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Media Server Support

Integrating Live Video and other Media with DL.3 and DL.2 Fixtures

Topics Included:

> **Live Video Options**
> **S-Video**
> **Serial Device Interface (SDI)**
> **Previewing and Routing Live Video from the fixture's internal Camera**
> **Product and manufacturer recommendations**
> > - **S-Video to Cat 5 Ethernet Baluns for Long Distance S-Video Signal Distribution**
> > - **S-Video and Composite Video Cables**
> > - **S-Video to Composite Converter for Sending Video to Preview Monitor Racks**
> > - **LCD Video Monitor Racks**
> > - **DMX-triggered Video Switchers**
> > - **Rack Systems for DL.2 Video Gear Storage and Transport**
> > - **Live Video Camera System with FOH Previews & DMX-triggered Video Routing & Switching**

Live Video Options
Internal Camera
Every DL.3 is equipped with a internal video camera and IR illuminator capable of capturing live video even in blackout conditions. The camera is mounted on the front of the unit near the projector iris to point wherever the fixture is directed. All of the camera functions can be controlled via a DMX console.
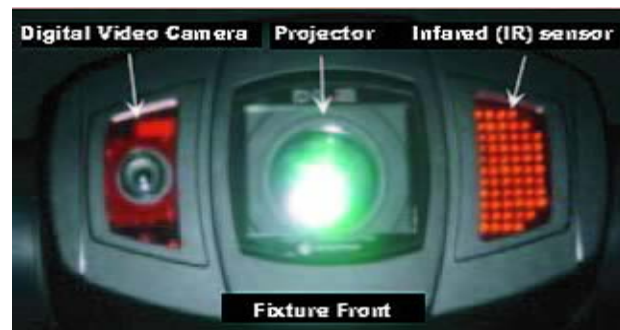
The DL.2 video camera is also equipped with an infrared (IR) illuminator sensor that makes it capable of "seeing" people and other subject matter in dark environments.

Other Video Sources
DL.3 and DL.2 fixtures can project other live video sources connected to the fixture's RGBHV, or S-Video input ports. DL.3 fixtures also include SDI input and output capabilities. Live SDI or S-Video input can both be enhanced and manipulated by the graphics engine. Video input via RGBHV bypasses the internal graphics engine and is projected without change.

> *NOTE: You can configure the graphics engine to capture video from an external source or the internal camera but not from both at the same time.*

S-Video
Each DL.2 has an S-Video input and an S-Video output, as seen in the image below:

S-Video Formats
DL.3 and DL.2 fixtures support multiple S-Video formats including:

NTSC_M; PAL_B; PAL_H; SECAM_B; SECAM_K; NTSC_MJ; PAL_D; PAL_I; SECAM_D;
SECAM_K1; PAL_G; PAL_M; SECAM_G; SECAM_L; PAL_N; SECAM_H; SECAM_L1

You will need to configure the DL.3 fixture to identify which video input source you have chosen. The active input can be configured the following ways:

- Manually using the DL.3 menu system
- Remotely through the CMA
- Via the DMX console commands
  NOTE: The integrated camera provides an NTSC_M video signal.

Sending the Camera Feed to S-Video Camera Out
The factory default assigns the video feed from the internal camera to the graphics engine. However, a DL.3 fixture can be configured to route the camera video feed to the Camera Out connector by setting the Control Parameter to a DMX value between 229-232.

> *NOTE: You can route the internal camera video feed to either the graphic engine or the camera out connector, but not to both at the same time.*
> *This setting will be retained until you change it or restore the factory defaults.*

Serial Device Interface (SDI)
The SDI capture is accessible in the graphics engine in the same way that the S-video capture is. Media Folder 255 Media file 1 will display the S-video capture. Media folder 255 media file 2 will display the SDI capture.

A DL.3 fixture can both capture SDI (accept external SDI feeds) and also output its camera through SDI. There are two separate ports on the DL.3 back panel.

> *NOTE: A DL.3 fixture cannot capture SDI and output its own camera feed through SDI simultaneously. So, unlike the S-video capture, it cannot be displaying the SDI feed of another fixture while outputting its own camera through SDI.*

To switch between SDI in and SDI out, access the Motion Control parameters through your DMX console. The iris does not have to be closed for the switch to happen.

Note the following when using the SDI video input and output option:

- While capturing SDI, anything that is being fed to the "In" SDI port will be mirrored on the "Out" port. Therefore, it is possible to daisy chain fixtures together via SDI, allowing multiple DL.3s to have the same SDI feed without a switcher/splitter device.
- In order for the DL.3 to output its camera through SDI, the S-video relays must be set to internal camera capture (otherwise known as camera feedback). This is necessary because the S-video signal must be routed to the computer.
- The "frame delay" on the SDI capture is nearly identical to that of the S-video capture. The difference cannot be seen with the naked eye.
- It is possible for a unit to have both SDI and S-video inputs coming in at the same time.

Previewing and Routing Live Video from fixture's internal camera

Step 1: It may be best to monitor the cameras from each DL.2 at front of house. S-Video (also called SVHS and YC) can be transmitted with good cable to distances of up to 150 feet. There is also another way to achieve even longer distances for sending S-Video signals with the use of a video balun adapter to Cat 5 Ethernet cable. With an S-Video to Cat 5 Ethernet adapter lightweight twisted pair cables can be run up to 1000 feet with very little discernable signal degradation. See the MuxLab 50016 Video Balun pictured below:

This longer distance should enable runs to front of house. MuxLab makes a video balun that is does not require an external power supply. Two MuxLab 500016 S-Video baluns are required to send an S-Video signal from a DL.2 camera to the front of house using Cat 5 Ethernet twisted pair cable. The MuxLab S-Video baluns have a street price of about $30 each.

Step 2: After routing the DL.2 camera S-Video signals to front of house using S-Video baluns and Cat 5 Ethernet cable we will need to "see" the camera image on a monitor. Assuming the show uses several DL.2's an LCD monitor rack will need to be used. Unfortunately most LCD multi-monitor racks only handle Composite video inputs and not S-Video. Marshal Electronics' MC-0201-4 S-Video to Composite converter is a device that can loop our S-Video "IN and OUT" while also providing a Composite output for our rack LED monitors. This device can accept up to four camera signals from 4 DL.2s, loop the S-Video though and also provide a Composite output to a monitor bank. See the photo of the Marshal MC-0201-4 S-Video to Composite BNC converter:

The MC-0201-4 can also be rack mounted and 1U racks are available for one each or two each MC-0201-4 units as follows:
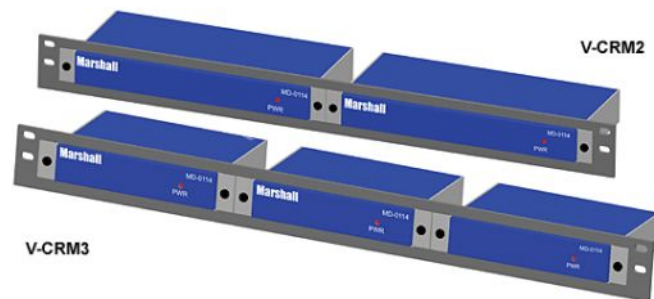
Step 3: So now we can have 4 each or 8 each DL.2 sending our S-Video camera signals over Cat 5 Ethernet wire to our MC-0201-4 Composite converters. At each of the now converted Composite outputs of the MC-0201-4 we can now connect an LCD monitor. Here is a rack mount LCD monitor panel that can be connected to the Marshall unit referenced in Step 2. The V-R44P has 8 each 1.8 inch color monitors. This will support previews of 4 DL.2 cameras:

V-R44P | **Four 4" Rack Mounted Full Color Active Matrix LCD Panel**

Step 4: Our DL.2 cameras can now be monitored live on our LCD monitor racks and at our DC-0201-4 converter each one has an available S-Video output at the S-Video loop out. We of course would like to send any of our DL.2 camera outputs to any or our DL.2 S-Video server inputs so that we can project a particular camera image from one DL.2 to any or all of the other DL.2s. This is where the D-Tek Mix Pro from D-Tek industries comes in. The D-Tek D-Mix Pro is a 4 x 4 video matrix switcher that allows DMX to switch any of it four S-Video inputs to any of it four S-Video outputs by crossfading:

Step 5: We have connected the S-Video loop outputs from our DC-0201-4 converter to each or the 4 S-Video inputs available on the D-Mix pro. At each of the 4 outputs of the D-Mix Pro we can send the signals back up to our DL.2 S-Video inputs using a 500016 S-Video balun and Cat 5 Ethernet cable, or into preview monintors first and then to desired DL.2 projectors. If we like we may also choose to send a D-Mix output to an LED screen, Soft LED curtain or central projector.

Tip: Use a protective case to store and transport the rackmounted video equipement described above. Below is the "6U Space RollX Rack" by SKB:

🔘 **Click to jump to Diagram of Live Video Camera System with FOH Previews and DMX-triggered Video Routing and Switching**

S-Video to Cat 5 Ethernet Baluns for Long Distance S-Video Signal Distribution

High End Systems recommends a S-Video to Cat 5 Ethernet balun made by MuxLab:

Manufacturer: MuxLab

MuxLab™

Website: **www.muxlab.com**
Product Name: VideoEase S-Video Balun
Product Model: VideoEase S-Video Balun
Product Part #: 500016
Product Description: "The VideoEase S-Video Balun allows one (1) S-Video channel to be connected via two (2) unshielded twisted pairs. Used in pairs, the S-Video Balun is used in home or commercial applications as a smart, fast and cost-effective means of connecting S-Video equipment using twisted pair instead of coax cable. The S-Video Balun may also be used in conjunction with MuxLab's CCTV-Audio/Video Hub (500200) for video distribution to multiple monitors. Ideal for video-conferencing, audio-video distribution, S-Video and other dual audio-video systems."
Product Page: **VideoEase S-Video Balun**
How to Buy: See the **MuxLab's website** for more information.

S-Video and Composite Video Cables

High End Systems recommends S-Video and Composite video cables made by Comprehensive:

Manufacturer: Comprehensive Video Group

Comprehensive®
A Division of Vcom International Multimedia Corporation

Website: **www.comprehensiveinc.com**
Product Name: HR Pro Series 4 pin plug to plug S-Video Cable (lengths may vary)
Product Model: HR Pro Series 4 pin plug to plug S-Video Cable (lengths may vary)
Product Part #: (depends on length chosen)
Product Description: "Comprehensive's HR Series Premium S-Video Cables are specifically engineered for today's high resolution applications. HR Series S-Video cables utilize two individually 100% shielded, high resolution coax conductors for the highest quality image reproduction. Premium, home theater style molded 24K gold 4 pin connectors ensure maximum signal transfer and a perfect connection every time (also available with 7 pin connectors). Finished with Comprehensive's famous X-traflex jacket and Lifetime Warranty"
Product Page: **S-Video Cables**
How to Buy: See the **Comprehensive's website** for more information.

S-Video to Composite Converter for Sending Video to Preview Monitor Rack

High End Systems recommends a S-Video to Composite Converter made by Marshall Electronics:

Manufacturer: Marshall Electronics

Marshall Electronics

Website: **www.lcdracks.com**
Product Name: MC-0201-4 - Precision 4 channel S-Video to Composite Converter
Product Model: MC-0201-4 - Precision 4 channel S-Video to Composite Converter
Product Part #: See website
Product Description: "The MC-0201-4 S-Video to Composite conversion module fills a void that has long existed in Professional and Multimedia applications. Until now, the only way to convert S-Video to Composite was by using a very low quality passive device or expensive boxes that lacked in capability. The MC-0201-4 is the only product of its type available, providing simultaneous conversion of 4 separate S-Video (Y/C) channels to Composite video. The S-Video is processed and amplified for output to another device like a vision mixer or VCR. Compare the features and price of the MC-0201-4 to similar devices and you will be pleasantly surprised. In most cases the MC-0201-4 provides 4 channels of conversion compared to other products providing only 1 channel at a similar price point. An optional base holder (V-CB1) is available for use in desktop applications."
Note: The power supply for this product is rated at 100-240 vac 50/60hz.
Product Page: **MC-0201-4 - Precision 4 channel S-Video to Composite Converter**
How to Buy: See the **Marshall Electronics' LCD Racks website** for more information.

LCD Video Monitor Racks

High End Systems recommends LCD Video Monitor Racks made by Marshall Electronics:

Manufacturer: Marshall Electronics

Website: **www.lcdracks.com**
Product Name: V-R44P - Four 4" Rack Mounted Full Color Active Matrix LCD Panel
Product Model: V-R44P - Four 4" Rack Mounted Full Color Active Matrix LCD Panel
Product Part #: See website
Product Description: "The V-R44P is a rack mountable unit that offers four 4" high-resolution active matrix LCD panels. Each of the four 480 x 234 pixel screens has its own set of controls for color, tint, contrast, and brightness. Each panel has its own input with active loop through feature, a 3 color tally system, and auto-recognition of NTSC or PAL formats. This unit is only 2U high, and can be tilted up to 90 degrees while rack mounted, and is the smallest video monitoring system of its kind. All V-R Series models are constructed of steel and aluminum, and include power supply and owners manual."
Note: The power supply for this product is rated at 100-240 vac 50/60hz.
Product Page: **V-R44P - Four 4" Rack Mounted Full Color Active Matrix LCD Panel**
How to Buy: See the **Marshall Electronics' LCD Racks website** for more information.

DMX-triggered Video Switchers
High End Systems recommends DMX video switchers made by D-TEK Industries:
Manufacturer: D-TEK Industries

Website: **www.d-tek-industries.com/**
Product Name: D-MIX PRO 4:4 Rack Mount Video Mixer
Product Model: D-MIX PRO 4:4 Rack Mount Video Mixer
Product Part #: see D-TEK website
Product Description: "The D-Mix Pro unit allows the user the best of both the D-Switch Pro and the D-Mix units, giving the ability to switch, mix and matrix four video inputs to four video outputs. This device is perfect for using with multiple sources and outputs, such as video cameras and multiple video projectors and screens."
Product Page: **D-MIX PRO 4:4 Rack Mount Video Mixer**
How to Buy: See the **D-TEK Industries' website** for more information.

Rack Systems for Video Gear Storage and Transport

High End Systems recommends rack systems made by SKB:

Manufacturer: SKB

Website: **www.skbcases.com/**
Product Name: 6U Space RollX Rack
Product Model: SKB-RLX6
Product Part #: see SKB website
Product Description: "The new Roll-X cases have a depth of 17" and accommodate 19" rack mount equipment with 3, 4, 5 and 6 rack space models. RollX Rack Features: Made of polyethylene rotationally molded plastic with 2.5" wheels and industrial pull handle, the Roll-X racks interlock and stack with each other."
Product Page: **6U Space RollX Rack**
How to Buy: See the **SKB website** for more information.

Live Video Camera System with FOH Previews of live video and DMX-triggered Video Routing and Switching

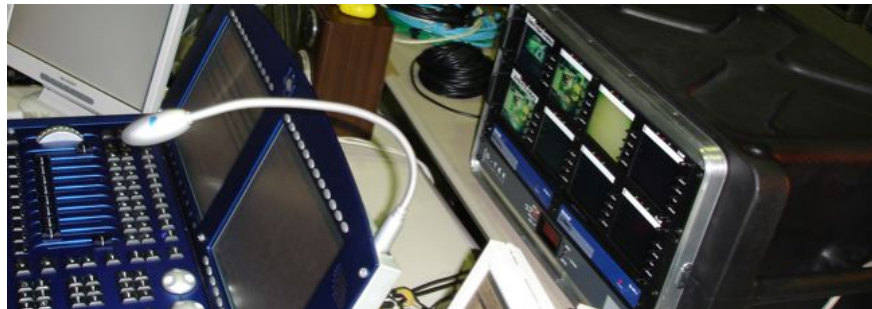# DMX Controlled Camera Mixing System

Wiring Schematic
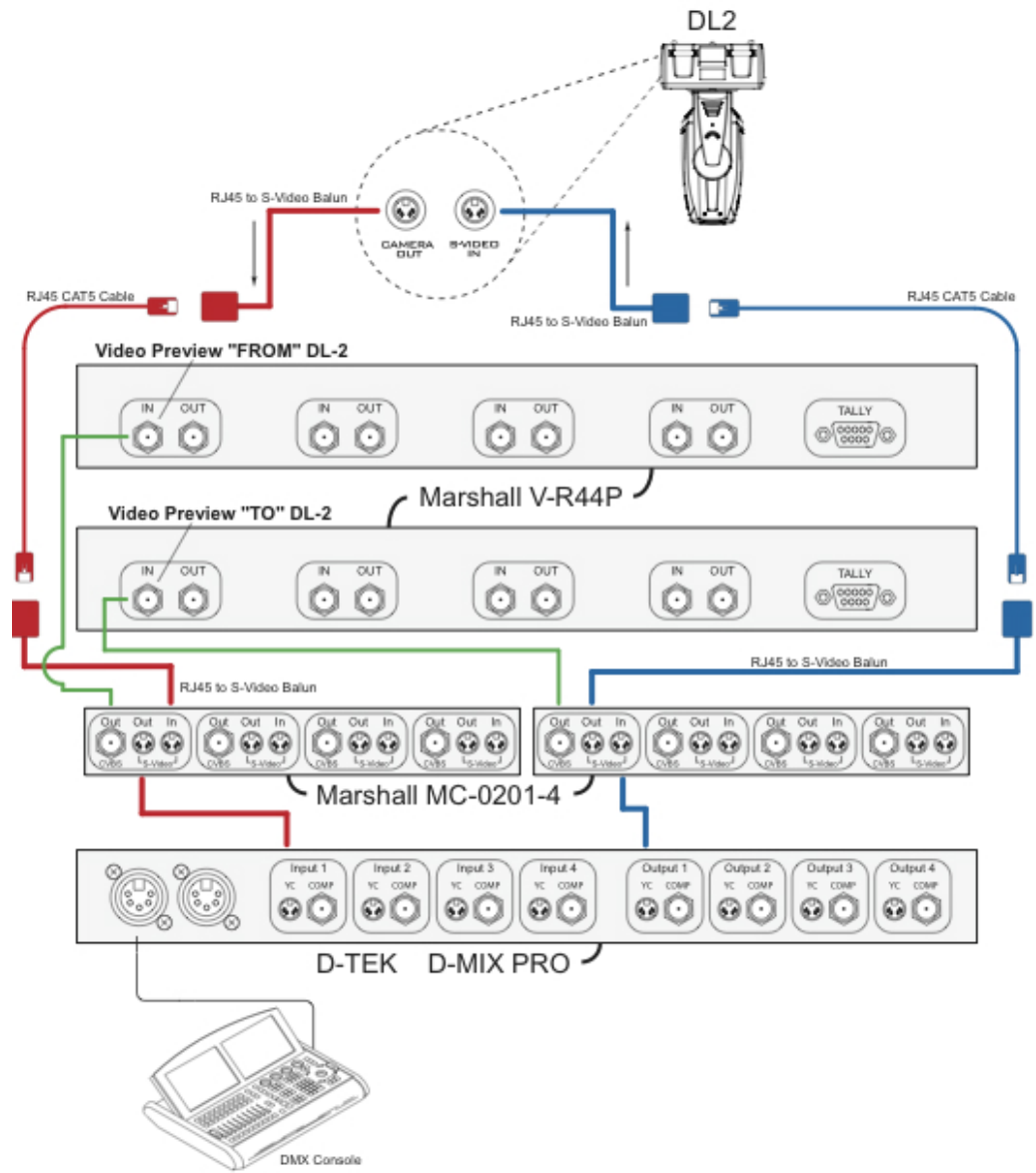
Example of how video preview monitors, S-Video to Composite converters and D-TEK Pro could be mounted in 1U rackmount configuration at FOH position

DMX can be used to route and mix video inputs to desired outputs

Configuration could be tailored to meet various requirements

Other setup examples: