisfactory completion, the parties will execute an OMES Form 051 Certificate of Completion and Acceptance, in accordance with this contract.

This quotation remains valid for 120 days from the date signed by vendor named below.

This document must be completed and signed by all parties listed before any service can be performed. No additional terms or conditions will be added to this Statement of Work. The Statement of Work only details how the specific services required will be completed.

This SOW is hereby agreed to by:  
(List name and address of ordering agency)

City of Broken Arrow  
220 South 1<sup>st</sup> Street, Broken Arrow Oklahoma 74012

This SOW is hereby agreed to by:  
(Vendor Name and Address)

Ford Audio-Video Systems, LLC.  
8349 East 51st, Tulsa, OK 74145

By: \_\_\_\_\_  
Authorized Signature

By: \_\_\_\_\_  
Authorized Signature

Name: \_\_\_\_\_  
Type or Print

Name: **Bryan Burdick**  
Type or Print

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Purchase Order #: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Phone #: \_\_\_\_\_



February 26, 2015

Re: Ford Audio-Video Systems LLC

To Whom It May Concern:

It has been the privilege of Willis of Oklahoma, Inc. and Fidelity and Deposit Company of Maryland to provide surety bonds on behalf of Ford Audio-Video Systems LLC for over 24 years, during which time Ford Audio-Video Systems LLC has performed and we have issued performance and payment bonds for contracts valued in the range of \$10,000,000. In our opinion, Ford Audio-Video Systems LLC remains properly financed, well equipped, and capably managed.

At the present time, Fidelity and Deposit Company of Maryland provides a \$25,000,000 single project / \$50,000,000 aggregate surety program to Ford Audio-Video Systems LLC. As always, Fidelity and Deposit Company of Maryland reserves the right to perform normal underwriting at the time of any bond request, including, without limitation, prior review and approval of relevant contract documents, bond forms, and project financing. We assume no liability to you or any affiliates if for any reason we do not execute such bonds.

Fidelity and Deposit Company of Maryland is listed on the U.S. Treasury Department's Listing of Approved Sureties (Department Circular 570), and is rated A (Excellent) (XV) by A.M. Best Company.

Very truly yours,  
Fidelity and Deposit Company of Maryland

By: 

Renee A. Folkerts, Attorney-in-Fact

This page reflects all employees who have received various levels of CTS Certifications. See the Reimbursements tab for employees who failed their exams or did not take the exam after payment was made.

Name	Position	Designation	Effective	Expiration	City	State
Allen, Daniel	SE	CTS	09/04/12	09/30/15	AUS	TX
Allen, David	DM	CTS	03/06/07	03/31/16	AUS	TX
Alvarado, Justin	JS	CTS	08/14/10	10/31/16	OKC	OK
Alvarado, Justin	JS	CTS-I	10/02/10	10/31/16	OKC	TX
Amador, Aaron	ES	CTS	11/19/13	11/30/16	HOU	TX
Anderson, Brandon	PE	CTS	04/05/07	04/30/16	AUS	TX
Anderson, Brandon	PE	CTS-D	04/04/10	04/30/16	AUS	TX
Armbruster, Paul	PE	CTS	12/07/11	04/30/15	DEN	CO
Armbruster, Paul	PE	CTS-D	04/03/12	04/30/15	DEN	CO
Berron, Raul	ST	CTS	08/01/08	01/31/16	DAL	TX
Berron, Raul	ST	CTS-I	01/29/10	01/31/16	DAL	TX
Booth, John	PE	CTS	06/06/07	10/31/16	TUL	OK
Brooks, Joel	IT	CTS	04/25/09	09/30/15	DAL	TX
Brooks, Joel	IT	CTS-I	09/10/09	09/30/15	DAL	TX
Brown, Travis	JS	CTS	01/08/10	01/31/17	AUS	TX
Brown, Travis	JS	CTS-I	01/28/11	01/31/17	AUS	TX
Brudahl, Andrew	AM	CTS	12/23/08	07/31/15	AUS	TX
Brudahl, Andrew	AM	CTS-I	07/23/09	07/31/15	AUS	TX
Burdick, Bryan	DM	CTS	04/14/07	04/30/16	TUL	OK
Burton, Michael	AM	CTS	08/21/10	08/31/16	OKC	OK
Calish, Adam	SE	CTS	11/15/07	11/30/16	HOU	TX
Canfield, Ed	PM	CTS	02/12/07	05/31/15	OKC	OK
Canfield, Ed	PM	CTS-I	05/26/09	05/31/15	OKC	OK
Carlson, Drew	JSIT	CTS	05/04/13	05/31/16	DEN	CO
Cole, Jeremy	PE	CTS	08/17/07	08/31/16	OKC	OK
Compo, Kevin	PM	CTS	02/28/07	07/31/15	OKC	OK
Compo, Kevin	PM	CTS-I	05/22/09	07/31/15	OKC	OK
Compo, Kevin	PM	CTS-D	07/09/09	07/31/15	OKC	OK
Dilks, Kevin	PM	CTS	08/09/05	08/31/14	HOU	TX
Doolen, Jordan	BE	CTS	03/08/07	05/31/16	TUL	OK
Doolen, Jordan	BE	CTS-D	05/14/10	05/31/16	TUL	OK
Ellis, Travis	PE	CTS	12/05/07	12/31/16	OKC	OK
Ewald, Gary	PE	CTS	07/17/07	07/31/16	AUS	TX
Flores, Del	JSIT	CTS	10/24/11	12/31/15	HOU	TX
Flores, Del	JSIT	CTS-I	12/01/12	12/31/15	HOU	TX
Ford, Chris	PEIT	CTS-D	10/29/13	10/31/16	HOU	TX
Glaze, Kyler	JSIT	CTS	04/17/13	04/30/16	DAL	TX
Guinn, James	ST	CTS	05/16/11	05/31/14	HOU	TX
Hendrix, Tim	AM	CTS	12/07/10	12/31/16	DAL	TX
Hoerberling, Ron	AM	CTS	04/13/05	04/30/14	OKC	OK
Hornbeck, Donny	SE	CTS	09/11/07	09/30/16	OKC	OK
Hutchens, Tim	PE	CTS	06/24/10	07/31/16	OKC	OK
Hutchens, Tim	PE	CTS-D	07/06/13	07/31/16	OKC	OK
Ketcham, Andrew	IT	CTS	08/22/13	08/31/16	OKC	OK
Kilpatrick, Steve	PMIT	CTS	04/13/10	04/30/16	OKC	OK
Kimball, Doug	JS	CTS	08/11/07	07/31/15	DAL	TX
Kimball, Doug	JS	CTS-I	07/28/09	07/31/15	DAL	TX
King, Brent	SE	CTS	04/10/07	04/30/16	TUL	OK
Kizzia, Chris	BE	CTS	03/21/07	09/30/16	TUL	OK

This page reflects all employees who have received various levels of CTS Certifications. See the Reimbursements tab for employees who failed their exams or did not take the exam after payment was made.

Name	Position	Designation	Effective	Expiration	City	State
Kizzia, Chris	BE	CTS-D	08/09/10	09/30/16	TUL	OK
Koceski, Ken	DOE	CTS	09/12/07	10/31/16	OKC	OK
Koceski, Ken	DOE	CTS-D	10/28/10	10/31/16	OKC	OK
Laliberte, Richard	JS	CTS	01/02/10	06/30/14	DEN	CO
Laliberte, Richard	JS	CTS-I	06/24/11	06/30/14	DEN	CO
Le, Kim	IT	CTS	12/09/13	12/31/16	DAL	TX
Lehman, Gary	PE	CTS	05/18/11	05/31/14	DEN	CO
Marcha, Rod	PM	CTS	11/16/11	11/30/14	OKC	OK
Miller, Andrew	PM	CTS	07/03/07	07/31/16	TUL	OK
Mitchell, James	AM	CTS	07/21/07	08/31/16	TUL	OK
Moss, Stephen	Box Sales	CTS	06/08/13	06/30/16	AUS	TX
Neighbors, Matt	IT	CTS	10/09/08	01/31/15	OKC	OK
Neighbors, Matt	IT	CTS-I	01/31/09	01/31/15	OKC	OK
Peters, Blake	IT	CTS	09/18/12	09/30/15	TUL	OK
Peterson, Julien	PM	CTS	07/17/07	09/30/16	AUS	TX
Peterson, Julien	PM	CTS-I	09/23/10	09/30/16	AUS	TX
Plumlee, Dustin	PMIT	CTS	03/19/07	06/30/14	TUL	OK
Plumlee, Dustin	PMIT	CTS-I	06/19/08	06/30/14	TUL	OK
Popowsky, Tim	FOM	CTS	06/07/13	06/30/16	OKC	OK
Premkumar, Shadrack	JS	CTS	03/07/11	04/30/14	OKC	OK
Premkumar, Shadrack	JS	CTS-I	04/23/11	04/30/14	OKC	OK
Price, SanChay	JS	CTS	10/25/10	10/31/16	DAL	OK
Randall, Jordan	SE	CTS	02/04/10	02/28/15	DAL	TX
Randall, Jordan	SE	CTS-D	02/06/12	02/28/15	DAL	TX
Roberts, Kevin	JS	CTS	08/17/11	08/31/14	LAS	NV
Routman, Daniel	SE	CTS	03/20/07	07/31/16	DEN	CO
Schmetzer, Will	PMIT	CTS	07/03/10	10/31/16	DEN	CO
Schmetzer, Will	PMIT	CTS-I	10/24/10	10/31/16	DEN	CO
Schmidt, Ryan	IT	CTS	06/25/11	04/30/16	OKC	OK
Schmidt, Ryan	IT	CTS-I	04/12/13	04/30/16	OKC	OK
Slocum, Shawn	SE	CTS	07/31/06	07/31/15	DAL	TX
Smith, Michael	PE	CTS	12/13/06	12/31/15	OKC	OK
Stine, Cody	PM	CTS	09/01/10	10/31/14	AUS	TX
Stine, Cody	PM	CTS-I	10/20/11	10/31/14	AUS	TX
Stoneman, Joyce	JS	CTS	10/20/11	10/31/14	OKC	OK
Street, Matt	ES	CTS	11/17/10	11/30/16	OKC	OK
Thomas, Michael	BE	CTS	07/12/07	07/31/16	TUL	OK
Tindle, Mark	BA	CTS	03/21/07	07/31/16	TUL	OK
Tudor, Chris	BE	CTS	01/07/14	01/31/17	TUL	OK
Vance, Chad	SE	CTS	07/26/07	08/31/16	OKC	OK
Waltisperger, Ron	PM	CTS	11/25/07	06/30/14	AUS	TX
Waltisperger, Ron	PM	CTS-I	06/24/11	06/30/14	AUS	TX
Warren, Mitch	DM	CTS	12/19/06	12/31/16	HOU	TX
Warren, Mitch	DM	CTS-D	02/02/10	12/31/16	HOU	TX
Warren, Mitch	DM	CTS-I	12/11/13	12/31/16	HOU	TX
Werle, Jason	PM	CTS	05/21/07	12/31/15	DAL	TX
Werle, Jason	PM	CTS-I	12/20/12	12/31/15	DAL	TX
White, Rusty	SE	CTS	12/01/12	12/31/15	DAL	TX
Wilke, Jonathan	IT	CTS	11/18/13	11/30/16	AUS	TX

This page reflects all employees who have received various levels of CTS Certifications. See the Reimbursements tab for employees who failed their exams or did not take the exam after payment was made.

Name	Position	Designation	Effective	Expiration	City	State
Williams, Tom	BE	CTS	07/03/07	07/31/16	TUL	OK
Wright, Jacob	Ren JSIT	CTS	05/16/13	05/31/16	OKC	OK
Wright, Natasha	PE	CTS	03/05/12	03/31/15	OKC	OK





# DMC-D

DIGITAL MEDIA CERTIFIED DESIGNER

This certifies that

**PAUL ARMBRUSTER**

has successfully completed the requirements of the Crestron DigitalMedia™ certification program and is hereby awarded the title of

**DigitalMedia Certified Designer**

June 28, 2011  
Date

D-103-110630-5160  
Certification Number

*Paul Armbruster*  
Authorized Signature



# DMC-E

DIGITAL MEDIA CERTIFIED ENGINEER

This certifies that

**PAUL ARMBRUSTER**

has successfully completed the requirements of the Crestron DigitalMedia™ certification program and is hereby awarded the title of

**DigitalMedia Certified Engineer**

June 30, 2011  
Date

E-103-110630-2410  
Certification Number

[Signature]  
Authorized Signature





# DMC-T

DIGITAL MEDIA CERTIFIED TECHNICIAN

This certifies that

**PAUL ARMBRUSTER**

has successfully completed the requirements of the Crestron DigitalMedia™ certification program and is hereby awarded the title of

**DigitalMedia Certified Technician**

June 29, 2011  
Date

T-103-110630-1219  
Certification Number

*Paul Armbruster*  
Authorized Signature

### LOCAL OFFICES:

**Oklahoma City, OK**  
 4800 West Interstate 40  
 Oklahoma City, OK 73128  
**Phone:** 405-946-9966  
**Fax:** 405-946-9991

**Contract Bid Division**  
 8349 East 51st Street  
 Tulsa, OK 74145  
**Phone:** 918-664-2420  
**Fax:** 918-664-0592

**Tulsa, OK**  
 8349 East 51st Street  
 Tulsa, OK 74145  
**Phone:** 918-664-2420  
**Fax:** 918-664-0308

**Dallas, TX**  
 4901 Statesman Dr.  
 Irving, TX 75063  
**Phone:** 972-241-9966  
**Fax:** 972-241-9007

**Denver, CO**  
 4665 Paris Street  
 Suite 300  
 Denver, CO 80239  
**Phone:** 720-374-2345  
**Fax:** 720-374-2344

**Las Vegas, NV**  
 6255 S. Sandhill Road  
 Suite 100  
 Las Vegas, NV 89120  
**Phone:** 702-369-9965  
**Fax:** 702-369-9741

**Austin, TX**  
 1340 Airport Commerce Dr.  
 Suite 470  
 Austin, TX 78741  
**Phone:** 512-447-1103  
**Fax:** 512-447-0111

**Houston, TX**  
 4380 Blalock Rd.  
 Houston, TX 77041  
**Phone:** 713-690-0555  
**Fax:** 713-460-6543

Since 1973, Ford Audio-Video (Ford AV) has grown to the top of the professional audio/video integration industry. Engineering and installing systems across the United States, Ford AV provides sound, video, and lighting systems for churches, airports, corporations, government, entertainment, and sporting venues.



Ford AV was founded in 1973 by Jim and Claire Ford. Claire Ford, CEO, graduated from the Oklahoma College of Liberal Arts and later



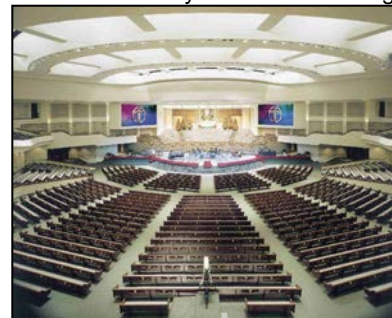
received her law degree from Oklahoma City University. She was admitted to the bar in 1989. Jim Ford, President, received a BS degree in electrical engineering from the University of Oklahoma in 1969 and later became registered with the State of Oklahoma, Texas and Colorado as a Professional Engineer.

Ford AV currently employs 360 individuals within seven divisions located in Oklahoma City, Tulsa, Dallas, Austin, Houston, Denver, and Las Vegas. The state-of-the-art 50,000 square foot Corporate Headquarters located in Oklahoma City was specifically designed to provide a highly efficient production facility for the engineering, fabrication, and testing of electronic systems. In addition, it houses a fully equipped audio/video rental center.

Ford AV excels at project management and engineering of large, complex and demanding audio/video installations similar to the Panther football stadium in Charlotte, NC shown above. With licenses in more than 20 states and a bonding capability of \$20,000,000 per project, Ford AV routinely manages forty projects simultaneously and completes more than three hundred installations each year.



Ford AV's strength lies in its experienced technical staff. With nearly 40 electrical engineers and 30 project managers, the Ford AV Job



Center schedules its own work force of job superintendents and installation technicians. Ford AV takes responsibility for a complete installation including software programming, service, warranty, and training.

Ford AV also has a team that specializes in Religious Facilities. From small to large, Ford AV has engineered and installed sound, video and lighting systems for thousands of churches, such as the 9,000 seat Prestonwood Baptist Church located in Dallas, TX.

Customer training is emphasized and facilitated in Ford AV's new Training Center. The Training Center features a 2,500 square foot studio and a seventy seat multilevel auditorium with high definition rear screen projection. The auditorium is equipped with the latest audio, video, computer, and lighting systems installed and ready for "hands on" demonstration. An annual schedule of training seminars provides customers with continuing education on systems operation.

*Helping People Communicate!*



## Service Center Profile

### LOCAL OFFICES:

#### Contract Bid Division

8349 East 51st Street  
Tulsa, OK 74145  
**Phone:** 918-664-2420  
**Fax:** 918-664-0592

#### Oklahoma City, OK

4800 West Interstate 40  
Oklahoma City, OK 73128  
**Phone:** 405-946-9966  
**Fax:** 405-946-9991

#### Tulsa, OK

8349 East 51st Street  
Tulsa, OK 74145  
**Phone:** 918-664-2420  
**Fax:** 918-664-0308

#### Dallas, TX

4901 Statesman Drive  
Irving, TX 75063  
**Phone:** 972-241-9966  
**Fax:** 972-241-9007

#### Denver, CO

4230 Carson Street  
Denver, CO 80239  
**Phone:** 720-374-2345  
**Fax:** 720-374-2344

#### Las Vegas, NV

6255 S. Sandhill Road  
Suite 100  
Las Vegas, NV 89120  
**Phone:** 702-369-9965  
**Fax:** 702-369-9741

#### Austin, TX

1340 Airport Commerce Dr.  
Suite 470  
Austin, TX 78741  
**Phone:** 512-447-1103  
**Fax:** 512-447-0111

#### Houston, TX

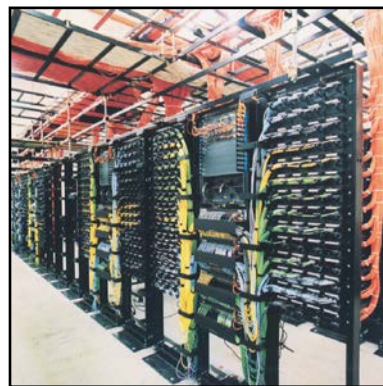
4380 Blalock Road  
Houston, TX 77041  
**Phone:** 713-690-0555  
**Fax:** 713-460-6543

Ford Audio-Video Systems, LLC (Ford AV) understands how important our customer's audio and video systems are to their day-to-day business success. Whether your installation is a mission critical command and control center, a 24/7 paging announcement system in one of the busiest airport terminals in the world, a house of worship, or a hotel convention and meeting facility, you require, and should expect, prompt attention to your service and maintenance requests. Considering that our audio and video systems are one of our customer's most important communication tools, it doesn't make sense for them to trust anyone but Ford AV to keep their systems in like new condition!



In response to our customer's needs for reliable service and maintenance, Ford AV developed a centrally-located, state-of-the-art Service Center strategically placed within our Oklahoma City corporate headquarters. The Service Center functions as a central network "hub" for our remote service centers located within each regional Division office. It employs a dedicated team of support personnel whose only job is to ensure that our customers' requests for service are handled promptly, efficiently, and accurately.

The Service Center Manager and Coordinators answer our customer's incoming requests for service, properly document the customer's request for service, dispatch the appropriate service technician and/or engineer, and track the resulting service ticket through the entire service process. They are also responsible for providing customer follow-up to ensure that our service department fulfilled the customer's request satisfactorily.

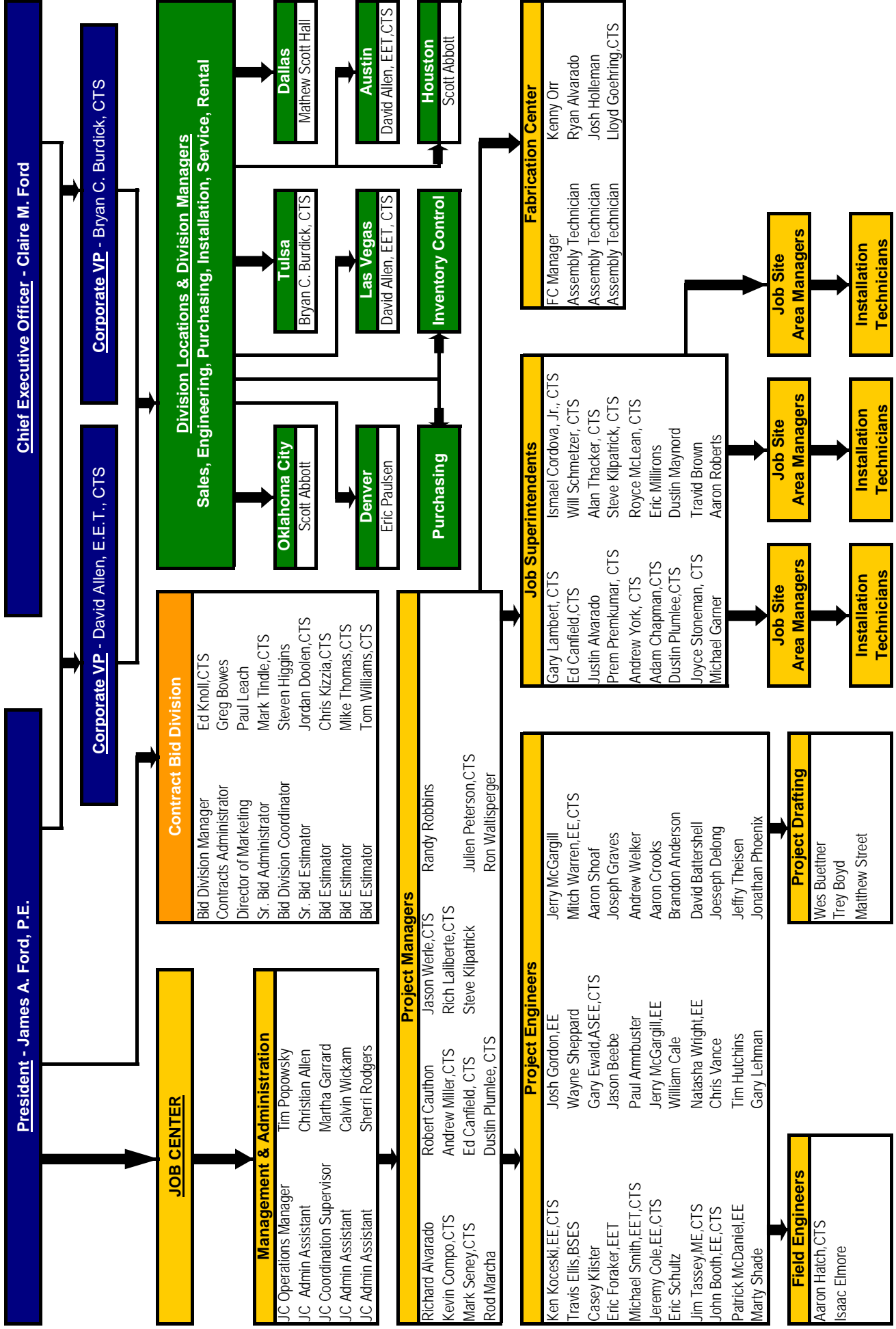


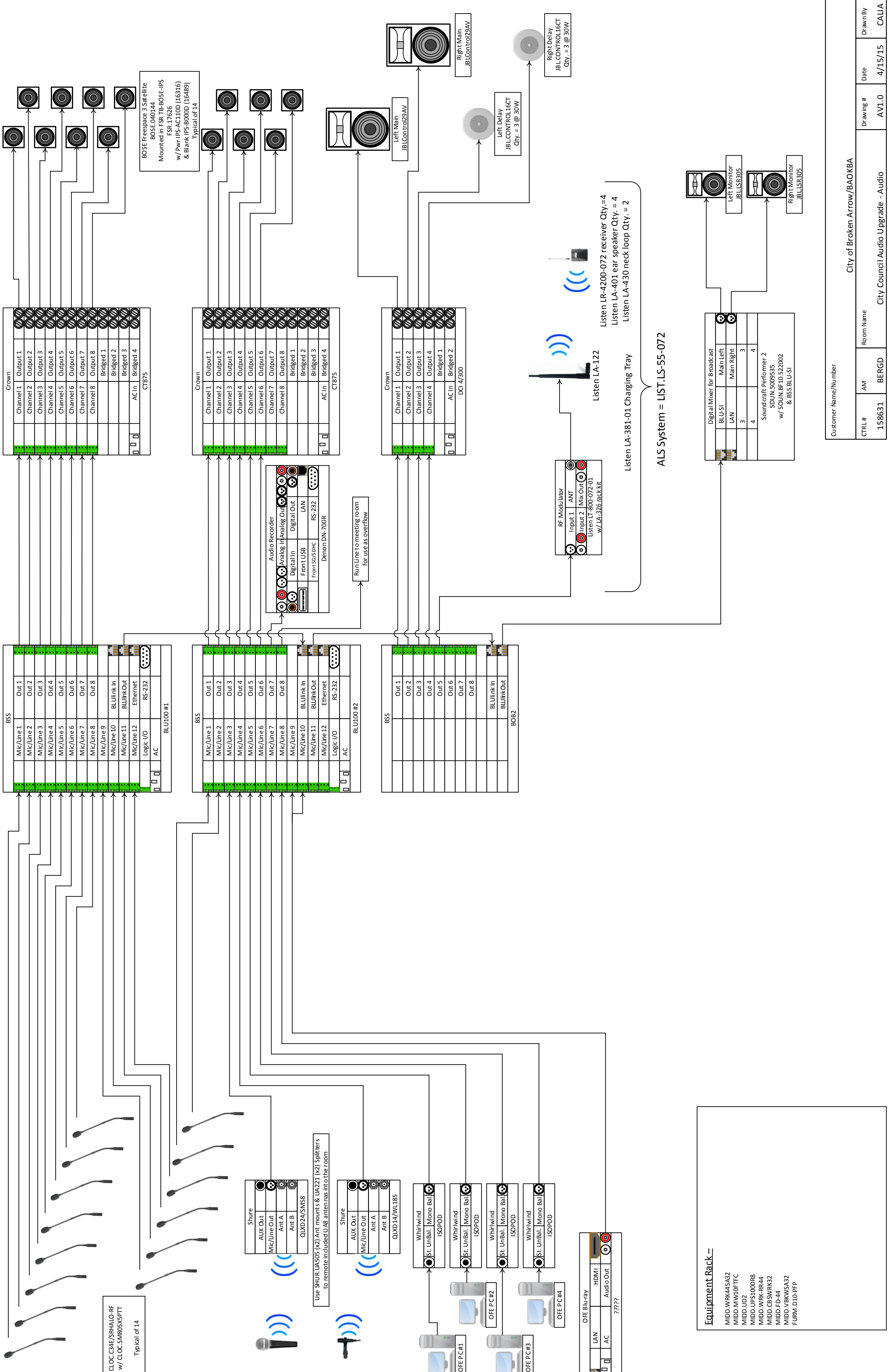
Our staff of factory-trained Service Technician's and Project Engineers may be dispatched from a combination of either Ford AV's local Division offices or from our Corporate Service Center, depending upon the nature of the service requested. Although service personnel resources are distributed among our entire network of offices, they all draw upon the capabilities and support of the centralized Corporate Service Center.

The Service Center is available 24 hours a day, 7 days a week, nationwide, via our toll free number: 800-654-6744. The Service Center can also be reached via any of our local Division offices, via our networked VoIP telephone system. Service representatives are also on call for after-hours service and support calls.

*Helping People Communicate!*

Contact Ford AV TOLL FREE : 800-654-6744





CLOC C34E/SRHALO-RF  
w/ CLOC SM80XSPTT  
Typical of 14

BOSE Freespace 3 Satellite  
BOSE 040144  
Mounted in FSR TB-BOSE-IPS  
FSR.17626  
w/ Pwr IPS-AC110D (16316)  
& Blank IPS-R000D (16489)  
Typical of 14

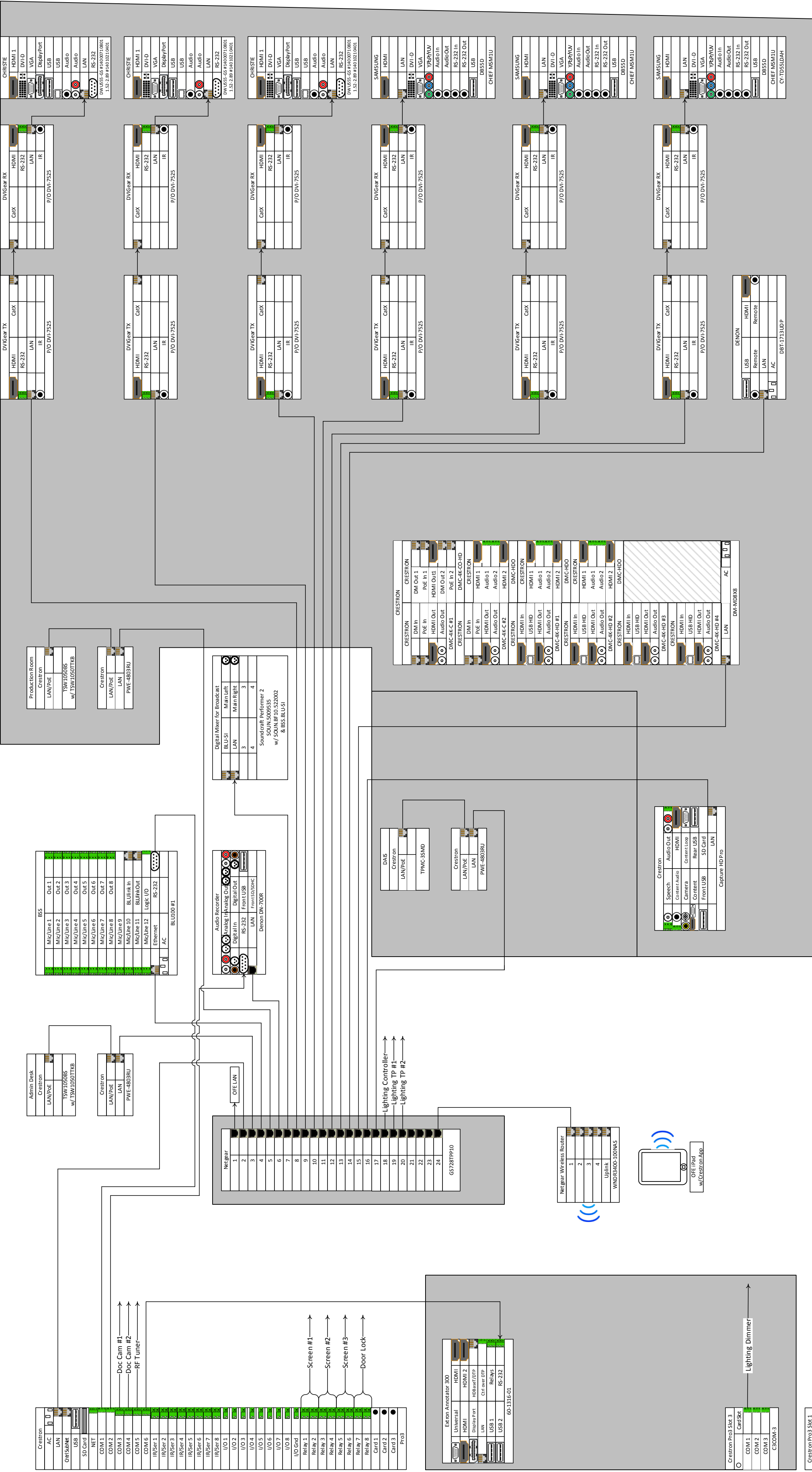
Use SHUR UA505 (x2) Ant mounts & UA221 (x2) Splitters  
to remote included UA8 antennas into the room

Listen LR-4200-072 receiver Qty. = 4  
Listen LA-401 ear speaker Qty. = 4  
Listen LA-381-01 Charging Tray  
Listen LA-430 neck loop Qty. = 2

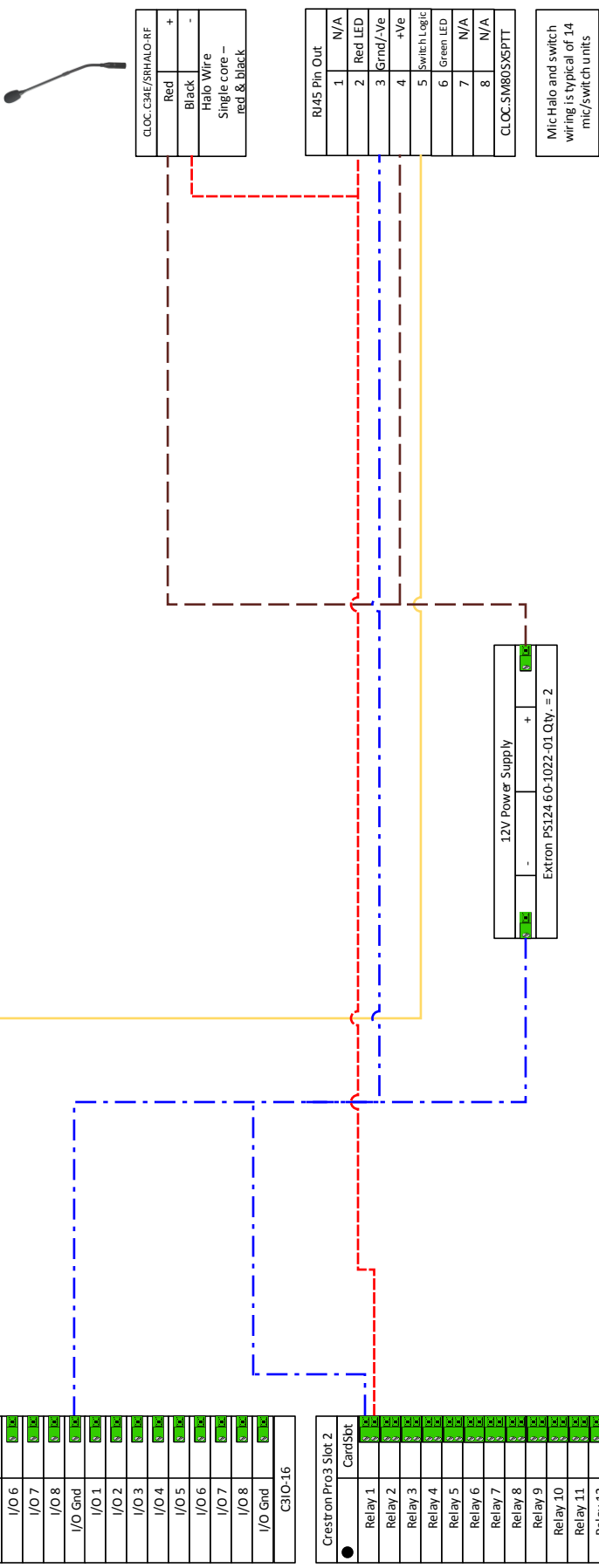
ALS System = LIST.LS-55-072

Equipment Rack =  
MIDD.WFR445A32  
MIDD.MW10FTFC  
MIDD.UJ2  
MIDD.LPS1000R8  
MIDD.WFR-RR44  
MIDD.CB SW RK32  
MIDD.FD-44  
MIDD.VBKWSA32  
FURM.D10-PPF

Customer Name/Number		City of Broken Arrow/BAOKBA	
CTRL#	AM	Room Name	City Council Audio Upgrade - Audio
158631	BERGD		
Drawing #	Date	Drawn By	CALLIA
AV1.0	4/15/15		



Gray backed equipment is added in the video quote







CHRISTE	HDMI 1
	DVI-D
	VGA
	DisplayPort
	USB
	Audio
	LAN
	RS-232
	DW15.6" GS#440001 0801
	1.7" FOR PROXIMATE WALL
	7013/15.116"X2.5"
	Advantage
	Electrol

CHRISTE	HDMI 1
	DVI-D
	VGA
	DisplayPort
	USB
	Audio
	LAN
	RS-232
	DW15.6" GS#440001 0801
	1.7" FOR PROXIMATE WALL
	7013/15.116"X2.5"
	Advantage
	Electrol

CHRISTE	HDMI 1
	DVI-D
	VGA
	DisplayPort
	USB
	Audio
	LAN
	RS-232
	DW15.6" GS#440001 0801
	1.7" FOR PROXIMATE WALL
	7013/15.116"X2.5"
	Advantage
	Electrol

SAMSUNG	HDMI
	LAN
	DVI-D
	VGA
	VBY/VMU
	AudioIn
	AudioOut
	RS-232 In
	RS-232 Out
	USB
	DB55D
	CHIEF MSMTU

SAMSUNG	HDMI
	LAN
	DVI-D
	VGA
	VBY/VMU
	AudioIn
	AudioOut
	RS-232 In
	RS-232 Out
	USB
	DB55D
	CHIEF MSMTU

SAMSUNG	HDMI
	LAN
	DVI-D
	VGA
	VBY/VMU
	AudioIn
	AudioOut
	RS-232 In
	RS-232 Out
	USB
	DB55D
	CHIEF MSMTU

CRESTRON	LINK
	USB
	USB-EXT (TN)

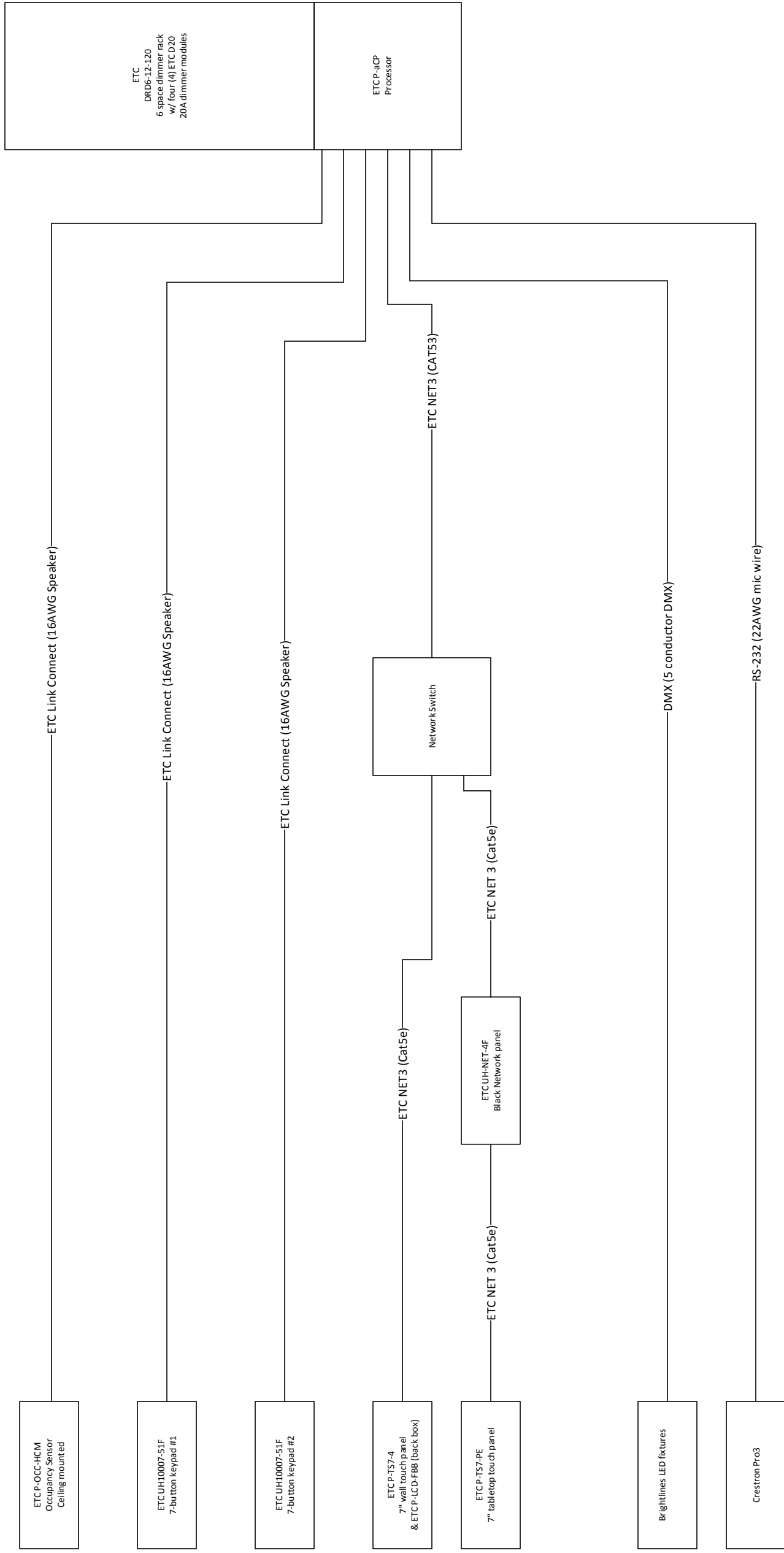
MIDDLE ATLANTIC	
1	Ford AV
2	Power
3	BLANK
4	LCD Display TXS
5	LCD Scaler & DA
6	Projector TXS
7	Projector Scaler & DA
8	
9	DM-MDS8
10	
11	BLANK
12	Amnolator
13	USB RX
14	BLANK
15	Hearing Assst
16	BLANK
17	Pro 3
18	
19	BLANK
20	RF Tuner
21	Wireless Mic RX #1 & #2
22	LAN Switch
23	CT675 #1
24	CT675 #2
25	BLANK
26	BOB2
27	BSS Blu-100 #1
28	BSS Blu-100 #2
29	BLANK
30	CD-4/300
31	BLANK
32	BLANK
33	BLANK
34	Power
35	Blu-Ray
36	Audio Recorder
37	MDD-UD2
38	
39	
40	
41	UPS #2
42	UPS #1
43	
44	44 Space Rack

MIDDLE ATLANTIC	
1	Ford AV
2	Power
3	Blu-Ray
4	Audio Recorder
5	MDD-UD2
6	
7	
8	
9	
10	BRK-10 w/ RK-RR10

Customer Name/Number		City of Broken Arrow/BAOKBA	
Ctrl #	Room Name	Drawing #	Date
160857	BERGD	AV4.0	5/29/15
			Drawn By
			CALLA



Cat5e = WEST.254245  
 16AWG Spk = WEST.252258  
 DMX = WEST.DA252402  
 Mic = WEST.25291B



Customer Name/Number			
City of Broken Arrow/BAOKBA		Room Name	
CTRL#	AM	Drawing #	Date
161031	BERGD	AV5.0	6/4/15
City Council - Lighting			Drawn By
			CALIA

# Advantage Electrol

Designed to eliminate the extra step of finishing the screen with trim, the Advantage line of projection screens is designed with ceiling trim already in place. Once the screen is installed, the screen's trim conceals the rough opening eliminating the need to complete additional trim work.

Sliding installation brackets make it easy to attach the screen housing to the structure above the drop ceiling.

The Advantage® Electrol® screen features simple in ceiling installation that can be done in two stages. The screen case can be installed during the rough-in construction stage and the fabric assembly can be completed during the finishing stage.

The Advantage Electrol does not include the automatic closure door or the Tensioning Cable System. See Tensioned Advantage Electrol for Tensioning Cable System or Tensioned Advantage Deluxe Electrol for both the Tensioning Cable System and the additional aesthetic of the automatic closure door.

## Features

- Standard Silent Drive System to keep your screen whisper quiet (sizes up to 10x10)
- Standard Low Voltage Control (LVC) to keep your screen operation flexible
- Simple Installation with a new installation kit and user-friendly packaging to keep you on schedule
- Support includes a comprehensive five-year warranty to keep you confident in your purchase
- UL Plenum rated case
- White powder-coated case for a clean aesthetic
- Available with SCB-100 and SCB-200 (RS-232 serial control board) or Video Projector Interface (screen trigger) built into the case
- Decora-style, three-button wall switch
- Standard black backing retains projected brightness
- Seamless surfaces in all models

## Optional Accessories:

- Radio Frequency Wireless Remote
- Infrared Wireless Remote
- Locking Switch Cover Plate
- Red Laser Pointers
- Green Laser Pointers
- RF PowerPoint Remote with Green Laser Pointer



## 16:9 HDTV Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
45" x 80"	114 x 203	92"	234	89½"	227
52" x 92"	132 x 234	106"	269	101½"	258
54" x 96"	137 x 244	110"	279	105½"	268
58" x 104"	147 x 264	119"	302	113½"	288
65" x 116"	165 x 295	133"	338	125½"	319
78" x 139"	198 x 353	159"	404	149½"	380
90" x 160"	229 x 406	184"	467	169½"	431

## 16:10 Wide Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
50" x 80"	127 x 203	94"	239	89½"	227
57½" x 92"	146 x 234	109"	277	101½"	258
60" x 96"	152 x 244	113"	287	105½"	268
65" x 104"	165 x 204	123"	312	113½"	288
69" x 110"	175 x 279	130"	330	119½"	304
<b>72½" x 116"</b>	<b>184 x 295</b>	<b>137"</b>	<b>348</b>	<b>125½"</b>	<b>319</b>
87" x 139"	221 x 353	164"	417	149½"	380
100" x 160"	254 x 406	189"	480	169½"	431

## 4:3 Video Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
43" x 57"	109 x 145	72"	183	65½"	166
50" x 67"	127 x 170	84"	213	75½"	192
57" x 77"	145 x 196	96"	244	89½"	227
60" x 80"	152 x 203	100"	254	89½"	227
69" x 92"	175 x 234	120"	305	101½"	258
87" x 116"	221 x 295	150"	381	125½"	319
105" x 140"	267 x 356	180"	457	149½"	380
120" x 160"	305 x 406	200"	508	169½"	431

Available with the Following Screen Surfaces

---



**Matte White**

Half Angle: 60° Gain: 1.0



**High Contrast Matte White**

Half Angle: 50° Gain: 1.1



**Video Spectra 1.5**

Half Angle: 35° Gain: 1.5



**Silver Lite 2.5**

Half Angle: 25° Gain: 2.5

Product images

---



Case Profile



In Ceiling (Closed)



In Ceiling (Open)



A Milestone AV Technologies Brand

3100 North Detroit Street  
Warsaw, Indiana 46582  
P: 574.267.8101 or 800.622.3737  
F: 574.267.7804 or 877.325.4832  
E: [info@da-lite.com](mailto:info@da-lite.com)  
[www.da-lite.com](http://www.da-lite.com)

DL-0423 07.14

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# Christie GS Series

Boardroom  
Conference rooms  
Government

Higher education  
Houses of worship  
Location based entertainment



## Long-life laser phosphor projectors with a low-cost of ownership

Free yourself from regular maintenance with the Christie® GS Series of lampless projectors. These laser phosphor, 1-chip DLP® projectors eliminate the need for lamp and filter replacements and provide an astonishing 20,000 hours of low-cost operation. Avoid the down-time, cost of lamps and the maintenance associated with lamp-based projectors by choosing the Christie GS Series for your next project.

Available in three resolutions (WXGA, HD, WUXGA), the Christie GS Series delivers accurate color reproduction, image quality and high-brightness. Wireless connectivity, a small footprint, low-weight, quiet operation and a full suite of lenses satisfies virtually all customer needs, from boardrooms and classrooms to location based entertainment.

**CHRISTIE®**

		Christie DWX555-GS	Christie DHD555-GS	Christie DWU555-GS
Image	brightness	• 5400 ANSI lumens (typical)	• 5000 ANSI lumens (typical)	• 5400 ANSI lumens (typical)
	contrast (full on/full off)	• 2,000,000:1 with Christie RealBlack™ enabled, 250:1 ANSI (nominal)		
Display technology	type	• 1-chip 0.65" DMD	• 1-chip 0.65" DMD	• 1-chip 0.67" DMD
	native resolution	• 1280 x 800 (1,024,000 pixels) (16:10)	• 1920 x 1080 (2,073,600 pixels) (16:9)	• 1920 x 1200 (2,304,000 pixels) (16:10)
Illumination	type	• Solid state (laser phosphor)		
	estimated life	• 20,000 hrs		
Inputs	standard	• HDMI x 1 • DVI-D x 1 (digital only) • DisplayPort x 1 • HD-15 x 1 • Composite video x 1 (RCA) • S-Video x 1 (mini DIN) • USB x 1 (type B mini) – display over USB • Component x 1 (Y/Pb/Pr) • USB x 1 (type A) – image viewer or WiFi dongle (optional) • HDBaseT x 1 • RJ-45 x 1		
	signals	• HDTV formats VGA through to WUXGA (1920 x 1200) • Horizontal and vertical scaling while maintaining aspect ratio (all inputs)		
	pixel clock	• 162 MHz		
	scan rates	• Horizontal: 15-100kHz • Vertical: 24-85Hz		
Signal outputs	monitor out	• HD-15 x 1		
Control and networking		• RS-232 in • Ethernet (10/100) RJ-45 with ChristieNET™ connectivity • Built-in backlit keypad • Wired remote control (3.5mm stereo) • Compatible with Crestron Connected, AMX Discovery		
Lens mount	type	• Tool-free lens insertion system • Boresight adjustable • Motorized horizontal and vertical lens offset • Motorized zoom and focus adjustment		
Lenses	zoom	• 1.0-1.28:1 (WX) • 1.28-1.60:1 (WX) • 1.60-3.07:1 (WX) • 3.04-5.78:1 (WX)	• 0.95-1.22:1 (HD/WU) • 1.22-1.53:1 (HD/WU) • 1.52-2.92:1 (HD/WU) • 2.9-5.50:1 (HD/WU)	
	offsets	• ±100% Vertical (±400 pixels) • ±30% Horizontal (±192 pixels)	• ±120% Vertical (±648 pixels) • ±30% Horizontal (±288 pixels)	• ±100% Vertical (±600 pixels) • ±30% Horizontal (±288 pixels)
Accessories	standard	• IR Remote with wired remote jack (wire not included) • AC line cord for projector head • User manual		
	optional	• 1DWUSB-BGN (wireless dongle for video and control) (133-113106-01) • Warp module (133-111104-01) • Cable cover (140-106108-01 white, 140-106119-01 black) • Christie One Mount (108-506102-XX) • Portrait Side Cover (140-108100-01 white, 140-108111-01 black)		
Power requirements	operating voltage	• 100-240 VAC @ 50/60Hz		
	power consumption	• 520W max • 340W eco mode		
	operating current	• 6.0A max		
	dissipation	• 1774 BTU/hr max • 1160 BTU/hr eco mode		
Audible noise	• Standard mode: 38dB(A) • Eco mode: 34dB(A)			
Physical	size	• (LxWxH): 19.88 x 18.31 x 7.48" (505 x 465 x 190mm) w/o feet		
	shipping size	• (LxWxH): 31.89 x 23.43 x 13.43" (810 x 595 x 341mm)		
	weight	• 35.0lbs (15.9kg)		
	shipping weight	• 47.8lbs (21.7kg)		
Environment	• Operating temperature: 5-40°C (40-104°F) • Humidity (non-condensing): 0-90%			
Regulatory	• This product conforms to all relevant European directives, standards, safety, health and environmental concerns • Directives: RoHS • REACH • WEEE • UL/CSA/IEC 60950-1 • FCC Class A • CE • CCC • KC • EAC • PSE • CU • BIS • RCM and South Africa			
Warranty	• 3 years on the projector • 3 years or 15,000 hours on the illumination system <sup>1</sup> • Contact an authorized Christie representative for full details of our limited warranty			

<sup>1</sup> Reference the Christie Standard Limited Warranty document for details.

#### Corporate offices

Christie Digital Systems USA, Inc.  
USA – Cypress  
ph: 714 236 8610  
USA – Arizona  
ph: 602 943 5700  
USA – New York  
ph: 646 779 2014  
Christie Digital Systems Canada Inc.  
Canada – Kitchener  
ph: 519 744 8005

#### Worldwide offices

Australia  
ph: +61 (0) 7 3624 4888  
Brazil  
ph: +55 (11) 2548 4753  
China (Beijing)  
ph: +86 10 6561 0240  
China (Shanghai)  
ph: +86 21 6278 7708  
France  
ph: +33 (0) 1 41 21 44 04

Germany  
ph: +49 2161 664540  
India  
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Mexico  
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Russian Federation  
and Eastern Europe  
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Singapore  
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Spain  
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**CHRISTIE®**





# SAMSUNG

# DB-D SERIES COMMERCIAL LED LCD DISPLAYS

MAKE AN IMPACT ON YOUR AUDIENCE, NOT ON YOUR BUDGET



## AFFORDABLE COMMERCIAL LED LCD DISPLAYS WITH FULL CONNECTIVITY

Engaging audiences in a cost-efficient way has always been a strength of Samsung. The tradition continues with the DB-D Series. Available in 32", 40", 48" and 55", these innovative displays are a highly reliable and highly cost-efficient solution ideal for retail environments, quick service restaurants, meeting rooms, public spaces and more. Full HD screens deliver rich and detailed imagery, flexible content options are ensured via a multitude of inputs, and there's an opportunity to save even more with the Smart Signage Platform. **The New Business Experience**

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## KEY FEATURES



### Enhanced System-on-Chip Performance with Quad-Core CPU

Powered by a System-on-Chip semiconductor and quad-core CPU, Samsung's Smart Signage Platform reduces TCO for digital signage deployments, providing savings in hardware, installation and operating costs.



### New Industrial Design

A sleek, stylish new look features a 9.5mm with optional customizable bezel trim kits (white, titanium silver, matte black, wood grain).



### Ultra-Slim 2.0" Chassis

The stylishly thin chassis helps simplify installation while meeting ADA compliance requirements.



### Slim-Direct LED Backlight

The slim-direct-lit displays of the DB-D Series feature 1920 x 1080 Full HD resolution with 350 nits brightness and 5000:1 contrast ratio for sharp, detail-rich images and crisp, easily legible type.



### Optional Touch Overlay

PC-less touch, uses embedded SoC doesn't require external PC. Add an optional IR touch overlay accessory to enable up to 10 simultaneous touch points.



### Magic Info-s Digital Signage Software

The software allows you to create playlists, set playback schedules and publish content directly to the display. Most traditional file formats are supported including RSS feed and live web pages.

THE NEW  
BUSINESS  
EXPERIENCE

# Samsung DB-D Series Commercial LED LCD Displays

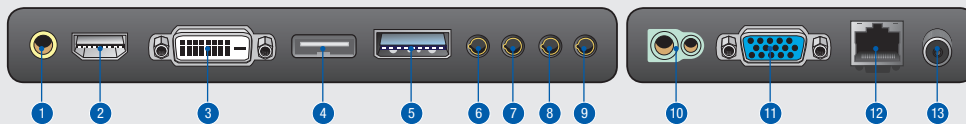


## KEY SPECIFICATIONS For complete product specifications, visit [samsung.com/prodisplay](http://samsung.com/prodisplay)

Display	Model Number	DB32D	DB40D	DB48D	DB55D	
Screen Size		32"	40"	48"	55"	
Panel Technology		60Hz Slim D-LED BLU	60Hz Slim D-LED BLU	60Hz Slim D-LED BLU	120Hz Slim D-LED BLU	
Resolution		1920x1080 (16:9)	1920x1080 (16:9)	1920x1080 (16:9)	1920x1080 (16:9)	
Brightness		350 nits	350 nits	350 nits	350 nits	
Contrast Ratio		5000:1	5000:1	5000:1	5000:1	
Orientation		Landscape / Portrait	Landscape / Portrait	Landscape / Portrait	Landscape / Portrait	
Response Time (G-to-G)		8ms	8ms	8ms	8ms	
Connectivity	Input	Video: VGA (D-Sub 15 Pin), DVI-D, Component/Composite, HDMI, Audio: Stereo Mini Jack	Video: VGA (D-Sub 15 Pin), DVI-D, Component/Composite, HDMI, Audio: Stereo Mini Jack	Video: VGA (D-Sub 15 Pin), DVI-D, Component/Composite, HDMI, Audio: Stereo Mini Jack	Video: VGA (D-Sub 15 Pin), DVI-D, Component/Composite, HDMI, Audio: Stereo Mini Jack	
	Output	Audio: Stereo Mini Jack	Audio: Stereo Mini Jack	Audio: Stereo Mini Jack	Audio: Stereo Mini Jack	
	External Control	RS232C (In/Out) thru Stereo Jack, RJ45	RS232C (In/Out) thru Stereo Jack, RJ45	RS232C (In/Out) thru Stereo Jack, RJ45	RS232C (In/Out) thru Stereo Jack, RJ45	
	External Sensor	IR, Ambient Light	IR, Ambient Light	IR, Ambient Light	IR, Ambient Light	
Power	Power Supply	AC 100 - 240 V~ (+/- 10 %), 50/60 Hz	AC 100 - 240 V~ (+/- 10 %), 50/60 Hz	AC 100 - 240 V~ (+/- 10 %), 50/60 Hz	AC 100 - 240 V~ (+/- 10 %), 50/60 Hz	
	Power Consumption (Typical/Max)	43W / 77W	60W / 121W	65W / 132W	86W / 176W	
	Power Consumption (Standby)	< 0.5W	< 0.5W	< 0.5W	< 0.5W	
Environmental Conditions	Operating Temperature	0°C - 40°C	0°C - 40°C	0°C - 40°C	0°C - 40°C	
	Operating Humidity	10%~80%	10%~80%	10%~80%	10%~80%	
Features			Slim & Light LFD with Built-in MagicInfo Player S2	Slim & Light LFD with Built-in MagicInfo Player S2	Slim & Light LFD with Built-in MagicInfo Player S2	Slim & Light LFD with Built-in MagicInfo Player S2
	Special	Hardware	Super Clear Coating, Temperature Sensor, Pivot Display, Button Lock, Clock Battery (80hrs Clock Keeping), Built in Speaker, SD Card Slot	Super Clear Coating, Temperature Sensor, Pivot Display, Button Lock, Clock Battery (80hrs Clock Keeping), Built in Speaker, SD Card Slot	Super Clear Coating, Temperature Sensor, Pivot Display, Button Lock, Clock Battery (80hrs Clock Keeping), Built in Speaker, SD Card Slot	Super Clear Coating, Temperature Sensor, Pivot Display, Button Lock, Clock Battery (80hrs Clock Keeping), Built in Speaker, SD Card Slot
		Software	Magic Clone (to USB), Auto Source Switching & Recovery, RS232C/RJ45 MDC, Plug and Play (DDC2B), PIP/PPB, Image Rotation, Smart F/W update, Built In MagicInfo Player S2, Firmware Update by Network, LFD New Home Screen, Predefined Template for Vertical Usage, Multi Channel, Mobile Control, Event Schedule, Backup Player, PC-less Touch	Magic Clone (to USB), Auto Source Switching & Recovery, RS232C/RJ45 MDC, Plug and Play (DDC2B), PIP/PPB, Image Rotation, Smart F/W update, Built In MagicInfo Player S2, Firmware Update by Network, LFD New Home Screen, Predefined Template for Vertical Usage, Multi Channel, Mobile Control, Event Schedule, Backup Player, PC-less Touch	Magic Clone (to USB), Auto Source Switching & Recovery, RS232C/RJ45 MDC, Plug and Play (DDC2B), PIP/PPB, Image Rotation, Smart F/W update, Built In MagicInfo Player S2, Firmware Update by Network, LFD New Home Screen, Predefined Template for Vertical Usage, Multi Channel, Mobile Control, Event Schedule, Backup Player, PC-less Touch	Magic Clone (to USB), Auto Source Switching & Recovery, RS232C/RJ45 MDC, Plug and Play (DDC2B), PIP/PPB, Image Rotation, Smart F/W update, Built In MagicInfo Player S2, Firmware Update by Network, LFD New Home Screen, Predefined Template for Vertical Usage, Multi Channel, Mobile Control, Event Schedule, Backup Player, PC-less Touch
	Tuner	Yes	Yes	Yes	Yes	
	SMART Signage Platform Compliant	Yes	Yes	Yes	Yes	
	Internal Media Player	Cortex-A9 1GHz Quad Core, 1.5GB DDR3, 4GB FDM, USB 2.0, Linux OS	Cortex-A9 1GHz Quad Core, 1.5GB DDR3, 4GB FDM, USB 2.0, Linux OS	Cortex-A9 1GHz Quad Core, 1.5GB DDR3, 4GB FDM, USB 2.0, Linux OS	Cortex-A9 1GHz Quad Core, 1.5GB DDR3, 4GB FDM, USB 2.0, Linux OS	
	VESA Standard Wall Mount Interface	200 x 200mm	200 x 200mm	400 x 400mm	400 x 400mm	
	Dimensions	Product Dimensions (without stand)	28.4" x 16.5" x 2.0"	35.7" x 20.7" x 2.0"	42.3" x 24.4" x 2.0"	48.4" x 27.8" x 2.0"
		Packaging Dimensions	31.5" x 18.5" x 4.6"	39.4" x 23.0" x 5.0"	46.7" x 28.1" x 5.8"	53.1" x 31.9" x 5.8"
		Bezel Width	10.5 (L/L), 15.0 (R/B)	9.5 (L/L), 15.0 (R/B)	9.5 (L/L), 15.0 (R/B)	9.5 (L/L), 15.0 (R/B)
Weight	Product Weight	10.5 lbs.	16.1 lbs.	24 lbs.	33.5 lbs.	
	Shipping Weight	12.8 lbs.	19.6 lbs.	30 lbs.	42.5 lbs.	
Service	Standard Warranty	3 Years On-Site (Parts / Labor / Backlight)	3 Years On-Site (Parts / Labor / Backlight)	3 Years On-Site (Parts / Labor / Backlight)	3 Years On-Site (Parts / Labor / Backlight)	
Accessories	Included	Quick Setup Guide, Warranty Card, D-Sub cable, Power Cord, Remote Controller, Batteries	Quick Setup Guide, Warranty Card, D-Sub cable, Power Cord, Remote Controller, Batteries	Quick Setup Guide, Warranty Card, D-Sub cable, Power Cord, Remote Controller, Batteries	Quick Setup Guide, Warranty Card, D-Sub cable, Power Cord, Remote Controller, Batteries	
	Optional Mount	WMN4070SD, WMN250MD	WMN4070SD, WMN250MD	WMN4270SD, WMN250MD	WMN4270SD, WMN250MD	
	Optional Stand	STN-L3240E	STN-L3240E	STN-L4655E	STN-L4655E	
	Optional Media Player	SBB-C, SBB-CD7, SBB-CQ7	SBB-C, SBB-CD7, SBB-CQ7	SBB-C, SBB-CD7, SBB-CQ7	SBB-C, SBB-CD7, SBB-CQ7	
	Optional Touch Overlay	CY-TD32	CY-TD40	CY-TD48	CY-TD55	
	Optional Bezel Trim Kit	TBD	TBD	TBD	TBD	
Green Management	Emission Standard	EMC	EMC	EMC	EMC	
	ENERGY STAR® 6.0 Compliant	Yes	Yes	Yes	Yes	
	RoHS Compliant	Yes	Yes	Yes	Yes	
Packaging Recyclability	Packing Materials Recyclable	Packing Materials Recyclable	Packing Materials Recyclable	Packing Materials Recyclable		

## CONNECTIVITY

1. AV In
2. HDMI In
3. DVI In
4. USB
5. SD Card Slot
6. Audio Out
7. Audio In
8. RS232C Out
9. RS232C In
10. IR/Ambient Sensor In
11. VGA In
12. RJ45 In
13. Antenna In



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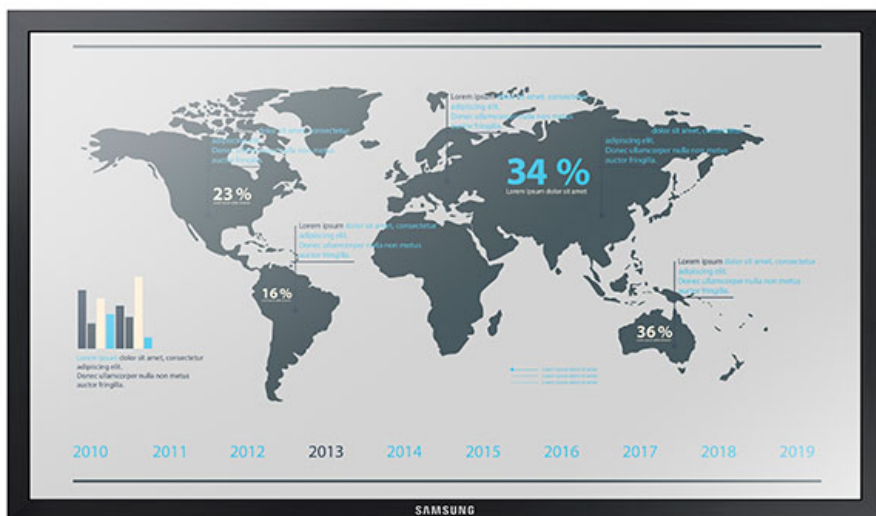
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**SAMSUNG**

# CY-TD55LDAH — 55" Touch Overlay

MAKE AN IMPACT ON YOUR AUDIENCE, NOT ON YOUR BUDGET

Convert the Samsung DH55D, DM55D or DB55D into a dynamic touch screen with this 55" Touch Overlay. A special treatment on the front of the panel allows for realistic writing that is similar to writing on a conventional whiteboard, while scratch-resistant protection glass safeguards your display from hazards.



## Main Features

- Touchscreen
- multi-touch
- infrared
- wired
- for Samsung DB55D
- DH55D
- DM55D



# SPECIFICATIONS

<b>Dimensions</b>		
PRODUCT DIMENSION 50.2" x 30.1" x 1.1"	PACKAGE DIMENSION 53.8" x 34.6" x 5.0"	
<b>Weight</b>		
PRODUCT WEIGHT 21.7 lb.	PACKAGE WEIGHT 27.8 lb.	
<b>Glass Thickness</b>		
2.8mm		
<b>Glass Film</b>		
AG(Front),PET(Rear)		
<b>Glass Reflection rate</b>		
≤10%		
<b>Glass Haze</b>		
≤15%		
<b>Frame Material</b>		
Aluminum Extrusion		
<b>Bezel Width (mm)</b>		
32.75mm		
<b>Touch Technology</b>		
IR		
<b>Number of touch points</b>		
2 Drawing 10 touch		
<b>Accessory</b>		
INCLUDED	HARDWARE	Extention
USB Cable(2m) IR receiver		

## SAMSUNG

For complete product information and accessories, visit [samsung.com/business](http://samsung.com/business) or [samsung.com/prodisplay](http://samsung.com/prodisplay)

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# HD-DA4-4K-E

## 1-to-4 4K HDMI® Distribution Amplifier

- > Splits one HDMI® source to four outputs
- > Handles video resolutions up to 4K and Ultra HD
- > Handles 3D video and Deep Color
- > Handles Dolby® TrueHD, DTS-HD®, and uncompressed 7.1 linear PCM audio
- > HDCP compliant
- > Includes input and output sync indicators
- > No programming or control system required
- > Thin profile — less than one inch deep
- > Surface, shelf, or single rack rail mountable



The Crestron® HD-DA4-4K-E is a simple to use, high-performance distribution amplifier designed to split a single HDMI® signal to feed up to four separate displays, switchers, AV receivers, and other devices. It handles Full HD 1080p, Ultra HD, 2K, and 4K video signals with support for HDCP, 3D, Deep Color, and high-bitrate 7.1 audio. No programming or control system is required for operation.

The full line of Crestron HDMI DAs also includes the two-output [HD-DA2-4K-E](#) and the eight-output [HD-DA8-4K-E](#).

## SPECIFICATIONS

### Video

**Input Signal Types:** HDMI® w/Deep Color, 3D, & 4K (DVI & DisplayPort Multimode compatible<sup>[1]</sup>)

**Output Signal Types:** HDMI w/Deep Color, 3D, & 4K (DVI compatible<sup>[1]</sup>)

**Maximum Resolutions:**

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 4K DCI & 3840x2160 Ultra HD	24 Hz	4:4:4	30 bit
		30 Hz	4:4:4	24 bit
		30 Hz	4:2:2	36 bit
		60 Hz <sup>[2]</sup>	4:2:0	24 bit
	2560x1600 WQXGA	60 Hz	4:4:4	36 bit
	1920x1080 HD1080p	60 Hz	4:4:4	36 bit
Interlaced	1920x1080 HD1080i	30 Hz	4:4:4	36 bit

NOTE: Common resolutions are shown; other custom resolutions are supported at pixel clock rates up to 300 MHz

### Audio

**Input Signal Types:** HDMI (DisplayPort Multimode compatible<sup>[1]</sup>)

**Output Signal Type:** HDMI

**Formats:** Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby® TrueHD, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio™, LPCM up to 8 channels

### Communications

**HDMI:** HDCP & EDID (does not pass CEC)

**EDID:** Mode selectable for COPY 1ST or DEFAULT:

- COPY 1ST copies the EDID from the device connected to OUTPUT 1 and sends it to the source connected to the INPUT<sup>[3]</sup>
- DEFAULT = 720x480@60Hz, 1280x720@60Hz, 1920x1080@30Hz, 1920x1080@60Hz (preferred), and 2-channel linear PCM audio)

### Connectors

**INPUT:** (1) 19-pin Type A HDMI female;

HDMI digital video/audio input;

Also supports DVI and DisplayPort Multimode<sup>[1]</sup>

**OUTPUT 1 – 4:** (4) 19-pin Type A HDMI female;

HDMI digital video/audio outputs;

Also supports DVI<sup>[1]</sup>

**SERVICE:** (1) USB Type Mini-B jack;

For factory use only

**24VDC 0.75A:** (1) 2.1 x 5.5 mm DC power connector;

24 Volt DC power input;

PW-2407WU power pack included

### Controls & Indicators

**PWR:** (1) green LED, indicates operating power supplied via power pack

**INPUT:** (1) green LED, indicates a video signal at the HDMI input

**OUTPUT 1 – 4:** (4) green LEDs, indicate video signals at each corresponding HDMI output

**EDID:** (1) 2-position slide switch, selects EDID mode

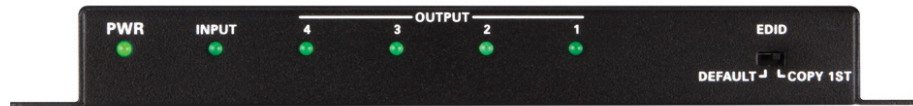
### Power Requirements

**Power Pack:** 0.75 Amps @ 24 Volts DC;

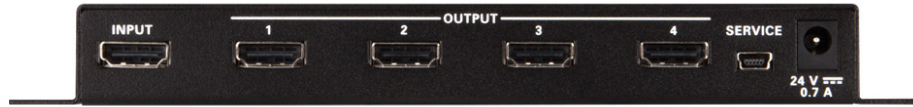
100-240 Volts AC, 50/60 Hz power pack, model PW-2407WU included

**Power Consumption:** 5 Watts typical

# HD-DA4-4K-E 1-to-4 4K HDMI® Distribution Amplifier



HD-DA4-4K-E – Top View



HD-DA4-4K-E – Bottom View

## Environmental

**Temperature:** 32° to 104°F (0° to 40°C)

**Humidity:** 10% to 90% RH (non-condensing)

**Heat Dissipation:** 17.1 BTU/Hr

## Enclosure

**Chassis:** Metal, black finish, with (2) integral mounting flanges

**Mounting:** Freestanding, surface mount, or attach to a single rack rail

## Dimensions

**Height:** 4.06 in (104 mm)

**Width:** 8.06 in (205 mm)

**Depth:** 0.87 in (23 mm)

## Weight

**1.11 lb (0.50 kg):**

## MODELS & ACCESSORIES

### Available Models

HD-DA4-4K-E: 1-to-4 4K HDMI® Distribution Amplifier

### Included Accessories

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

### Available Accessories

CBL-HD-LOCK: Locking High-Speed HDMI® Cables

CBL-HD: Crestron® Certified HDMI® Interface Cables

CBL-HD-DVI: Crestron® Certified HDMI® to DVI Interface Cables

### Notes:

1. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. [CBL-HD-DVI](#) interface cables are available separately.
2. Support for 4K and UHD at 50/60 Hz with 4:2:0 color sampling will be enabled through a future firmware update.
3. Using the COPY 1ST mode, if the device connected to OUTPUT 1 is disconnected, the current EDID will be retained. Changing the device connected to OUTPUT 1 will not update the EDID at the INPUT until the EDID switch is moved to the DEFAULT position and then back to the COPY 1ST position.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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# HD-SCALER-HD-E

## High-Definition Video Scaler, HDMI® In, HDMI Out

- > Automatically scales any input signal to match the native resolution of your display
- > Supports a range of display resolutions up to Full HD 1080p and WUXGA
- > Perfect for adapting all kinds of video devices to handle any input resolution
- > Supports any input resolution up to Full HD 1080p and WUXGA<sup>[5]</sup>
- > Performs deinterlacing of NTSC, PAL, and 1080i sources
- > Handles HDMI® signals with Deep Color and HDCP
- > Also handles DVI and DisplayPort Multimode sources<sup>[1]</sup>
- > Handles Dolby Digital® 5.1, DTS® 5.1, and uncompressed 7.1 linear PCM audio
- > Includes stereo analog audio input and output
- > Allows embedding of analog stereo audio to HDMI<sup>[3]</sup>
- > Allows extraction of digital stereo audio to analog<sup>[4]</sup>
- > Provides up to 150 ms lip-sync audio delay
- > Affords easy setup via on-screen display
- > Compact, low-profile surface mount design
- > Universal 100-240V external power pack included

The HD-SCALER-HD-E is a simple, cost-effective video scaler designed to enable an HD, SD, or computer display device to handle virtually any input resolution up to Full HD 1080p or WUXGA. Its low-profile, surface-mountable design and set-and-forget simplicity allow the HD-SCALER-HD-E to be installed discreetly in the back of an equipment rack, behind a flat panel display, or above a ceiling projector.

### HD Scaler

True, most video displays include a built-in scaler. But, too often these displays just can't handle all the different formats and resolutions that you're likely to encounter day-to-day in a dynamic presentation environment. The HD-SCALER-HD-E simply connects to the HDMI® or DVI input<sup>[1]</sup> of your video display and ensures that every source you feed it appears reliably and beautifully. Fully automatic operation is achieved using the display's EDID<sup>[2]</sup> — just insert the HD-SCALER-HD-E into the incoming video signal path and it intelligently converts and enhances that signal for optimal appearance on your display.

The HD-SCALER-HD-E handles standard and high-definition digital video sources with resolutions up to Full HD 1080p60 progressive and 1080i30 interlaced, as well as computer sources up to WUXGA 1920x1200. Whatever the source, the HD-SCALER-HD-E is capable of scaling it up or down, deinterlacing it, reducing noise artifacts, and adjusting its aspect ratio to match the native resolution of your video display or computer monitor. A wide selection of display resolutions up to 1920x1200 can be supported, with auto-calibration ensuring a quick and easy setup and hands-off operation.

The HD-SCALER-HD-E provides a single HDMI input and is compatible with HDMI, DVI, and DisplayPort Multimode sources.<sup>[1]</sup>



### Audio Support

Via its HDMI input and output, the HD-SCALER-HD-E handles 5.1 audio formats like Dolby Digital® and DTS®, as well as uncompressed 7.1 linear PCM. The audio signal is passed through unprocessed, with the option of delaying the signal up to 150 ms for lip-sync alignment.

### Audio Embedding

In addition to HDMI, the HD-SCALER-HD-E includes an analog audio input to accommodate the stereo signal from a line-level audio source, or the headphone output from a laptop or mobile device. The analog input signal is combined with the HDMI video input signal and routed to the scaler's HDMI output.<sup>[3]</sup>

### Audio Extracting

The selected audio input signal is routed simultaneously to the HDMI output and the stereo analog output, allowing distribution of the audio signal to the display device, or to a sound bar, amplified speakers, or a separate sound system.<sup>[4]</sup>

### On-Screen Display

Setup and diagnostics are facilitated through an on-screen display (OSD). The OSD appears right on the video display with navigation enabled using simple controls located on the scaler unit. The OSD displays detailed information about the connected source and display device, and includes settings for selecting the audio input, output resolution, and aspect ratio, and for adjustment of the picture and color settings, audio delay, and other parameters.

### Simple and Versatile

The HD-SCALER-HD-E is well-suited for a wide range of applications including boardrooms and classrooms, home entertainment, rental and staging, and digital signage. Its simple set-and-forget nature and compact size let it go anywhere a high-quality video scaler is needed.



# HD-SCALER-HD-E High-Definition Video Scaler, HDMI® In, HDMI Out



Bottom View



Top View

## SPECIFICATIONS

### Features

HD video scaler and deinterlacer, noise reduction, 3:2/2:2 pull-down detection and recovery, aspect ratio selection, picture and RGB color adjustments, OSD setup, analog audio embedding and de-embedding

### Video

**Input Signal Types:** HDMI w/Deep Color (DVI & DisplayPort Multimode compatible <sup>[1]</sup>)

**Output Signal Types:** HDMI w/Deep Color (DVI compatible <sup>[1]</sup>)

**Input Resolutions, Progressive:** 640x480@60/72/75/85Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@56/60/72/75/85Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60/70/75/85Hz, 1024x852@60Hz, 1024x1024@60Hz, 1280x720@50/60Hz (720p50/60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60/75/85Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz<sup>[6]</sup>, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24/25/50/60Hz (1080p24/25/50/60), 1920x1200@60Hz<sup>[6]</sup>, plus any other resolution up to 165MHz pixel clock

**Input Resolutions, Interlaced:** 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25/30Hz (1080i25/30), plus any other resolution up to 165MHz pixel clock

**Scaler Output Resolutions, Progressive:** 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 1024x768@60Hz, 1280x720@50/60Hz (720p50/60), 1280x800@60Hz, 1280x1024@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz<sup>[6]</sup>, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@50/60Hz (1080p50/60), 1920x1200@60Hz<sup>[6]</sup>

**Scaler Output Resolutions, Interlaced:** 1920x1080@25/30Hz (1080i25/30)

### Audio

**Input Signal Types:** HDMI (DisplayPort Multimode compatible)<sup>[1]</sup>, analog stereo

**Output Signal Types:** HDMI, analog stereo

**Formats, HDMI:** Dolby Digital®, Dolby Digital EX, DTS®, DTS-ES, DTS 96/24, LPCM up to 8 channels at up to 48 kHz

**Formats, Analog:** Stereo 2-channel

**Analog-To-Digital Conversion:** 24-bit 48 kHz

**Digital-to-Analog Conversion:** 24-bit 48 kHz

**Delay:** 0, 40, 110, or 150 ms selectable

### Communications

**HDMI:** HDCP compliant, responds to EDID from display device, copies EDID from display device to input; does not pass CEC

**USB:** For factory use only

### Connectors

**5V 1.2A:** (1) 1.3 x 3.5 mm DC power connector; 5 Volt DC power input (PW-0510WU power pack included)

**SERVICE:** (1) USB Type A female; For factory use only

**AUDIO IN:** (1) 3.5mm TRS mini phone jack; Unbalanced stereo line-level audio input <sup>[3]</sup>; Input Level: 2 Vrms maximum; Input Impedance: 44k Ohms

**HDMI IN:** (1) 19-pin Type A HDMI female; HDMI digital video/audio input; Also supports DVI and DisplayPort Multimode <sup>[1]</sup>

**HDMI OUT:** (1) 19-pin Type A HDMI female; HDMI digital video/audio output; Also supports DVI <sup>[1]</sup>

# HD-SCALER-HD-E High-Definition Video Scaler, HDMI® In, HDMI Out

**AUDIO OUT:** (1) 3.5mm TRS mini phone jack;  
Unbalanced stereo line-level audio output <sup>(4)</sup>;  
Output Level: 1 Vrms maximum;  
Output Impedance: 100 Ohms

## Controls & Indicators

---

**5V 1.2A:** (1) green LED, indicates operating power supplied via power pack  
**MENU/ENTER:** (1) pushbutton, used to open the onscreen setup menu and enter settings  
**UP, DOWN:** (2) pushbuttons, used to navigate the on-screen setup menu and adjust settings

## Power Requirements

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**Power Pack:** 1.2 Amps @ 5 Volts DC;  
100-240 Volts AC, 50/60 Hz power pack, model PW-0510WU included

**Power Consumption:** 5.5 Watts

## Environmental

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**Temperature:** 32° to 104°F (0° to 40°C)  
**Humidity:** 20% to 90% RH (non-condensing)  
**Heat Dissipation:** 19 BTU/hr

## Enclosure

---

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

## Dimensions

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**Height:** 6.01 in (153 mm)  
**Width:** 5.22 in (133 mm)  
**Depth:** 1.00 in (26 mm)

## Weight

---

TBD

## MODELS & ACCESSORIES

### Available Models

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HD-SCALER-HD-E: High-Definition Video Scaler, HDMI® In, HDMI Out

### Included Accessories

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**PW-0510WU:** Wall Mount Power Pack, 5VDC, 1.2A, 2.1mm, Universal (Qty. 1 included)

### Available Accessories

---

**CBL Series:** Crestron® Certified Interface Cables

### Notes:

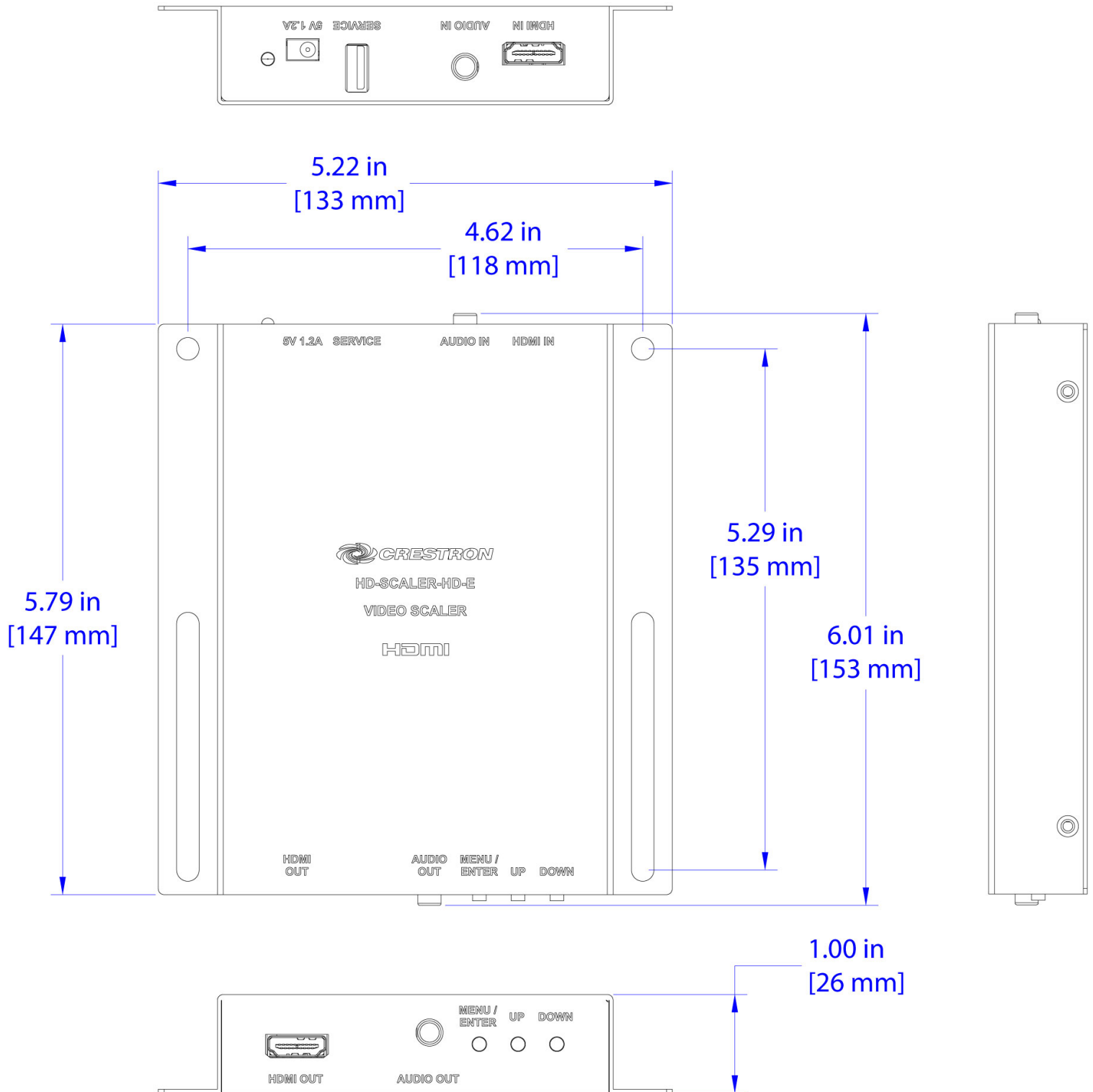
1. The HDMI input requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. [CBL-HD-DVI](#) interface cables are available separately.
2. EDID (Extended Display Identification Data) is data embedded in an HDMI or DVI signal that enables the display device to tell the scaler what resolutions and formats it can support, allowing the scaler to configure itself automatically to feed an optimal output signal to the display.
3. The analog and HDMI audio inputs are mutually exclusive. The audio input can only be selected manually via the built-in OSD setup menu.
4. The analog stereo audio output is only active when the input is receiving a 2-channel stereo signal via either the analog input or HDMI.
5. Supports any input resolution and scan rate that has a pixel clock of 165 MHz or lower.
6. With reduced blanking only.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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

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# HD-SCALER-HD-E High-Definition Video Scaler, HDMI® In, HDMI Out



## DigitalMedia 8G+<sup>®</sup> Receiver & Room Controller w/Scaler

- > DigitalMedia 8G+<sup>®</sup> receiver, high-definition scaler, and display controller
- > Connects to a DM<sup>®</sup> switcher or transmitter over a single CAT type twisted pair cable<sup>[1]</sup>
- > Supports cable lengths up to 330 ft (100 m) using DM 8G<sup>®</sup> cable or CAT5e<sup>[1]</sup>
- > HDBaseT<sup>™</sup> Certified — Enables direct connection to other HDBaseT certified equipment
- > Provides one HDMI<sup>®</sup> or DVI display output<sup>[2]</sup>
- > Handles any video resolution from standard NTSC 480i or PAL 576i, to HD 1080p60 w/Deep Color
- > Handles any computer resolution from VGA to UXGA/WUXGA
- > Scales the signal to match the native resolution of virtually any digital video display or computer monitor up to 1080p or WUXGA
- > Provides intelligent frame rate conversion
- > Includes content-adaptive noise reduction
- > Allows motion-adaptive de-interlacing or interlacing
- > Allows adjustable overscan or underscan up to 7.5%
- > Provides automatic 3D to 2D signal conversion<sup>[3]</sup>
- > Automatically passes 3D video without scaling to 3D capable displays<sup>[3]</sup>
- > Supports left/right eye steering for dual-projector 3D setups<sup>[3]</sup>
- > Scalable zoom feature enables 2x2, 3x2, 3x3, 4x3, or 4x4 video wall capability<sup>[6]</sup>
- > Handles Dolby<sup>®</sup> TrueHD, DTS-HD<sup>®</sup>, and uncompressed 7.1 linear PCM audio
- > HDCP compliant
- > Provides a 10/100 Ethernet LAN connection
- > Enables device control via CEC, IR, RS-232, and Ethernet
- > Enables USB HID signal extension for a local keyboard/mouse
- > Compatible with Crestron<sup>®</sup> USB over Ethernet Extenders<sup>[5]</sup>
- > Allows quick, easy setup and diagnostics
- > Low-profile design mounts to a 2-gang US, UK, or European wall box
- > Universal power pack included

The DM-RMC-SCALER-C provides an advanced one-box interface solution for a single display device as part of a complete Crestron<sup>®</sup> DigitalMedia<sup>™</sup> system. It functions as a DM 8G+<sup>®</sup> receiver, video scaler, and control interface. It provides a single HDMI<sup>®</sup> output along with Ethernet, USB HID, RS-232, and IR control ports. In addition to DM 8G+, it is also compatible with HDBaseT<sup>™</sup>, allowing it to be connected directly to an HDBaseT certified source. Built-in scaling enables the connected display to handle any video resolution up to HD 1080p or WUXGA. Its compact, low-profile design allows the DM-RMC-SCALER-C to be installed discreetly behind a flat panel display or above a ceiling mounted projector. It connects to the head end or source location using a single CAT type twisted pair cable.<sup>[1]</sup>



### DigitalMedia 8G+<sup>®</sup>

As the leader in HDMI and control system technologies, Crestron developed DigitalMedia (DM<sup>®</sup>) to deliver the first complete HD AV distribution system to take HDMI to a higher level. DigitalMedia allows virtually any mix of HDMI and other AV sources to be distributed throughout a home, office, school, or virtually any other facility. The latest generation of DM is called DigitalMedia 8G<sup>™</sup> (DM 8G<sup>®</sup>). Engineered for ultra high-bandwidth and ultimate scalability, DM 8G provides a true one-wire lossless transport for moving high-definition video, audio, Ethernet, and control signals over a choice of twisted pair or fiber optic cable.

DM 8G over twisted pair copper wire is called DigitalMedia 8G+ (DM 8G+). DM 8G+ handles uncompressed Full HD 1080p video signals with support for 3D, Deep Color, and HDCP, as well as computer signals up to WUXGA. Audio capabilities include support for high-bitrate 7.1 audio formats like Dolby<sup>®</sup> TrueHD and DTS-HD Master Audio<sup>™</sup> as well as uncompressed linear PCM. All signals are transported over a single CAT type cable, supporting distances up to 330 feet (100 m) using Crestron [DM 8G Cable](#) or CAT5e.<sup>[1]</sup>

### HDBaseT<sup>™</sup> Certified

Crestron DigitalMedia 8G+ technology is designed using HDBaseT Alliance specifications, ensuring interoperability with other HDBaseT certified products. Via its DM 8G+ input, the DM-RMC-SCALER-C can be connected directly to an HDBaseT compliant source without requiring a DM transmitter.

### Multimedia Display Interface

A single HDMI digital AV output port is provided on the DM-RMC-SCALER-C for connection to a display or other device. The HDMI output can also handle DVI signals using an appropriate adapter or interface cable<sup>[2]</sup>.

A single CAT type cable connects the DM-RMC-SCALER-C to a DM switcher or transmitter, or to an HDBaseT source, transporting video, audio, control, and networking signals all through one simple RJ45 connection.<sup>[1]</sup> Multiple DM-RMC-SCALER-Cs may be installed to handle each display in a multiroom distribution system, all fed from a central DM-MD series





DM-RMC-SCALER-C — Rear, Top, Front, and Bottom Views

switcher. Or, a single DM-RMC-SCALER-C can be fed straight from a DM 8G+ or HDBaseT transmitter, affording a simple solution for extending a computer or AV signal to a single display.

### High-Definition Scaler

Through a distributed scaler approach, DigitalMedia truly delivers the most flexible and user-friendly solution for routing multiple disparate sources to many different display devices. By placing an independent high-performance scaler at every display device, DM ensures an optimal image on every screen no matter what sources are selected. Distributed scaling allows a high-res computer source to be viewed on any display in the building. It also allows a high-definition 3D source to be viewed on lower-resolution 2D displays without compromising the original signal, letting you share your theater's full HD 1080p 3D image with smaller, lesser displays in other rooms.

The DM-RMC-SCALER-C accepts any video source from standard NTSC 480i to Full HD 1080p60, as well as computer sources from VGA to UXGA/WUXGA, and scales them perfectly to match the native resolution of your video display. A range of common output resolutions are supported to work with virtually any popular flat-panel display, projector, or computer monitor. Intelligent frame rate conversion enables support for 24p and PAL format sources, and 3D to 2D conversion allows 3D content to be fed simultaneously to separate 3D and 2D displays.<sup>[3]</sup> Setup and use of the scaler is simplified through fully automatic operation utilizing the display's EDID<sup>[4]</sup>.

### Dual-Projector 3D Support

A pair of DM-RMC-SCALER-Cs can be used to facilitate a dual-projector 3D setup, steering just the left eye portion of a 3D signal to one projector, and the right eye portion to the other. This is done using the scaler's 3D to 2D conversion mode, enabling 3D capability with scaling.<sup>[3]</sup>

### Video Wall Processing

The DM-RMC-SCALER-C has another trick up its sleeve, providing zoom capability and bezel compensation on its output to display just a portion of the source image. Using this feature, multiple units may be combined to configure a video wall composed of up to 16 individual displays. Configurations of 2x2, 3x2, 3x3, 4x3, or 4x4 are supported, and all that is required is a separate DM-RMC-SCALER-C for each display, and a DM switcher with sufficient DM 8G+ outputs.

### LAN Connectivity

Along with high-definition AV and control, DigitalMedia also integrates high-speed Ethernet networking for a total signal distribution solution. The DM-RMC-SCALER-C includes a 10/100 Ethernet port, providing a convenient LAN connection for a local network device.

### USB Signal Extension

DigitalMedia allows for the routing of USB signals alongside video and audio. A USB HID compliant mouse or keyboard can be connected directly to the DM-RMC-SCALER-C and used to control a computer or media server that's located at the central equipment cabinet or some other location. Crestron also offers USB over Ethernet Extender Modules (USB-EXT-DM)<sup>[5]</sup>, which may be added to enable support for more USB devices of virtually any type.

# DM-RMC-SCALER-C DigitalMedia 8G+® Receiver & Room Controller w/Scaler

## Embedded Device Control

The primary objective of every Crestron system is to enable precisely the control desired for a seamless user experience. The DM-RMC-SCALER-C includes built-in RS-232, IR, and Ethernet control ports to allow programmable control of the display device connected to it. But, it can also provide an alternative to such conventional control methods by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Through its connection to the control system, the DM-RMC-SCALER-C provides a gateway for controlling the display device right through the HDMI connection, potentially eliminating the need for any dedicated control wires or IR emitters.

## Low-Profile Installation

Its low-profile design makes the DM-RMC-SCALER-C perfect for installation behind a flat panel display or above a ceiling mounted projector. It mounts to a standard 2-gang US, UK, or European electrical box using the mounting bracket provided, affording a clean installation that protrudes a mere 1-1/8 inches (29 mm) from the mounting surface.

Connections for the display device are all positioned along the top and bottom of the unit for a clean, serviceable installation. The DigitalMedia connection is provided on the rear panel within the electrical box. An array of indicators is provided on the front panel for easy setup and troubleshooting.

Please refer to the DigitalMedia Resources Webpage at <http://www.crestron.com/dmresources/> for additional design tools and reference documents.

## SPECIFICATIONS

### Video

**Scaler:** HD video scaler, motion-adaptive deinterlacer, interlacer, intelligent frame rate conversion, Deep Color support, 3D to 2D conversion<sup>[3]</sup>, content-adaptive noise reduction, widescreen format selection (zoom, stretch, maintain aspect-ratio, or 1:1), video wall processing (2x2, 3x2, 3x3, 4x3, or 4x4)<sup>[6]</sup>

**Input Signal Types:** DM 8G+® (DigitalMedia™ over one CAT type twisted pair copper wire), HDBaseT®<sup>[1]</sup>

**Output Signal Types:** HDMI®, DVI<sup>[2]</sup>

**Formats:** DM 8G+, HDBaseT, & HDMI w/Deep Color & 3D<sup>[3]</sup>; DVI; HDCP content protection support

**Input Resolutions, Progressive:** 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, plus any other resolution allowed by HDMI up to 165MHz pixel clock

**Input Resolutions, Interlaced:** 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25Hz (1080i25), 1920x1080@30Hz (1080i30), plus any other resolution allowed by HDMI up to 165MHz pixel clock

**Scaler Output Resolutions, Progressive:** 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 1024x768@60Hz<sup>[7]</sup>, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz<sup>[7]</sup>, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1366x768@60Hz<sup>[7]</sup>, 1400x1050@60Hz<sup>[7]</sup>, 1440x900@60Hz<sup>[7]</sup>, 1600x900@60Hz<sup>[8]</sup>, 1600x1200@60Hz, 1680x1050@60Hz<sup>[7]</sup>, 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz<sup>[8]</sup>, 2048x1152@60Hz<sup>[8]</sup>

**Scaler Output Resolutions, Interlaced:** 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25Hz (1080i25), 1920x1080@30Hz (1080i30)

**Pass-Thru Output Resolutions:** Matched to input

### Audio

**Input Signal Types:** DM 8G+, HDBaseT

**Output Signal Type:** HDMI

**Formats:** Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby® TrueHD, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio™, up to 8ch PCM

### Communications

**Ethernet:** 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP

**USB:** Supports signal extension of USB HID class devices, expandable to support virtually any USB 1.1 or 2.0 device using Crestron USB-EXT-DM USB over Ethernet Extenders<sup>[5]</sup>

**RS-232:** 2-way device control and monitoring up to 115.2k baud with hardware and software handshaking

**IR/Serial:** 1-way device control via infrared up to 1.1 MHz or serial TTL/RS-232 (0-5 Volts) up to 19.2k baud

**DigitalMedia:** DM 8G+, HDCP, EDID, CEC, Ethernet

**HDBaseT:** HDCP, EDID, Ethernet

**HDMI:** HDCP, EDID, CEC

NOTE: Supports management of HDCP and EDID; supports management of CEC between the connected HDMI device and a control system

### Connectors – Bottom

**HDMI OUT:** (1) 19-pin Type A HDMI female;

HDMI digital video/audio output;

Also supports DVI<sup>[2]</sup>

**USB HID:** (1) USB Type A female;

USB 2.0 host port for connection of a mouse/keyboard or other USB HID-compliant device

**COM:** (1) 5-pin 3.5mm detachable terminal block;

Bidirectional RS-232 port;

Up to 115.2k baud, hardware and software handshaking support

# DM-RMC-SCALER-C

DigitalMedia 8G+® Receiver & Room Controller w/Scaler

**IR 1 – 2:** (1) 4-pin 3.5mm detachable terminal block comprising (2) IR/Serial ports;  
IR output up to 1.1 MHz;  
1-way serial TTL/RS-232 (0-5 Volts) up to 19200 baud

## Connectors – Top

**LAN:** (1) 8-wire RJ45 female, shielded;  
10Base-T/100Base-TX Ethernet port

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

## Connectors – Rear

**G:** (1) 6-32 screw, chassis ground lug

**DM IN:** (1) 8-pin RJ45 female, shielded;  
DM 8G+ input, HDBaseT compliant;  
Connects to the DM 8G+ output of a DM switcher, transmitter, or other DM device, or to a HDBaseT device, via CAT5e or Crestron DM-CBL-8G cable<sup>[1]</sup>

## Controls & Indicators

**PWR:** (1) green LED, indicates operating power supplied via local power pack

**DM LINK:** (1) green LED, indicates DM link status

**VIDEO:** (1) green LED, indicates video signal presence and lock status

**USB HID:** (1) green LED, indicates a valid device connection and activity on the USB HID port

**SETUP:** (1) red LED and (1) miniature recessed pushbutton, for Ethernet setup

**RESET:** (1) miniature recessed pushbutton, for hardware reset

**LAN (Top):** (2) LEDs, green LED indicates Ethernet link status, amber LED indicates Ethernet activity

**DM IN (Rear):** (2) LEDs, green LED indicates DM link status, amber LED indicates video and HDCP signal presence

## Power Requirements

**Power Pack:** 0.75 Amps @ 24 Volts DC;  
100-240 Volts AC, 50/60 Hz power pack, model PW-2407WU included

## Environmental

**Temperature:** 32° to 104°F (0° to 40°C)

**Humidity:** 10% to 90% RH (non-condensing)

**Heat Dissipation:** 41 BTU/Hr

## Enclosure

**Chassis:** Metal, black finish, vented sides and front

**Mounting:** Mounts to a 2-gang electrical box, 2-gang UK (BS 4662) electrical box, or 2-gang European (DIN 49073) electrical box

## Dimensions

**Height:** 7.62 in (194 mm)

**Width:** 7.61 in (194 mm)

**Depth:** 1.46 in (37 mm)

## Weight

1.90 lb (0.87 kg)

## MODELS & ACCESSORIES

### Available Models

**DM-RMC-SCALER-C:** DigitalMedia 8G+® Receiver & Room Controller w/Scaler

### Included Accessories

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

### Available Accessories

**DM-CBL-8G-NP:** DigitalMedia 8G™ Cable, non-plenum

**DM-CBL-8G-P:** DigitalMedia 8G™ Cable, plenum

**DM-8G-CONN:** Connector for DM-CBL-8G DigitalMedia 8G™ Cable

**DM-8G-CRIMP:** Crimping Tool for DM-8G-CONN

**DM-8G-CONN-WG:** Connector with Wire Guide for DM-CBL-8G DigitalMedia 8G™ Cable

**DM-8G-CRIMP-WG:** Crimping Tool for DM-8G-CONN-WG

**CBL Series:** Crestron® Certified Interface Cables

**MP-WP Series:** Media Presentation Wall Plates

**MPI-WP Series:** Media Presentation Wall Plates - International Version

**CNSP-XX:** Custom Serial Interface Cable

**IRP2:** IR Emitter Probe w/Terminal Block Connector

**USB-EXT-DM:** USB over Ethernet Extender with Routing

Notes:

- For DM 8G+ or HDBaseT wiring, use Crestron [DM-CBL-8G](#) DigitalMedia 8G Cable or third-party CAT5e (or better) UTP or STP. (Crestron legacy [DM-CBL](#) DigitalMedia Cable or [DM-CBL-D](#) DigitalMedia D Cable may also be used.) The maximum wire length for DM 8G+ is 330 ft (100 m) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the [Crestron DigitalMedia Design Guide, Doc. #4546](#) for complete system design guidelines. DM 8G+ is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment. All wire and cables are sold separately.
- The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. [CBL-HD-DVI](#) interface cables are available separately.
- Automatically passes 3D video if the display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion (with scaling) if the display device does not support 3D. 3D with scaling is only supported using two DM-RMC-SCALER-Cs configured for use with a dual-projector 3D setup.
- EDID (Extended Display Identification Data) is data embedded in an HDMI, DVI, or VGA signal that enables a display device to tell the source device what resolutions and formats it can support, allowing the source to configure itself automatically to feed the best signal that both devices can support.
- USB-EXT-DM USB over Ethernet Extender Modules are sold separately. Refer to the [USB-EXT-DM](#) spec sheet for more information.

# DM-RMC-SCALER-C

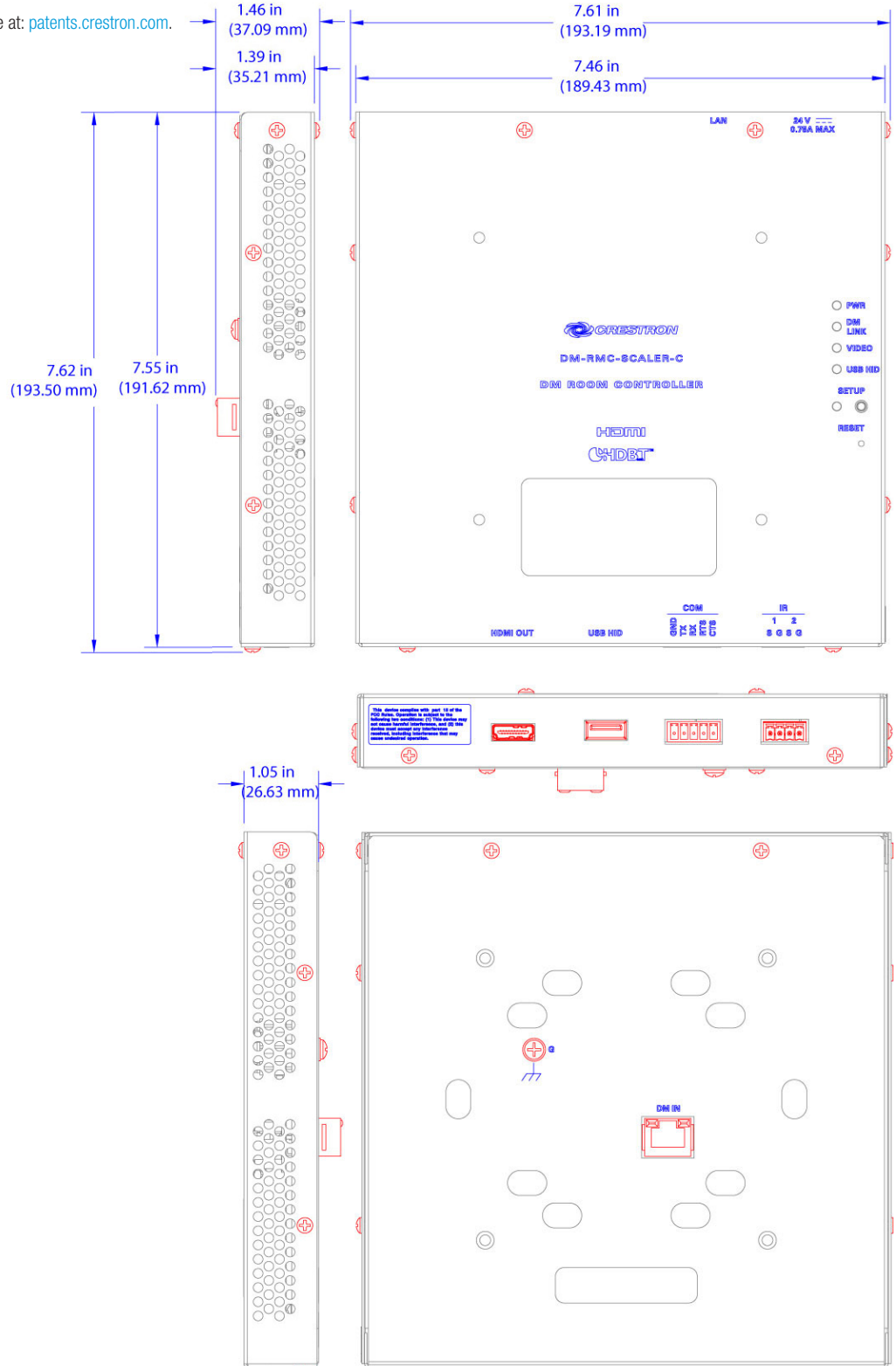
# DigitalMedia 8G+® Receiver & Room Controller w/Scaler

6. Video wall processing requires a separate DM-RMC-SCALER-C for each individual display.
7. With or without reduced blanking.
8. With reduced blanking only.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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

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# UP/DOWN CROSS CONVERTER DAC-70



Datavideo DAC-70 up/down/cross converter is designed to convert video signals from VGA, HDMI, SDI with Audio input to 3G/HD/SD SDI outputs.

Perfect for connecting a VGA/HDMI output from computer to SDI devices over long distance SDI cable. Solutions like lecture theater, church, auditorium room and conference hall.



## FEATURES

- 3G/HD/SD Up/Down/Cross convert A/HDMI/SDI input
- 3G/HD/SD SDI and HDMI output
- Datavideo RMK-2 2RU Rack solution
- DC 12V, 3.6 watts

### Video Input formats

SD-SDI:  
525i, 625i

3G-SDI:  
1080p60/50, 1080p59.94

HD-SDI:  
1080i60/50, 1080p30/25/24, 1080p29.97, 1080p23.98, 1080i59.94, 720p60/50, 720p59.94

HDMI:  
(YUV/RGB): 1080p60/50, 1080p59.94, 1080p30/25/24, 1080p29.97, 1080p23.98, 1080i60/50, 1080i59.94, 720p59.94, 720p60/50, 576p, 480p, VGA, 1600x1200@60Hz, 1400x1050@60Hz, 1366x768@60Hz, 1280x1024@60Hz, 1024x768@60Hz, 800x600@60Hz

### Video Output formats

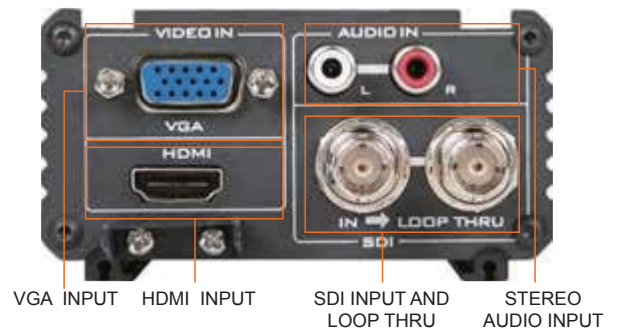
SDI / HDMI (YUV: 4:2:2)  
1080p60/50, 1080p59.94  
1080p23.98/29.97/24/25/30, 1080i60/50, 1080i59.94, 720p60/50, 720p59.94, 525i, 625i

### Supported Audio formats

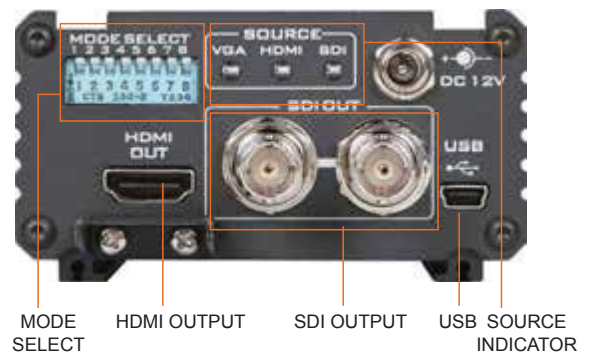
SDI embedded Audio: Up to 8-CH, PCM 48KHz  
HDMI embedded Audio: up to 8-CH, PCM 96KHz  
- Stereo audio input: 2-CH, PCM 48KHz

\* USB interface for firmware upgrade

## FRONT VIEW



## REAR VIEW



INPUT FORMATS			OUTPUT FORMATS		
3G-SDI/ HDMI	1080p 60 / 50	VGA/ HDMI	800x600 @60Hz	3G-SDI/ HDMI	1080p 60 / 50
	1080p 59.94		1024x768 @60Hz		1080p 59.94
HD-SDI/ HDMI	1080p 30 / 25 / 24		1280x1024 @60Hz	HD-SDI/ HDMI	1080p 30 / 25 / 24
	1080p 29.97		1366x768 @60Hz		1080p 29.97
	1080p23.98		1400x1050 @60Hz		1080p23.98
	1080i 60 / 50		1600x1200 @60Hz		1080i 60 / 50
SD-SDI/ HDMI	1080i 59.94			1080i 59.94	
	720p 60 / 50			720p 60 / 50	
	720p 59.94			720p 59.94	
SD-SDI/ HDMI	NTSC(525i)			NTSC(525i)	
	PAL(625i)			PAL(625i)	



## Capture HD® High-Definition Capture Recorder

- > Delivers a low-cost, high-performance HD presentation capture solution
- > Designed for college, university, teaching hospital, government, and business applications
- > Records the complete AV presentation, classroom lecture, or training session
- > Captures in high-quality H.264 format at up to HD 1080p resolution
- > Allows live streaming of HD video and audio over an IP network
- > Extremely easy to use and flexible enough to fit any workflow model
- > Works with Crestron® Fusion RV® software for a total workflow engine [1]
- > Integrates easily into existing AV presentation systems and networks
- > Provides inputs for high-definition digital and analog AV sources
- > Built-in scaling ensures compatibility with a full range of sources
- > Provides a composite video input for the presenter's camera
- > CAPTURE-HD-PRO model includes high-definition 3G-SDI camera input
- > Includes local AV output for confidence monitoring or presentation pass-thru
- > Allows Crestron control system integration via Ethernet
- > Gigabit Ethernet enables high transfer rates for uploading of HD media files
- > Easy out-of-the-box setup
- > Single-space 19" rack-mountable



stream live video to a touch screen, computer, mobile device, DigitalMedia™ system, or third-party streaming media system. Schools and businesses may easily implement a facility-wide media capture solution by equipping every room with CAPTURE-HD recorders, all centrally managed by Crestron Fusion RV® Remote Asset Management Software [1].

### A Closer Look at the Box

The CAPTURE-HD recorder is a compact unit, designed to sit on a shelf or mount in an equipment rack or podium. It captures presentation content from a computer or other source along with a live camera image and records them together in full-motion HD. The two images may be composited on screen side-by-side or picture-in-picture (PIP). The camera PIP window can be sized and positioned in any corner of the screen over the presentation content. Either image may be captured full screen as well.

Audio content from the presentation source is captured in stereo along with the live "speech" signal from a wireless microphone. The two signals are mixed together and recorded as one high-quality stereo signal.

### Additional Features:

- **Front Panel** — Intuitive controls are provided on the front panel for starting, pausing, and stopping a recording. Each button lights up in a different color to provide clear indication of recording status. An LED bargraph meter provides indication of the speech signal level so you'll know that you're being picked up loud and clear. A full-color LCD screen displays additional feedback and provides access to setup functions.
- **Content Inputs** — Connecting a computer, DVD player, or other presentation source is enabled via HDMI® and RGBHV inputs on the rear panel. The HDMI input handles high-definition digital AV devices and computers with stereo audio. The RGBHV input handles analog computer sources. Built-in scaling ensures compatibility with a full range of signals. A stereo analog audio input is also provided.
- **Camera Input** — A composite video input provides for the connection of a single camera. Crestron offers the CAM-IFB-100 camera, which is ideally suited for the application [2]. A 3G-SDI input (CAPTURE-HD-PRO model only) is also offered, allowing for the use of a high-definition camera with SDI, HD-SDI, or 3G-SDI output.
- **Speech Input** — A wireless microphone (with line level output) can be connected for pickup of the presenter. A mic mixer such as the Crestron MMX-6-USB [2] may also be added to enable the connection of both wired and wireless microphones.

The CaptureLiveHD® system from Crestron® answers the call for a high-quality meeting and lecture capture solution that's simple enough for the entire faculty to use, and affordable enough for wide-scale deployment across any sized campus or corporate enterprise. CaptureLiveHD delivers a complete end-to-end solution for scheduling, recording, and online delivery of captured content at the lowest cost of ownership on the market. Flexible enough to fit any education, government, medical or corporate work-flow model, CaptureLiveHD translates to greater usage of resources and a more effective education experience while minimizing support overhead.

As part of a complete CaptureLiveHD system, the Capture HD High-Definition Capture Recorder (CAPTURE-HD) provides a very simple, one-box component for capturing lectures, AV presentations, medical procedures, seminars, and training sessions. It is designed for easy integration in a classroom, lecture hall, training lab, or boardroom. It allows presenters and instructors to use their choice of multimedia sources, including high-definition videos, computers, whiteboards, and annotators. The CAPTURE-HD base model provides HDMI® and RGBHV inputs for such sources, plus a composite video input for a camera and line-level audio input for a wireless mic. The CAPTURE-HD-PRO model adds a 3G-SDI input to support HD digital cameras.

Without requiring any special training or extra effort from the presenter, the CAPTURE-HD records the complete presentation in full-motion HD 1080p or 720p and uploads it to a network server for publishing. It can also

# CAPTURE-HD Capture HD® High-Definition Capture Recorder



CAPTURE-HD – Rear View



CAPTURE-HD-PRO – Rear View

- **Local Output** — HDMI and analog audio outputs are included for connection to a confidence monitor or AV system. These outputs may be used to view and hear exactly what is being recorded, or to pass the selected content source through for local presentation.
- **File Storage** — Captured AV files are stored locally on a memory card or USB hard drive prior to uploading to the network. A memory card slot and USB port are provided on the rear panel, and a 16 GB SDHC memory card is included. An additional USB port is provided on the front panel, allowing recordings to be saved directly to a portable USB hard drive.<sup>[3]</sup>
- **Live Streaming** — As an alternative to capturing video, the CAPTURE-HD can also be used to stream live HD video and audio to a computer, mobile device, touch screen, DigitalMedia system, or third-party streaming media system. The CAPTURE-HD supports both unicast and multicast, with or without RTSP (Real Time Streaming Protocol). Streaming connections can be configured to stream directly to one or more specific IP addresses, or to use RTSP to manage the configuration of multiple connections automatically.
- **Gigabit Ethernet** — Connection to the LAN is via 1000Base-T Ethernet, affording the highest possible transfer rate for uploading HD media files to your network server or streaming live video.

## Touch Screen Remote

Adding the optional touch screen controller ([CAPTURE-TPMC-4SM](#)<sup>[2]</sup>) enables simplified operation of the CAPTURE-HD from a lectern, desk, or wall mount location in the room. The presenter need only follow the prompts on the touch screen to easily start and stop a recording, pause or mute the recording and even add bookmarks<sup>[4]</sup> during the session. The touch screen can also display a live view of the room camera and a microphone level meter to lend an extra level of confidence during operation.

## Control System Integration

The CAPTURE-HD integrates seamlessly with a Crestron control system to enable expanded control over AV and room devices using a variety of touch screens, wireless remotes, computers, and mobile devices.

## SPECIFICATIONS

### Capture & Streaming

**Video Recording Formats:** H.264 high profile @ 720p24, 720p30, 720p60, 1080p24, and 1080p30

**Video Recording Bitrates:** 500 to 6000 kbps

**Video Streaming Formats:** H.264 high profile @ 720p10, 720p15, 720p30, 720p60, 1080p10, 1080p15, and 1080p30

**Video Streaming Bitrates:** 500 to 6000 kbps

**Audio Format:** AAC stereo

**Container:** MPEG-2 transport stream (.ts), MPEG-4 Part 14 (.mp4)

**File Transfer Protocols:** FTP, SFTP, SCP

**Streaming Protocols:** RTP, RTSP, SDP

**Session Initiation Modes:** By receiver (unicast), by transmitter (unicast), multicast via RTSP, multicast via UDP

### Storage

**Memory Card:** Supports SD and SDHC memory cards, 16 GB SDHC card included

**USB:** Supports USB hard drives<sup>[3]</sup>

**Network:** Supports file transfer to network media server

### Video

**Scaling:** VXP® video processing, 3D and 2D noise reduction, block artifact reduction, mosquito noise reduction, motion and edge adaptive deinterlacing, detail enhancement, adaptive contrast enhancement, adaptive de-banding, film cadence detection, picture-in-picture and side-by-side windowing

**Input Signal Types (Content):** HDMI®, DisplayPort Multimode<sup>[5]</sup>, DVI<sup>[5]</sup>, RGB

**Input Signal Types (Camera):** composite, 3G-SDI<sup>[6]</sup>

**Output Signal Types:** HDMI, DVI<sup>[5]</sup>

**Input Formats:** HDMI, DVI<sup>[5]</sup>, RGBHV up to UXGA/WUXGA, HD up to 1080p60, NTSC or PAL, SD-SDI (SMPTE 259M)<sup>[6]</sup>, HD-SDI (SMPTE 292M)<sup>[6]</sup>, 3G-SDI (SMPTE 424M)<sup>[6]</sup>

**Input Resolutions, HDMI, Progressive:** Any resolution and frame rate from 640x400 to 1920x1200 up to 162 MHz pixel clock

**Input Resolutions, HDMI, Interlaced:** 480i, 576i, 1080i25 (1125 lines), 1080i30



**Input Resolutions, RGB, Progressive:** Any resolution and frame rate from 640x400 to 1920x1200 up to 162 MHz pixel clock

**Input Resolutions, Composite:** 480i, 576i

**Input Resolutions, 3G-SDI<sup>[6]</sup>:**

SMPTE 425M (3G-SDI) 4:2:2 Colorspace: 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60);

SMPTE 425M (3G-SDI) 4:4:4 Colorspace: 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@30Hz (1080p30), 1920x1080@50Hz (1080i50 or 1080sF25), 1920x1080@60Hz (1080i60 or 1080sF30);

SMPTE 260M (HD-SDI): 1920x1035@60Hz (1035i60);

SMPTE 295M (HD-SDI): 1920x1080@50Hz (1080i50);

SMPTE 274M (HD-SDI): 1920x1080@24Hz (1080p24), 1920x1080@24Hz (1080sF24), 1920x1080@25Hz (1080p25), 1920x1080@30Hz (1080p30), 1920x1080@50Hz (1080i50 or 1080sF25), 1920x1080@60Hz (1080i60 or 1080sF30);

SMPTE 296M (HD-SDI): 1280x720@50Hz (720p50), 1280x720@60Hz (720p60);

SMPTE 259M-C (SD-SDI): 720x480@59.94 (NTSC), 720x576@50i (PAL)

**Output Resolutions, HDMI:** Same as CONTENT input (HDMI or RGBHV) when viewing the selected content source, or same as capture settings when viewing the capture image

**A-D Conversion:** 10-bit 162 MHz per each of 3 channels

## Audio

**Processing:** Provides mixing of the stereo CONTENT audio signals with the mono SPEECH signal

**A-D/D-A Conversion:** 24-bit 48 kHz

**Input Signal Types:** HDMI, DisplayPort Multimode<sup>[5]</sup>, analog stereo, analog mono

**Output Signal Types:** HDMI, analog stereo

**Formats, HDMI:** 2ch PCM

**Formats, Analog:** Stereo 2-channel

**Content Input Compensation:** ±10.0 dB

**Content Mix Level:** -80.0 to 0.0 dB

**Content Bass:** ±15.0 dB

**Content Treble:** ±15.0 dB

**Content Audio Delay:** 0.0 to 40.0 ms

**Speech Input Compensation:** ±10.0 dB

**Speech Mix Level:** -80.0 to 0.0 dB

**Speech Bass:** ±15.0 dB

**Speech Treble:** ±15.0 dB

**Output Volume<sup>[7]</sup>:** -80 to +20 dB, adjustable from 0% to 100%, plus mute

**Output Bass<sup>[7]</sup>:** ±15.0 dB

**Output Treble<sup>[7]</sup>:** ±15.0 dB

**Performance (analog):**

Frequency Response: 20Hz to 20kHz ±0.75dB typical;

S/N Ratio: >90dB, 20Hz to 20kHz A-weighted;

THD+N: <0.05% @ 1kHz;

Stereo Separation: >90dB

## Communications

**Ethernet:** 10/100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP

**USB:** USB 2.0 host, supports USB hard drives<sup>[3]</sup>

## Connectors

**SPEECH IN (Unbalanced):** (1) RCA female;

Unbalanced line-level audio input;

Input Impedance: 10k Ohms nominal;

Input Level: 2 Vrms maximum

**SPEECH IN (Balanced):** (1) 3-pin 3.5mm detachable terminal block;

Balanced/unbalanced line-level audio input;

Input Impedance: 17.5k Ohms nominal balanced/unbalanced;

Balanced Input Level: 4 Vrms maximum;

Unbalanced Input Level: 2 Vrms maximum

**CONTENT AUDIO IN (Unbalanced):** (1) 3.5mm TRS mini phone jack;

Unbalanced stereo line-level audio input;

Input Impedance: 18.5k Ohms nominal;

Input Level: 1 Vrms maximum

**CONTENT AUDIO IN (Balanced):** (1) 5-pin 3.5mm detachable terminal block;

Balanced/unbalanced stereo line-level audio input;

Input Impedance: 24k Ohms nominal balanced/unbalanced;

Balanced Input Level: 4 Vrms maximum;

Unbalanced Input Level: 2 Vrms maximum

**AUDIO OUT L, R (Unbalanced):** (2) RCA female;

Unbalanced stereo line-level audio output;

Output Impedance: 100 Ohms nominal;

Output Level: 2 Vrms maximum

**AUDIO OUT (Balanced):** (1) 5-pin 3.5mm detachable terminal block;

Balanced/unbalanced stereo line-level audio output;

Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced;

Balanced Output Level: 4 Vrms maximum;

Unbalanced Output Level: 2 Vrms maximum

**CAMERA IN, COMPOSITE:** (1) BNC female analog composite video input; RCA adapter included;

Input Impedance: 75 Ohms nominal;

Input Level: 1 Vp-p nominal

**CAMERA IN, 3G-SDI<sup>[6]</sup>:** (1) BNC female, SDI video input;

Input Impedance: 75 Ohms nominal

**CONTENT IN, RGBHV:** (1) DB15HD female, RGB (VGA) input;

Formats: RGBHV, RGSB, RGSB;

Input Levels: 0.5 to 1.5 Vp-p with built-in DC restoration;

Input Impedance: 75 Ohms nominal;

Sync Detection: RGBHV, RGSB, RGSB;

Sync Input Level: 3 to 5 Vp-p;

Sync Input Impedance: 511 Ohms nominal



**CONTENT IN, HDMI:** (1) 19-pin Type A HDMI female;  
Signal Types: HDMI, DVI, DisplayPort Multimode<sup>[5]</sup>

**LOOP OUT, RGBHV:** (1) DB15HD female, buffered pass-thru from RGBHV input

**HDMI OUT:** (1) 19-pin Type A HDMI female;  
Signal Types: HDMI, DVI<sup>[5]</sup>

**MEMORY:** (1) SD memory card slot; for local storage;  
Supports SD and SDHC cards (16 GB SDHC card included)

**USB:** (2) USB Type A female (1 front, 1 rear); USB 2.0 host ports for connection of a USB hard drive<sup>[3]</sup>

**LAN:** (1) 8-wire RJ45, female;  
10Base-T/100Base-TX/1000Base-T Ethernet port

**12VDC 5.0A:** (1) 2.5 x 5.5 mm DC power connector;  
12 Volt DC power input; PW-1250DU power pack included

**G:** (1) 6-32 screw, chassis ground lug

**COMPUTER (front):** (1) USB Type B female, for future use

## Display

**Display Type:** TFT active matrix color LCD

**Size:** 1.8 inch (45 mm) diagonal

**Resolution:** 220 x 176 pixels

**Functions:** Displays recording status, time counter, audio levels, setup parameters, and other details

## Controls & Indicators

**RESET:** (1) recessed miniature pushbutton for hardware reset

**Meter:** (1) 10-segment LED bargraph, indicates Speech audio signal level

**▲, ▼, ◀, ▶:** (4) pushbuttons, for 4-way LCD menu navigation and parameter adjustment

**SELECT:** (1) pushbutton, used to select or execute the highlighted menu item or value

**HOME:** (1) pushbutton, returns to the home menu

**BACK:** (1) pushbutton, steps menu back one level

**REC, PAUSE, STOP:** (3) transport style buttons with translucent button caps and LED backlighting for feedback, used to control the capture function

**LAN (rear):** (2) green LEDs, indicate Ethernet link status, speed, and activity

## Power Requirements

**Power Pack:** 5 Amps @ 12 Volts DC;

100-240 Volts AC, 50/60 Hz power pack, model PW-1250DU included

## Environmental

**Temperature:** 32° to 104°F (0° to 40°C)

**Humidity:** 10% to 90% RH (non-condensing)

**Heat Dissipation:** 69 BTU/hr

## Enclosure

**Chassis:** Metal with matte black finish, vented sides, variable-speed fan-cooled

**Faceplate:** Metal, matte black finish with polycarbonate label overlay

**Mounting:** Freestanding or 1U 19-inch rack-mountable (adhesive feet and rack ears included)

## Dimensions

**Height:** 1.91 in (49 mm);  
1.70 in (44 mm) without feet

**Width:** 17.03 in (433 mm);  
19.00 in (483 mm) with ears

**Depth:** 9.25 in (235 mm)

## Weight

**CAPTURE-HD:** 4.1 lb (1.9 kg)

**CAPTURE-HD-PRO:** 4.2 lb (1.9 kg)

## MODELS & ACCESSORIES

### Available Models

**CAPTURE-HD:** Capture HD® High-Definition Capture Recorder

**CAPTURE-HD-PRO:** Capture HD® High-Definition Capture Recorder w/3G-SDI

### Included Accessories

**PW-1250DU:** Universal Power Pack for CAPTURE-HD (Quantity 1 included)

### Available Accessories

**SW-FUSION-RV:** Fusion RV® Remote Asset Management Software

**CEN-FUSION-RVS-R320:** Pre-configured Fusion RV® Server System

**CAPTURE-TPMC-4SM:** Touch Screen Controller for CAPTURE-HD

**CAM-IFB-100:** Camera for CAPTURE-HD

**MMX-6-USB:** 6-Channel USB Microphone Mixer

**CBL Series:** Crestron® Certified Interface Cables

# CAPTURE-HD Capture HD® High-Definition Capture Recorder

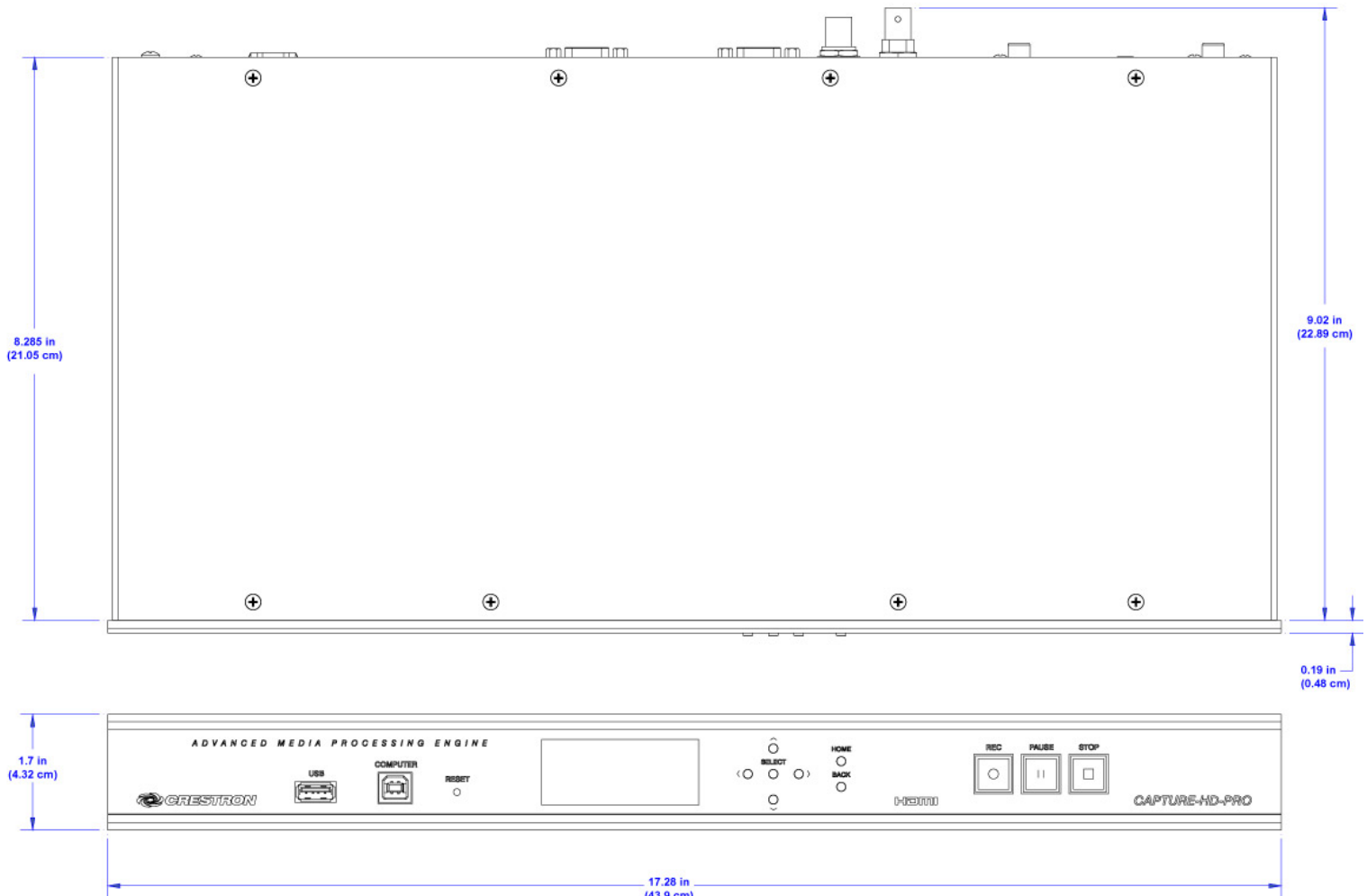
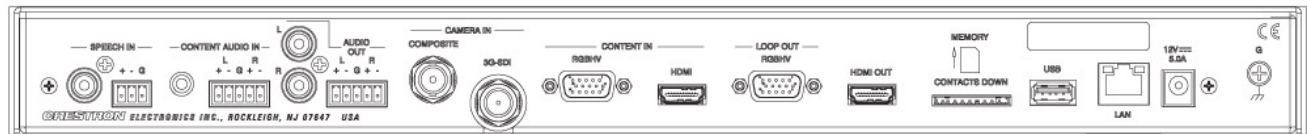
## Notes:

1. Fusion RV software and hardware server(s) sold separately. Refer to the Crestron CaptureLiveHD Design Guide, Doc. #4552 for complete system requirements and design guidelines.
2. Item(s) sold separately.
3. Due to inconsistencies in the performance and quality of USB flash drives (a.k.a., "memory sticks" or "thumb drives"), their use with Capture HD is not recommended.
4. The bookmark feature requires integration with Fusion RV software (sold separately). Playback of bookmarked recordings is exclusively supported using Crestron Media Player. Crestron Media Player is a Web-based streaming media player that is included as part of the Media Services component of Fusion RV. Refer to the Crestron [CaptureLiveHD](#) spec sheet for additional information.
5. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. [CBL-HD-DVI](#) interface cables available separately.
6. SDI input capability is available on the CAPTURE-HD-PRO model only.
7. Affects analog audio outputs only.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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

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# Annotator 300

HDCP-COMPLIANT ANNOTATION  
PROCESSOR WITH DTP EXTENSION

**DTP**  
SYSTEMS

Powerful Annotation Capabilities, Plus  
High Performance Video Processing  
and Output Extension

- ▶ Real-time annotation over high resolution computer and live video sources
- ▶ Integrated three-input switcher with HDMI, DisplayPort, and universal analog video inputs
- ▶ Three simultaneous video outputs
- ▶ Integrated DTP™ digital twisted pair output
- ▶ Compatible with popular touch displays and graphics tablets
- ▶ Intuitive graphical annotation interface



**Extron Electronics**  
INTERFACING, SWITCHING AND CONTROL

# Introduction

The Extron **Annotator 300** is a high performance, hardware-based annotation processor that allows a presenter to draw, point, or type over live presentations using a touch display, graphics tablet, or a keyboard and mouse. The HDCP-compliant Annotator 300 includes HDMI and DisplayPort inputs, a universal analog video input, and three simultaneous outputs including two HDMI and a DTP™ twisted pair output. It also features advanced Extron video signal processing with a high performance scaling engine and fast, reliable switching. The DTP twisted pair output extends HDMI and bidirectional control signals to a DTP receiver over a shielded CATx cable up to 330 feet (100 meters). The Annotator 300 offers a wide range of annotation tools and controls, all easily accessible by any presenter using an intuitive on-screen GUI.

## Create Real-Time Annotations with a User-Friendly Interface

User-friendly graphical icons and menus provide quick access to essential annotation tools for drawing freehand or lines, adding rectangular or elliptical shapes, typing text, highlighting an area of the presentation, and pointing to objects on-screen, with various customization tools. A presenter can also isolate a specific area of the presentation by creating a spotlight with the image darkened around it. Additional annotation options include the ability to use a touch flat-panel display as a whiteboard, zoom and pan within the image, and freeze a live image. Annotated images may be captured and saved to internal memory, a removable USB flash drive, or a network location. These images can also be printed using a network printer.

## Supports Popular Touch Displays and Graphics Tablets

Annotating over live video or presentations is easy using common touch displays, graphics tablets, and any standard keyboard and mouse. A total of 25 devices can be connected via USB hubs. The Annotator 300 is ideal for collaboration applications requiring simultaneous on-screen annotation from two users.

## High Performance Video Processing and Digital Video Integration Capabilities

The Annotator 300 features an advanced scaling engine that can scale HDMI, DisplayPort, RGB, component, and standard definition video signals to a common high resolution output. It provides high performance deinterlacing of all interlaced signals up to 1080i, and Deep Color processing to deliver optimal image quality. The universal analog video input automatically detects incoming RGB, component video, S-video, or composite video. The Annotator 300 accepts signals up to 1920x1200 and 2K, plus DisplayPort input signals at resolutions up to 2560x1600. The output can be set for various resolutions up to 1920x1200, including 1080p/60 and 2K.

To simplify integration of HDMI sources and displays, the Annotator 300 features three Extron-exclusive technologies: EDID Minder®, Key Minder®, and SpeedSwitch®. EDID Minder and Key Minder automatically manage EDID communication and HDCP key negotiation between input and output devices to ensure reliable operation. With SpeedSwitch Technology, the Annotator 300 delivers exceptional switching speeds for HDCP-encrypted content.

## Integrated Digital Twisted Pair Extension

The DTP output can extend HDMI, analog audio, and bidirectional control signals up to 330 feet (100 meters) to a DTP 330 receiver or up to 230 feet (70 meters) to a DTP 230 receiver in a remote location. Bidirectional RS-232 and IR signals can be inserted from a control system and transmitted over the shielded CATx cable together with the video, enabling control of a display. The Annotator 300 can also send power to the DTP receiver over the same shielded CATx cable, streamlining system design and installation. In addition, the Annotator 300 can be integrated into a larger AV switching system with a DTP-enabled switcher or matrix switcher, such as the Extron IN1608 or DTP CrossPoint 84.

## HDBaseT-Compatible Output

The DTP output can be configured for compatibility with an HDBaseT-enabled display to send digital video and embedded audio, plus bidirectional RS-232 and IR signals up to 330 feet (100 meters) over a shielded CATx cable.

## Configurable Main and Confidence Outputs

One of the three outputs on the Annotator 300 can be used as a dedicated Confidence output for the presenter, while the remaining two serve as Main outputs for the audience. The Confidence output can be configured so that only the presenter can view the annotation GUI. The presenter can also use this output to preview annotations before making them live for the audience.





### HDCP compliant

Worry-free display of protected content from digital video sources

### Print captured images

Captured images can be sent directly to a network printer without connecting to a PC.

### Advanced scaling

High-quality graphics and video upscaling and downscaling, deinterlacing, and HDMI Deep Color processing



Annotator 300 - Front

### Capture, store, and recall images

Images with annotations can be captured and saved to internal memory, a removable USB flash drive, or a network location.

### User-friendly interface

An intuitive LCD Interface, direct access buttons, and precise rotary controls simplify system setup and operation.

### HDMI, DisplayPort, and universal analog inputs

Ensure compatibility with a wide variety of sources

### Compatible with HDBaseT-enabled devices

The DTP output can be configured to send video, embedded audio, and control signals to an HDBaseT-enabled display.

### DTP twisted pair extension

Supports digital signal transmission up to 330 feet (100 meters) over a shielded twisted pair cable to a DTP receiver

### Supports popular touch displays and graphics tablets

Two USB ports are available to support touch displays, graphics tablets, or a keyboard and mouse. Additional devices can be connected via USB hubs.



Annotator 300 - Back

### Three simultaneous outputs

One DTP output and two HDMI outputs are available to drive three displays.

### Configurable Main and Confidence outputs

The outputs can be configured so that the audience views annotated video or graphics through one or two Main outputs, while a Confidence output displays the annotation GUI for a presenter or system operator.

### Ethernet, RS-232, and contact closure control

The Annotator 300 can be controlled over RS-232 or Ethernet, and configured using Extron PCS - Product Configuration Software. The contact closure ports can be used for external control of source switching.

# Features

## Create real-time annotations over high resolution PC and video sources

The Annotator 300 allows a presenter to draw, point, or add text in real-time over live video and graphics presentations.

## Integrated three-input switcher with HDMI, DisplayPort, and universal analog video inputs

The Annotator 300 delivers fast, reliable input switching between HDMI, DisplayPort, and analog video sources. The universal auto-detecting analog video input automatically detects incoming RGB, component video, S-video, or composite video signals.

## Three simultaneous video outputs

One DTP twisted pair output and two HDMI outputs are available for driving three displays.

## Compatible with all DTP 230 and DTP 330 Series receivers and DTP-enabled products

The Annotator 300 supports DTP twisted pair signal transmission of HDMI, analog audio, and control up to 330 feet (100 meters) over a single shielded CATx cable. The Annotator 300 can also power a DTP receiver over the twisted pair connection.

## Intuitive graphical annotation interface

A user-friendly on-screen display enables quick and easy annotation. Essential annotation tools are available for drawing freehand or lines, adding rectangular or elliptical shapes, typing text, highlighting an area of an image, pointing to an object on-screen, and using the screen as a whiteboard. Customization options are available for text and graphics, including point size and color.

## Hardware-based graphics and video processing

The Annotator 300 features a fully hardware-based system architecture designed to deliver the performance and operational reliability essential for mission-critical applications.

## Compatible with popular touch displays and graphics tablets

The Annotator 300 supports a wide variety of touch displays and graphics tablets from third-party manufacturers, and also can be used with a standard keyboard and mouse.

## Supports 25 total device connections and simultaneous annotation for two users

The Annotator 300 allows up to a total of 25 pointing device connections via USB hubs. It is ideal for collaboration applications requiring simultaneous on-screen annotation from two users.

## Capture, store, and recall images

An image can be captured as a snapshot of the live video output, including annotations, and saved to internal memory, a removable USB flash drive, or a network location for archiving.

## Print captured images using a network printer

The Annotator 300 supports connection to a printer on the network, enabling captured images to be sent directly to the printer without connecting to a PC.

## HDCP compliant

The Annotator 300 fully supports HDCP-encrypted sources, with selectable authorization for unencrypted content.

## Supported HDMI specification features include data rates up to 6.75 Gbps, Deep Color, and HD lossless audio formats

## Supports DisplayPort input signals at resolutions up to 2560x1600

## Extron XTP DTP 24 shielded twisted pair cable strongly recommended

XTP DTP 24 cable is highly recommended for optimal signal transmission between the Annotator 300 and the DTP receiver.

## Bidirectional RS-232 and IR pass-through for AV device control

Bidirectional RS-232 control and IR signals can be transmitted alongside the video signal over the DTP connection, allowing the remote device to be controlled without the need for additional cabling. Bidirectional control extension eliminates the need for control system wiring to remote devices.

## DTP output is compatible with HDBaseT-enabled devices

The DTP output can be configured to send video and embedded audio, plus bidirectional RS-232 and IR signals to an HDBaseT-enabled display.

## Auto-switching between inputs Auto Input Format Detection

For the universal analog video input, the Annotator 300 detects the incoming signal format, automatically reconfiguring itself to provide the appropriate decoding and signal processing.

## Selectable output rates

Available output rates include computer and video up to 1920x1200, including 1080p/60 and 2K.

## Advanced scaling engine with 30-bit precision processing

## Motion-adaptive deinterlacing for signals up to 1080i

## Key Minder

Authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments.

## EDID Minder

Automatically manages EDID communication between connected devices. EDID Minder ensures that all sources power up properly and reliably output content for display.

## SpeedSwitch

Provides exceptional switching speed for HDCP-encrypted content.

## Aspect Ratio Control

The aspect ratio of the video output can be controlled by selecting a FILL mode, which provides a full screen output, or a FOLLOW mode, which preserves the original aspect ratio of the input signal.

## HDCP Visual Confirmation

When processing HDCP-encrypted content, the Annotator 300 outputs a full-screen green signal on any video output connected to a non-HDCP compliant display for immediate visual confirmation that protected content cannot be viewed on the display.

## Auto-Image™ setup

## Auto Input Memory

When activated, the unit automatically stores size, position, and picture settings based on the incoming signal. When the same signal is detected again, these image settings are automatically recalled from memory.

## Ethernet, USB, RS-232, and contact closure control

# Features

## CONFIGURABLE MAIN AND CONFIDENCE OUTPUTS

The outputs of the Annotator 300 can be configured as separate Main and Confidence outputs, with the ability to selectively control visibility of the annotations and on-screen menus. The Confidence output may be configured so that only the presenter or system operator can view the annotation GUI, while the audience sees the video and annotations through the Main outputs. The Confidence output can also be used by the presenter to preview annotations before making them live through the Main outputs for the audience.



Confidence output – with annotation menu



Main output – annotations only

## COMPATIBLE WITH EXTRON DTP SYSTEM PRODUCTS

**DTP SYSTEMS** The Annotator 300 includes a DTP output that supports transmission of HDMI, analog audio, and bidirectional RS-232 and IR signals over a single shielded CATx cable up to 330 feet (100 meters). It may be paired with a DTP 230 or DTP 330 receiver, available in low-profile enclosures and Decora wallplate models. In addition, the Annotator 300 can conveniently power the receiver over the same shielded CATx cable, and directly interface with control systems for sending RS-232 and IR control to display devices. These capabilities allow system integrators to create flexible yet efficient system designs that include remote display locations in a variety of presentation environments.

Additionally, the Annotator 300 can be integrated with a larger DTP-enabled switcher or matrix switcher, such as the Extron IN1608 or DTP CrossPoint 84.





# Annotation User Interface

The intuitive pop-up graphical user interface of the Annotator 300 features icons for essential tools that enable the user to perform powerful markup and system control functions. Some of these are shown below. Visit [www.extron.com/annotator300demo](http://www.extron.com/annotator300demo) to try an interactive demo of the graphical user interface.



**Inputs**  
Select video source for display



**Pointer**  
Direct attention without marking on the screen



**Auto Image**  
Set display parameters automatically



**Freehand**  
Draw freely on screen



**Line**  
Draw a line between two points



**Arrow**  
Draw an arrow between two points



**Rectangle**  
Draw a rectangle by pointing to two corners



**Ellipse**  
Draw an ellipse by pointing to two points



**Text**  
Use a keyboard to place text on screen



**Highlighter**  
Freehand translucent marking



**Size**  
Select line thickness and text size



**Eraser**  
Rub out on-screen annotations



**Color**  
Select color of next annotation



**Fill**  
Draw filled rectangles and ellipses



**Undo**  
Remove the last annotation



**Redo**  
Recreate the undone annotation



**Clear**  
Remove all on-screen annotations



**Capture**  
Save screen to internal memory, removable USB thumb drive, or network



**Freeze**  
Halt/release on-screen video



**Mute**  
Display a black screen



**Whiteboard**  
Use screen as whiteboard



**Spotlight**  
Gray out all video outside a defined ellipse



**Zoom**  
Enlarge a defined area



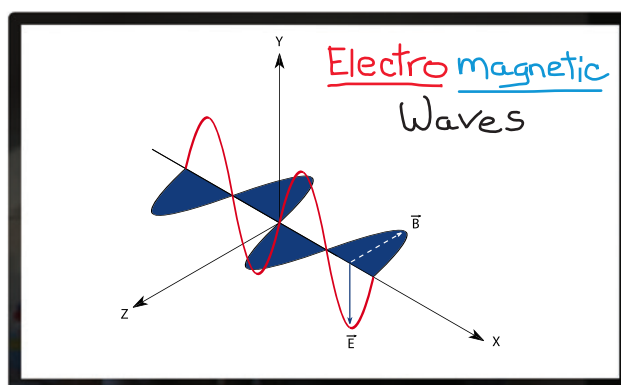
**Pan**  
Move displayed area of zoomed image

# Applications

## EDUCATION AND TRAINING

The drawing and text capabilities of the Annotator 300 help in the creation of more effective presentations by enabling the instructor to emphasize important course material and tailor the instruction to meet students' needs. An educator can collaborate with another presenter on-screen to annotate diagrams, images, and other presentation material. Both presenters can elaborate on fundamental principles and provide examples by first showing a diagram and then making notations on the screen to clarify particular points. The instructor can then use the image capture function of the Annotator 300 to save the material or print the annotated slides for distribution to the students.

The Annotator 300 also enables the instructor to use the touch display or graphics tablet as a whiteboard to draw, write, and make additional notations on a blank screen. The ability to annotate over high resolution, full-motion video further expands the presenter's ability to communicate with impact, especially for medical training, scientific research, and other fields where analysis of visual material is crucial.



## COURTROOM

Use of the Annotator 300 in the courtroom can greatly simplify complex exhibits, improving fact-finding by both the judge and jury. Counsel and witnesses can mark any image shown on the display by circling, drawing arrows, and underlining in several colors to highlight key points within photos, documents, or video-based evidence. The counsel can also direct the jury's attention to an area of interest within the image using the spotlight annotation tool. Once annotation is complete, the image may be printed or saved electronically for use as a record by the legal teams, and as supporting evidence during the trial.

Auto-Image and Auto Input Memory on the Annotator 300 allow new AV equipment, such as laptops, to be added or switched quickly and easily. EDID Minder ensures that the correct video formats from these sources are displayed reliably on the courtroom displays. This minimizes delays during trial proceedings. The DTP twisted pair output provides high quality video extension from the equipment location to the main display, especially considering the significant distances to cover in a large courtroom.



# Specifications

VIDEO INPUT	
Number/signal type	1 RGB, RGBcVs, component (interlaced, progressive, HD), S-video, composite video 1 HDMI (HDCP compliant) 1 DisplayPort (HDCP compliant)
Horizontal frequency	15 kHz to 100 kHz
Vertical frequency	24 Hz to 75 Hz
Resolution range	
VGA and HDMI	640x480 to 1600x1200 and 1920x1200* NTSC, PAL, SECAM, 480i, 480p, 576i, 576p, 720p, 1080i, 1080p, and 2k
DisplayPort	640x480 to 1600x1200 and 2560x1600* 480p, 576p, 720p, 1080i, 1080p, and 2k *reduced blanking
DC offset (max. allowable)	0.5 V
Standards	DVI 1.0, HDMI, DisplayPort 1.1a, HDCP
VIDEO PROCESSING	
Decoder	12 bit digital (3D-adaptive comb filter)
Analog sampling	12 bits per color; 13.5 MHz standard (video), 170 MHz standard (RGB)
HDMI pixel data bit depth	8, 10, or 12 bits per channel; 165 MHz pixel clock
Display Port pixel data bit depth	8, 10, or 12 bits per channel; 270 MHz pixel clock
Colors	1 billion, (10 bit processing)
VIDEO OUTPUT	
Number/signal type	2 HDMI (HDCP compliant) 1 DTP (HDCP compliant)
Digital bit depth	8 or 10 bit, automatic
Vertical frequency	23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 59.94 Hz, 60 Hz
Scaled resolution	640x480 <sup>8</sup> , 800x600 <sup>8</sup> , 1024x768 <sup>8</sup> , 1280x768 <sup>8</sup> , 1280x800 <sup>8</sup> , 1280x1024 <sup>8</sup> , 1360x768 <sup>8</sup> , 1366x768 <sup>8</sup> , 1440x900 <sup>8</sup> , 1400x1050 <sup>8</sup> , 1600x900 <sup>8</sup> , 1600x1200 <sup>8</sup> , 1680x1050 <sup>8</sup> , 1920x1200 <sup>8</sup> HDTV: 480p <sup>7,8</sup> , 576p <sup>6</sup> , 720p <sup>3,4,5,6,7,8</sup> , 1080i <sup>6,7,8</sup> , 1080p <sup>1,2,3,4,5,6,7,8</sup> , 2048x1080i <sup>1,2,3,4,5,6,7,8</sup> <sup>1</sup> = 23.98 Hz, <sup>2</sup> = 24 Hz, <sup>3</sup> = 25 Hz, <sup>4</sup> = 29.97 Hz, <sup>5</sup> = 30 Hz, <sup>6</sup> = 50 Hz, <sup>7</sup> = 59.94 Hz, <sup>8</sup> = 60 Hz
INTERCONNECTION BETWEEN ANNOTATOR 300 AND DTP/HDBT RECEIVER	
Termination standard	TIA/EIA T568B
Signal transmission distance	1080p @ 60 Hz Up to 330' (100 m) using shielded twisted pair cable or XTP DTP 24 STP cable
Cable requirements	Solid conductor, 24 AWG or better
Cable recommendations	400 MHz bandwidth, STP (shielded twisted pair)
NOTE:	Extron XTP DTP 24 shielded twisted pair cable is strongly recommended for optimal performance
SYNC	
Input type	RGBHV, RGBS, RGsB, RGBcVs, bi-level or tri-level component video
Input standards	NTSC 3.58, NTSC 4.43, PAL, SECAM

COMMUNICATION – SIGNAL PROCESSOR		
Serial control port	1 bidirectional RS-232, 3-pin captive screw connector	
Contact closure	1 rear panel 3.5 mm captive screw connector, 3 pole	
USB control port	1 female mini USB on front panel	
USB standards	USB 2.0, high speed	
Ethernet control port	1 RJ-45 female connector	
Web server	Up to 200 simultaneous sessions 40 MB nonvolatile user memory	
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™)	
COMMUNICATIONS		
External device (pass-through, unidirectional or bidirectional) (RS-232/IR over DTP)		
Serial control pass-through ports		
Annotator 300 output/DTP Rx	RS-232 via (1) 3.5 mm, 5 pole captive screw connector (shared with IR port)	
IR pass-through control ports	TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz	
COMMUNICATION – ANNOTATION		
Number/signal type	32 USB devices (via hubs)	
Connectors	3 USB type A connectors (2 on rear and 1 on front)	
USB standards	USB 2.0, USB 1.1, USB 1.0 compatible	
USB data rates	Low speed (1.5 Mbps), full speed (12 Mbps)	
GENERAL		
Power supply	Internal Input: 100-240 VAC, 50-60 Hz	
Power consumption	37 watts	
Auxiliary power output		
DTP output	Supports one endpoint (one DTP Rx)	
Cooling	Fan, air flows from right to left (as viewed from the front panel)	
Mounting		
Rack mount	Yes, with pre-installed brackets.	
Enclosure dimensions	1.75" H x 17.5" W x 9.5" D (1U high, full rack wide) (4.4 cm H x 44.5 cm W x 24.1 cm D) (Depth excludes connectors and knobs.)	
Product weight	5.4 lbs (2.4 kg)	
Regulatory compliance		
Safety	CE, c-UL, UL	
EMV/EMC	CE, C-tick, FCC Class A, ICES, VCCI	
Environmental	Complies with the appropriate requirements of RoHS, WEEE.	
Warranty	3 years parts and labor	
NOTE:	All nominal levels are at ±10%.	
Model	Version Description	Part number
Annotator 300	Annotation Processor with DTP Extension	60-1316-01

For complete specifications, please go to [www.extron.com](http://www.extron.com)  
Specifications are subject to change without notice.

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## 8x8 DigitalMedia™ Switcher

Crestron® DM® Switchers provide the foundation for a complete DigitalMedia™ system, delivering an advanced 4K ultra high-definition AV signal routing solution that's extremely flexible and installer-friendly. The DM-MD8X8 affords ultra fast switching and pure, lossless distribution of HDMI® and other signals to support all the digital media players, HDTV receivers, computers, cameras, and display devices that fill any modern home or commercial facility. DigitalMedia thoughtfully manages all of the disparate AV signals and devices to deliver a transparent user experience, and to ensure an optimum video image and audio signal at every location.



The DM-MD8X8 is field-configurable to handle up to eight AV sources of virtually any type. The outputs are also field-configurable to provide up to eight DM, HDBaseT®, and/or HDMI outputs, or up to four H.264 streaming outputs, in a single chassis.<sup>[1]</sup> A full selection of DM switcher input and output cards, DM transmitters, and DM receivers provides extensive connectivity throughout a residence or commercial facility, supporting a complete range of analog and digital signal types — all through one switcher!

Integrated Ethernet networking and USB distribution provide a complete connectivity solution combined with built-in Crestron control<sup>[2]</sup> for

- > Delivers a unified HD signal distribution solution incorporating both point-to-point wired and IP streaming technologies
- > Provides lossless HD AV signal routing over twisted pair copper wire or fiber
- > Integrates video, audio, networking, and control over one wire or fiber strand
- > Enables high-performance H.264 streaming from any input source up to 1080p or WUXGA
- > Affords full matrix switching with ultra high 12.5 Gbps backplane data rate
- > Handles HDMI® with Deep Color, 3D, 4K, and high-bitrate 7.1 encoded audio<sup>[3]</sup>
- > HDBaseT® Certified — Enables direct connection to other HDBaseT certified equipment
- > HDCP 2.2 compliant via compatible input and output cards<sup>[3]</sup>
- > Distributes Full HD 1080p, Ultra HD, and 4K signals over CAT type twisted pair cable at distances up to 330 ft (100 m) via DM 8G+® and HDBaseT<sup>[4,9]</sup>
- > Distributes 1080p and WUXGA signals over multimode fiber at distances up to 1000 ft (300 m) via DM 8G® Fiber<sup>[5,9]</sup>
- > Distributes 1080p and WUXGA signals over single-mode fiber at distances up to 7.5 miles (12 km) via DM 8G SM Fiber<sup>[6,9]</sup>
- > Allows streaming of 1080p signals over an IP network with no distance limitations
- > Also supports all first-generation DM® CAT and DM Fiber products<sup>[7,8,9]</sup>
- > Configurable with up to eight DM, HDBaseT, and/or HDMI outputs
- > Configurable with up to four streaming outputs<sup>[1]</sup>

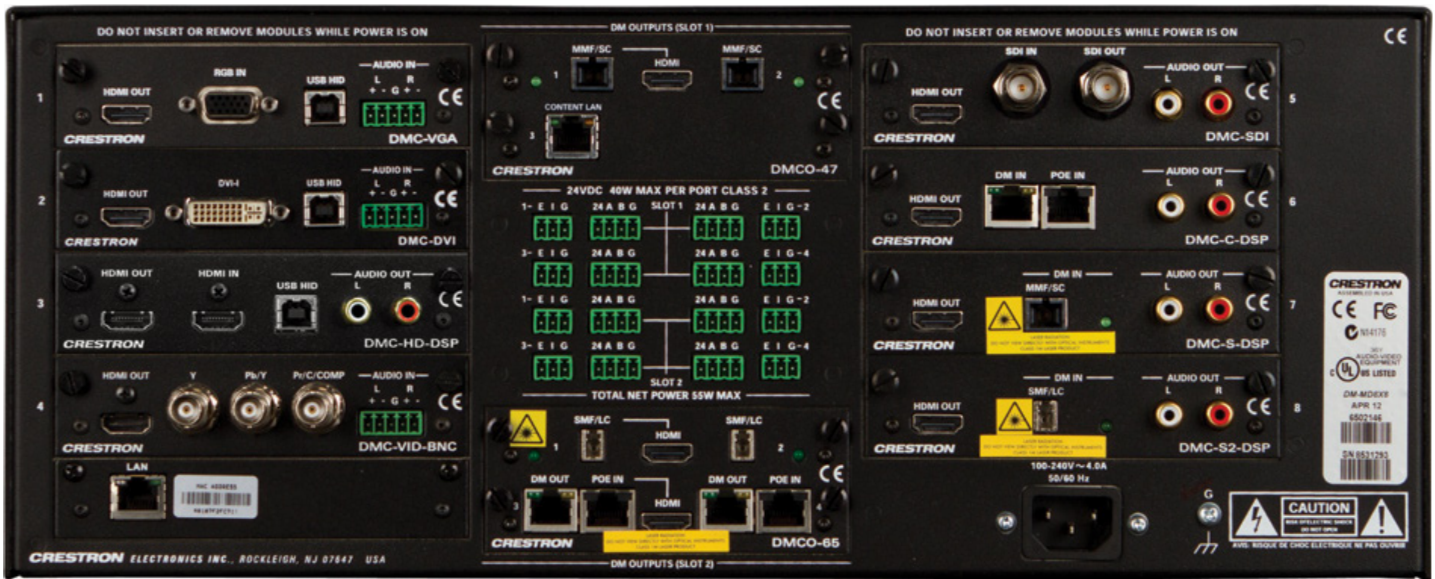
managing the displays and other room devices without necessitating any additional wiring. User-friendly operation, setup, and troubleshooting tools are provided through the DM-MD8X8 front panel, or via Crestron Toolbox™ software, to make setting up a complete multiroom 4K video distribution system easy.

To configure a DM switcher complete with input and output cards, cables, and other peripherals, please use the DigitalMedia Switcher Configuration Tool.

- > Easy output expansion using multiple DM switchers
- > Modular inputs support a complete range of digital, analog, and streaming signal types
- > QuickSwitch HD® technology manages HDCP keys for fast, reliable switching
- > Auto-Locking™ technology achieves rapid switching between disparate sources
- > Detects and displays detailed video and audio input information
- > Performs automatic AV signal format management via EDID
- > Allows independent scaling for every display through select DM receivers<sup>[12]</sup>
- > Enables device control via CEC
- > Distributes USB HID mouse and keyboard signals<sup>[15]</sup>
- > Expanded USB routing capabilities available using USB over Ethernet Extenders<sup>[15]</sup>
- > Allows full audio and USB breakaway switching
- > Integrates with analog audio distribution systems
- > Enables simultaneous output of stereo and surround sound audio
- > Includes integrated Ethernet switch with Gigabit LAN port
- > Private Network Mode — requires just one IP address for the complete DM system
- > Provides easy setup and diagnostics tools via front panel or software
- > Half-million hour rated internal universal power supply
- > 4-space 19-inch rack-mountable



# DM-MD8X8 8x8 DigitalMedia™ Switcher



DM-MD8X8 – Rear view with I/O cards installed

## 4K Ultra HD

Crestron DigitalMedia continues to advance the standard for digital AV signal distribution, delivering the world's first end-to-end 4K system solution. From day one, the DM-MD8X8 was designed to meet the extreme bandwidth requirements for handling 4K and Ultra HD video signals. Support for 4K video also ensures support for the latest generation of computers and monitors with native resolutions beyond 1080p and WUXGA.<sup>[3]</sup>



## DigitalMedia 8G™

As the leader in HDMI and control system technologies, Crestron developed DigitalMedia (DM) to deliver the first complete HD AV distribution system to take HDMI to a higher level. DigitalMedia allows virtually any mix of HDMI and other AV sources to be distributed throughout a room, building, or campus. The latest generation of DM is called DigitalMedia 8G (DM 8G<sup>®</sup>). Engineered for ultra high-bandwidth and ultimate scalability, DM 8G provides a true one-wire lossless transport for moving high-definition video, audio, Ethernet, and control signals over a choice of twisted pair or fiber optic cable.

DM 8G handles uncompressed Full HD 1080p, Ultra HD, 2K, and 4K<sup>[3]</sup> video signals with support for 3D, Deep Color, and HDCP 2.2<sup>[3]</sup>. Audio capabilities include the simultaneous distribution of stereo and multichannel surround sound signals, with support for high-bitrate 7.1 audio formats like Dolby<sup>®</sup> TrueHD and DTS-HD Master Audio™ as well as uncompressed linear PCM. All signals are transported over one CAT type twisted pair cable or one strand of multimode or single-mode fiber. DM 8G enables wire distances up to 330 feet (100 m) via DM 8G+<sup>®</sup> (DM 8G over twisted pair copper wire)<sup>[4,9]</sup>, 1000 feet (300 m) via DM 8G Fiber (DM 8G over multimode fiber)<sup>[5,9]</sup>, or 7.5 miles (12 km) via DM 8G SM Fiber (DM 8G over single-mode fiber)<sup>[6,9]</sup>.

The DM-MD8X8 provides full support for Crestron DM 8G devices as well as all first-generation DM CAT<sup>[7,9]</sup> and DM Fiber<sup>[8,9]</sup> products, letting you take advantage of the latest Crestron DM 8G technology without compromising your existing investment.

## HDBaseT<sup>®</sup> Certified

Crestron DigitalMedia 8G+<sup>®</sup> technology is designed using HDBaseT Alliance specifications, ensuring interoperability with other HDBaseT certified products. Via DM 8G+, the DM-MD8X8 can be connected directly to an HDBaseT compliant device without requiring a DM transmitter or receiver.



## H.264 Streaming

High-performance H.264 streaming capability enables enterprise-wide distribution of HD content over an IP network. Streaming expands the capabilities of DM to remove all distance limitations and allow distribution to virtually any device — anywhere in the world. Streaming is an essential component of any complete DM system, allowing for high-definition signal routing to Crestron touch screens, digital signage displays, remote buildings, and global offices without requiring any new or dedicated wiring. Large-scale streaming to computers and mobile devices can be facilitated through integration with a streaming media system such as Wowza<sup>®</sup> or Kaltura<sup>®</sup>.

DigitalMedia with streaming affords the ability to distribute any combination of sources to virtually any device anywhere. Each streaming output supports resolutions up to HD 1080p at bitrates up to 25 Mbps. Built-in scaling enables fast, trouble-free switching between sources of any type or resolution up to 1080p or WUXGA. Audio support includes stereo signals, as well as multichannel audio signals downmixed to stereo via any “DSP” type input card.<sup>[10]</sup> High-quality video and audio is maintained using high-performance H.264 video and AAC audio compression. The encoded video and audio can be output as independent RTP streams or encapsulated in an MPEG-TS (MPEG-2 Transport Stream) container. HDCP management ensures that protected content cannot be distributed via streaming.

Each streaming output is actually fed internally by two separate switcher outputs, allowing any two input sources to appear picture-in-picture or side-by-side in a single stream. Instant, single-frame switching between two full screen images is also possible. The audio signals from both input sources can also be mixed, allowing both signals to be heard simultaneously.

# DM-MD8X8 8x8 DigitalMedia™ Switcher

The DM-MD8X8 can receive streaming signals as well as transmit them. Streaming input capability enables IP cameras and other H.264 encoded sources to be distributed via DigitalMedia alongside HDMI and other non-streaming sources. It also allows DM switchers to be bridged together across a campus or around the world, enabling simplified routing of HD content between buildings and global offices.

DigitalMedia provides many deployment options to address a wide range of streaming applications and accommodate each organization's specific IT requirements. DM with streaming supports both unicast and multicast, with or without RTSP (Real Time Streaming Protocol). Streaming connections can be configured to stream directly to one or more specific IP addresses, or to use RTSP to manage the configuration of numerous connections automatically. Any streaming input or output may be configured to stream via the DM switcher's LAN port or via a dedicated "CONTENT LAN" port, allowing the option to combine control and content on a single network or isolate them onto separate networks.

## Modular Architecture

The DM-MD8X8 features a modular architecture with 8 input card slots, and 4 dual output card slots. Each card slot on the DM-MD8X8 is field-installable, allowing for easy and flexible system configuration with the ability to make changes to the system as needs change. A wide selection of input cards is offered to support a complete range of digital and analog AV signal types including HDMI, DVI, DisplayPort Multimode<sup>[1]</sup>, SDI, RGB/VGA and analog video, SPDIF and analog audio, HDBaseT, H.264 streaming, and all types of DigitalMedia. Available outputs include all types of DigitalMedia, as well as HDBaseT, HDMI, analog audio, and H.264 streaming.<sup>[1]</sup>

## Output Expansion

An HDMI "pass-through" output is provided on every input card to allow the inputs of up to 5 DM switchers to be daisy-chained, enabling the configuration of very large distribution systems with many outputs. Using five DM-MD8X8 switchers, it is possible to support up to 40 separate outputs.

## QuickSwitch HD®

Handling high-definition digital media means handling HDCP (High-bandwidth Digital Content Protection), the encryption scheme that content providers use to protect their DVDs, Blu-ray™ discs, and broadcast signals against unauthorized copying. Viewing HDCP encrypted content requires a source device to "authenticate" each display and signal processor in the system and issue it a "key" before the content can be viewed. Ordinarily this causes a complete loss of signal for up to 15 seconds each time a new source or display is selected anywhere in the system. To make matters worse, every source device has a limited number of keys available, so connect too many displays and the source will simply stop outputting a signal without warning.

Not to worry — Crestron QuickSwitch HD manages the keys for every HDCP-compliant device in the system, maintaining continuous authentication for each device to ensure fast, reliable routing of any source to any number of display devices.

## Auto-Locking™ Technology

Crestron Auto-Locking Technology enables super fast signal switching by instantaneously configuring every device in the signal path as soon as the signal hits the first device. Whether switching between sources or TV channels, Auto-Locking significantly reduces the time it takes each device to sense the new signal and configure itself to handle the changes, virtually eliminating any noticeable gap while switching.

## EDID Format Management

With all of today's varied AV sources comes a multitude of confusing video and audio formats to keep track of, and chances are not every device in your system supports all of the same formats. Such conflicts can wreak havoc any time you route one source to more than one display or audio component. The media source feeding your 1080p or Ultra HD projector in the theater may restrict itself to a lower resolution, or even shut off completely, if someone decides to view the same signal on a smaller TV in another room. And, instead of enjoying your theater's incredible 7.1 surround sound, you may find yourself limited to 5.1 or even plain old stereo.

DigitalMedia eliminates such conflicts by managing the EDID (Extended Display Identification Data) that modern digital devices use to communicate their capabilities. Via Crestron Toolbox software, the format and resolution capabilities of each device can be assessed, allowing the installer to configure EDID signals appropriately for the most desirable and predictable behavior.

## A Scaler for Every Display

High-performance scaling capability can be added to any DM system using select DM receivers with built in HD and 4K scalers. By placing an independent scaler at every display device, DigitalMedia truly delivers the most flexible and user-friendly solution for routing multiple disparate sources to many different display devices. This "Distributed Scaler Approach" ensures an optimal image on every screen no matter what sources are selected. Distributed scaling allows a high-res computer source to be viewed on any display in the building. It also allows an HD, Ultra HD, or 3D video source to be viewed simultaneously on the 4K display in your theater and on lower-resolution 2D displays throughout the house.

## Versatile Audio Routing

HDMI is the key to handling all the latest 7.1 surround sound formats like Dolby TrueHD and DTS-HD Master Audio. Great for your high-end home theater, but how do you share that same source with other audio zones in the house?

DigitalMedia provides the answer, allowing for the simultaneous distribution of multichannel surround sound and two-channel stereo signals from the same HDMI source. Using a choice of "DSP" type input cards, the DM-MD8X8 employs onboard digital processing to derive a stereo downmix from the original multichannel signal. Both signals can be routed separately or simultaneously from any of the switcher's DM outputs, allowing either signal to be selected for output at each DM receiver location.

Back at the switcher, the digital stereo signal is also converted to analog to enable sharing with every other room in the house via a [Sonnex®](#) Multiroom Audio System or any other audio distribution system. The DM-MD8X8 also allows surround sound processors and amplifiers to be

# DM-MD8X8 8x8 DigitalMedia™ Switcher

located centrally instead of at the display location via optional local HDMI outputs.

## Built-in Ethernet Switch

In addition to transporting digital video and audio, DigitalMedia can also extend 10/100 Ethernet out to each display and source device via select DM receivers and transmitters, providing high-speed connectivity for any room device that requires a LAN connection. Ethernet is also utilized internally by the Crestron control bus to manage all of the DM devices in the system and provide display control in each room.

## Private Network Mode

To streamline its implementation on a corporate or university LAN, the DM-MD8X8 employs Private Network Mode to provide a single-point connection for the complete system. Using Private Network Mode, the DM-MD8X8 requires just one IP address for the complete DM network including all connected DM receivers and transmitters.

## USB Signal Routing

Along with video, audio, and Ethernet, DigitalMedia also provides for the routing of USB HID (Human Interface Device) signals, allowing a USB HID compliant keyboard and/or mouse at one location to control a computer or media server at another location. USB HID connectivity is provided through select DM receivers, transmitters, and input cards.

Crestron also offers USB extenders to enable the routing of virtually any type of USB peripheral to any host device, all managed through the DigitalMedia system. Connect a USB over Ethernet Extender host module ([USB-EXT-DM-LOCAL](#)<sup>[12]</sup>) to each computer, media server, game system, annotator, and any other host that you want to control or communicate with. Then, install a device module ([USB-EXT-DM-REMOTE](#)<sup>[12]</sup>) at every display location to connect keyboards, mice, game controllers, whitboards, flash drives, Web cameras, and mobile devices. Every module communicates with the DM switcher over the local Ethernet network or via a direct connection to the LAN port of a DM transmitter or receiver.

## CEC Embedded Device Control

The primary objective of every Crestron system is to enable precisely the control desired for a seamless user experience. DigitalMedia provides an alternative to conventional IR and RS-232 device control by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Through its connection to the control system, the DM-MD8X8 provides a gateway for controlling many devices right through their HDMI or HDBaseT connections, potentially eliminating the need for any dedicated control wires or IR emitters.<sup>[13]</sup>

## Easy Setup

Via the front panel or using Crestron Toolbox software, every step of the DM-MD8X8's setup process is designed to be quick and easy, configuring inputs and outputs automatically while letting the installer make intelligent design decisions along the way. The switcher even tests and measures the length of each DM cable, automatically making the appropriate calibrations for optimal signal transmission to every room. With DigitalMedia, an entire 8x8 system can be commissioned in under an hour.

To configure a DM switcher complete with input and output cards, cables, and other peripherals, please use the [DigitalMedia Switcher Configuration Tool](#).

Are you upgrading an existing DM switcher that has older "multi-gang" DMCO-series output cards? Use the online [Output Card Additions and Upgrades Tool](#) to update your existing output cards and switcher to the new "single-gang" output card format.

Please refer to the [DigitalMedia Resources Webpage](#) at <http://www.crestron.com/dmresources/> for additional design tools and reference documents.

## SPECIFICATIONS

### Maximum DM 8G® Cable Lengths

Cable Type:	DM-CBL-ULTRA DM® Ultra Cable	DM-CBL-8G DM 8G® Cable	3rd-Party CAT5e (or better) UTP or STP
Resolution:			
1080p60 Full HD	330 ft (100 m) via any DM 8G+ cards		
1920x1200 WUXGA			
1600x1200 UXGA			
2048x1080 2K DCI @24Hz			
2048x1080 2K DCI @60Hz	330 ft (100 m) via "4K" DM 8G+ cards	230 ft (70 m) via "4K" DM 8G+ cards	165 ft (50 m) via "4K" DM 8G+ cards
2560x1440 WQHD			
2560x1600 WQXGA			
3840x2160 Ultra HD			
4096x2160 4K DCI			

Cable Type:	CRESFIBER8G CresFiber® 8G Multimode Fiber	3rd-Party OM3 Multimode Fiber
Resolution:		
1080p60 Full HD	1000 ft (300 m) via DM 8G Fiber cards	
1920x1200 WUXGA		
1600x1200 UXGA		
2048x1080 2K DCI @24Hz		
2048x1080 2K DCI @24Hz		500 ft (150 m) via DM 8G Fiber cards

Cable Type:	CRESFIBER8G-SM CresFiber 8G Single-Mode Fiber	3rd-Party G.652.D (or better) Single-Mode Fiber
Resolution:		
1080p60 Full HD	7.5 miles (12 km) via DM 8G SM Fiber cards	
1920x1200 WUXGA		
1600x1200 UXGA		
2048x1080 2K DCI @24Hz		



# DM-MD8X8 8x8 DigitalMedia™ Switcher

## Video

---

**Switcher:** 8x8 digital matrix, modular input/output cards, Crestron QuickSwitch HD®

**Input Signal Types:** Configurable via modular plug-in cards supporting HDMI®, DisplayPort Multimode<sup>[11]</sup>, DVI, HDBaseT®, 3G-SDI, RGB/VGA, component, S-Video, composite (NTSC & PAL), DM® CAT, DM Fiber, DM 8G+®, DM 8G Fiber, DM 8G SM Fiber, & H.264 streaming

**Output Signal Types:** Configurable via modular plug-in cards supporting DM CAT, DM Fiber, DM 8G+, DM 8G Fiber, DM 8G SM Fiber, HDBaseT, HDMI, DVI<sup>[14]</sup>, & H.264 streaming (All input cards also include HDMI pass-through outputs)

**Backplane Data Rate:** 12.5 Gbps

*Note: For additional specifications, please refer to the spec sheet for each input and output card.*

## Audio

---

**Switcher:** 8x8 digital multichannel audio-follow-video matrix switching, plus independent 8x8 stereo matrix for audio breakaway

**Input Signal Types:** Configurable via modular plug-in cards supporting HDMI, DisplayPort Multimode<sup>[11]</sup>, HDBaseT, 3G-SDI, analog (stereo 2-channel), SPDIF, DM CAT, DM Fiber, DM 8G+, DM 8G Fiber, DM 8G SM Fiber, & H.264 streaming

**Output Signal Types:** Configurable via modular plug-in cards supporting DM CAT, DM Fiber, DM 8G+, DM 8G Fiber, DM 8G SM Fiber, HDBaseT, HDMI, analog (stereo 2-channel), & H.264 streaming; (All input cards also include HDMI pass-through outputs, and most digital audio input cards also include analog stereo pass-through audio outputs)

*Note: For additional specifications, please refer to the spec sheet for each input and output card.*

## Communications

---

**Ethernet:** 10/100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, Private Network Mode

**USB:** USB signal routing via select input cards, transmitters, receivers, and extenders<sup>[15]</sup>; USB computer console port for setup

**DigitalMedia:** DM 8G+, DM 8G Fiber, DM 8G SM Fiber, DM Fiber, DM CAT, DMNet®, HDCP 2.2<sup>[3]</sup>, EDID, CEC, PoDM, PoDM+, Ethernet

**HDBaseT:** HDCP 2.2<sup>[3]</sup>, EDID, CEC, PoH, Ethernet

**HDMI:** HDCP 2.2<sup>[3]</sup>, EDID, CEC

*NOTE: Supports management of HDCP and EDID; supports management of CEC between connected HDMI and HDBaseT devices and a control system<sup>[13]</sup>. For additional specifications, please refer to the spec sheet for each input and output card.*

## Card Slots

---

**1 – 8:** (8) DM switcher input card slots;  
Each slot accepts (1) DMC-series input card

**DM OUTPUTS:** (4) DM switcher output card slots;  
Each slot accepts (1) DMC-series output card

## Connectors

---

**LAN:** (1) 8-wire RJ45 female;  
10Base-T/100Base-TX/1000Base-T Ethernet port

**24ABG / EIG 1 – 4 (SLOT 1 – 2):** (8) sets of (1) 4-pin and (1) 3-pin 3.5mm detachable terminal blocks;

Comprises (8) DMNet ports with “EIG” power selection ports, each set associated with a corresponding DM CAT output port on the output card in either output slot;

Each DMNet port provides power and communications for a DM CAT device connected via DM cable;

Each EIG port connects to an external power supply<sup>[16]</sup>, or to the internal power source via a jumper, to power the DM CAT device connected to the corresponding DMNet port;

Maximum Load: 75 Watts (3.13 Amps @ 24 Volts DC) per port when connected to external power supply<sup>[16]</sup>, otherwise limited to available DMNet power (see “Power Requirements” below)

**100-240V~300W 50/60Hz:** (1) IEC 60320 C14 main power inlet;  
Mates with removable power cord, included

**G:** (1) 6-32 screw, chassis ground lug

**COMPUTER (front):** (1) USB Type B female;  
USB computer console port (6 ft cable included)

## LCD Display

---

Green LCD dot matrix, 128 x 64 resolution, adjustable LED backlight; Displays inputs/outputs by name, video & audio signal information, Ethernet configuration and setup menus

## Controls & Indicators

---

**SOFTKEYS:** (4) pushbuttons for activation of LCD driven functions

**HW-R:** (1) recessed miniature pushbutton for hardware reset, reboots the switcher

**ROUTE:** (1) pushbutton and red LED, selects ROUTE mode to allow routing changes

**VIEW:** (1) pushbutton and red LED, selects VIEW mode for viewing current routes

**INFO:** (1) pushbutton and red LED, selects INFO mode for viewing AV and device info

**MENU:** (1) pushbutton, steps menu back one level

**ENTER:** (1) pushbutton, executes highlighted menu or value

**AUDIO:** (1) pushbutton & red LED, selects audio routing view

**VIDEO:** (1) pushbutton & red LED, selects video routing view

**USB:** (1) pushbutton & red LED, selects USB routing view

**Quick-Adjust Knob:** (1) continuous turn rotary encoder, adjusts menu parameters

**IN 1 – 8:** (8) pushbuttons and red LEDs, select input for routing

**OUT 1 – 8:** (8) pushbuttons and red LEDs, select output for routing

**LAN (rear):** (2) LEDs, green LED indicates Ethernet link status, amber LED indicates Ethernet activity

# DM-MD8X8 8x8 DigitalMedia™ Switcher

## Power Requirements

---

**Main Power:** 300 Watts @ 100-240 Volts AC, 50/60 Hz

**Available DMNet Power:** 55 Watts (2.3 Amps @ 24 Volts DC) from internal power supply

**Available PoDM/PoH Power:** Refer to the specifications for each DM 8G+ input and output card

## Environmental

---

**Temperature:** 32° to 104°F (0° to 40°C)

**Humidity:** 10% to 90% RH (non-condensing)

**Heat Dissipation:** 750 BTU/Hr

**Ambient Noise:** 31.5 to 37 dBA typical;  
30 to 30.5 dBA idle

## Enclosure

---

**Chassis:** Metal with black finish, vented sides, fan-cooled

**Front Panel:** Metal, black finish with polycarbonate label overlay

**Mounting:** Freestanding or 4U 19-inch rack-mountable (adhesive feet and rack ears included)

## Dimensions

---

**Height:** 6.97 in (177 mm) without feet

**Width:** 17.28 in (439 mm), 19.00 in (483 mm) with ears

**Depth:** 18.13 in (461 mm) without cards

## Weight

---

20.0 lb (9.1 kg) without cards

## MODELS & ACCESSORIES

### Available Models

---

**DM-MD8X8:** 8x8 DigitalMedia™ Switcher

### Available Accessories

---

**DMC Series:** Input & Output Cards

**DM-PSU-8:** 8-Port PoDM Power Supply

**DM-PSU-16:** 16-Port PoDM Power Supply

**DM-CBL-ULTRA-NP:** DigitalMedia™ Ultra Cable, Non-Plenum Type CMR

**DM-CBL-ULTRA-P:** DigitalMedia™ Ultra Cable, Plenum Type CMP

**DM-CBL-ULTRA-LSZH:** DigitalMedia™ Ultra Cable, Low Smoke Zero Halogen

**DM-CONN:** Connector for DM-CBL & DM-CBL-ULTRA

**DM-CBL-8G-NP:** DigitalMedia 8G™ Cable, non-plenum

**DM-CBL-8G-P:** DigitalMedia 8G™ Cable, plenum

**DM-8G-CONN:** Connector for DM-CBL-8G

**DM-8G-CRIMP:** Crimping Tool for DM-8G-CONN

**DM-8G-CONN-WG:** Connector with Wire Guide for DM-CBL-8G

**DM-8G-CRIMP-WG:** Crimping Tool for DM-8G-CONN-WG

**DM-CBL-NP:** DigitalMedia™ Cable, non-plenum

**DM-CBL-P:** DigitalMedia™ Cable, plenum-rated

**DM-CBL-D-NP:** DigitalMedia™ D Cable, non-plenum

**DM-CBL-D-P:** DigitalMedia™ D Cable, plenum

**DM-DR:** DigitalMedia™ CAT Repeater

**CRESFIBER8G-NP:** CresFiber® 8G Multimode Fiber Optic Cable, 50/125 x4 breakout, non-plenum

**CRESFIBER8G-P:** CresFiber® 8G Multimode Fiber Optic Cable, 50/125 x4 breakout, plenum

**CRESFIBER-CONN-SC50UM-12:** Connectors for CresFiber® 8G Multimode Fiber Optic Cable, SC 50µm, 12-Pack

**CRESFIBER8G-SM-P:** CresFiber® 8G Single-Mode Fiber Optic Cable, plenum

**CRESFIBER8G-SM-CONN-LC-12:** Connectors for CresFiber® 8G Single-Mode Fiber Optic Cable, LC, 12-Pack

**CRESFIBER-TK:** CresFiber® Termination Kit

**CRESFIBER-SINGLE-SC-P:** CresFiber® Simplex Fiber Optic Cable Assemblies, 50/125, SC, Plenum

**USB-EXT-DM:** USB over Ethernet Extender with Routing

# DM-MD8X8 8x8 DigitalMedia™ Switcher

## Notes:

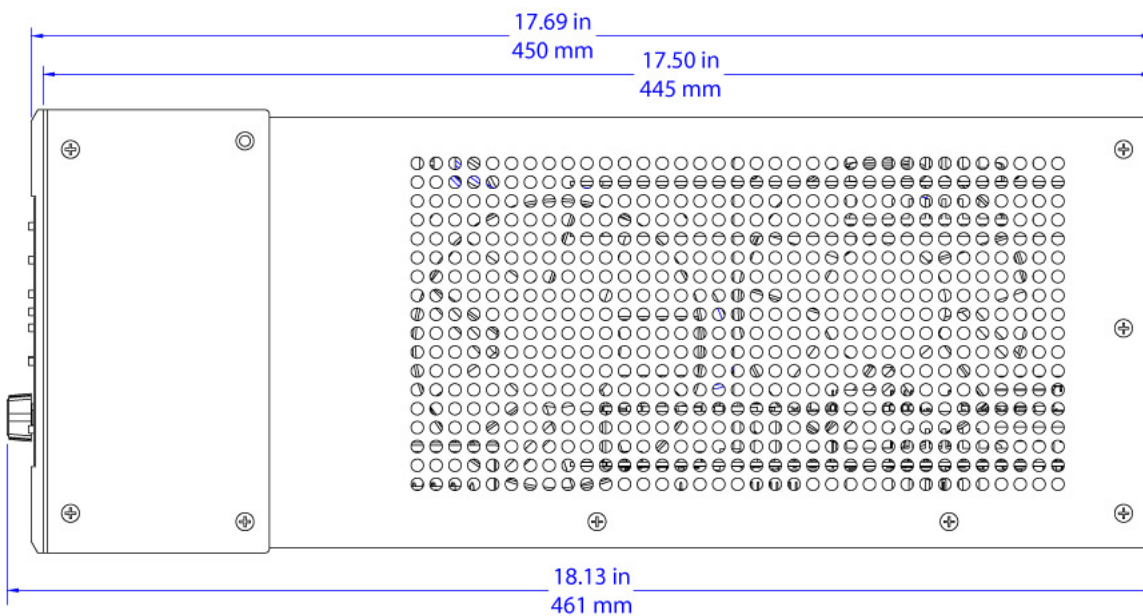
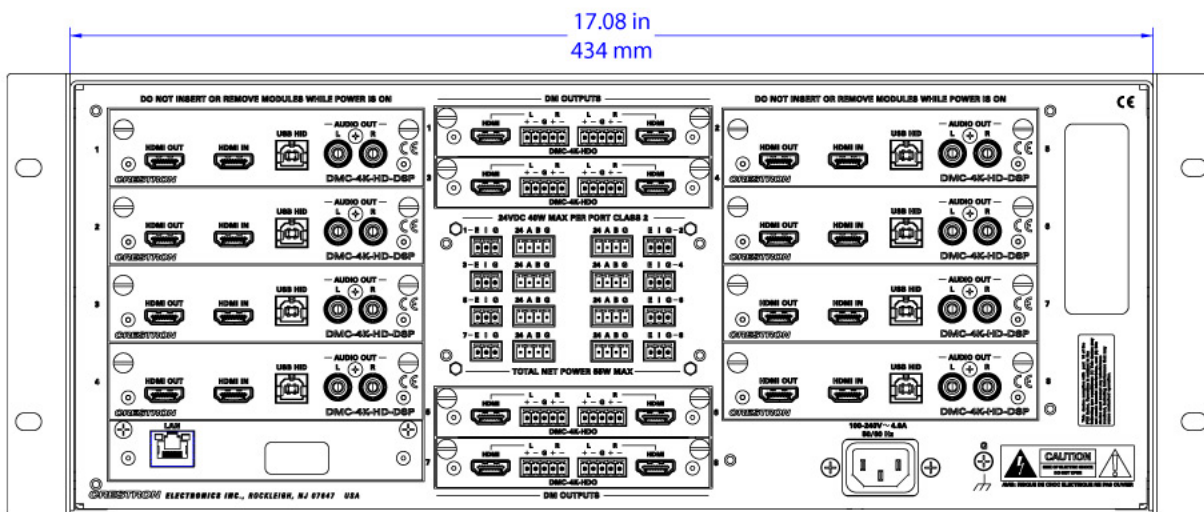
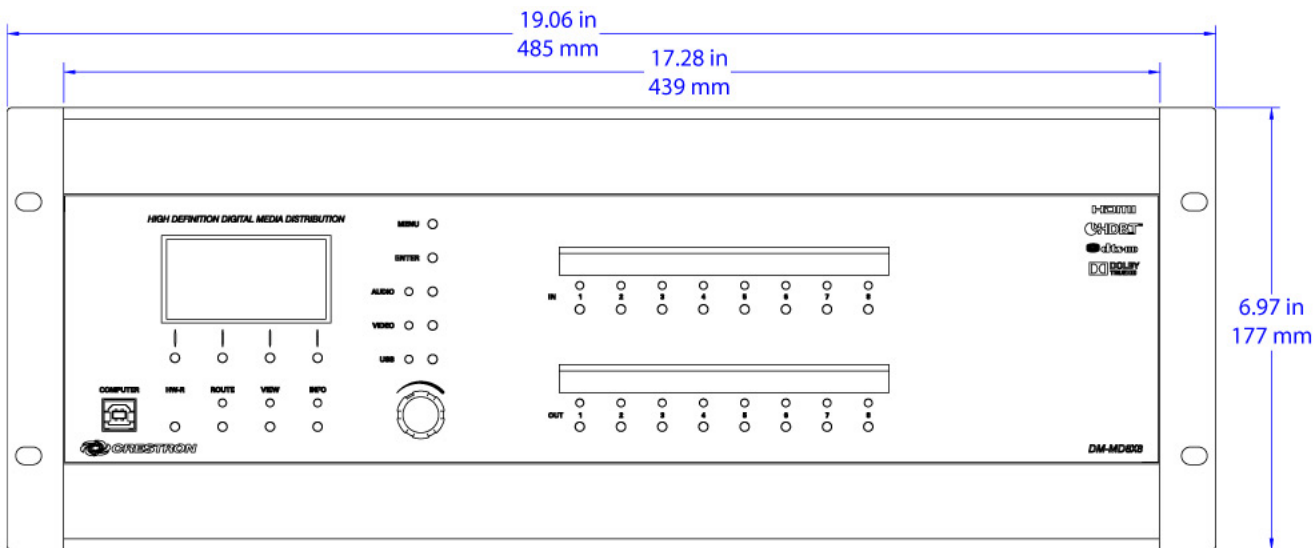
1. All output types are configured in pairs except for streaming (a single streaming output occupies the space of two outputs of any other type). To configure a complete DM switcher with output and input cards, please use the online [DigitalMedia Switcher Configuration Tool](#). Current DM switchers use DMC-series “single-gang” output cards. For older DM switchers with DMCO-series “multi-gang” output cards, please use the online [Output Card Additions and Upgrades Tool](#) to update your existing output cards and switcher to the new single-gang output card format.
2. Crestron control via the DM network requires a Crestron control system, sold separately.
3. 4K, Ultra HD, and HDCP 2.2 are currently supported over HDMI, DM 8G+, and HDBaseT using select input and output cards. Refer to the specifications for each card for its full capabilities.
4. The maximum cable length for DigitalMedia 8G+ (DM 8G+) or HDBaseT is dependent upon the type of cable, the choice of input/output card, and the resolution of the video signal. Refer to the “Maximum DM 8G Cable Lengths” table for a detailed overview. Crestron legacy cable models [DM-CBL](#) DigitalMedia Cable and [DM-CBL-D](#) DigitalMedia D Cable support the same resolutions and cable lengths as CAT5e. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. DM 8G+ is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment.
5. The maximum cable length for DigitalMedia 8G Fiber (DM 8G Fiber) is 1000 ft (300 m) using [CRESFIBER8G](#) multimode fiber optic cable, or 500 ft (150 m) using [CRESFIBER](#) (legacy), [CRESFIBER-SINGLE-SC](#), or third-party OM3 simplex multimode fiber optic cable.
6. The maximum cable length for DigitalMedia 8G Single-Mode Fiber (DM 8G SM Fiber) is 7.5 miles (12 km) using [CRESFIBER8G-SM](#) or third-party G.652.D (or better) single-mode fiber optic cable.
7. The maximum cable length for DigitalMedia CAT (DM CAT) is 450 ft (137 m) using [DM-CBL](#) DigitalMedia Cable. Actual cable length depends upon multiple factors. Up to two DM Repeaters (Model [DM-DR](#)) may be required.
8. The maximum cable length for DigitalMedia Fiber (DM Fiber) is 1000 ft (300 m) using [CRESFIBER](#) (legacy), [CRESFIBER8G](#), or third-party OM2/OM3 duplex multimode fiber optic cable.
9. Refer to the [Crestron DigitalMedia Design Guide, Doc. #4546](#) for complete system design guidelines. All wire and cables are sold separately.
10. Streaming output supports 2-channel stereo audio only. Multichannel surround sound audio sources cannot be streamed unless downmixed to stereo. Stereo downmix capability requires a “DSP” type DM switcher input card, sold separately.
11. DisplayPort Multimode connectivity is supported via an HDMI or DVI input port using a suitable adapter or interface cable.
12. Item(s) sold separately.
13. Control of third-party HDBaseT devices using CEC is only supported via “4K” DM 8G+ input and output cards.
14. DVI output is supported via an HDMI output port using a suitable adapter or interface cable. [CBL-HD-DVI](#) interface cables are available separately.
15. Manages the routing of USB HID signals between peripheral DM devices and input cards that are equipped with USB HID ports. Also programmable to manage the routing of USB signals between Crestron USB over Ethernet Extender modules ([USB-EXT-DM](#), sold separately). Refer to the USB-EXT-DM spec sheet for more information.
16. For external DMNet power, use a Crestron [CNPWS-75](#), [C2N-SPWS300](#), or other Cresnet power supply as required. Do not interconnect DMNet with Cresnet.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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

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# DM-MD8X8 8x8 DigitalMedia™ Switcher





# HD-MD4X1-4K-E

## 4x1 4K HDMI® Switcher

- > 4x1 ultra high-definition 4K/60 digital AV switcher
- > For standalone use, or as part of a fully integrated Crestron® system
- > Fully operable using onboard controls, a Web browser, or a Crestron control system
- > Simplified setup through the front panel OLED display or Web browser
- > Four HDMI® inputs and one HDMI output
- > DVI and DisplayPort Multimode compatible<sup>[2]</sup>
- > Auto-switching mode for hands-off operation
- > QuickSwitch HD® technology manages HDCP keys for fast, reliable switching
- > Comprehensive built-in EDID configuration tools
- > Enables display device control via CEC<sup>[1]</sup>
- > Handles Dolby® TrueHD, DTS-HD®, and uncompressed 7.1 linear PCM audio
- > High-speed Ethernet LAN connection
- > Compact, low-profile surface mount design
- > Universal 100-240V external power pack included



The Crestron® HD-MD4X1-4K-E is a simple to use, ultra high-definition signal switcher with four HDMI® inputs and one HDMI output. It handles Full HD 1080p, Ultra HD, 2K, and 4K video signals with support for HDCP, 3D, Deep Color, and high-bitrate 7.1 audio. Auto-switching mode allows for completely automatic operation, while manual operation is enabled using the onboard controls, a Web browser, or a Crestron control system. Simplified setup is facilitated through the front panel OLED display or a Web browser.

### 4K Ultra HD

Support for 4K video is essential to ensuring support for the latest generation of UHD and 4K DCI displays and sources, as well as computers and monitors with native resolutions beyond 1080p and WUXGA.

### QuickSwitch HD® Technology

Handling digital media signals means handling HDCP (High-bandwidth Digital Content Protection), the encryption scheme used by content providers to protect their DVDs, Blu-ray™ discs, and broadcast signals against unauthorized copying. Viewing HDCP encrypted content requires a source device to “authenticate” each display and signal processor in the system and issue it a “key” before delivering an output signal. Crestron QuickSwitch HD manages these keys to ensure fast, reliable switching and immunity to “blackouts.”

### EDID Format Management

To ensure that every source gets displayed at its optimal resolution and format, the HD-MD4X1-4K-E provides comprehensive management of the EDID (Extended Display Identification Data) information that passes between the display and source devices. Most applications require no changes to the default settings. For applications requiring custom configuration, the HD-MD4X1-4K-E allows for easy assessment of each

device's format and resolution capabilities, with the ability to configure signals appropriately for the most desirable and predictable behavior.

### CEC Embedded Device Control

For controlling the connected display device, the HD-MD4X1-4K-E offers an alternative to conventional IR and RS-232 control by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Using CEC, many display devices can be controlled right through their HDMI connection, eliminating the need for any dedicated serial cables or IR emitters.<sup>[1]</sup>

### Low-Profile Installation

The HD-MD4X1-4K-E mounts conveniently to a wall or other flat surface. At just over one inch deep, it can fit easily behind a flat panel display or under a table. It can also be placed on a rack shelf, or attached to a single rack rail.

## SPECIFICATIONS

### Features

4x1 digital AV switcher, auto-switching, QuickSwitch HD® technology, local or Web browser setup and control, Crestron® controllable

### Video

**Input Signal Types:** HDMI® w/Deep Color, 3D, & 4K (DVI & DisplayPort Multimode compatible<sup>[2]</sup>)

**Output Signal Types:** HDMI w/Deep Color, 3D, & 4K (DVI compatible<sup>[2]</sup>)

# HD-MD4X1-4K-E 4x1 4K HDMI® Switcher

## Maximum Resolutions:

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 4K DCI & 3840x2160 Ultra HD	24 Hz	4:4:4	30 bit
		30 Hz	4:4:4	24 bit
		30 Hz	4:2:2	36 bit
		60 Hz	4:2:0	24 bit
	2560x1600 WQXGA	60 Hz	4:4:4	36 bit
1920x1080 HD1080p	60 Hz	4:4:4	36 bit	
Interlaced	1920x1080 HD1080i	30 Hz	4:4:4	36 bit

NOTE: Common resolutions are shown; other custom resolutions are supported at pixel clock rates up to 300 MHz

## Audio

**Input Signal Types:** HDMI (DisplayPort Multimode compatible<sup>[2]</sup>)

**Output Signal Types:** HDMI

**Formats:** Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby® TrueHD, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio™, LPCM up to 8 channels<sup>[6]</sup>

## Communications

**Ethernet:** 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, Web browser setup and control, Crestron control system integration

**USB:** For factory use only

**HDMI (Inputs):** HDCP, EDID

**HDMI (Output):** HDCP, EDID, CEC

NOTE: Supports management of EDID; supports management of CEC between the device connected to the HDMI output and a control system

## Connectors

**INPUT 1 – 4:** (4) 19-pin Type A HDMI female; HDMI digital video/audio inputs; Also supports DVI and DisplayPort Multimode<sup>[2]</sup>

**OUTPUT:** (1) 19-pin Type A HDMI female; HDMI digital video/audio output; Also supports DVI<sup>[2]</sup>

**LAN:** (1) 8-wire RJ45 female; 10Base-T/100Base-TX Ethernet port

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

**SERVICE:** (1) USB Type A female; for factory use only

## Display

**Display Type:** 2x20 character alphanumeric OLED

**Functions:** Displays setup and configuration menus, signal information, customizable input names



HD-MD4X1-4K-E – Top, Front, and Bottom Views

## Controls & Indicators

**MENU:** (1) pushbutton, opens the setup menu

**▲, ▼, ◀, ▶:** (4) pushbuttons, for menu navigation and parameter adjustment

**Enter:** (1) pushbutton, applies a change

**BACK:** (1) pushbutton, steps menu back one level

**EXIT:** (1) pushbutton, exits the menu

**PWR:** (1) bicolor green/amber LED, indicates operating power supplied from power pack, turns amber while booting and green when operating

**AUTO:** (1) pushbutton and green LED, selects auto-switching mode

**INPUT 1 – 4:** (4) pushbuttons for manual input selection, and (4) bicolor green/amber LEDs to indicate the current active input and signal presence at each corresponding input

**LAN:** (2) LEDs, amber LED indicates Ethernet activity, green LED indicates Ethernet link status

## Power Requirements

**Power Pack:** 0.75 Amps @ 24 Volts DC;

100-240 Volts AC, 50/60 Hz power pack, model PW-2407WU included

## Environmental

**Temperature:** 32° to 104°F (0° to 40°C)

**Humidity:** 10% to 90% RH (non-condensing)

## Enclosure

**Chassis:** Metal, black finish, with (2) integral mounting flanges

**Mounting:** Freestanding, surface mount, or attach to a single rack rail

# HD-MD4X1-4K-E 4x1 4K HDMI® Switcher

## Dimensions

**Height:** 4.08 in (104 mm)  
**Width:** 8.68 in (221 mm)  
**Depth:** 1.08 in (28 mm)

## Weight

1.35 lb (0.62 kg)

## MODELS & ACCESSORIES

### Available Models

**HD-MD4X1-4K-E:** 4x1 4K HDMI® Switcher

### Included Accessories

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

### Available Accessories

**CBL Series:** Crestron® Certified Interface Cables

**MP-WP Series:** Media Presentation Wall Plates

**MPI-WP Series:** Media Presentation Wall Plates - International Version

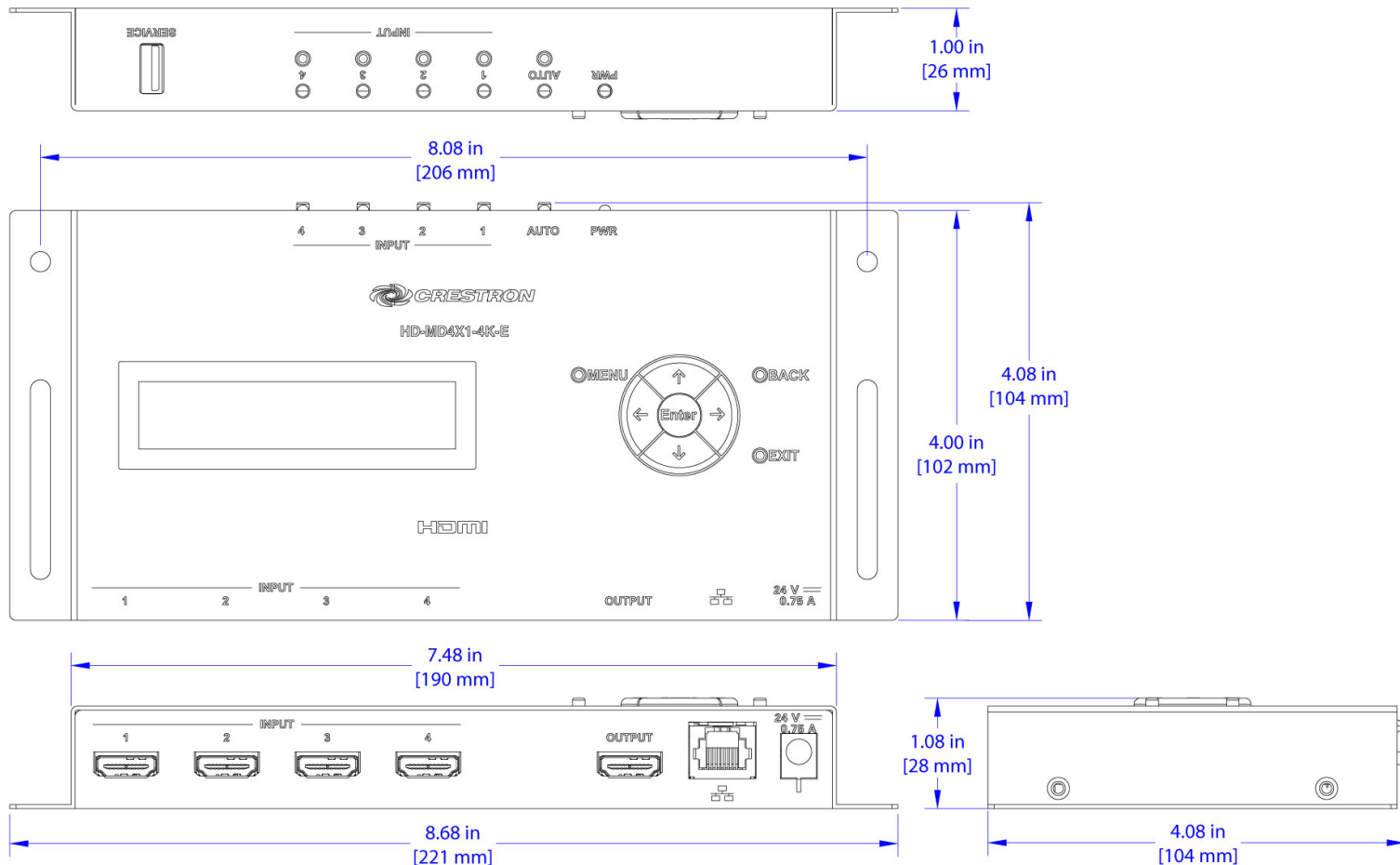
## Notes:

1. Requires a Crestron control system and custom programming.
2. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. [CBL-HD-DVI](#) interface cables are available separately.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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# DBT-1713UD

Universal Audio/Video Player

# DENON

  
**PROFESSIONAL**

## Denon 3D Universal disc player with versatile media and streaming service supports

Denon's 3D 'Universal' disc playback technology provides playback of virtually all popular disc formats, including high definition Blu-ray discs, as well as DVD-Audio and Super Audio CD high resolution stereo and multi-channel music format discs, along with DVD-Video and music CD playback. The DBT-1713UD also supports playback of your locally stored music, photo and video content via network (DLNA 1.5) and USB, as well as versatile online video streaming services such as Netflix, Youtube, Hulu Plus, and VUDU, all with Denon superb audio and video technology.



### Features

#### New Features

- Design Matching to the new Denon A/V Receivers
- Wide variety of video streaming, movies, videos, TV shows (YouTube, Netflix, VUDU, Hulu Plus)



- Quick response for disc loading and playback (20% faster than current model)
- Quick Start mode, enables fast access to play
- New servo circuit, to reduce moving noise of pickup mechanism
- HDMI cable included (HIGH SPEED HDMI™ CABLE)

\*Netflix is available in certain countries. Unlimited membership required. More information at [www.netflix.com](http://www.netflix.com).

#### Denon Technologies for superior sound and picture quality

- Universal Disc Playability (Blu-ray, DVD-Audio, DVD-Video, Super Audio CD, CD)
- DLNA 1.5 Support and front USB port for music, photo, video contents playback
- 1080p/24 video output, to bring out the full quality of film
- HDMI source direct mode to output native resolution of the disc
- Picture adjustments
- Playing high-quality audio, using by pure direct function

#### Build Quality

- Fully Shielded Mechanism, suppress internal and external vibrations and electromagnetic noises for high precision disc playability at all times
- Separated 4-block construction for faithful playback of audio and video signals (Disc mechanism, Video/Audio, Power supply, and Indicator block)
- Fan-less construction for noise reduction
- Solid cabinet and large foot

#### Ease of Use

- Easy-to-use Multi language GUI and CD-ROM interactive manual
- User-friendly GUI
- Easy-to-use remote control handset
  - Glow-key for cursor keys and operation keys
  - Direct access for online video services
  - Remote Control also controls Denon AV receiver for convenience
- New "Denon Remote App" control via 2012 new Denon networking A/V Receivers\*1)

#### Others

- One stereo channel (2ch) output for Multi-zone
- Eco Stand-by mode, lower power consumption (0.3W)
- Detachable AC cord

\*1) The DBT-1713UD has remote control functionality by using the new "Denon Remote App" together with Denon new A/V Receiver such as AVR-1713.



Design Matching to the new Denon A/V Receivers



Fully Shielded Mechanism



Easy-to-use remote control handset

### Versatile Disc Formats Playability

- BD-Video
- BD-R
- BD-RE
- DVD-Video
- DVD-Audio
- DVD+R, DVD+RW  
(Video mode, AVCHD format)
- DVD-R, DVD-RW  
(Video mode, AVCHD format)
- Super Audio CD
- Audio CD
- CD-R, CD-RW

### Playable files

Playable files	Playable media		
	BD-R/-RE DVD-R/-RW/+R/+RW/ CD-R/-RW	USB memory device	Network
MP3 (.mp3)	•	•	•
WMA (.wma)	•	•	•
AAC (.m4a)	•	•	•
LPCM (.wav)	•*1	•	•
FLAC (.flac)	•*1	•	•
JPEG (.jpg/.jpeg)	•	•	•
PNG (.png)	•	•	•
DivX® (.avi/.divx/.mkv)	•*1	•	•
MPEG (.mpeg/.mpeg/.mp4/.ts/.m2t)	•*1	•	•
WMV (.wmv)	•*1	•	•
AVI (.avi)	•*1	•	•

\* Depending on recording conditions (Bit-rate), these files may not be playable.

\*1) Except CD-R/-RW.

### Main Specifications

<b>Video</b>	
Signal format	NTSC, PAL
<b>Audio output characteristics</b>	
S/N	115 dB (BD)
Total harmonic distortion	1 kHz, 0.0025% (BD)
Dynamic range	100 dB (BD)
<b>General</b>	
Power supply	120V, 60Hz
Power consumption	20 W
	0.3 W (Energy Saving Standby)
	0.5 W (Normal Standby)
	12 W (Quick Start)
Dimensions W x H x D	17 3/32" x 4 1/4" x 11 39/64"
	434 x 108 x 295 mm
Weight	10 lbs 13 oz, 4.9 kg

### Ports

<b>Video</b>	HDMI output	1
<b>Audio</b>	Analog output (2ch, L/R)	1
<b>Control</b>	Ethernet	1
	USB port	1
	Remote control (IN/OUT)	1 / 1

\*Design and specifications are subject to change without notice.

\*The "BD-LIVE" logo is trademark of Blu-ray Disc Association

\*\*"AVCHD" and the "AVCHD" logo are trademark of Panasonic Corporation and Sony Corporation.

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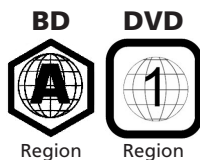
\*DLNA CERTIFIED™ Audio/Video/Image Player

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\*VUDU™ is a trademarks of VUDU, Inc.

\*HULU and HULU.COM are trademarks and service marks of Hulu, LLC

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High Speed HDMI™ Cable Included



D&M Professional, Americas

1100 Maplewood Drive, Itasca, Illinois 60143 USA  
TEL: 630-741-0330  
www.d-mpro.com

D&M Holdings Inc.

D&M Building, 2-1 Nisshin-cho, Kawasaki-ku, Kawasaki-shi,  
Kanagawa, 210-8569, Japan  
www.denon.com

20100511A

# NEC AccuSync™ Series

## 17"-24" LCD monitors ideal for value-conscious users

### High-quality LCD monitors don't necessarily have to be associated with high-end price tags.

NEC AccuSync Series monitors have set a new standard in value for the flat-panel monitor category, offering you a perfect opportunity to take advantage of the many benefits offered by the latest display technology without having to break your budget. The 17" NEC AccuSync **AS172**, 19" **AS193i** and widescreen 20" **AS203WMi**, 22" **AS222WM** and 24" **AS242W** deliver eco-friendly, value-driven and cost-conscious display solutions to small-to-medium-sized businesses and home office users. The widescreen models increase productivity by expanding your working area to simultaneously view multiple application windows.

### It's easy to be green.

The AccuSync Series is loaded with features that promote environmental consciousness. Eco-friendly benefits include ECO Mode™ and an off timer for further energy savings, a resettable carbon footprint meter for tracking the conservation of green gas emissions, and a significant reduction in packaging materials. The AccuSync Series sets the bar for "green" technology by using LED backlighting, which is more energy-efficient. Compared to their predecessors, these models consume up to 33% less power overall, weigh up to 20% less, radiate less heat, use less packaging, utilize recycled plastics in their production and are free of hazardous materials such as mercury, lead and arsenic.

### Highlights

- LED backlight technology provides for industry-leading low power consumption and less hazardous materials
- Ambix® dual-input technology allows for digital/analog compatibility
- Tilt adjustable stand helps you reach a more comfortable view
- Integrated multimedia speakers provide an option for business conferencing (AS203WMi & AS222WM)
- IPS LCD for outstanding color and wide-angle viewing (AS193i and AS203WMi)
- Touch integration-enabling design increases application options (AS222WM)
- NaViSet™ software (available via download) offers an expanded and intuitive interface, allowing you to more easily adjust display settings via mouse and keyboard
- ECO Mode (default setting) sets the brightness variable from 0-80%, saving more power and reducing your energy costs
- Carbon footprint meter helps track and calculate the reduction of green gas emissions
- Rapid Response™ technology delivers virtually uninterrupted, undistorted viewing of high-speed, full-motion video
- EPEAT Silver compliance ensures the displays reduce hazardous waste and electricity usage, resulting in lower energy costs and increased protection for the environment
- ENERGY STAR® and TCO qualifications reduce electrical costs and lower total cost of ownership



## Specifications

MODEL	AS172	AS193i	AS203WMI	AS222WM	AS242W
<b>DISPLAY</b>					
Panel Technology	TN	IPS		TN	
Viewable Image Size	17"	19"	20"	21.5"	23.6"
Aspect Ratio	5:4		16:9		
Native Resolution	1280 x 1024		1600 x 900	1920 x 1080	
Pixel Pitch	0.26mm	0.29 mm	0.271mm	0.25mm	0.272mm
Pixels Per Inch	96 @ native resolution	86 @ native resolution	97 @ native resolution	102 @ native resolution	94 @ native resolution
Backlight Type	W-LED				
Brightness (typical)	250 cd/m <sup>2</sup>				
Contrast Ratio (typical)	1000:1				
Viewing Angle (typical)	170° Vert., 170° Hor. (85U/85D/85L/85R) @ CR>5	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR>10		160° Vert., 160° Hor. (80U/80D/80L/80R) @ CR>10	170° Vert., 176° Hor. (85U/85D/88L/88R) @ CR>5
Response Time (typical)	5ms	14ms		5ms	
Displayable Colors	More than 16.7 million				
Synchronization Range					
Horizontal (Analog/Digital)	31.5-81.1 kHz				
Vertical	56-76 Hz				
Input Signal					
Video	Analog RGB 0.7 Vp-p/75 Ohms				
Sync	Separate Sync: TTL Level (Positive/Negative); Composite Sync: TTL Level (Positive/Negative); Composite Sync on Green: (0.3Vp-p negative 0.7Vp-p positive)				
Input Connectors	DVI-D, VGA 15-pin D-sub				
<b>POWER CONSUMPTION</b>					
On (typical)	11W	18W	14W	18W	19W
Power Savings Mode (typical)	0.15W		0.4W	0.35W	0.45W
<b>PHYSICAL SPECIFICATIONS</b>					
Dimensions (WxHxD)					
Net (with stand)	14.7 x 14.7 x 8.1 in. / 373.2 x 373.1 x 205.1mm	16.2 x 15.9 x 8.1 in. / 412.5 x 403.1 x 205.1mm	18.3 x 13.2 x 8.1 in. / 466.0 x 335.1 x 205.1mm	20.0 x 14.4 x 8.1 in. / 507.4 x 364.7 x 205.1mm	22.5 x 15.8 x 8.3 in. / 571.4 x 400.9 x 211.2mm
Net (without stand)	14.7 x 12.2 x 2.7 in. / 373.2 x 310.2 x 69mm	16.2 x 13.4 x 2.7 in. / 412.5 x 341.2 x 69mm	18.3 x 11.0 x 2.1 in. / 466.0 x 278.2 x 53.3mm	20.0 x 11.9 x 2.4 in. / 507.4 x 301.1 x 60.0mm	22.5 x 13.8 x 2 in. / 571.4 x 350.8 x 50.4mm
Weight					
Net (with stand)	7.3 lbs. / 3.3 kg	8.6 lbs. / 3.9 kg	7.5 lbs. / 3.4 kg	9 lbs. / 4.1 kg	8.8 lbs. / 4.0 kg
Net (without stand)	6.4 lbs. / 2.9 kg	7.7 lbs. / 3.5 kg	6.4 lbs. / 2.9 kg	8.2 lbs. / 3.7 kg	7.9 lbs. / 3.6 kg
VESA Hole Configuration	100 x 100mm				
<b>ENVIRONMENTAL CONDITIONS</b>					
Operating Temperature	41-95°F / 5-35°C				
Operating Humidity	20 - 80%				
Operating Altitude	6562 ft. / 2000m				
Storage Temperature	14-140°F / -10-60°C				
Storage Humidity	10-85%				
Storage Altitude	40,000 ft. / 12,192m				
<b>ENVIRONMENTAL COMPLIANCE</b>					
ENERGY STAR	6.0				
TCO	6.0				
EPEAT	Silver				
RoHS	Yes				
<b>LIMITED WARRANTY</b>					
3 years parts and labor, including backlight*					
<b>ADDITIONAL FEATURES</b>					
ECO Mode; Carbon footprint meter; Thin frame; Tilt; Rapid Response; Ambix; XtraView; OSD user controls; NaViSet software; Cable management; VESA mount; HDCP; DDC/CI; No Touch Auto Adjust; Plug and Play (VESA DDC 2B); VESA DPMS power management; AccuColor color control; Digital smoothing; Digital controls; ISO 9241-307 Class I		ECO Mode; Carbon footprint meter; Thin frame; Tilt; Integrated speakers; Rapid Response; Ambix; XtraView; OSD user controls; NaViSet software; Cable management; Touch-integratable (AS222WM); VESA mount; HDCP; DDC/CI; No Touch Auto Adjust; Plug and Play (VESA DDC 2B); VESA DPMS power management; AccuColor color control; Digital smoothing; Digital controls; ISO 9241-307 Class I			ECO Mode; Carbon footprint meter; Thin frame; Tilt; Rapid Response; Ambix; XtraView; NaViSet software; VESA mount; HDCP; DDC/CI; No Touch Auto Adjust; Plug and Play (VESA DDC 2B); VESA DPMS power management; AccuColor color control; Digital smoothing; Digital controls; ISO 9241-307 Class I
<b>SHIPS WITH</b>					
Setup sheet; User manual; Power cord; 15-pin D-sub cable		Setup sheet; User manual; Power cord; Video cable; Remote if applicable	Setup sheet; User manual; Power cord; 15-pin D-sub cable; Audio cable		Setup sheet; User manual; Power cord; 15-pin D-sub cable

\* Warranty restrictions apply. Contact your representative for details.

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25.NEC.80.GL.UN.022 rev. 3.24.15

## NEC Display Solutions

500 Park Boulevard, Suite 1100  
Itasca, IL 60143  
866-NEC-MORE

## VZ-8 Visualizer Systems





# Driving the Creation of Knowledge

VZ-8light<sup>4</sup> and VZ-8plus<sup>4</sup> Desktop Visualizer Systems



WolfVision is a worldwide provider of systems and services to leading universities, businesses, schools, and other organizations. An acknowledged 'technology leader' in the Visualizer and presentation solutions market, WolfVision is the company that takes the lead, setting standards worldwide for innovative, reliable, user-friendly, high performance presentation solutions.

The popular RedDot Design Award winning fourth generation VZ-8 Series Visualizers offer quick and efficient handling of multimedia presentation content, and can be customized using WolfVision feature packs, software, and accessories to provide an impressive all-in-one presentation solution.



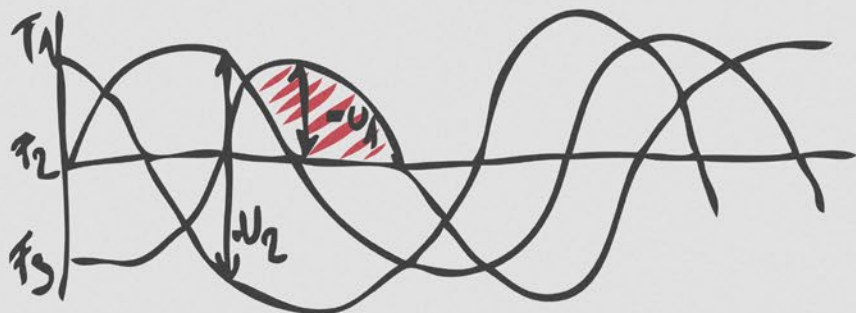
Our extensive knowledge and expertise across all application sectors enables us to offer comprehensive consultative guidance on customized combinations of Visualizer hardware systems, software, and accessories, which enhance communication, collaboration, and knowledge sharing across all environments. As part of each individual ✓Solution we offer not only pre-sales advice, but also post-sales support, training and service, ensuring that you receive maximum benefit from your investment.

Driving the Creation of Knowledge. Since 1966.



reddot design award  
winner 2013





$$U_1 = 220 \text{ W}; U_2 = 380 \text{ W}$$

## Our Vision

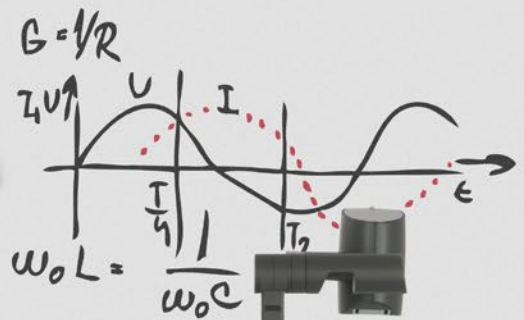
When you've got something to say, we believe it is important that getting your message across and making an impact should be as easy as possible.

Our aim is to help you to explain it better, to give you the freedom to share your knowledge with others - however you want, and whenever you want, when your audience is in the same room or on the other side of the world.

**Because knowledge matters -  
to all of us.**



$$I = U/R$$



$$G = 1/R$$

$$Z_U$$

$$\omega_0 L = \frac{1}{\omega_0 C}$$



# High Performance Imaging

WolfVision Visualizers are well-known for their unrivalled imaging quality, which is due to the perfect combination of high quality components and remarkable expertise. Our systems deliver high resolution throughout the entire picture, true-to-life colors, and consistently high frame rates to ensure smoothness of motion. They have fast and accurate autofocus and zooming, giving high quality dependable results every time! High end lenses provide distortion-free images, and high tech lighting systems deliver smooth and consistent lighting without distracting reflections or hot spots.

WolfVision's state-of-the-art YSOP1 image processing engine enables the fast and efficient processing of high volumes of data ensuring the consistent real-time display of impressive high definition pictures with unsurpassed levels of accuracy and detail.

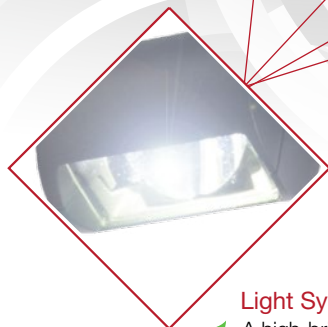
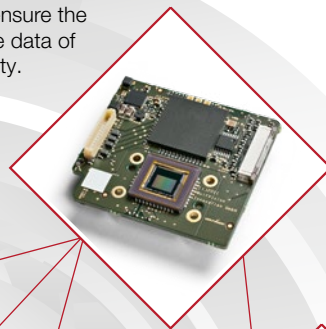
## High End Optics

Large premium quality lenses provide unrivalled imaging performance.




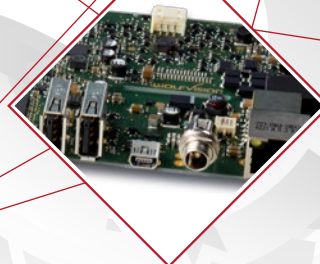
## Image Sensor

WolfVision's high resolution image sensors ensure the capture of image data of the highest quality.



## Light System

 A high-brightness LED lamp with low power consumption provides smooth and consistent lighting for accurate color reproduction.



## Electronic Hardware

High quality components deliver high performance, stability, and reliability.



## Software (Firmware)

Sophisticated software maximises the hardware potential to guarantee excellent picture quality.



++ Video ++

# Unique Features

## Large Zoom Range

14x optical zoom gives great flexibility in presentations - objects as large as an open book or as small as a postage stamp can easily be picked up, and for enlarging even smaller objects, a 2x digital zoom is also provided.

## Flexible Memory Options

Nine images can be stored in the internal memory of the VZ-8plus<sup>4</sup> and recalled instantly using the infrared remote control. The image memory can be expanded by connecting USB sticks to the USB Host port. These memory features are also available on the VZ-8light<sup>4</sup> with 'Remote Pack' option.

## Rotating Camera Head

The rotating camera head allows imaging from virtually any angle, and high-grade mechanical components ensure a stable mount for the camera.

## Live Image Preview Monitor (VZ-8plus<sup>4</sup>)

The VZ-8plus<sup>4</sup> features a built-in LCD preview monitor which makes it easy to position an object correctly on the working surface.

## Easy to Use / Zoom Wheel

For basic operation, users only need to use the zoom wheel on top of the camera head (or the zoom keys on the remote control) as all other controls such as focus, brightness, etc., are adjusted automatically.

## Power Over Ethernet Plus

The LAN port of the VZ-8 Series Visualizers includes Power over Ethernet Plus (PoE+) functionality, compatible with devices meeting the IEEE 802.3at industry standard. Power over Ethernet is a popular way of saving on cables and installation costs.

## Write On Your Visualizer

Self-adhesive dry-erase working surfaces are available as optional accessory items. When fixed to the working surface you can write onto, and erase directly from the Visualizer working surface using whiteboard markers and erasers.

## Powerful HD Cameras

The VZ-8plus<sup>4</sup> features a native 1080p HD CMOS camera with 60 frames per second. The VZ-8light<sup>4</sup> comes with the same camera with 30 frames per second.



+ 3D Model +



reddot design award  
winner 2013

# Feature Pack Options

VZ-8light<sup>4</sup> and VZ-8plus<sup>4</sup> Visualizer systems can be upgraded using our feature packs to provide additional features and functionality - this gives you unrivalled flexibility when selecting your system. In the case of the VZ-8light<sup>4</sup> each feature pack functions as a stand-alone upgrade and they are not dependent on each other.



## Remote Pack (VZ-8light<sup>4</sup>)

The Remote Pack for the VZ-8light<sup>4</sup> is an outstanding upgrade for this popular model. In addition to the provision of an infrared remote control, the accompanying firmware upgrade also activates the 9 image






internal memory, seamless cross-fading between image sources, a Picture-in-Picture comparison feature, and the USB host port (USB memory sticks can be used).



## BYOD Pack (VZ-8light<sup>4</sup>, VZ-8plus<sup>4</sup>)

The BYOD Pack is available for VZ-8light<sup>4</sup> and VZ-8plus<sup>4</sup>. It provides a WLAN stick and firmware upgrade which gives wireless connectivity using either 2.4GHz or 5GHz channels.

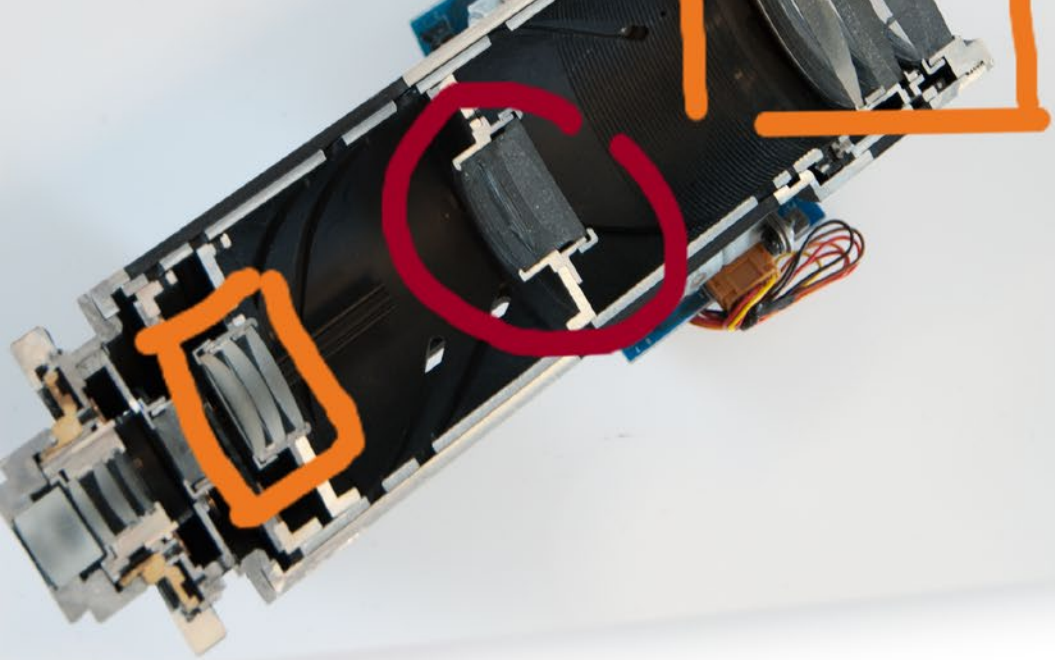
This provides for quick and easy connection to wifi enabled smartphones or laptops, and also enables our vSolution Connect for iPad app to be used in combination with these units.

					
14x optical zoom + 2x digital zoom	✓	✓	✓	✓	✓
Native resolution 1080p HD	✓	✓	✓	✓	✓
USB and LAN port	✓	✓	✓	✓	✓
High speed autofocus	✓	✓	✓	✓	✓
HDMI output	✓	✓	✓	✓	✓
Smartphone remote compatible	✓	✓	✓	✓	✓
Infrared remote control	X	✓	X	✓	✓
Memory extension via USB stick	X	✓	X	✓	~
9 image internal memory	X	✓	X	✓	✓
Seamless cross-fading between image sources	X	✓	✓	✓	✓
User defined settings can be stored on USB stick	X	✓	X	✓	~
Live to freeze comparison (Picture in Picture)	X	✓	✓	✓	✓
LCD live preview monitor	X	X	X	✓	✓
60 frames per second in all resolutions	X	X	X	✓	✓
H.264 video streaming via LAN	X	X	X	✓	~
BYOD (vSolution Connect support)	X	X	✓	X	✓
WLAN support	X	X	✓	X	✓

~ denotes feature that is not available when vSolution Connect is in use with the Visualizer.





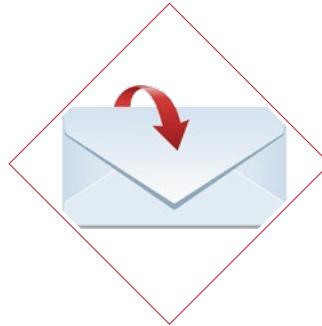


# Innovative Sharing Options



## Efficient Knowledge Transfer via Streaming

The VZ-8plus<sup>4</sup> Visualizer or connected vSolution Link software can stream video and audio to computers, tablets or smartphones on the internal network or the internet using either H.264, Motion JPEG, or RTP Motion JPEG modes. An external device receiving the Visualizer's stream can also be used as a larger control monitor.



## Quick and Convenient Distribution

WolfVision offers several possibilities for taking snapshots with VZ-8 Visualizer systems, and emailing or printing them using our software components. This facilitates quick and easy distribution of materials during a presentation when required.



## Easy Cloud Storage (Dropbox)

Using the BYOD Pack together with vSolution Connect software for iPad facilitates uploading and downloading of material to and from Dropbox. When using vSolution Connect during a presentation, content stored in Dropbox is always easily available.





# Flexible Network Integration

## Wired or Wireless Network Connection

For maximum stability and reliability, VZ-8 Visualizers can be connected to existing wired LAN infrastructure using encrypted security. Ethernet functionality of the Visualizer can be restricted and access can be password protected. Using the optional BYOD Pack adds wireless connectivity and facilitates integration into existing wireless LAN infrastructure using encrypted security.

## Wireless Encryption

VZ-8 Visualizers with the BYOD Pack upgrade support WEP, WPA and WPA2 wireless encryption. This allows for straightforward integration into the enterprise level IT networks commonly found in universities and other organizations, and ensures that no compromises in network security are required.

## Single User Authentication

When using a smartphone or iPad with the Visualizer, Single User Authentication ensures a quick and easy wireless connection between device and Visualizer, and prevents any third party from interrupting the connection during a presentation.

## Wireless Connectivity (Access Point)

VZ-8 Visualizers with BYOD Pack can also be configured to operate using an encrypted ad-hoc wireless network. This 'standalone' option allows for the direct wireless connection of smartphone, tablet, and PC devices, and means that full bandwidth is available for Visualizer use. It gives users maximum flexibility, particularly if a Visualizer is required to be used in multiple locations.



# Bring Your Own Device

## ✓Solution Connect for tablets

Sync your WolfVision Visualizer with vSolution Connect, our powerful app for iOS, and Android tablets. Using this multimedia control dashboard enables all media types to be integrated and controlled using a single device. Content materials can easily be prepared in advance and added seamlessly into presentations when required.

The app also allows entire presentations including any external content to be recorded, and saved to the tablet memory. A Live Image Preview shows exactly what the audience sees on-screen at all times, and wireless connectivity allows wireless presentations or lectures to be delivered from anywhere in the room.

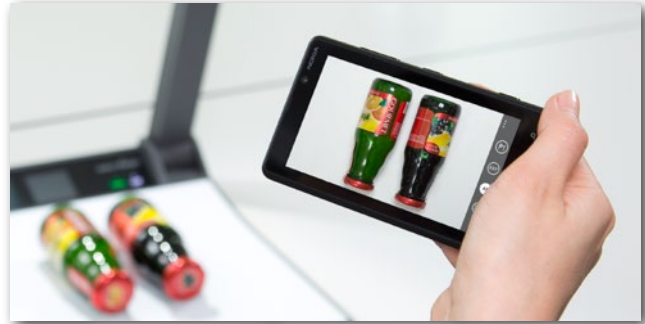
The annotation feature is ideal for making notes, sketching, and highlighting documents, charts, and pictures. A dedicated whiteboard function also provides a separate space for making and displaying notes on-screen during a presentation.



# Transforming Presentations

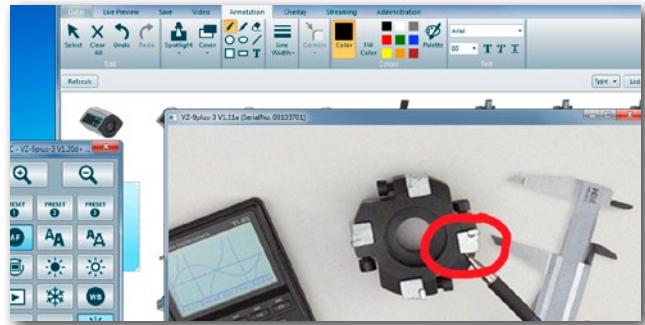
## √Solution Control for Smartphones

The vSolution Control App enables WolfVision Visualizers to connect to an iPhone, Windows 8, Windows Phone 8 or Android device via WLAN. This intuitive and easy to use app allows presenters to use the device keypad and Live Image Preview to control a presentation or lecture wirelessly whilst moving freely around a room.



## √Solution Link for PC and Mac

vSolution Link allows a user to connect a computer directly to a Visualizer. This software allows for saving, printing and emailing of images, recording of videos, adding annotations and video streaming. It also provides useful tools for automatically applying Visualizer firmware updates, allowing new features and technical improvements to be added at no cost!



Fast Multimedia Source Switching	✓	✓	✓
Visualizer Remote Control	✓	✓	✓
Live Image preview	✓	✓	✓
Image Snapshot	✓	✓	✓
Video Recording	✗	✓	✓
Image Annotation	✗	✓	✓
Live Web Streaming	✗	✗	✓
Access to Web-based Material	✗	✓	✓
Display Content From Device	✗	✓	✓
Multiple Source Preview	✗	✓	✗



# Technical Data

	VZ-8light <sup>4</sup>	VZ-8plus <sup>4</sup>
Camera	1-CMOS 1/3"	
Pictures per second (as picked up by the camera)	30 frames in all resolutions	60 frames in all resolutions
Effective Pixels (=pixels actually used for image information)	1920x1080 (=2,073,600)	
Total pixels of camera sensor	2,073,600	
Pixels processed per second (=effective pixels x frames per sec.)	62,208,000	124,416,000
Color reproduction / precision	very good colors (sRGB color precision)	
Native signal output	1080p HD (1920x1080)	
Converted output signals (4:3 and 5:4)	UXGA (1600x1200), SXGA (1280x1024), XGA (1024x768), SVGA (800x600)	
Converted Widescreen output signals (16:9 and 16:10)	720p HD (1280x720), WXGA (1280x800), WUXGA (1920x1200)	
Resolution (measured)	980 lines	
Brightness control / Exposure	automatic (manual in on-screen menu or with optional Remote Pack)	automatic and manual
White balance adjustment	automatic and manual	
Autofocus / Speed	yes (continuously working, high speed)	
Manual focus	yes	
Built-in LCD preview monitor	-	yes
Live to Freeze Comparison (Picture in Picture)	optional (with Remote Pack)	yes (still image is a small picture, integrated into the large live image)
On screen menu and on screen help	yes	
Firmware Updates via	USB, LAN, USB stick	
Zoom / Lens	28x zoom (14x optical + 2x digital), with 2-speed zoom wheel	
Max. object height on working surface	120mm (4.7") in tele position 300mm (11.8") in wide	
Max. pick-up area on working surface	length: 300mm (11.8"), width: 400mm (15.8")	
Min. pick-up area on working surface (full resolution, optical zoom)	29x16mm (1.1" x 0.63")	
Min. pick-up area on working surface (with digital zoom)	15x8mm (0.59" x 0.31")	
Max. pick-up area outside of working surface	unlimited	
Depth of focus on small object (42 x 33 mm)	7mm (0.3")	
Depth of focus on large object (360 x 270 mm)	200mm (7.9")	
Tilt range of camera	220° (120° to speaker + 100° to audience)	
Light source	Maintenance free high-brightness LED light system (high light output, low power consumption), lamp lifetime: 30,000 hours	
vSolution Link Software (USB/LAN, for controlling, image and video capturing and firmware updates)	included (for 32 and 64 bit Windows and Macintosh, Twain/WIA compatible, with video capture driver)	
Reflection-free area on working surface	whole working surface	
Recordings outside of the working surface	yes (to the back and to the front of the unit)	
Automatic image flip	yes (for recordings to the front of the unit)	
Intelligent folding system	pneumatic arm, 2-step set up	
User programmable presets	1 (3 presets with optional Remote Pack)	3
User defined Visualizer settings on USB Stick	optional (with Remote Pack)	yes
Special working surface for transparencies	yes	
External computer input / Input switch	yes, HDMI (DVI or DisplayPort via optional adaptor or cable)	
Seamless cross-fading between image sources	optional (with Remote Pack)	yes
WolfVision image processing engine "YSOP1"	yes	
Image memory	1 image freeze (or 9 pictures in internal memory + unlimited number on USB stick with optional Remote Pack)	9 pictures in internal memory + unlimited number on USB stick
RGB output	one (15-pin D-Sub/VGA-plug)	
DVI output	- (via optional HDMI-DVI cable or adaptor)	
HDMI output	yes	
USB port / standard	USB 2.0 device port (plus USB host port with optional Remote Pack)	USB 2.0 device port and USB 2.0 host port
RS232 port (serial protocol with position setting and status report)	- (if required external LAN to RS232 adaptors can be used)	
Ethernet / LAN port	yes, with PoE+	
LAN web interface	yes	
LAN streaming modes (multicast and unicast)	-	H.264, Motion JPEG, RTP Motion JPEG
WLAN (Dual band stick for 2.4GHz and 5GHz)	Optional: with BYOD Pack	
Advanced controlling with professional protocol via LAN & USB	yes, via LAN and USB	
Weight	5 kg (11 lbs)	
Infrared remote control (including laserpointer)	optional infrared (with Remote Pack)	yes
Anti-theft device	T-Lock (Kensington® Lock) and table lock bolt	
Power (external power pack on portable units)	External power pack: multi range 100-240 V, power consumption: 16W in full operation and between 0.5W and 6.6W in standby modes (adjustable), Power over Ethernet plus (IEEE 802.3at standard)	
Dust cover	included, carrying case optional	
Warranty	5 years	

All units made in Austria, Europe.

Design and specifications subject to change!

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# TSW-1050

## 10.1" Touch Screen

- > Ultra clean, modern appearance
- > Thin profile and compact footprint
- > Affordable and easy to install
- > 10.1" widescreen active-matrix color display
- > 1280 x 800 WXGA display resolution
- > Capacitive touch screen technology
- > Smart Graphics™ support <sup>[1]</sup>
- > High-performance H.264 streaming video
- > Rava® SIP intercom and phone technology
- > Customizable audio feedback
- > Built-in microphone and speakers
- > 5 soft-touch capacitive buttons
- > Single-wire Ethernet connectivity
- > PoE network powered
- > Supports US or European electrical wall box mounting
- > Can be mounted directly to drywall or paneling over a cutout
- > Compatible with TSW-UMB Universal Mounting Bracket <sup>[2]</sup>
- > Compatible with TSW-RMB Retrofit Mounting Brackets <sup>[2]</sup>
- > Pre-construction and masonry mounting options available <sup>[2]</sup>
- > Available tabletop and swivel mount options <sup>[2]</sup>
- > Available in smooth black or white finish



### Advanced Touch Screen Control

A Crestron® touch screen offers an ideal user-interface for controlling all the technology in your home, boardroom, classroom, courtroom, or command center. Touch screens do away with piles of remote controls, cluttered wall switches, and cryptic computer screens, simplifying and enhancing the way you use technology. For controlling audio, video, lighting, shades, HVAC, security, and other systems, Crestron touch screens are fully-customizable with easy-to-use controls and icons, true feedback and real-time status display, live streaming video, and advanced navigation of digital media servers, tuners, and other devices.

With its clean, contemporary design highlighted by edge-to-edge glass and stunning HD color graphics, the Crestron TSW-1050 touch screen makes an elegant statement on any wall, tabletop, or lectern. Perfectly at home in the most contemporary residence or modern office building, its high-tech good looks underline its power for simplifying everyday tasks and functions throughout any facility.

The TSW-1050 delivers the ultimate touch screen experience in an unobtrusive, space-saving design featuring a brilliant, high-definition 10.1 inch capacitive touch screen display and 5 soft-touch buttons. PoE connectivity and a range of mounting options make installation a breeze for both new and retrofit applications. Additional features include high-performance H.264 video, audio feedback, [Rava® SIP Intercom](#), and advanced Smart Graphics™.

### Smart Graphics™<sup>[1]</sup>

Crestron touch screens use Smart Graphics to deliver the ultimate user experience *and* the ultimate value by enabling the creation of dynamically rich user interfaces with incredible efficiency and unparalleled functionality. Using Smart Graphics, programmers can swiftly integrate fluid gesture-driven controls, animated feedback, rich metadata, embedded apps and widgets, and full-motion video for a deeply engaging and ultra-intuitive touch screen experience.

Crestron Smart Graphics offers these enhancements and more:

- Cool-looking graphical buttons, sliders, knobs, and gauges that are intuitive and fun to use
- Kinetic effects to enhance the feeling of realism, with lists and toolbars that scroll with momentum at the flick of a fingertip
- Drag-and-drop objects that snap into place, offering an easy way to switch sources
- Dashboard widgets to personalize the touch screen with clocks, weather, news, and other information
- Customizable themes allowing a completely different look and feel for every user, event, or season
- Fully-developed SmartObjects™ that enable sophisticated control over complex devices with minimal programming

### Soft-Touch Buttons

The TSW-1050 includes five soft-touch capacitive buttons for quick access to commonly used functions. The buttons are pre-labeled with icons for “Power”, “Home”, “Lights”, “Up”, and “Down” functions. Each button is programmable via the control system for custom functionality.



# TSW-1050 10.1" Touch Screen



TSW-1050-W-S – Shown in White

## Streaming Video

High-performance streaming video capability makes it possible to view security cameras and other video sources right on the touch screen. Native support for H.264 and MJPEG formats allows the TSW-1050 to display live streaming video from an IP camera, a streaming server (Crestron [CEN-NVS200](#) or similar<sup>[2]</sup>), or a [DigitalMedia™](#) switcher. Video is delivered to the touch screen over Ethernet, eliminating the need for any extra video wiring.

## Rava® SIP Intercom

[Rava SIP Intercom Technology](#) enables hands-free VoIP communication with other Rava-enabled touch screens and door stations. Rava works over Ethernet, supporting 2-way intercom, video intercom<sup>[3]</sup>, and paging without any special wiring. VoIP phone capability is also possible through integration with an SIP-compatible IP phone system or SIP server, allowing hands-free telephone functionality complete with speed-dialing, caller ID, custom ringers, and other enhancements. Built-in echo cancellation affords full-duplex performance for clear, seamless voice communication using the TSW-1050's integrated microphone and speakers.

## Audio Feedback

Customized audio files can be loaded to add another dimension to the touch screen graphics using personalized sounds, button feedback, and voice prompts.

## Single-Wire Connectivity

A simple Ethernet LAN connection is all that is required to wire the TSW-1050, containing all control, video, intercom, and power signals within a single wire.

## Power over Ethernet

Using PoE technology, the TSW-1050 gets its operating power right through the LAN wiring. PoE (Power over Ethernet) eliminates the need for a local power supply or any dedicated power wiring. A PoE Injector ([PWE-4803RU](#)<sup>[2]</sup>) simply connects in line with the LAN cable at a convenient location. Crestron PoE switches ([CEN-SW-POE-5](#) or [CEN-SWPOE-16](#), or [CEN-SWPOE-24](#)<sup>[2]</sup>) may also be used to provide a total networking solution with built-in PoE.



TSW-1050-B-S with TSW-1050-TTK TableTop Mounting Kit

## Simple, Versatile Mounting

Using the bracket provided, the TSW-1050 installs easily over a 2-gang or 3-gang electrical box, or a 2-gang European electrical box. It can also be attached directly to drywall and other surfaces over the front of a 2-3/8" H x 3-3/8" W (60mm H x 86mm W) cutout. When installed, it protrudes just 1/2 inch from the mounting surface and is magnetically adhered to its mounting bracket, eliminating any visible screws for an ultra clean appearance.

Crestron also offers the [TSW-UMB](#) Universal Mounting Bracket<sup>[2]</sup>, which provides a post-construction wall mounting solution that can accommodate a variety of current and future Crestron devices including the TSW-1050. The TSW-UMB makes it easy to change devices at any time without having to cut or patch the wall, or order any additional mounting hardware. For a pre-construction mounting solution, the TSW-UMB can be used along with a [TSW-UMB-PMK](#) Pre-Construction Mounting Kit<sup>[2]</sup>. Masonry and concrete applications can be accommodated using the TSW-UMB along with a [TSW-550-BBI](#) back box<sup>[2]</sup>.

Replacing an older Crestron touch screen with a new TSW-1050 can be made simple using a [TSW-RMB](#) Retrofit Mounting Bracket. A variety of adapter brackets are available to enable easy installation of the TSW-1050 right over the existing back box, mounting kit, or cut-out.

## Tabletop Option

Using the optional Tabletop Kit ([TSW-1050-TTK](#)<sup>[2]</sup>), the TSW-1050 becomes a stylish, freestanding touch screen that fits perfectly on a table, desk, or countertop. It can even be permanently attached to the surface using the optional Swivel Mount Kit ([TSW-550/750/1050-SMK](#)<sup>[2]</sup>).

## SPECIFICATIONS

### Touch Screen Display

Display Type: TFT Active matrix color LCD

Size: 10.1 inch (257 mm) diagonal

Aspect Ratio: 16:10 WXGA

# TSW-1050 10.1" Touch Screen

**Resolution:** 1280 x 800 pixels  
**Brightness:** 400 nits (cd/m<sup>2</sup>)  
**Contrast:** 800:1  
**Color Depth:** 24-bit, 16.7M colors  
**Illumination:** Edgelit LED  
**Viewing Angle:** ±80° horizontal, ±80° vertical  
**Touch Screen:** Projected Capacitive

## Buttons

**Hard Keys:** (5) Projected capacitive pushbuttons, programmable, pre-labeled with icons for "Power", "Home", "Lights", "Up", and "Down"  
**Reset:** (1) Miniature pushbutton on rear panel for hardware reset

## Memory

**LPDDR2 RAM:** 1 GB  
**Flash:** 4 GB  
**Maximum Project Size:** 512 MB

## Graphics Engine

Supports Smart Graphics™<sup>[1]</sup>

## Communications

**Ethernet:** 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, IEEE 802.3af and 802.3at Type 1 compliant

## Video

**Streaming Formats:** H.264 (MPEG-4 part 10 AVC), MJPEG

## Audio

**Features:** Built-in microphone and speakers, Rava® SIP Intercom  
**Audio Feedback Formats:** MP3

## Connectors

**LAN PoE:** (1) 8-wire RJ45 with 2 LED indicators;  
10Base-T/100Base-TX Ethernet port, Power over Ethernet compliant;  
Green and yellow LEDs indicate Ethernet port status

## Power Requirements

**Power over Ethernet:** IEEE 802.3at Type 1 (802.3af compatible) Class 3 (12.95W) PoE Powered Device

## Environmental

**Temperature:** 32° to 112°F (0° to 45°C)  
**Humidity:** 10% to 90% RH (non-condensing)  
**Heat Dissipation:** 44 BTU/hr

## Enclosure

**Construction:** Plastic, smooth black or white finish  
**Mounting:** Surface mount over a 2 or 3-gang electrical box, 2-Gang

European (DIN 49073) electrical box, or 2-3/8" H x 3-3/8" W (60mm H x 86mm W) cutout; additional wall mount and tabletop options available separately

## Dimensions

**Height:** 6.46 in (164 mm)  
**Width:** 10.12 in (257 mm)  
**Depth:** 2.03 in (52 mm)

## Weight

23.9 oz (675 g)

## MODELS & ACCESSORIES

### Available Models

**TSW-1050-B-S:** 10.1" Touch Screen, Black Smooth  
**TSW-1050-W-S:** 10.1" Touch Screen, White Smooth

### Available Accessories

**TSW-1050-TTK:** Tabletop Kit for TSW-1050 [specify color]  
**TSW-550/750/1050-SMK:** Swivel Mount Kit for TSW-1050-TTK  
**TSW-UMB:** Universal Mounting Bracket  
**TSW-UMB-PMK:** Pre-Construction Mounting Kit for TSW-UMB  
**TSW-550-BBI:** Wall Mount Back Box for TSW-UMB – International Version  
**TSW-RMB:** Retrofit Mounting Brackets  
**PWE-4803RU:** PoE Injector  
**CEN-SW-POE-5:** 5-Port PoE Switch  
**CEN-SWPOE-16:** 16-Port Managed PoE Switch  
**CEN-NVS200:** Network Video Streamer  
**SW-VMK-WIN:** TouchPoint® Virtual Mouse & Keyboard Software for Windows®

Notes:

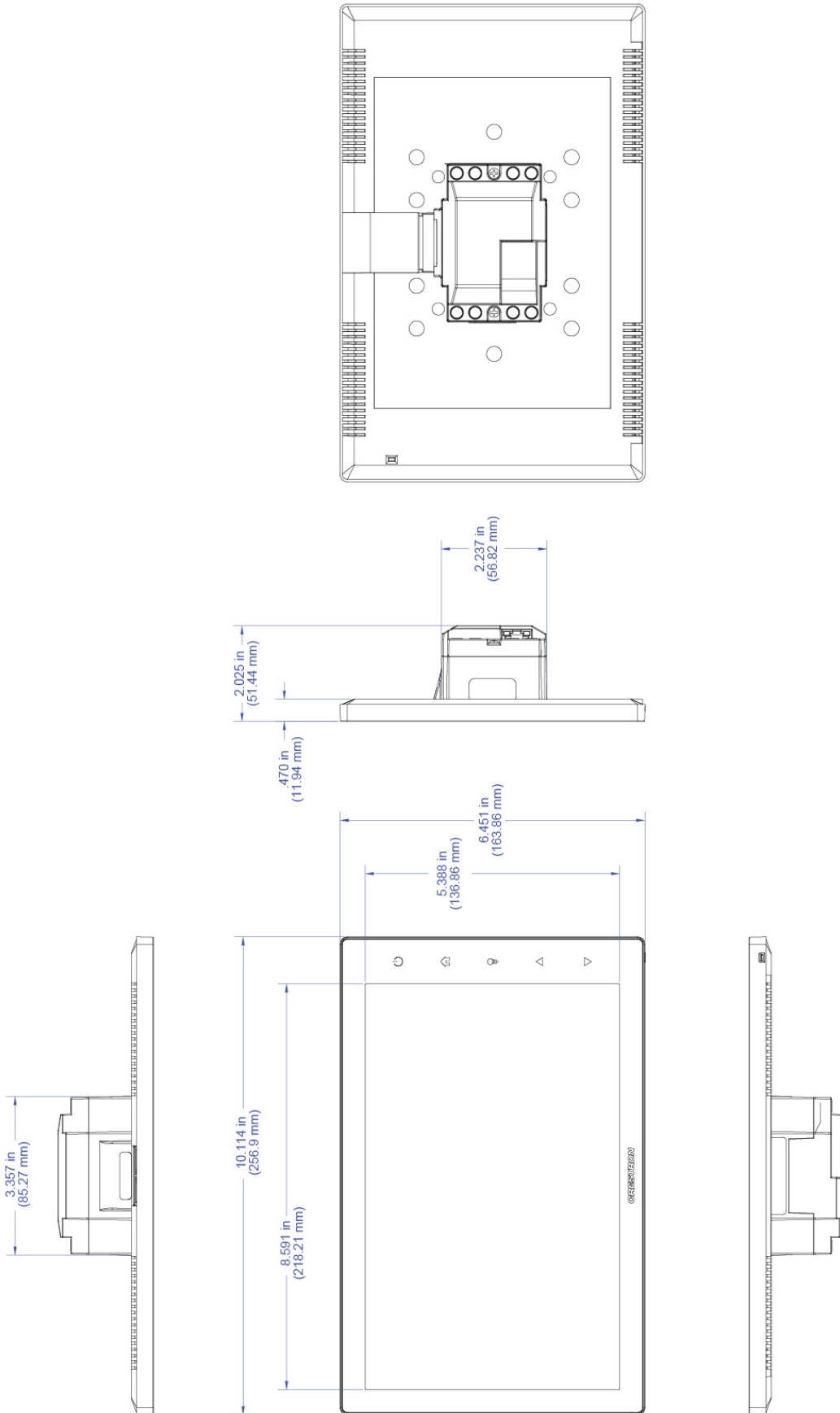
1. Supports Smart Graphics only. Not compatible with "traditional" UI projects.
2. Item(s) sold separately.
3. H.264 compatible IP camera required.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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

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# TSW-1050 10.1" Touch Screen



# TSW-1050-TTK

## TableTop Kit for TSW-1050 & TSW-1052

- > Converts a TSW-1050 or TSW-1052 to a stylish 10.1" tabletop touch screen
- > Provides a 38° fixed operating angle
- > Allows permanent mounting using the optional swivel mount kit<sup>[1]</sup>
- > Provides the choice of a rear or bottom wire exit

The TSW-1050-TTK provides a stylish and convenient tabletop enclosure for a [TSW-1050](#) or [TSW-1052](#) Touch Screen. The touch screen is angled when installed in the enclosure. The complete assembly may be placed on any flat, level surface.

An optional swivel mount accessory ([TSW-550/750/1050-SMK](#)) is available separately, providing a means for permanently mounting the enclosure while retaining the ability to rotate it for optimal positioning. The swivel range can be customized using optional limit screws, with a maximum of 330-degree rotation allowed. The swivel mount may be installed on any flat table, desk, or counter top surface with a thickness of 1 inch (25 mm) minimum to 1 3/8 inch (35 mm) maximum.

Wiring may be passed out the rear of the enclosure through a grommet and strain relief, or routed through the bottom for a very clean, cordless appearance. The rear wire opening can accommodate a single cable up to 1/4 inch (6 mm) diameter such as standard CAT5. The bottom opening measures 29/32 inch (23 mm) diameter, while the swivel mount<sup>[1]</sup> can accommodate wiring up to 11/16 inch (17 mm) diameter.

## SPECIFICATIONS

### Enclosure

Plastic, black or white; 38° fixed angle device opening; freestanding or swivel mount installation<sup>[1]</sup>

### Dimensions

**Height:** 4.01 in (102 mm);  
4.14 in (105 mm) with swivel mount<sup>[1]</sup>  
**Width:** 7.91 in (201 mm)  
**Depth:** 5.37 in (136 mm)

With touch screen installed:

**Height:** 4.79 in (122 mm);  
4.92 in (125 mm) with swivel mount<sup>[1]</sup>  
**Width:** 10.13 in (258 mm)  
**Depth:** 5.84 in (149 mm)

### Weight

17.3 oz (491 g);  
41.2 oz (1166 g) with touch screen installed



Touch screen sold separately.

## MODELS & ACCESSORIES

### Available Models

**TSW-1050-TTK-B-S:** TableTop Kit for TSW-1050 & TSW-1052, Black Smooth

**TSW-1050-TTK-W-S:** TableTop Kit for TSW-1050 & TSW-1052, White Smooth

### Available Accessories

**TSW-550/750/1050-SMK:** Swivel Mount Kit for TSW-550-TTK, TSW-750-TTK & TSW-1050-TTK

Notes:

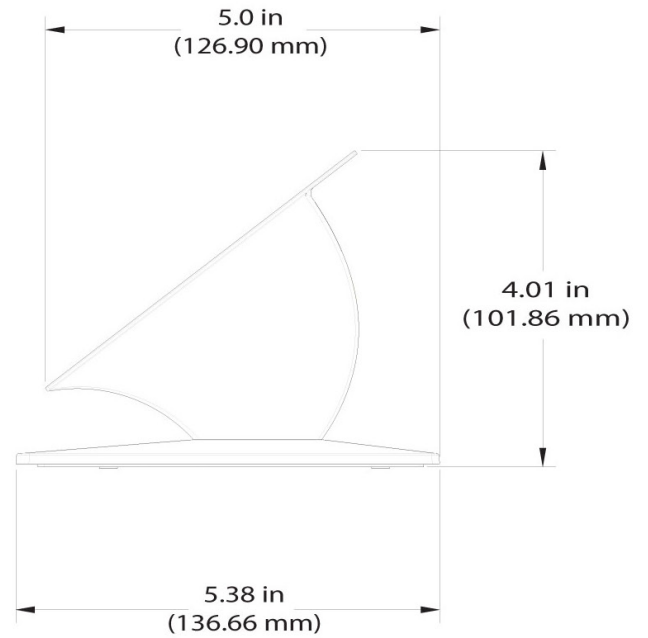
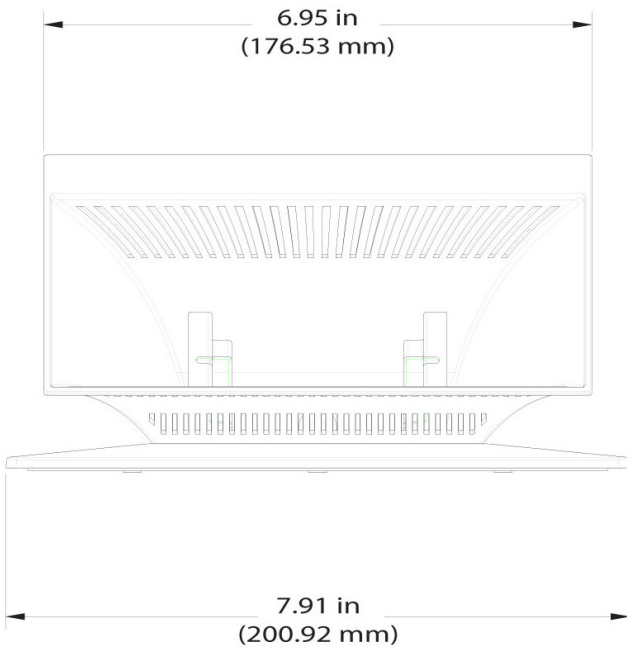
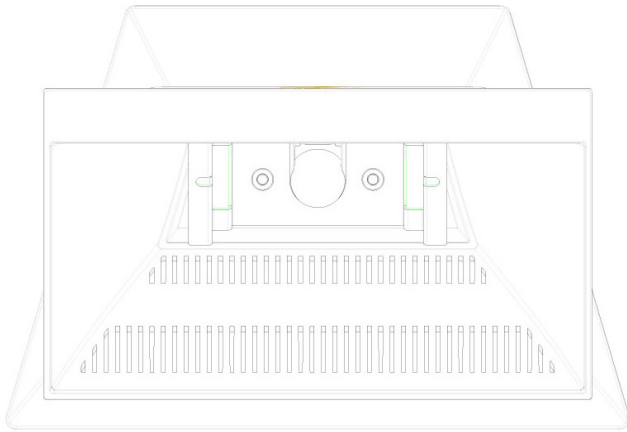
1. TSW-550/750/1050-SMK Swivel Mount Kit sold separately.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/salesreps](http://www.crestron.com/salesreps) or by calling 800-237-2041.

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

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# TSW-1050-TTK TableTop Kit for TSW-1050 & TSW-1052





# SONIFEX

SignalLED Studio Illuminated Signs

2014-15  
Catalogue





## Studio Illuminated Signs

The SignalLED range of illuminated RGB LED signs are a range of signs designed for use outside recording studios, on-air & production studios, meeting rooms, conference rooms and for fixed installations. The sign itself contains the control electronics, and RGB LEDs are used, so the signs can be simply configured onsite for your particular requirements.

SignalLED Range of LED Signs	252
Custom Signs	254



*Sonifex SignalLED Sign.  
Photo courtesy of ABC Erina & OnAir Solutions.*



## SignalLED Range of LED Signs



**Category:** SignalLED Illuminated Signs.

**Product Function:** Signage for outside studio/office doors and on studio walls to indicate Mic Live, Recording, etc

**Typical Applications:** MIC LIVE, ON-AIR, PHONE and RECORD signs for radio/TV studios, TX-REH for production galleries, MEETING IN PROGRESS for board rooms, SILENCE PLEASE outside lecture theatres.

### Features:

- Low power consumption, only 4W.
- Maintenance free, LED lighting.
- Multi-coloured RGB LEDs offering 9 different colours.
- Sign can be made to flash, pulse, fade and be on or off.
- Flush-mounting as standard or end/ceiling-mounting with kits.
- 20cm (8") or 40cm (16") widths or 2 x 20cm (2 x 8").
- Standard wording includes: MIC LIVE, ON AIR, RECORD, PHONE, TRAFFIC FLAG ON, AD BREAK, TX, REH, REHEARSAL, DOOR,

OBIT, NO ENTRY, EXIT, SILENCE PLEASE, MEETING IN PROGRESS, INTERVIEW IN PROGRESS.

- Custom signs can be etched with company logos, different wording or graphics.
- 2 x GPIs for control from a light switch, or fader GPO (pull down to 0V).
- Supplied as standard as red/green switching.
- Use separate remote control (LD-RPC) to program the colour, switching mode or brightness.
- Supplied complete with fixings & DC power supply.

The SignalLED range of illuminated RGB LED signs are a new range of signs designed for use outside recording studios, on-air & production studios, meeting rooms, conference rooms and for fixed installations. The sign itself contains the control electronics, and RGB LEDs are used, so the signs can be simply configured onsite for your particular requirements.

### Different Display Modes

Five modes of illumination are available:

- Constant illumination.
- Flashing, regularly on/off.
- Pulsing - flashing, then off, repeated
- Fading
- Off

### RGB LEDs - Any Colours Possible

The illuminating LEDs in the unit are RGB meaning that the colour of the sign can be selected on installation.

You can configure the sign from one of 9 colours: white, green, red, blue, brick red, yellow, orange, cyan and magenta.



9 different colours of the SignalLED Sign.

### Single or Twin Signs

Each sign is 40cm or 20cm long. The 40cm signs can be split into two 20cm sides which can be separately, or jointly controlled, e.g. you can have a 40cm 'ON AIR' sign, or twin 2 x 20cm signs, such as 'ON AIR' and 'MIC LIVE'.



LD-40F1ONA Single Flush Mounting 40cm 'ON AIR' Sign.



LD-40F2ONA-MCL Twin 'ON AIR' & 'MIC LIVE' sign.

### Single 20cm Flush Mounting Sign

These are the available choices for the smaller 20cm flush-mounting signs. Custom signs can be made to order, if required.



LD-20F1REC Single Flush Mounting 20cm 'RECORD' Sign.



LD-20F1ONA Single Flush Mounting 20cm 'ON AIR' Sign.



LD-20F1MCL Single Flush Mounting 20cm 'MIC LIVE' Sign.

### LD-KC1 Ceiling Mounting Kit

The LD-KC1 mounting kit can be used to attach a 40cm or 20cm flush mounting sign to the ceiling or a desktop.



The LD-KC1 mounting kit used to attached the sign to the ceiling.



The LD-KC1 mounting kit used to attached the sign to the desktop.



The LD-KC1 mounting kit.

### Dual Control Inputs

The sign can be controlled by either, or both, of 2 pull-low inputs, e.g. a single input can be used to control a single 'MIC LIVE' sign, or 2 inputs can be used to control a twin 'TX' and 'REH' sign with independent control of each side of the sign.

### 7V-36V DC Input Option

For a small additional cost, the SignalLED main circuit board can be modified to accept a DC input in the range 7V-36V, for example, if you have a 12V or 24V distributed DC power network.

When placing your order, or requesting a quotation, please either:

Change the 'LD' of the order code to 'LDD', so for example, 'LD-F1ONA' becomes 'LDD-F1ONA', or:

Add the item LD-DC to your order.

### Flush or End Mounting

The sign is supplied as standard so that it can be mounted flush to a wall, e.g. for the 'TX' & 'REH' sign shown below. However, a mounting kit is available, LD-KE1, to mount the sign perpendicular to a wall, e.g. above a door, such as the ON AIR sign shown.



LD-KE1 End Mounting Kit For 40cm Or 20cm Flush Mounting Signs.



End Mounting 40cm Single Sign (Created From Single Flush Mounting LD-40F1ONA Sign & LD-KE1 kit).



LD-40F2TX-REH Flush Mounting 40cm Twin Sign.



LD-40F2ONA-SIL Twin 'ON AIR' & 'SILENCE' sign.

### Simple Installation

The signs are supplied with a 6V DC power supply. Simply wire up your control signal(s) and DC input to the 'screw terminal block' inside the sign, route the cables through the integral cable clamp and mount the unit on the wall.

An installation tool, the LD-IT can be used to hold the sign in place on the wall mount whilst you wire it up.

The display mode and colour options are set-up using a separate remote control, the LD-RPC.



LD-IT LED Sign End Mounting Installation Tool.

### LD-RPC SignalLED Remote Programming Controller

The SignalLED signs are preconfigured to display certain colours when the control inputs are active. Information on the colours shown can be found on the Sonifex website. To vary the colours and switching modes, the LD-RPC Remote Programming Controller must be used. This allows a simple way of programming any sign using a hand-held remote control.

Please note that the control is sold separately and one LD-RPC can program multiple signs.



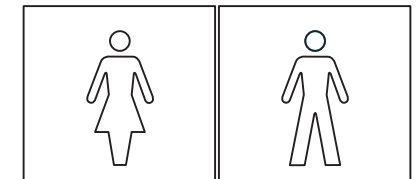
### Custom Signs

Although a range of standard signs is supported, custom signs, for example with your company name or logo, can be produced for a nominal setup fee. Contact Sonifex with your requirements.



Custom Single Flush Mounting 40cm Sign.

### Examples Of Custom Signs





**How to Order**

Just select the name of the sign from the list below.



LD-40F1ONA Single Flush Mounting 40cm 'ON AIR' Sign.



LD-40F1MCL Single Flush Mounting 40cm 'MIC LIVE' Sign.



LD-40F1PHN Single Flush Mounting 40cm 'PHONE' Sign.



LD-40F1TRF Single Flush Mounting 40cm 'TRAFFIC FLAG ON' Sign.



LD-40F1ADB Single Flush Mounting 40cm 'AD BREAK' Sign.



LD-40F1REH Single Flush Mounting 40cm 'REHEARSAL' Sign.



LD-40F1DOR Single Flush Mounting 40cm 'DOOR' Sign.



LD-40F1OBT Single Flush Mounting 40cm 'OBIT' Sign.



LD-40F1NOE Single Flush Mounting 40cm 'NO ENTRY' Sign.



LD-40F1EXIT Single Flush Mounting 40cm 'EXIT' Sign.



LD-40F1SIL Single Flush Mounting 40cm 'SILENCE PLEASE' Sign.



LD-40F1MET Single Flush Mounting 40cm 'MEETING IN PROGRESS' Sign.



LD-40F1INT Single Flush Mounting 40cm 'INTERVIEW IN PROGRESS' Sign.

**Specification For SignalLED**

Power Input:	5-7V DC	40cm Sign: 500mA max
Input Connector:	4 way screw terminal block	
Control Inputs:	2 x pull-down to 0V	
Dimensions (Perspex):	Small Single: 20cm (W) x 8cm (H)	Large Single: 40cm (W) x 8cm (H)
Dimensions (Boxed 20cm):	40cm (W) x 20cm (D) x 11cm (H)	15.7" (W) x 7.9" (D) x 4.3" (H)
Dimensions (Boxed 40cm):	60cm (W) x 20cm (D) x 11cm (H)	23.6" (W) x 7.9" (D) x 4.3" (H)
Weight (20cm):	Nett: 0.35kg	Gross: 0.85kg
	Nett: 0.8lb	Gross: 1.9lb
Weight (40cm):	Nett: 0.55kg	Gross: 1.15kg
	Nett: 1.2lb	Gross: 2.6lb

**Equipment Type**

**Single Flush Mounting Signs (40cm):**

LD-40F1REC	40cm 'RECORD' Sign
LD-40F1ONA	40cm 'ON AIR' Sign
LD-40F1MCL	40cm 'MIC LIVE' Sign
LD-40F1PHN	40cm 'PHONE' Sign
LD-40F1TRF	40cm 'TRAFFIC FLAG ON' Sign
LD-40F1ADB	40cm 'AD BREAK' Sign
LD-40F1REH	40cm 'REHEARSAL' Sign
LD-40F1DOR	40cm 'DOOR' Sign
LD-40F1OBT	40cm 'OBIT' Sign
LD-40F1NOE	40cm 'NO ENTRY' Sign
LD-40F1EXIT	40cm 'EXIT' Sign
LD-40F1SIL	40cm 'SILENCE PLEASE' Sign
LD-40F1MET	40cm 'MEETING IN PROGRESS' Sign
LD-40F1INT	40cm 'INTERVIEW IN PROGRESS' Sign

**Twinn Flush Mounting Signs (2 x 20cm):**

LD-40F2TX-REH	2 x 20cm 'TX' & 'REH' Sign
LD-40F2ONA-MCL	2 x 20cm 'ON AIR' & 'MIC LIVE' Sign

**Single Flush Mounting Signs (20cm):**

LD-20F1REC	20cm 'RECORD' Sign
LD-20F1ONA	20cm 'ON AIR' Sign
LD-20F1MCL	20cm 'MIC LIVE' Sign

**Mounting Kits:**

LD-KE1	End Mounting Kit For 40cm Or 20cm Flush Mounting Signs
LD-KC1	Ceiling Mounting Kit For 40cm Or 20cm Flush Mounting Signs
LD-IT	LED Sign End Mounting Installation Tool



**Middle Atlantic Products**

EXCEPTIONAL SUPPORT & PROTECTION™

# BRK/MBRK/OBRK/RK/SRK/OSR Laminate Racks



EIA/TIA Compliant

## The BRK/MBRK/OBRK/RK/SRK/OSR Series 19" Equipment Racks

### Features

- High quality equipment rack features an oak, maple or black wood grain finish
- 5/8" or 3/4" furniture grade MDF board construction (depending on model)
- Four depths available to accommodate any permanent installation
- Assembles easily with included hardware
- Rear access panel available for 22" and 28" deep models



RK/BRK/MBRK



SRK



OBRK



OSR

### Architects' and Engineers' Specifications

#### RK/BRK/OBRK/MBRK

EIA compliant Wooden Studio Rack shall be Middle Atlantic Products model # \_\_RK\_\_ (refer to chart). \_\_RK\_\_ shall have \_\_ useable rackspaces with a \_\_" overall height (refer to chart). \_\_RK\_\_ shall have a \_\_" depth. Studio rack shall be constructed of \_\_" furniture grade MDF board and shall feature a high quality \_\_ wood grain laminate finish (refer to chart). Rackrail shall be equipped with one set of 11-gauge steel with tapped 10-32 holes in universal EIA spacing (2 sets included for racks with 22" and 28" depths). Assembly hardware shall be 1/4 turn bolts with 1/4 turn cams for MBRK, 22" and 28" deep racks. Other models use joint connector screws. Studio rack shall be rated to \_\_lb. weight capacity. Studio Rack shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. Studio Rack shall be RoHS EU Directive 2002/95/EC compliant. Studio rack shall be manufactured by an ISO 9001 and ISO 14001 registered company. Studio rack shall be warranted to be free from defects in material or workmanship under normal use and conditions for a period of 7 years.

#### SRK

EIA compliant Sloped Rolling Equipment Rack shall be Middle Atlantic Products model # SRK. Equipment rack shall provide a 16 rackspace lower bay and an upper 12 rackspace bay sloped back at a 25° angle. SRK shall be constructed of 5/8" furniture grade MDF board and shall feature a high quality black wood grain laminate finish. Pre-installed rackrail shall be 11-gauge steel with tapped 10-32 holes in universal EIA spacing. Assembly hardware shall be 2-1/4" joint connector screws. A hex key shall be included for assembly. Black plastic screw caps shall snap into place to cover the included hardware. Studio rack shall be rated to 200 lb. weight capacity. Studio rack includes four pre-installed casters. Studio rack shall be rated to 200 lb. weight capacity. Studio Rack shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. Studio Rack shall be RoHS EU Directive 2002/95/EC compliant. Studio rack shall be manufactured by an ISO 9001 and ISO 14001 registered company. Studio rack shall be warranted to be free from defects in material or workmanship under normal use and conditions for a period of 7 years.

#### OSR

EIA compliant Sloped Rolling Equipment Rack shall be Middle Atlantic Products model # OSR-\_\_ (refer to chart). Equipment rack shall provide a \_\_ rackspaces (refer to chart) sloped at \_\_° (refer to chart). OSR shall be constructed of 3/4" furniture grade MDF board and shall feature a high quality Oak laminate finish. Pre-installed rackrail shall be 11-gauge steel with tapped 10-32 holes in universal EIA spacing. Assembly hardware shall be 2-1/4" joint connector screws. A hex key shall be included for assembly. Black plastic screw caps shall snap into place to cover the included hardware. Studio rack shall be rated to 200 lb. weight capacity. Studio rack includes four pre-installed casters. Studio Rack shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. Studio Rack shall be RoHS EU Directive 2002/95/EC compliant. Studio rack shall be manufactured by an ISO 9001 and ISO 14001 registered company. Studio rack shall be warranted to be free from defects in material or workmanship under normal use and conditions for a period of 7 years.

#### OPTIONS (OBRK, BRK and RK)

- Set of four casters shall be model # RKW, RKW shall have a 150 lb. weight capacity.
- Set of 4 heavy duty casters shall be model # RKW-HD. RKW-HD shall have a weight capacity of 250 lbs.
- Additional set of rear rackrail, shall be model # RK-RRX (X = total # of rackspaces)

#### OPTIONS

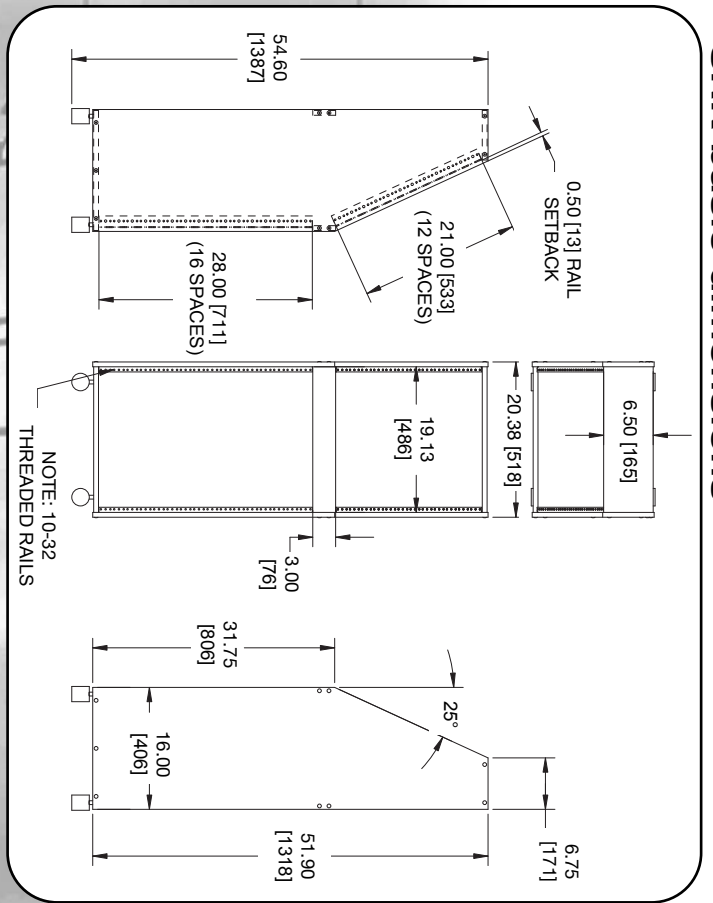
- Smoked glass front door shall be model # RK-GD \_\_ (6, 8, 10, 12, 14, 16, 20, 28) for \_\_ rackspace (M), (O), (B)RK rack
- Quick-Position™ shelf with built-in cable management slots shall be model # SH-BRK. Shelf mounts without rackrail for OBRK/BRK and MBRK-18" depth and accepts horizontal mounting of PD-8155C or PD-8155C-NS power strip

#### OPTIONS (BRK, MBRK 22" and 28" DEPTHS)

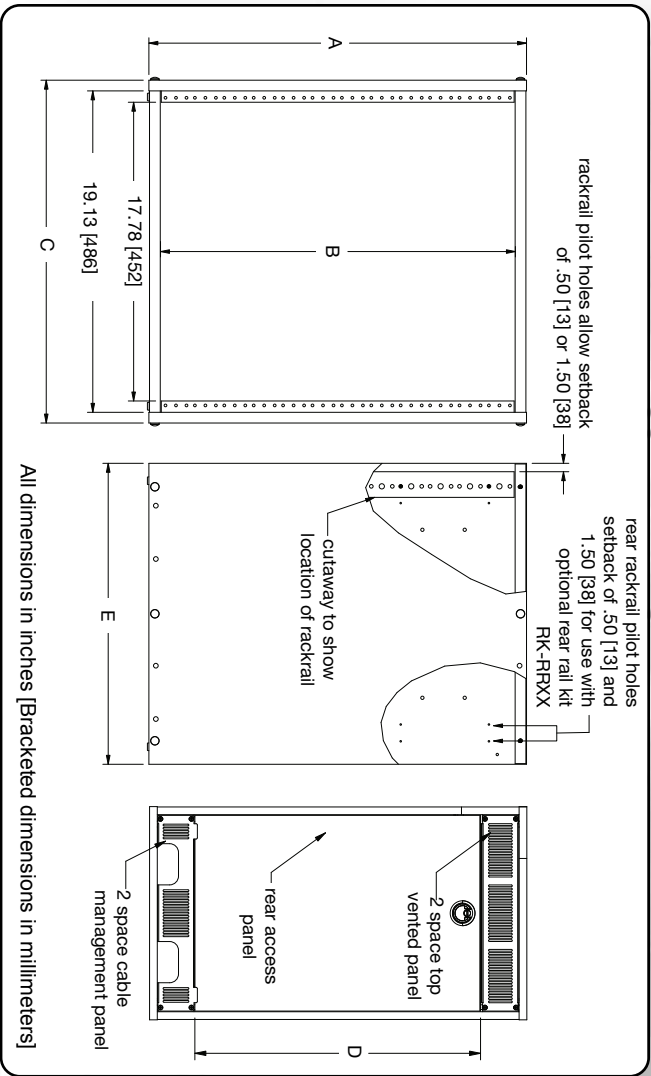
- Rear access panel shall be Middle Atlantic Products model # \_\_ (refer to chart). Rear access panel shall have an overall height of \_\_ (refer to chart). Rear access panel shall include a 2-space top vented panel and a 2-space cable management panel.
- Fan kit shall be Middle Atlantic Products model # DCFANKIT-4 (110V), or IDCFANKIT-4 (220V). Fans shall displace 100 CFM of free air and replaces vented panel on rear access panel. Fan kit works with rear access panel.

CUSTOMIZABLE SPECIFICATION CLIPS AVAILABLE AT MIDDLEATLANTIC.COM

## SRK basic dimensions



## RK/BRK/OBRK/MBRK/MBRK basic dimensions



Model Number	A Overall Height	B Racking Height	C Outside Width	E Overall Depth	Weight Capacity
RK2	4.98 (126)	3.50 (89)	20.40 (518)	15.91 (404)	200 lbs.
RK4	8.48 (215)	7.00 (178)	20.40 (518)	15.91 (404)	200 lbs.
RK6	11.98 (304)	10.50 (267)	20.40 (518)	15.91 (404)	200 lbs.
RK8	15.48 (393)	14.00 (356)	20.40 (518)	15.91 (404)	200 lbs.
RK10	18.98 (482)	17.50 (445)	20.40 (518)	15.91 (404)	200 lbs.
RK12	22.48 (571)	21.00 (533)	20.40 (518)	15.91 (404)	200 lbs.
RK14	25.98 (660)	24.50 (622)	20.40 (518)	15.91 (404)	200 lbs.
RK16	29.48 (749)	28.00 (711)	20.40 (518)	15.91 (404)	200 lbs.
RK20	36.48 (927)	35.00 (889)	20.40 (518)	15.91 (404)	200 lbs.
BRK6	11.98 (304)	10.50 (267)	20.40 (518)	17.91 (455)	200 lbs.
BRK8	15.48 (393)	14.00 (356)	20.40 (518)	17.91 (455)	200 lbs.
BRK10	18.98 (482)	17.50 (445)	20.40 (518)	17.91 (455)	200 lbs.
BRK12	22.48 (571)	21.00 (533)	20.40 (518)	17.91 (455)	200 lbs.
BRK14	25.98 (660)	24.50 (622)	20.40 (518)	17.91 (455)	200 lbs.
BRK16	29.48 (749)	28.00 (711)	20.40 (518)	17.91 (455)	200 lbs.
BRK20	36.48 (927)	35.00 (889)	20.40 (518)	17.91 (455)	200 lbs.
OBRK8	15.63 (397)	14.00 (356)	20.70 (526)	17.91 (455)	200 lbs.
OBRK12	22.63 (575)	21.00 (533)	20.70 (526)	17.91 (455)	200 lbs.
OBRK16	29.63 (753)	28.00 (711)	20.70 (526)	17.91 (455)	200 lbs.
OBRK20	36.63 (930)	35.00 (889)	20.70 (526)	17.91 (455)	200 lbs.
MBRK8	15.63 (397)	14.00 (356)	20.70 (526)	17.91 (455)	200 lbs.
MBRK12	22.63 (575)	21.00 (533)	20.70 (526)	17.91 (455)	200 lbs.
MBRK16	29.63 (753)	28.00 (711)	20.70 (526)	17.91 (455)	200 lbs.
MBRK20	36.63 (930)	35.00 (889)	20.70 (526)	17.91 (455)	200 lbs.
(M)BRK8-22	15.63 (397)	14.00 (356)	20.70 (526)	22.00 (559)	200 lbs.
(M)BRK12-22	22.63 (575)	21.00 (533)	20.70 (526)	22.00 (559)	200 lbs.
(M)BRK16-22	29.63 (753)	28.00 (711)	20.70 (526)	22.00 (559)	200 lbs.
(M)BRK20-22	36.63 (930)	35.00 (889)	20.70 (526)	22.00 (559)	200 lbs.
(M)BRK28-22	50.63 (1286)	49.00 (1245)	20.70 (526)	28.00 (711)	250 lbs.

RK and BRK (18" depths) racks are constructed of 5/8" furniture grade MDF board construction.  
 BRK (22" and 28" depths), MBRK and OBRK racks are constructed of 3/4" furniture grade, MDF board construction.

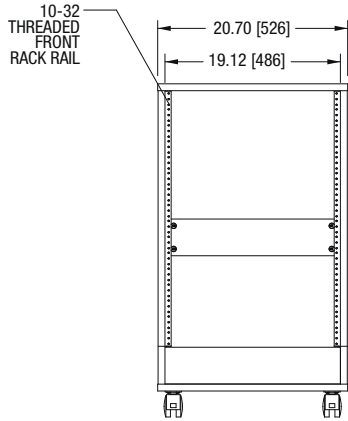
Model Number	D Rear Access Panel
RK-RAPI(-MP)	6.78 (172)
RK-RAPI2(-MP)	13.78 (350)
RK-RAPI6(-MP)	20.78 (528)
RK-RAPI20(-MP)	27.78 (706)
RK-RAPI28(-MP)	41.78 (1062)

Model	Color
RK	Black
OBRK	Oak
MBRK	Maple
BRK	Black
SRK	Black

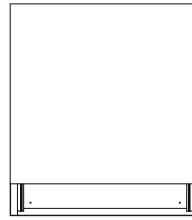


# OSR basic dimensions

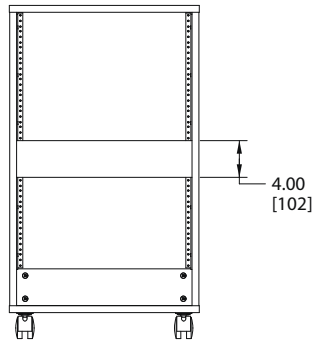
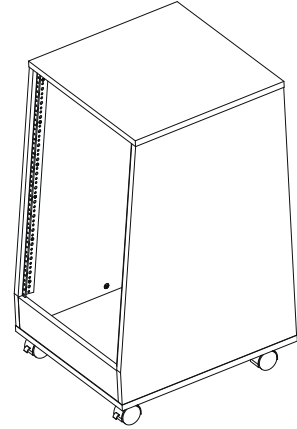
All dimensions in inches [Bracketed dimensions in millimeters]



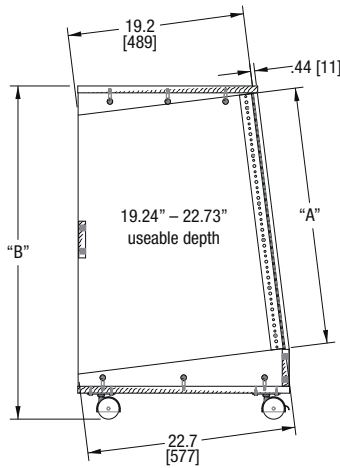
FRONT VIEW



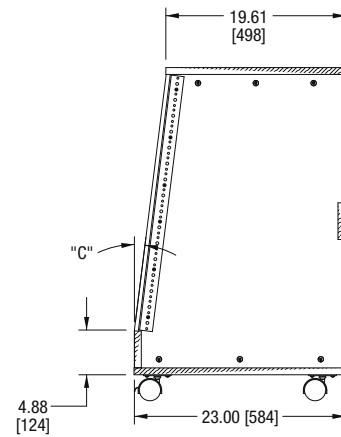
TOP VIEW



REAR VIEW



LEFT SIDE VIEW



RIGHT SIDE VIEW

Model Number	Racking Height	"A"	"B" Overall Height	"C" Angle
OSR-16	16 Space	28.00 [711]	36.37 [924]	7°
OSR-24	24 Space	42.00 [1067]	50.37 [1279]	5°

