



Saudi Arabian Railways (SAR)


Multi Purpose Room

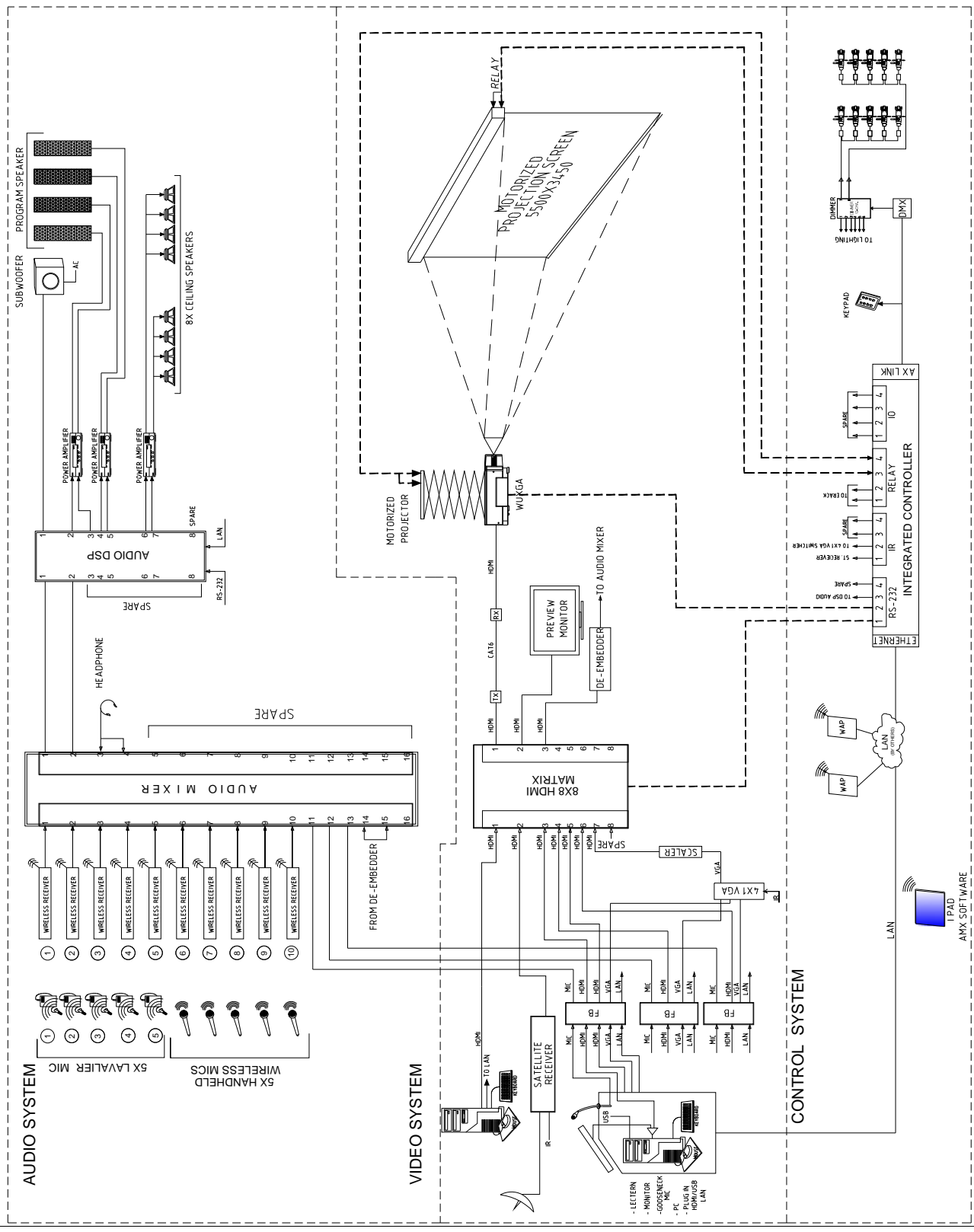
Technical Submittal

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NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 2. THIS DRAWING SHALL BE READ IN ACCORDANCE WITH ARCHITECTURAL AND ELECTRICAL MECHANICAL SHOP DRAWING SERVICES.
 3. SCOPE OF WORK IS STATED IN THE CONTRACT BILL OF MATERIALS. OTHER RELATED WORKS (E.G. CIVIL, CARPENTRY, ELECTRICAL & POWER CONDUITING, FLOORBOXES, CABLE TRAYS, TRIMMING ETC.) NOT MENTIONED SHALL BE PERFORMED BY OTHERS.

 Saudi Arabia Kingdom of Saudi Arabia	
SAUDI ARABIAN RAILWAY MULTI PURPOSE ROOM	
DRAWING NUMBER: E150-001 AV SYSTEM	REVISION: 0
DATE: 05/20/2015 DRAWN BY:	CHECKED BY:
FOR APPROVAL DATE: 06/01/2015	
CONTRACT NUMBER: 095	



AV SYSTEM E150-001
 ONE LINE DIAGRAM



Functional Systems Description

Multipurpose Hall

Functional Systems Description

Item: Multipurpose Hall

SAR Requirement:

The system requirement for the SAR Multipurpose Hall is stated in the DRS as:

- All the equipment listed below shall be supplied, installed, connected, tested and commissioned. An installation plan with all designs, equipment and material used shall be submitted for approval to the client.
 - All Audio, Video and data cabling shall be included.
 - All Audio, Video connectors shall be supplied complete with necessary back boxes (wall or floor mounted) and faceplates (to the approval of the client)
 - All equipment shall be rack mounted except Lectern, Projectors, Screen, Lifts for Projectors, mixers. Rack shall be located in separate room (next to stage)
 - All necessary interfaces shall be provided for interlock with main Public Address System, MATV/Satellite Dish receiver system and Data Network System/Internet.
 - All audio and video connectors (wall or floor mounted) comprise HDMI / DVI, RGB, VGA, RS-232, audio jack, XLR
 - Supplier shall design, deliver and install a complete and working audio visual and lighting system for the Multi Purpose room. This shall consist of at least the following: Video projection Supply, Install and Connect an operational System
 - A 1 HD 1080P Video Projector ceiling mounted
 - B 1 Motorized Lift for Video Projector
 - C 1 Motorized Screen 16:10, 5,5 m wide
 - D 1 Blu-ray player
 - E 1 video 1080P Switcher with at least 8 HDMI inputs (placed on Equipment table)
 - F 1 Equipment Rack (installed in separate room next to stage)
 - G 1 Equipment table (installed in separate room next to stage)
 - H All necessary raceways, conduits, cabling and accessories for Video System Audio System Supply, Install and Connect an operational System
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- I Sufficient number of stage-, wall- and ceiling mounted speakers including subwoofer system
 - J all necessary Power Amplifiers
 - K 5 Wireless Tie Clip Microphones with receivers (in rack, if necessary with external antenna on stage)
 - L 5 wireless microphones with stands and receivers (in rack, if necessary with external antenna on stage)
 - M 2 CD players
 - N 1 Audio Mixer (placed on Equipment table)
 - All necessary raceways, conduits, cabling and accessories for Audio System Lighting System Supply, Install and Connect an operational System
 - P 10 coloured stage lights, truss mounted, DMX controlled
 - Q 1 ceiling mounted truss
 - R 1 DMX controller (placed on Equipment table)
 - S auditorium main lighting (complete) T auditorium main lighting controller (placed on Equipment table)
 - U All necessary raceways, conduits, cabling and accessories for Lighting System Ducting and cabling. Supply, install and connect inlet and outlet boxes with conduit and cabling between the following outlet boxes and system rack/ table: V 4 Audio and Video inlet recessed in floor boxes at the stage.

Solution:

The proposed solution is fully specification compliant based on the above outline specification as well as clarifications from SAR.

1. A Christie Digital DWU951-Q WUXGA (1920 x 1200), 8900 ANSI lumen projector with 1.6-2.4 zoom lens is ceiling mounted on a Display Devices DL3-B-7.5 motorized projector mount. This model has 3 positions: Up (stored above ceiling), Down (at standard projection height) and Maintenance (2.2 meters beneath ceiling level for facilitating projector maintenance).
 2. A DaLite Professional Electrol motorized projection screen with viewable screen area of 5.5 x 3.45 H meters is mounted above ceiling level and lowers in coordination
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with the projector lift. The screen surface is High Contrast Grey for enhanced viewing of computer graphics.

3. Video sources are switched through an Extron DXP 88 HDMI matrix under the control of the AMX remote control system. Video sources include HD satellite receiver, BluRay disc player (built-in to presentation PC) and multiformat (DVI/HDMI/VGA) floor boxes and interface plates. Analog VGA/RGB sources will be applied to an Aten 4 x 1 VGA switch before being applied to a Gefen EXT-VGA AUD -2 – HDMI's digital scaler.
 4. Audio sources are applied to a Yamaha MG-166CX 16 channel audio mixer that is mounted at a control desk in the equipment room. Sources include 10 wireless microphone receivers, gooseneck lectern microphone and two channels of audio (stereo) that are de-embedded from the HDMI AV signals at the HDMI matrix.
 5. Stereo outputs of the Yamaha mixer are applied to a Peavey Digital audio DSP for speaker management. The Digitool will be programmed for low pass subwoofer, stereo column speakers at stage right and left, and 2 channels of ceiling speakers at the rear of the auditorium. The speakers are comprised of JBL subwoofer, Bose MA-12 column speakers and Posh Retro5.25 ceiling speakers.
 6. Wireless microphones are comprised of five (5) Shure lavalier and five (5) Shure handheld UHF multichannel ULXF models. The handheld microphones are furnished with telescoping microphone stands and 1.5 meter microphone cables.
 7. The stage lectern will house an I7 Win7 presentation PC, 19" HD LCD monitor and gooseneck microphone.
 8. Stage lighting is mounted to two trusses, right and left of center stage, with ten (10) Altman RGBW LED lighting fixtures under DMX-512 control. House lighting is also DMX-512 controlled with DALI interface to the lighting channels (to be confirmed in final design)
 9. The control desk in the equipment room houses the Yamaha audio mixer and an IPAD with AMX remote control program for control of the AV equipment and auditorium lighting. The control desk also has monitor headphones (Yamaha CM500) for operator monitoring.
 10. The remote control system is based on AMX Netlinx NX-2200, which controls all AV and lighting in the auditorium. Manual (cleaner/housekeeping) switches will be installed with relay communications to the AMX controller.
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11. The AMX controller will have GP I/O interface for the FAS/BMS system (by others) whereby during FAS alarms audio will be muted and lights raised to full on to facilitate building evacuation.
 12. Primary AV equipment, aside from the projector and projector lift and speakers, will be rack-mounted in an Estap 42U rack with casters, power management and ventilation.

Drawing Ref E150-001 depicts the connectivity of the SAR Multipurpose Hall AV System.

Multi-Purpose Hall (E150-001)



Video System



Projector

Christie | DWU951-Q

Christie Q Series

Auditoriums

Boardrooms

Conference rooms

Education

Events

Government

Health care

Houses of worship

Meeting rooms

Rental and staging

Video mapping



Available in black

Bringing performance to new
levels in an affordable solution

CHRISTIE[®]

Christie Q Series

The Christie® Q Series takes projectors to a new level of high-brightness to bring you the industry's highest-quality 1-chip DLP® projector. Deliver your presentations and video content clearly with image quality that you would expect from Christie. With a range of projection options, sleek overall style and high-performance features, the Christie Q Series brings you superior image processing, versatility and affordability.



Best-in-class brightness

Christie DXG1051-Q
XGA – 10,000 ANSI lumens

Christie DHD951-Q
HD – 8200 ANSI lumens

Christie DWX951-Q
WXGA – 8500 ANSI lumens

Christie DWU951-Q
WUXGA – 8500 ANSI lumens

Advanced features for superior image quality

eClarity

Our eClarity advanced image processing enhances your content by improving sharpness, gloss and shading, perfect for making non-HD content look like HD. Use eClarity to improve your standard and high-definition content for a brilliant, true-to-life image reproduction.



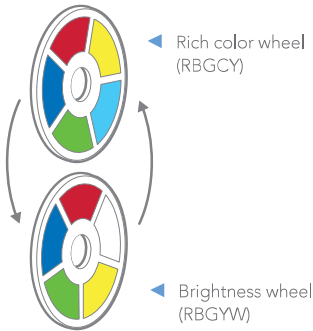
▲ Unadjusted image ▲ Adjusted image



▲ Sharpen ▲ Gloss ▲ Shade

Built-in dual-color wheel

A set of two color wheels are built into the projector and can be selected at a touch of a button. The built-in color wheels allow for easy switching between high brightness or ultra-rich color reproduction mode, perfect for your presentation needs. In large venues the high brightness color wheel gives you maximum output and superior white levels. The ultra-rich color wheel expands the color gamut for incredible reproduction that rivals cinema color standards.



High Dynamic Contrast Range

High Dynamic Contrast Range (HDCR) improves visual contrast to avoid giving content a washed out effect in environments with a lot of ambient light. HDCR helps by adjusting the dynamic contrast level which will help recapture detail lost by excess ambient light on the screen.



◀ HDCR off



◀ HDCR on

Advanced image control

Motion-adaptive de-interlace delivers improved viewing of video content and fast-moving motion graphics. On-image display of gamma and color balance equalization allows you to manipulate your image configuration in real time.

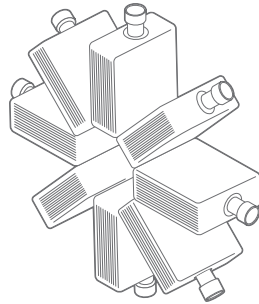


◀ Standard video capture



◀ Digital rapid motion adaptive de-interlacer

Designed for performance



▲ 360 degree projection



▲ Standard mode



▲ DICOM simulation mode

Blending or warping capabilities

Blending or warping are easy with the new Q Series software and the use of off-the-shelf standard cameras¹. The software and camera option allow for easy and quick edge-blending capabilities. You can also use the software to set up multiple projectors for warping images (advanced geometry correction) or for multi projector blending to create large panoramic seamless display.

Broad variety of lensing options

New lens shift capability with our ultra-short throw lenses allows you to install projectors as close as necessary to your projected image without compromising display size.

Multiple screens, or creative projection on multiple areas, are not a problem with up to three memory settings for lens shift, zoom and focus recalls.

Portrait mode and 360 degree projection

Projectors can be used in portrait orientation using existing lamps, reducing your set-up time and minimizing extra costs for special lamps. They can also be installed in a 360 degree configuration.

Enhanced lamp options

Dual-lamp design lets you maximize brightness or extend lamp life. Lamps can be used in relay, eco, auto backup and balance mode. Lamp life is up to 2000 hours for standard mode, up to 4000 hours for eco 2-lamp and up to 8000 hours in optional lamp relay modes. The lamps are also designed to be swapped out without shutting down the projector².

Connectivity

HDBaseT provides the latest in intelligent and flexible connectivity, simplifying installation and management by allowing for video content, audio and control to be delivered over low cost CAT5/6e cabling to HDBaseT-compatible products.

Digital Imaging and Communication in Medical (DICOM) simulation

DICOM simulation mode provides enhanced grey scale levels for medical training³ applications requiring DICOM part 14 specifications.

Built-in LCD information display

The LCD display gives you real-time diagnostic information, assisting in network setup or helping with troubleshooting. Examples of some display options:

Lamp time

Filter hours

Projector usage

IP address

¹ Logitech : HD Pro Webcam C910 / HD Pro Webcam C920; Canon Digital SLR: T1i / T2i / T3 / T3i.

² Please reference manual for activating feature.

³ Simulation mode is for training purposes only, not for medical diagnostics of actual patients.



Variety of lens options to choose from

Our suite of lenses give you the range to install from a 0.8:1 all the way to a 9.2:1 throw ratio⁴.

Lens options⁴

Description	Part number
0.8-1.0 ultra short throw zoom	121-118101-01
1.2-1.8/1.1-1.7 short throw zoom	121-119102-01
1.7-2.6/1.6-2.4 standard zoom (WXGA/WUXGA)	121-120104-01
1.7-2.5 standard zoom (XGA)	121-121105-01
2.5-3.8/2.4-3.6 middle throw zoom	121-122106-01
3.6-5.8/3.7-5.9/3.5-5.6 long throw zoom	121-123107-01
5.7-9.1/5.8-9.2/5.5-8.8 ultra long throw zoom	121-124108-01

Wireless presentation and projector control

Using Christie® Q Series projectors and the Christie QuickConnect App you can project photos, documents and websites over Wi-Fi® from your iOS or Android™ based mobile digital devices.



◀ Choice between black or white models in every resolution

⁴ Throw ratio varies by resolution. See www.christiedigital.com for further information.

Going above and beyond

In addition to high quality products, what makes Christie® different from everyone else?

We go above and beyond to take care of our customers. Customers keep coming back to us because they can't get the same level of support anywhere else.

We care about our customers. Your satisfaction is our ultimate goal. We stand behind our products, and support you with our industry recognized warranty and service programs.

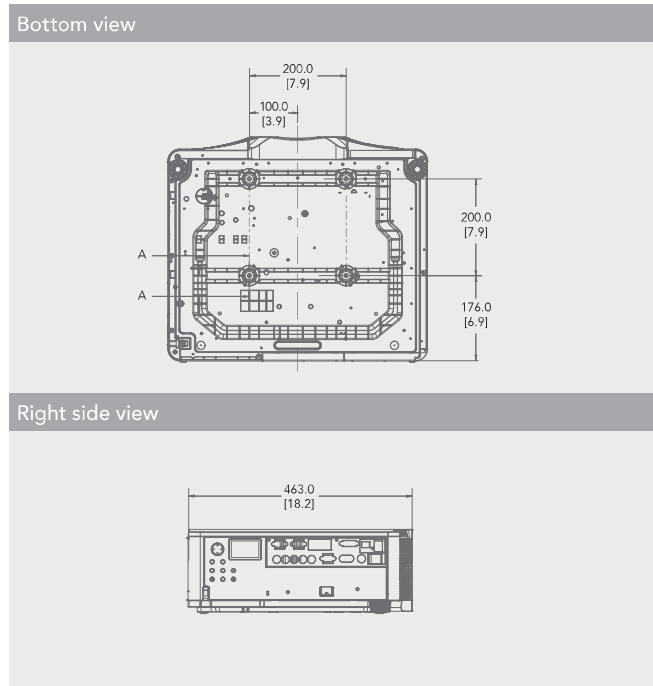
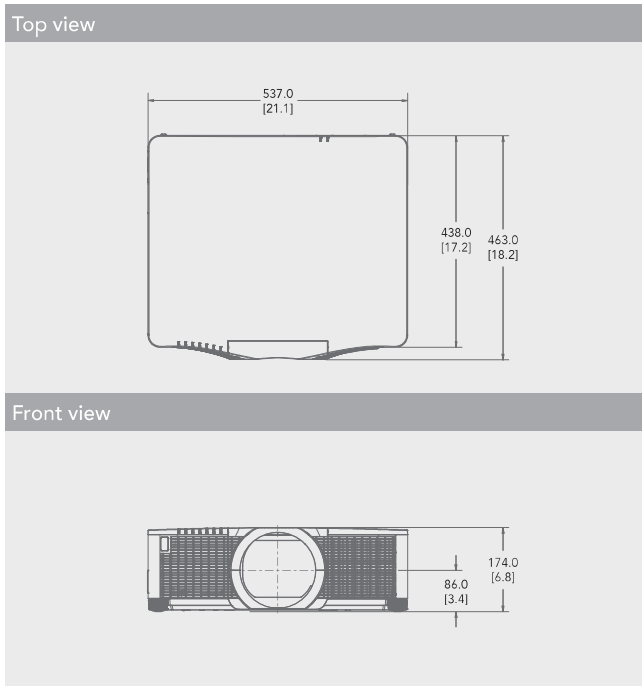


Christie support and service

All Christie products are backed by industry-leading warranties, renowned service and support. We ensure our customers are well supported with training, service and technical support through our extensive distribution and support network.

Christie has local support on five continents offering support for international installations and global deployments.

We offer customer-centric service with years of extensive experience in varieties of applications.



		Christie DXG1051-Q	Christie DWX951-Q	Christie DHD951-Q	Christie DWU951-Q
Image	brightness	• 10,000 ANSI lumens – (10,400 center lumens)	• 8500 ANSI lumen – (8900 center lumens)	• 8200 ANSI lumens – (8500 center lumens)	• 8500 ANSI lumens – (8900 center lumens)
	contrast	• 2000:1 full on/off	• 2500:1 full on/off		
	uniformity	• ≤90% brightness uniformity			
Display	type	• 1-chip 0.7" DLP	• 1-chip 0.65" DLP	• 1-chip 0.65" DLP	• 1-chip 0.67" DLP
	native resolution	• XGA (1024 x 768)	• WXGA (1280 x 800)	• HD (1920 x 1080)	• WUXGA (1920 x 1200)
	color wheels	• Built-in color wheel (CW) options: high brightness CW segments = RGBYW/ultra rich CW segments = RGBYC			
Lamp	type	• 370W P-VIP x 2			
	typical lifetime	• Standard mode: up to 2000 hrs • Eco mode: up to 4000 hrs		• Portrait mode: up to 1000 hrs	• Portrait mode: up to 500 hrs
Inputs	standard	• Computer D-sub 15 pin mini jack x 1 • BNC connector x 1 (composite) • HDMI connector x 2 • DVI-D connector x 1 /RJ-45 x 1 (HDBaseT) • D-sub 9 pin x 1 (RS232c) • RJ-45 x 1 (LAN) • USB type A connector x 1 (Optional Wireless USB or PC-less) • Wired remote control (3.5mm)			
	optional	• 5BNC connector x 1 • BNC connector x 1 (composite)		• 3G-SDI (only available on DHD951-Q)	• 5BNC connector x 1 • BNC connector x 1 (composite)
	signals	• Optional wireless dongle (USB)			
	pixel clock	• 525i(480) • 525p(480p) • 625i(576i) • 1125i(1080i@50/60) • 750p(720p@50/60) • 1125p(1080p@50/60)			
Outputs	standard	• Computer out D-sub 15 pin mini jack x 1 • Wired remote control (3.5mm)			
Control and networking		• RJ-45 x 1 (LAN) • RJ-45 x 1 (HDBaseT) • D-sub 9 pin x 1 (RS232c)			
Lenses		• For further details on lenses, please see www.christiedigital.com			
Accessories	standard	• Power cord (US cord, 3m) / (Euro code, 3m) / Power cord (China cord, 3m only for China models) • RGB cable (2m) • Wireless remote control / AA batteries x 2 • Adapter cover • Ferrite core and band x 2 • Cable tie x 2 • User's manual CD (safety guide) • Quick setup guide • Network quick setup guide • Operating guide • Network guide • Network guide • Instant stack guide • Technical guide • Software license agreement x 1 • User's manual			
	optional	• Replacement lamp (003-004774-XX)	• Replacement lamp (003-005053-01)	• Replacement lamp (003-004774-XX)	
Enhanced feature sets		• Replacement hybrid filter (003-004775-X) • Optional wireless dongle (USB) (121-116109-XX) • Replacement remote			
Power requirements	operating voltage	• 110-120 VAC • 220-240 VAC			
	consumption	• AC110-120V, 50/60Hz 1060W • AC220-240V, 50/60Hz 990W • Less than 0.5W @ standby with saving. (AC230V) • Saving mode disables MONITOR OUT, AUDIO OUT, speaker sound, LAN communication and RS232C control except Power ON command in standby			
	operating current	• 10.5A +10% or less at 110-120VAC • 5.2A+10% or less at 220-240 VAC			
	dissipation	• 3618 BTU/hr (110-120V) • 3379 BTU/hr (220-240V)			
Physical specs	size	• (LxWxH) 18.2 x 21.1 x 6.9" (463 x 537 x 174mm) without lens and feet in minimum position			
	shipping size	• (LxWxH) 22.1 x 29.3 x 12.4" (561 x 743 x 315mm) without lens and feet in minimum position			
	weight	• 37.5lbs (17kg)			
	shipping weight	• 49.6lbs (22.5kg)			
Operating environment	noise	• Standard mode: 36dBA • Eco mode: 29dBA			
	operating temperature	• 32-113°F (0-45°C) from sea level to 5249ft (1600m) • 32-104°F (0-40°C) from 5249ft (1600m) to 10,000ft (3048m)			
	altitude	• 0-10,000ft (3048m)			
	humidity	• 10-80% non-condensing			
Regulatory		• This product conforms to the following regulations related to product safety, environmental requirements and electromagnetic compatibility (EMC) • FCC, Part 15, Subpart B, Class A • EN55022/CISPR22 Class A • ICES/NMB003 (A) • EN55024 / CISPR24 • IEC 60950-1 • UL 60950-1 • EN 60950-1 • CAN/CSA C22.2 No. 60950-1 • Directive 2011/65/EU (RoHS) • Directive 2012/19/EU (WEEE) • EU Regulation (EC) No. 1907/2006 (REACH) • Certifications marks (check with Christie for latest update): cULus (Canada & US), CE (EU), CCC (China), EAC (Russia), RCM (Australia and New Zealand), India (BIS), Mexico (NOM), Saudi Arabia, South Africa			
Limited warranty		• Three years parts and labor limited warranty • Lamp: 500 hours or one year (whichever comes first) • Contact an authorized Christie representative for full details of our limited warranty			



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For the most current specification information, please visit www.christiedigital.com



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Printed in Canada on recycled paper. 3857 Jun 14

CHRISTIE®

Ceiling Projector Lift

Digital Device | DL3B-7.5- 220V-SER

With a lowering distance of up to 14 feet and a weight capacity of up to 160 lbs., the DL3B Series Projector Lifts are the perfect solution for auditoriums, boardrooms, or virtually any room with a high ceiling.

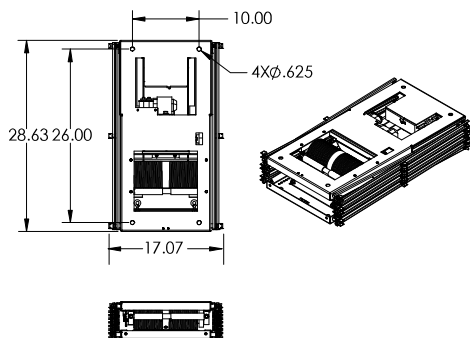
- Lowering distances: 7.5'-14'
- Weight capacity: 160 lbs.
- Three positions: stowed, show, service
- For mid-sized to large projectors, flat panel displays
- Position repeatable to better than 1/16"
- Cable management system
- Whisper-quiet operation
- Includes programmable wired hand-held remote
- Accessories: optional controls - RS232, IR, RF, optional closure styles for finished or grid tile, plenum enclosures, motorized rotation, and cable pre-wire package



Lift only - no projector or closure system

DL3B-7.5	17.5"w x 28.5"l x 6.75"h	92 lbs.
DL3B-9.5	17.5"w x 28.5"l x 7.75"h	97 lbs.
DL3B-11	17.5"w x 28.5"l x 8.75"h	102 lbs.
DL3B-12.5	17.5"w x 28.5"l x 9.75"h	107 lbs.
DL3B-14	17.5"w x 28.5"l x 10.75"h	112 lbs.

Model	Length
• DL3B-7.5	7.5 feet
• DL3B-9.5	9.5 feet
• DL3B-11	11 feet
• DL3B-12.5	12.5 feet



All plenum enclosures are built to the smallest dimension possible. Contact Sales for dimensional drawings of your specific projector / installation.

Metric conversion: inches x 25.4

- Contact closure operation - 12V trigger in / out
- Power requirements: 110V, 1.2 amp; 220V, 0.6 amp
- Safety belt for earthquake standards
- Digital electronics with self diagnostics
- User-programmable show / service positions
- Specify projector / lens for proper mount / closure
- Requires Display Devices mount adapter
- 1 year warranty

Model #	DL3B Series Projector Lifts Options and Accessories
xxx	Mounting Adapter interface for projector. Must specify make and model number of projector and lens if projector offers lens options.
OPT-1	Ceiling Closure Frame. Used with drywall or wood ceilings. Provides 2" trim finish for projector opening. Spring loaded and fully adjustable. <u>Note:</u> EBR is recommended for installations with restricted access.
OPT-1L	Lipless Ceiling Closure Frame - Provides minimal seam around projector opening for drywall or wood ceilings. Spring loaded and fully adjustable. <u>Note:</u> EBR is recommended for installations with restricted access.
OPT-3	Plenum Rated Housing With Closure Frame - Enclosed support framework and closure frame for drop-tile ceilings with plenum requirements. 2" trim finish for projector opening. Includes ceiling closure, spring-loaded and fully adjustable.
OPT-3L	Plenum Rated Housing With Lipless Closure Frame. Enclosed support framework and closure frame for drop-tile ceilings with plenum requirements. Provides minimal seam around projector opening. Includes ceiling closure, spring-loaded and fully adjustable.
OPT-4	Non-Plenum Rated Housing With Closure Frame. Support framework and closure frame for drop tile ceilings with non-plenum requirements. 2" trim finish for projector opening. Includes ceiling closure, spring-loaded and fully adjustable.
OPT-4L	Non-Plenum Rated Housing With Lipless Closure Frame. Support framework and closure frame for drop tile ceilings with non-plenum requirements. Provides minimal seam around projector opening. Includes ceiling closure, spring-loaded and fully adjustable.
OPT-5	Bomb Bay Door ceiling closure system. Provides support framework and dual opening doors for non-plenum applications.
OPT-9	RS-232 Serial control interface - allows for unlimited show positions when using a third party control system (Crestron/AMX).
OPT-11A	Cable Pre-Wire of lift with control, signal and power cabling.
PCS-02	Power Current Sensor for projectors and Flat Panel Displays, 110V only.
EMRCM	Electronic Motorized Rotating Ceiling Mount. Adds rotation of a projector to any Display Devices projector lift. Controlled via third party RS-232 (i.e., Crestron, AMX, etc.) to allow nine programmable vertical and rotational show positions. Weight capacity of 100 lbs. 110V /220V.
REM-IR	Wireless Infrared Remote control. May be used with any motorized Display Devices product.
REM-RF	Wireless RF Remote control. May be used with any motorized Display Devices product.
WPR-L01-W	Wall Plate Remote for all lifts. Single-gang white.
WPR-L01-B	Wall Plate Remote for all lifts. Single-gang black.
WPR-L01-S	Wall Plate Remote for all lifts. Single-gang brushed steel.
REM-L19-RM	Rack Mount Panel Remote wired control panel. 1.75" x 19" EIA. Black.
REM-L02-W	Locking Wall Plate Remote wired control panel with security key lock. 2-gang, white.
REM-L02-B	Locking Wall Plate Remote wired control panel with security key lock. 2-gang, black.
REM-L02-S	Locking Wall Plate Remote wired control panel with security key lock. 2-gang, brushed steel.
SPK-DL	Spare Parts Kit - includes control electronics, timing sprocket, limit switches, multi meter, motor control box.
EBR	Emergency Brake Release - Lowers lift for service access. Recommended when access to a retracted lift is restricted i.e., drywall. Must be purchased at the same time as the lift.



Projection Screen



Da-Lite | Professional Electrol



Professional Electrol

For larger venue installs, the Professional Electrol® can be ceiling recessed, wall mounted or suspended from the ceiling. The screen features a wooden housing with adjustable brackets that can be used in any type of installation.

The Professional Electrol does not include the Tensioning Cable System. See the Tensioned Professional Electrol for Tensioning Cable System.

Features

- Three-position, Decora-style switch
- Standard black backing retains projected brightness
- Black painted case
- Seamless surfaces up to and including 16' high

Optional Accessories:

- Single Motor Low Voltage Control System
- Radio Frequency Wireless Remote Single Motor LVC
- Infrared Wireless Remote Single Motor LVC
- Video Projector Interface
- SCB-100
- Key Operated, 110 Volt Switch
- Locking Switch Cover Plate
- Dual Motor Low Voltage Control System
- Radio Frequency Wireless Remote Dual Motor LVC
- Infrared Wireless Remote Dual Motor LVC
- 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
78" x 139"	198 x 353	159"	404	154"	391
92" x 164"	234 x 417	188"	478	178"	452
106" x 188"	269 x 478	216"	549	202"	513
119" x 212"	302 x 538	243"	617	226"	574
133" x 236"	338 x 599	271"	688	250"	635
146" x 260"	371 x 660	298"	757	274"	696
160" x 284"	406 x 721	326"	828	298"	757

4:3 Video Format

Viewing Area (H x W)		Nominal Diagonal		Overall Case Length	
in.	cm	in.	cm	in.	cm
120" x 160"	305 x 406	200"	508	174"	442
123" x 164"	312 x 417	210"	533	178"	452
141" x 188"	358 x 478	240"	610	202"	513
159" x 212"	404 x 538	265"	673	226"	574
177" x 236"	450 x 599	295"	749	250"	635
195" x 260"	495 x 660	325"	826	274"	696
213" x 284"	541 x 721	355"	902	298"	757

Available with the Following Screen Surfaces



Matte White

Half Angle: 60° Gain: 1.0



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8 x 8 HDMI Matrix Switch

Extron | DXP 88 HDMI

DXP HDMI Series

HDMI MATRIX SWITCHERS

- ▶ Available in 4x4, 4x8, 8x4, and 8x8 I/O sizes
- ▶ Supports computer-video to 1920x1200, including HDTV 1080p/60
- ▶ Supports HDMI specification features including data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats
- ▶ HDCP compliant
- ▶ SpeedSwitch™ Technology provides exceptional switching speed for HDCP-encrypted content
- ▶ Key Minder®
- ▶ EDID Minder®
- ▶ Automatic cable equalization for each input to 100 feet (30 meters) at 1920x1200
- ▶ Automatic output reclocking
- ▶ Provides +5VDC, 250mA power on the HDMI outputs for peripheral devices



The Extron DXP HDMI Series are designed for applications where routing of high resolution, digital video signals is required. They are HDCP compliant and available in sizes of 4x4, 4x8, 8x4, and 8x8, and offer several proprietary features to optimize performance and reliability of HDMI transmission to and from the matrix switcher. The DXP HDMI Series also offers the same convenience features common to Extron matrix switchers, such as the QS-FPC front panel controller with tri-color backlit buttons, global presets, Ethernet control, and RS-232/RS-422 serial control.



Extron Electronics
INTERFACING, SWITCHING AND CONTROL

DESCRIPTION

The Extron **DXP HDMI Series** are high performance, HDMI matrix switchers. They support resolutions up to 1920x1200 and HDTV 1080p/60, enabling simultaneous distribution of content-protected HDMI and DVI signal sources to one or more compliant displays. The matrix switchers support HDMI specification features, including data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats. The DXP HDMI Series also incorporates a number of intelligent technologies that help integrators ensure reliable system operation and compatibility between digital devices, including SpeedSwitch™ Technology, Key Minder®, HDCP Visual Confirmation, EDID Minder®, and Automatic Input Cable Equalization and Output Reclocking. Available in I/O sizes from 4x4 to 8x8, the DXP HDMI Series is ideal for use in applications that require reliable, high performance routing of HDMI and DVI digital signals between multiple devices.

The DXP HDMI Series features two key Extron technologies that enhance and simplify integration: EDID Minder and Key Minder. EDID Minder automatically manages EDID communications for each input/output tie. By maintaining continuous EDID communication with all sources, EDID Minder ensures that all HDMI sources power up properly and maintain their video outputs whether or not they are actively connected to the digital display devices through the matrix switcher's outputs. For HDMI signals with protected content, Key Minder continuously authenticates HDCP-compliant input and output devices to ensure quick and reliable switching in professional AV environments while enabling simultaneous distribution of a single source signal to one or more displays. When an HDCP-compliant source is routed to a non-compliant display, the switcher outputs a full-screen green signal, providing immediate visual confirmation that the protected content cannot be viewed on the selected display.

DXP HDMI matrix switchers also feature automatic cable equalization for all inputs and output reclocking for each output. This reduces the need for additional signal conditioning equipment by compensating for weak source signals or signal loss when using long input cable assemblies. Automatic output reclocking restores signal integrity for improved performance. Signals are reshaped and the timing is restored to allow for transmission over long HDMI cables. Additionally, all models offer +5VDC, 250mA on the HDMI outputs for powering peripheral devices.

The DXP HDMI Series matrix switchers are ideal for use in commercial, medical, government, residential, and other environments where a fully digital pathway is essential to maintain image quality of high resolution, digital video signals from multiple sources to multiple displays.

FEATURES

- ▶ **Supports computer-video to 1920x1200, including HDTV 1080p/60**
 - ▶ **Supports HDMI specification features including data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats**
 - ▶ **HDCP compliant**
 - ▶ **SpeedSwitch Technology provides exceptional switching speed for HDCP-encrypted content**
- ▶ **Key Minder continuously verifies HDCP compliance for quick, reliable switching** – Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source signal to one or more displays.
 - ▶ **HDCP Visual Confirmation provides a green signal when encrypted content is sent to a non-compliant display** – A full-screen green signal is sent when HDCP-encrypted content is transmitted to a non-HDCP compliant display, providing immediate visual confirmation that protected content cannot be viewed on the display.
 - ▶ **EDID Minder automatically manages EDID communication between connected devices** – EDID Minder ensures that all sources power up properly and reliably output content for display.
 - ▶ **Automatic color bit depth management** – The switcher automatically adjusts color bit depth based on display EDID, preventing color compatibility conflicts between source and display.
 - ▶ **Automatic cable equalization for each input to 100 feet (30 meters) at 1920x1200/8-bit color when used with Extron HDMI Pro cables**
 - ▶ **Automatic output reclocking** – Reshapes and restores timing of HDMI signals at each output, enabling transmission over long HDMI cables.
 - ▶ **Provides +5VDC, 250mA power on the HDMI outputs for peripheral devices**
 - ▶ **Audio breakaway** – Provides the capability to separate an embedded audio signal, allowing the audio and video signals from one source to be switched to different destinations.
 - ▶ **Global presets** – Up to 32 frequently used I/O configurations may be saved and recalled from the front panel, Ethernet, or serial control.
 - ▶ **Rooming** – The matrix switchers can be configured to group selected outputs into specific "rooms," each with its own set of unique presets. A total of 10 rooms, with 10 presets per room, are available.
 - ▶ **I/O Grouping** – Allows the matrix switcher to be virtually divided into smaller sub-switchers, making installation and control easier.
 - ▶ **Tri-color, backlit buttons** – Can be custom labeled for easy identification. The backlit buttons illuminate red, green, or amber, depending on function, for ease of use in low-light environments.
 - ▶ **Ethernet monitoring and control** – DXP HDMI matrix switchers can be proactively monitored and managed over a LAN, WAN, or the Internet, using standard TCP/IP protocols.
 - ▶ **RS-232 and RS-422 control port** – Using serial commands, DXP HDMI matrix switchers can be controlled and configured via the included Windows®-based control software, or integrated into a control system.
 - ▶ **Control software** – Provides a graphical, drag-and-drop interface for I/O configuration and other customization functions via RS-232 and RS-422 remote control. This software also offers an emulation mode for configuration of an offsite matrix switcher; the I/O configuration may be saved for future downloading to the matrix switcher.
 - ▶ **Front panel security lockout** – Prevents unauthorized use in non-secure environments.
 - ▶ **Rack-mountable 2U, full rack width metal enclosure**
 - ▶ **Includes LockIt® HDMI cable lacing brackets**
 - ▶ **Internal universal power supply**

SPECIFICATIONS

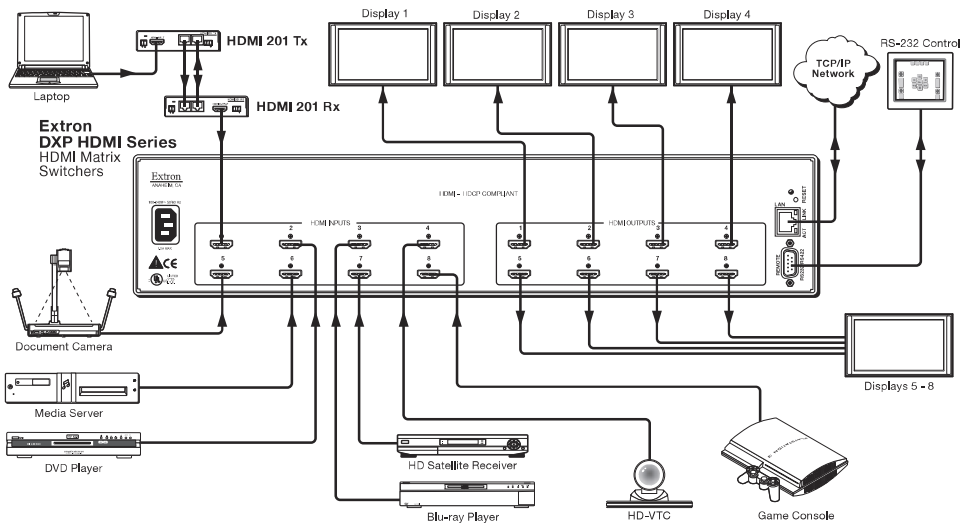
NOTE: *Appropriate HDMI to DVI-D cables or adapters are required for DVI signal input/output.

VIDEO	
Routing	
DXP 44 HDMI	4 x 4 matrix
DXP 48 HDMI	4 x 8 matrix
DXP 84 HDMI	8 x 4 matrix
DXP 88 HDMI	8 x 8 matrix
Signal type	TMDS digital RGB and single-link DVI digital video signals are supported
Digital video	RGB digital video (DVI and HDMI standards) or Y, Cr, Cb digital component video (HDMI), actively buffered (supports all single-link DVI and HDMI [if using an optional adapter] standards from 640x480 @ 60 Hz to 1600x1200 @ 60 Hz computer video and HDTV 480p, 720p, 1080i, 1080p)
NOTE: The DXP HDMI Series switchers support HDMI specification features including data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats.	
Digital audio	Supports HDMI audio transmitted through the RGB and Y, Cr, Cb lines, actively buffered.
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered.
HDCP	Compliant with High-bandwidth Digital Content Protection (HDCP) using DVI and HDMI standards
HPD	Supports hot plug detection (HPD) of display as a pass-through signal.
Gain	Unity
Resolution range	Up to 1080p (HDTV) or 1920x1200 (the highest resolution of the single-link DVI standard) @ 60 Hz
Maximum data rate	6.75 Gbps (2.25 Gbps per color)
Maximum pixel clock	225 MHz
Standards	DVI 1.0, HDMI
Switching speed	200 ns, max.
VIDEO INPUT	
Number/signal type	4 or 8 (depending on model) digital RGB (TMDS) +HDMI (or single-link DVI-D*)
Connectors	4 or 8 female HDMI type A (digital only)
Nominal level	
Digital video	1.2 Vp-p
DDC (Display Data Channel)	5.0 Vp-p (TTL)
Minimum/maximum level	0.5 V to 1.0 Vp-p with no offset
Impedance	100 ohms
Return loss	<-15 dB @ 1 MHz to 1.5 GHz
TDR rise time (10%-90%)	75 ps
Equalization	Automatic
Input cable length	>100' (30 m) at 1920x1200 @ 48, 50, or 60 Hz; or 1080p; 8 bit color
NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphic card, and display used in the system.	
VIDEO OUTPUT	
Number/signal type	4 or 8 (depending on model) digital RGB
Connectors	4 or 8 female HDMI type A
Nominal level	1.2 Vp-p
Minimum/maximum level(s)	0.5 V to 1.0 Vp-p with no offset (follows input)
Impedance	100 ohms
Return loss	<-15 dB @ 1 MHz to 1.5 GHz
DC offset	±500 mV maximum with input at 0 offset
Rise and fall time (20-80%)	0.6 ns
Re-clocking	Automatic
Peripheral device power	250 mA per output

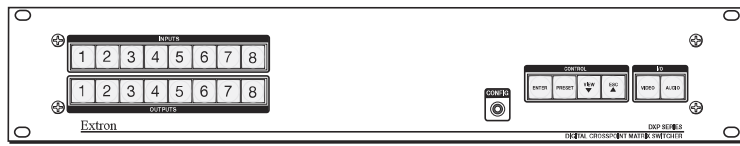
CONTROL/REMOTE — SWITCHER		
Serial control port	(1) RS-232, 9-pin female D connector (1) RS-232, front panel 2.5 mm mini stereo jack	
Baud rate and protocol	9600 to 115200 baud, 9600 baud (default), 8 data bits, 1 stop bit, no parity	
Serial control pin configurations		
9-pin D connector	2 = Tx, 3 = Rx, 5 = GND	
Mini stereo jack	Tip = Tx, ring = Rx, sleeve = GND	
Ethernet control port	(1) RJ-45 female connector	
Ethernet data rate	10/100Base-T, half/full duplex with autodetect	
Ethernet protocol	ARP, ICMP (ping), IP, TCP, DHCP, HTTP, Telnet	
Default settings	Link speed and duplex level = autodetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Gateway = 0.0.0.0 DHCP = off	
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™) Microsoft® Internet Explorer® ver. 6 or higher, Telnet	
GENERAL		
Power supply	Internal Input: 100-240 VAC, 50-60 Hz	
Power consumption	48 watts, fully loaded 8 x 8 unit	
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing	
Cooling	Fan, air flows right to left (as viewed from front)	
Thermal dissipation, full load	164 BTU	
Mounting		
Rack mount	Yes, 2U high	
Enclosure type	Metal	
Enclosure dimensions	3.5" H x 17.5" W x 12.0" D (2U high, full rack wide) (8.9 cm H x 44.4 cm W x 30.5 cm D) (Depth excludes connectors, Width excludes integrated rack ears.)	
Product weight	10.0 lbs (4.5 kg)	
Shipping weight	15 lbs (7 kg)	
Vibration	ISTA 1A in carton (International Safe Transit Association)	
Regulatory compliance		
Safety	CE, c-UL, UL	
Compliances	CE, C-tick, FCC Class A, ICES, VCCI	
MTBF	30,000 hours	
Warranty	3 years parts and labor	
NOTE: All nominal levels are at ±10%.		
Model	Version Description	Part number
DXP 44 HDMI	4x4 HDMI Matrix Switcher	60-880-01
DXP 48 HDMI	4x8 HDMI Matrix Switcher	60-1010-01
DXP 84 HDMI	8x4 HDMI Matrix Switcher	60-884-01
DXP 88 HDMI	8x8 HDMI Matrix Switcher	60-882-01

For complete specifications, please go to www.extron.com
Specifications are subject to change without notice.

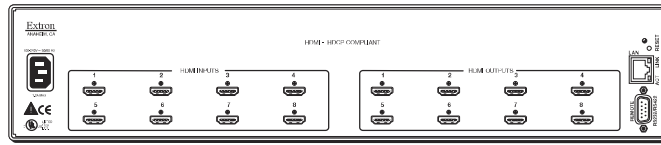
APPLICATION DIAGRAM



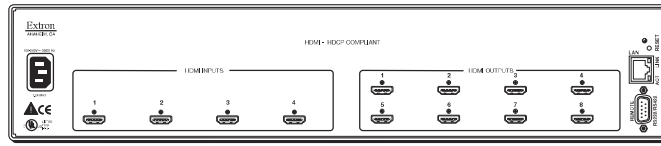
PANEL DRAWINGS



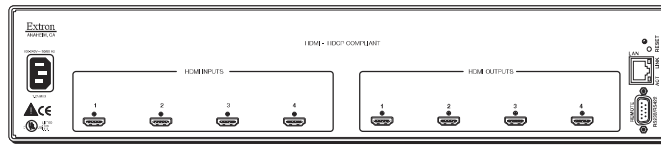
DXP HDMI - Front



DXP HDMI 8x8 - Back



DXP HDMI 4x8 - Back



DXP HDMI 4x4 - Back

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HDMI Extenders

Extron| DTP HDMI 4K 230 Tx/Rx

DTP HDMI 4K 230

HDMI TWISTED PAIR EXTENDER

DTP
SYSTEMS

4K UHD



DTP HDMI 4K 230 Tx

DTP HDMI 4K 230 Rx

The Extron DTP HDMI 4K 230 extender sends HDMI, analog audio, and bidirectional control signals up to 230 feet (70 meters) over a shielded CATx cable. The HDCP-compliant extender set features a compact enclosure that enables discreet installation in a wide variety of applications.

- ▶ Transmits HDMI plus control and analog audio up to 230 feet (70 meters) over a shielded CATx cable
- ▶ Supports computer and video resolutions up to 4K, including 1080p/60 Deep Color
- ▶ Extron XTP DTP 24 shielded twisted pair cable is strongly recommended for optimal performance
- ▶ Bidirectional RS-232 and IR pass-through for AV device control
- ▶ Accepts additional analog stereo audio signals
- ▶ Supported HDMI specification features include data rates up to 10.2 Gbps, Deep Color up to 12-bit, 3D, HD lossless audio formats, and CEC pass-through
- ▶ HDCP compliant
- ▶ Supports EDID and HDCP transmission
- ▶ Remote power capability
- ▶ UL 2043 plenum rated receiver
- ▶ Compatible with all DTP™ 230 Series models and DTP-enabled products
- ▶ 1" (2.5 cm) high, quarter rack width metal enclosures
- ▶ Highly reliable, energy-efficient external universal power supply included with Tx models



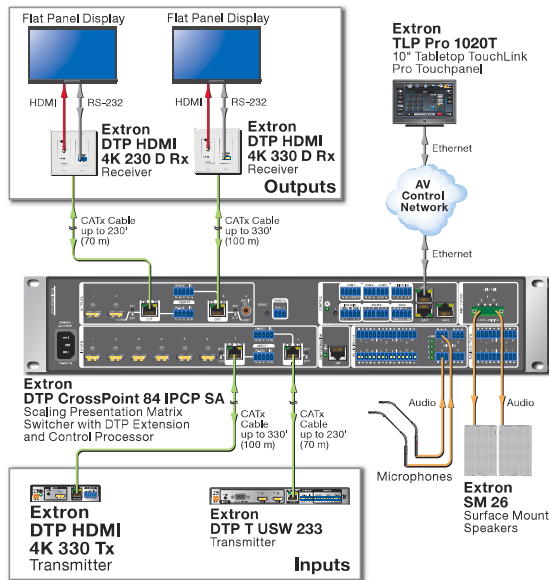
Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

DESCRIPTION

The Extron **DTP HDMI 4K 230** is a transmitter and receiver set for sending HDMI, audio, and bidirectional RS-232 and IR signals up to 230 feet (70 meters) over a shielded CATx cable to Extron DTP™-enabled products. It provides an economical and effective means for extending HDMI with embedded multi-channel audio from HDMI-equipped devices. The DTP HDMI 4K 230 accepts analog stereo audio signals for simultaneous transmission over the same shielded twisted pair cable. It supports video signals at resolutions up to 4K, including 1080p/60 Deep Color. The DTP HDMI 4K 230 enables the reliable transmission of HDMI signals, supporting Deep Color up to 12-bit, CEC pass-through, and embedded HD lossless audio formats. In addition, DDC communication of EDID and HDCP is continuously maintained between a source and display, ensuring direct compatibility and optimal signal transmission between devices.

For installation flexibility, the DTP HDMI 4K 230 transmitter or receiver can be remotely powered over the shielded twisted pair cable by a DTP-enabled product. The twisted pair extender also supports simultaneous transmission of bidirectional RS-232 and IR signals from a control system for AV device control. The DTP HDMI 4K 230 can be integrated with an Extron DTP CrossPoint® 84 Presentation Matrix Switcher, or other DTP-enabled products to support inputs, plus displays and other output devices at remote locations.

APPLICATION DIAGRAM



SPECIFICATIONS

VIDEO		
Maximum data rate	10.2 Gbps (3.4 Gbps per color)	
Resolution range	Up to 2560x1600* @ 60 Hz or 4K (4096x2160) @ 30 Hz, UHD (3840x2160) @ 30 Hz, 4K/UHD @ 60 Hz with 4:2:0 chroma subsampling (* reduced blanking)	
Color bit depth	8, 10, or 12 bits — subject to the maximum data rate limit	
VIDEO INPUT — TRANSMITTER		
Connectors	1 female HDMI type A	
INTERCONNECTION BETWEEN TRANSMITTER AND RECEIVER		
Connectors	1 female RJ-45 per unit	
Signal transmission distance		
1080p @ 60 Hz	Up to 230* (70 m) using shielded twisted pair (STP) cable or XTP DTP 24 STP cable	
2560x1600 @ 60 Hz	Up to 130* (40 m) using shielded twisted pair (STP) cable or XTP DTP 24 STP cable	
4K/UHD @ 30Hz and 60 Hz	Up to 130* (40 m) using shielded twisted pair (STP) 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.		
VIDEO OUTPUT — RECEIVER		
Connectors	1 female HDMI type A	
AUDIO INPUT		
Number/signal type	1 PC level stereo, unbalanced	
NOTE: Analog audio is not embedded onto the digital video signal. Embedded digital audio is not de-embedded from the digital video signal.		
AUDIO OUTPUT		
Number/signal type	1 stereo (2 channel), balanced/unbalanced	
CONTROL/REMOTE		
External device (pass-through, unidirectional or bidirectional)		
Serial control port input/output		
Transmitter	RS-232 via (1) 3.5 mm, 5 pole captive screw connector for RS-232 control (±5 V) (connector is shared with IR control port)	
IR control port	(1) 3.5 mm, captive screw connector, 5 pole (connector is shared with RS-232 control port) TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz	
GENERAL		
Power supply	External Input: 100-240 VAC, 50-60 Hz Output: 12 VDC, 1 A, 12 watts	
Model	Version Description	Part number
DTP HDMI 4K 230 Tx	HDMI Tx - 230 feet (70 m)	60-1271-12
DTP HDMI 4K 230 Rx	HDMI Rx - 230 feet (70 m)	60-1271-13
Decora Style	Version Description	Part number
DTP HDMI 4K 230 D Tx	Decora Tx, Black - 230 feet (70 m)	60-1441-12
DTP HDMI 4K 230 D Tx	Decora Tx, White - 230 feet (70 m)	60-1441-13
DTP HDMI 4K 230 D Rx	Decora Rx, Black - 230 feet (70 m)	60-1441-22
DTP HDMI 4K 230 D Rx	Decora Rx, White - 230 feet (70 m)	60-1441-23

For complete specifications, please go to www.extron.com
Specifications are subject to change without notice.

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Preview Monitor

Samsung| LS24D390HL/ZR



24" LED Monitor with the Touch of Color



Overview

- Next generation. Touch of Colour.
- With the very latest Touch of Colour technology, Samsung brings design to new heights. This bold new step ahead builds on Samsung's monitor design legacy.
- The monitor is no longer an item of electronics equipment that is limited to just black and white – with the SD390, the monitor is now a piece of art with crystal blue accents that softly illuminate a super narrow bezel and sleek body.
- Although it features high-quality design and high functionality, the SD390 also offers outstanding value for money.

10.1 General

Model Name		S22D390H / S22D393H	S24D390HL / S24D393HL	S27D390H / S27D393H
Panel	Size	21.5 Inches (54 cm)	23.6 Inches (59 cm)	27 Inches (68 cm)
	Display area	476.64 mm (H) x 268.11 mm (V) 18.77 Inches (H) x 10.56 Inches (V)	521.28 mm (H) x 293.22 mm (V) 20.52 Inches (H) x 11.54 Inches (V)	597.9 mm (H) x 336.3 mm (V) 23.54 Inches (H) x 13.24 Inches (V)
	Pixel Pitch	0.24825 mm (H) x 0.24825 mm (V) 0.00977 Inches (H) x 0.00977 Inches (V)	0.2715 mm (H) x 0.2715 mm (V) 0.0107 Inches (H) x 0.0107 Inches (V)	0.3114 mm (H) x 0.3114 mm (V) 0.0123 Inches (H) x 0.0123 Inches (V)
Power Supply		This product supports 100-240 V. Since the standard voltage may differ from country to country, please check the label on the back of the product.		
Dimensions (W x H x D) / Weight	Without Stand	514.2 x 323.3 x 81.7 mm 20.2 x 12.7 x 3.2 Inches	547.8 x 332.5 x 80.1 mm 21.6 x 13.1 x 3.2 Inches	625.2 x 376.3 x 79.6 mm 24.6 x 14.8 x 3.1 Inches
	With Stand	514.2 x 401.4 x 184.9 mm / 3.2 kg (Square Stand Base) 20.2 x 15.8 x 7.3 Inches / 7.1 lbs (Square Stand Base) 514.2 x 389.4 x 209.0 mm / 3.2 kg (Round Stand Base) 20.2 x 15.3 x 8.2 Inches / 7.1 lbs (Round Stand Base)	547.8 x 409.2 x 209.8 mm / 3.7 kg (Square Stand Base) 21.6 x 16.1 x 8.3 Inches / 8.2 lbs (Square Stand Base) 547.8 x 401.2 x 243.4 mm / 3.7 kg (Round Stand Base) 21.6 x 15.8 x 9.6 Inches / 8.2 lbs (Round Stand Base)	625.2 x 453 x 209.8 mm / 4.7 kg (Square Stand Base) 24.6 x 17.8 x 8.3 Inches / 10.4 lbs (Square Stand Base) 625.2 x 445 x 243.4 mm / 4.7 kg (Round Stand Base) 24.6 x 17.5 x 9.6 Inches / 10.4 lbs (Round Stand Base)
Environmental Consideration	Operating	Temperature : 50 °F – 104 °F (10 °C – 40 °C) Humidity : 10 % – 80 %, non-condensing		
	Storage	Temperature : -4 °F – 113 °F (-20 °C – 45 °C) Humidity : 5 % – 95 %, non-condensing		



Plug-and-Play

This monitor can be installed and used with any Plug-and-Play compatible systems. Two-way data exchange between the monitor and PC system optimizes the monitor settings. Monitor installation takes place automatically. However, you can customize the installation settings if desired.



Panel Dots (Pixels)

Due to the nature of the manufacturing of this product, approximately 1 pixel per million (1ppm) may be brighter or darker on the LCD panel. This does not affect product performance.



The above specifications are subject to change without notice to improve quality.



This device is a Class B digital apparatus.

(USA only)

Dispose unwanted electronics through an approved recycler.

To find the nearest recycling location, go to our website:

www.samsung.com/recyclingdirect or call, (877) 278 - 0799

10.2 PowerSaver


The power-saving function of this product reduces power consumption by switching off the screen and controlling the power LED status if the product is not used for a specified period of time. The power is not turned off in power-saving mode. To switch the screen back on, press any key on the keyboard or move the mouse. Power-saving mode functions only when the product is connected to a PC that has a power-saving function.

PowerSaver	Energy Star Test Condition	Power saving mode	Power off (Power button)
Power Indicator	On	Blinking	Off
Power Consumption (S22D390H / S22D393H)	Typical 21 W	Typical 0.3 W	Less than 0.3 W
Power Consumption (S24D390HL / S24D393HL)	Typical 21 W	Typical 0.3 W	Less than 0.3 W
Power Consumption (S27D390H / S27D393H)	Typical 22 W	Typical 0.3 W	Less than 0.3 W



- The power consumption level can vary in different operating conditions or when settings are changed. (S**D390/S**D393 Model Power saving mode : Max 0.45 W)
- ENERGY STAR® is a US registered mark of the United States Environmental Protection Agency. Energy Star power is measured with the test method in the current Energy Star® Standard.
- To reduce the power consumption to 0, disconnect the power cord. Be sure to disconnect the power cable when you will not be using the product for an extended period of time. To reduce the power consumption to 0 watts when the power switch is not available, disconnect the power cable.

10.3 Standard Signal Mode Table

-  This product can be set to only one resolution for each screen size to obtain the optimum picture quality due to the nature of the panel. Therefore, a resolution other than the specified resolution may degrade the picture quality. To avoid this, it is recommended that you select the optimum resolution specified for the screen size of your product.
- Check the frequency when you exchange a CDT monitor (connected to a PC) for an LCD monitor. If the LCD monitor does not support 85Hz, change the vertical frequency to 60Hz using the CDT monitor before you exchange it with the LCD monitor.

Synchronization	Horizontal Frequency	30 – 81 kHz
	Vertical Frequency	56 – 75 Hz
Resolution	Optimum Resolution	1920 x 1080 @ 60 Hz
	Maximum Resolution	1920 x 1080 @ 60 Hz

If a signal that belongs to the following standard signal modes is transmitted from your PC, the screen will automatically be adjusted. If the signal transmitted from the PC does not belong to the standard signal modes, the screen may be blank even though the power LED turns on. In such a case, change the settings according to the following table by referring to the graphics card user manual.

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 720 x 400	31.469	70.087	28.322	-/+
MAC, 640 x 480	35.000	66.667	30.240	-/-
MAC, 832 x 624	49.726	74.551	57.284	-/-
MAC, 1152 x 870	68.681	75.062	100.000	-/-
VESA, 640 x 480	31.469	59.940	25.175	-/-
VESA, 640 x 480	37.861	72.809	31.500	-/-
VESA, 640 x 480	37.500	75.000	31.500	-/-
VESA, 800 x 600	35.156	56.250	36.000	+/+
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 800 x 600	48.077	72.188	50.000	+/+
VESA, 800 x 600	46.875	75.000	49.500	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1024 x 768	56.476	70.069	75.000	-/-
VESA, 1024 x 768	60.023	75.029	78.750	+/+
VESA, 1152 x 864	67.500	75.000	108.000	+/+

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
VESA, 1280 x 720	45.000	60.000	74.250	+/+
VESA, 1280 x 800	49.702	59.810	83.500	-/+
VESA, 1280 x 1024	63.981	60.020	108.000	+/+
VESA, 1280 x 1024	79.976	75.025	135.000	+/+
VESA, 1440 x 900	55.935	59.887	106.500	-/+
VESA, 1600 x 900RB	60.000	60.000	108.000	+/+
VESA, 1680 x 1050	65.290	59.954	146.250	-/+
VESA, 1920 x 1080	67.500	60.000	148.500	+/+



- Horizontal Frequency

The time required to scan a single line from the left to the right side of the screen is called a horizontal cycle. The reciprocal number of a horizontal cycle is called horizontal frequency. Horizontal frequency is measured in kHz.

- Vertical Frequency

Repeating the same picture dozens of times per second allows you to view natural pictures. The repeat frequency is called "vertical frequency" or "refresh rate" and is indicated in Hz.



De Embedder



Extron | HAE 100



HAE 100

HDMI AUDIO DE-EMBEDDER

- HDMI audio de-embedding with analog stereo and digital S/PDIF audio outputs
- Compatible with HDMI 1.3 Deep Color
- HDCP compliant
- EDID Minder™
- Automatic input cable equalization
- Comprehensive, real-time status LED indicators for troubleshooting and monitoring
- Front panel USB configuration port



The Extron HAE 100 provides a simple, convenient solution for extracting the audio from an HDMI signal. It offers analog stereo and digital S/PDIF audio outputs as well as several integrator-friendly features, including EDID Minder, input cable equalization, and front-panel status LED indicators. The HAE 100 includes full HDMI signal pass-through and is compatible with HDMI 1.3 Deep Color.



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

DESCRIPTION

The Extron HAE 100 is an HDMI Audio De-Embedder that accepts an HDMI input and provides analog stereo and digital S/PDIF audio along with a buffered HDMI video output. The HAE 100 supports data rates of up to 6.75 Gbps for compatibility with HDMI 1.3 Deep Color and is HDCP compliant. It is compatible with HDTV 1080p/60 and computer-video resolutions up to 1920x1200. The HAE 100 is equipped with several integrator-friendly features, including EDID Minder™, input cable equalization, and a comprehensive LED status display. It provides a simple, convenient solution in HDMI installations for sending audio to a sound system for stereo audio or surround sound.

EDID Minder automatically manages EDID communication between the input source and the display, ensuring the source powers up properly and reliably delivers content to the display. Input cable equalization compensates for weak source signals or signal loss when using long input cable assemblies.

LEDs on the front panel offer comprehensive, real-time device status monitoring, including HDMI input / output and audio output signal presence, HDCP authentication, and whether the extracted audio is two-channel PCM or encoded bitstream audio for Dolby® Digital or DTS® Digital Surround. A mini USB port on the front panel provides convenient access for device configuration. The HAE 100 is housed in a compact 1U, quarter rack width metal enclosure.

FEATURES

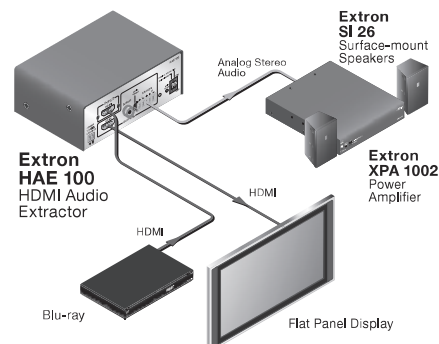
- **HDMI audio de-embedding with analog stereo and digital S/PDIF audio outputs** – The HAE 100 offers the flexibility to support analog stereo, PCM audio, or Dolby or DTS multi-channel surround sound in systems with HDMI.
- **Compatible with HDMI 1.3 Deep Color** – The HAE 100 supports HDMI data rates up to 6.75 Gbps.
- **HDCP compliant**
- **EDID Minder** – A selectable feature that enables automatic and continuous EDID management between the input source and the display. EDID Minder ensures that the source powers up properly and reliably outputs content to the display.
- **Automatic input cable equalization**
- **Comprehensive, real-time status LED indicators for troubleshooting and monitoring** – Front panel LEDs verify the presence of HDMI input / output and audio output signals, HDCP authentication, and the de-embedded audio format.
- **Front panel USB configuration port**
- **Rack-mountable 1U, quarter rack width metal enclosure**
- **External universal power supply included**

SPECIFICATIONS

VIDEO		
Maximum data rate	6.75 Gbps (2.25 Gbps per color)	
Maximum pixel clock	225 MHz	
Resolution range	Up to 1920x1200 or 1080p @ 60 Hz, 12-bit color	
VIDEO INPUT		
Number/signal type.....	1 single link HDMI	
Equalization.....	Automatic for up to -12 dB of cable loss	
Input cable length.....	Up to 25' (7.6 m)	
VIDEO OUTPUT		
Number/signal type.....	1 single link HDMI	
Output cable length.....	Up to 15' (5 m)	
AUDIO INPUT		
Number/signal type.....	1, combined with HDMI video input	
Source formats	PCM, Dolby Digital 2/0, Dolby Digital 2/0 Surround, Dolby Digital 5.1, Dolby Digital EX, DTS Digital Surround 5.1, DTS-ES Matrix 6.1, DTS-ES Discrete 6.1	
AUDIO OUTPUT		
Number/signal type.....	1 combined with HDMI video output and either 1 stereo balanced/unbalanced or 1 S/PDIF	
Connectors	(1) 3.5 mm captive screw connector, 5 pole 1 female RCA jack (tip, ring)	
CONTROL/REMOTE		
USB control ports.....	1 front panel female mini USB B	
USB standards	USB 2.0, low speed	
GENERAL		
External power supply	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 1 A, regulated	
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing	
Thermal dissipation 115 VAC, 60 Hz.....	4.0 BTU/hr	
Regulatory compliance	Safety..... CE, c-UL, UL EMI/EMC..... CE, C-tick, FCC Class A, ICES, VCCI NOTE: All nominal levels are at ±10%.	
Model	Version Description	Part number
HAE 100	HDMI Audio De-Embedder	60-1075-01

Specifications are subject to change without notice.

APPLICATION DIAGRAM



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Extron **China**
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+86.21.3760.1566 FAX



Workstation PC

HP | Z230



Data sheet

HP recommends Windows.

HP Z230

Tower and SFF

Workstations

Affordable performance and flexibility, re-defined.



August 2014

**HP Z230 SFF****HP Z230 Tower**

Workstations that fit your workspace

Create a totally immersive work environment for those who demand reliability and performance on a budget. Designed for heavy 24x7x365 workloads, the HP Z230 delivers next-generation processor and graphics technologies in two redesigned models. Choose between an amazingly capable Small Form Factor (SFF) for constrained spaces, and a new compact Tower that is impressively expandable.

Rock solid reliability, affordably priced

With the HP Z230 SFF and Tower Workstations, you will gain peace of mind from our extreme test and validation processes designed for always-on environments. You can control your environmental impact better than ever¹ while lowering your total cost of ownership with a 92% efficient power supply. Work smarter with software tools designed to deliver better, smarter performance—the HP Z230 Tower Workstation has earned a wide range of ISV certifications.

Totally immersive. Perfectly productive.

Engineered to impress, the redesigned HP Z230 Small Form Factor Workstation provides the capability and flexibility you demand in a 57% smaller form factor than the tower. You can realize impressive performance, unbelievable storage capacity, wide variety of I/O slots and ports and amazing flexibility while retaining the small form factor size.

The HP Z230 Tower Workstation features complete computing power in a new compact design. Don't let its compact design fool you, it is remarkably expandable to ensure you'll always have all the computing power you need. It is designed to grow along with your business so that you can scale and expand by adding more storage and connectivity when you need it. Enhance your storage capacity with six available drive bays including a 2.5-inch HD bay for high speed solid state drives. The optional ergonomic Handle in Top ODD Bay allows tool free installation of SSD Hard Drives for easy expandability.^{2,3}

Boost your storage performance with RAID, solid state drives, or get the best of both worlds by combining large hard drives with an optional solid state drive as a cache device.⁴ Optimize these workstations for peak performance with HP Performance Advisor that easily configures your system with the best settings designed for specific applications.⁵

The HP Z230 has power to spare—and share.

Enjoy the latest in performance and energy efficiency from Intel's next generation processor architecture. The latest Intel® Xeon® processor E3-1200 v3 family⁶ and rich graphics are designed to keep up with your workload. You can choose between cost-effective integrated graphics or powerful 2D or 3D discrete graphics.^{7,8} Keep your work front-and-center with support for up to six monitors^{7,8} and easily connect your peripherals and devices using the four PCIe slots⁹, one PCI input/output slot,* ten external USB ports and the fast charging USB port.* With HP RGS you can take your graphics intensive workstation applications wherever you go and collaborate with colleagues around the office or around the world, in real time.

HP Z230 Workstations

	HP Z230 Tower ¹⁰		HP Z230 SFF ¹⁰							
Form Factor	Tower		Small Form Factor							
Available Operating Systems	Windows 8.1 Pro 64 bit. Other editions available** Windows 8 Pro 64-bit and other editions available** Windows 7 Professional 32 bit. Other editions available*** HP Linux Installer Kit SUSE Linux Enterprise Desktop 11 (90 day support)									
Available Processors^{5,11}	Processor	GHz	Max Turbo GHz	Cache	Memory	Cores	Hyper-Threading	Intel® vPro™ Technology	Intel® HD Graphics	
	Intel® Pentium® G3220 processor	3.0	-	3 MB	1333 MHz	2	N	N	Yes	
	Intel Pentium G3240 processor	3.1	-	3 MB	1333 MHz	2	N	N	Yes	
	Intel Core™ i3-4130 processor	3.4	-	3 MB	1600 MHz	2	Y	N	4400	
	Intel Core i3-4150 processor	3.5	-	3 MB	1600 MHz	2	Y	N	4400	
	Intel Core i3-4330 processor	3.5	-	4 MB	1600 MHz	2	Y	N	4600	
	Intel Core i3-4350 processor	3.6	-	4 MB	1600 MHz	2	Y	N	4600	
	Intel Core i5-4570 processor	3.2	3.6	6 MB	1600 MHz	6	N	Y	4600	
	Intel Core i5-4590 processor	3.3	3.7	6 MB	1600 MHz	6	N	Y	4600	
	Intel Core i5-4670 processor	3.4	3.8	6 MB	1600 MHz	6	N	Y	4600	
	Intel Core i5-4690 processor	3.5	3.9	6 MB	1600 MHz	6	N	Y	4600	
	Intel Core i7-4770 processor	3.4	3.9	8 MB	1600 MHz	8	Y	Y	4600	
	Intel Core i7-4771 processor	3.5	3.9	8 MB	1600 MHz	8	Y	Y	4600	
	Intel Core i7-4790 processor	3.6	4.0	8 MB	1600 MHz	8	Y	Y	4600	
	Intel Xeon® processor E3-1225v3	3.2	3.6	8 MB	1600 MHz	8	N	Y	P4600	
	Intel Xeon processor E3-1226v3	3.3	3.7	8 MB	1600 MHz	8	N	Y	P4600	
	Intel Xeon processor E3-1230v3	3.3	3.7	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1231v3	3.4	3.8	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1240v3	3.4	3.8	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1241v3	3.5	3.9	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1245v3	3.4	3.8	8 MB	1600 MHz	8	Y	Y	P4600	
	Intel Xeon processor E3-1246v3	3.5	3.9	8 MB	1600 MHz	8	Y	Y	P4600	
	Intel Xeon processor E3-1270v3	3.5	3.9	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1271v3	3.6	4.0	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1280v3	3.6	4.0	8 MB	1600 MHz	8	Y	Y	No	
	Intel Xeon processor E3-1281v3	3.7	4.1	8 MB	1600 MHz	8	Y	Y	No	
Chipset	Intel® C226 chipset									
Memory^{12,13}	4 DIMM slots, up to 32 GB ECC/non-ECC, DDR3 1600 MHz (ECC/non-ECC choice and actual memory speed dependent on processor capability)									
Drive Controllers¹⁴	Integrated SATA Controller, RAID 0,1 supported; 5 ports, 6 Gb/s									
Storage¹⁵	Up to (3) 3.5-inch 7200 rpm SATA drives: 500 GB, 1, 2 or 3 TB (9 TB max) Up to (3) 2.5-inch 10K rpm SATA drives: 250, 500 GB, 1 TB (3 TB max) Up to (3) 2.5-inch SATA SSD drives: 128, 180, 240, 256, 480, 512 GB, or 1 TB (3 TB max) Up to (1) 2.5-inch SATA self-encrypting solid state boot drive (SED SSD): 256 GB Up to (1) 2.5-inch SATA self-encrypting 7200 rpm boot drive (SED): 180, 500 GB Up to (1) PCIe SSD: HP Z Turbo Drive 256 GB, HP Z Turbo Drive 512 GB**** Optional (1) 64 GB SSD Disk Cache Module can be used in conjunction with up to (2) SATA HDDs in RAID 0/RAID 1 using Intel® Smart Response Technology.				Up to (2) 3.5-inch 7200 rpm SATA drives: 500 GB, 1, 2 or 3 TB (6 TB max) Up to (2) 2.5-inch 10K rpm SATA drives: 250, 500 GB, 1 TB (2 TB max) Up to (2) 2.5-inch SATA SSD drives: 128, 180, 240, 256, 480, 512 GB or 1 TB (2 TB max) Up to (1) 2.5-inch SATA self-encrypting SSD (SED SSD): 256 GB Up to (1) 2.5-inch SATA self-encrypting 7200 rpm HDD (SED): 180, 500 GB Up to (1) PCIe SSD: HP Z Turbo Drive 256 GB, HP Z Turbo Drive 512 GB**** Optional (1) 64 GB SSD Disk Cache Module can be used in conjunction with up to (2) SATA HDDs in RAID 0/RAID 1 using Intel® Smart Response Technology.					
Optical Storage^{16,17}	DVD-ROM, DVD+/-RW DL Super Multi, HP Blu-ray Writer, HP 15-in-1 Media Card Reader									
Drive Bays	2 internal 3.5-inch bays, 1 internal 2.5-inch bay (for SSD only), 1 external slim ODD bay, 2 external Half-Height 5.25-inch bays				1 internal 3.5-inch bay, 1 internal 2.5-inch bay (for SSD only), 1 internal/external 3.5-inch bay, 1 external Half-Height 5.25-inch bay					
Expansion Slots	1 PCIe Gen3 x16, 1 PCIe Gen2 x4 slot/x16 connector, 1 PCIe Gen2 x1 slot/x4 connector, 1 PCIe Gen2 x1 slot, 1 PCI 32-bit.				1 PCIe Gen3 x16, 1 PCIe Gen2 x4 slot/x16 connector, 1 PCIe Gen2 x1 slot/x4 connector, 1 PCIe Gen2 x1 slot. All slots are Low Profile.					
Available Graphics	Integrated Graphics: Intel® HD Graphics available on select processors as above Professional 2D: NVIDIA NVS 310, NVIDIA NVS 315, NVIDIA NVS 510 Entry 3D: AMD FirePro™ V3900, NVIDIA Quadro 410, NVIDIA Quadro K600 Mid-range 3D: NVIDIA Quadro K2000 High-end 3D: AMD FirePro™ W7000 (AMO [†] only), NVIDIA Quadro K4000				Integrated Graphics: Intel® HD Graphics available on select processors as above Professional 2D: NVIDIA NVS 310, NVIDIA NVS 315, NVIDIA NVS 510 Entry 3D: AMD FirePro™ V3900, NVIDIA Quadro 410, NVIDIA Quadro K600					
Audio	High Definition Integrated Realtek ALC221 Audio and integrated speaker; optional HP Thin USB Powered Speakers									
Network	Integrated Intel I217LM PCIe GbE Controller; Optional Intel Ethernet I210-T1 PCIe as 2nd NIC; WLAN Intel 7260 802.11 a/b/g/n/ PCIe x 1 NIC									
Remote Management	Intel® vPro™ with Intel® AMT 9.0									
Ports	Front: 2 USB 3.0; 1 USB 2.0; 1 USB 2.0 Charging Data Port; 1 microphone in; 1 headphone out Rear: 2 USB 3.0; 4 USB 2.0; 1 DVI-I single link and 2 DisplayPort 1.2 (for use with Intel HD Graphics); 1 audio in; 1 audio out; 1 microphone; 1 serial (optional); 2 PS/2; RJ-45 (LoM), optional 2 IEEE 1394b ports Internal: 1 USB 3.0, 3 USB 2.0 1 Thunderbolt™ 2 ^{8,19} via optional add-in PCIe card				Front: 2 USB 3.0; 2 USB 2.0; 2 USB 2.0; 1 microphone in; 1 headphone out Rear: 2 USB 3.0; 4 USB 2.0; 3 DisplayPort 1.2 (for use with Intel HD Graphics); 1 audio in; 1 audio out; 1 standard/1 serial (optional); 2 PS/2; RJ-45 (LoM), optional 2 IEEE 1394b ports (PCIe card), Optional HP Thunderbolt-2 PCIe 1-port I/O Card Internal: 1 USB 3.0, 3 USB 2.0 1 Thunderbolt™ 2 ^{8,19} via optional add-in PCIe card					

HP Z230 Workstations

	HP Z230 Tower ¹⁰	HP Z230 SFF ¹⁰
Remote Technology	HP Remote Graphics Software (RGS)	
Input Devices	HP PS/2 keyboard, HP USB keyboard, HP USB CCID smart card keyboard, HP PS/2 mouse, HP USB optical mouse, HP USB 1000 dpi laser mouse, HP Optical 3-button optical mouse, USB SpaceMouse Pro, USB SpacePilot Pro	
Dimensions (H x W x D)	15.7 x 6.7 x 17.4 in (39.93 x 17.04 x 44.25 cm)	Standard desktop orientation: 3.95 x 13.3 x 15.0 in (10.5 x 33.83 x 38.15 cm)
Power Supply	400-watt 92% efficient power supply, 320 W, Standard Efficiency Power Supply available in some countries.	240-watt, 92% Efficiency power supply; 240-watt Standard Efficiency Power Supply available in some countries.
Compatible Displays (screen size diagonally measured)	HP DreamColor LP2480zx Professional Display; HP ZR30w 30-inch S-IPS LCD Monitor; HP ZR2740w 27-inch LED Backlit IPS Monitor; HP ZR2440w 24-inch LED Backlit IPS Monitor; HP Z Display Z30i 30-inch IPS LED Backlit Monitor; HP Z Display Z27i 27-inch IPS LED Backlit Monitor; HP Z Display Z24i 24-inch IPS LED Backlit Monitor; HP Z Display Z23i 23-inch IPS LED Backlit Monitor; HP Z Display Z22i 21.5-inch IPS LED Backlit Monitor	
Warranty¹⁸	Limited three-year Mon-Fri 8-5 next business day, parts, labor and 24x7 phone support, terms and conditions may vary. One-year warranty option available in selected countries.	

* Available on Z230 Tower only

** Not all features are available in all editions of Windows 8 and 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 functionality. See www.microsoft.com.

*** This system may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See microsoft.com/windows/windows-7/ for details.

**** Each drive requires a PCIe x4 (minimum)

† After-Market Option

1 When comparing previous generations of HP Workstations.

2 Sold separately both as a configure-to-order (CTO) or after-market option (AMO).

3 Does not allow 4 SSDs/SFF drives (CTO/AMO)

4 Requires a compatible Intel® Core processor, enabled chipset, Intel® Rapid Storage technology software and non-SED HDD + optional 2.5" SSD flash cache module. Intel® Smart Response Technology is only available on select HP systems. Read performance levels assume that the data to be read is in the cache. Depending on system configuration, results may vary.

5 Requires Windows 7 or Windows 8.

6 Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance. See intel.com/info/em64t for more information.

7 Requires both NVIDIA NVS 510 and NVS 310 graphics cards to be installed.

8 Optional feature sold separately or as an add on feature.

9 PCIe Gen 3 is a new technology; card availability may be limited.

10 Some features may not be available in all regions.

11 Intel® Hyper-Threading - The hyper-threading feature is designed to improve performance of multi-threaded software products; please contact your software provider to determine software compatibility. Not all customers or software applications will benefit from the use of hyperthreading. Go to intel.com/info/hyperthreading for more information, including which processors support HT Technology.

12 Each processor supports up to 2 channels of DDR3 memory. To realize full performance at least 1 DIMM must be inserted into each channel.

13 Intel® Xeon E3, Intel Core i3 and Intel Pentium processors can support either ECC or non-ECC memory. Intel Core i5 and i7 processors only support non-ECC memory.

14 SATA hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.

15 For hard drives, 1 GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less.

16 Actual speeds may vary. Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses. Note that DVD-RAM cannot read or write to 2.6 GB Single Sided/5.2 GB Double Sided - Version 1.0 media.

17 Blu-ray Writer - As Blu-ray is a new format containing new technologies, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD DVD movies cannot be played on this workstation.

18 HP Care Pack Services extends service contracts beyond the standard warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at hp.com/go/lookuptool. Additional HP Care Pack Services information by product is available at hp.com/go/cpc. Service levels and response times for HP Care Packs may vary depending on your geographic location.

19 Thunderbolt™ 2 is available via an optional add-in card. Thunderbolt is new technology. Thunderbolt cable and Thunderbolt device (sold separately) must be compatible with Windows. To determine whether your device is Thunderbolt Certified for Windows, see thunderbolttechnology.net/products.

Learn more hp.com/go/z230

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4AA4-7343ENW, August 2014





Graphics Card



Nvidia | Quadro K600



THE POWER TO REALIZE YOUR VISION NVIDIA® QUADRO® K600

NVIDIA Kepler™ Architecture Performance and Features in An Affordable Low-Profile Professional Graphics Solution

The NVIDIA® Quadro® K600 graphics board offers great performance and outstanding features at an affordable price for a wide range of leading professional applications. You get 1GB of onboard DDR3 GPU memory, 192 SMX CUDA parallel processing cores, and full Shader Model 5 compatibility; all in a low-profile form factor for maximum system flexibility.

Designed and built specifically for professional workstations, NVIDIA Quadro GPUs power more than 200 professional applications across a broad range of industries including manufacturing, media and entertainment, sciences, and energy. Professionals trust them to realize their most ambitious visions – whether it's product design, visualization and simulation, or spectacular visual storytelling – and get results to market faster, more profitably, and with superior visual quality.

FEATURES

- > DisplayPort 1.2 Connector
- > DisplayPort with Audio
- > DVI-I Dual-Link Connector
- > VGA Support¹
- > nView Desktop Management Software Compatible
- > HDCP Support
- > Mosaic Mode²



SPECIFICATIONS

GPU Memory	1GB DDR3
Memory Interface	128-bit
Memory Bandwidth	29.0GB/s
CUDA Cores	192
System Interface	PCI Express 2.0 x16
Max Power Consumption	41W
Thermal Solution	Ultra-quiet active fansink
Form Factor	2.713" H x 6.3" L, Single Slot, Low Profile
Display Connectors	DVI-I DL + DP1.2
Max Simultaneous Displays	2
Max DP 1.2 Resolution	3840 x 2160 at 60Hz
Max DVI-I DL Resolution	2560 x 1600 at 60Hz
Max DVI-I SL Resolution	1920 x 1200 at 60Hz
Max VGA Resolution	2048 x 1536 at 85Hz
Graphics APIs	Shader Model 5.0, OpenGL 4.4, DirectX 11
Compute APIs	CUDA, DirectCompute, OpenCL

¹ Via supplied adapter/connector/bracket | ² Windows 7 and Linux

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HD Satellite Receiver

Humax | iCord HD

iCord HD

HDTV Personal Video Recorder
with integrated Multimedia Player

HDTV Recorder: Record several HDTV programmes without quality loss and simultaneously watch an additional HDTV programme (HDTV Twin Tuner)

HDTV Picture Quality: Experience conventional digital television in HD quality (HD-Upscaling) thanks to the integrated picture enhancer

HDTV Multimedia: Access your Multimedia-Data at anytime and enjoy JPEGs in HD quality as well as MP3s and videos on your TV





iCord HD

Television, HDTV and Multimedia as easy as never before

With the HUMAX iCord HD, the variety of multimedia possibilities is endless. Digital television and HDTV can be recorded on an integrated hard disc, concisely archived as well as viewed later at your convenience, regardless whether it is standard programming (analog broadcast) or encoded programming.

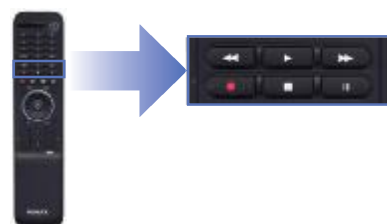
With the modern HD-Twin Tuner, you can simultaneously view an HDTV programme and record up to four additional HDTV programmes. An overview is provided through an excellent electronic programme guide designed by tvtv.

The connection of external devices* is made easy thanks to numerous connections and enables the playing of MP3 files, photos, videos and much more. And yet, the menu-driven operation of the iCord HD remains concise as usual and easy to operate.

HDTV Recorder



- Simultaneously record up to 4 HDTV programmes while viewing an additional programme
- Concise movie and file management with thumbnails
- Timeshift-Function: Pause live programmes and continue for up to two hours later (time-delayed playback)
- Possesses all common DVD recorder functions, such as FFWD and FBWD with various speeds, slow motion function, pause
- Convenient chapter selection function for recordings just like with a DVD
- Simple programming for recordings with the electronic programme guide of tvtv (EPG)
- Exact recordings of live programmes simply with the touch of a button

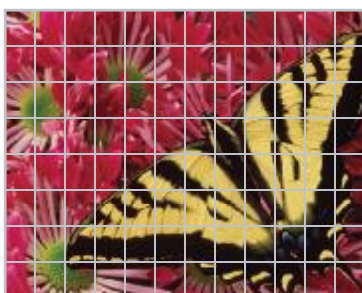


* Please take into consideration that not every external medium is supported. As a rule, most external hard disks and also memorycards can be used. Please ask your local dealer for more details.

HDTV Picture Quality



- The HUMAX-Upscaler (picture enhancer) transforms the traditional digital input signal into 'true to life' quality and provides a sharper picture suitable for your HD television set or HD projector.
- Even common PAL-programmes are improved through upgrading to an HD standard thanks to the modern and reliable HUMAX technology. The result is a clean and sharper picture.



Conventional resolution (567 x 720)

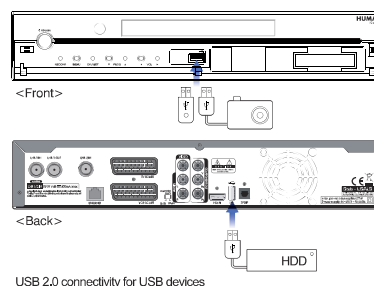


HD resolution (1080 x 1920)

HDTV Multimedia



- With the iCord HD you can enjoy photos and movies HD quality as simple as never before. Simply connect a camera or a USB stick to the USB port and immediately display the files on the television set.
- The iCord HD is a musical talent and automatically recognizes your MP3 files, organizes them and plays them back in excellent quality.
- Are you a radio enthusiast? With the iCord HD, a clear sorting of DVB-S radio programmes can be carried out. So nothing stands in the way of pure listening pleasure.



USB 2.0 connectivity for USB devices

Electronic Programme Guide



- With the EPG from tv tv you have a programme preview for up to 7 days with useful extra features such as serial programming, programme announcements and much more.
- You will no longer miss fascinating programmes, because you receive regular and automatic recommended attractive "highlights".
- With the convenient search function, you will find your desired programmes fast and easy sorted by name or genre.
- Programmes or series can very easily be programmed with the touch of a button: Simply select a programme in the EPG and the iCord HD does the recording for you.

Additional Features

- Simple and easy installation and start up
- Pre-programmed programme list from 0-99
- 4000 channel storage places for TV and radio programmes
- Integrated hard disk
- 2 CI slots for pay TV programmes
- Dolby digital outlet for a superb surround sound
- 5 individual favourite groups
- Automatic sorting of the most viewed programmes in a favourite group
- Universal remote control for TV, DVD and audio
- Supports teletext
- DiseqC 1.0, 1.2, USALS
- Supports SCD (one cable solution)
- LAN-port for the connection to a PC
- Automatic software update through OTA

iCord HD

HDTV Personal Video Recorder with integrated Multimedia-Player

Specifications

Video Recorder Features

Hard Disc 320GB, 160GB

Power Supply

Operating Voltage AC 100-240 50/60 Hz
 Power Consumption 57W
 Standby Consumption < 2W

Demodulation

Frequency DVB-S2 (QPSK & 8PSK)

Tuner & Channel

1 Input 2 x F-Connector, IEC 169-24
 1 Output F-Connector, IEC 169-24
 Frequency Range 950-2150 MHz
 Signal Level -25 to -75 dBm
 LNB - Control 13.5/18 Volt & max 500mA
 DiSEqC Control 1.0, 1.2 USALS compatible

Video Decoder

Transport Current MPEG-II ISO/IEC 13818-1
 Input Rate max. 15Mb/s
 Video Outlet/TV CVBS, RGB, YPbPr, HDMI
 Video Outlet/VCR CVBS
 Picture Format 4:3 (default), 16:9, letterbox
 Video Resolution 1080i, 720p, 576p, 576i

Audio Decoder

Audio Decoding ISO/IEC 13818-3 (MPEG-2 audio / MUSICAM),
 Dolby AC-3, (Dolby Digital)
 Audio Mode Single/Dual Mono/Stereo/Joint Stereo

Conditional Access Interface

Common Interface 2

Characteristics

Channel Storage 4000
 Channel Sorting All, Satellite, Favorites, Encoded
 Menu Languages German, English, Turkish, French, Italian, Spanish,
 Czech, Hungarian, Greek, Polish, Russian,
 Dutch, Croatian
 Favorite Channels 5
 EPG HUMAX EPG, TVTV EPG

Scart

TV Scart Video Output (CVBS, RGB, Y/C)
 Audio Output
 VCR Scart Video Input (CVBS, RGB)
 Video Output (CVBS)
 Audio Input/Output

Front

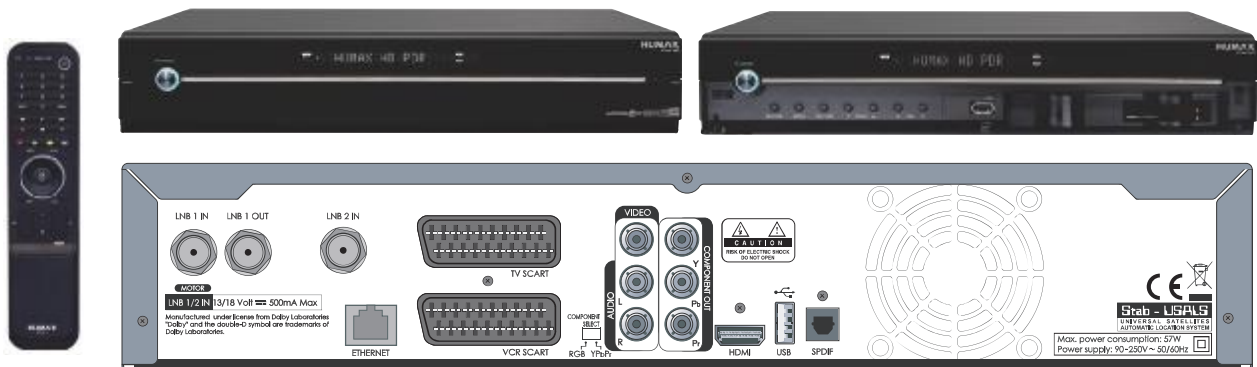
Buttons 8 (STANDBY, RECORD, MENU,
 OK/LIST, P-, P+, VoL-, Vol+)
 Display VFD (alpha-numerical)
 CI-Slots 2
 USB-Port 1

Back

Power Cord Fixed
 Tuner&LNB 2 Inputs, 1 Output
 Scarts 1 for TV, 1 for VCR
 RCA 1 Video Output, 2 Audio Outputs
 Data Interface Ethernet / USB
 S/PDIF Yes
 Power Switch Yes
 YUV/HDMI 1 / 1

Physical Specifications

Dimensions (Width x Height xDepth) 380x70x281
 Weight 3.5 kg
 Operating Temperature 0°C bis +45°C
 Storage Temperature -10°C bis +70°C
 Accessories 1 Remote Control incl. Batteries, Scart cable,
 Operating Manual, Quick Start
 Colors Black or Silver



4x1 VGA Switcher

Aten | VS0401

VS0201 / VS0401

2/4-Port VGA Switch with Audio

- The VS0201 / VS0401 2/4-Port VGA Switch with Audio allows you to connect two/four audio/video source computers to a single monitor or projector with full audio and quickly switch between the devices for use

VS0201/VS0401 built-in bi-directional RS-232 serial port for high-end system control, and advanced RS-232 control. With the ability to use high-end serial control devices via RS-232 commands allows the VS0201 / VS0401 to be controlled by secondary systems with advanced functions such as; port switching, auto switching, front panel pushbutton lock, and Power on Detection.

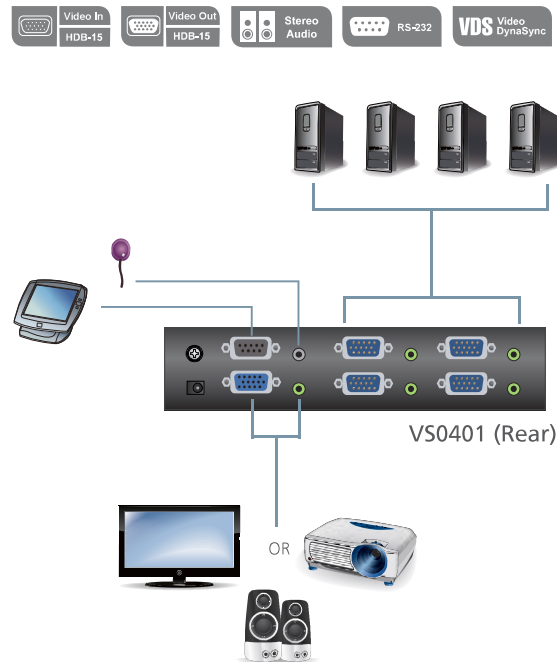
The VS0201 / VS0401 is perfect for the meeting room, media centers, class rooms, or any presentation environment requiring multiple audio/video sources to be accessed on a single display.



Features

- Displays the video output of two (VS0201) or four (VS0401) computers on a single monitor or projector
- Quick and easy switching between VGA/Audio sources via front panel pushbuttons, RS-232, or IR remote control
- Superior video quality – up to 1920 x 1440
- Long-distance transmission – up to 65 m
- Supports VGA, SVGA, UXGA, WUXGA and multisync monitors
- Video DynaSync™ - Exclusive ATEN technology eliminates boot-up display problems and optimizes resolution when switching between ports**
- Built-in bi-directional RS-232 serial port for high-end system control*
- RS-232 Control:
 - Power On Detection – if one VGA source is powered off, the VS0201 / VS0401 will automatically switch to the next powered-on source
 - Auto Switching – sets the priority for auto switching to a connected port**
 - Pushbutton Lock – locks use of the front panel pushbuttons**
- Supports stereo audio
- DDC compatible
- Supports up to 300 MHz bandwidth for optimal video quality
- LED indication of power status and source device
- All-metal casing provides durability and protection
- Plug-and-play – no software installation required

* Note: The VS0201/VS0401 AP and GUI operation instructions can be downloaded from the ATEN website (www.aten.com)



Specification

Function		VS0201	VS0401
Display Connections		2	4
Connectors	Input	Video	2 x HDB-15 Male (Blue)
		Audio	2 x Mini Stereo Jack Female (Green)
	Output	Video	1 x HDB-15 Female (Blue)
		Audio	1 x Mini Stereo Jack Female (Green)
RS-232 Port		1 x DB-9 Female (Black)	
IR Input port		1 x Mini Stereo Jack Female (Black)	
Power		1 x DC Jack	
Switches	Port Selection	2 x Pushbuttons	4 x Pushbuttons
	Power	1 x Pushbuttons	
LEDs	Selected	2 x (Green)	4 x (Green)
	Power	1 x (Green / Orange)	
Video		1920 x 1440 at 30 m 1280 x 1024 at 65 m	
Power Consumption		DC5.3V, 0.55W	
Environment	Operating Temp.	0–50°C	
	Storage Temp.	-20–60°C	
	Humidity	0–80% RH, Non-condensing	
Housing		Metal	
Physical Properties	Weight	0.45 kg	0.66 kg
	Dimensions (L x W x H)	13.00 x 7.61 x 4.40 cm	20.00 x 7.61 x 4.40 cm

ATEN International Co., Ltd.

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VGA to HDMI Scaler

Gefen | EXT-VGAAUD-2-HDMIS



VGA Audio to HDMI Scaler

EXT-VGAAUD-2-HDMIS

User Manual



www.gefen.com

SPECIFICATIONS

Video Bandwidth	165 MHz
Video Input Connector	DE-15F type, 15-pin
Audio Input Connector (analog)	1 x 3.5mm Mini-Stereo phone jack
Audio Format	2-channel PCM and bitsream audio
Audio Input Connector (digital)	1 x TOSLINK (optical fiber)
Audio/Video Output Connector	1 x HDMI Type "A", 19-pin
Audio Output Connector (analog)	1 x 3.5mm Mini-Stereo phone jack
Audio Output Connector (digital)	1 x TOSLINK (optical fiber)
Power Supply	5V DC
Power Consumption	13W
Dimensions	3.9" W x 1" H x 6" D
Shipping Weight	2.0 lbs



Headphone

Yamaha | CM500

CM500

Headset with built-in microphone



Specs

Specifications

Frequency Response	20 Hz - 20kHz
Impedance	120 ohms
Sensitivity	96 dB/mW
Mic Range	100 Hz - 20 kHz
Mic Impedance	600 ohms
Jacks	1/8" plug and 1/4" adaptor
Cord	9' cord
Weight	10.6 oz. without cord
Warranty	One year limited warranty
Compatibility	Compatible with all audio devices. Equipped with 1/8" plug and 1/4" adaptor.



HDMI Cable

Extron| HDMI Pro

HDMI Ultra Series

Ultra Flexible High Speed HDMI Cables



DESCRIPTION

The Extron **HDMI Ultra Series** cables are designed to transmit high-speed digital video and audio signals. The HDMI Ultra Series is engineered with Extron-exclusive ultra-flexible, 30 AWG cable and features a low bend radius and compact, gold-plated connectors. They are ideal for applications with tight equipment racks or AV presentation furniture, or with wall-mount or pole-mount displays. The HDMI Ultra cables conform to HDMI High Speed cable specifications and are available in lengths from 6 feet to 15 feet (1.8 m to 4.5 m).



MODEL	VERSION DESCRIPTION	PART #
HDMI Ultra/6	6' (1.8 m) High Speed.....	26-663-06
HDMI Ultra/9	9' (2.7 m) High Speed.....	26-663-09
HDMI Ultra/12	12' (3.6 m) High Speed.....	26-663-12
HDMI Ultra/15	15' (4.5 m) High Speed.....	26-663-15

HDMI Pro Series

High Speed and Standard Speed HDMI Cables



DESCRIPTION

Extron **HDMI Pro Series** cables are designed for applications that require high performance transmission of HDMI digital video and audio signals. Cable lengths up to 12 feet conform to HDMI High Speed Cable Specifications and support signals up to 1920 x 1200 @ 60 Hz and 1080p/60. Cable lengths 25 feet and longer conform to HDMI Standard Speed Cable Specifications and support 1920 x 1200 @ 60 Hz and 1080p/60 up to 75 feet without a cable equalizer. An Extron HDMI 101 Cable Equalizer is recommended for use with cables longer than 75 feet.



MODEL	VERSION DESCRIPTION	PART #
HDMI Pro/3	3' (90 cm) High Speed.....	26-650-03
HDMI Pro/6	6' (1.8 m) High Speed.....	26-650-06
HDMI Pro/12	12' (3.6 m) High Speed.....	26-650-12
HDMI Pro/25	25' (7.6 m) Standard Speed.....	26-650-25
HDMI Pro/35	35' (10.6 m) Standard Speed.....	26-650-35
HDMI Pro/50	50' (15.2 m) Standard Speed.....	26-650-50
HDMI Pro/75	75' (22.8 m) Standard Speed.....	26-650-75
HDMI Pro/100	100' (30.4 m) Standard Speed.....	26-650-100
HDMI Pro/125	125' (38 m) Standard Speed.....	26-650-125
HDMI Pro/150	150' (45.7 m) Standard Speed.....	26-650-150
HDMI Pro/175	175' (53.2 m) Standard Speed.....	26-650-175
HDMI Pro/200	200' (60.9 m) Standard Speed.....	26-650-200



Audio System





Audio Processor

Peavey | Digitool MX16

Digitool® MX16



OVERVIEW

The Digitool MX 16 is an 8 input, 8 output configuration designed primarily for small to medium fixed installation projects. This product is strategically placed to be the go to product for those jobs that do not require the complexity of MediaMatrix products, nor the need for transferring audio over a network.

FEATURES

- 8 input, 8 output DSP Processor
- Improved mic/line input circuitry
- Enhanced navigation
- Full-color LCD display
- Individual front panel mute for each input and output
- 5 segment LED meters for each input and output
- USB port for external programming and firmware updating
- Rear panel Ethernet port for network, programming and control
- 8 control voltage ports
- AES input
- Upgraded and more powerful DSP processing
- Enhanced security system
- New graphical user interface featuring Media Matrix N-Ware
- Improved dynamic range
- Weight Unpacked: 11.60 lb(5.261 kg)
- Weight Packed: 14.62 lb(6.63 kg)
- Width Packed: 21"(53.34 cm)
- Height Packed: 22.5"(57.15 cm)
- Depth Packed: 6.5"(16.51 cm)

16-channel Audio Mixer

Yamaha | MG166CX

MG166CX, MG124CX, MG82CX

Mixing Consoles



MG166CX



MG124CX



MG82CX

Yamaha's one-knob compressor and built-in SPX effects give these mixers refined creative control.

- 8, 12, or 16 inputs in remarkably lightweight, portable designs.
- Yamaha's innovative one-knob compressor lets you easily dial in the amount of compression you need.
- Built-in digital SPX multi-effect processor.
- All models feature high-quality Neutrik™ balanced XLR connectors on mono microphone/line channels and XLR-equipped stereo channels.
- Top-mounted input and output connectors for easy setup and re-patching.
- High-performance microphone preamplifiers with switchable phantom power.
- 3-band channel EQ and high-pass filters (sweepable midrange on the MG166CX).
- Smooth 60-millimeter faders & illuminated channel ON switches.
- The MG82CX has a single stereo bus (i.e. two mono buses), while the other models feature one or two additional stereo group buses and outputs for convenient channel grouping.
- AUX sends with master send controls for convenient processing and monitoring.
- Return level controls for the AUX and STEREO buses.
- Bright meters for visual level monitoring.
- Optional microphone stand mount available for the MG82CX.
- MG166CX rack mountable.

OPTION

BMS10A
Mic Stand Adaptor
for MG82C



FC5
Foot Switch



MG166CX, MG124CX, MG82CX

GENERAL SPECIFICATIONS

	MG166CX	MG124CX	MG82CX
Mic/Line inputs	10	6	4
Line inputs	8 mono + 4 stereo	4 mono + 4 stereo	2 mono + 3 stereo
Mixer input channels	16	12	8
Group buses	4	2	-
AUX buses	3 (Incl. 1x Effect send)	2 (Incl. 1x Effect send)	1 (Effect send)
Main buses	Stereo	Stereo	Stereo
Total harmonic distortion** (THD+N)	Less than 0.1%, 20Hz-20kHz		
Frequency response	0, +1, -3dB, 20Hz-20kHz		
Hum & noise level**	Equivalent input noise (EIN): -128dBu Residual output noise: -98dBu		Equivalent input noise (EIN): -128dBu Residual output noise: -100dBu
Crosstalk (@1kHz)	-70dB		
Power supply adaptor	PA-30 AC adaptor (AC35VCT, 1.4A) 100V, 120V, 220V, 230V or 240V; 50/60Hz	PA-20 AC adaptor (AC35VCT, 0.94A) 100V, 120V, 220V, 230V or 240V; 50/60Hz	PA-10 AC adaptor (AC38VCT, 0.62A) 100V, 120V, 220V, 230V or 240V; 50/60Hz
Power consumption	35W	30W	21W
Dimensions (W x H x D)	478 x 105 x 496mm (18.8" x 4.1" x 19.5")	346.2 x 86.1 x 436.6mm (13.6" x 3.4" x 17.2")	256.6 x 62.2 x 302.5mm (10.1" x 2.5" x 11.9")
Net weight	5.5kg (12.1lbs)	3.2kg (7.0lbs)	1.6kg (3.5lbs)
Accessories	Owners manual, AC adaptor		

*1 Total harmonic distortion is measured with a 18dB/Oct filter @80kHz.

**2 Hum & noise level is measured with a 6dB/oct filter @12.7kHz; equivalent to 20kHz filter with infinite dB/Oct attenuation

INPUT SPECIFICATIONS

Terminal	Gain	Actual Load Impedance	For Use With Nominal	Input Level			Connector
				Sensitivity	Nominal	Max. before Clip	
MG166CX							
CH IN MIC (1-8)	-60dB	3kΩ	50-600Ω Mics	-80dBu	-60dBu	-40dBu	XLR-3-31 type*
	-16dB			-36dBu	-16dBu	+4dBu	
CH IN LINE (1-8)	-34dB	10kΩ	600Ω Lines	-54dBu	-34dBu	+14dBu	TRS Phone jack*
	+10dB			-10dBu	+10dBu	+30dBu	
ST CH MIC IN (9/10, 11/12)	-60dB	3kΩ	50-600Ω Mics	-80dBu	-60dBu	-40dBu	XLR-3-31 type*
	-16dB			-36dBu	-16dBu	-6dBu	
ST CH LINE IN (9/10, 11/12)	-34dB	10kΩ	600Ω Lines	-54dBu	-34dBu	+14dBu	Phone jack**
	+10dB			-10dBu	+10dBu	+30dBu	
ST CH IN (13/14, 15/16)	-	10kΩ	600Ω Lines	-30dBu	-10dBu	+10dBu	Phone jack** RCA pin jack**
CH INSERT IN (1-8)	-	10kΩ	600Ω Lines	-20dBu	0dBu	+20dBu	TRS Phone jack**
RETURN [L,R]	-	10kΩ	600Ω Lines	-12dBu	+4dBu	+24dBu	Phone jack**
2TR IN [L,R]	-	10kΩ	600Ω Lines	-26dBV	-10dBV	+10dBV	RCA pin jack**
MG124CX							
CH IN MIC (1-4)	-60dB	3kΩ	50-600Ω Mics	-80dBu	-60dBu	-40dBu	XLR-3-31 type*
	-16dB			-36dBu	-16dBu	+4dBu	
CH IN LINE (1-4)	-34dB	10kΩ	600Ω Lines	-54dBu	-34dBu	+14dBu	TRS Phone jack*
	+10dB			-10dBu	+10dBu	+30dBu	
ST CH MIC IN (5/6, 7/8)	-60dB	3kΩ	50-600Ω Mics	-80dBu	-60dBu	-40dBu	XLR-3-31 type*
	-16dB			-36dBu	-16dBu	-6dBu	
ST CH LINE IN (5/6, 7/8)	-34dB	10kΩ	600Ω Lines	-54dBu	-34dBu	+14dBu	Phone jack**
	+10dB			-10dBu	+10dBu	+30dBu	
ST CH IN (9/10, 11/12)	-	10kΩ	600Ω Lines	-30dBu	-10dBu	+10dBu	Phone jack** RCA pin jack**
CH INSERT IN (1-4)	-	10kΩ	600Ω Lines	-20dBu	0dBu	+20dBu	TRS Phone jack**
RETURN [L,R]	-	10kΩ	600Ω Lines	-12dBu	+4dBu	+24dBu	Phone jack**
2TR IN [L,R]	-	10kΩ	600Ω Lines	-26dBV	-10dBV	+10dBV	RCA pin jack**
MG82CX							
CH IN MIC (1, 2)	-60dB	3kΩ	50-600Ω Mics	-72dBu	-60dBu	-40dBu	XLR-3-31 type*
	-16dB			-28dBu	-16dBu	+4dBu	
CH IN LINE (1, 2)	-34dB	10kΩ	600Ω Lines	-46dBu	-34dBu	+14dBu	TRS Phone jack*
	+10dB			-2dBu	+10dBu	+30dBu	
ST CH MIC IN (3/4, 5/6)	-60dB	3kΩ	50-600Ω Mics	-72dBu	-60dBu	-40dBu	XLR-3-31 type*
	-16dB			-28dBu	-16dBu	-6dBu	
ST CH LINE IN (3/4, 5/6)	-34dB	10kΩ	600Ω Lines	-46dBu	-34dBu	+14dBu	Phone jack**
	+10dB			-2dBu	+10dBu	+30dBu	
ST CH IN (7/8)	-	10kΩ	600Ω Lines	-22dBu	-10dBu	+10dBu	Phone jack** RCA pin jack**
CH INSERT IN (1, 2)	-	10kΩ	600Ω Lines	-12dBu	0dBu	+20dBu	TRS Phone jack**
RETURN [L,R]	-	10kΩ	600Ω Lines	-8dBu	+4dBu	+24dBu	Phone jack**
2TR IN [L,R]	-	10kΩ	600Ω Lines	-22dBV	-10dBV	+10dBV	RCA pin jack**

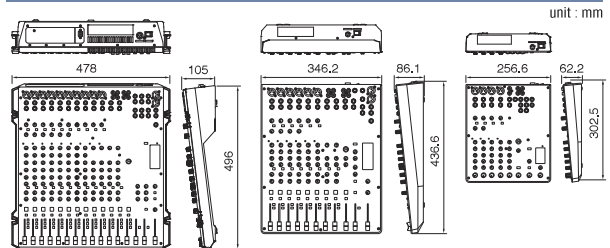
Sensitivity is the lowest level that will produce the nominal output level when the unit is set to maximum level.

OUTPUT SPECIFICATIONS

Terminal	Actual Source Impedance	For Use With Nominal	Output Level		Connector
			Nominal	Max. before Clip	
MG166CX					
STEREO OUT [L,R]	75Ω	600Ω Lines	+4dBu	+24dBu	XLR 3-32 type* TRS Phone jack*
GROUP OUT [1-4]	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
AUX SEND (1, 2)	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
EFFECT SEND	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
CH INSERT OUT (1-8)	75Ω	10kΩ Lines	0dBu	+20dBu	TRS Phone jack**
REC OUT [L,R]	600Ω	10kΩ Lines	-10dBV	+10dBV	RCA pin jack**
MONITOR OUT [L,R]	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack*
PHONES OUT	100Ω	40kΩ Lines	3mW	75mW	Stereo phone jack**
MG124CX					
STEREO OUT [L,R]	75Ω	600Ω Lines	+4dBu	+24dBu	XLR 3-32 type* TRS Phone jack*
GROUP OUT [1, 2]	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
AUX SEND	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
EFFECT SEND	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
CH INSERT OUT (1-4)	75Ω	10kΩ Lines	0dBu	+20dBu	Phone jack**
REC OUT [L,R]	600Ω	10kΩ Lines	-10dBV	+10dBV	RCA pin jack**
MONITOR OUT [L,R]	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
PHONES OUT	100Ω	40kΩ Lines	3mW	75mW	Stereo phone jack**
MG82CX					
STEREO OUT [L,R]	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
EFFECT SEND	150Ω	10kΩ Lines	+4dBu	+20dBu	TRS Phone jack***
CH INSERT OUT (1-2)	75Ω	10kΩ Lines	0dBu	+20dBu	TRS Phone jack**
REC OUT [L,R]	600Ω	10kΩ Lines	-10dBV	+10dBV	RCA pin jack**
MONITOR OUT [L,R]	150Ω	10kΩ Lines	+4dBu	+20dBu	Phone jack***
PHONES OUT	100Ω	40kΩ Lines	3mW	75mW	Stereo phone jack**

*** : Impedance balanced

DIMENSIONS



MG166C, MG166CX, MG206C, MG166C-USB, MG166CX-USB, MG206C-USB

MG124C, MG124CX

MG102C, MG82CX

Wireless Lavalier Microphone

Shure| ULXS14-85

Shure ULXS14/85-M1



The ULXS14/85 lavalier wireless system includes WL185 cardioid lavalier microphone, ULX1 bodypack transmitter, and ULXS4 diversity receiver. The ULXS14/85-M1 offers a frequency range of 662-698 MHz.

WL185 Lavalier Condenser Microphone:

The WL185 is a cardioid mic Recommended for general purpose sound reinforcement applications requiring good rejection of ambient noise. Use of windscreen highly recommended. Pickup angle: 130 degrees. It has a 1.2 meter (4 ft.) cable terminated with a miniature 4-pin mini connector. Included tie clip can be rotated in 90 degree intervals for placement flexibility.

ULX1 Wireless Bodypack Transmitter:

- Three-segment battery fuel gauge
- Frequency and power lockout
- Flexible 1/4 wave antenna
- TA4F mini four-pin input connector
- Backlit LCD display shows group and channel setting
- Adjustable audio gain control

- Input attenuation switch (selects 0 dB or -20 dB attenuation)
- PEAK icon appears when audio input overloads the transmitter
- Power on/off switch
- 8 hour battery life (9V battery)
- 300 foot (100m) operating range

ULXS4 Standard Wireless Receiver:

- Automatic Frequency Selection with group scan function
- Over 1400 selectable frequencies
- 5-segment transmitted audio signal strength meter
- RF indicator
- 3-segment transmitter battery fuel gauge
- Advanced multi-function LCD displays group and channel
- Mic/Line switch
- Removable 1/2-wave antenna
- XLR and 1/4-inch output
- 1/2 rack design



Wireless Handheld Microphone

Shure| ULXS24-58

Shure ULXS24/58

ULXS24/58 Includes The following components:



ULXS Receiver

- Power On Indicator
- "RF" Diversity Signal Indicators
- Transmitted (TX) Audio Indicators
- Receiving Antenna Indicator
- Group/Channel Displays
- Transmitter Battery Life Indicator
- MODE Button for Menu Display
- SET Button for Saving Settings
- Mic/Line level Switch
- XLR and 1/4" outputs with level control
- PS40, PS40E, PS40J or PS40UK in-line power supply with locking DC connector
- Space-saving 1/2 rack design



SM58 Handheld Mic

- 8-9 Hour Battery Life
- Power On/Off Switch
- Power/Battery LED-Green When ON, Red When Battery Low
- Three-segment Battery Power Icon
- PEAK Icon-Appears When Audio Signal Overloads
- Group/Channel Displays
- MODE Button for Menu Display
- SET Button for Saving Settings
- Adjustable Audio Gain Control
- Input Attenuation Switch-Select 0dB for Voice/Low Output; 20dB for High Output
- 4-pin Mini Connector
- Battery Cover Unscrews to Expose Battery and Gain Control
- 9V Battery Included



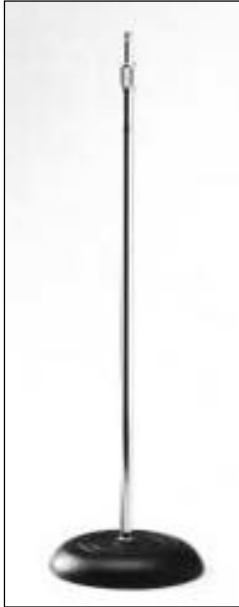
Mic Floorstand

Atlas Sound| MS-10C

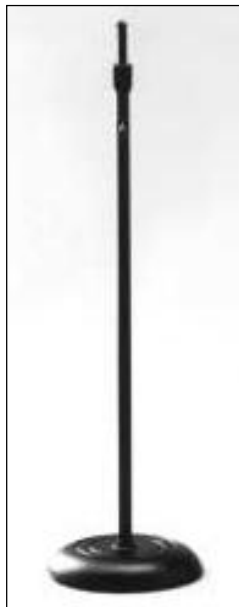


ALL-PURPOSE MICROPHONE FLOOR STANDS

MS-10C
MS-10CE



MS-10C



MS-10CE

FEATURES

- Economical, Industry Standard Floor Stands Suitable for a Variety of Applications
- Wearproof, Three-Piece Clutch Offers Secure, Fast, and Noise-Free Height Adjustment
- Edge-Concentrated, One-Piece Circular Base Ensures Maximum Stability
- Available in Choice of Chrome or Non-Reflective Ebony Epoxy Finish
- Field Serviceable Parts Guarantee Long Product Life

Steel tubing is finished in a choice of mirrored chrome or non-reflective ebony epoxy (E).

Anti-vibration cap absorbs incidental vibrations and sounds.

Lock-nut ring securely positions tubing to base.



Atlas Sound stands are threaded $\frac{1}{2}$ "-27 and include a lock-nut ring for versatile positioning of accessories.

Famous Atlas Sound clutch won't slip under pressure. Three-piece assembly is also field serviceable.

Bases are high-stability cast metal equipped with shock absorbing rubber pads.

APPLICATIONS

Atlas Sound® brand microphone floor stand Models MS-10C/MS-10CE are the industry standard for application in schools, churches, recreation complexes, lounges, restaurants, conference areas, meeting rooms or wherever sound reinforcement or communications systems are applied. Outstanding U.S. craftsmanship and high-quality materials are combined to make these functional, full-height stands extremely stable and durable-serving as exceptional values for performers and presenters.

GENERAL DESCRIPTION

MS-10C / MS-10CE. These all-purpose chrome and ebony finished stands, respectively, are quality, long-lasting models which feature durable tubing, the famous Atlas Sound® wearproof clutch, and a 10" dia. die cast circular base. The three-piece clutch provides positive locking control and is able to withstand years of stage and studio handling. The base features edge-concentrated weight distribution and is equipped with rubber pads to absorb shock and protect floor surfaces.

The $\frac{1}{2}$ " and $\frac{3}{8}$ " dia. tubing is fully adjustable with a vertical extension ranging from 35" to 63". Tubing is manufactured of cold rolled steel and terminates in the industry standard $\frac{1}{2}$ " - 27 thread suitable for microphone clamps and accessories (see reverse side). Top and bottom lock-nut rings are included for versatile and secure positioning.

Model MS-10C is finished in chrome; Model MS-10CE is finished in ebony epoxy to eliminate reflections caused by high-intensity lighting. This durable epoxy finish will withstand the rigors of repeated use and frequent transportation.

MODEL	HEIGHT SPAN	BASE DIAMETER	TUBE FINISH	BASE FINISH	WEIGHT
MS-10C	35" - 63"	10"	Chrome	Ebony	9.0 lbs.
MS-10CE	(89 - 160 cm)	(25 cm)	Ebony	Ebony	(4.1 kg)

Specifications subject to change without notice



1601 JACK MCKAY BLVD. / ENNIS, TEXAS 75119 U.S.A. / TELEPHONE: (800) 876-3333 / FAX (800) 765-3435

ACCESSORIES

BOOM ATTACHMENTS

BB-28X(E)	Adj. 26 1/4" - 38 3/4" Length, Chrome (Ebony)
BB-77(E)	Fixed 34" Length, Fixed 3/4 lb. Counterweight, Chrome (Ebony)
PB11X(E)	Adj. 16 1/2" - 24 1/2" Length, Fixed 3/4 lb. Counterweight, Chrome (Ebony)
PB15(E)	Fixed 34" Length, Counterweight, Fixed 3/4-lb. Chrome (Ebony)
PB21X(E)	Adj. 25 1/4" - 38 1/2" Length, Fixed 3/4 lb. Counterweight, Chrome (Ebony)
PB25	Fixed, 34 1/2" Length, Adj. 2 lb. Counterweight, Chrome
PB25X	Adj. 32" - 51 1/2" Length, Adj. 2 lb. Counterweight, Chrome

GOOSENECK FLEXIBLE EXTENSIONS (.338" I.D.)

GN-6(E)	6" L, Chrome (Ebony)
GN-13(E)	13" L, Chrome (Ebony)
GN-19(E)	19" L, Chrome (Ebony)

CLIP-MOUNTING MICROPHONE ACCESSORIES

LO-2B(E)	Lock-On / Mic Clip Disconnect, Chrome (Ebony)
SO-1B	Snap-On / Mic Clip Disconnect, Chrome
SW-1B	Gyro-Microphone Swivel, Chrome
TM-1(E)	Twin Microphone Mount, Chrome (Ebony)
VM-2	Compact, Shock Isolation Accessory, Chrome (replaces VM-1)

MULTI-PURPOSE CLAMPS

CO-1B	Adapter & Clamp, 5/8" -27, Max. Opening 7/8", Ebony
MAC-1	Adapter & Clamp, 5/8" -27, Max. Opening 1 1/2", Ebony

CABLE HANGERS & TUBE EXTENSIONS FOR USE WITH COUPLING ADAPTERS

CH-1B(E)	Cable / Tambourine Hanger, Chrome (Ebony)
AD-7B	3" Long Tube, 5/8"-27 Male Thread, Chrome Plated
AD-8B	6" Long Tube, 5/8"-27 Male Thread, Chrome Plated
AD-14B	90° Angle Tube, 5/8"-27 Male & Female Thread, Chrome Plated, 4"H x 4" Ext.
AD-19B	90° Angle Tube, 5/8"-27 Male & Female Thread, Chrome Plated, 6"H x 3" Ext.

REPLACEMENT KITS FOR MS-10C AND MS-10CE

MSC	Chrome Tube Assembly (5/8" - 7/8") with Clutch
MSCE	Ebony Tube Assembly (5/8" - 7/8") with Clutch
MSC-K	Clutch for Chrome Stands with 7/8" Dia. Tubing
MSCE-K	Clutch for Ebony Stands with 7/8" Dia. Tubing
MSAC-K	Miscellaneous Parts Kit with (1) Lock Ring, (1) Anti-Vibration Cap, and (3) Rubber Base Pads

Specifications subject to change without notice



1601 JACK MCKAY BLVD. / ENNIS, TEXAS 75119 U.S.A. / TELEPHONE: (800) 876-3333 / FAX (800) 765-3435



Ceiling Speaker

Posh| 5.25 Retro

5.25 Retro Ceiling Speaker

posh
Speaker Systems, Inc.

Features

- Full-range 5.25" coaxial speaker
- Sealed drawn steel enclosure
- ABS baffle
- Paintable grille
- Easy installation, new and retrofit
- 70/100 volt transformer (selector switch)

Applications

- Restaurants (indoor/outdoor)
- Retail establishments
- Houses of worship
- Commercial facilities
- Amusement parks
- Corporate audio — boardrooms



Description

The innovative Posh 5.25 Retro-fit Ceiling Speaker offers exceptional frequency response and ease of installation. The 5.25" coaxial loudspeaker comes self-contained in a sealed drawn steel enclosure, and includes a built-in extended bandwidth 70/100 volt transformer with multiple tap positions. With its small footprint (just 9.25") and light weight (only 6 lb), the Posh 5.25 Retro Ceiling Speaker mounts quickly and easily with four screw-mounted dogleg brackets to either ceiling tiles or sheet-rock. An attractive grille pushes into place to finish the quick installation. The system comes fully assembled, pair-packed with mounting C-ring and tile bridge supports.

The 5.25 Retro Ceiling Speaker has excellent full-range response with exceptional off-axis sound dispersion. It is an economical yet attractive full-range ceiling speaker, making it ideal for all types of commercial and business environments. This speaker is designed to perform multiple functions such as paging, messaging, and delivering either high-fidelity foreground or background music.

Specifications

Frequency Response	80 Hz – 18 kHz
Power Handling	20 watts RMS
Sensitivity	88 dB, 1 Watt / 1 meter
70 V Transformer, 10 W	Taps: .625, 1.25, 2.5, 5, 10
100 V Transformer, 10 W	Taps: 1.25, 2.5, 5, 10
Crossover Frequency	3 kHz first order
LF Driver	5.25" doped paper cone, butyl rubber surround, Kapton voice coil
HF Driver	.75" sealed ferrofluid poly
Enclosure	Drawn steel
Dimensions	9.25" diameter, 8.00" deep
Net Weight	6 lb

www.poshspeakers.com

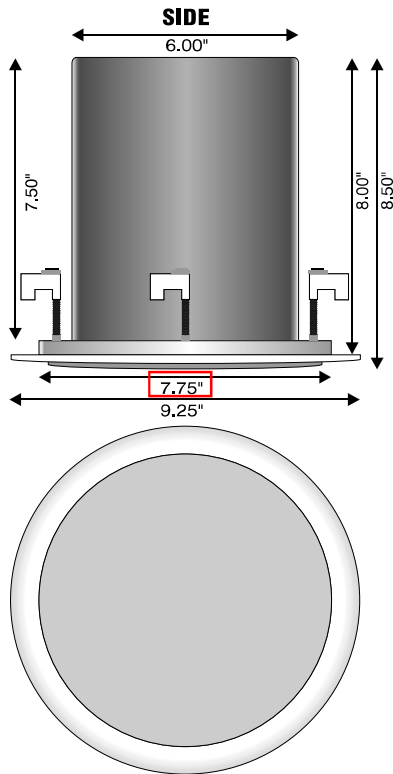
800.841.8501

Specifications subject to change without notice

5.25 Retro Ceiling Speaker



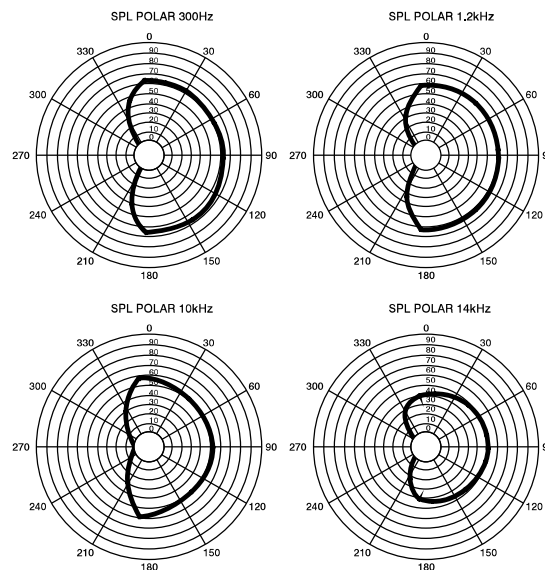
Technical Drawings



Options

- Rough-in mounting brackets for new construction

Acoustical Specifications



Architectural Specifications

The loudspeaker shall consist of a 5.25-inch low-frequency transducer, .75-inch high-frequency transducer in a coaxial alignment, and frequency dividing network installed in a drawn steel enclosure.

Performance specifications of a typical production unit shall be as follows: Measured sensitivity (SPL at 1 m [3.3 ft] with 2.83 V input, averaged from 500 Hz to 1.5 kHz) shall be at least 88 dB. Usable frequency response shall extend from 80 Hz–18 kHz (10 dB below rated sensitivity, in half-space, with no external equalization). The frequency dividing network shall have a crossover frequency of 3 kHz. Rated power capacity shall be at least 20 watts RMS.

The enclosure shall be constructed of drawn steel. The grille shall be a paintable steel with ABS bezel. The low-frequency transducer shall be constructed of a doped paper cone with a butyl rubber surround. The high-frequency transducer shall be constructed of sealed ferrofluid poly cone. Overall cabinet dimensions shall be no greater than 9.25 inches in diameter by 8.00 inches deep, and shall weigh no more than 6 lb. The system shall be the Posh 5.25 Retro Ceiling Speaker System.

Posh Speaker Systems Inc.

7865 NE Day Road West • Bainbridge Island, WA 98110
Fax: 206.842.0494 • email: info@poshspeakers.com

www.poshspeakers.com

800.841.8501

Specifications subject to change without notice



Power Amplifier



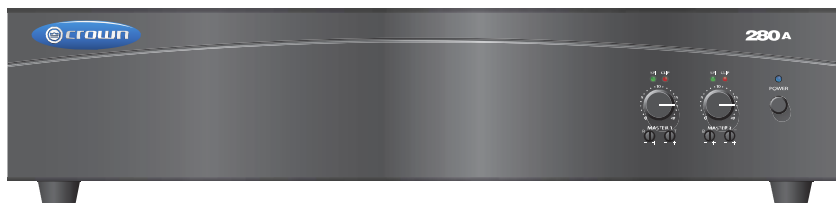
Crown Audio| 280A



180A
280A
1160A



COMMERCIAL AUDIO SERIES



The Crown® 180A, 280A, and 1160A are high-value amplifiers for commercial and industrial audio. They provide 4-ohm and constant-voltage outputs (70V and 100V). The amps are part of Crown's Commercial Audio Series, which also includes mixers and mixer-amps. These low-cost units provide all necessary features in a simple building-block format.

The amplifiers vary in their number of inputs, number of outputs, and power range:

- 180A has 1 input and one 80W power amplifier for single-zone systems.
- 280A has 2 inputs and dual 80W power amplifiers for two-zone systems.
- 1160A has 1 input and one 160W power amplifier for single-zone systems.

Some applications include schools, hospitals, factories, restaurant/retail, houses of worship, fitness facilities, A/V boardrooms, prisons, and small offices. Typical uses are paging, background music, security and evacuation instructions.

The sound system can be upgraded as a facility expands. For example, you can add more mixers for more inputs, or add more power amps (or mixer-amps) to handle more zones.

Specifications

Performance

Frequency Response (at 1 watt from 4-ohm tap): 70 Hz to 19 kHz +/- 1 dB.

Frequency Response (at line out): 20 Hz to 20 kHz +/- 1 dB.

Power Bandwidth (at 4-ohm tap, 2 dB below maximum 1 kHz power): 50 Hz to 20 kHz with < 0.5% THD

Signal to Noise Ratio (ref. to rated power, master volume at minimum): 85 dB.

DC Output Offset: < ±5 mV.

THD: Less than 0.5% at rated power at 1 kHz.

Input Sensitivity (for full output at maximum gain): 800 mV.

Input Impedance (nominal): 100 kilohms.

Minimum Load Impedance:

100V output: 160 ohms.

70V output: 80 ohms.

4-ohm output: 4/8 ohms.

Crosstalk (all controls at "10"): -70 dB at 1kHz.

Line Output Level (nominal): 1V into 10 kilohms.

AC Line Voltages Available:

100V 50/60 Hz

120V 60 Hz

220V 50/60 Hz

230V 50/60 Hz

240V 50/60 Hz

Features

- 1 or 2 inputs, 1 or 2 amplifier output channels.
- Ideal for commercial and industrial use
- Balanced Phoenix-type line inputs; touch-proofed screw-terminal speaker outputs
- Advanced protection system includes output current limiting, DC protection, circuit breaker/fuse, and thermal protection; details available online at www.crownaudio.com
- Three-Year, No-Fault, Fully Transferable Warranty completely protects your investment and guarantees its specifications

180A

*1 kHz Power

Minimum guaranteed power into 4 ohms or 70V/100V output **80W**

*1 kHz Power: refers to maximum power in watts at 1 kHz with 0.5% THD.

280A

*1 kHz Power

Minimum guaranteed power per channel into 4 ohms or 70V/100V output **80W**

*1 kHz Power: refers to maximum power in watts at 1 kHz with 0.5% THD.

1160A

*1 kHz Power

Minimum guaranteed power into 4 ohms or 70V/100V output **160W**

*1 kHz Power: refers to maximum power in watts at 1 kHz with 0.5% THD.

Operating Temperature/Humidity: 0° C to 40° C at 95% relative humidity (non-condensing).

Storage Temperature: -20° C to 85° C.

Front Panel Controls and Indicators

Power Switch: Pushbutton on-off switch. The power switch does not affect the 24V DC auxiliary power input.

Power Indicator: Blue LED indicates power on.

Output Signal Presence Indicator: Green LED, one for each output channel, illuminates when output signal level exceeds 100 mV (45 dB below full power) from the 4-ohm tap.

Clip Indicators: Red LED, one per output channel. Illuminates at threshold of audible distortion.

Master Volume Controls: One per output channel. Detented potentiometer with knob.

Tone Controls: Bass and Treble non-detented potentiometers on each channel. Bass ±10 dB at 100 Hz, Treble ±10 dB at 10 kHz.

Back Panel Controls and Connectors

Reset Switch: Resets the circuit breaker that protects the power supply. 220/230/240V units have a fuse instead.

AC Power Inlet: Detachable IEC.

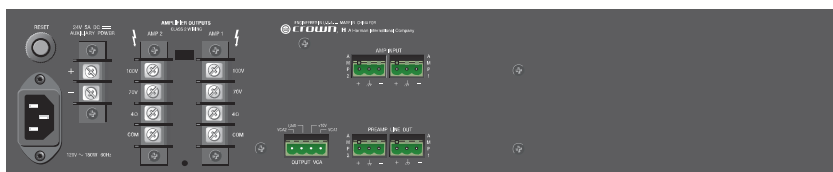
Auxiliary Power Input: 2-position terminal strip for 24 VDC (±10%) backup power. Accepts up to 14 AWG terminal forks.

Amplifier Outputs Connectors: One per channel, 4-position terminal strip with COM (Common), 4 ohms, 70V and 100V terminals. Accepts up to 10 AWG terminal forks. Non-touch cover included.

Output VCA Connector: One for every two channels, 4-pin Phoenix-type connector for two VCA control lines of +10 VDC and ground. Compatible with Crown 1-VCA and 4-VCA modules.



180A
280A
1160A



280A back panel. 180A and 1160A are similar except for the number of channels.

Line Out Connector: One 3-pin balanced Phoenix-type connector per output channel. Post master, pre-VCA. Level controlled by master volume control.

Amp Input Connector:
3-pin Phoenix-type, high-impedance balanced, one per amplifier channel.

Cooling
Convection cooled.

Protection
Current Limit Protection: Included.

Thermal Limit Protection: Over-temperature thermal cutout.

DC-Fault Load Protection: Included.
Included Accessories

- Power cord
- Detachable rack ears
- Screws for rack ears
- Non-touch cover for output connectors
- Phoenix-type connectors
- Spade lugs

Optional Accessories

- 1-VCAP remote volume control for one channel.
- 4-VCAP remote volume control for four channels.

Dimensions

EIA Standard 19-inch (48,3-cm) rack mount width (EIA RS-310-B) with rack ears, 3.5-inch (8,9-cm) height and 12,2-inch (31,0-cm) depth behind the mounting surface (not including non-touch cover). 4,1 inches (10,5 cm) high including feet. 13,9 inches (35,2 cm) deep from front of knobs to back of non-touch cover.

Weight

- Net Weight:**
- 180A: 21.0 lb (9.5 kg)
 - 280A: 25.3 lb (11.5 kg)
 - 1160A: 25.3 lb (11.5 kg)

Shipping Weight:

- 180A: 26.0 lb (11,8 kg)
- 280A: 30.3 lb (13,7 kg)
- 1160A: 30.3 lb (13,7 kg)

Crown's Three-Year, No-Fault, Fully Transferable Warranty

Crown offers a Three-Year, No-Fault, Fully Transferable Warranty for every new Crown amplifier—an unsurpassed industry standard. With this unprecedented No-Fault protection, your new Crown amplifier is warranted to meet or exceed original specifications for the first three years of ownership. During this time, if your amplifier fails, or does not perform to original specifications, it will be repaired or replaced at our expense. About the only things not covered by this warranty are those losses normally covered by insurance and those caused by intentional abuse. And the coverage is transferable, should you sell your amplifier.

See your authorized Crown dealer for full warranty disclosure and details. For customers outside of the USA, please contact your authorized Crown distributor for warranty information or call 574-294-8200.



H A Harman International Company

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Elkhart, IN 46517-9439
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FAX: 574-294-8FAX
www.crownaudio.com

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Loud Speaker

Bose| MA12 with Bracket

Panaray® MA12

mid/high modular line array



Key Features

- **Twelve 2.25" (64 mm) drivers** mounted in a vertical line array deliver wide horizontal coverage with narrow vertical pattern control
- **Modular design** allows stacking of multiple enclosures in a line array configuration to provide increased vertical pattern control which improves "throw" distance and reduces unwanted floor/ceiling reflections
- **145° horizontal x 20° nominal coverage** for a single module. Vertical coverage varies with number of modules stacked in line array configuration
- **Mid/high configuration** allows bass management and design flexibility. Use with Bose MB4, MB12, or MB24 modular bass loudspeakers for full-range reinforcement
- **Optional brackets** allow easy installation of single-, double- or triple-stack line array modules



TECHNICAL DATA SHEET

Product Overview

The Bose® Panaray® MA12 is a mid/high-frequency modular line array loudspeaker designed to provide outstanding vocal intelligibility in acoustically demanding spaces. The slim column enclosure blends with almost any décor.

Technical Specifications

System Performance	
Frequency Response (+/-3 dB) ¹	155 Hz - 12 kHz
Frequency Range (-10 dB) ¹	100 Hz - 16 kHz
Nominal Dispersion ²	145° H x 20° V
Recommended High-Pass Filter	125 Hz
Loudspeaker EQ	Required
Overload Protection	PTC / Lamp
Long-Term Power Handling ³	300 W (1200 W peak)
Sensitivity (SPL / 1 W @ 1 m) ⁴	88 dB SPL
Maximum SPL @ 1 m ⁵	113 dB SPL (119 dB SPL peak)
Nominal Impedance	8 Ω
Transformer Taps (70/100 V)	CVT-MA12 transformer available
Transducers	
Driver Complement	Twelve (12) 2.25" (57 mm) mid/high-frequency drivers
Physical	
Enclosure	Powder-coated aluminum, black or white
Grille	Powder-coated steel grille
Environmental	Indoor use only
Connectors	Two (2) parallel-wired NL4 Neutrik® Speakon® connectors One (1) two-conductor barrier strip
Suspension / Mounting	Four (4) x M6 threaded inserts (back)
Dimensions	38.8" H x 4.2" W x 5.0" D (984 mm x 105 mm x 128 mm)
Net Weight	19 lb (8.5 kg)
Shipping Weight	21 lb (9.4 kg)
Product Code	
Black	040189
White	040188

Footnotes:

- 1 Frequency response and range measured on-axis with recommended active EQ in an anechoic environment.
- 2 Vertical coverage varies by number of modules vertically arrayed and distance from line-source boundary. Use Modeler® software for the best prediction.
- 3 Power handling tested using pink noise filtered to meet IEC 268-5, 6 dB crest factor, 100 hours, with recommended EQ.
- 4 Sensitivity measured in free field (no boundary-loading gain) with recommended active EQ, referenced to 1W/1m.
- 5 Maximum SPL calculated from sensitivity and power handling specifications, exclusive of power compression.

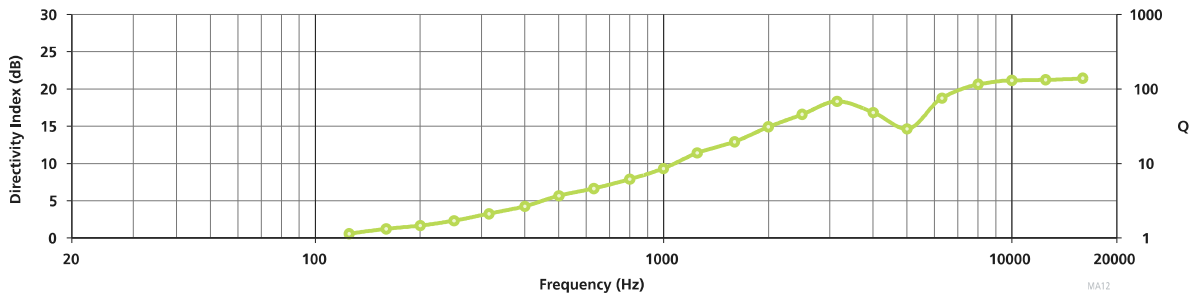
Panaray® MA12

mid/high modular line array

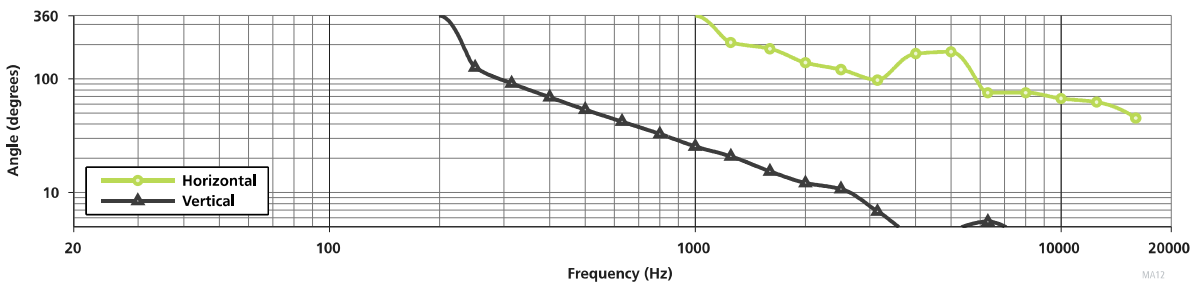


TECHNICAL DATA SHEET

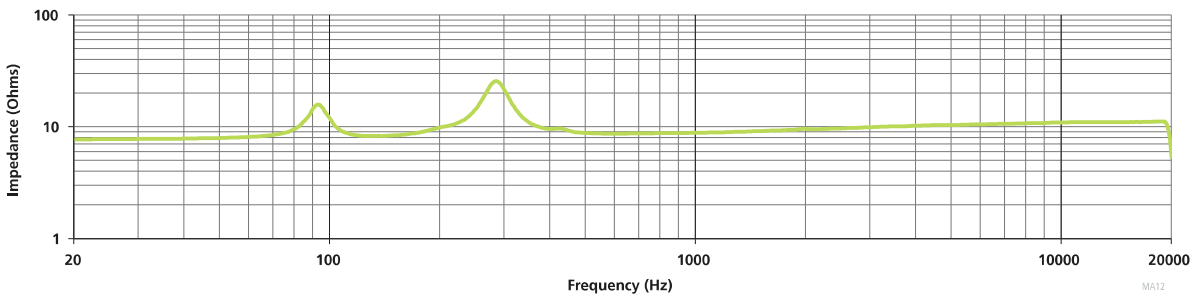
Directivity Index and Q



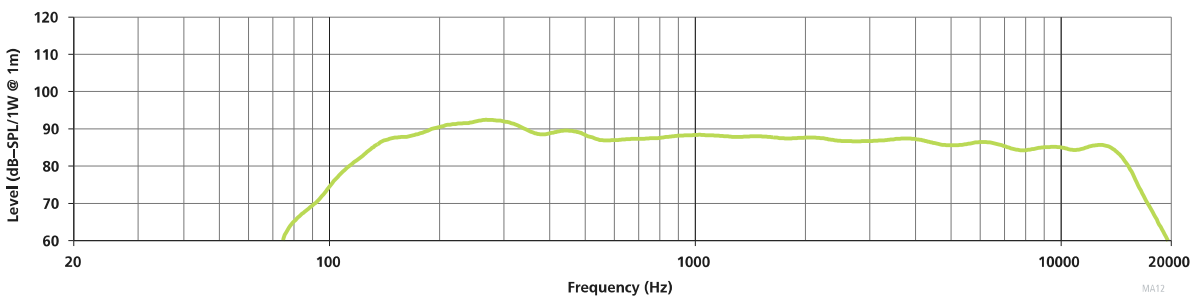
Beamwidth



Impedance



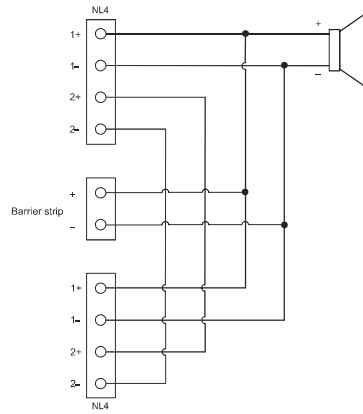
On-Axis Response



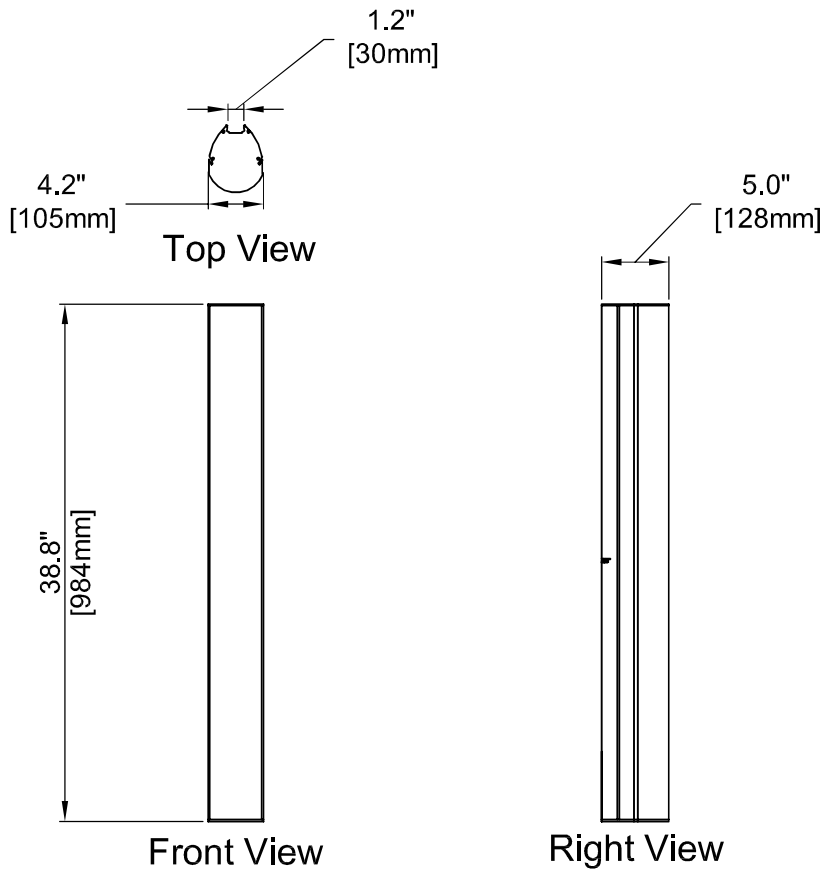
Panaray® MA12 mid/high modular line array



Wiring Diagram



Mechanical Diagrams

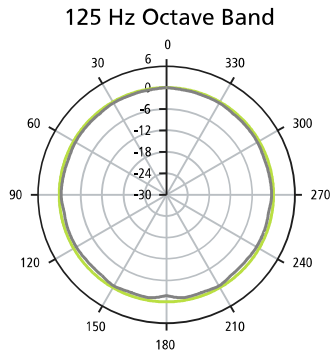


Panaray® MA12

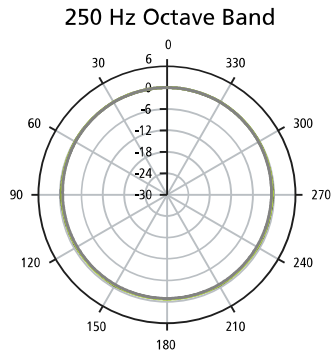
mid/high modular line array



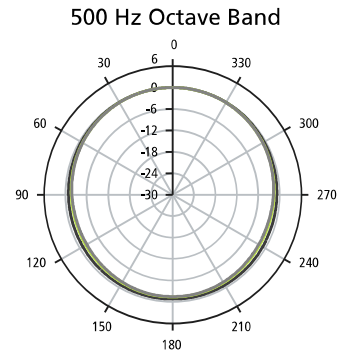
Horizontal Plots



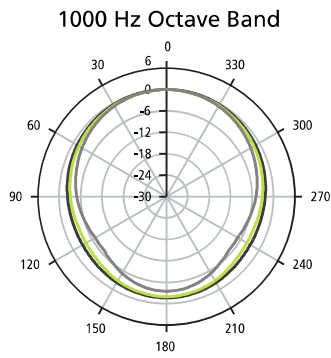
— 125 Hz
— 160 Hz



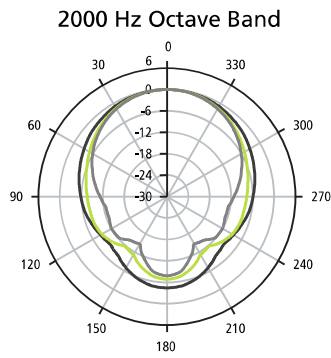
— 200 Hz
— 250 Hz
— 315 Hz



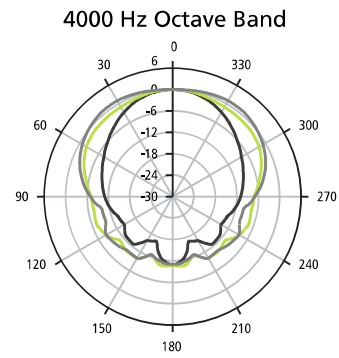
— 400 Hz
— 500 Hz
— 630 Hz



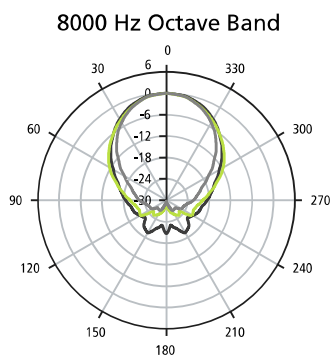
— 800 Hz
— 1000 Hz
— 1250 Hz



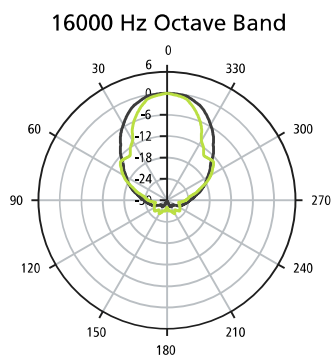
— 1600 Hz
— 2000 Hz
— 2500 Hz



— 3150 Hz
— 4000 Hz
— 5000 Hz



— 6300 Hz
— 8000 Hz
— 10000 Hz



— 12500 Hz
— 16000 Hz

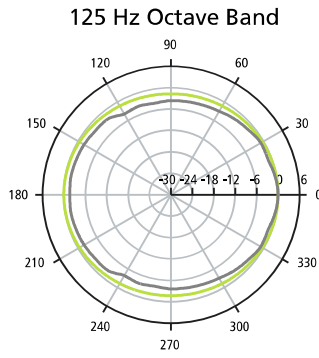
MA12

Panaray® MA12

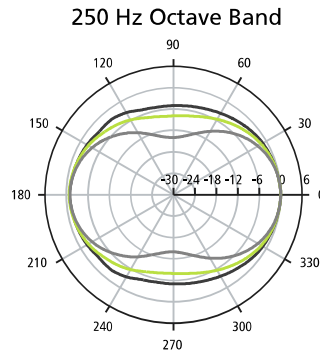
mid/high modular line array



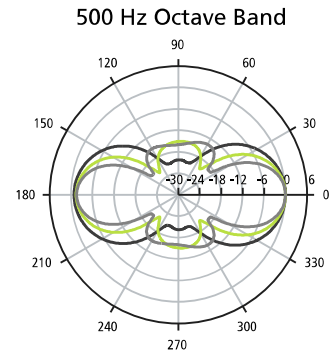
Vertical Plots



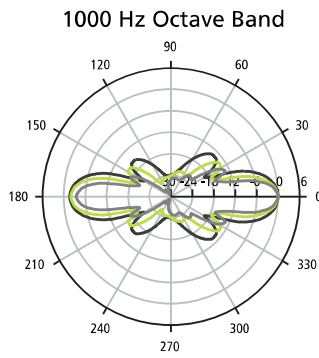
— 125 Hz
— 160 Hz



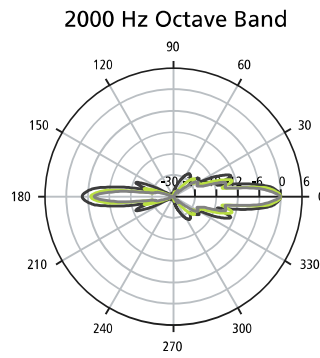
— 200 Hz
— 250 Hz
— 315 Hz



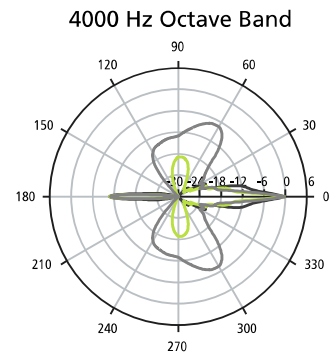
— 400 Hz
— 500 Hz
— 630 Hz



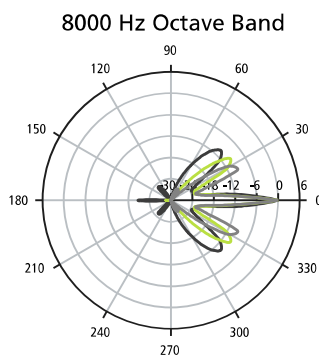
— 800 Hz
— 1000 Hz
— 1250 Hz



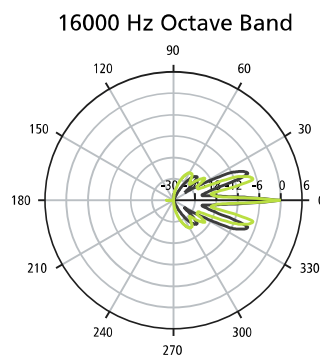
— 1600 Hz
— 2000 Hz
— 2500 Hz



— 3150 Hz
— 4000 Hz
— 5000 Hz



— 6300 Hz
— 8000 Hz
— 10000 Hz



— 12500 Hz
— 16000 Hz

MA12

Panaray® MA12

mid/high modular line array



Architects' and Engineers' Specifications

The loudspeaker shall be a multiple driver system with matched active equalization as follows:

The transducer complement shall consist of twelve 2.25" (57 mm) mid/high-frequency drivers mounted in vertical line array. Each driver shall have a rated impedance of 6.2 ohms and wired in series/parallel, resulting in a composite nominal impedance of 8 ohms.

The nominal horizontal beamwidth of the loudspeaker shall be 145 degrees, and the vertical coverage is a band of constant height. The power handling capacity of the loudspeaker shall be 300 watts continuous pink noise, band-limited from 155 Hz to 12 kHz (± 3 dB).

The loudspeaker shall be provided with a ducted vent system, tuned at 150 Hz. The input connector of the loudspeaker module shall consist of two parallel-wired NL4 Neutrik® Speakon® connectors and one (1) two-conductor barrier strip.

The enclosure of the MA12 loudspeaker module shall be aluminum. Its outer dimensions shall be 38.8" x 4.2" x 5.0" (984 mm x 105 mm x 128 mm). Its weight shall be 19 lb (8.5 kg).

The loudspeaker shall be the Bose® Panaray® MA12 modular line array loudspeaker.



Power Amplifier

Crest Audio| CPX 1500





(CPX2600 model shown)

Power Specifications	8Ω stereo	4Ω stereo	2Ω stereo	8Ω bridged	4Ω bridged
1kHz, 0.1% THD+N (2Ω stereo and 4Ω bridged have 1% THD)					
CPX 2600	500w	750w	1100w	1550w	2200w
CPX 1500	300w	500w	750w	1000w	1500w
CPX 900	180w	300w	450w	600w	900w

Features

- GCL Gain Comparator Limiting system with rear panel defeat switch
- Built-in Crossover
150 Hz, -24 dB per octave Linkwitz-Riley filter, tuned for subs
Individual in/out switches for Channels A and B
1/4" daisy chain outputs
- Built-in low cut filter
-18 dB per octave at 80 Hz
Individual in/out switches for Channels A and B
- Input connectors - Barrier strip, Female XLR 1/4" TRS
Pin 2 hot
- Outputs connectors
Speakons™ for Ch A and B and Bridged mono
Binding posts for Bridge mode
- Mode selector switch for stereo and bridged-mono operation
- Two speed DC Fan

Protection Circuitry

GCL (Gain Comparator Limiting): Monitors input/output gain and reduces signal when distortion or excessive high current conditions occur. Protects loudspeakers from dangerous transients and unexpected level changes. Transparent in operation, yet very effective for its designed purpose.

Thermal: Amp monitors internal heat sink temperature and temporarily shuts down during extreme thermal conditions.

DC Triac Crowbar: Prevents amplifier from putting out or receiving dangerous DC over the speaker lines.

Turn On/Off Muting: Outputs are muted during turn on and turn off to prevent audible pop through speakers.

Description

The CPX is an affordable line of amplifiers geared toward the MI and DJ markets. A tradition of great sound quality, flexibility and reliability is carried over into the Crest Performance series. Industry standard connectors and features make the CPX a great backbone for mobile sound systems, project studios and many other applications. Musicians will also find CPX as the power amp of choice.

Power points: Crest CPX amps are available in three models, CPX900, CPX1500 and CPX2600. Power capabilities range from 180 Watts to 2200 Watts. CPX amps will drive loads that range from 8 Ohms stereo to 2 Ohms stereo, or 4 Ohms bridged.

Feature set: With a comprehensive set of features including built-in signal limiting, low pass filters and low frequency crossovers with direct outputs, the CPX line addresses several applications and serves as a low-cost solution for most power amplification needs.

Preliminary Specifications

CPX Series Power Amplifiers

	CPX 900	CPX 1500	CPX 2600
stereo power 8Ω	180W	300W	500W
4Ω	300W	500W	750W
2Ω (1% THD)	450W	750W	1100W
bridged mono power 8Ω	600W	1000W	1550W
4Ω (1% THD)	900W	1500W	2200W

1kHz, 0.1% THD+N Power figures are watts per channel, both channels driven @ 120/240 VAC

HUM & NOISE:

Stereo mode Below rated output power, 4 ohms 100 dB 100 dB 100 dB

INPUT SENSITIVITY & IMPEDANCE: 0.87V RMS 1.12V RMS 1.50V RMS
 @ rated output power, 4 ohms (-1.2 dBv) (+1dBv) +3.5 (dBv)

Unbalanced, 1/4" phone jack / Balanced, XLR 10K / 20K Ohms 10K / 20K Ohms 10K / 20K Ohms
 Overall system gain per channel 40X (+32 dB) 40X (+32 dB) 40X (+32 dB)

DISTORTION

SMPTE-IM Less than 0.01% Less than 0.01% Less than 0.01%
 (THD, typical value)

Stereo mode, both channels driven, 4 ohms
 20 Hz to 20 KHz, 10dB below rated power Less than 0.03% Less than 0.03% Less than 0.03%
 20 Hz to 2 KHz, at full rated power Less than 0.03% Less than 0.03% Less than 0.03%

FREQUENCY RESPONSE:

+0,-1 dB @ 1W RMS, 4 ohms 20 Hz to 20 kHz 20 Hz to 20 kHz 20 Hz to 20 kHz
 +0,-3 dB @ rated output, 4 ohms 5 Hz to 50 kHz 5 Hz to 50 kHz 5 Hz to 50 kHz

DAMPING FACTOR: (Typical value)

8 ohms, 1 KHz >300 >300 >300

POWER CONSUMPTION:

Stereo mode, both channels driven
 @ 1/3 rated output power, 4 ohms 120 VAC 5.0 A 8.0 A 10.0A

TOPOLOGY Class AB Class AB Class H

WEIGHT 40 lbs (18.2 kg) 45 lbs (20.5 kg) 49 lbs (22.3 kg)

DIMENSIONS (all models) Height: 3.5" (8.9 cm), Width: 19" (48.3 cm), Depth: 14" 35.6 cm)



Crest Audio reserves the right to make improvements in manufacturing or design which may affect specifications.

7/23/01
v.1.2



A4500011

Crest Audio Inc.
 16-00 Pollitt Dr. Fair Lawn, NJ 07410 USA
 TEL: 201.909.8700 FAX: 201.909.8744
 www.crestaudio.com



Subwoofer

JBL| EON518S

JBL

EON518S

Portable Self-Powered 18", Bass-Reflex Design

Professional Series

Applications:

- ▶ Live sound reinforcement, speech and vocals, music playback in entertainment, A/V, and institutional venues – especially when ease of use and portability are important factors.
- ▶ Extending the low-frequency output performance of powered and non-powered full-range speaker systems.
- ▶ Optimized for complete compatibility with EON® full-range speakers.

Features:

- ▶ 500 watt High-Performance Powered Subwoofer System
- ▶ True portability weighing only 29.5 kg (65 lb)
- ▶ Compact enclosure
- ▶ Designed handles with comfort rubber grips for easy transport
- ▶ 18" Differential Drive® low-frequency driver with neodymium magnet for low-distortion and light weight
- ▶ Efficient Class-D digital amplifier technology
- ▶ Stereo balanced loop-through outputs
- ▶ Integrated and switchable High Pass Filter on loop-through outputs
- ▶ Easy "daisy-chain" connections for extending the system
- ▶ Polarity reverse selector
- ▶ Integrated 36 mm pole mount socket for sub/satellite applications
- ▶ Rugged DuraFlex™ finish

The EON518S is an 18-inch, direct radiating, high performance powered compact subwoofer system. Designed to extend low frequency performance of any EON system. It also offers the convenience of an integrated crossover and stereo loop-thru capability. The EON518S is comprised of a 460 mm (18") Differential Drive® woofer driven by a 500 watt Class-D digital amplifier.

The amplifier input panel offers stereo or mono line level inputs via balanced XLR connectors as well as a single channel speaker level input via a ¼ inch TS phone jack. Signal processing, crossover functionality and limiting for the system is integrated into the input section functionality. Overall subwoofer input sensitivity is controlled by a single easy grip knob and a simple switch enables polarity reversal for sub/satellite system optimization. Signal present and limit lights indicate performance status. An additional switch is provided to defeat the illuminated logo in theatre applications.

The enclosure has been engineered for maximum performance and absolute minimum size. Constructed of 18 mm plywood it is coated in JBL's rugged DuraFlex™ finish. It also features a full screen-backed steel grille designed into a rugged copolymer bezel for maximum component protection. For comfortable portability the EON518S features two large ergonomic rubber grip handles.



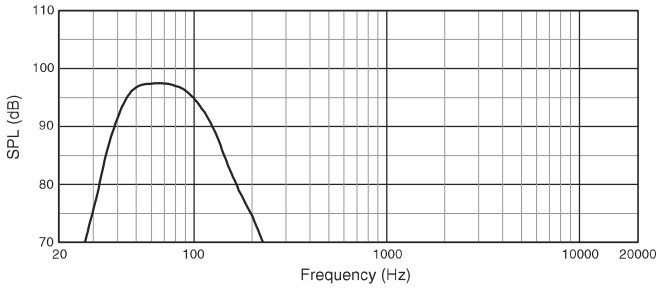
Specifications:

System Type:	Self powered 18", bass-reflex design
Frequency Range (-10 dB):	36 Hz - 130 Hz
Frequency Response (±3 dB):	42 Hz - 100 Hz
Crossover Frequency:	120 Hz (HPF selectable on outputs)
System Power Rating:	500 W continuous, 1000 W peak
Distortion:	Less than 0.1% at rated power
Maximum SPL:	129 dB
Signal indicators:	Limit: Red LED indicates input overload condition Signal: Green LED indicates signal present
Input Gain:	- Infinity to +4 dBu
Input Impedance:	Nominal 20k Ohms (balanced)
Polarity:	0° or 180° phase shift
LF Driver:	1 x JBL 268G 460 mm (18") Differential Drive® integrated woofer with dual voice coils, 4 ohm impedance
Enclosure:	18 mm, plywood
Suspension / Mounting:	36 mm pole socket on top
Finish:	DuraFlex™ finish
Grille:	Powder coated perforated steel with acoustically transparent black screen backing.
Input Connectors:	Balanced XLRs with loop through (stereo) to balanced XLR satellite outputs. ¼" Speaker level input.
XLR Pin Assignments:	Pin 2 (+), Pin 3 (-), Pin 1 (GND)
AC input:	120 – 230 V, 50/60 Hz
Dimensions (H x W x D):	617 mm x 569 mm x 652 mm (24.3 in x 22.4 in x 25.7 in)
Net Weight:	29.5 kg (65 lb)

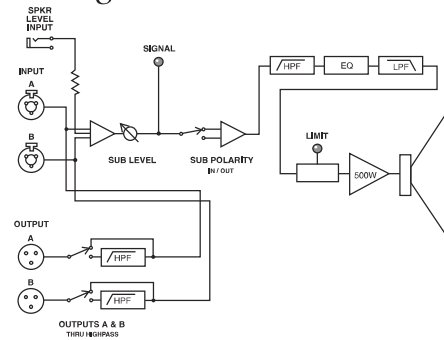
JBL continually engages in research related to product improvement. Some materials, production methods and design refinements are introduced into existing products without notice as a routine expression of that philosophy. For this reason, any current JBL product may differ in some respect from its published description, but will always equal or exceed the original design specifications unless otherwise stated.

► EON518S Portable Self-Powered 18", Bass-Reflex Design

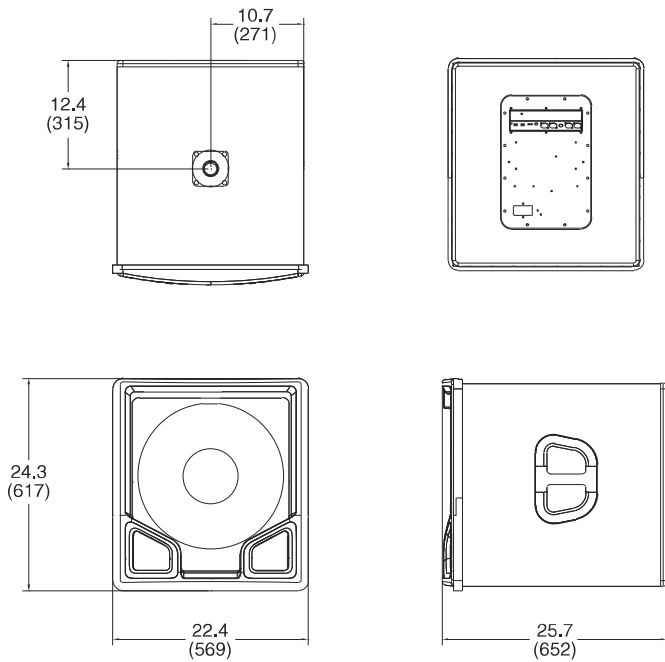
On Axis Frequency Response



Block Diagram

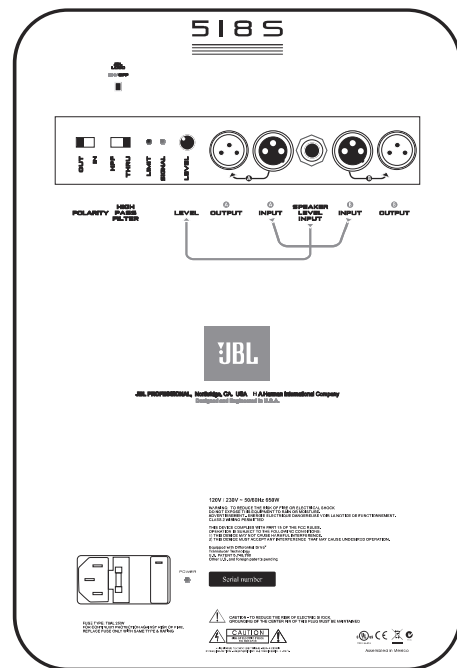


Dimensions



Dimensions in inches (mm)

Input Panel



JBL Professional
8500 Balboa Boulevard, P.O. Box 2200
Northridge, California 91329 U.S.A.

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www.jblpro.com

SSEON518S
CRP 5M
09/08

Control & Lighting System



Integrated Controller

AMX| NX-2200



NetLinx® NX Integrated Controller

NX-2200 (FG2106-02)



Overview

The next generation NetLinx Integrated Controller Family, the NX Series, provides a scalable platform for the future by combining high performance, backward compatibility and extensive network security features. The NX-2200 is ideal for control and automation of medium-sized rooms and multi-room applications.

Common Applications

The NX-2200 is a good fit for medium-sized conference rooms or classrooms, as well as multi-room applications in home theaters, whole homes, hotel rooms and other environments.

Features

- **Hardware / Software Built for 24/7/365 Operation** – Provides outstanding reliability and improved diagnostics
- **IPv6 and wired 802.1x** – Supports modern networking standards
- **Dual NIC** – Enables two discrete network interfaces for unrivaled security
- **High Performance Architecture, Flexible Programming Platform (RPM, NetLinx and Java)** – Easily scalable to support a wide range of applications for today and tomorrow
- **Full Line Compatible (Backwards and Cross-Compatibility)** – Standardized port numbers and new configuration import/export tools mean fewer coding changes
- **Enhanced Diagnostics on Serial and IR Ports** – Provides real time error feedback when Serial and IR ports are disconnected or improperly wired
- **File Import / Export from USB Drive** – Backup and restore configuration and program data and update firmware from a standard USB flash drive

Additional Features

- **Ultra-Fast 1600 MIPS processor**
- **512 MB Onboard RAM**
- **1 M Non-Volatile Memory**
- **8 GB SDHC FLASH Memory**
- **1 RU Rack Space**
- **1 AXLink Interface**
- **1 10/100 LAN Interface**
- **1 10/100 ICSLan Interface**
- **4 Digital I/O Ports**
- **1 RS-232/422/485 Port**
- **3 RS-232-Only Ports**

- 4 IR/Serial Output Ports
- 4 Relay Ports

Specifications

GENERAL	
Enclosure	Metal with black matte finish
Dimensions (HWD)	1 3/4" x 17" x 9 1/8" (44.86 mm x 431.80 mm x 231.65 mm)
Weight	6.08 lb. (2.758 Kg)
Certifications	FCC CFR Title 47 Part 15 CE EN 55022 CE EN 55024 CE EN 60950-1 IEC 60950-1 UL 60950-1 C-Tick CISPR 22 IC CISPR 22 VCCI CISPR 22 RoHS / WEEE Compliant
Included Accessories	<ul style="list-style-type: none"> • 2-pin 3.5 mm mini-Phoenix (female) PWR connector (41-0002-SA) • 4-pin 3.5 mm mini-Phoenix (female) AxLink connector (41-5047) • 10-pin 3.5mm mini-Phoenix female RS-232/422/485 connectors (41-5107) • (3) 5-pin 3.5mm mini-Phoenix female RS-232 connectors (41-0336) • 6-pin 3.5 mm mini-Phoenix female I/O connector (41-5063) • 8-pin 3.5 mm mini-Phoenix female Relay connector (41-5083) • (2) CC-NIRC IR Emitters • (2) Removable rack ears
Optional Accessories	<ul style="list-style-type: none"> • PSN6.5, 6.5 A Power Supply (FG423-41) • PSR4.4, 13.5 VDC, 4.4 A Power Supply with 3.5 mm Phoenix Connector with Retention Screws (FG423-46) • PSN4.4, 13.5 VDC, 4.4 A Power Supply with 3.5 mm Phoenix Connector (FG423-45) • CC-USB-NI, USB Programming Cable (FG10-2105) • CC-NIRC, IR Cables (FG10-000-11) • CC-NET, Cat5 Ethernet Cable (FG10-051-10) • CBL-ETH-FL, Ethernet Cat5e Flat Cable (FG10-2182-16) • EXB-IRS4, ICSLan IR/S Interface, 4 IR/S and 4 Inputs (FG2100-23) • EXB-COM2, ICSLan Serial Interface, 2 Ports (FG2100-22) • EXB-REL8, ICSLan Relay Interface, 8 Channels (FG2100-20) • EXB-I/O8, ICSLan Input/Output Interface, 8 Channels (FG2100-21) • EXB-MP1, ICSLan Multi-Port, 1 COM, 1 IR/S, 2 I/O, 1 IR RX (FG2100-26)
ACTIVE POWER REQUIREMENTS	
Voltage, DC (typical)	12 VDC
DC Current Draw	250 mA @ 12 VDC

Voltage DC Range	9 - 18 VDC
Power Connector	3.5mm Phoenix with retaining screws

POWER CONSUMPTION	
Active Power Consumption	4.2 W

ENVIRONMENTAL	
Temperature (Operating)	32° F to 122° F (0° C to 50° C)
Temperature (Storage)	14° F to 140° F (-10° C to 60° C)
Humidity (Operating)	5% to 85% RH
Heat Dissipation (Typical)	14.3 BTU/hr

ONBOARD MASTER	
Processor	1600 MIPS
Program Port	(1) USB Standard B
Configuration Dip Switch	4-position
Status Indicator	Status LED (green) blinks to indicate that the system is programmed and communicating properly
Input Indicator	Input LED (yellow) blinks to indicate that the Controller is receiving data
Output Indicator	Output LED (red) blinks to indicate that the Controller is transmitting data
ID Pushbutton	Black ID pushbutton for setting IP mode and reverting to default configuration and firmware
USB Host Port	(2) USB Standard A, one on front and one on back, USB Host port supports Solid State drive for upgrading firmware, loading code files, copying configuration data and remote storage

MEMORY	
NVRAM	1 MB
Memory Card	8 GB SD
DDRAM	512 MB
Note	Supports external USB Solid State Drives

ETHERNET	
Connection	(1) RJ-45
Description	10/100 Port RJ-45 connector provides TCP/IP communication. Auto MDI/MDI-X enabled. Supports IPv4 and IPv6 networks. Supports HTTP, HTTPS, Telnet, FTP
Link/Act Indicator	Link/Activity LED (green) blinks when receiving Ethernet data packets, one on Ethernet RJ-45 connector and one on the front panel
Speed Indicator	Speed LED (yellow) lights On when the connection speed is 100 Mbps Ethernet connection and turns OFF when the speed is 10 Mbps

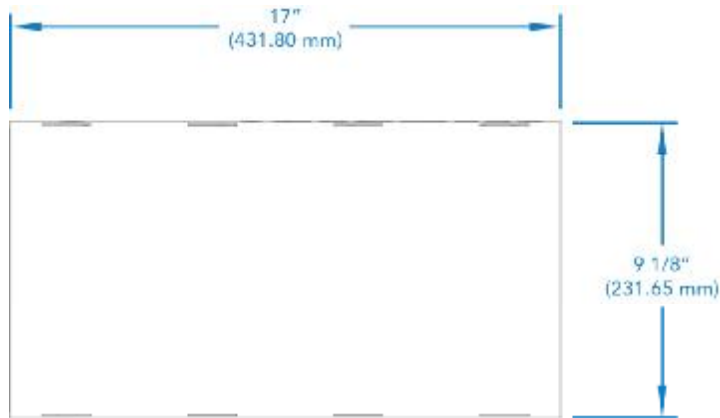
ICSLan	
ICSLan Connection	(1) RJ-45, 10/100 Port RJ-45 connector. Auto MDI/MDI-X enabled. Supports IPv4 and IPv6 networks. Supports HTTP, HTTPS, Telnet, FTP

ICSLan Link/Active Indicator	ICSLan LED (green) blinks when receiving Ethernet data packets, one on Ethernet RJ-45 connector and one on the front panel
ICSLan Speed Indicator	Speed LED (yellow) lights On when the connection speed is 100 Mbps Ethernet connection and turns OFF when the speed is 10 Mbps

CONTROL PORTS & INDICATORS	
AxLink Port	(1) 4-position 3.5mm Screw Terminal, provides data and power to external AxLink control devices
AxLink Indicator	(1) AxLink LED (green) indicates the state of the AxLink port
RS-232/422/485 Port	(1) 10-position 3.5mm Screw Terminal NetLinx Port 1 XON/XOFF (transmit on / transmit off) CTS/RTS (clear to send/ready to send) 300 - 115,200 baud
RS-232 Port	(3) 5-position 3.5mm Screw Terminal NetLinx Port 2-4 XON/XOFF (transmit on / transmit off) CTS/RTS (clear to send/ready to send) 300 - 115,200 baud
Serial Indicator	(4) sets of LEDs (red/yellow) indicate when serial Ports 1-4 are transmitting and receiving data
IR/Serial	(4) 2-position 3.5mm Screw Terminal 4 IR Transmit / 1-way Serial ports NetLinx Ports 11-14 Support high-frequency carriers up to 1.142 MHz 4 IR/Serial data signals can be generated simultaneously
IR/Serial Indicators	(2) LEDs (red) indicate when each of the IR/Serial ports (11-14) are transmitting control data
I/O Channels	(4) One 6-position 3.5mm Screw Terminal 4-channel binary I/O port for contact closure with each input being capable of voltage sensing NetLinx Port 22 Channels 1-4
I/O Indicator	(4) LEDs (yellow) indicate each of the I/O channels (1-4) are active
Relays	(4) One 8-position 3.5 mm Screw Terminal, (4) single-pole, single-throw relays NetLinx Port 21 Channels 1-4 Each relay can switch up to 24 VDC or 28 VAC @ 1 A Each relay is independently controlled
Relay Indicators	(4) LEDs (red) indicate when each of the relay channels (1-4) are active (closed)



For a more detailed pictorial drawing please visit: <http://www.amx.com/products/NX-2200.asp>



NX-2200
(Top View)



NX-2200
(Front View)



NX-2200
(Back View)



NX-2200
(Right View)

About AMX

AMX hardware and software solutions simplify the implementation, maintenance, and use of technology to create effective environments. With the increasing number of technologies and operating platforms at work and home, AMX solves the complexity of managing this technology with reliable, consistent and scalable systems. Our award-winning products span control and automation, system-wide switching and audio/video signal distribution, digital signage and technology management. They are implemented worldwide in conference rooms, homes, classrooms, network operation / command centers, hotels, entertainment venues, broadcast facilities, and more. ©2014 AMX. All rights reserved. Specifications subject to change. 4-September-2014.

AMX.com | 800.222.0193 | 469.624.8000 | +1.469.624.7400 | fax 469.624.7153



Wireless Access Point

TP-LINK| TL-WA901ND

300Mbps Wireless N Access Point

TL-WA901ND

⦿ Features

- Wireless N speed up to 300Mbps makes it ideal for bandwidth consuming or interruption sensitive applications like video streaming, online gaming and VoIP calling
- Backward compatible with 802.11 b/g products
- MIMO™ technology provides robust high-bandwidth wireless Tx/Rx capability at further range
- Supports multiple operating modes (Access Point, Client, Universal/WDS Repeater, Point to Point, Point to Multi-point)
- WPA/WPA2 encryptions provide your network with active defense against security threats
- Supports Wi-Fi Multimedia (WMM) assures the quality of VoIP and multimedia streaming
- Up to 30 meters (100 feet) of flexible deployment with included Passive Power over Ethernet Injector
- Up to 4 SSIDs and VLAN support, it allows networks administrator to segregate different services or applications to different designated users
- External detachable antennas allow for better alignment and stronger antenna upgrades
- Wall mounted available, also can be placed horizontally on a table or desk



⦿ Description

The TP-LINK Wireless N Access Point TL-WA901ND is designed to establish or expand a scalable high-speed wireless N network or to connect multiple Ethernet enabled devices such as game consoles, digital media adapters, printers, or network attached storage devices to a wireless network. The AP supports a host of different functions that makes your wireless networking experience more flexible than ever before. Now, you can enjoy a better Internet experience when downloading, gaming, video streaming or with any other application that you may wish to use.

Specifications

HARDWARE FEATURES

Interface	1 * 10/100M Ethernet Port (RJ45) Support Passive PoE
Button	Power On/Off Button WPS Button Reset Button
External Power Supply	9VDC / 0.85A
Wireless Standards	IEEE 802.11n, IEEE 802.11g, IEEE 802.11b
Dimensions (Wx Dx H)	7.67*5.12*1.43 in.(194.82*129.93*36.2mm)
Antenna Type	3*5dBi Detachable Omni Directional (RP-SMA)

WIRELESS FEATURES

Frequency	2.4-2.4835GHz
Signal Rate	11n: Up to 300Mbps(dynamic) 11g: Up to 54Mbps(dynamic) 11b: Up to 11Mbps(dynamic)
EIRP	<20dBm(EIRP)
Reception Sensitivity	270M: -68dBm@10% PER 130M: -68dBm@10% PER 108M: -68dBm@10% PER 54M: -68dBm@10% PER 11M: -85dBm@8% PER 6M: -88dBm@10% PER 1M: -90dBm@8% PER
Wireless Modes	Access Point Repeater (Range Extender) Bridge with AP Client Multi-SSID
Wireless Functions	Enable/Disable Wireless Radio WDS Bridge MAC Address Filter
Wireless Security	64/128/152-bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK
Quality of Service	WMM
Management	SNMP
Advanced Functions	Up to 30 meters Passive PoE is supported

OTHERS

Certification

CE, FCC, RoHS

System Requirements

Microsoft Windows 98SE, NT, 2000, XP, Vista™ or Windows 7/8,
MAC OS, NetWare, UNIX or Linux.

Environment

Operating Temperature: 0°C ~40°C (32°F~104°F)

Storage Temperature: -40°C ~70°C (-40°F~158°F)

Operating Humidity: 10%~90% non-condensing

Storage Humidity: 5%~90% non-condensing

Diagram:

Wired



Package Contents

- 300 Mbps Wireless Access Point TL-WA901ND
- 3 Detachable Omni Directional Antennas
- Power Supply Unit
- Passive PoE Power Injector
- Resource CD
- Quick Installation Guide

Related Products

- 300Mbps High Gain Wireless USB Adapter TL-WN822N
- 300Mbps Wireless N USB Adapter TL-WN821N
- 300Mbps Wireless N PCI Adapter TL-WN851ND
- ADSL2+ Modem Router TD-8816



Wall Keypad



AMX| MIO-CLASSIC-S-WH





Overview

The Mio Modero Classic (FG5795-01xx, single style; FG5795-02xx, double style; xx indicates color selection) provides a wide range of control capabilities in the form of keypads that are as adept as they are elegant. Each device is available as single style (8 button max) or double style (16 button max). You need KeypadBuilder to properly program these devices. The application and documentation are available from www.amx.com.

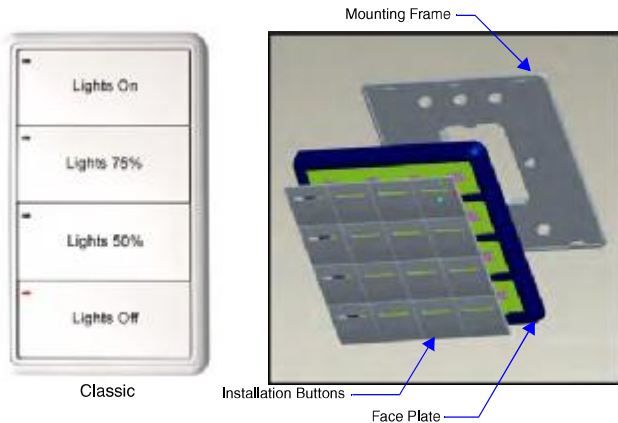


FIG. 1 Mio Modero Single Style Classic

Specifications

The Mio Modero device family keypad specifications are as follows:

Specifications	
Power:	12 vDC, 70 - 230 mA (range depending on device type and number of buttons)
Front Panel Components:	<ul style="list-style-type: none"> Pushbuttons - a maximum of 8 buttons on the single style and 16 buttons on the double style, with a direct LED light.
Rear Panel Components:	<ul style="list-style-type: none"> DIP switch - 8 position mini DIP switch used to set the device address for the keypad on the AXLink Bus. Wiring connection - 4 pin 3.5mm Phoenix AXLink connector.
Dimensions (HWD):	<ul style="list-style-type: none"> Single style - 4.46" x 2.71" x .57" (113.28 mm x 68.83 mm x 14.48 mm) Double style - 4.46" x 4.39" x .57" (113.28 mm x 111.51 mm x 14.48 mm)
Weight (range):	.25 lbs (.11 kg) - .50 lbs (.23 kg) Style and number of buttons will decide weight.
Operating Environment:	<ul style="list-style-type: none"> Operating Temperature: 0° to 50° C (32° to 122° F) Storage Temperature: -10° to 70° C (14° to 158° F)
Mounting:	Mounts into US and a majority of International single gang back boxes.
Included Accessories:	<ul style="list-style-type: none"> Single style mounting kit (KA-5795-01) Double style mounting kit (KA-5795-02) Installation Buttons (Classic only) Phoenix Connector (41-5045)
Optional Accessories:	<ul style="list-style-type: none"> Accent Frame (for some larger wallboxes): <ul style="list-style-type: none"> Classic (xx indicates color selection) - FG5795-08xx (single button); FG5795-09xx (double button) Custom buttons: <ul style="list-style-type: none"> Classic Colors (xx indicates color selection) - FG5795-21xx (4 single buttons); FG5795-22xx (2 double buttons) Blank buttons: <ul style="list-style-type: none"> Classic Colors (xx indicates color selection) - FG5795-07xx

Available Color Schemes

The Mio Modero device family is available in a range of colors. The Classic supports these color schemes, Black (BL), White (WH), and Beige (BG).

Installation

Note: Before touching the device, discharge the static electricity from your body by touching a grounded metal object.

The basic front and rear components of the Mio Modero are as follows:

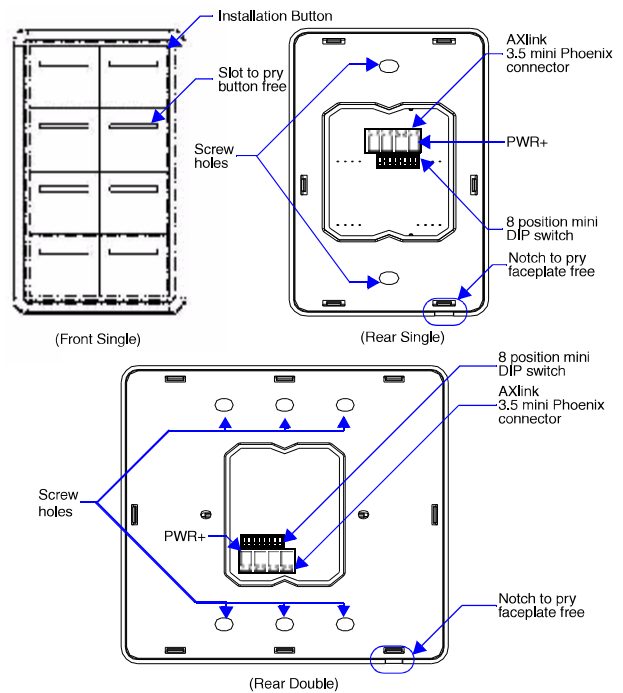


FIG. 2 Mio Modero Front and Rear Components

Changing Buttons

The Mio Modero Classic is shipped with "installation" buttons; they are intended to be place holders until your engraved buttons, designed with KeypadBuilder, arrive.

To switch out "installation" buttons:

1. Pry the button using the slot on the front of the "installation" buttons to remove them from the Mio Modero.
2. Select the location of the custom buttons and snap them into place. Be sure to note the orientation of the white insert on the back of the button, the notch must be down. Insert the bottom of the button first and then push the top into place.
3. Snap the faceplate on the mounting frame.

To change custom buttons:

1. If connected, disconnect the power supply.
2. If connected to mounting frame, place a flathead screwdriver in the notch at the bottom right of the Mio Modero, and pry the faceplate from the mounting frame.
3. On the back of the faceplate locate the button access points, outlined with white circles. Using a straightened paperclip, poke through the button access points until the buttons pop free.
4. Snap the desired custom buttons into place. Be sure to note the orientation of the white insert on the back of the button, the notch must be down. Insert the bottom of the button first and then push the top into place.
5. If the power supply was disconnected in Step 1, reconnect and return power to the device.
6. Snap the faceplate on the mounting frame.

Be certain to reprogram the Mio Modero to match the new button arrangement; use KeypadBuilder to assign the locations. See the *KeypadBuilder Instruction Manual* available at www.amx.com.

Setting The AXlink Device Number

1. If connected, disconnect the power supply.
2. Locate the 8-position Device DIP switch on the rear panel.(FIG. 3).
3. Set the DIP switch according to the switch values shown below.

Switch	1	2	3	4	5	6	7	8
Value	1	2	4	8	16	32	64	128

The device number is set by the total value of DIP switch positions that are ON (up).

As an example, the DIP switch in FIG. 3 defines device number 129 (1+128=129).

If you later change the device number, remove and reconnect the AXlink power connector to enter the new device number into memory.

Note: AMX has created Dip Switch2 to assist in calculating dip switch position values. Download the program Dip Switch2 from www.amx.com for free.



FIG. 3 Example Device DIP Switch set to 129

Wiring

The Mio Modero uses a four-pin mini AXlink connector for power and data.

Caution: Do not connect power to the Mio Modero until the wiring is complete.

Preparing captive wires

You will need a wire stripper, and flat-blade screwdriver to prepare and connect the captive wires.

1. Strip 0.25 inch (6.35 mm) of wire insulation off all wires.
2. Insert each wire into the appropriate opening on the connector according to the wiring diagrams and connector types described in this section.
3. Turn the flat-head screws clockwise to secure the wires in the connector.

Note: Do not over-torque the screws; doing so can bend the seating pins and damage the connector.

Wiring guidelines

The Mio Modero requires 12 VDC power to operate properly. The necessary power is supplied via the AXlink cable. The maximum AXlink wiring distance is determined by power consumption, supplied voltage, and the wire gauge used for the cable. The following table lists wire sizes and the maximum lengths allowable based on the maximum power consumption rating of 170 mA.

Wiring Guidelines at 170 mA	
Wire Size	Maximum Wiring Length
18 AWG	690.42 feet (210.43 m)
20 AWG	436.80 feet (133.13 m)
22 AWG	272.33 feet (83.00 m)
24 AWG	171.66 feet (52.32 m)

The maximum wiring lengths for using AXlink power are based on a minimum of 13.5 volts available. If the distance is greater than what is listed in the table, consult the *Mio Modero Device Family Instruction Manual* for wiring with external power sources.

Connecting the Wiring

Caution: If using power from AXlink, disconnect the wiring from the control system before wiring the Mio Modero.

AXlink Data and Power Connections

Connect the control system's AXlink connector to the AXlink connector on the rear panel of the Mio Modero for data and 12 VDC power as shown in FIG. 4.

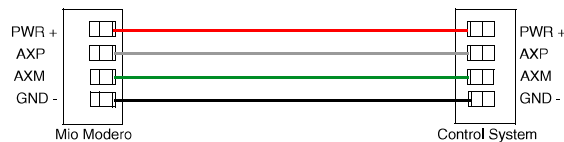


FIG. 4 AXlink wiring

Mounting Procedures

AMX recommends mounting the Mio Modero in a standard one-gang wallbox, a conduit box per NEC specs section 370, with a minimum internal clearance of 2-5/8" x 1-3/4" x 1-5/8" (HWD), but it is possible to mount the Mio Modero to a podium without a wallbox. More installation details are available in the *Mio Modero Device Family* instruction manual.

Wallbox Mounting

1. Use the cutout dimension for the wallbox to cutout the install surface for the Mio Modero.
2. Confirm that the terminal end of the AXlink cable is disconnected, and not receiving power.
3. If the faceplate is connected to the mounting frame, place a flathead screwdriver in the notch at the bottom right of the Mio Modero, and pry the faceplate from the mounting frame.
4. Connect the AXlink power supply. The connector passes through the center of the mounting frame and connects to the board. The connection is illustrated in FIG. 2.
5. Place the mounting frame on the wallbox; align the screw holes with the mounting holes on the panel, and fasten the mounting frame to the wallbox using the screws supplied.

Note: Do not overtighten the screws when mounting the mounting frame. The device should be flush with mounting surface.

6. Attach the faceplate to the mounting frame first at the top and swing it to the bottom. See FIG. 5

Podium Mounting

1. The necessary area for the mounting frame opening is 2.00 x 2.25; cutout the mounting frame install surface to accommodate the Mio Modero.
2. Confirm that the terminal end of the AXlink cable is disconnected, and not receiving power.
3. If the faceplate is connected to the mounting frame, place a flathead screwdriver in the notch at the bottom right of the Mio Modero, and pry the faceplate from the mounting frame.
4. With the mounting frame resting in the cutout area, drill the mounting holes into the flat surface.

Note: Do not overtighten the screws when mounting the mounting frame. The device should be flush with mounting surface.

5. Connect the AXlink power supply. The connector passes through the center of the mounting frame and connects to the board. The connection is illustrated in FIG. 2.
6. Attach the faceplate to the mounting frame first at the top and swing it to the bottom. See FIG. 5.

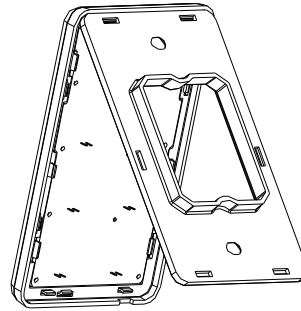


FIG. 5 Attaching the faceplate to the mounting frame

Programming The Mio Modero KeypadBuilder

Most functionality of the Mio Modero is handled using the application, *KeypadBuilder*. Go to www.amx.com for the *KeypadBuilder Instruction Manual*.

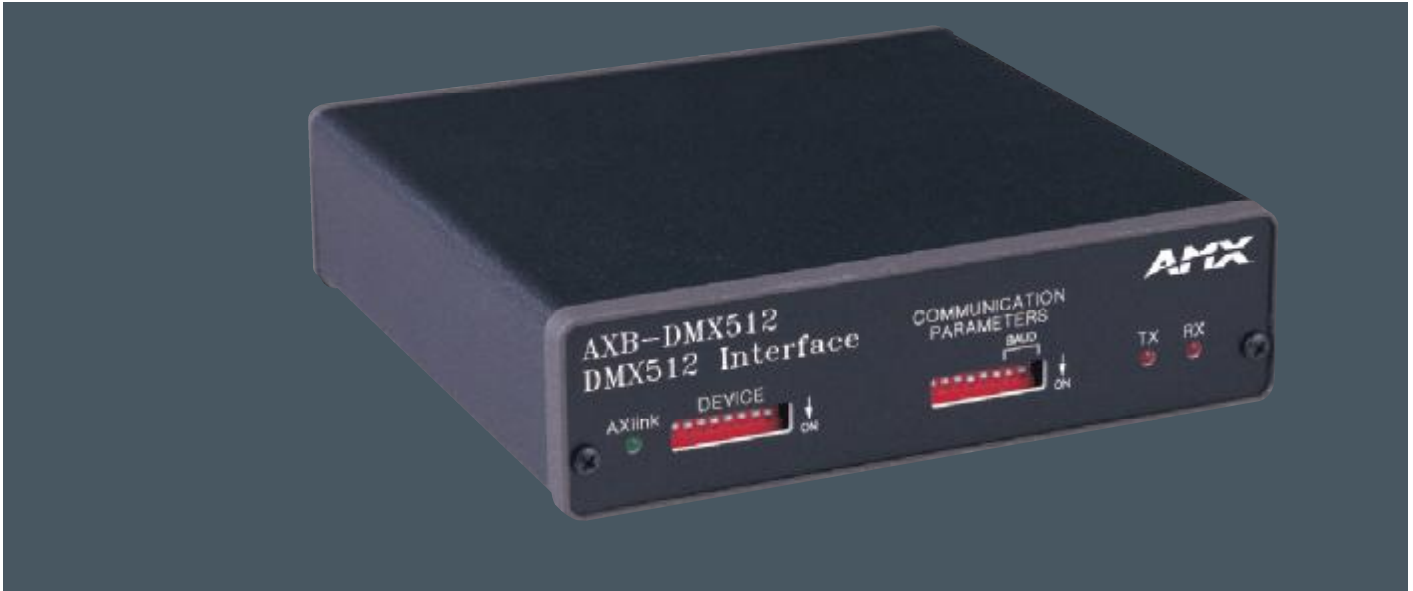
There are a select number or SEND_COMMANDS the Mio Modero recognizes. For a full list and descriptions, consult the *Mio Modero Device Family Instruction Manual*.



DMX 512 Interface

AMX| AXB-DMX512

dmx512 interface



The AXB-DMX512 Interface acts as an intelligent bi-directional DMX512 to AXLink interface, transmitting and receiving up to 512 DMX channels for lighting dimmers, spotlights, and other DMX control applications.

An intelligent interface, the AXB-DMX512 contains onboard processing and memory. DMX channels can be grouped, soft-patched, or assigned to a fader. Up to 72 presets (284 presets with added memory) can be stored and recalled from internal memory.

A DMX lighting board can operate in tandem with the AXB-DMX512, generate levels for storing internal presets, or bypass the interface for direct control of channels. The board's channel commands will not be affected by AXB-DMX512 channel patches or groupings.

The AXB-DMX512 can be extended up to 3,000 feet using the AXLink data/power bus. The optional AC-RK Accessory Rack Kit is available for rack mounting.



dmx512 interface

AXB-DMX512 (FG5972)

- Generates DMX512 data signals (data stream software adjustable from 1 to 512 channels)
- Receives DMX commands from a USITT DMX lighting console or other sources
- Stores channel groups, patches, and up to 72 presets in non-volatile onboard memory, 284 with optional extended memory (EXM-256KB)
- Assigns channels to as many as 8 groups as well as attaches both channels and groups to up to 8 faders
- Operates in tandem with DMX lighting board (highest level has precedence)
- Provides bypass mode to allow direct control from a lighting board or DMX source
- Re-transmits DMX data from external sources without affecting the source's channel grouping or patches
- Extends control up to 3,000 feet via the AXLink data/power bus
- Mounts in equipment rack with optional AC-RK Accessory Rack Kit

FRONT PANEL

AXLink: Green LED lights to show status of AXLink communication and DC power

Device: 8-position device assignment DIP switch

TX: Red LED lights when transmitting DMX data

RX: Red LED lights when receiving DMX data

REAR PANEL

In: 6-pin DMX In jack

Out: 6-pin DMX Out jack

AXLink: 4-pin jack for AXLink data/power bus

ENCLOSURE

- Metal with black matte finish

DIMENSIONS (HWD)

- 1.51" x 5.55" x 5.45" (38.4 cm x 14.10 cm x 13.84 cm)

WEIGHT

- 1.1 lbs (513.0 g)

POWER

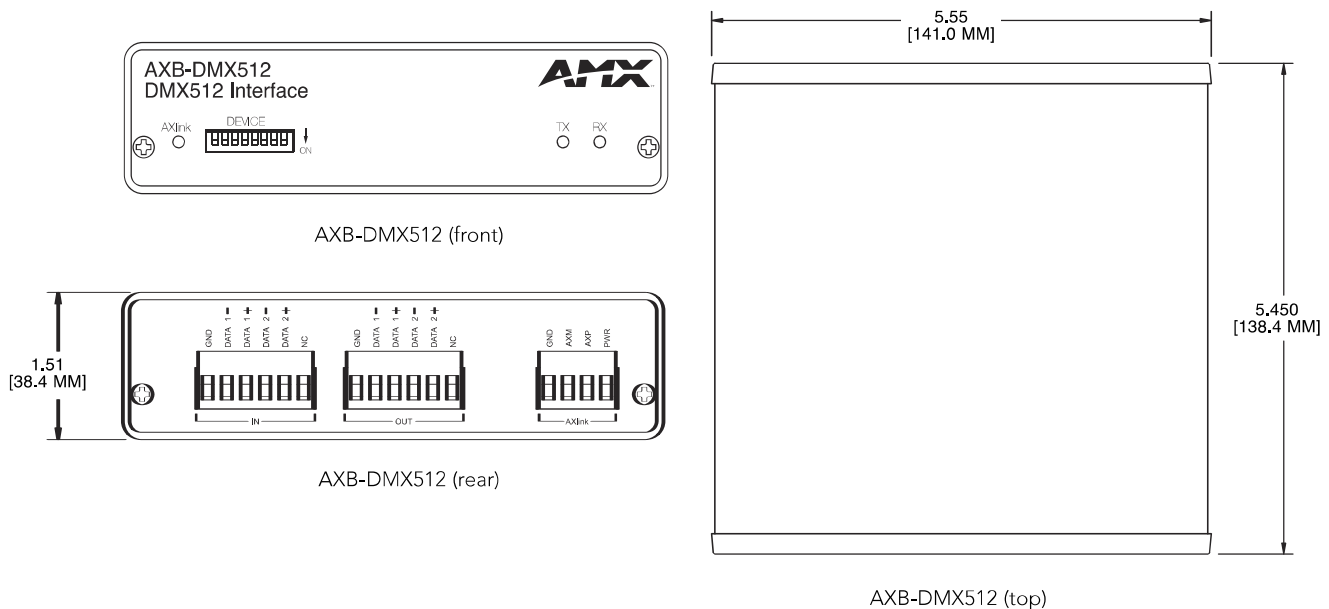
- 12 VDC at 160 mA

INCLUDES

- One 4-pin AXLink connector
- Two 6-pin DMX connectors

OPTIONS

- AC-RK Accessory Rack Kit
- EXM-256KB Extended Memory



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iPAD



Apple| iPad Air 2





iPad Air 2

Environmental Report



Date introduced

October 16, 2014

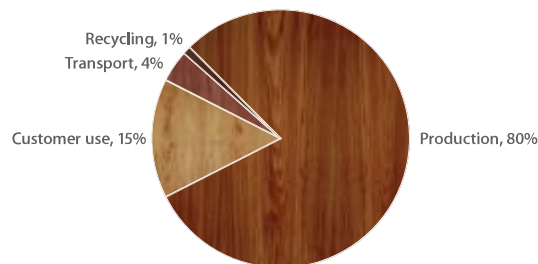
Apple and the Environment

Apple believes that improving the environmental performance of our business starts with our products. The careful environmental management of our products throughout their life cycles includes controlling the quantity and types of materials used in their manufacture, improving their energy efficiency, and designing them for better recyclability. The information below details the environmental performance of iPad Air 2 as it relates to climate change, energy efficiency, material efficiency, and restricted substances.¹

Climate Change

Greenhouse gas emissions have an impact on the planet's balance of land, ocean, and air temperatures. Most of Apple's corporate greenhouse gas emissions come from the production, transport, use, and recycling of its products. Apple seeks to minimize greenhouse gas emissions by setting stringent design-related goals for material and energy efficiency. The chart below provides the estimated life-cycle greenhouse gas emissions for iPad Air 2.

Greenhouse Gas Emissions for iPad Air 2 (Wi-Fi + Cellular)



Total greenhouse gas emissions: 190 kg CO₂e

Energy Efficiency

iPad Air 2 uses power-efficient components and software that intelligently manages power consumption. In addition, iPad Air 2 outperforms the stringent requirements of the ENERGY STAR Program Requirements for Computers Version 6.1. The following table details the power consumed by iPad Air 2 in different use modes.

Power Consumption for iPad Air 2 (Wi-Fi + Cellular)

Mode	100V	115V	230V
Sleep	0.22W	0.22W	0.26W
Idle—Display on	3.13W	3.14W	3.21W
Power adapter, no-load	0.09W	0.09W	0.09W
Power adapter efficiency	80%	81%	80%

Environmental Status Report

iPad Air 2 is designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable aluminum enclosure
- Power adapter that outperforms strictest global energy-efficiency standards
- Speaker enclosures made with 30 percent post-consumer recycled plastic

Meets ENERGY STAR® Version 6.1 requirements

Achieves a Gold rating from EPEAT²

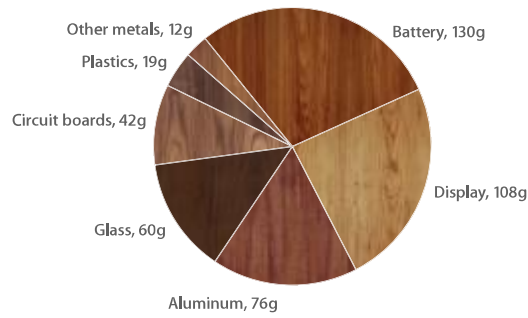
Battery chemistry

- Lithium-ion polymer, 27.6 Whr
- Free of lead, cadmium, and mercury

Material Efficiency

Apple's ultracompact product and packaging designs lead the industry in material efficiency. Reducing the material footprint of a product helps maximize shipping efficiency. It also helps reduce the energy consumed during production, and material waste generated at the end of the product's life. iPad Air 2 is made of aluminum and other materials highly desired by recyclers. The chart below details the materials used for iPad Air 2.

Material Use for iPad Air 2 (Wi-Fi + Cellular)



iPad Air 2 retail packaging uses a minimum of 38 percent post-consumer recycled content.

Packaging

The packaging for iPad Air 2 is highly recyclable. It uses corrugated cardboard made from a minimum of 38 percent post-consumer recycled content, and molded fiber made entirely from recycled content. The following table details the materials used in iPad Air 2 packaging.

Packaging Breakdown for iPad Air 2 (U.S. Configurations)

Material	Retail box	Retail and shipping box
Paper (corrugate, molded fiber)	170g	392g
High-impact polystyrene	61g	61g
Other plastics	6g	6g

Restricted Substances

Apple has long taken a leadership role in restricting harmful substances from its products and packaging. As part of this strategy, all Apple products comply with the strict European Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, also known as the RoHS Directive. Examples of materials restricted by RoHS include lead, mercury, cadmium, hexavalent chromium, and the brominated flame retardants (BFRs) PBB and PBDE. iPad Air 2 goes even further than the requirements of the RoHS Directive by incorporating the following more aggressive restrictions:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- BFR-free
- PVC-free
- Beryllium-free



Recycling

Through ultra-efficient design and the use of highly recyclable materials, Apple has minimized material waste at the product's end of life. In addition, Apple offers and participates in various product take-back and recycling programs in 95 percent of the regions where Apple products are sold. All products are processed in the country or region in which they are collected. For more information on how to take advantage of these programs, visit www.apple.com/recycling.

Definitions

Greenhouse gas emissions: Estimated emissions are calculated in accordance with guidelines and requirements as specified by ISO 14040 and ISO 14044. Calculation includes emissions from the following life-cycle phases contributing to Global Warming Potential (GWP 100 years) in CO₂ equivalency factors (CO₂e):

- **Production:** Includes the extraction, production, and transportation of raw materials, as well as the manufacture, transport, and assembly of all parts and product packaging.
- **Transport:** Includes air and sea transportation of the finished product and its associated packaging from the manufacturing site to continental distribution hubs. Transport of products from distribution hubs to the end customer is not included.
- **Use:** User power consumption assumes a three-year period. Product use scenarios are modeled on data that reflects intensive daily use of the product. Geographic differences in the power grid mix have been accounted for at a continental level.
- **Recycling:** Includes transportation from collection hubs to recycling centers as well as the energy used in mechanical separation and shredding of parts.

Energy efficiency terms: The energy efficiency values in this report are based on the ENERGY STAR Program Requirements for Computers Version 6.1 and/or the ENERGY STAR Program Requirements for Single Voltage External AC-DC and AC-AC Power Supplies Version 2.0. For more information, visit www.energystar.gov.

- **Sleep:** Low power state that is entered automatically after 2 minutes of inactivity (default), or by pressing the Sleep/Wake button. Tested with a fully charged battery and powered by the 10W USB Power Adapter. Connected to Wi-Fi and cellular networks. All other settings were left in their default state.
- **Idle—Display on:** iPad Air 2 is on and at the Home screen. Tested with a fully charged battery and powered by the 10W USB Power Adapter. Display brightness was set as defined by ENERGY STAR Program Requirements for Computers Version 6.1, and Auto-Brightness was turned off. Connected to Wi-Fi and cellular networks. All other settings were left in their default state.
- **Power adapter, no-load:** Condition in which the 10W USB Power Adapter is connected to AC power, but not connected to iPad Air 2.
- **Power adapter efficiency:** Average of the 10W USB Power Adapter's measured efficiency when tested at 100 percent, 75 percent, 50 percent, and 25 percent of the power adapter's rated output current.

Restricted substances: Apple defines a material as BFR-free and PVC-free if it contains less than 900 parts per million (ppm) of bromine and of chlorine. Apple defines a material as beryllium-free if it contains less than 1000 parts per million (ppm) of beryllium.

1. Product evaluations based on U.S. configurations of iPad Air 2 Wi-Fi + Cellular with 128GB capacity.

2. iPad Air 2 achieved a Gold rating from EPEAT in the United States and Canada.



Apple Integration Software

AMX| TPC-IPAD

TPC-APPLE



Authorized AMX Touch Panel Application for Mobile Devices

OVERVIEW

TPControl enables Apple® mobile devices to transform into a fully functional touch panel for controlling AMX system platforms. This easy-to-use application provides real-time, touch control of AV systems, lighting, shades, room temperatures and more. These mobile devices can seamlessly communicate with an AMX control system via 3G, GPRS and EDGE cellular networks, or Wi-Fi, to allow the convenience of remote use. TPControl was created by [AMX APP™ \(Authorized Product Partner\)](#) Touch Panel Control, and is the only Apple mobile app for control that AMX supports because it was specifically designed and thoroughly tested for use with AMX equipment.

Use the TPDesign4 application to create the user interface and then use TPTransfer (available as a separate download) for licensing and transferring the TP4 file to the mobile device.

Supported devices include: Apple iPhone, iPod Touch and iPad.

COMMON APPLICATIONS

Ideal in residences for wireless control in home theaters and whole home systems and perfect in boardrooms/conference rooms for controlling AV equipment for presentations or training. Use your existing Apple device to control your AMX solution and even take control remotely using the cellular network.

FEATURES

- **VoiceControl** - Using Speech-to-Text and Text-to-Speech functionality within TPControl allows you to talk to your control system and have it talk to you. For example, you say "Turn the entry lights on" and TPControl initiates the command and replies "The entry lights are on" when completed
- **AppControl** - Launch installed applications directly from TPControl; start an SMS, launch an email client, web pages and much more without leaving the TPControl environment
- **Multi-Profiles** - Dynamically and instantly change connection profiles such as office or home, connecting seamlessly to different control systems from the same device
- **Intercom** - Converse from TPControl to devices such as the AMX Metreau Communicator, AMX Intercom enabled touch panels, and other TPControl enabled devices

- **TPCloud** - Cloud power lets you update TP4 files, change device settings or even apply tokens to TPControl devices, right from the My Account section of the Touch Panel Control website
- **eICSP** - Encrypt, Verify and secure ICSP data for your local and remote connections

- **Additional Features**

TPDESIGN Supported Features

Transfer your custom TP4 designs, created using AMX's TPDesign4, to iPad/iPhone/iPod Touch (utilizing TPTransfer, included).

- Page Flips and Popups
- Sounds
- Multitouch
- Keyboards/Keypads
- Multistate Levels/Levels
- Dynamic Images/Scaled Dynamic Images
- Multistate Buttons
- Full Feedback
- Supports multiple ports
- Loopback Port Support for most commands
- Native TP4 File support
- Most G4 commands, as well as legacy G3 commands
- Unitype Fonts
- Font Effects
- Borders - PopUp Show/Hide Effects
- Opacity
- Chameleon Images
- Multiple resolution support (Android™ only)

Lighting Dimmer

Applied Elect.| DP12/2400



Architectural Dimmer Systems

Applied Electronics **DP 12/2400** Commercial Dimmer

Permanent Installations

Applied Electronics has a solution to all of your dimming requirements including permanent installation dimmers for multi-channel applications. The DP12/2400 permanent installation dimmer is available for control of 12 to 96 channels and can provide 2.4 kW of dimming power per channel. The unit is made from 16 gauge steel and houses 12 dimmer channels which is expandable by up to seven additional 12 channel "slave" units.

The Applied Architectural dimmer is versatile and can be configured for any application. Features include fully magnetic circuit breakers, front panel LCD display, soft patching, manual override, dimmer/switch selection for each channel, pre-heat selection and DMX control or input from an optional wall plate system.



With almost thirty years experience in the theatrical lighting industry, Applied Electronics is a leader in innovation and custom solutions for your stage and theatrical dimming requirements. Our engineering staff has a broad range of experience and is available to assess and solve your immediate requirements.



DP12/2400 Wall Mount Commercial Dimmer

Specifications:

- 12 (to 96 dimmer channels with additional slave units) with 2.4 kW output per channel
- Simple 4 bolt mounting
- Single phase, bi-phase or three phase—no jumper settings required
- Terminal block connections for input and output
- UL listed (E136519). Meets the requirements of UL 508
- Fully magnetic 20 Amp output circuit breakers
- Convection cooled (no fans)
- Convenient conduit knockouts for wiring ease
- DMX-512 control input or control from wall plate system
- Scenes are set up and stored at each wall plate
- 16 gauge steel enclosure
- Front panel control including; soft patch, manual override, pre-heat and dim/switch
- Front panel 40 character x 2 backlit LCD displays system status of 12 channels at a time
- Size: 22" x 16" x 6 1/2"
- Weight: 70 lbs



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Applied Electronics 722 Blue Crab Road Newport News, VA 23606
800-883-0008 757-591-9371 Fax: 757-591-9514
sales@appliednn.com www.appliednn.com



PAR Lighting



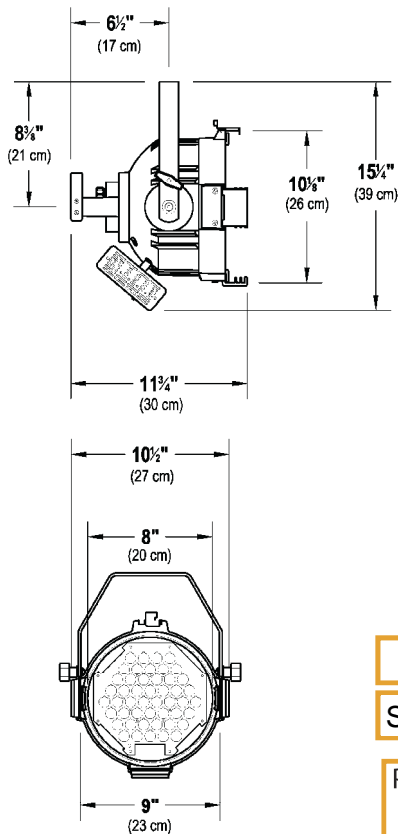
Altman| Spectra Star PAR



SPECTRA STAR PAR

The Spectra Star PAR is a 100 Watt PAR Luminaire utilizing high efficiency Philips Luxeon Rebel LED emitters. Featuring a durable, light weight die cast aluminum housing the Spectra Star PAR is available as a pipe mount or Smart Track™ fixture. Designed for theatrical and architectural applications, the SPECTRA Star PAR acts as a true PAR lighting fixture with tools-free exchangeable VNSP, NSP, MFL, WFL, and (optional) XWFL Lenses.

An on board power supply allows for direct power & data connection to conventional distribution or a Smart Track™ systems. The Spectra StarPAR 100 watt PAR is compatible with both DMX & RDM protocols, and comes complete with a library of pre-programmed single colors and various color mixes. Shows and addressing are accessed via the push button display.



ALTMAN
Lighting
BRINGING IMAGINATION TO LIGHT

WASH LIGHTING

Catalog Numbers

SSSP-**-**
SSSPY-**-**



100 WATT SPECTRA STAR PAR Features

- Available in 4 Standard LED color configurations: *RGBA, RGBW, 3K White or 3K-6K Tunable White*.
- Convection Cooled.
- Available in pipe mount and Smart Track™ versions.
- Tool-free exchangeable VNSP, NSP, MFL, WFL & XWFL lenses.
- On-board multi-voltage power supply 100-240VAC or Mains Dimmable drivers.
- Feed through data capabilities using 5-pin XLR connectors.
- Compatible with DMX and RDM protocols.
- Push button addressing.
- Pre-programmed modes for fixed colors, timed color changes and strobes.
- 16 lbs.
- ETL & cETL listed.
- Made in the USA

Model	-	LED Array	-	Finish Color	-	Control
SSSP	-	RGBA	-	B (Black)	-	D (DMX)

SSSPY for Smart Track mounting

Project:	Approval Date:
Location:	Fixture Type:

57 Alexander St., Yonkers, NY 10701
© 2012 Altman Stage Lighting, Inc.

Tel: 914-476-7987

Visit our website at www.altmanlighting.com

Specifications:

Materials: Construction employs all corrosion-resistant materials and hardware

Housing: Die-case aluminum construction

Light Engine: Luxeon Rebel LED's– 100 Watts Max at full RGBA

Lenses: Borosilicate glass 8" diameter PAR64

Lens Holder: Fully rotational, provided with three insulated finger tabs. Tool-free changing of lenses. 360° rotation

Rating: Multi-Voltage; 100-240 volt AC operation, or Mains Dimmable Drivers

Data Ports: Two 6' 5-Pin XLR cables for DMX:1 Male & 1 Female or Smart Track™

Power Cable: 6' total length with Edison connector

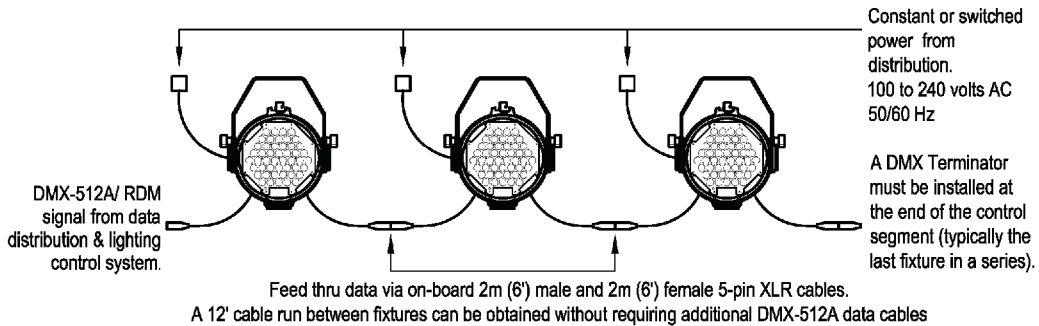
Finish: Black, White or Silver TGIC polyester, electrostatic application. Custom colors available

Weight: Approx. 16 lbs. (7.26 kg)

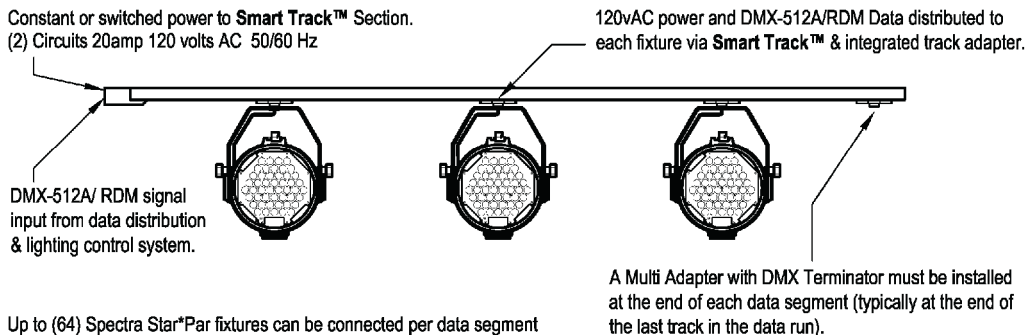
Accessories:

Model Number	Supplied with the fixture
97-0150	Set of 4 Lenses(VNSP, NSP, MFL, WFL)
SC-36-BK	36" Black Safety Cable w/ Spring Clip
Additional Accessories	
XLR-5-5	5' 5-Pin XLR Extension Cable
XLR-5-10	10' 5-pin XLR Extension Cable
XLR-5-25	25' 5-pin XLR Extension Cable
99-DMX-TERM	In line 5-pin DMX terminator
510	Malleable Iron Pipe Clamp for 3/4"-1 1/2" Pipe
8-BD-4	Four Leaf Barndoor
8-CFB	Black Color Frame 10"x10"
8-SN	Black Snoot

Basic wiring diagram for SSSP*- Spectra Star PAR (Portable/Theatrical Version)**



Basic wiring diagram for SSSPY*- Spectra Star PAR (Smart Track™ Version)**



Performance per Lens:

RGBA:

VNSP Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	1.7' x 1.7' 0.5m x 0.5m	2.5' x 2.5' 0.8m x 0.8m	3.3' x 3.3' 1m x 1m	4.2' x 4.2' 1.3m x 1.3m
Illuminance (fc)	215	96	54	34
Illuminance (lux)	2,316	1,029	579	371

NSP Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	2.2' x 2.2' 0.7m x 0.7m	3.3' x 3.3' 1m x 1m	4.4' x 4.4' 1.3m x 1.3m	5.5' x 5.5' 1.7m x 1.7m
Illuminance (fc)	147	65	37	23
Illuminance (lux)	1,579	702	395	253

MFL Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	3.27' x 2.5' 1.1m x 0.7m	5.6' x 3.7' 1.7m x 1.1m	7.4' x 4.9' 2.3m x 1.5m	9.3' x 6.1' 2.8m x 1.9m
Illuminance (fc)	81	36	20	13
Illuminance (lux)	871	387	218	139

WFL Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	7' x 3.5' 2.1m x 1.1m	10.5' x 5.3' 3.2m x 1.6m	14' x 7.1' 4.3m x 2.1m	17.5' x 8.8' 5.3m x 2.7m
Illuminance (fc)	41	18	10	7
Illuminance (lux)	438	194	109	70

XWFL Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	9.5' x 9.6' 2.9m x 2.9m	14.3' x 14.3' 4.4m x 4.4m	19' x 19' 5.8m x 5.8m	23.8' x 24' 7.2m x 7.3m
Illuminance (fc)	35	18	11	7
Illuminance (lux)	377	204	118	75

3K White

VNSP Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	1.7' x 1.7' 0.5m x 0.5m	2.5' x 2.5' 0.8m x 0.8m	3.3' x 3.3' 1m x 1m	4.2' x 4.2' 1.3m x 1.3m
Illuminance (fc)	471	209	118	75
Illuminance (lux)	5,068	2,252	1,267	811

NSP Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	2.2' x 2.2' 0.7m x 0.7m	3.3' x 3.3' 1m x 1m	4.4' x 4.4' 1.3m x 1.3m	5.5' x 5.5' 1.7m x 1.7m
Illuminance (fc)	364	162	91	58
Illuminance (lux)	3,917	1,741	979	627

MFL Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	3.27' x 2.5' 1.1m x 0.7m	5.6' x 3.7' 1.7m x 1.1m	7.4' x 4.9' 2.3m x 1.5m	9.3' x 6.1' 2.8m x 1.9m
Illuminance (fc)	181	80	45	29
Illuminance (lux)	1,948	866	487	312

WFL Lens

Throw Distance (d)	10' 3m	15' 4.6m	20' 6.1m	25' 7.6m
Beam Size, (H x V)	7' x 3.5' 2.1m x 1.1m	10.5' x 5.3' 3.2m x 1.6m	14' x 7.1' 4.3m x 2.1m	17.5' x 8.8' 5.3m x 2.7m
Illuminance (fc)	88	39	22	14
Illuminance (lux)	947	421	237	152

Equipment Rack

Estep| CKR42U68



19" Free Standing Cabinet / UNIVERSALLINE 600x600 mm/600x800 mm/600x1000 mm



FEATURES

Easy to access

Front door features a full-length smoked and shatterproof glass door with decorative accent trim reinforced with left/right metal frames and integral locking mechanism.

Side doors; lockable, removable complete with slam latches and locks.

Rear door; lockable, removable with lock.

Secure, locking front and back doors with spring loaded hinges offer best accessibility even when connecting the cabinets. The door hinge is easily swapped from one side to the other.

All giving you 4-way access to equipment. Front and rear door can be replaced that gives you flexibility for different installations.

Cable access

Multiple cable entry points provide maximum versatility. There is a rubber edge sliding cover mechanism that protects and fix the cables.

There is a brush on the rear panel that can be positioned on top or bottom (brush entry available on racks of 32U and above)

Construction

Rigid welded frame construction in steel sheet, rapidly dismantled per 4 screw per corner. Corner of bases have welded sockets on each corner that tightly fixed into the columns gives maximum stability.

Frames are made with 28-fold design for increased stability.

C-rails (3ea.left+3ea.right) increase the stability of equipment mounting and fixing shelves in 4 points.

Vented Pagoda-style top cover with built-in space for available top mount cooling system providing protection against dust flow from the top. Besides that it cause a chimney effect to provide passive heat transportation via convection.

19" mounting angles (front/2ea. and back/2ea) allow for flexible configuration and adjustable in depth.

Levelling feet is included as a standard feature. Extensive range of accessories.

STANDARDS

ISO 9001:2000

TSE:EN 61587-1 Mechanical Structures For Electronic Equipment - Tests For IEC 60917 And IEC 60297

Climatic and Environment: EN 61587-1/4.2, IEC60068-2-1, IEC60068-2-2, IEC60068-2-30,

Static Mechanical Load Lifting: EN61587-1/5.2.1

Static Mechanical Load Stiffness: EN61587-1/5.2.2

Dynamic Mechanical Load Vibration and Shock, Impact: EN61587-1/5.3.1, EN61587-1/5.3.3, IEC60068-2-6, IEC60068-2-27,

Earth Bond: EN61587-1/6.2

Flammability: EN61587-1/6.3

Degrees Of Protection Provided By Enclosures (Ip Code):

IP20 or IP55, EN61587-1/6.4

COMPLIANCES

UL and cUL

Load Carrying Capacity: 600 kg

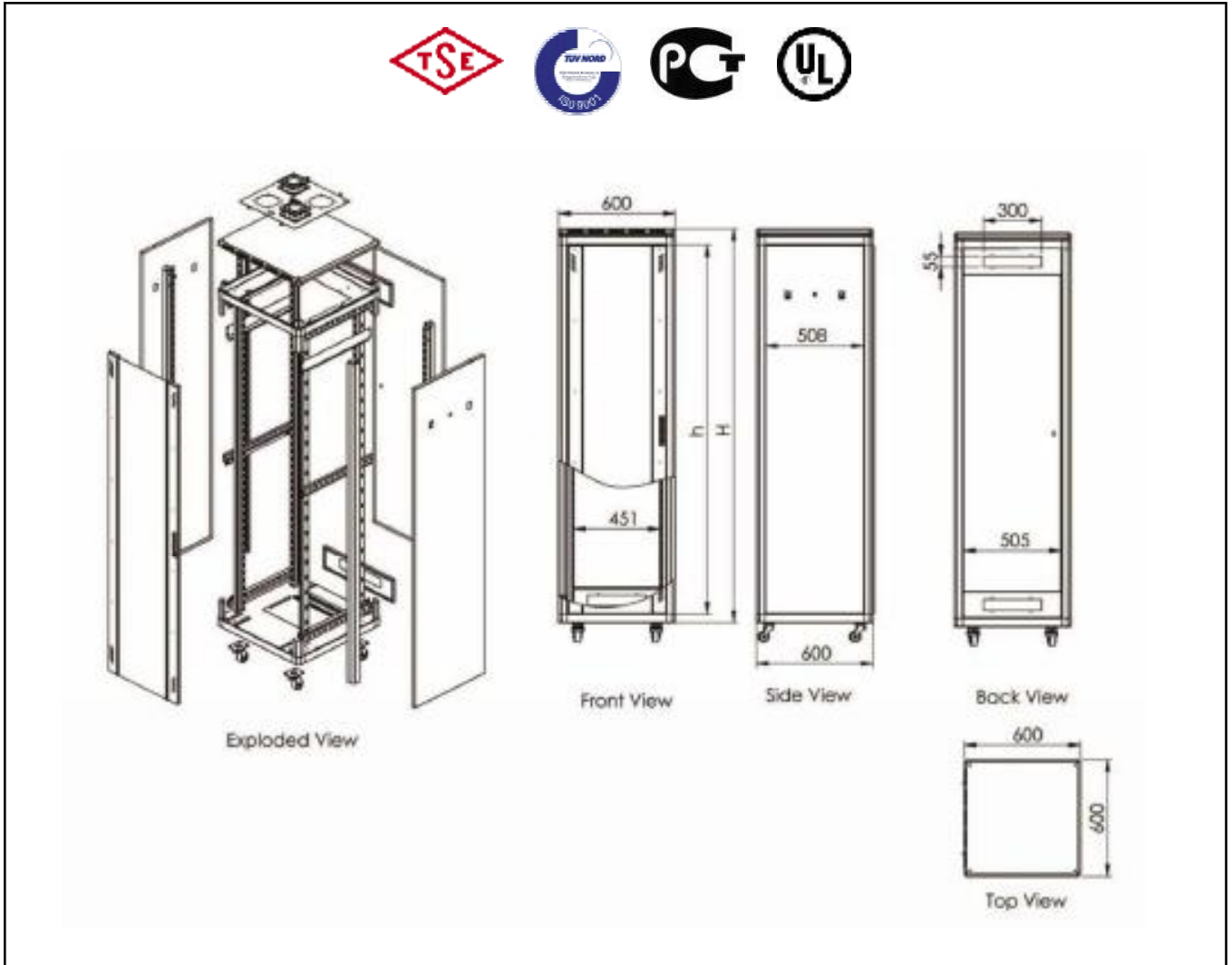
Surface Treatment: Fosfat coating

Painting: Ral7035 / Ral9005

Material Definition and Properties, Thicknesses and Shipment Configuration			
Part Definition	Material thickness	Material definition & properties	Shipment Configuration
Upper Case	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS	1ea.
Bottom Case	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS	1ea.
Front Door	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS & 4mm SECURE AND TEMPERED GLASS AND LOCK	1ea.
19" mounting angles	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 & GALVANIZED COATING	4ea. (2ea. at front , 2ea. at rear)
Rear Door	1,2 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS	1ea.
Frame	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 7122 CRS	4ea.
Side Panel Supports	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS	2ea.
C-rails	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 & GALVANIZED COATING	6ea.
Fan Tray (unloaded)	1,5 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS	1ea.
Side Doors	1 mm	DIN EN 10130 - 99 EREGLI DC-01 7122 CRS	2ea.
Top Cover	1 mm	DIN EN 10130 - 99 EREGLI DC-01 6112 CRS	1ea.

19" Free Standing Cabinet / Universalline 600x600mm

TECHNICAL DRAWINGS

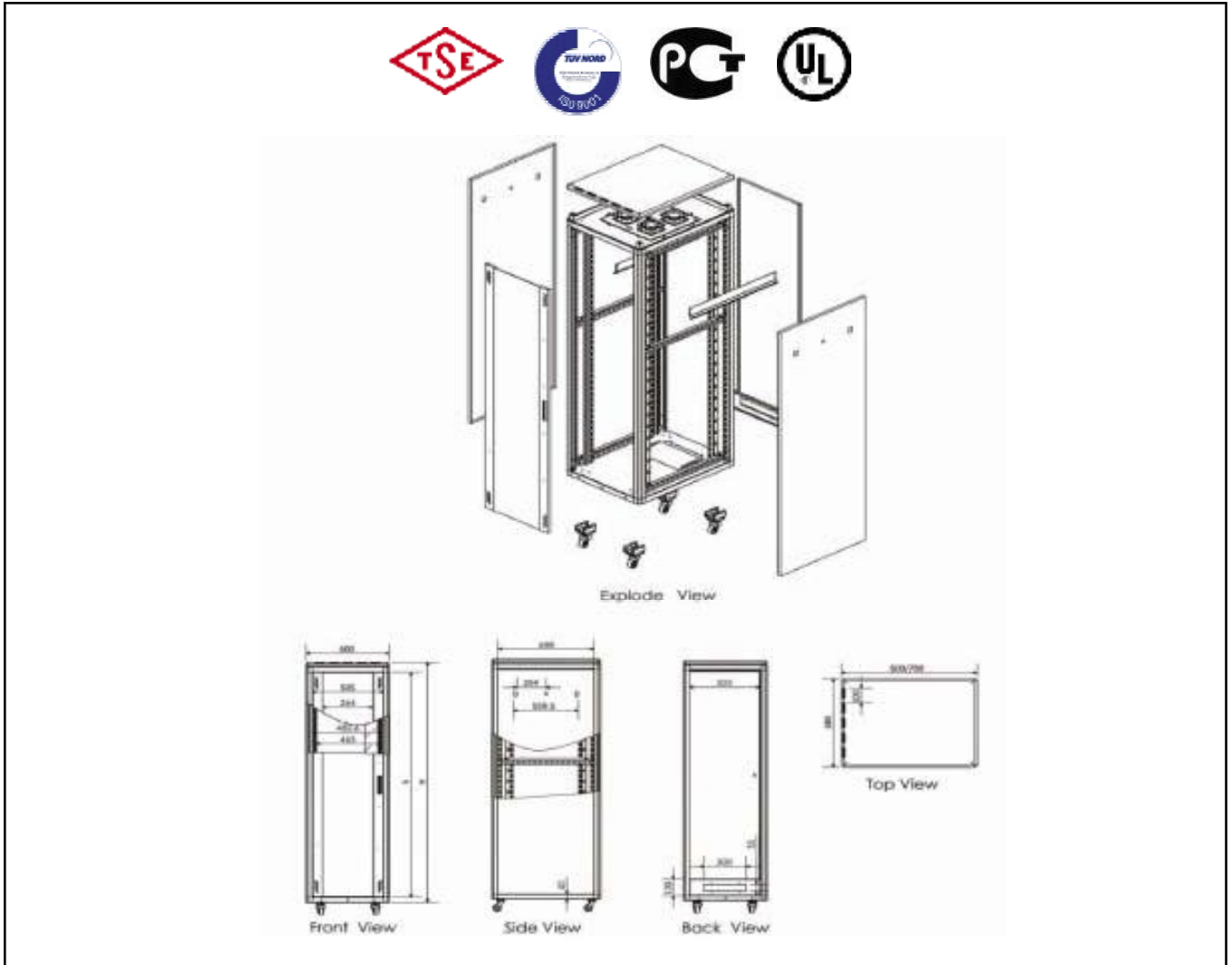


width=600 mm depth=600 mm			
Order No	U=44.45 (mm)	h = inside height(mm)	H=outside height(mm)
CKR16U66	16	740,40	865,40
CKR20U66	20	917,40	1042,40
CKR22U66	22	1006,30	1131,40
CKR26U66	26	1184,40	1309,40
CKR32U66	32	1451,40	1576,40
CKR36U66	36	1629,40	1754,40
CKR39U66	39	1762,40	1887,40
CKR42U66	42	1896,40	2021,40
CKR44U66	44	1985,40	2110,40
CKR47U66	47	2118,75	2243,75

Shipping Data						
Order No	Quantity	Shipping Dimension (palette) WxDxH	Net Weight (kg)	Gross Weight (kg)	Shipping configuration depth (mm)	Max 19" depth
CKR16U66	2	680x630x1994	88,40	97,14	390	535
CKR20U66	2	680x630x2360	99,43	116,40	390	535
CKR22U66	2	680x630x2600	106,80	120	390	535
CKR26U66	1	680x630x1440	58,20	65,60	390	535
CKR32U66	1	680x630x1710	67,20	74,80	390	535
CKR36U66	1	680x630x1880	73,20	81,40	390	535
CKR39U66	1	680x630x2020	78,80	87	390	535
CKR42U66	1	680x630x2160	81,00	89,40	390	535
CKR44U66	1	680x630x2245	85,80	94,00	390	535
CKR47U66	1	680x630x2380	90,23	101,20	390	535

19" Free Standing Cabinet / Universalline 600x800mm

TECHNICAL DRAWINGS

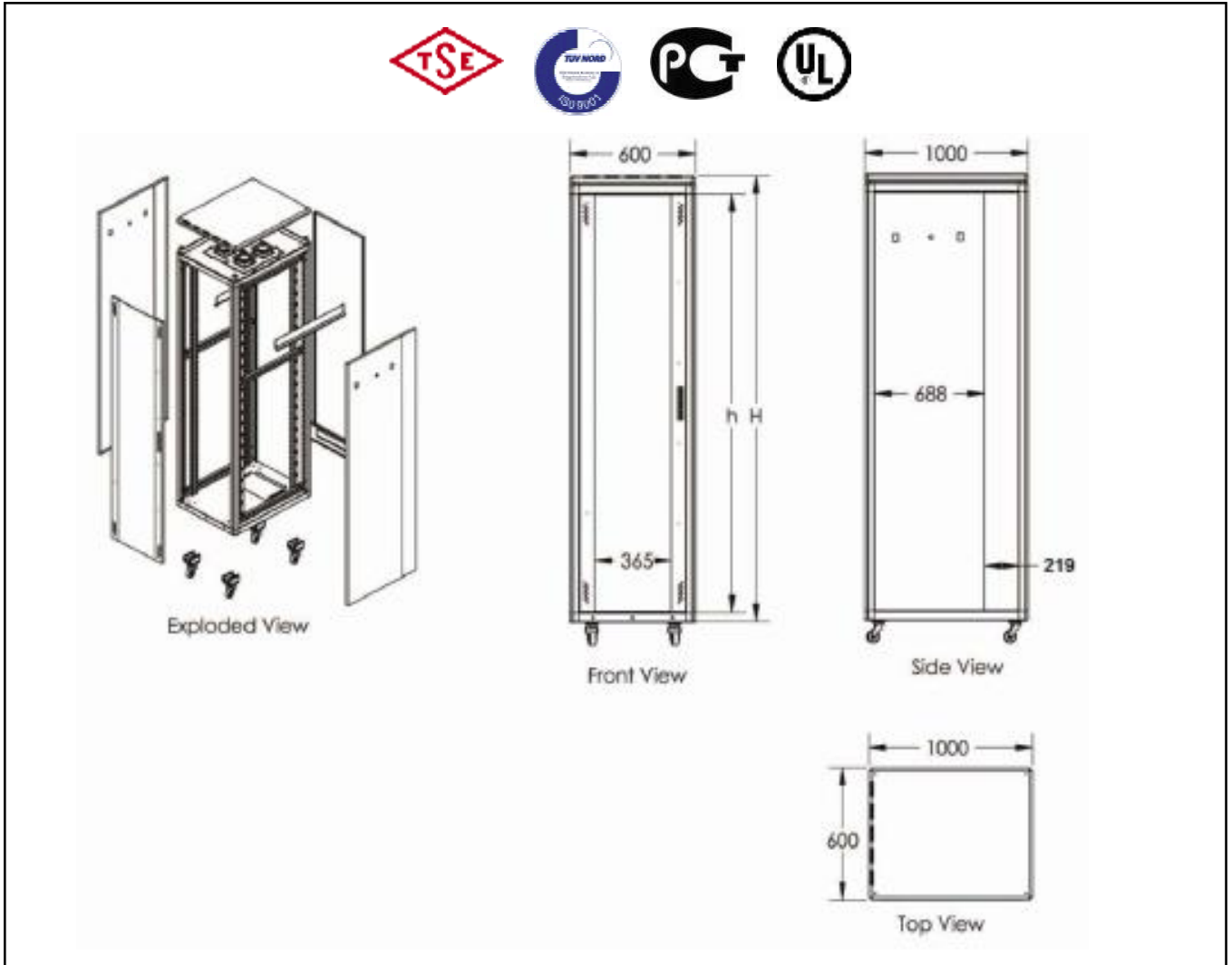


19" Free Standing cabinets width=600 mm depth=800 mm			
Order No	U=44.45 (mm)	h = inside height(mm)	H =outside height(mm)
CKR16U68	16	740,40	865,40
CKR20U68	20	917,40	1042,40
CKR22U68	22	1006,30	1131,40
CKR26U68	26	1184,40	1309,40
CKR32U68	32	1451,40	1576,40
CKR36U68	36	1629,40	1754,40
CKR39U68	39	1762,40	1887,40
CKR42U68	42	1896,40	2021,40
CKR44U68	44	1985,40	2110,40
CKR47U68	47	2118,75	2243,75

Shipping Data						
Order No	Quantity	Shipping Dimension (palette) WxDxH	Net Weight (kg)	Gross Weight (kg)	Shipping configuration depth (mm)	Max 19" depth
CKR16U68	2	680x630x1994	106,23	126,80	555	715
CKR20U68	2	680x630x2360	122,86	139,26	555	715
CKR22U68	2	680x630x2600	124,86	141,26	555	715
CKR26U68	1	680x630x1440	68,83	78,00	555	715
CKR32U68	1	680x630x1710	80,23	90,83	555	715
CKR36U68	1	680x630x1880	87,00	99,00	555	715
CKR39U68	1	680x630x2020	95,00	104,83	555	715
CKR42U68	1	680x630x2160	95,83	107,83	555	715
CKR44U68	1	680x630x2245	97,83	109,83	555	715
CKR47U68	1	680x630x2380	106,63	118,23	555	715

19" ESTAP Universalline Cabinets and Racks 600x1000mm

TECHNICAL DRAWINGS



19" Free Standing cabinets width=600mm depth=1000mm			
Order No	U=44.45 (mm)	h = inside height(mm)	H = outside height(mm)
CKR26U6100	26	1184,40	1309,40
CKR36U6100	36	1629,40	1754,40
CKR42U6100	42	1896,40	2021,40
CKR47U6100	47	2118,75	2243,75

Shipping Data						
Order No	Quantity	Shipping Dimension (palette) WxDxH	Net Weight (kg)	Gross Weight (kg)	Shipping configuration depth (mm)	Max 19" depth
CKR26U6100	1	680x1070x1440	82,60	93,80	740	940
CKR36U6100	1	680x1070x1880	103,60	117,80	740	940
CKR42U6100	1	680x1070x2160	113,80	127,80	740	940
CKR47U6100	1	680x1070x2380	125,00	138,00	740	940