

MLS 608 D

EIGHT INPUT MEDIALINK®
SWITCHER WITH ProDSP™ AUDIO

- Multi-input switcher for digital and analog video signals
- HDMI audio de-embedding
- Transmits HDMI and analog video, plus audio and RS-232 over CAT 5-type cables to included MTP/HDMI U R Twisted Pair Receiver
- HDCP compliant
- EDID Minder®
- MTP/HDMI U R receiver automatically routes incoming signals to appropriate output connectors
- Audio switching and output volume control
- Available stereo or mono power amplification
- ProDSP™ audio signal processing:
 - 32/64-bit floating point digital signal processing engine
 - Low latency DSP processing
 - Intuitive Graphical User Environment
- Controllable via TouchLink™ Control System, MediaLink® Controller, front panel buttons, or RS-232



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Introduction

The Extron **MLS 608 D** MediaLink® Switcher is a simple-to-use, eight input, multi-format switcher designed to integrate digital and analog sources. All signals are transmitted over CAT 5-type cable to the included MTP/HDMI U R Twisted Pair Receiver. The MLS 608 D features Extron ProDSP™ digital audio processing, which provides an extensive array of easy-to-use tools for audio system set-up and fine-tuning. The MLS 608 D offers digital video switching with

four HDCP-compliant, HDMI inputs, and analog video switching with four universal inputs, including an Extron Universal MTP Twisted Pair input. It outputs HDMI twisted pair signals and analog MTP Twisted Pair to the included MTP/HDMI U R receiver, providing a complete digital and analog video and audio switching system.



The MLS 608 D is ideal for classrooms and other A/V environments that require an integration of a mix of digital and analog video sources.

Three Switcher Models

The MLS 608 D is available in three models. The MLS 608 D is a non-amplified model with a variable preamp output. The MLS 608 D SA features stereo power amplification with 20 watts rms per channel into 4 or 8 ohms. The MLS 608 D MA features mono 70 volt amplification with 40 watts rms output. The MLS 608 D MediaLink Switchers are ideal for environments that require the flexibility to integrate digital and analog video switching in a single switcher.

Both amplified models feature an Extron exclusive, highly efficient, advanced Class D amplifier design with patented CDRS™ - Class D Ripple Suppression technology that provides a smooth, clean audio waveform and an improvement in signal fidelity over conventional Class D amplifier designs.

Extensive Control Options

The switcher can be controlled using the front panel backlit buttons or RS-232. The front panel provides control for direct input switching as well as mic and audio volume. These backlit buttons can be individually labeled to enable easy identification of video and audio inputs.

In addition, the switchers can be controlled via RS-232 using an optional TouchLink™ Touchpanel Control System or MediaLink Controller. TouchLink and MediaLink are configurable control systems that provide a simple and intuitive user interface for the MLS 608 D Switcher, and the entire room.

MTP Twisted Pair System Optimization

The MLS 608 D offers features designed to streamline installation and set-up of MTP Twisted Pair systems, including video level and peaking compensation for the MTP input of the switcher as well as the MTP/HDMI U R Twisted Pair Receiver. Skew compensation is provided by the MLS 608 D for both the MTP input and output, maintaining RGB color alignment. Additionally, with automatic signal format detection, the MTP/HDMI U R receiver automatically detects the incoming video signal format, as well as any incoming audio or RS-232 control signal from the MLS 608 D. The incoming signals are then routed to the appropriate output connectors.

The HDMI and RS-232 signals are carried on the digital output over the dual twisted pair cables. Audio signals from the MLS 608 D are transmitted to the MTP/HDMI U R over the MTP cable.

Accepts Multiple Digital and Analog Signal Formats

The MLS 608 D features independent digital and analog video switching. The digital portion comprises four HDCP compliant HDMI Inputs. Each HDMI input features automatic cable equalization, which reduces the need for additional signal conditioning equipment by compensating for signal loss when using long input cable assemblies. The MLS 608 D de-embeds two-channel PCM audio signals from the HDMI input, allowing for audio DSP processing and signal routing to the outputs.

Introduction

The analog portion includes three universal inputs that accept all common video formats, from high resolution RGB to HDTV and composite video. A fourth, Extron Universal MTP Twisted Pair input accepts all of these signals from an MTP Series Twisted Pair Transmitter.

EDID Minder®

The MLS 608 D features EDID Minder®, which automatically manages the EDID information between the display device and all the HDMI and VGA input sources. EDID Minder offers an automatic mode which captures and stores the EDID from the display, and then communicates this EDID to the input sources. Also available is a user assigned mode, which allows pre-stored EDID, based on a user selected resolution, to be manually assigned to the sources. By maintaining continuous EDID communication with all sources, EDID Minder ensures that all HDMI and VGA sources power up properly and maintain their video outputs whether or not they are actively connected to the display device through the switcher's outputs.

Digital and Analog Twisted Pair Outputs

The MLS 608 D includes a dual twisted pair output for the HDMI signals, and a single Universal MTP Twisted Pair output for the analog signals. These outputs enable transmission over economical and installation-friendly CAT 5-type cables to the included MTP/HDMI U R Twisted Pair Receiver, which can be conveniently mounted at the display.

RS-232 Insertion Port

The local RS-232 insertion port allows direct transmission of bi-directional serial control signals into the twisted pair output. This eliminates the need for a separate control cable infrastructure to the remote display, simplifying installation and reducing cost.

Audio Switching and Integrated ProDSP™

The MLS 608 D features seven-input stereo audio switching to accompany incoming video sources. A mic/line audio matrix mixer allows either of two available mic/line inputs to be mixed into any or all of the audio switcher outputs. Input gain and attenuation is provided for each input, and the MLS 608 D provides master volume control on the front panel as well as a separate control for mic volume.

The MLS 608 D also incorporates ProDSP, an Extron-developed audio platform based on a powerful 32/64-bit floating point DSP engine, with easy-to-use tools to control level, dynamics, filters, delay, ducking, loudness, and feedback suppression. ProDSP is managed by the intuitive DSP Configurator™ Software, which features a Graphical User Environment that offers a clear view of all input and outputs, audio processing blocks, audio switcher settings, and microphone mix points in a single window.

Extensive Control Options

TouchLink™ Control System



TLP 700MV
7" Wall mount Touchpanel



TLP 1000TV
10" Tabletop Touchpanel



TLP 350CV
Cable Cubby Touchpanel



IPCP 505
IP Link® Control Processor

MediaLink® Controllers

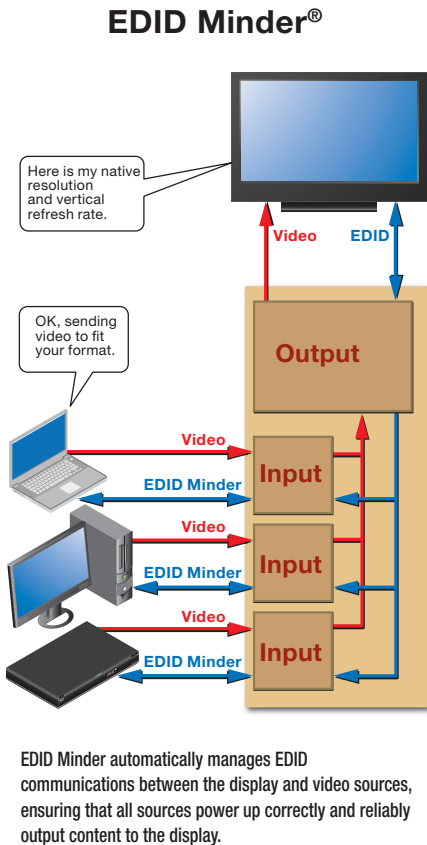


MLC 104 IP Plus
MediaLink Controller with IP Link®



MLC 226 IP
Enhanced MediaLink Controller with IP Link®

Features



Accepts and switches multiple digital and analog video signal formats

Four input HDMI switching

Four input analog universal video switching

Four universal inputs, including an Extron Universal MTP Twisted Pair, accept RGBHV, HDTV component video, and S-video or composite video sources.

Transmits HDMI and analog video over CAT 5-type cables to included MTP/HDMI U R Twisted Pair Receiver

The MLS 608 D includes twisted pair outputs for transmitting HDMI and analog video signals, plus audio and RS-232 to the included MTP/HDMI U R. The receiver then automatically routes incoming signals to the appropriate output connectors.

EDID Minder®

Automatically manages EDID – Extended Display Identification Data communication between the display and connected HDMI and VGA input sources. EDID Minder ensures that all sources power up correctly and reliably output content, whether or not they are actively connected to the display device through the switcher's outputs.

Sends HDMI signals 200 feet (60 meters) over twisted pair cable

The MLS 608 D sends 720p, 1080i, and XGA (1024x768) HDMI signals over 200 feet (60 meters), and 1080p/60 and 1920x1200 HDMI signals over 100 feet (30 meters). Extron DTP26 Digital Twisted Pair cable provides added protection from outside interference and increases overall signal transmission distance, allowing 1080p/60 and 1920x1200 signals to be sent 50% further than with standard CAT 5e cable.

Extensive Control Options

The switcher can be controlled using the front panel backlit buttons or RS-232. An optional TouchLink™ Touchpanel Control System or MediaLink® Controller may be connected to the RS-232 port to provide a simple and intuitive user interface for the MLS 608 D Switcher, and the entire room.

HDCP compliant

The MLS 608 D and included MTP/HDMI U R fully support switching and long distance transmission of HDCP signals.

Cable equalization for each HDMI input

Actively conditions incoming HDMI signals to compensate for signal loss when using long HDMI cables, low quality HDMI cables, or source devices with poor HDMI signal output.

Skew equalization for MTP input and output

Skew adjustments are stored in memory for both the MTP input and output, maintaining RGB color alignment at all times.

Separate variable level and peaking controls on MLS 608 D MTP input and MTP/HDMI U R receiver

Front Panel Control with backlit buttons

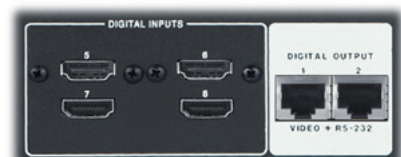
The buttons can be custom-labeled for easy identification. Because the buttons illuminate, they are helpful for presenters in low-light environments.

HDMI audio de-embedding

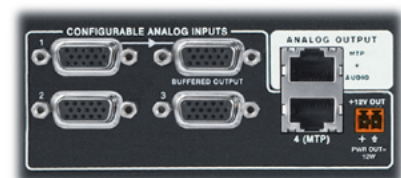
Strips two-channel PCM audio off HDMI inputs, allowing for DSP and signal routing.

Audio switching and output volume control

The MLS 608 D features PCM audio switching for seven stereo balanced or unbalanced input sources, and provides master volume control and muting. Three balanced or unbalanced outputs

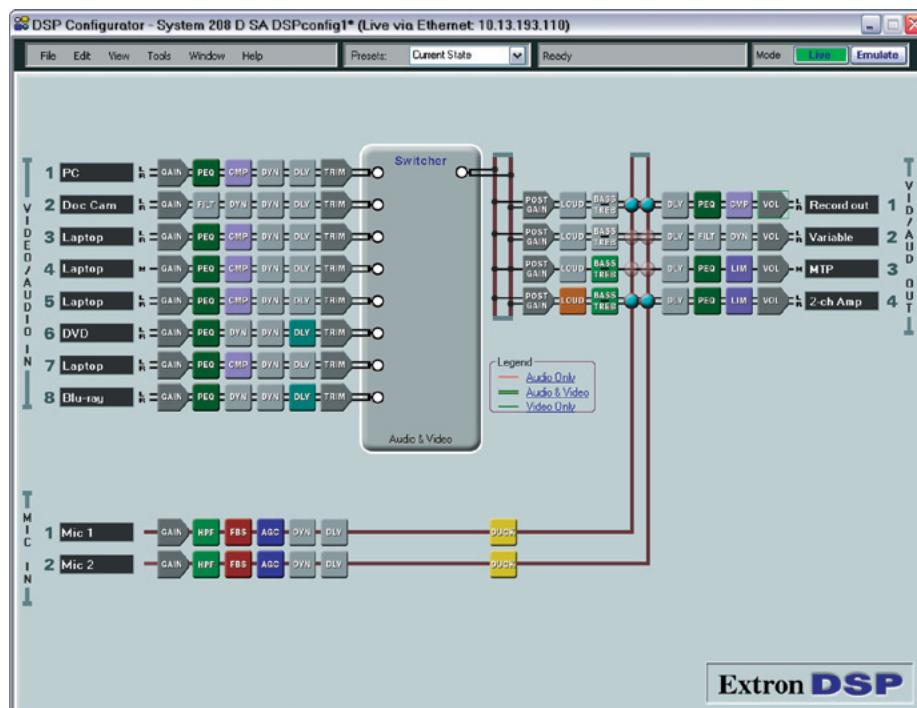


Four Input HDMI Switching



Four Input Analog Video Switching

Features



The intuitive DSP Configurator Software features a Graphical User Environment that offers a clear view of all input and outputs, audio processing blocks, audio switcher settings, and microphone mix points in a single window.

are available, two on the MLS 608 D, and a third on the MTP/HDMI U R. Each output can be set as variable or fixed.

Audio input gain and attenuation

Gain or attenuation can be adjusted for each input to eliminate noticeable differences when switching between sources.

Mic/line audio matrix mixing

The MLS 608 D provides microphone bussing so that each of the two mic/line inputs can be mixed into any or all of the audio outputs.

Available power amplification

The MLS 608 D SA includes a stereo power amplifier with 20 watts rms per channel into 4 or 8 ohms. The MLS 608 D MA offers a mono 70 volt amplifier with 40 watts rms output. Both models feature an Extron exclusive, highly efficient, advanced Class D amplifier design with CDRS™ - Class D Ripple Suppression, an Extron Patented technology that

provides a smooth, clean audio waveform and an improvement in signal fidelity over conventional Class D amplifier designs. CDRS eliminates the high frequency switching ripple characteristic of Class D amplifiers, a source of RF emissions which can interfere with sensitive A/V equipment such as wireless microphones.

ProDSP™ audio signal processing

The MLS 608 D features a powerful 32/64-bit floating point audio DSP processing engine, which provides very wide dynamic range and maintains audio signal transparency while preventing DSP signal clipping and simplifying management of gain staging.

Essential audio DSP tools

ProDSP provides an extensive array of easy-to-use, digital audio processing tools for audio system setup and fine-tuning, including audio gain, dynamics, compression, filtering, delay, microphone ducking, loudness, and feedback suppression.

DSP Configurator Software

A powerful yet user-friendly software tool for managing all audio setup and operations of the MLS 608 D. It enables complete setup and configuration of digital audio processing tools on the ProDSP platform as well as microphone mixing.

USB configuration port

Provides convenient access to the MLS 608 D for system setup and configuration, as well as ProDSP for audio system integration.

MTP/HDMI U R receiver plenum rated

The MTP/HDMI U R receiver meets UL 2043 for heat and smoke release, excluding the power supply.

Overview - MLS 608 D

USB configuration port

Provides convenient access to the MLS 608 D for system setup and configuration.

Backlit input selection buttons

Input selection buttons are easily identifiable using backlit buttons with overlay labels, enabling simple front panel operation.

Volume controls

Allow for adjustment of master volume and microphone level, with accompanying LEDs to indicate volume level.



MLS 608 D - Front

Analog universal video inputs

Includes three video inputs that accept all common formats, from composite video to HDTV and RGBHV.

Digital and analog twisted pair outputs

The MLS 608 D outputs HDMI twisted pair and analog Universal MTP Twisted Pair signals to the included MTP/HDMI U R receiver.

Mic/line inputs and matrix mixer

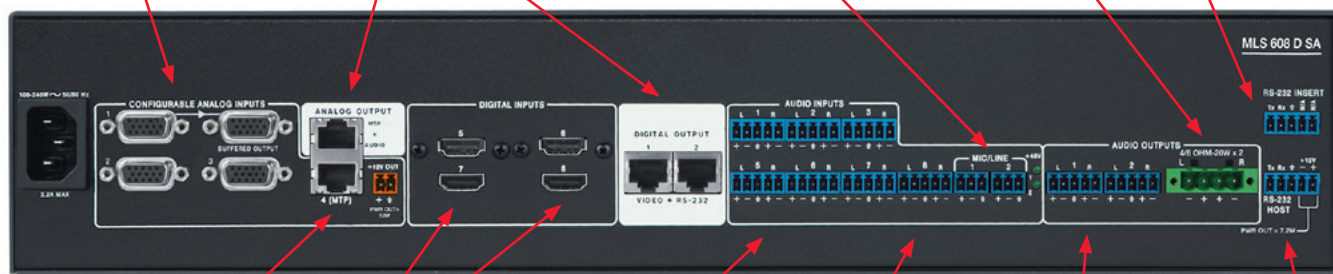
Inputs for microphones can be selectively mixed into any or all of the available audio outputs.

Audio amplifier output

MLS 608 D models are available with stereo or mono amplified audio output.

RS-232 insertion

Eliminates the need for separate control cable infrastructure to the display.



MLS 608 D SA - Back

Universal MTP Twisted Pair Input

Extron MTP input accepts all common video formats along with audio on a single CAT 5-type cable.

Four HDCP compliant HDMI inputs

Audio switching

Seven stereo inputs accept balanced and unbalanced signals.

ProDSP™

Provides full control of audio input and output levels plus a wide array of audio processing tools for program and microphone signals.

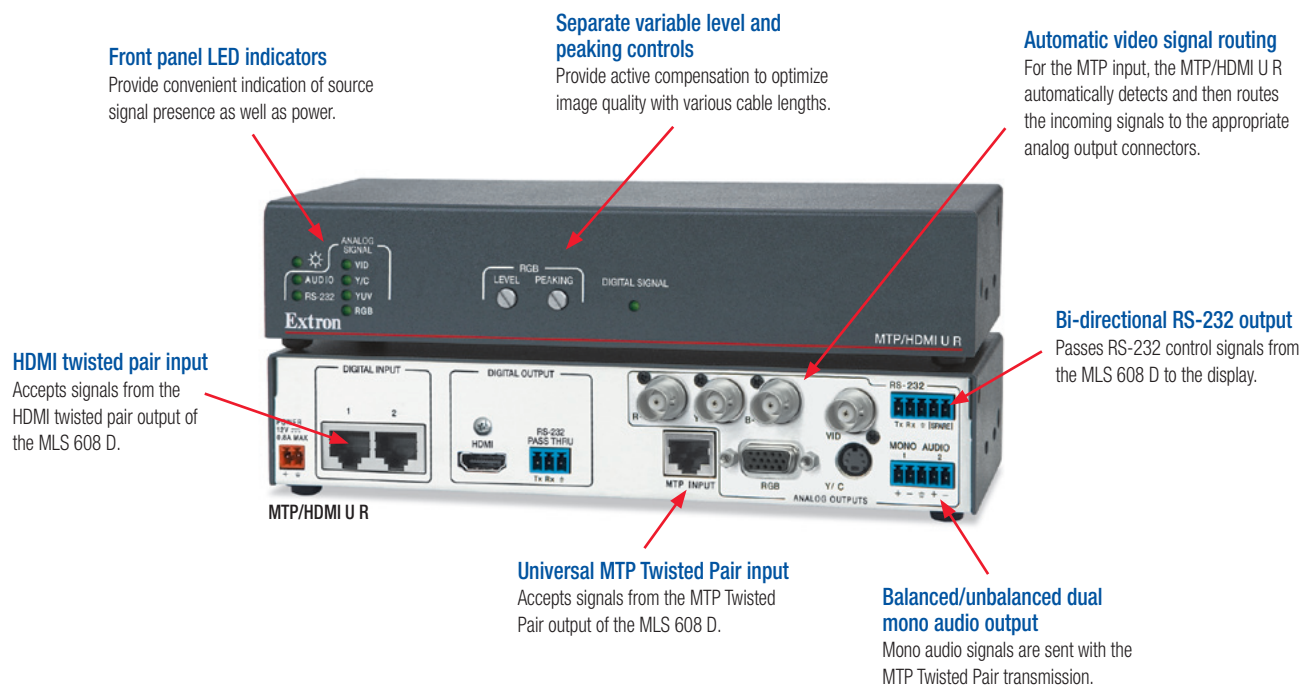
Configurable audio outputs

Three audio outputs, including one on the MTP/HDMI U R, can be set as balanced or unbalanced, as well as stereo or dual mono.

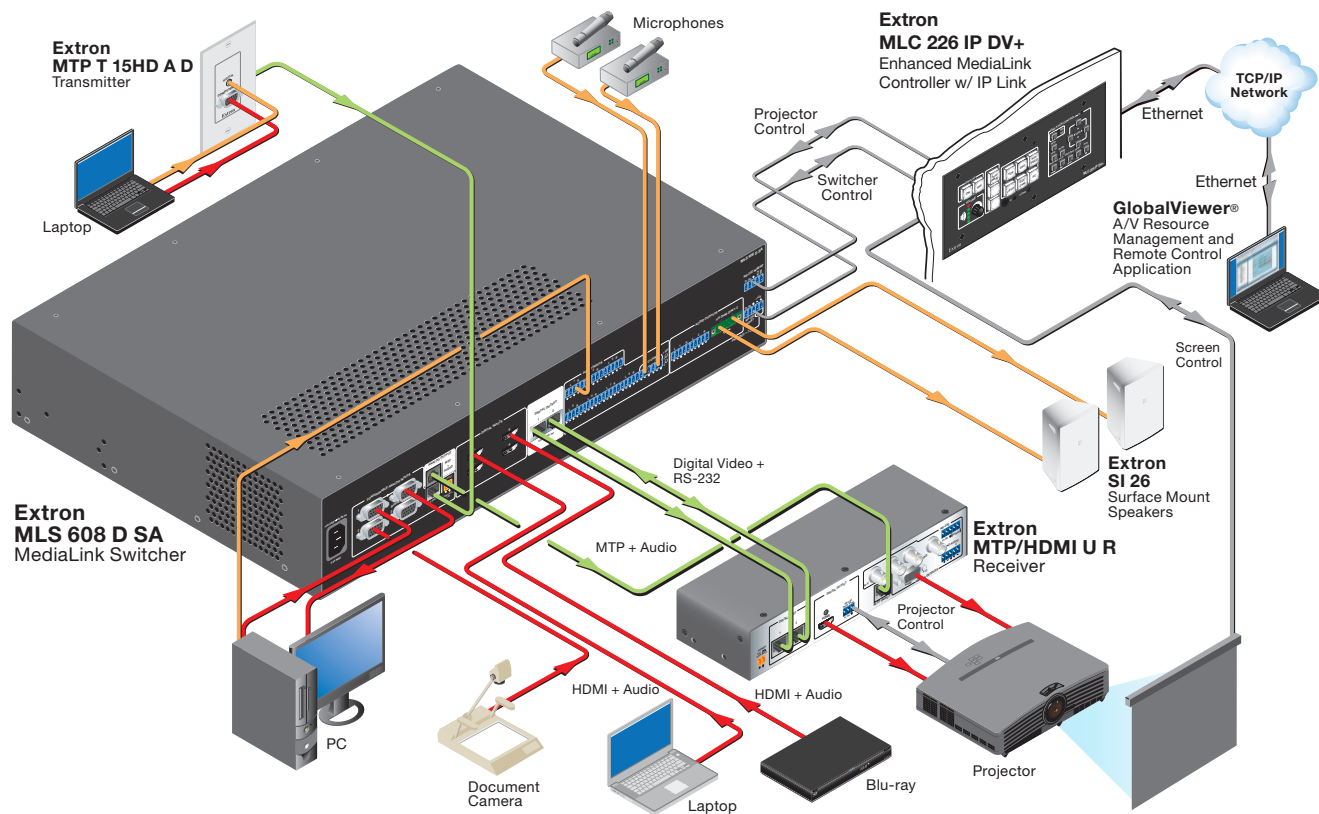
RS-232 control port

Can connect to a MediaLink Controller or IP Link Control Processor for separate room and display control.

Overview - MTP/HDMI U R Twisted Pair Receiver



APPLICATION DIAGRAM



Specifications

VIDEO — MLS ANALOG INPUTS

Bandwidth 350 MHz (-3 dB), fully loaded

VIDEO — MLS DIGITAL INPUTS

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

Standards DVI 1.0, HDMI 1.3

VIDEO INPUT AND LOOP-THROUGH MLS

Number/signal type

Analog 3 RGBHV, RGBS, RGsB, RsGsBs, component video, S-video, or composite video input
1 RGBHV, RGBS, RGsB, RsGsBs loop-through
1 analog proprietary signal from an Extron MTP transmitter

Digital video 4 HDMI (or DVI*) digital video

Resolution range Up to 1920x1200 or 1080p @ 60 Hz

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

AUDIO INPUT — MLS

Number/signal type 7 stereo, balanced/unbalanced (inputs 1-3, 5-8)
2 mono, balanced/unbalanced (mic/line level inputs)
1 proprietary analog signal (mono, balanced/unbalanced, from MTP input 4)

AUDIO OUTPUT — LINE LEVEL (ALL MODELS) — MLS

Number/signal type 2 stereo or dual mono, balanced/unbalanced (fixed or variable, selectable)
1 dual mono, balanced/unbalanced (fixed or variable, selectable), via MTP

AUDIO OUTPUT — power amplifier (amplifier models only) — MLS

Number/signal type

MA model 1 mono, 70 V line

SA model 1 stereo (default) or 2 mono, 2 channels total

Load impedance

MA model 123 ohms minimum

SA model 4 or 8 ohms

Amplifier type Class D

Output power

MA model 40 watts (rms), 70 V, 1 watt tolerance, 1 kHz, 1% THD

SA model 20 watts (rms) per channel, 1 watt tolerance; 4 or 8 ohms; 1 kHz; 1% THD

CONTROL/REMOTE — SWITCHER — MLS

Serial control port 1 bidirectional RS-232: 1 rear panel 3.5 mm captive screw connector, 5 pole (only 3 poles are used)

USB control ports 1 front panel female mini USB B

GENERAL — MLS

Power 100 VAC to 240 VAC, 50-60 Hz, 50 watts, internal

Rack mount Yes, with included brackets

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, knob, and buttons. Width excludes rack ears.)

Regulatory compliance

Safety CE, c-UL, UL
Compliances CE, C-tick, FCC Class A, ICES, VCCI
Environmental Complies with the appropriate requirements of RoHS, WEEE

VIDEO — MTP/HDMI U R

MTP input

Maximum resolution

Analog Up to 2048x1080 or 1080p at 60 Hz

HDMI digital input

Maximum data rate 4.95 Gbps (1.65 Gbps per color)

Maximum pixel clock 165 MHz

Maximum resolution

Digital Up to 1920x1200 or 1080p at 60 Hz

Standards DVI 1.0, HDMI 1.2

VIDEO OUTPUT — MTP/HDMI U R

Number/signal type

Analog output 1 RGBHV, RGBS, component video (bi-level and tri-level), S-video, composite video (follows input type)

HDMI digital output 1 single link HDMI (or DVI-D*)

SYNC — ANALOG OUTPUTS — MTP/HDMI U R

Output type RGBHV, RGBS, Component video (bi- or tri-level)

Standards NTSC 3.58, NTSC 4.43, PAL, SECAM

AUDIO OUTPUT — FROM MTP INPUT — MTP/HDMI U R

Number/signal type 2 mono, balanced/unbalanced

CONTROL/REMOTE

External device (pass-through, unidirectional or bidirectional) from MTP input — MTP/HDMI U R

Serial control port input/output RS-232 via (1) 3.5 mm, 5 pole captive screw connector (3 poles are used)

GENERAL — MTP/HDMI U R

Recommended cable type Shielded or unshielded

MTP input CAT 5/5e/6

HDMI digital input CAT 5/5e/6, Extron DTP26

External power supply 100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 1 A, regulated

Power input requirements 12 VDC, 0.8 A

Mounting

Rack mount Yes, with optional 1U rack shelf

Enclosure type

Metal

Enclosure dimensions 1.7" H x 8.75" W x 3.0" D (half rack wide)
(4.3 cm H x 22.2 cm W x 7.6 cm D)
(Depth excludes connectors.)

Regulatory compliance

Safety CE, c-UL, UL
UL rated for use in plenum airspaces: meets UL 2043 for heat and smoke release, excluding the power supply.
CE, C-tick, FCC Class A, ICES, VCCI

EMI/EMC

Model	Version Description	Part number
MLS 608 D	Variable Preamp Output - No Amplifier	60-1052-01
MLS 608 D MA	40 Watt 70 Volt Mono Power Amplifier	60-1052-02
MLS 608 D SA	2x20 Watt Stereo Power Amplifier	60-1052-03

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



Extron **USA - West**
Headquarters

+800.633.9876
Inside USA / Canada Only

+1.714.491.1500
+1.714.491.1517 FAX

Extron **USA - East**

+800.633.9876
Inside USA / Canada Only

+1.919.863.1794
+1.919.863.1797 FAX

Extron **Europe**

+800.3987.6673
Inside Europe Only

+31.33.453.4040
+31.33.453.4050 FAX

Extron **Middle East**

+971.4.2991800
+971.4.2991880 FAX

Extron **Asia**

+800.7339.8766
Inside Asia Only

+65.6383.4400
+65.6383.4664 FAX

Extron **Japan**

+81.3.3511.7655
+81.3.3511.7656 FAX

Extron **China**

+400.883.1568
Inside China Only

+86.21.3760.1568
+86.21.3760.1566 FAX