

# Axon HD and Axon HD Pro Media Server User Manual

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#### Declaration of Conformity

according to ISO/IEC Guide 22 and EN45104

Manufacturer's name: High End Systems, Inc. Distributor's name: High End Systems, Inc. Distributor's address: 2105 Gracy Farms Lane Austin, Texas 78758 USA Declares that the product Product Name: Axon Product Number: All **Product Options:** All conforms to the following EEC directives: 73/23/EEC, as amended by 93/68/EEC 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC Equipment referred to in this declaration of conformity was first manufactured in compliance with the following standards in 2005: Safety: EN 60598-1: 1997 EN 60598-2-17; 1990 A1-A3: 1998 A13: 1999 EMC: EN 55022 Conducted Emissions Class A Radiated Emissions Class A ANSI C63.4 Class A FCC 47 CFR Part 15 Class A VCCI V-1/2001.04 Class A EN 55024 EN 61000-4-2 4/8kV EN 61000-4-3 A1 3V/m EN 61000-4-4 1kV/0.5kV EN 61000-4-5 2kV/1kV EN 61000-4-6 3 Vrms EN 61000-4-11 >95%-0.5p, 30%-25p,>95%-250p EN 61000-3-2 Class A EN 61000-3-3

Remark Farren

USA, Tuesday, November 04, 2014 Kenneth Stuart Hansen, Compliance Engineer

Axon HD Media Server User Manual

## **Product Modification Warning**

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### **FCC** Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

#### Important Safety Information

Instructions pertaining to continued protection against fire, electric shock, and injury to persons are found in this manual. Please read all instructions prior to assembling, mounting, and operating this equipment.

#### Important: Informations De Sécurité

Instructions relatives à la protection permanente contre l'incendie, de choc électrique excessive et des blessures se trouvent dans ce manuel. S'il vous plaît lire toutes les instructions avant d'assembler, d'installer ou d'utiliser cet équipement.

#### Wichtige Sicherheitshinweise

Anweisungen für den dauerhaften Schutz vor Feuer, Stromschlag, übermäßiger und Verletzungen werden in diesem Handbuch gefunden. Bitte lesen Sie die Anleitung vor der Montage, der Installation oder der Verwendung dieses Geräts.

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Le istruzioni in materia di protezione permanente contro gli incendi, scosse elettriche, eccessivi e lesioni si trovano in questo manuale. Si prega di leggere tutte le istruzioni prima di assemblare, installare o utilizzare questa apparecchiatura.

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Instrucciones relativas a la protección permanente contra incendio, descarga eléctrica, excesiva y las lesiones se encuentran en este manual. Lea todas las instrucciones antes de ensamblar, instalar o utilizar este equipo.

#### **Symbols**

The following international caution and warning symbols appear in margins throughout this manual to highlight messages.



CAUTION: This symbol appears adjacent to Caution messages. Not heeding these messages could result in personal injury and/or damage to equipment.



WARNING: This symbol appears adjacent to high voltage warning messages. Not heeding these messages could result in serious personal injury.

## **Packaged Media Notice:**

Any use of this product other than consumer personal use in any manner that complies with the MPEG-2 Standard for encoding video information for packaged media is expressly prohibited without a license under applicable patents in the MPEG-2 patent portfolio, which license is available from MPEG LA, L.L.C., 250 Steele Street, Suite 300, Denver Colorado 80206.

## Warranty Information

#### Limited Warranty

Unless otherwise stated, your *product (excluding the lamp)* is covered by a one year parts and labor limited warranty. The lamp warranty for Christie projectors is 120 days or 500 hours whatever comes first. It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.

#### Returning an Item Under Warranty for Repair

It is necessary to obtain a Return Material Authorization (RMA) number from your dealer or point of purchase BEFORE any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty.

Any Product unit or parts returned to High End Systems must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts and with an RMA number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction. Ship returned Product units or parts to: 2105 Gracy Farms Lane, Austin, TX 78758 USA.

Note:Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.

#### Freight

All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the Continental United States. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the continental United States.

REPAIR OR REPLACEMENT AS PROVIDED FOR UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER OTHER THAN THE LIMITED WARRANTY STATED ABOVE. HIGH END SYSTEMS, INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO ANY PRODUCT, AND HIGH END SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGH END SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGE, INCLUDING LOST PROFITS, SUSTAINED OR INCURRED IN CONNECTION WITH ANY PRODUCT OR CAUSED BY PRODUCT DEFECTS OR THE PARTIAL OR TOTAL FAILURE OF ANY PRODUCT REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, AND WHETHER OR NOT SUCH DAMAGE WAS FORESEEN OR UNFORESEEN.

Warranty is void if the product is misused, damaged, modified in any way, or for unauthorized repairs or parts. This warranty gives you specific legal rights, and you may also have other rights specific to your locality.

#### What You Should Know About Copyright

The following FAQ can help you understand copyright laws and how they apply to content used with the DL.3, DL.2 and Axon HD media servers.

By Suzy Vaughan Associates for High End Systems.

I want to use a film clip from "When Harry Met Sally" in a promotional piece advertising my services. What do I have to do to be able to do that?

First of all, you need to obtain permission to use the clip from its owners. The clip is considered intellectual property, just as though it were your car or some software code developed by and belonging to Microsoft. This is because the U.S. Copyright Act gave creators of literary works (which include books, films, television programs, art works, still photos and musical compositions and recordings) the right to sell or license these works and to make money from them for the period of the copyright.

# But what about public domain material? I heard that lots of material is in the public domain and can be used for free.

Once the copyright runs out, the creative work falls into the public domain and can be used freely by anyone without payment or licensing. If the work is not public domain, it is considered literary property. The Copyright Act provides substantial penalties for copyright infringement ranging from \$10,000 for accidental infringement to \$250,000 for willful infringement. However, contrary to popular belief, there really is not that much material in the public domain so this approach will limit you creatively.

What if I want to use a clip in a public performance? It's not being filmed or taped. Surely I don't need permission for that?

Public gatherings require clearance whenever copyrighted data is projected to audiences, or for any use other than just personal viewing. Concerts, trade shows, industrial shows, parties and raves are all examples of public performance and permission must be obtained.

Suppose I want to use a still photo or a magazine cover or a television clip? Do I have to obtain permission for them too?

Yes, they are also copyrighted works, whose owners must grant a license for their usage.

Do I need any other permissions to use this material?

In many cases you do. You may need to obtain permission to use the appearance of actors who appear in the clip as well as pay the writers and directors of the film that your clip comes from.

#### What about music? I hear you can use 8 bars for free.

8 bars for free is a fallacy that has been passed around as a fact for a long period of time. However, it isn't true. Both musical compositions and records require licensing and payment.

What about High End Systems material included with Axon and DL.2 media servers? Do I have to clear that?

No. High End Systems has worked to provide clearance for the content that is provided with Axon and DL.2 media servers. Any materials you received directly from HES with the purchase of a new media server have already been properly licensed for your use in shows and presentations. That does not, however, license you to sell this content separately from High End Systems media servers. Also, please be sure that any new content you obtain from outside sources is properly cleared for public presentation.

# This sounds really difficult and I don't know how to do it? What do I do to properly license copyrighted material?

You need to consult with a Content Clearing House or with a properly licensed Intellectual Property Attorney. Content clearinghouses are typically less expensive to work with and have well established industry relations that can result in cost savings. High End Systems uses and highly recommends Suzy Vaughan Associates. Suzy Vaughan Associates has 20 years of experience in clearing clips, talent, and music for use in any number of venues. Their clients include Barbara Streisand, Michael Jackson, and The Emmys among other shows. You can obtain more information about Suzy Vaughan Associates' services by calling 818-988-5599 or emailing info@suzyvaughan.com. Their website is www.suzyvaughan.com. Suzy Vaughan is also an attorney specializing in intellectual property issues.

#### How much does it typically cost to license copyrighted material?

The answer depends entirely on what material you want to use and how you plan to use it. Prices can range from hundreds of dollars for photography content to thousands of dollars for a highly desirable film/video clip. Since price is content-sensitive, the best thing to do is to contact a clearinghouse like Suzy Vaughan Associates and let them find out for you.

## **Table of Contents**

## Chapter 1: Axon HD and Axon HD Pro Media ServerUser Manual

Contacting High End Systems® ii
Patents ii
Declaration of Conformity iii
Product Modification Warning iv
FCC Information iv
Important Safety Information iv
Symbolsv
Packaged Media Notice:
Warranty Informationv
What You Should Know About Copyright vi

#### **Chapter 1: Product Overview**

This chapter describes features and specifications for the Axon HD, the Axon HD Pro Media Servers and the Content Management Application (CMA) software.

Features	. 1
System	. 1
Graphics Engine	. 2
Content Management Application	. 2
Related Products and Optional Accessories	. 3

## **Chapter 2: Setup and Configuration**

This chapter describes both Hardware and Software setup and configuring the Axon HD or Axon HD Pro server.

Hardware Setup	5
Unpacking the Axon HD Media Server	5
Replacing a Power Cord Cap	6
Installing a Line Cord Cap - U.K. Only	6
Vatic Fitter Heads Information - Danmark	6
Hardware Connections	7
Axon HD	7
Axon HD Pro	8
Mounting the Server	8
Linking Axon HD	9
Setting up a Standard DMX Link	9
Using an Ethernet Link	9
Linking Configurations	. 10
Powering On the Axon HD Server	. 11

Software Setup	12
The Axon Desktop	12
Launching the Content Management Application (CMA)	13
Verifying and Uploading Software	13
Configuring Axon Media Servers	14
Shutting Down the Server	16

#### Chapter 3: Axon HD Pro Live Video Input and Control

The Axon HD Pro media server can receive and control standard or high definition live video from an external source.

Live Video Sources	17
Serial Digital Interface (SDI)	
High Definition SDI	
Selecting HD-SDI Format	
Accessing Live Video Feed in the Graphics Engine	

### **Chapter 4: DMX Programming Basics and Quick Start**

If you are new to DMX programing, this chapter gives you a brief overview on programming Axon HD, Axon, DL.3, and DL.2 media servers and an example of using a Wholehog console to patch and display output from a media server.

DMX Programming Overview21	1
DMX512 Links	1
8-bit vs. 16-bit DMX Parameters21	1
Determining a DMX Start Channel21	1
Overview	1
Digital Lighting Products	2
Lighting Console Tips	3
Fixture Libraries	3
Patching Digital Light Fixtures and Axon Media Servers	3
DMX Output Display Formats	3
Wholehog Programming Notes	4
Play Speed24	4
Mask Strobe 24	4
Play Modes (Opacity) 24	4
CMY	4
Control Channel Functions 24	4
Quick Start with a Wholehog Console25	5

### **Chapter 5: Graphics Engine Overview**

*DL.3, DL.2, and Axon Media servers all use the same graphic engine software to control content selection, playback, and 3-D Object and Global manipulation.* 

Protocol Options	27
Image Optimizing Controls	
Graphics Control Hierarchy	
Graphics Engine Function Flow	
Graphics Engine Functions	
Object Graphic Functions	
Global Functions	
Making Graphics Effect Choices	30

### **Chapter 6: Graphic Functions: Defining Content**

Each Graphic Object's content is composed of a 3-D object overlaid with a media file. This chapter outlines how to select an image's object and media file components as well as define the video segment and its playback.

Content Overview	31
Selecting Content	31
Content Selection Parameters	32
Object	32
Media Folder	33
Media Folder Descriptions	
Media File	35
Defining a Media File Segment	35
In Frame and Out Frame Parameters	35
Segment Selection Examples	
Defining Playback	37
Playback Mode	37
Scrubbing	37
Playback Speed	38

#### Chapter 7: Graphic Functions: Rotation, Position, Scale

You can independently control each Graphic Object's rotation direction and speed; along with its position and scale in *X*, *Y*, and *Z* axis directions.

Rotating a 3-D Object	
Rotation Parameters	
X Rotation	
Y Rotation	
Z Rotation	
Scaling the Object	
X Scale	
Y Scale	
Z Scale	
Changing Object Position	
X Position	
Y Position	
Z Position	

### **Chapter 8: Graphic Functions: Opacity and Effects**

You can adjust opacity and apply a variety of color mixing and geometric effects to each individual Graphic Object.

Opacity	51
Effect Mode Parameters	52

#### **Chapter 9: Global Functions**

Global Graphic controls affect the composite image created by defining multiple separate object graphics. You can adjust intensity, define masks, select a point in space to view the composite image, and control keystone correction.

Global Intensity	59
Global Effect Mode Channels	60
Global Control	67
Shutdown and Reset Options	67
On-Screen Statistics	67
Spherical Control Statistics	67
Performance Statistics	67
Text Color	67
All-in-One Control Option	68

Masking Control	70
Mask Shape Select and Strobing	
Mask Shapes	
Strobing Mask Shapes	
Mask Size	
Mask Edge Fade	
Image Edge Fade	73
Keystone Correction Parameters	74
Keystone X Ratio	
Keystone Y Ratio	
Framing Parameters	76
Audio Control	77
Audio Out Connections	
Axon HD Pro	
Audio – Axon HD	
Outputting Audio	
Setting Audio on a Hog4 Console	

## Chapter 10: Global Functions: Collage Generator™

This chapter describes how to display content from multiple media servers in panoramic arrays and includes an example for creating a collage.

Collage Overview	79
Collage Parameters	80
Collage Туре	80
Collage Configuration Selection	82
Collage Cell Selection	82
Collage Blending Adjustment	83
Alignment Pattern Control	84
Variable Edge Blending	84
Collage Setup Example	85
Creating Custom Content for the Collage Generator Effect	
Collages Using Live S-Video and SDI Input	87

## **Chapter 11: Effect Mode Options Descriptions**

Effects can be applied to the Media File content (texture) mapped onto a 3-D object. Multiple Color and Geometric effects are available in Effect Mode parameters for both individual Graphic object and Global control.

Effect Mode Color Options	90
All or Nothing	90
Background Color	91
Background Color Cycle	91
СМҮ	92
CMY Add All Pixels	93
CMY Add Non-black Pixels	94
Color Cycle	95
Color DeConverge	95
Colorize Gray Scale	
Color to Alpha	97
Color to Alpha, Inverted	98
Color to B/W	99
DotP and Resample	99
Edge Detect Black and White	100
Edge Detect Black and White 2	101
Edge Detect Color	102
Edge Detect Color 2	103
Edge Fade Color	104
Exposure Control	105
Fire Gradient	105
Glow	106
Glow Color Cycle	107
Gray maker 1	108
Gray maker 2	109
HS Effect Mode Options	110
HS to Gray	110
HS Selected to Transparent	111
HS to Transparent	111
Intensity Key	112
Mask Color	113
Mask Color and Edge Fade Color	114
Negative Art	115
Posterizer	116
Push to Sepia	117
Push to Red	118
RGB Add, All Pixels	119
RGB Add2, All Pixels	120

Axon HD Media Server User Manual

	RGB Add to Non-black Pixels	120
	RGB Invert	121
	RGB Invert and Swap to BRG	122
	RGB Invert and Swap to GBR	123
	RGB Scale	124
	RGB Swap to BGR	124
	RGB Swap to BRG	125
	RGB Swap to GBR	126
	RGB Swap to GRB	127
	RGB Swap to RBG	128
	Scan Line	128
	Sharpen	129
	Solarize	130
	Solarize 1	130
	Solarize 2	131
	Solarize 3	131
	Solarize 4	131
	Solid Color RGB	132
	Transparent Color	132
	Transparent Color Coarse	132
	Transparent Color Fine	132
	Transparent Color Medium	132
	Transparent Color, Invert	133
	Transparent Color Invert, Coarse	133
	Transparent Color Invert, Medium	133
	Transparent Color Invert, Fine	133
	UV Effect Mode Options	134
	UV to Gray	134
	UV Selected to Transparent	135
	UV to Transparent	135
	Yxy Luminance Scaling	136
G	eometric Effect Options	137
	Cartoon Edge	137
	Chroma Shift	138
	Curved Surface Correction	139
	Digital MSpeed and Digital MSpeed 2	141
	Downward Vertical Streaks	142
	Drop Shadow	143
	Edge Frame Profiles	144
	Framing Shutter Emulation	144
	Faux LED	146
	Faux Tile	147
	Film Burn/Unburn	148

Axon HD Media Server User Manual

Film Noise149
Film Roll
Flip151
Fuzzifier
Gaussian Blur
Gaussian Halo154
Horizontal Mirror
Image Scale and Rotate156
Lens Grid
Magnifying Lens
Magnifying Lens 2
Mattes
Pan and Scan162
Particle System
Particle System 1
Particle System 2165
Particle System 3165
Picture in Picture
Prerotation Translation
Pixelate168
Pixel Twist
Prism170
Raindrop171
Scene Change172
ShakeNBake173
Sinewave, Circular174
Sinewave, Circular w/X Axis Wobbulation174
Sinewave, Circular w/Y Axis Wobbulation174
Sinewave, Circular w/Z Axis Wobbulation174
Sinewave, Horizontal
Sinewave, Horizontal w/X Axis Wobbulation174
Sinewave, Horizontal w/Y Axis Wobbulation174
Sinewave, Horizontal w/Z axis Wobbulation174
Sinewave, Vertical
Sinewave, Vertical w/X Axis Wobbulation175
Sinewave, Vertical w/Y Axis Wobbulation175
Sinewave, Vertical w/Z Axis Wobbulation175
Slats
Vertical Slats
Horizontal Slats176

Spherical Mapping 177
Spherical Mapping, Outside 177
Spherical Mapping, Inside 177
Modifier Parameter Adjustments 177
Texture Mixing 179
Texture Ripple, Asymmetrical Circular
Texture Ripple, Circular
Texture Ripple, Horizontal
Texture Ripple, Vertical
Texture Shift 182
Tiling On 183
Transparent Wipes
Zoom Blur

### **Chapter 12: Synchronizing Content**

After designating a master fixture, you can synchronize the content of other Axon, DL.3, or DL.2 fixtures to any Graphic Object on the master in terms of playback time, rotation or both.

Network Synchronization Overview	187
Network Synchronization Requirements	187
Network Synchronization Capabilities	188
Programming Synchronization	188
Sync To Parameter	188
Sync Mode Parameter	188
Effect Synchronization	189
Synchronizing a Server to Itself	189
Synchronizing a Master Server to another Server	189

#### Chapter 13: Content Management Application (CMA)

A Content Management Application (CMA) running on an Axon HD media server or a computer connected through an Ethernet network gives you remote control of content, software and configuration management functions.

Launching the CMA	192
Installing the CMA on Your Computer	192
Launching the CMA on Axon	192
Auto Discovery	193
Fixture Identification	193

The CMA Client Window	. 194
Viewing Server Identification Information	195
Content Organization	196
Preloaded Stock Content	196
Custom User Content	197
Stock Media Files	197
Object Files	198
Viewing Server Configuration Data	198
Viewing Content	198
Viewing Folders	198
Viewing Files	199
Managing User Media and Object Content	. 201
Naming and Deleting User Content Files and Folders	201
Assigning DMX Values to User Content	201
Assigning DMX Values Automatically	201
Editing User Content DMX Values	202
Valid DMX Values	202
Moving User Content Files and Folders	203
Downloading Content from a Media Server to Your Local Drive	204
Uploading Content from Your Local Drive to a Media Server	. 205
Content Scanning	205
Content Scanning	205 206
Content Scanning CMA Interaction Archiving User Content	205 206 <b>.208</b>
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline	205 206 <b>.208</b> 208
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive	205 206 <b>.208</b> 208 208
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive	205 206 <b>.208</b> 208 208 208
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive	205 206 . <b>208</b> 208 208 209 209
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content	205 206 208 208 208 209 209 209
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content	205 206 .208 208 208 208 209 209 209 209
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content	205 206 .208 208 208 209 209 209 209 210 .211
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary	205 206 208 208 209 209 209 209 210 211 211
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software	205 206 .208 208 208 209 209 .209 .210 .211 .211 .213
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software Verifying Software Versions	205 206 208 208 209 209 209 209 210 211 211 213
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software Verifying Software Versions Upgrading the CMA Software	205 206 .208 208 209 .209 .209 .210 .211 .211 .211 .213 213
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software Versions Upgrading the CMA Software Upgrading Server Software	205 206 .208 208 209 .209 .210 .211 .211 .211 .213 213 213
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software Verifying Software Versions Upgrading the CMA Software Upgrading Server Software Viewing Server Configuration	205 206 208 208 209 209 209 209 210 211 211 213 213 213 213 213
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software Verifying Software Versions Upgrading the CMA Software Upgrading Server Software Viewing Server Configuration Viewing Current Configuration of All Servers	205 206 .208 208 209 .209 .210 .211 .211 .213 213 213 213 215 215
Content Scanning CMA Interaction	205 206 .208 208 209 .209 .209 .210 .211 .211 .213 213 213 213 215 215 216
Content Scanning CMA Interaction Archiving User Content Using Local Archives to Prepare Content Offline Creating a Local Archive Creating Content Backup Archive Deploying a Content Archive Cloning User Content Deleting Content DMX Summary Upgrading Software Verifying Software Versions Upgrading the CMA Software. Upgrading Server Software Viewing Server Configuration Viewing Current Configuration of All Servers Configuring Columns. Re-Order Columns.	205 206 208 208 209 209 209 209 209 210 211 213 213 213 213 215 215 216 216

AxonHD Media Server Configuration Options	217
Server Tab	218
DMX Settings	218
Display Connectors Tab	219
Display Connectors	219
Info Tab	220
Server Info	220
Version Info	220
Hardware	220
Miscellaneous	221
ArtNet and I/O Tab	222
ArtNet Settings	222
Menu Display Tab	223
Menu	223
Performance	223
Configuration Example	

## Chapter 14: Axon HD CMA: Warp Editor

User Warps are applied globally to modify the Axon HD output display shape. This chapter describes the Warp Editor and includes a step by step example for creating a custom warp graphic object.

Overview
Functional Operation
Warp Editing Screen
Manipulating the Mesh Display
Editing Fields
Geometry Editing Fields 229
Rectangular Grid 229
Spline Rectangular Grid 229
Sphere
Horizontal Cylinder 231
Vertical Cylinder 232
Cone
Camera Options 234
Centre of Operations 234
Rotation
Scale
Resolution 236
File Name
Elasticity 237
Draw Wireframe/Vertex

Force Warp Output/Checkerboard	238
Edit Undo, History and Reset View	239
Default Values	239
Point Size	239
Getting Started	240
Creating a New Warp	
Deleting Geometry from Mesh	240

### Chapter 15: Maintenance and Troubleshooting

This chapter includes information on maintaining filters, and some basic troubleshooting procedures.

Maintaining the Filtering System	
Cleaning and Replacing Filters	
Replacing Battery	
General Troubleshooting	
LED Functionality	248
Restarting Axon	248
Protocol Viewer on Axon Desktop	

## Chapter 16: Restoring the System

You can perform a system restore on a DL.3, Axon, or DL.2 Server with your System Restore CD.

Hardware Requirements	
Performing the System Restore	

# Chapter I:

## **Product Overvieu**

This chapter describes features and specifications for the Axon HD, the Axon HD Pro Media Servers and the Content Management Application (CMA) software.

Axon HD is a rack mounted unit housing a Digital Media Server. The built-in 32-bit **Graphics Engine** software utilizes Windows 7 Embedded and DirectX application programming interface to provide extensive image control of up to three 3-D graphic objects. Two models of Axon HD are currently available.

Axon HD media servers use standard DMX512 protocol to control digital media allowing you to position, scale, rotate, apply visual effects and color mix graphic objects. You can define up to 10 of these objects and then apply global effects to the composite image.

Axon HD Pro media servers offer the same features as the Axon HD model pluse four outputs instead of one and Live Video support.

The **Content Management Application** (CMA) operates on Axon and allows you to upload, move and clone content files, configure fixtures, and upgrade software. You can monitor performance metrics and downlog log files when required for support. Using the CMA, you can also perform the same functions remotely on multiple media servers over an Ethernet network.

## Features

#### **System**

- · Software based on Windows 7 Embedded and DirectX technology
- Powerful Content Management and Configuration software can remotely manage multiple Axon HD, Axon, DL.3, and DL.2 media servers.
- · Supports importing of custom content including: 3D objects, media files, still images
- Provides DMX512 and Art-Net capability
- · Upgrades software remotely
- · Includes a royalty-free stock digital art collection including over 1000 lighting-optimized files
- Collage<sup>™</sup> software included with graphics engine
- Powered by a Intel i7 processor with an ATI Radeon HD7750 Graphics Processor
  - Note: Some earlier versions of Axon media servers may have a different hardware configuration. Find all hardware configurations listed by serial number at the Digital Lighting support pages of the High End System website (<u>www.highend.com/support</u>).

CHAPTER 1 Product Overview

#### Graphics Engine

- Simultaneous playback of 10 discrete media streams on separate 2D/3D objects
- 45 Object parameters give you graphic controls for each individual media stream including:
  - A choice of multiple play modes and play speeds
  - The ability to define any segment of a video loop including Scrub capability
  - Black Level and Contrast controls for each image
  - Three Graphic Effect Mode channels provide multiple color mixing and visual effects
  - Variable Opacity to allow for crossfading or dissolves between media streams
  - Full control of image Rotation, Positioning and Scaling on X, Y and Z axes
- 55 Global parameters provide graphic controls to the composite image created by up to nine media streams
  - Collage Generator<sup>™</sup> technology configures multiple media server outputs to display a single image in arrays up to 16 horizontal x 8 vertical.
  - Curved Surface Support corrects for shape distortions that occur when you project onto surfaces that aren't flat.
  - Intensity overlays the opacity control to provide system-wide intensity level
  - Overall image Color Mixing applied to composite media stream image
  - Four Global Effect Mode channels provide multiple effects that can be applied to the composite image
  - Multiple Mask selections with edge fading and strobe effects
  - Edge fading for creating montages
  - Keystone correction of output projection
  - Digital Framing Shutters
- Modes for synchronizing content playback on multiple media servers linked through an Ethernet network.

## **Content Management Application**

- Available for Windows operating systems
- Communicates with other Axon HD, DLHD, DL.3, DL.3F, DL.2, Axon media servers over an Ethernet network
- Uploads and downloads custom digital content to fixtures on a Ethernet link
- Configures Axon HD, DLHD, DL.3, DL.3F, DL.2 and Axon media servers
- Updates software including content, applications, and operating system to Axon HD, DLHD, DL.3, DL.3F, DL.2 and Axon media servers.
- Three "gas gauges" in the server's Hardware Tab let you view available CPU, GPU and HDD resources remaining. This gives you the information you need to manage additional layers within the capabilities of the hardware available in their system.
- Log File Download available in All Servers view in the CMA to provide troubleshooting information to customer service if a problem occurs. Logs are saved with a .dlf (digital log file) extension.

## **Related Products and Optional Accessories**

The following table lists related products and accessories available for the Axon HD Media Server. For more information, contact your High End Systems dealer/distributor (see *Contacting High End Systems*® on page ii).

Part Description	Part Number
Wholehog 3 lighting console	61020001
Road Hog Full Boar lighting console	A6020001
Male 5-pin DMX terminator	90404039
Heavy duty 5-pin XLR cable (10')	55050017
Heavy duty 5-pin XLR cable (25')	55050018
Heavy duty 5-pin XLR cable (50')	55050019
Heavy duty 5-pin XLR cable (100')	55050020

CHAPTER 1 Product Overview

# Chapter 2:

# Setup and Configuration

This chapter describes both Hardware and Software setup and configuring the Axon HD or Axon HD Pro server.

## Hardware Setup



This server must be installed and operated by qualified personnel. The information listed in this chapter is intended to assist qualified personnel *only*.

The following steps make up the hardware setup for Axon HD servers: .

1. Unpack the Axon HD Media Server.

WARNING:

- 2. Install a power cord cap if necessary for your location.
- 3. Connect a monitor to the Mother Board DVI port and to power for accessing the Content Management Application (CMA).
- 4. Connect a monitor or other output device to the graphics cardDVI port and to power.
- 5. If you want to use the CMA from a remote computer or synchronize this server with other High End Systems Digital Lighting products, connect to Ethernet link.
- 6. Connect Axon HD media server to a DMX controller via DMX cabling or an Art-Net box on an Ethernet network.
- 7. Connect the Axon HD media server to power.

## Unpacking the Axon HD Media Server

Your Axon HD media server ships with the following:

- · Rack mountable Axon HD unit
- USB Mouse
- USB Keyboard
- Power Cord
- DMX Interface cable.
- · Documentation CD that contains
- CMA application
- Server software
- Recovery software image

Note: High End Systems® assumes no responsibility for products that are damaged during transport. Return a product for repair in its original packaging.

CHAPTER 2 Setup and Configuration

> Before sending anything to the factory, call your High End Systems dealer/ distributor for a Return Material Authorization (RMA) number. The factory cannot accept any goods shipped without an RMA number.

## **Replacing a Power Cord Cap**

Axon HD ships with an IEC power cord. Different locations (even within the same country) may require a different power cord cap to connect the server to a power outlet. Because of the variety of power cord caps used worldwide, High End Systems, Inc. cannot make specific recommendations for the power cord cap. Contact a local authority for the type of power cord cap needed. When installing the power cord cap, note that the cores in the mains lead are colored according to the following code:

- green and yellow = earth
- blue = neutral
- brown = live

#### Installing a Line Cord Cap - U.K. Only

In the United Kingdom, core colours in the mains lead of this equipment may not correspond with the coloured markings identifying the terminals in the fixture's plug. In that case, install a line cord cap according to the following code:

- Connect the blue core to the terminal marked with the letter "N" or coloured black.
- Connect the brown core to the terminal marked with the letter "L" or coloured red.

### WARNING: Class 1 equipment - This equipment must be earthed.

#### Vatic Fitter Heads Information - Danmark

Advarsel: Beskyttelse mod elektrisk chock.

Vigtigt!

Lederne med gul/groen isolation maa kun tilsluttes en klemme maerket



## **Hardware Connections**

#### Axon HD

The Axon HD back panel provides ports for:

- **DMX Adaptor** for 5-pin DMX Data In and Data Out (see *Setting up a Standard DMX Link* on page 9 for more information)
- Ethernet/Artnet to connect to other Axon HD, Axon, DL.3 and DL.2 units and your computer for accessing the CMA application (see *Using an Ethernet Link* on page 9).
- Eight USB ports for connecting peripheral hard drives, flash drives, keyboard or mouse.
- DVI port to a display monitor for viewing CMA.
- VGA port to an display monitor option for viewing CMA.
- **DVI** on graphics card for displaying server output on another monitor, a Digital light, or a projector.
- Audio Out port



Note: To initialize the motherboard graphic card output, one of the Display Output ports and one of the Server Output ports must have devices connected when starting the media server. When only one port is connected, it defaults to display the graphics engine output and will not display the CMA screen.

#### Axon HD Pro

The Axon HD back panel provides ports for:

- **DMX Adaptor** for 5-pin DMX Data In and Data Out (see *Setting up a Standard DMX Link* on page 9 for more information)
- Ethernet/Artnet to connect to other Axon HD, Axon, DL.3 and DL.2 units and your computer for accessing the CMA application (see *Using an Ethernet Link* on page 9).
- Nine **USB** ports for connecting peripheral hard drives, flash drives, keyboard or mouse.
- · Audio Out port
- Four **GFX** ports for displaying server output.
- **DVI -D** port to a display monitor for viewing CMA.
- VGA port to an display monitor option for viewing CMA.
- Two sets of SDI input and outputs plus a reference input on the Video Capture Card.



Note: To initialize the motherboard graphic card output, one of the Display Output ports and one of the Server Output ports must have devices connected when starting the media server. When only one port is connected, it defaults to display the graphics engine output and will not display the CMA screen.

## Mounting the Server

The Axon HD media server mounts in any standard 2U rack.

## Linking Axon HD

#### Setting up a Standard DMX Link

You can link the Axon HD server to fixtures on a standard DMX512 link using XLR cabling. The number of fixtures on a link is determined by the combined number of channels required by all the devices. The DMX channel range is determined by the protocol mode you choose.

Use data-grade cable and 5-pin XLR cable connectors. Data-grade cable is designed to carry a high-quality signal with less susceptibility to electromagnetic interference and less degradation over long distances. For cable and connector specification, see *Cable and Connector Specifications* on page 314.

Test each cable with a voltage/ohm meter (VOM) to verify correct polarity and to make sure that the negative and positive pins are not grounded or shorted to the shield or to each other.



CAUTION!

Do not connect anything to the ground lug on the XLR connectors. Do not connect or allow contact between the common (cable shield) and the server's chassis ground. Grounding the common could cause a ground loop and/or erratic behavior.

To establish a DMX link:

- 1. Connect the male XLR connector of a DMX Data cable to the controller's DMX Data Out connector.
- 2. Connect the Data cable's female XLR connector to the Data In connector of the first (or next) device on the DMX link.
- 3. Continue linking the remaining devices connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.
- 4. Connect a terminator to the Data Out connector of the last fixture in the link.

#### Using an Ethernet Link

Connecting multiple media servers to a common Ethernet network allows you to use the CMA to remotely manage content uploads and configuration for all the linked servers. An Ethernet link is also required if you want to synchronize playback between media servers. If you are using a DMX console and other automated lighting products compatible with Art-Net, an Ethernet network can also serve as the link for DMX control.

CHAPTER 2 Setup and Configuration

#### **Linking Configurations**

The following diagrams show configuration options for linking Axon HD, Axon, DL.3 and DL.2 media servers to each other via Ethernet. The laptop shown is optional since the CMA can be accessed directly on any Axon HD server on the link.



Axon HD Media Server User Manual

## Powering On the Axon HD Server



WARNING: This equipment is designed for connection to a branch circuit having a maximum overload protection of 20 A.



CAUTION: Do not power on the server until *verifying* that the line cord cap is suitable for the power source in your location. For more information, see *Replacing a Power Cord Cap* on page 6.

To power on Axon HD, connect it to an appropriately-rated power source. If the media server doesn't start, check that the manual power switch behind the right door on the front panel is ON.

Note: To initialize the motherboard graphic card output, one of the Display Output ports and one of the Server Output ports must have devices connected when starting the media server. When only one port is connected, it defaults to display the graphics engine output and will not display the CMA screen. CHAPTER 2 Setup and Configuration

## Software Setup

Software setup for Axon requires the following steps described in this section:

- 1. After powering on the Axon media server, launch the CMA software
- 2. Check the software version installed and upgrade if necessary.
- 3. Configure the Axon server DMX source, DMX protocol, and DMX Start Channel.

## The Axon Desktop

Upon starting, the CMA monitor will display the Axon Desktop. Buttons on the desktop let you:

- Launch CMA software
- Launch DMX View that displays the current DMX control setting for all the channels on this media server
- Reboot the system
- Launch the online Manual



NOTE: If you do not see the CMA screen upon powering up the Axon media server, check that the monitor is connected to the Display Output DVI port and that another output device is connected to the Server Output DVI port. If only one port is connected, it defaults to media server output and the CMA screen will not be displayed.

# Launching the Content Management Application (CMA)

After starting up the Axon unit, press the **Launch CMA** button on the local desktop. The application automatically finds and identifies the **Local Drives** including any connected USB drives, as well as other Axon and DL.2 media servers connected to the same Ethernet network. For more information on CMA operation and using the CMA, see *Chapter 16: Content Management Application (CMA)* on page 249.



## Verifying and Uploading Software

The latest Axon software and CMA software are always available at the High End Systems website, (<u>www.highend.com/support</u>). You can view the software version currently installed on your Axon unit in the CMA's **All Servers** view.

High End Systems Content M e Servers Help	anagement Appl	ication			
🥪 HIGH END SYSTE	MS				
🥪 All Servers (8 servers)	Server ID	Server Name	IP Address	Software Version +	Model
🖻 🧧 DL.3 One (1)	2	DL.3 Two	169.254.11.144	2.0.0.2385	DL3
🕀 🧰 User Media	11	Axon one	169.254.150.81	2.0.0.2385	Axon
User Objects	14	Axon Four	169.254.122.38	2.0.0.2385	Axon
⊕ ↓ Stock Media ↓ Stock Objects	12	Axon Two	169.254.179.247	2.0.0.2385	Axon
	1 1	DL.3 One	169.254.153.131	2.0.0.2385	DL3
. □ DL.3 IWO (2)	5	DL.3 Five	169.254.60.53	2.0.0.2385	DL3
E. DL.3 Five (5)	3	DL.3 Three	169.254.112.58	2.0.0.2385	DL3

If you need to upgrade the software, first download the file from the website to your computer. Then use the CMA to upload it to Axon, (see *Upgrading Software* on page 274).

CHAPTER 2 Setup and Configuration

### **Configuring Axon Media Servers**

Before programming the Axon media server from a DMX512 console, you need to:

- Identify the DMX Source for the fixture
- Select the Protocol type to determine the DMX channel range this fixture will utilize
- If you will be synchronizing output between fixtures, verify that each server has a unique Fixture Number to identify it on the Ethernet link.
- Assign a valid Start Channel (the first channel in the unique range of DMX channels designated by the console for this Axon)

To view configuration information for an individual server, click on **All Servers** in the left pane of the CMA window and select the + to view all the servers on the fixture network. Select a server in the left pane to view its configuration information in the right pane.

File Configuration Help		
HIGH END SYSTEMS		
All Servers (6 servers) B DRK-CUBE (1) B DRK-CUBE (1) B Data AxonHDPro (1) B Data AxonHDPro (1) B Data Wards D User Warps B D Stock Media Stock Media Stock Objects B M AxonHDPro TG (70) B All Configuration	Server Display Connectors Art-Net & I/O Info Menu Display DMX Settings Output 1 Start Channel 1 Identify Source DMX512 Protocol hd Layers 10 Fixture ID 3 Warp Edit Off Number 1 	Apply Cancel Client IP: 10.10.0.24

Identify 🗌

Number 1

Layers 10 -

Server | Display Connectors | Art-Net & I/O | Info | Menu Display

-

•

#### Select a Source

1.Select a **DMX Source** type by clicking on the down arrow of the Source field to select DMX512 or Art-Net.

#### Set the Channel range

- 2.Select a DMX Protocol type by choosing hd, V1 or V2 from the drop down list in the option field and select the number of Graphic Objects you want to use in your application:
  - hd —Sets the channel range and features for Axon High Definition protocol
  - V2—Version 2 provides 27 additional channels.
  - •V1—Version 1 protocol retains the original DMX protocol footprint and is compatible with legacy shows.

DMX Settings

Output 1

Start Channel 1

Source DMX512

Protocol hd

Fixture ID hd

Warp Edit v1

3.Select the number of Graphic Object Layers required for your application in the drop down field next to the protocol.

# of Graphic	HD		Version 2		Version 1	
Object Layers	Fixture Range	Last Valid Start Channel	Fixture Range	Last Valid Start Channel	Fixture Range	Last Valid Start Channel
0	57	456	55	458	35	478
1	102	411	100	413	73	440
2	147	368	145	368	111	402
3	192	323	190	323	149	364
4	237	278	235	278	187	326
5	282	233	280	233	225	288
6	327	188	325	188	263	250
7	372	143	370	143	301	212
8	417	98	415	98	339	174
9	462	52	460	52	377	136
10	507	6				

4.Enter a valid Start Channel in the Start Channel field.

# NOTE: DL.2 fixtures and original Axon servers can control up to four Graphic objects.

For more information, see *Determining a DMX Start Channel* on page 21 and *Protocol Options* on page 27

## Shutting Down the Server

- 1. A DMX controller can shut down the server remotely with the shutdown option of the Global Control channel (see *Shutdown and Reset Options* on page 120).
- 2. Manually turn the unit off with the power switch located behind the right door on the front panel. If you choose to shut down with the power switch, you will need to manually turn it back on the next time you boot up the server.
# Chapter 3:

# Axon HD Pro Live Video Input and Control

The Axon HD Pro media server can receive and control standard or high definition live video from an external source.

## Live Video Sources

The Axon graphics engine can enhance and manipulate live video from a source connected via the SDI-HD input card. After making the appropriate hardware connection, you can verify that a video input source was detected by checking the Axon graphics engine using the Content Management Application.

You can configure your Axon HD Pro media server to support multiple SDI inputs.



### Serial Digital Interface (SDI)

The Axon media server can accept SDI In, manipulate it, and then output it via the video card.

Note: While capturing SDI, anything that is being fed to the SDI In port will be mirrored on the SDI Out port. Therefore, it is possible to daisy chain servers together via SDI, allowing multiple servers to have the same SDI feed without a switcher/ splitter device.

### **High Definition SDI**

High Definition SDI capture is available for the Axon Media Server using only HD-SDI cards supplied by High End Systems.

#### Selecting HD-SDI Format

After installing the card, verify the format through the CMA, either locally on the Axon or remotely from another CMA computer.

The Axon HD Pro supports live video capture via the BNC connectors on the rear of the server. The connectors support multiple formats and frame rates. The technical details of the various formats supported have been embedded in the HD/SD-SDI stream, and there is no need for user configuration at this time. The Axon HD Pro application will decode this information and pass it to the CMA for feedback in the Art-Net & I/O tab.

igh end systems	
All Servers (4 servers) 2 92902AAA (0) 3 9904178 (0) 4 W AxonHDTG (75) 4 W AxonHDProTG (100) 5 W Ser Media 4 User Warps 5 User Warps 5 Stock Media 5 Stock Objects 4 NI Configuration	Server Display Connectors Art-Net & I/O Info Menu Display Capture Settings Signal Format 1080 30PsF SDI 1 Format 1080 30PsF SDI 2 Format 1080 30PsF 2

Standard Formats
NTSC
PAL
HD-Formats
1080 29.97 PsF
1080 25 PsF
1080 24 PsF
1080 23.97 PsF
720 59.94p
720 60p
720 50p

# Accessing Live Video Feed in the Graphics Engine

Setting the **Media Folder** parameter on one of the Graphic Object layers to a DMX value of 255 will allow you to access input from video capture cards installed on your Axon unit.

There are 5 connectors on the input card, these connectors relate to the input and output of the 2 capture channels as well as a reference signal. Capture Stream 1, is available for use in folder 255, file 1. Capture Stream 2 is available for use in folder 255, file 2. These file and folders can be used multiple times, on multiple layers, they are only referencing a live source.

The connector diagram below shows the position of Connectors for input 1, and input 2.



Note: At times there can be a mismatch in the information set on the camera and the information decoded for informational purposes. If the image being captured is visible, but the information does not match, this is a known issue across the video industry. The root cause is historical.

# Chapter 4: DMX Programming Basics and Quick Start

If you are new to DMX programing, this chapter gives you a brief overview on programming DLHD, DL.3, Axon HD, and Axon media servers and an example of using a Wholehog console to patch and display output from a media server.

## **DMX Programming Overvieu**

### DMX5I2 Links

A lighting console typically utilizes a protocol called DMX512 to communicate with automated lighting fixtures and conventional dimmers. This protocol consists of 512 unique channels of control per output link (universe). Typically a lighting fixture or device will use a channel for each parameter's function. Each channel consists of 256 values ranging from 0 to 255. The lighting console is programmed to transmit a corresponding DMX value for the desired function of each parameter. All DMX values are stored within the lighting console, and typically are referred to as cues, scenes, or presets. A lighting console locates a device on the link by its DMX Start Channel.

#### 8-bit vs. I6-bit DMX Parameters

Most parameters of an automated light use one channel of DMX providing 256 values of control (0-255). This is known as 8-bit DMX. Although most parameters use 8-bit DMX, several require a more accurate range of values than can be provided with a single DMX channel.

By utilizing two DMX channels for a single parameter, 65535 values become available for controlling and adjusting parameter functions. This is known as 16-bit DMX. You can adjust 16-bit DMX values in both coarse and fine increments. The first channel of the pair provides coarse control changes of the DMX value in increments of 256. The second channel provides fine control and changes of the DMX value in increments of 1.

Individual access of the two DMX channels used with 16-bit parameters varies by lighting console. Most modern DMX consoles bind these two channels into a single 16-bit parameter to accurately perform 16-bit crossfades. Consult your lighting console manual for further information.

## **Determining a DMX Start Channel**

#### Ονεινίεω

The DMX Start Channel is the first channel of a device's channel footprint on a DMX link. There are 512 available channels on each DMX universe divided among all the devices in a particular universe. A device must have a unique DMX channel range in order to respond independently to controller commands. The DMX Start Channel is the first channel in that fixtures channel range.

To determine each device's DMX Start Channel, identify the footprint of every device on the universe. The device's footprint is the number of consecutive DMX channels it requires and is determined by the channels in the fixture's protocol. The fixture's DMX channel footprint must not overlap any other device's channel footprint on the link. When two devices on the same DMX universe have overlapping channel footprints, one or both devices will be disabled or behave erratically.

Once you have determined the footprint of your device, a simple formula for finding the last valid Start Channel on a standard DMX512 link is:

#### 512 – the unit's channel footprint + 1

#### **Digital Lighting Products**

The channel range for your Digital lighting product will depend on the model, the Protocol mode and the number of Graphic objects you select. DL.3 and Axon media servers running Version 2.0 fixture software all provide individual and composite graphical control for up to nine Graphic Objects. DL.2 fixtures can control up to four Graphic objects. You can influence the footprint of the fixture on a DMX link with the protocol you select and the number of graphic objects you implement.

	Footprint on a Standard DMX512 Link				
# of Graphic ObjectI avers	High Definition		Version 2		
00,00124,010	Axon HD	DLHD	DL.3	Axon	DL.2
0	57	66	76	55	76
1	102	111	121	100	121
2	147	156	166	145	166
3	192	201	211	190	211
4	237	246	256	235	256
5	282	291	301	280	
6	327	336	346	325	
7	372	381	391	370	
8	417	426	436	415	
9	462	471	481	460	
10	507				-

Select the protocol level in the fixture's onboard menu system for DLHD, DL.3 and DL.2 fixtures or through the CMA for Axon HD, Axon and any Digital Light server (see *Viewing Server Configuration* on page 276). For a table of channels for Axon HD media server protocol, download the Protocol document from the High End Systems website at <a href="http://www.highend.com/support/digital\_lighting/axon.asp">http://www.highend.com/support/digital\_lighting/axon.asp</a>.

# Lighting Console Tips

Lighting consoles differ in many aspects and it is important to understand how your console operates with Axon HD, Axon, DL.3, and DL.2 media servers.

## **Fixture Libraries**

Many sophisticated lighting consoles utilize pre-made fixture libraries. A fixture library consists of profiles for various types of lighting fixtures and devices. Each profile corresponds to the fixture's DMX protocol and allows for ease of programming. Depending upon the manufacturer of your lighting console, some parameters might have different labels for parameter names and functions than are listed within this manual. Consult your lighting console manual for further information.

NOTE: Downloading the Wholehog Wheelset preferences for DL.2 and DL.3 fixtures will provide a more intuitive order to encoder layout on the console. (see <u>http://www.flyingpig.com/support/hog3/downloads/library/index.shtml</u>)

## Patching Digital Light Fixtures and Axon Media Servers

Digital Lighting servers are patched as multiple "fixture types" in the Wholehog library systems. This allows for ease of programming as well as the ability to adjust quickly for any of the various DMX protocol options. The Motion fixture type controls the actual moving yoke, projector, and integrated camera in DL.2 and DL.3 fixtures. The Global fixture type controls the global graphic engine functions such as intensity, keystone correction, viewpoint, etc. The Graphic fixture type controls each graphic object functions such as opacity, object, media.

An Axon media server has no motion control but utilizes the same Global and Graphic fixture types. In the *Fixture Schedule* or *Add Fixtures* window of Wholehog software, you would add 1 motion, 1 global, and 9 graphic "fixtures" for each complete DL.3 (4 graphic "fixtures" for each DL.2), or 1 global, and 9 graphic "fixtures" for each complete Axon (4 graphic "fixtures" for an original Axon).

The best way to organize your patching is to assign user numbers for these items. Patch the motion first, the global second, and the graphic fixture types last. For example, set up user numbers that correspond to the DL.3 fixture number 1, where user number 1 = motion, user number 2 = global, and user number 3-11 = graphic fixture types.

## **DMX Output Display Formats**

Although all lighting consoles output the same 512 DMX channels per universe, the on-screen labeling often differs. Parameter functions are displayed in either alpha-numeric descriptions (strobe 1), percentage (0-100%) or decimal (0-255 for 8-bit and 0-65535 for 16-bit). Consult your lighting console manual for further information.

# Wholehog Programming Notes

## Play Speed

You can adjust the Play Speed using the encoder wheel on the Beam parameter of the Graphic fixture type. Additionally you can press **Enable** and select **Media Speed Default On** to revert to the default speed setting with a DMX value = 128 (50%). Then if you touch the encoder again the previous play speed will be recalled.

### Mask Strobe

A unique function of the Wholehog library system allows the creation of a special encoder type. Flying Pig Systems has created a parameter called "mask strobe" in the Global fixture type. When this is adjusted, it will automatically change the DMX value of the mask select channel to the appropriate value and adjust the DMX channel for the strobe speed. This will override the Mask Edge parameter defined in the DL.3 or DL.2 DMX Protocol.

## Play Modes (Opacity)

Using the Graphic fixture type, press the Mode button to view the play mode options. By default all modes trigger normally. You can select "Media Trigger Opacity" to change to the Play Modes that trigger when Opacity is greater than zero. To restore to normal triggering, select "Media Trigger Normal".

### CMY

The Global and Graphic fixture types both contain CMY controls for the Effect Mode modifier channels. The default for Effect Mode 1 is set to CMY1 as well. For some effect options, the CMY parameters will not adjust color, but will adjust the effect per the DL.3 or DL.2 DMX protocol. You can find a description of CMY controls functionality for each effect option in *Chapter 11: Effect Mode Options Descriptions* on page 87.

## **Control Channel Functions**

Many of the control channel functions in the motion "fixture" only operate if the dimmer changes from >0 to 0 at the same time or just after a change is made to the control channel. For more detailed description, see *Control Channel Functions* on page 24.

# Quick Start with a Wholehog Console

Hog4 consoles allow easy control of the many attributes associated with Axon and Digital Light media servers. The Wholehog library groups these attributes as multiple "fixture types" for each unit:

- Motion fixture type (available on Digital Light fixtures only) controls movement and camera attributes
- Global fixture type controls attributes of the composit image
- Graphic fixture type controls attributes of an individual graphic objects

After setting up and configuring your media server as outlined in Chapter 2, use the following steps to get to the point of displaying output.

Add one of each type in the Fixture Schedule, shown in the Fixture Window. After adding each type, assign it to a DMX universe. The simplest setup would assign fixture types with no empty channels between fixtures.

Each "fixture type" of an Axon or a Digital Light media server has an intensity setting.

- Motion Intensity to opens the physical shutter (Available on Digital Light Fixtures only)
- Global Intensity sets the intensity of the composite image.
- Graphic Intensity sets Layer Opacity.

To view the projected output, set the intensity value of each type to 100%

If you are having trouble viewing output, double check that all default setting are being sent to the fixture. If you are using a different control board, please ensure that all DMX channels patched for the fixture match the default values.

# Chapter 5:

# **Graphics Engine Overview**

DLHD, DL.3 and AxonHD Media servers use virtually the same graphic engine software to control content selection and playback, as well as 3-D Object and Global manipulation.

## **Protocol Options**

The Axon HD, Axon HD Pro media servers as well as the DLHD Digital light use the latest HD Protocol for control. This protocol version allows for control of up to 10 graphic layers per output on the Axon HD and HD Pro Servers and up to 9 graphic layers on the DLHD. Limited backwards compatibility is provided for the V2 protocol on the Axon HD, HD Pro server and DLHD fixture.

You can adjust the footprint by patching only the number of graphic layers you need for a minimum of 1 Global Layer and 1 Graphic Layer for the Axon Servers. The minimum footprint for the DLHD is 1 Motion Layer, 1 Global Layer and 1 Graphic Layer.

You select the protocol level in the fixture's onboard menu system for DLHD and DL.3 fixtures from the onboard menu systems or through the CMA for both fixtures and Axon media servers (see *Viewing Server Configuration* on page 276).

# Image Optimizing Controls

Using Live Effects in additional to the Black Level and Contrast Controls, you can adjust the image for each cue. It is not necessary to precisely optimize images before preparing for a show.

# **Graphics Control Hierarchy**

There is a hierarchy to the DMX control parameters. In general, object control parameters render individual graphic images. Global control parameters act upon the composite image created by combining multiple objects. Motion parameters control the fixture movement and projection.

It is especially important to keep this in mind when applying graphical effects. At the lowest level, Graphic effects are applied to an individual 3-D Graphic Object. Any Global effects applied affect each object in the combined Object image. Finally, motion effects control the projection of the composite image.

### **Graphics Engine Function Flow**



# **Graphics Engine Functions**

### **Object Graphic Functions**

For an individual object, you can control:

- The media file and 3-D object selection for the layer
- Media playback including
- What portion of the movie plays
- Playback speed
- Playback mode (direction and style of playback)
- The object transparency (opacity)
- Visual Effects including colormixing and geometric effects
- Synchronization
- Image Rotation, Scale and Position

### **Global Functions**

Global controls are applied to composite image created by multiple 3-D images. For the combined image, you can:

- · Adjust the composite image intensity level
- · Apply visual effects including colormixing and geometric effects
- · Select a mask shape, size it and apply edge fades and color to the mask
- Apply and color mix an image edge fade
- Control keystone correction
- Control framing shutters
- Establish the point in 3-D space from which image will be viewed

# Making Graphics Effect Choices

Because you have control of many parameters, there are sometimes several ways to accomplish the same look.

Which solution you choose depends, to a large extent, on the transition to other effects you want to achieve.

CHAPTER 5 Graphics Engine Overview

# Chapter 6:

# **Graphic Functions: Defining Content**

Each Graphic Object's content is composed of a 3-D object overlaid with a media file. This chapter outlines how to select an image's object and media file components as well as define the video segment and its playback.

# Content Overview

In addition to a royalty-free stock digital art collection featuring more than 1,500 lightingoptimized files available as stock content, you can develop your own custom media files and 3D object files for playback on DL.3, DL.2 or Axon media servers. For a quick overview on developing your own custom User content, see *Appendix B: Custom User Content* on page 283. The Digital Lighting Product and Support pages at <u>highend.com/digital\_lighting</u> offer additional assistance and the latest software and techniques for creating and encoding custom content.

Every DL.3, DL.2 and Axon media server has a file system that holds the movies, images, and 3-D objects that make up the content that the server uses. These files, folders, and their associated DMX values are collectively known as the "Content" on the media server.



The Content Management Application (CMA) organizes and identifies content by source (preloaded Stock content or

custom User content) and type (Media files or 3-D Object files). For more information on using the CMA to view and manage content, (see *Chapter 16: Content Management Application (CMA)* on page 249).

# Selecting Content

Three Parameters control content selection. To define an image you have to set DMX values greater than 0 for the 3-D Object, Media Folder, and Media File parameters. The selected media file will be mapped onto the selected 3-D object.

To output an image from a media server:

- 1. Open the mechanical iris on the projector by setting its Dimmer parameter to full (100%).
- 2. Set the Global Intensity parameter to full (100%).
- 3. Set the Object opacity to full (100%)
- 4. Adjust the Object, Media Folder, and Media File parameters to greater than zero

When programming with Wholehog software, the Media Folder and Object parameters default to 1 so choosing any Media File DMX value from 1-35 will display a media loop from the HES Core folder (Media Folder 1) wrapped on a Flat Plane (Object 1).

NOTE: The Dimmer, Opacity and Global Intensity Parameters all have to be greater than zero before the image you create becomes visible.

# **Content Selection Parameters**

The following sections outline parameters you will use to create an image from content and define its playback. You will set the parameters described in this chapter for *each* individual Graphic Object you define.

NOTE: The suggested default DMX values given for each parameter are recommended to build libraries that provide the easiest and most reliable content selection, rendering and output. They are the default values built into the Wholehog libraries for High End Systems consoles.

### **Object**

The **Object** parameter selects the 3-dimensional object component of an image. Object files are the 3-D object shapes used to build a total image. The graphics engine supports a combined total of 255 stock and user-created object files.

Stock Objects have a fixed DMX value and cannot be edited. DMX values 1-149 are reserved for identifying stock object files. User-created object files must be assigned a unique DMX value from 150-255.

For a reference of 3-D object files available as stock content with your media server and information on how to create your own object files, go to the link for the Stock Object Guide for the DL.3, DL.2 and Axon products on <u>http://www.highend.com/support/digital\_lighting/</u>.

**Default DMX Value:** 1 = full screen flat surface

TIP: You can select the same object file for images that will be interacting with each other. If both objects occupy exactly the same area in 3-D space,

"Z-fighting" (a shimmering effect) on some portions of the composite image can occur as the graphics engine tries to determine which object should be in the foreground.

You can avoid this effect by making a slight adjustment to one of the object's scale or moving it forward or back (using the Z Position parameter) in respect to the other.

#### Media Folder

This parameter defines a folder (directory) containing a collection of media files. The media files within the assigned folder can then be selected using the **Media File** parameter. DMX values for folders are assigned as follows:

- DMX values = 1-39 are used or reserved for Stock Content
- DMX values = 40-240 are reserved for User Content
- DMX value = 255 is reserved for live video input

Default DMX Value = 1 (HES Core Media files)

The following table describes the Stock Content folders available on DL.3, DL.2 and Axon servers.

NOTE: Media folders with DMX Values of 27-35 are only available as stock content on DL.3 fixtures and Axon Version 2 servers.

CHAPTER 6 Graphic Functions: Defining Content

#### Media Folder Descriptions.

DMX Value	Media Folder Name	Content Description
1	HES Core	Premier High End Systems video loop collection
2	HES_Digital_Aerials_1	Digital still images and animations, designed for aerial effects
3	HES_Oils	Digitally simulated psychedelic oil projection loops
4	HES_Atmospheric	Video loops of natural settings clouds, water, fire
5	On_The_Wall_Studios	Digital video loops, promotional
6	Sean_Bridwell	Digital video loops, promotional
7	A_Luna_Blue	Digital video loops, promotional
8	Feedback_Video	Digital video loops, promotional
9	HES_Texture	Video loop textures
10	HES_Foliage	Collection of abstract and realistic foliage and floral video loops
11	HES_Religious	Religious themed video loops
12	HES_Gothic	Set of themed video loops
13	HES_Digital_Aerials _2	Digital still images and animations, designed for aerial effects
14	HES_Theme_Stills	Nature stills (foliage and flowers)
15	Apollo Glass	Digital Gobo Patterns, promotional
16	Artbeats	Digital video loops, promotional
17	DHA_TopMac	Digital patterns, promotional
18	Beacon DigiGobos	Digital video loops, promotional
19	Amorphous Digi-gobos	Digital animations, promotional
20	InLight	Digital video loops, promotional
21	HES_Lithopatterns_1	High End Systems Lithopattern® images
22	HES_Lithopatterns_2	More images from High End Systems Lithopattern library
23	HES_Logos	High End Systems® Axon and DL.2™ logos
24	HES_Hi_Res	Variety of high resolution video backgrounds
25	NASA_Images	Space images from the Hubble telescope
26	Blue_Pony	Assorted video loops
27	HES_Core_02	Mixed footage
28	V-Squared-Labs	Club themed footage
29	Virtual-Life-Media	Club themed footage and few stills
30	Daddy-Van-Productions	Digital backgrounds
31	Wet-Digital	Underwater footage
32	Idyll-Hands-Imagery	Aerial footage
33	David-Alley-Photography	Nature themed high resolution images
34	JTM-Photography	Nature stills
35-38	Reserved	Reserved for HES use
39	HES_Setup_and_Test	Images to use for setup and diagnostics
40-240	Open	Available for User Content
255	Video Input	Live video input from internal camera or external device

Axon HD Media Server User Manual

#### **Media File**

The **Media File** parameter lets you identify which Stock or User media file to apply (map) as a texture on the selected 3-D object. You can supplement the large library of Stock video loops and still images with Custom files. This parameter selects media files from within the folder defined by the **Media Folder** parameter.

For a reference of media files available as stock content with your media server, go to the link for the Stock Content Guide for DL.3, DL.2 and Axon products on <a href="http://www.highend.com/support/digital\_lighting/">http://www.highend.com/support/digital\_lighting/</a>.

Default DMX Value: 0 = No file selected

Tip: You can preview a visual display of the media files loaded on a media server in the Content Management Application's thumbnails view, (see Viewing Content on page 257) or in the File Tab of a DL.3 or DL.2 fixture menu display.

## Defining a Media File Segment

You can define any portion of a video media file to play using the **In Frame** and **Out Frame** parameters. By default, the In Frame is the beginning of the media file and the Out Frame is the end of the file. Media files can have different lengths.

NOTE: Media that is not properly encoded may still play, but may have issues when using In-Frame and Out-Frame parameters.

#### In Frame and Out Frame Parameters

You can select any segment of a media file for playback by assigning an In Frame value as a start point and an Out Frame as an end point.

NOTE: DMX parameter values for these parameters do not correspond to a particular "frame". They are defined as a percentage of the movie length. This makes it possible to create segments with an Out Frame preceding the In Frame and simplifies playback synchronization between media files.

The **In Frame** parameter corresponds to a 16-bit DMX value equal to a starting point for the playback segment of the selected file. The **Out Frame** parameter corresponds to a 16-bit DMX value equal to an end point for the playback segment of the selected media file.

Assigning the In Frame and Out Frame parameters to default DMX values will playback the entire movie file.

Choosing other settings are useful when you want to:

- · Begin or end a media file at any point other than the default
- · Start or stop on a specific image
- You need to shorten the media file to a specific length

In Frame Default DMX Value: 0 = The beginning of a media file is the playback start point.

Out Frame Default DMX Value: 65535 = The end of a media file is the playback endpoint.

As you move from 0 to 100% of the **In Frame** value range, you can select the beginning of a media file segment as a percentage of the file length. Moving from 0 to 100% of the **Out Frame** value range selects the end of a media file segment as a percentage of the file length.

#### Segment Selection Examples

You can create a segment anywhere between the beginning and the end of a media file. The In Frame does not have to precede the Out Frame.

To skip a segment in the center of a media file, set the In Frame to a point following the Out Frame. The file will play from the In Frame to the end and then start at the beginning of the file and play to the Out Frame. When you create a segment in this way, you may notice a jump as playback skips from the end of the file to the beginning.



# **Defining Playback**

After selecting and defining a media file segment to display on a 3-D object, you can choose from several **Playback Modes** and assign a **Playback Speed**.

### **Playback Mode**

A Playback Mode parameter for each 3-D image allows several playback options.

**Default DMX Value:** 0 = Plays forward in a continuous loop

DMX Value	Playback Mode	Description
0	Play forward looping	Plays the media segment from In Frame setting to Out Frame setting, looping continuously
1	Play forward once	Plays the media segment from In Frame setting to Out Frame setting, and holds on the last frame
2	Pause	Stops playback at the frame currently playing
3	Play forward once if opacity > 0	Plays the media segment from In Frame setting to Out Frame setting, and holds on the last frame, Plays only when the content opacity value is greater than zero.
4	Play forward if opacity > 0	Plays media segment from In Frame setting to Out Frame setting, looping continuously. Plays only when the content opacity value is greater than zero.
5	Pause and rewind	Stops playback at the frame currently playing, then jumps to the In Frame setting.
6	Scrub In Frame	Displays frame that has been defined by the In Frame parameter
7	Scrub Out Frame	Displays frame that has been defined by the Out Frame parameter
8	Scrub In Frame with statistics	Displays frame that has been defined by the In Frame parameter with media file data overlaid on the output.
9	Scrub Out Frame with statistics	Displays frame that has been defined by the Out Frame parameter with media file data overlaid on the output.

#### Scrubbing

**Scrubbing** displays the selected frame of the composite output of the media server. While scrubbing the In Frame, the frame selected by the **In Frame** coarse and fine channels will be displayed. Likewise, scrubbing the **Out Frame** will display the frame selected by the **Out Frame** coarse and fine channels. When the "with statistics" option is selected, the composite output includes text data related to the selected frame. Remember that the **In Frame** and **Out Frame** parameters are defined as a DMX value mapped to the percentage of the media file length, not a specific frame.

CHAPTER 6 Graphic Functions: Defining Content

> NOTE: If the Global Control Mode parameter = 255, a DMX value of 1-3 for the Global Control parameter provides an alternate font color to enhance statistics readability.

#### **Playback Speed**

The **Playback Speed** parameter controls the speed of the selected media file's Playback Mode. The Playback Speed for a media file is used whenever the Playback Mode Parameter's DMX value is assigned to any Play Forward option.

**Default DMX Value:** 128 = Playback at normal speed.

A DMX value of 0 or 128 (50%) plays back media files at the original recorded speed. DMX values from 1 to 127 plays the media file back at an increasing speed, from slowest to the original recorded speed. Values from 129-255 set playback speed from faster than normal to fastest speed.

NOTE: DMX Values 1-127 utilize frame blending to provide a smooth playback motion at slow speeds.

# Chapter 7:

# Graphic Functions: Rotation, Position, Scale

# You can independently control each Graphic Object's rotation direction and speed; along with its position and scale in X, Y, and Z axis directions.

The parameters described in this chapter are set for each Graphic Object you define. Parameters for composite image rotation, position and global scale are described in *Chapter 11: Global Functions*.

NOTE: The suggested default DMX values given for each parameter are recommended to build libraries that provide the easiest and most reliable content selection, rendering and output.

# Rotating a 3-D Object

The **Rotation** parameters for each object control 3-D object rotation with 16-bit precision. You can rotate a 3-D object up to 720° in either a clockwise or counterclockwise direction around the X, Y and/or Z axis.

# NOTE: Remember that rotation changes could affect an object's relationship to other objects.

When you rotate an object, you are rotating it around the selected axis. **X Rotation** produces the effect of a top-to-bottom flip. **Y Rotation** produces a left-to-right flip. **Z Rotation** causes a circular motion.



Axon HD Media Server User Manual

The Rotation parameters' suggested default values are the midpoint of the 16-bit DMX value range, which is equal to no rotation. Increasing the DMX value from the midpoint indexes the object in a clockwise direction. Reducing the DMX value below the midpoint indexes the object in a counterclockwise direction.

When the DMX value for a rotation parameter is greater than the 720° limit in either direction, the object begins rotating continuously. Additional adjustment to the DMX values increases the speed of continuous rotation.



NOTE: Global and Graphic Effects Mode parameters contain a Prerotation Translation effect option. When a Global or Graphic Effects Mode DMX value = 102, you can use the Effect Modifier parameters to locate the image in a virtual three dimensional space. Applying the Rotation parameters then cause the image to orbit around the selected axis from that location, see Prerotation Translation on page 165.

# **Rotation Parameters**

### **X Rotation**

The **X Rotation** parameter rotates the selected Graphic Object around the X axis with 16-bit precision. You can index the rotation or set a continuous rotation creating a vertical flip at variable speeds.

This parameter lets you view an object from a different angle by turning the object. You can also view an object from a different angle by changing the viewpoint in space for the composite image, (see *Global Viewpoint Mode* on page 130).

Default DMX Value: 32768 (50%) = No X Rotation

% of Value Range	Function
1–24	Continuous variable-speed counterclockwise image rotation around X-axis (fast to slow)
25	Continuous rotation stop
26–49	Rotates the image counterclockwise around X-axis in steps to -720 degrees
50	0° rotation around X-axis
51–74	Rotates the image clockwise around X-axis in steps to 720 degrees absolute
75	Continuous rotation stop
76–100	Continuous variable-speed clockwise image rotation around X-axis (slow to fast)

Tip: Using this parameter you can turn one object through another.



Original Object 1 and Object 2



X-axis Rotation Applied to Object 2

CHAPTER 7 Graphic Functions: Rotation, Position, Scale

#### **Y** Rotation

The **Y Rotation** parameter rotates or indexes the selected Graphic Object around the Y axis with 16-bit precision. You can index the rotation or set a continuous rotation creating a horizontal flip at variable speeds.

This parameter lets you view an object from a different angle by turning the object. You can also view an object from a different angle by changing the viewpoint in space for the composite image, (see *Global Viewpoint Mode* on page 130).

% of Value Range	Function
1–24	Continuous variable-speed counterclockwise image rotation around Y-axis (fast to slow)
25	Continuous rotation stop
26–49	Rotates the image counterclockwise around Y-axis in steps to -720 degrees
50	0° rotation around Y-axis
51–74	Rotates the image clockwise around Y-axis in steps to 720 degrees absolute
75	Continuous rotation stop
76–100	Continuous variable-speed clockwise image rotation around Y-axis (slow to fast)

Default DMX Value: 32768 (50%) = No Y Rotation

Tip: Using this parameter you can turn one object through another



Original Object 1 and Object 2



Y-axis rotation applied to Object 2

## **Z** Rotation

The **Z Rotation** parameter rotates or indexes the selected Graphic Object around the Z axis with 16-bit precision. You can index the rotation or set a continuous rotation creating a circular spin at variable speeds.

Default DMX Value: 32768 (50%) = No Z Rotation

% of Value Range	Function
1–24	Continuous variable-speed counterclockwise image rotation around Z-axis (fast to slow)
25	Continuous rotation stop
26–49	Rotates the image counterclockwise around Z-axis in steps to -720 degrees
50	0° rotation around Z-axis
51–74	Rotates the image clockwise around Z-axis in steps to +720 degrees
75	Continuous rotation stop
76–100	Continuous variable-speed clockwise image rotation around Z-axis (slow to fast)

This parameter lets you view an object from a different angle by turning the object. You can also view an object from a different angle by changing the viewpoint in space for the composite image, (see *Global Viewpoint Mode* on page 130).

Tip: Using this parameter you can turn one object around another



Original Object 1 and Object 2



Z-axis Rotation Applied to Object 2

CHAPTER 7 Graphic Functions: Rotation, Position, Scale

# Scaling the Object

You can scale an Graphic Object along the X, Y and/or Z axis to adjust the object size.

The **Scale** parameter adjusts the size of the object's image up to approximately 10x its original size. At a DMX value of zero, the image shrinks to a dot. At the midpoint of the DMX value range, the image is normal size. When the DMX value is increased from the midpoint, the image is enlarged. In addition, when the DMX value is reduced below the midpoint, an inverted image is enlarged.

**Tip:** Use the **X**,**Y** and **Z Scale** parameters together to enlarge or shrink a 3-D object proportionally.

### X Scale

The **X Scale** parameter uses two channels to scale the selected 3-D object along the X axis, either expanding it or making it smaller. Use it when you want to size the object's horizontal component.

A DMX value of 32768 (50%) sets the object at its normal size. Values less than 50% shrink the object horizontally to the smallest at 0. Values greater then 50% enlarge the object horizontally to the largest at 65535 (100%).

Default DMX Value: 32768 (50%) = Normal Scale



Original Object 1 and Object 2 All Scale DMX values = 32768 (50%)

Object 2 X-Scale DMX value = 165 Scaled 3 times in X direction

## Y Scale

The **Y Scale** parameter uses two channels to scale the selected 3-D object along the Y axis, either expanding it or making it smaller. Use it when you want to size the object's vertical component.

A DMX value of 32768 (50%) sets the object at its normal size. Values less than 50% shrink the object vertically to the smallest at 0. Values greater then 50% enlarge the object vertically to the largest at 65535 (100%).

Default DMX Value: 32768 (50%) = Normal Scale



Original Object 1 and Object 2 All Scale DMX values = 32768 (50%)



Object 2 Y-Scale parameter DMX value = 165 Scaled 3 times in Y direction

## Z Scale

The **Z Scale** parameter uses two channels to scale the selected 3-D object along the Z axis, either expanding or shrinking it. Use it when you want to size the object's thickness.

A DMX value of 32768 (50%) sets the object at its normal size. Values less than 50% shrink the the object thickness until it reaches a point at a value of 0. Values greater then 50% enlarge the object to a maximum thickness at 65535 (100%).



Default DMX Value: 32768 (50%) = Normal Scale

Original Object 1 and Object 2 All Scale DMX values = 32768 (50%)



Object 2 Z-Scale parameter DMX value = 223 Scaled 7.5 times in Z direction

CHAPTER 7 Graphic Functions: Rotation, Position, Scale

# Changing Object Position

You can reposition each 3-D object's position in 3-D space by moving it along the X, Y and Z axes. The following parameters act on an individual object. Use these parameters to position 3-D images in relation to each other.

## **X** Position

The **X Position** parameter moves your object along the X axis with 16-bit precision.

The midpoint of the 16-bit DMX value range centers the image on the X-axis. Values below the DMX midpoint move the object left, and values above the DMX midpoint move the object right.

**Default DMX Value:** 32768 (50%) = object centered in frame



Original Object 1 and Object 2 All Position DMX values = 32768 (50%)



Object 1: X Position DMX value = 32022



Object 1: X Position DMX value = 33561

### **Y** Position

The **Y Position** parameter moves your object along the Y axis with 16-bit precision.

The midpoint of the 16-bit DMX value range, centers the image on the Y-axis. Values below the DMX midpoint move the object down, and values above the DMX midpoint move the object up.

Default DMX Value: 32768 (50%) = object centered in frame



Original Object 1 and Object 2 All Position DMX values = 32768 (50%)



Object 1: Y Position DMX value = 32255



Object 1: Y Position DMX value = 33269

CHAPTER 7 Graphic Functions: Rotation, Position, Scale

### **Z** Position

The **Z Position** parameter moves your object along the Z axis with 16-bit precision.

The midpoint of the 16-bit DMX value range centers the object on the Z axis. Values below the DMX midpoint move the object away from the viewer and appears to become smaller, and object above the DMX midpoint move the object toward the viewer and appears to become larger.

Default DMX Value: 32768 (50%) = object centered in frame

**Tip:** This parameter can create a zoom effect. Remember that by moving an object, you can obscure other objects or move it behind your viewpoint where it is no longer visible.



Original Object 1 and Object 2 All Position DMX values = 32768 (50%)



Object 1: Z Position DMX value = 31884



Object 1: Z Position DMX value = 32822



Object 1: Z Position DMX value = 33144

# Chapter 8: Graphic Functions: Opacity and Effects

You can adjust opacity and apply a variety of color mixing and geometric effects to each individual Graphic Object.

The parameters described in this chapter are set for each Graphic Object you define. Parameters for composite image intensity and effects are described in *Chapter 11: Global Functions* on page 113.

NOTE: The suggested default DMX values given for each parameter are recommended to build libraries that provide the easiest and most reliable content selection, rendering and output.

# Opacity

Adjusting an object's opacity allows one object to "show through" another. You can adjust the opacity of an individual 3-D object from completely transparent to full opacity using this parameter. Increase opacity from not visible at a value of zero to full opacity at a value of 255.

**Default DMX Value:** 0 = completely transparent

The Global Intensity parameter provides a similar adjustment to the combined image. This global control parameter controls intensity levels on the overall image (see *Global Intensity* on page 113). When you have multiple objects in relation to each other, the Global Intensity parameter is the best way to apply a fade to the composite image.

**Tip:** The **Dimmer**, **Object Opacity** and **Global Intensity** parameters all have to be greater than 0 to make a defined image visible.



Graphic Object 1 Intensity DMX = 255 (100%) Graphic Object 2 Intensity DMX = 255 (100%)



Graphic Object 1 Intensity DMX = 255 (100%) Graphic Object 2 Intensity DMX = 179 (70%)

## **Effect Mode Parameters**

Three **Effect Mode** parameters are available for each individual 3-D object, each with three **Modifier** parameters. Both Effect parameters have an identical list of color and visual effect options. This lets you apply a dual-effect combination to the selected 3-D object.

# NOTE: Not all modes combine effectively. For example, you cannot glow a wobbulating object very well.

The table below describes the interaction between an Effect Mode parameter and its three associated Modifier parameters. You can find a detailed description and example of each option in *Chapter 11: Effect Mode Options Descriptions* on page 87.

NOTE: Modifier channels for Effect Mode 1 are labeled as CMY in the Wholehog system so you can also make use of the color picker, HSI, and other Wholehog functions. Use the CMY parameter controls to adjust the three Effect Mode 1 Modifier parameters for both the Global and Graphic fixture types. The default for Effect Mode 1 is set to CMY1 as well. Effect Mode 2 and 3 Modifier channels are labeled Mod 1, Mod 2, and Mod 3.

DMX	Name/Description	Adjustments		
value	Name/Description	Modifier 1	Modifier 2	Modifier 3
0	Safe (no effects selection)	NA	NA	NA
1	CMY (RGB invert)	Cyan	Magenta	Yellow
2	CMY Add, All Pixels	Cyan	Magenta	Yellow
3	CMY Add, All Non-black Pixels	Cyan	Magenta	Yellow
4	RGB Add, All Pixels	Red	Green	Blue
5	RGB Add 2, All Pixels	Red	Green	Blue
6	RGB Add, All Non-black Pixels	Red	Green	Blue
7	RGB Swap to GBR	Red to Green	Green to Blue	Blue to Red
8	RGB Swap to BRG	Red to Blue	Green to Red	Blue to Green
9	Solarize 1 inverts a color value < DMX value	Red	Green	Blue
10	Solarize 2 inverts a color if value > DMX value	Red	Green	Blue
11	Solarize 3 sets color to 0 if value < DMX value	Red	Green	Blue
12	Solarize 4 sets color to 0 if value > DMX value	Red	Green	Blue
13	DotP and Resample	Red	Green	Blue
14	Color Cycle cycles colors with DMX value controlling cycle speed.	Red	Green	Blue
15	All or Nothing sets color values > mod value = 255 and all other color values = 0	Red	Green	Blue
16	Solid color RGB	Red	Green	Blue

DMX	Nome/Deparintion	Adjustments		
value	Name/Description	Modifier 1	Modifier 2	Modifier 3
17	RGB Invert	From Red to Cyan	From Green to Magenta	From Blue to Yellow
18	RGB, Invert and Swap to GBR	Red to Green	Green to Blue	Blue to Red
19	RGB, Invert and Swap to BRG	Red to Blue	Green to Red	Blue to Green
20	Edge Detect Color	Horizontal search size	Vertical search size	Comparison threshold
21	Edge Detect B/W	Horizontal search size	Vertical search size	Comparison threshold
22	Texture Ripple, Horizontal	Amplitude	Frequency	Phase
23	Texture Ripple, Vertical	Amplitude	Frequency	Phase
24	Texture Ripple, Circular	Amplitude	Frequency	Phase + Direction
25	Texture Ripple, Circular Asymmetrical	Amplitude	Frequency	Phase
26	Transparent Color Fine selects key color using Modifier channels	Red	Green	Blue
27	Transparent Color Medium selects key color using Modifier channels	Red	Green	Blue
28	Transparent Color Coarse selects key color using Modifier channels	Red	Green	Blue
29	Transparent Color Invert, Fine selects key color using Modifier channels	Red	Green	Blue
30	Transparent Color Invert, Medium selects key color using Modifier channels	Red	Green	Blue
31	Transparent Color Invert, Coarse selects key color using Modifier channels	Red	Green	Blue
32	Scan Line converts image colors to colors in a single line of the image	Selects scan line	Fades to con- verted image	Not used
33	Transparent Wipes "opens" the selected graphic to reveal another graphic positioned behind it	Area of wipe	Selects center of wipe	Selects from 6 wipe options
34	Pixel Twist swirls a portion of the texture	Twist center on X axis	Twist center on Y axis	Direction and amount of twist
35	Picture-in-picture duplicates the texture and overlays it on the original	Subpicture center on Xaxis	Subpicture center on Yaxis	Subpicture size
36	Magnifying Lens creates a virtual convex lens that magnifies a portion of the texture	Lens center on X axis	Lens center on Y axis	Lens size
37	Magnifying Lens 2 creates a virtual double convex lens that magnifies a portion of the texture.	Lens center on X axis	Lens center on Y axis	Lens size
38	Cartoon Edge creates variable outline around picture elements	Reduces Color	Enhances Contrast	Edge detection sensitivity

CHAPTER 8 Graphic Functions: Opacity and Effects

DMX	Name/Description	Adjustments		
value	Name/Description	Modifier 1	Modifier 2	Modifier 3
39	Color DeConverge separates image color components and offsets them	Moves Red component up	Moves Green component down and right	Moves Blue component down and left
40	Horizontal Mirror creates a mirror effect	Defines mirror center	Not Used	Not Used
41	RGB Swap to BGR redefines component color	Red to Blue	Green	Blue to Red
42	RGB Swap to RBG redefines component color	Red	Green to Blue	Blue to Green
43	RGB Swap to GRB redefines component color	Red to Green	Green to Red	Blue
44	Colorize Gray Scale maps pixel intensity to color	Selects Color Scheme	Selects zero intensity point	Controls fading
45	Intensity Key turns pixels of selected intensity transparent	Selects Color Scheme	Sets Intensity bandwidth	Controls Transparency
46	Raindrop simulates raindrops falling on a liquid surface	Controls size/ speed	Seeds random # generator	Controls raindrop rate
47	RGB, Scale varies the color mapping values	Red	Green	Blue
48	Tiling On multiplies image in a defined grid	Horizontal #	Vertical #	Space between tiles
49	Color to Alpha varies the transparency level of an image's component color values	Red to alpha	Green to alpha	Blue to alpha
50	Color to Alpha, Inverted varies the transparency level of an image's inverted color values	Inverted Red to alpha	Inverted Green to alpha	Inverted Blue to alpha
51	Texture Mixing crossfades between the current image and another graphic object texture	Selects Source Texture	Selects Source Effect Level	Crossfade Between Textures
52	Image Scale and Rotate Scales and rotates the media file texture applied to a 3-D object	Scales image	Selects Rotation Angle	Sets Rotation Speed
53	Film Roll scrolls the media file texture horizontally or vertically	Horizontal roll speed	Vertical roll speed	Scales Image
54	Pixelate divides the image into rectangles using the center pixel color of each "box" as its color	Sets amount of Pixelation	Scales horizontally	Scales vertically
55	Faux LED divides the image into a grid of circles to mimic an LED wall	LED size	Spacing	Color peaking
56	Faux Tile divides the image into square tiles	Tile Size	Spacing	Color peaking
57	Fuzzifier creates a multi-image blurring effect	Horizontal distance	Vertical distance	Fuzz Decay
58	Drop Shadow creates a scalable drop shadow behind the graphic object	Horizontal shadow size	Vertical shadow size	Shadow opacity
59	Zoom Blur zooms into a position on the image with a multi-image blurring effect	Horizontal position center	Vertical position center	Zoom in and out

Axon HD Media Server User Manual
DMX	Name/Description	Adjustments		
value	Name/Description	Modifier 1	Modifier 2	Modifier 3
60	Chroma Shift shifts the red, blue, and green component colors	Horizontal shift	Vertical shift	Not Used
61	ShakeNBake introduces a random vibration effect	Horizontal Shake	Vertical Shake	Scale
62	Slats, Vertical renders the image in offset vertical slats	Number of Slats	Vertical Displacement	Fade from Normal to Slats
63	Slats, Horizontal renders the image in offset horizontal slats	Number of Slats	Horizontal Displacement	Fade from Normal to Slats
80	Downward Vertical Streaks "pulls" the image down	Vertical Start Position	Streak Angle	Fade from Normal to Streak
81	Gaussian Blur blurs the image	Sample Distance	Number of Filter Passes	Scales the Effect
82	Sharpen	Sample Distance	Number of Filter Passes	Scales the Sharpen Effect
83	Flip	Horizontal Flip	Vertical Flip	Not Used
84	UV to Gray turns everything in the image gray except for a selected UV chroma coordinate	U Coordinate	V Coordinate	Tolerance
85	UV to Transparent turns everything in the image transparent except for a selected UV chroma coordinate.	U Coordinate	V Coordinate	Tolerance
86	UV Select to Transparent turns a selected UV chroma coordinate transparent with the rest of the image unchanged	U Coordinate	V Coordinate	Tolerance
87	HS to Gray retains selected hue and saturation, and turns everything else gray.	Hue Coordinate	Saturation Coordinate	Tolerance
88	HS to Transparent retains selected hue and saturation, and turns everything else transparent.	Hue Coordinate	Saturation Coordinate	Tolerance
89	HS Selected To Transparent makes selected hue and saturation transparent	Hue Coordinate	Saturation Coordinate	Tolerance
90	Texture Shift shifts texture coordinate by color value	Horizontal Shift	Vertical Shift	Color and Scale
91	Lens Grid views texture through grid of lenses	Magnification	Edge Shading	# of Lenses
92	Edge Detect, BW2 detects edges as black or white	Sample Distance	Edge Threshold Comparison	Detected Edge Scaler
93	Film Burn/Unburn creates burn pattern over image	Burn Through Rate	Film Blackening	Burn Pattern
94	Film Noise creates an "aged" film look	Noise Rate	Push to Sepia add Jitter	Noise Level

CHAPTER 8 Graphic Functions: Opacity and Effects

DMX	Namo/Description	Adjustments		
value	Name/Description	Modifier 1	Modifier 2	Modifier 3
95	Particle System 1 converts image to a particle pattern	Emitter Type	Trail Length	Particle Acceleration
96	Particle System 2 adds adjustments to Effect 95	Number of Particles	Particle Size	Emitter Size
97	Particle System 3 adds adjustments to Effect 95 + Effect 96	Initial Particle Velocity	Particle Rotation	Particle Lifetime
98	Prism	Number of Facets	Refraction Index	Rotation
99	Gaussian Halo creates blur from a clear center toward edges	Sample Distance	Number of Filter Passes	Gaussian Curve Shape
100	Scene Change Detect transparency effect	Scale RGB	Scale Alpha	Scale RGB+ alpha
101	Yxy Luminance Scaling adjusts brightness independent of color values	Scale Luminance	Scale X	Scale y
102	Prerotation Translation sets image in virtual 3-D space for rotation	Translate X	Translate Y	Translate Z
103	Digital Mspeed	Rotation MSpeed	Scaling MSpeed	Position MSpeed
104	Edge Detect2Color. Mod1 = Sample distance, Mod2 = Edge threshold comparison, Mod3 = Detected edge scaler	Sample Distance	Edge Threshold Compare	Detected Edge Scaler
105	Digital Mspeed 2. Mod1 = keystone speed, Mod2 = framing speed, Mod3 = not used.	Keystone Speed	Framing Speed	Not Used
106	Sepia Tones. Mod1 = fades from original image color to sepia tones, Mod2 = saturation, Mod3 = not used	Color Fade to Sepia	Saturation	Not Used
107	Red Tones. Mod1 = fades from original image color to red tones, Mod2 = saturation. Mod3 = not used.	Color Fade to Red	Saturation	Not Used
108	Gray Maker. Mod1 = compresses colors to shades of gray, Mod2 = constrast, Mod3 = not used	Compress Color to Gray	Contrast	Not Used
109	Gray Maker2. Always gray. Mod1 = brightness, Mod2 = contrast, Mod3 = not used	Brightness	Contrast	Not Used
110	Posterizer. Mod1 = reduces color detail, Mod2 = contrast, Mod3 = not used	Reduces Color Detail	Contrast	Not Used
111	Black & White. Mod1 = comparison, Mod2 = not used, Mod3 = not used.	Comparison	Not Used	Not Used
112	Fire Gradient. Mod1= fade from original image to converted image, Mod2 = not used, Mod3 = not used.	Fade Image to Converted	Not Used	Not Used

Axon HD Media Server User Manual

DMX	Namo/Description	Adjustments		
value	Name/Description	Modifier 1	Modifier 2	Modifier 3
113	Negative Art. Mod1 = scales RGB, Mod2 = color subtract, Mod3 = not used.	Scales RGB	Color Subtract	Not Used
114	Exposure Control. Mod1 = expand/contract color, Mod2 = color shift. Mod3 = not used.	Expand/ Contract Color	Color Shift	Not Used
253	Special value used with global spherical mapping effect 142. Defaults to 0 otherwise.	NA	NA	NA
254	Special value used with global spherical mapping effect 142. Defaults to 0 otherwise.	NA	NA	NA
255	Pan and Scale zooms in and pans across a still image	Horizontal position	Vertical position	Zoom in and out

CHAPTER 8 Graphic Functions: Opacity and Effects

# Chapter 9: Global Functions

Global Graphic controls affect the composite image created by defining multiple separate object graphics. You can adjust intensity, define masks, select a point in space to view the composite image, and control keystone correction.

## **Global Intensity**

The **Global Intensity** parameter creates a smooth *fade to video black* that doesn't affect the opacity relationship between individual objects. Use this parameter to adjust the intensity of a composite image over the separate Graphic Object's Opacity parameter settings. Increase intensity from not visible at a DMX value of 0 to full intensity at a value of 255 (100%).

**Default DMX Value:** 0 = no intensity (video black)

**Tip:** The Dimmer, Object Opacity and Global Intensity parameters all need DMX values greater than 0 for a defined image to be visible.



Graphic Object 1 Intensity DMX = 255 (100%) Graphic Object 2 Intensity DMX = 255 (100%)



Graphic Object 1 Intensity DMX = 255 (100%) Graphic Object 2 Intensity DMX = 179 (70%)



Global Intensity DMX = 128 (50%)

Axon HD Media Server User Manual

## **Global Effect Mode Channels**

There are five banks of **Global Effect Mode** parameters, each with associated Modifier channels. All **Global Effect Mode** parameters have an identical list of color and visual effect options. This lets you apply a multiple-effect combination to the composite image.

The table below describes the interaction between a **Global Effect Mode** parameter and the three associated **Modifier** parameters for each option. You can find a detailed description of each option in *Chapter 11: Effect Mode Options Descriptions.* 

DMX	Effect Mode Name/Description	Adjustments		
Value	Effect mode Name/Description	Modifier 1	Modifier 2	Modifier 3
0	Safe (no effects selection)	NA	NA	NA
1	CMY (RGB inverse)	Cyan	Magenta	Yellow
2	CMY Add, All Pixels	Cyan	Magenta	Yellow
3	CMY Add, All Non-black Pixels	Cyan	Magenta	Yellow
4	RGB Add, All Pixels	Red	Green	Blue
5	RGB Add 2, All Pixels	Red	Green	Blue
6	RGB Add, All Non-black Pixels	Red	Green	Blue
7	RGB Swap to GBR	Red to Green	Green to Blue	Blue to Red
8	RGB Swap to BRG	Red to Blue	Green to Red	Blue to Green
9	Solarize 1 inverts a color if value < DMX value	Red	Green	Blue
10	Solarize 2 inverts a color if value > DMX value	Red	Green	Blue
11	Solarize 3 sets color to 0 if value is < DMX value	Red	Green	Blue
12	Solarize 4 sets color to 0 if value is > DMX value	Red	Green	Blue
13	DotP and Resample	Red	Green	Blue
14	Color Cycle cycles colors with DMX value controlling cycle speed.	Red	Green	Blue
15	All or Nothing sets color values > mod value = 255 and all other color values = 0	Red	Green	Blue

The default for Effect Mode 1 is set to CMY1 as well. Other Effect Mode Modifier channels are labeled Mod 1, Mod 2, and Mod 3.

Axon HD Media Server User Manual

NOTE: Modifier channels for Effect Mode 1 are labeled as CMY in the Wholehog system so you can also make use of the color picker, HSI, and other Wholehog functions. Use the CMY parameter controls to adjust the three Effect Mode 1 Modifier parameters for both the Global and Graphic fixture types.

DMX	Effect Mode Name/Description	Adjustments		
Value	Effect Mode Name/Description	Modifier 1	Modifier 2	Modifier 3
16	Solid color RGB	Red	Green	Blue
17	RGB Invert	From Red to Cyan	From Green to Magenta	From Blue to Yellow
18	RGB, Invert and Swap to GBR	Red to Green	Green to Blue	Blue to Red
19	RGB, Invert and Swap to BRG	Red to Blue	Green to Red	Blue to Green
20	Edge Detect Color	Horizontal search size	Vertical search size	Comparison threshold
21	Edge Detect B/W	Horizontal search size	Vertical search size	Comparison threshold
22	Texture Ripple, Horizontal	Amplitude	Frequency	Phase
23	Texture Ripple, Vertical	Amplitude	Frequency	Phase
24	Texture Ripple, Circular	Amplitude	Frequency	Phase and Direction
25	Texture Ripple, Circular Asymmetrical	Amplitude	Frequency	Phase
26	Transparent Color Fine selects key color using Modifier channels	Red	Green	Blue
27	Transparent Color Medium selects key color using Modifier channels	Red	Green	Blue
28	Transparent Color Coarse selects key color using Modifier channels	Red	Green	Blue
29	Transparent Color Invert, Fine selects key color using Modifier channels	Red	Green	Blue
30	Transparent Color Invert, Medium selects key color using Modifier channels	Red	Green	Blue
31	Transparent Color Invert, Coarse selects key color using Modifier channels	Red	Green	Blue
32	Scan Line converts image colors to colors in a single line of the image	Selects scan line	Fades to converted image	Not used
33	Transparent Wipes "opens" the selected graphic to reveal another graphic positioned behind it	Area of wipe	Selects center of wipe	Selects from 6 wipe options
34	Pixel Twist swirls a portion of the texture	Twist center on X axis	Twist center on Y axis	Direction and amount of twist
35	Picture-in-picture duplicates the texture and overlays it on the original	Subpicture center on Xaxis	Subpicture center on Yaxis	Subpicture size

DMX	Effect Mode Name/Description	Adjustments		
Value		Modifier 1	Modifier 2	Modifier 3
36	Magnifying Lens creates a virtual convex lens that magnifies a portion of the texture	Lens center on X axis	Lens center on Y axis	Lens size
37	Magnifying Lens 2 creates a virtual double convex lens that magnifies a portion of the texture.	Lens center on X axis	Lens center on Y axis	Lens size
38	Cartoon Edge creates variable outline around picture elements	Reduces Color	Enhances Contrast	Edge detection sensitivity
39	Color DeConverge separates and offsets image color components from original position	Moves Red up	Moves Green down and right	Moves Blue down and left
40	Horizontal Mirror creates a mirror effect	Defines mirror center	Not Used	Not Used
41	RGB Swap to BGR redefines component color	Red to Blue	Green	Blue to Red
42	RGB Swap to RBG redefines component color	Red	Green to Blue	Blue to Green
43	RGB Swap to GRB redefines component color	Red to Green	Green to Red	Blue
44	Colorize Gray Scale maps pixel intensity to color	Selects Color Scheme	Selects zero intensity point	Controls fading
45	Intensity Key turns pixels of selected intensity transparent	Selects Color Scheme	Sets Intensity bandwidth	Controls Transparency
46	Raindrop simulates raindrops falling on a liquid surface	Controls size/ speed	Seeds random # generator	Controls raindrop rate
47	RGB, Scale varies the color values	Red	Green	Blue
48	Tiling On multiplies image mapped to a defined grid	Horizontal #	Vertical #	Space between tiles
49	Color to Alpha varies the transparency level of an image's component color values	Red to alpha	Green to alpha	Blue to alpha
50	Color to Alpha, Inverted varies the transparency level of the inverted color values	Inverted Red to alpha	Inverted Green to alpha	Inverted Blue to alpha
51	Texture Mixing crossfades between the current image and another graphic object texture	Selects Source Texture	Selects Source Effect Level	Crossfade Textures
52	Image Scale and Rotate Scales and rotates the media file texture applied to a 3-D object	Scales image	Selects Rotation Angle	Sets Rotation Speed
53	Film Roll scrolls the media file texture horizontally or vertically	Horizontal roll speed	Vertical roll speed	Scales Image
54	Pixelate divides the image into rectangles using the center pixel color of each "box" as it's color	Sets amount of Pixelation	Scales horizontally	Scales vertically

DMX	Effect Mode Name/Description	Adjustments		
Value		Modifier 1	Modifier 2	Modifier 3
55	Faux LED divides the image into a grid of circles to mimic an LED wall	LED size	Spacing	Color peaking
56	Faux Tile divides the image into square tiles	Tile Size	Spacing	Color peaking
57	Fuzzifier creates a multi-image blurring effect	Horizontal distance	Vertical distance	Fuzz Decay
58	Drop Shadow creates a scalable drop shadow behind the graphic object	Horizontal shadow size	Vertical shadow size	Shadow opacity
59	Zoom Blur zooms into a position on the image with a multi-image blurring effect	Horizontal position center	Vertical position center	Zoom in and out
60	Chroma Shift shifts the red, blue, and green component colors	Horizontal shift	Vertical shift	Not Used
61	ShakeNBake introduces a random vibration effect	Horizontal Shake	Vertical Shake	Scale
62	Slats, Vertical renders the image in offset vertical slats	Number of Slats	Vertical Displacement	Fade from Normal to Slats
63	Slats, Horizontal renders the image in offset horizontal slats	Number of Slats	Horizontal Displacement	Fade from Normal to Slats
80	Downward Vertical Streaks "pulls" the image down	Vertical Start Position	Streak Angle	Fade from Normal to Streak
81	Gaussian Blur	Sample Distance	Number of Filter Passes	Scales the Effect
82	Sharpen	Sample Distance	Number of Filter Passes	Scales the Sharpen Effect
83	Flip	Horizontal Flip	Vertical Flip	Not Used
84	UV to Gray turns everything in the image gray except for a selected UV chroma coordinate	U Coordinate	V Coordinate	Tolerance
85	UV to Transparent turns the image transparent except for a selected UV chroma coordinate.	U Coordinate	V Coordinate	Tolerance
86	UV Select to Transparent turns only a selected UV chroma coordinate in the image transparent	U Coordinate	V Coordinate	Tolerance
87	HS to Gray retains selected hue and saturation, and turns everything else gray.	Hue Coordinate	Saturation Coordinate	Tolerance
88	HS to Transparent retains selected hue and saturation, and turns everything else transparent.	Hue Coordinate	Saturation Coordinate	Tolerance

DMX	Effect Mode Name/Description	Adjustments		
Value		Modifier 1	Modifier 2	Modifier 3
89	HS Selected To Transparent makes selected hue and saturation transparent with the rest of the image unchanged	Hue Coordinate	Saturation Coordinate	Tolerance
90	Texture Shift shifts texture coordinate by color value.	Horizontal Shift	Vertical Shift	Color and Scale
91	Lens Grid views texture through grid of lenses	Magnification	Edge Shading	# of Lenses
92	Edge Detect, BW2 creates a pencil line drawn effect	Sample Distance	Edge Threshold Comparison	Detected Edge Scaler
93	Film Burn/Unburn create a burn pattern on the image	Burn/Unburn Rate	Film Blackening	Burn Pattern
94	Film Noise creates an "aged" film effect	Noise Rate	Push to Sepia add Jitter	Noise Level
95	Particle System 1 converts image to a particle pattern	Emitter Type	Trail Length	Particle Acceleration
96	Particle System 2 adds adjustments to Effect 95	Number of Particles	Particle Size	Emitter Size
97	Particle System 3 adds adjustments to Effect 95 + Effect 96	Initial Particle Velocity	Particle Rotation	Particle Lifetime
98	Prism	Number of Facets	Refraction Index	Rotation
99	Gaussian Halo creates blur from clear center toward the edges of an image	Sample Distance	Number of Filter Passes	Gaussian Curve Shape
100	Scene Change Detect transparency effect	Scale RGB	RGB to Alpha	Scale color with alpha applied
101	Yxy Luminance Scaling adjusts brightness without effecting color	Scale Luminance	Scale X	Scale
102	Prerotation Translation places object in 3-D space	Translate X	Translate Y	Translate Z
103	Digital Mspeed.	Rotation MSpeed	Scaling MSpeed	Position MSpeed
104	Edge Detect2Color.	Sample Distance	Edge Threshold Compare	Detected Edge Scaler
105	Digital Mspeed. 2	Keystone Speed	Framing Speed	Not Used
106	Sepia Tones.	Color Fade to Sepia	Saturation	Not Used
107	Red Tones.	Color Fade to Red	Saturation	Not Used

DMX	Effect Mode Name/Description	Adjustments		
Value	Effect wode Name/Description	Modifier 1	Modifier 2	Modifier 3
108	Gray Maker.	Compress Color to Gray	Contrast	Not Used
109	Gray Maker2.	Brightness	Contrast	Not Used
110	Posterizer. Mod1 = reduces color detail, Mod2 = contrast, Mod3 = not used	Reduces Color Detail	Contrast	Not Used
111	Black & White. Mod1 = comparison, Mod2 = not used, Mod3 = not used.	Comparison	Not Used	Not Used
112	Fire Gradient. Mod1= fade from original image to converted image, Mod2 = not used, Mod3 = not used.	Fade Image to Converted	Not Used	Not Used
113	Negative Art. Mod1 = scales RGB, Mod2 = color subtract, Mod3 = not used.	Scales RGB	Color Subtract	Not Used
114	Exposure Control. Mod1 = expand/contract color, Mod2 = color shift. Mod3 = not used.	Expand/ Contract Color	Color Shift	Not Used
128	Mask Color applies color to mask parameter selection	Red	Green	Blue
129	Edge Fade Color applies color to Edge Fade parameter selection	Red	Green	Blue
130	Mask Color and Edge Fade Color applies the same color to both the selected Mask and Image Edge Fade parameters	Red	Green	Blue
131	Background Color selects background color	Red	Green	Blue
132	Background Color Cycle sequences the background color	Red Speed	Green Speed	Blue Speed
133	Edge Fade Profiles defines edge fading patterns	Selects Mode	Adjusts Profile	Selects Source
135	Curve Correction, Vertical Convex Cylinder corrects shape projecting on curved surface	Adjusts Correction	Sets Vertical Center	Not Used
136	Curve Correction, Vertical Concave Cylinder corrects shape projecting on curved surface	Adjusts Correction	Sets Vertical Center	Not Used
137	Curve Correction, Vertical Inside Corner corrects shape projecting on curved surface	Adjusts Correction	Sets Vertical Center	Sets Horizontal Center
138	Curve Correction, Vertical Outside Corner corrects shape projecting on curved surface	Adjusts Correction	Sets Vertical Center	Sets Horizontal Center
139	Curve Correction, Outside Sphere corrects shape projecting on a sphere's outside surface	Adjusts Correction	Sets Vertical Center	Sets Horizontal Center

DMX	Effect Mode Name/Description	Adjustments		
Value	Effect mode Name/Description	Modifier 1	Modifier 2	Modifier 3
140	Curve Correction, Inside Sphere corrects shape projecting on a sphere's inside surface.	Adjusts Correction	Sets Vertical Center	Sets Horizontal Center
142	Spherical Mapping, Outside maps output to a portion of a sphere's outside surface.	Sets Longitude Angle	Sets Latitude Angle	Sets Latitude Center
143	Spherical Mapping, Inside maps output to a portion of a sphere's inside surface.	Sets Longitude Angle	Sets Latitude Angle	Sets Latitude Center
144	Mattes apply provided mattes over image.	Matte Effect	Matte Pattern	Texture Source
148	Curved Surface, Horizontal Convex Cylinder corrects shape projecting on curved surface.	Adjusts Correction	Sets Horizontal Centerpoint	Not Used
149	Curved Surface, Horizontal Concave Cylinder corrects shape projecting on curved surface.	Adjusts Correction	Sets Horizontal Centerpoint	Not Used
154	Output Correction, Horizontal Convex Corner.	Adjusts Correction	Sets Horizontal Centerpoint	Sets Vertical Centerpoint
155	Output Correction, Horizontal Concave Corner.	Adjusts Correction	Sets Horizontal Centerpoint	Sets Vertical Centerpoint
253	Modifier used with global spherical mapping effect 142. Defaults to 0 otherwise.	NA	NA	NA
254	Modifier used with global spherical mapping effect 142. Defaults to 0 otherwise.	NA	NA	NA
255	Pan and Scale zooms in and pans across a still image.	Horizontal position	Vertical position	Zoom in and out

## **Global Control**

The **Global Control** parameter allows access to different global control modes. How you set the Global control parameter determines the functionality of the **Global Control Modifier** parameter. Setting this parameter to a DMX value of 255 brings up On-screen programming statistics. In this case, the **Global Control Modifier** parameter controls the text color.

#### **Shutdown and Reset Options**

When the Global Intensity parameter is set to 0, you can Shutdown the server (DMX Value = 120-130) or Reset the internal Graphics Engine for either DL.3, Axon or DL.2 media servers (DMX Value = 145-149).

## **On-Screen Statistics**

#### **Spherical Control Statistics**

When the **Global Control** parameter is set to a DMX value = 252, Spherical Control Statistics are displayed and the **Global Control Modifier** parameter selects text color. page 324.

#### **Performance Statistics**

When the **Global Control** parameter DMX value = 254, performance statistics are projected on screen. These are a subset of the statistics shown when **Global Control** = 255.

Statistics displayed are:

- render loops per second
- cpu utilization
- · hard disk read
- cue length
- available memory

The **Global Control Modifier** controls the opacity of the of the statistics display background, fading from 0 = opaque to 255 = transparent. Discussion of the global control modifier is on page 325 and should include discussion of background opacity control.

#### **Text Color**

When the Global Control parameter is set at a DMX Value of 255, the **Global Control Modifier** parameter lets you choose the text color that will best display over your selected image:

DMX Value	Color
1	Gray
2	Red
3	Blue
4	Green

#### All-in-One Control Option

When the Global Control parameter is set to a DMX value = 253, you can use the **Global Control Modifier** parameter to control the **All-in-One** control option. This option helps you visualize what the graphics engine is doing. The **All-in-One** option maps the media file content of Collage and Curved Surface support effects as well as up to three effects applied to graphics objects and displays it in a multi-quadrant grid.

These effects are accessed according to rendering hierarchy used by the graphics engine, (see *Graphics Control Hierarchy* on page 27).

When the **Global Control** parameter is set to the All-In-One option, you can view the individual effects applied to each Graphic object in the **Global Control Modifie**r parameter.

DMX Value	Global Control Modifier Option (Global Control parameter	= 253)
0	Displays each defined Graphic Object with no effects applied	
1	Displays the first effect (if any) applied to any defined Graphic Object	
2	Displays the second effect (if any) applied to any defined Graphic Object	
3	Displays the third effect (if any) applied to any defined Graphic Object	As the next effect
4	Displays the fourth effect (if any) applied to any defined Graphic Object	level is displayed, each object displays
5	Displays the fifth effect (if any) applied to any defined Graphic Object	the highest level of effect applied to that
6	Displays the sixth effect (if any) applied to any defined Graphic Object	point.
7	Displays the seventh effect (if any) applied to any defined Graphic Object	
8	Displays the eighth effect (if any) applied to any defined Graphic Object	
9	Displays the ninth effect (if any) applied to any defined Graphic Object	



Graphic Object 1	Graphic Object 2	Graphic Object 3	Graphic Object 4
Graphic Object 5	Graphic Object 6	Graphic Object 7	Graphic Object 8
Graphic Object 9		<b>Composite Image</b> displaying the object	
Spherical Effect or Collage Effect		with graphic effects applied	

## **Masking Control**

## Mask Shape Select and Strobing

The **Mask Select** parameter lets you choose a mask to frame or overlay a composite image. You can choose to apply a mask to an image when you don't want an entire image to be seen or you want to transition from an image to black or a solid color without fading intensity.

#### **Mask Shapes**

The graphics engine currently provides 30 mask shapes including circular, rectangular, and oval masks that close from inside out or outside in. Checker Board, Radial Wipes, and Multi-panel options are also included with variations.

**Default DMX Value** = 0 Round "iris" closes from outside in.

DMX values 0-127 (0-50%) are reserved for static mask shapes. Values of 128-255 (51-100%) are reserved for strobing Mask shapes. Values not yet implemented default to 128.

#### Strobing Mask Shapes

A strobing version of each simple mask shape is defined in the 128-255 (51-100%) DMX value range. When a strobing mask is selected, the strobe rate is controlled by the **Mask Edge Fade** parameter from the slowest = 0 to the fastest = 255 (100%).

NOTE: A Global Effect Mode parameter option lets you define a Mask color, (see Global Effect Mode Channels on page 58, and Mask Color on page 111).

DMX value	Strobe DMX Value	Mask Shapes
0	128	Round <i>iris</i> closing from outside in
1	129	Round <i>iris</i> closing from inside out
2	130	Rectangle closing from outside in
3	131	Rectangle closing from inside out
4	132	Checkerboard, variation 1
5	133	Checkerboard, variation 2
6	134	Radial wipe, variation 1
7	135	Radial wipe, variation 2
8	136	Radial wipe, variation 3
9	137	Radial wipe, variation 4
10	138	Triangles, variation 1
11	139	Triangles, variation 2
12	140	Rectangular wrap
13	141	Tiles closing in
14	142	Horizontal doors, closing
15	143	Horizontal doors closing from opposing sides
16	144	Vertical doors closing from outside in
17	145	Vertical wipe closing from inside out
18	146	Rectangular tiles closing from inside out 1
19	147	Rectangular tiles closing from inside out 2
20	148	Vertical panels closing from outside in 1
21	149	Vertical panels closing from outside in 2
22	150	Vertical diamonds 1
23	151	Vertical diamonds 2
24	152	Horizontal diamonds 1
25	153	Horizontal diamonds 2
26	154	Pinwheel
27	155	Oval Iris closing from outside in
28	156	Oval Iris closing from inside out
29	157	Oscillating iris closing from outside in
30	158	Animated dynamic Iris

Axon HD Media Server User Manual

#### Mask Size

The Mask Size parameter defines mask size for all mask shapes.

Default DMX Value: 255 (100%) = no masking effect

When this parameter is set at a value of 255 (100%), the mask is sized to leave the image 100% visible. When Mask Size is set at 0, the mask totally covers the composite image.

Tip: Crossfading the Mask Size parameter can create unique fades to and from video black.



Mask Select DMX value = 0 Mask Size DMX value = 255 (100%)



Mask Select value of 0 Mask Size DMX value = 128 (50%)



Mask Select DMX value = 1 Mask Size DMX value = 126 (50%)

#### Mask Edge Fade

The **Mask Edge Fade** parameter operates differently depending on the value of the Mask Select parameter.

**Default DMX Value:** 0 = no adjustment to mask

When the **Mask Select** parameter value = 0 to 127 (49%), **Mask Edge Fade** adjusts the amount of fading from a DMX value of  $0 = n_0 edge$  fade to 255 (100%) = maximum edge fade.

When the **Mask Select** parameter value =128 (50%) to 255 (100%), the strobing masks are selected and **Mask Edge Fade** adjusts the speed of the strobing from minimum at a DMX value = 0 to a maximum strobe speed at a DMX value = 255 (100%),

NOTE: A Global Effect Mode parameter option lets you define a Mask Edge Fade color, (see page 58).



Original Image



Mask applied without Edge Fade



Mask with Edge Fade applied

## Image Edge Fade

Four **Image Edge Fade** parameters let you control the Edge Fade for individual sides of your object (top, bottom, left and right). When projecting abutting images, adjusting the Edge Fade parameter lets you smooth the line between two images and also allows you to change an object's boundary.

**Default DMX Value:** 0 = all edges are sharp and hard.

Adjust each side separately for edge fade from 0 = no fade to 255 (100%) = opaque.



**Original Content** 



100% Top Edge Fade



100% Left Edge Fade



100% Top, Bottom, Left, Right Edge Fade

## **Keystone Correction Parameters**



Each corner has an x and a y value that let you adjust and correct the scale of the projection from any corner toward the image center on that axis.

Setting all **Keystone X** and **Y** parameters DMX values to zero will place the four corners of the image at the four corners of the projector output. Adjusting keystone x values toward 255 (100%) moves the respective x corner positions horizontally toward the center of that image edge. Adjusting keystone y values toward 255 (100%) adjusts the respective y corner positions vertically toward the center of that edge of the image.



Keystone Top Left X DMX value = 85 Keystone Top Left Y DMX value = 85 Keystone Top Right X DMX value = 85 Keystone Top Right Y DMX value = 85 Other Keystone parameter DMX values = 255



Keystone Top Left Y DMX value =128 Keystone Top Right X DMX value = 0 Keystone Bottom Left X DMX value = 239 Keystone Bottom Left X DMX value =0 Keystone Bottom Right Y DMX value = 2 Other Keystone parameter DMX values = 255

NOTE: DL.3 fixtures have vertical lens shift capability that provides additional keystone control. Engage lens shift with your DMX console in the Control Parameter of the Motion Control fixture type.

### Keystone X Ratio

The **Keystone X Ratio** Parameter shapes the output to adjust for keystone effects created in certain output situations. This parameter adjusts the output by compressing or expanding the image horizontally.

Default DMX Value: 128 (50%) = no adjustment

DMX value settings below the midpoint of the range compress the image horizontally from maximum compression at a value of 0 to no compression at a value of 128. DMX value settings above the midpoint of the range expand the image horizontally from 128 = no expansion to 255 (100%) = maximum expansion.



Original media file



X Ratio DMX value = 255 (100%)

## **Keystone Y Ratio**

The **Keystone Y Ratio** parameter shapes the output to adjust for keystone effects created in certain output situations. This parameter adjusts the output by compressing or expanding the image vertically.

**Default DMX Value:** 128 (50%) = no adjustment

DMX value settings below the midpoint of the range compress the image vertically from 0 = maximum compression to 255 (100%) = no compression.

DMX value settings above the midpoint of the



Y Ratio DMX value = 255 (100%)

range expands the image vertically from 128 = no expansion to 255 (100%) = maximum expansion.

## Framing Parameters

Eight **Framing** parameters allow you to clip an image from each corner in horizontal and vertical directions.

**Default DMX Value:** 0 = no effect applied.

Each corner has an x and a y value that adjust and correct scale of the projection from any corner toward the image center on that axis.





Framing Top Left X DMX value = 8 Framing Top Left Y DMX value = 31 Framing Top Right X DMX value = 32 Framing Bottom Left X DMX value = 23 Framing Bottom Left X DMX value = 67 Other Framing parameter DMX values = 0



Framing Top Left X DMX value = 5 Framing Top Right X DMX value = 188 Framing Bottom Right X DMX value = 5 Framing Bottom Left X DMX value = 188 Other Framing parameter DMX values = 0

Setting all **Framing X** and **Y** parameters DMX values to zero will place the four corners of the image at the four corners of the projector output. Adjusting framing x values across 255 (100%) clips the image from the selected x corner position horizontally toward the image. Adjusting keystone y values toward 255 (100%) clips the image from the selected y corner position vertically across the image.

## **Audio Control**

## Audio Out Connections

#### Axon HD Pro

Axon HD Pro supports audio output via the 1.5mm jack on the rear of the server. There are multiple jacks. The green jack labeled Line Out is the correct jack to use. In addition to the other analog 1.5mm jacks there is an optical SPDIF jack that may be supported in future releases.



#### Audio – Axon HD

Axon HD supports audio output via the 1.5mm jack on the rear of the server. There are 3 jacks on the rear of the server, the center, green jack labeled Line Out is the correct jack to use. The optical SPDIF jack is currently not used by the Axon HD Software.



#### **Outputting Audio**

Audio information encoded in the video file is processed by the Axon HD /HD Pro application. Only the Left and Right Channels encoded into the file will be processed at this time.

To hear sound from the server:

- 1. Enable Audio on each layer you wish to hear
- 2. Adjust the Volume Control on the Global layer and each Graphic Layer.

### Setting Audio on a Hog4 Console

By default on Hog4 the Audio Control channel is set to " Enable Audio Mute On", and the Volume is set to 100%. To disable mute:

- 1. Choose the graphic layer which you want to listen to
- 2. Press "Enable Audio Mute Off" and
- 3. Adjust the volume parameter to 100%,

Audio information is logically contained on layers, meaning that multiple audio streams can be output at once. Crossfading between audio layers is fundamentally the same as cross fading between video layers. Be aware, if using video content containing audio while using a collage, it is best to choose one file to output audio, not multiple sources of audio.

Note: Audio is disabled internally any time the play speed parameter is adjusted.

## Chapter IO:

## Global Functions: Collage Generator™

This chapter describes how to display content from multiple media servers in panoramic arrays and includes an example for creating a collage.

## Collage Overview

Collage Generator™ technology allows you to create virtually seamless panoramic media projections controlled from your DMX console. You can display either stock or custom content.

The Axon HD version of the Collage Generator has streamlined this process. The Collage Generator is no longer a part of Global Effects but is defined using dedicated parameters.

You can configure multiple media server outputs to display a single image in arrays up to 16 units horizontal by 8 units vertical using DL fixtures or Axon media servers outputting to Orbital Head fixtures or other digital projectors.

NOTE: When using third party projectors, you will need to position output manually.



The native aspect ratio of one DL fixture or Axon media server output is 4:3. Some of the arrays configured in conjunction with the Collage Generator will output a different overall aspect ratio.

CHAPTER 10 Global Functions: Collage Generator™

> NOTE: You can find other configurations and information on sizing and compressing media to use with the Collage Generator at the High End Systems website (www.highend.com/support/digital\_lighting).

## **Collage Parameters**

## Collage Type

The **Collage Type** global parameter has eighteen collage options including 14 Collage+ modes:

DMX Value	Action
1	Standard Collage divides content for projection onto a flat surface
2	Standard Collage with 360° wrap divides the content into an array and edge blending for projection onto a 360° surface
3	Multipane Collage pre-configures the content into cells that are then arranged into an array for projection onto a flat surface
4	Multipane Collage with 360° wrap pre-configures the content into cells that are then arranged into an array for projection onto a 360° surface.
10	Standard collage plus blend right outside edge
11	Standard collage plus blend left outside edge
12	Standard collage plus blend bottom outside edge
13	Standard collage plus blend top outside edge
14	Standard collage plus blend right and bottom outside edges
15	Standard collage plus blend left and bottom outside edges
16	Standard collage plus blend right and top outside edges
17	Standard collage plus blend left and top outside edges
18	Standard collage plus blend left and right outside edges
19	Standard collage plus blend bottom and top outside edges
20	Standard collage plus blend right, left and bottom outside edges
21	Standard collage plus blend right, left and top outside edges
22	Standard collage plus blend right, bottom and top outside edges
23	Standard collage plus blend left, bottom and top outside edges
24	Standard collage plus blend right, left, bottom and top outside edges.

In **Standard Collage** and **Standard Collage with 360° Wrap** options, the content is automatically divided into cell segments by the graphics engine after you define the array size. This yields good results in situations where moderate output resolution is suitable.

In **Multipane Collage** options where you pre-configure the content into cells and project each cell from a separate server, you can project a 1024x768 from each server.

In situations where you require extremely high resolution output of custom content, the **Multipane Collage** options' resolution capabilities is greatly increased because the graphics

engine is no longer taking a single file and stretching it across multiple servers; but is, instead, showing the file as rendered. Using **Multipane Collage** gives you the option to use video files that match the resolution of the display devices exactly. For example, if you have four 1080p HD projectors using a 4 part Multipane Collage with individual 1080p HD video files, the resulting collage resolution will be much higher. In standard collage modes, a single file is divided by the number of parts in the collage. To equal the same resolution in standard collage mode, the single file would have to be 4 times larger, and it would have a negative impact on server performance.

The **Collage + mode** expands the Standard Collage modes, by additionally allowing blend edges on Top, Right, Bottom, Left and all combinations. In **Collage + Modes** the blend edges are no longer prescribed by the positions in the cell layout arrangement. Instead each external boundary edge can be set independently. The simplest scenario is a 1x1 collage with 4 blended edges. These multiple blend options allow for unique technical scenarios, or allowing the ability to combine several collage types in a larger installation.

#### Collage Configuration Selection

The **Collage Config Selection** parameter selects which type of Collage array to use from DMX Values 1-127. The selected size displays in the upper right corner of the grid pattern. A DMX value of 0 = No collage. DMX Values of 126-255 are reserved and default to No collage.

DMX Value	Array (W x H)								
1	2 x 1	26	1 x 6	51	8 x 2	76	10 x 5	101	13 x 6
2	1 x 2	27	6 x 2	52	2 x 8	77	10 x 6	102	13 x 7
3	2 x 2	28	2 x 6	53	8 x 3	78	10 x 7	103	13 x 8
4	3 x 1	29	6 x 3	54	3 x 8	79	10 x 8	104	14 x 1
5	1 x 3	30	3 x 6	55	8 x 4	80	11 x 1	105	14 x 2
6	3 x 2	31	6 x 4	56	4 x 8	81	11 x 2	106	14 x 3
7	2 x 3	32	4 x 6	57	8 x 5	82	11 x 3	107	14 x 4
8	3 x 3	33	6 x 5	58	5 x 8	83	11 x 4	108	14 x 5
9	4 x 1	34	5 x 6	59	8 x 6	84	11 x 5	109	14 x 6
10	1 x 4	35	6 x 6	60	6 x 8	85	11 x 6	110	14 x 7
11	4 x 2	36	7 x 1	61	8 x 7	86	11 x 7	111	14 x 8
12	2 x 4	37	1 x 7	62	7 x 8	87	11 x 8	112	15 x 1
13	4 x 3	38	7 x 2	63	8 x 8	88	12 x 1	113	15 x 2
14	3 x 4	39	2 x 7	64	9 x 1	89	12 x 2	114	15 x 3
15	4 x 4	40	7 x 3	65	9 x 2	90	12 x 3	115	15 x 4
16	5 x 1	41	3 x 7	66	9 x 3	91	12 x 4	116	15 x 5
17	1 x 5	42	7 x 4	67	9 x 4	92	12 x 5	117	15 x 6
18	5 x 2	43	4 x 7	68	9 x 5	93	12 x 6	118	15 x 7
19	2 x 5	44	7 x 5	69	9 x 6	94	12 x 7	119	15 x 8
20	5 x 3	45	5 x 7	70	9 x 7	95	12 x 8	120	16 x 1
21	3 x 5	46	7 x 6	71	9 x 8	96	13 x 1	121	16 x 2
22	5 x 4	47	6 x 7	72	10 x 1	97	13 x 2	122	16 x 3
23	4 x 5	48	7 x 7	73	10 x 2	98	13 x 3	123	16 x 4
24	5 x 5	49	8 x 1	74	10 x 3	99	13 x 4	124	16 x 5
25	6 x 1	50	1 x 8	75	10 x 4	100	13 x 5	125	16 x 6
	•	-						126	16 x 7
								127	16 x 8

## Collage Cell Selection

The **Collage Cell Selection** parameter selects which cell of the grid a particular Axon server or DL fixture will display. DMX values 0 up to 127 are used to step through grid pattern you selected with the Modifier 1 channel. As you dial through Modifier 2, the selected cell in the grid is

Array Size (8 x 5) Selected cell

highlighted. DMX values of 128-255 default to the upper left corner of the grid.

Selecting any value larger then the number of grid rectangles defined by the **Collage Config Selection** parameter or values from 128-255 defaults to the top-left rectangular area of the grid.

## **Collage Blending Adjustment**

The Collage Blending Adjustment parameter lets you select from a variety of blend curves to control the edge blending of the adjacent projections.

DMX Value	Action
0	Standard color blend curve. No adjustment
1-33	Standard color blend curve with intensity reduction adjustment (1 = maximum reduction)
34	Standard color blend curve. No adjustment
35-63	Standard color blend curve with increasing intensity (63 = maximum increase)
64-95	Gray scale blend curve with reduced intensity adjustment (64 = maximum reduction)
96	Gray scale blend curve. No adjustment
97-127	Gray scale blend curve with increasing intensity (127 = maximum increase)

## Alignment Pattern Control

The **Adjustment Pattern Control** parameter lets you determine how to view the cell as you apply the selected blend curve. You can also display grid overlays that show your selections for **Collage Config** and **Collage Cell Selection** parameters.

DMX Value	Action
0	Graphics out. Normal blending per selected blend adjustment
1	Graphics out. Blend area defaulted to black
2	Graphics out. Blend area shown with no blending applied
3	Alignment pattern out. Normal blending per selected blend adjustment
4	Alignment pattern out. Blend area defaulted to black
5	Alignment pattern out. Blend area shown with no blending applied
6	Grid cell selection shown over graphics output

## Variable Edge Blending

Variable Edge Blending parameters are used in conjunction with the Collage Generator parameters and allow for on-the-fly adjustment of blend overlap between projectors. These parameters allow more flexibility for sizing a collage to a given screen or projection surface, as well as smoother blending if wider blend regions are used. Horizontal and vertical blend regions can be controlled independently of one another.

The **Variable Edge Blend Horizontal** parameters allow 16-bit control of the horizontal blend region width from 0% (hard edge) up to 50% of the image size. The default fixture library value has been chosen to give a 9% overlap, this starting value is adjustable based on your specific installation.

The **Variable Edge Blend Vertical** parameters allow 16-bit control of the vertical blend region width from 0% (hard edge) up to 50% of the image size. The default fixture library value has been chosen to give a 9% overlap, this starting value is adjustable based on your specific installation.

## Collage Setup Example

The new Axon HD offers multiple types of blending, and this example focuses on building a standard 2x2 collage using four Axon HD media servers and a lighting console based on Hog 4 software.

#### Setup the Collage effect:

1. Select the same content on four media servers.

- NOTE: Any parameter adjustment to a graphic object must be set on ALL graphic objects that are a part of the Collage. For example, if you are configuring Graphic Object 1 on four media servers to project as a Collage and want to apply a color effect, that effect must be manipulated on Graphic Object 1 of all four media servers.
- 2. Set the Collage Type parameter on the Global Layer to Standard Collage (DMX = 1).
- 3. In the **Alignment Control** parameter on the Global Layer, show the collage selection grid by selecting the **Grid Cell Selection** option (DMX=6).
- In the Collage Config Selection parameter, select 2x2 (DMX=3) on all four Axon HD servers.
- 5. Select and assign each individual Axon HD media server its unique section of the collage using the **Collage Cell Selection** parameter on the Global Layer.
- 6. Show the alignment grid by selecting the **Pattern Normal Blend** (DMX=3) option in the **Alignment Control** parameter on the Global Layer.
- 7. Use the **Edge Blend Horizontal** and **Edge Blend Vertical** parameters on the Global Layer to adjust the edge blend on each server.

#### Execute the panorama Collage:

- 1. 1) Select All GLOBAL LAYERS and GRAPHIC LAYER 1 @ FULL.
- 2. Select a Media Folder and Media File.
- 3. Select All GLOBAL LAYERS.
- 4. Under the Collage Type; select Standard. (available on Slot Toolbar).

none	standard	wrap	mutpane	multpane wrap												
Effect 1 Mode	Effect 2 Mode	Effect 3 Mode	Effect 4 Mode	Mask	Collage Type	Algnment Control	Control Mode									Control
Beam 9 of 10	i i	dge Blend Ho			Edge Blend Ve	rt		Collage Typ	F		Collage Confi	a		Collage Cell		
Beam					_				KRNED		MAP Page 1		Programmer	Master 4	0	12:55 PM
Select.	Grouping	Touch	Suck.	Out	Rem Dim	Knockout	FIp 3	Unblock	Undo	Redo	Park	Unpark	Renumber		1	Beckup.

5. Under Alignment Control; select Cell Selection Grid. (available on Slot Toolbar)

Select	Greeping	Touch	Suck	Out	Rem Dim	Knockout	Fip	Unblock	Undo	Redo	Park	Unpark	Returber		-	Backsp
Beam									KND.		Abc Page 1		Programmer	Naster 4	0	2:191
Beam 10 of 10	Conce Sing Scale	Collag	e Blend	A	ignment Corr	irol										
Effect 1 Mode	Effect 2 Mode	Effect 3 Mode	Effect 4 Mode	Mask	Colage Type	Alignment Control	Centrol Mode									Control
graphics normal blend	graphics black blend	graphics no blend	pattern normal blend	pattern black blend	pattern no blend	cell selection grid										

CHAPTER 10 Global Functions: Collage Generator™

6. Under Collage Config.; select 1 for a 2x1

Effect 1 Mode	Effect 2 Mode	Effect 3 Mode	Effect 4 Mode	Wast	Collage Type	Alignment Control	Control Mode	l)					1 6:854	Wide		Control
Beam 9 of 10		Edge Blend Hor	2		Edge Blend Ve	n		Collage Typ			Collage Confi	0	]	Collage C	ell.	
Beam	-								KNO	MAR	Page 1	51	Programmer	Master 4	Ø	12.56 PM
Select	Grouping	Touch	Suck	Out	Rem Dim	Knockout	Fip	Unblock	Undo	Redo	Park	Urpark	Renumber			Backup

7. Select each individual GLOBAL LAYER; use Collage Cell to assign collage section to each fixture; for example select 0 for the left display device, and 1 for the right display device.

Effect 1 Mode	Effect. 2 Mode	Effect 3 Mode	Effect 4 Mode	Mask	Collage	Alignment	Control Mode									Control
Beam 9 of 10	E	dge Blend Hor			Edge Blend Ve	n		Collage Typ	0		Collage Confi	9		Collage Co	si .	
Beam			-	<u> </u>					KND		PPage 1		Programmer	Master 4	0	12:561
Select	Grouping	Touch	Suck	Out	Rem Dim	Knockput	- Hp	Unblock	Undo	Redo	Park	Unpark	Renumber			Backup

8. Select ALL GLOBAL LAYERS; under Alignment Control select Pattern Normal Blend. This will bring up the standard alignment grid.



9. Under Edge Blend Horz.; set the value to 50%. (This will set a blend size)



- 10. Align the grid using the following:
- Position
- Zoom/Focus
- Keystone
- Keystone Ratio
- 11. Once grid is aligned; Set Alignment Control to Graphics Normal Blend.



## **Creating Custom Content for the Collage Generator Effect**

There are two main steps to process HD footage into DL.3, DL.2 and Axon compliant media for use with the Collage Generator.

First, acquire or commission High-resolution media footage or stills. In most cases, scaling and cropping of the media is a simple process. However, certain types of media such as footage of people or round objects like planets may require more sophisticated cropping and scaling to optimize display in certain aspect ratios.

Then, save your media at Photo jpeg 95% or a non compressed format (these can be very large files) to use as a master file. Or, if you are an intermediate video editor yourself, there are many Video editing packages that will allow you to size and optimize the master for your application.

Once the master file is created, you will need high-definition encoder software.

For more information on creating Digital Lighting content and selecting encoder software, go to <u>www.highend.com/support/digital\_lighting</u>.

## Collages Using Live S-Video and SDI Input

DL.3, Axon and DL.2 media servers can create Collage arrays using live S-Video or SDI input. All the media servers used to project a Collage need to be receiving the same source input signal to use video as a Collage feed.

For example, using DL.3 Camera outputting across a 2 x 2 20-K lumen Central Panorama Collage, four DL.3 fixtures are assigned an output from the SDI-DMX Mixer Pro to each SDI input and a fifth DL.3 fixture is used as the source.

CHAPTER 10 Global Functions: Collage Generator™

# Chapter II: Effect Mode Options Descriptions

#### Effects can be applied to the Media File content (texture) mapped onto a 3-D object. Multiple Color and Geometric effects are available in Effect Mode parameters for both individual Graphic object and Global control.

Most of the effect options you will find described in this chapter are available for **Effects Mode** parameters at both the graphic control level for each Graphic Object and global control level for the composite image. The following pages describe all the **Effect Mode** options available along with a description of how each **Modifier** parameter functions with that mode selected. Options are arranged alphabetically and grouped as Color or Geometric Effects.

Check boxes in the upper right hand corner indicate whether this mode is available as a Graphic Object Effect, a Global Effect or both.

#### ☑ Object Effect ☑ Global Effect

Because the options for all **Effect Mode** parameters are identical, you can apply up to three effects at the graphic level and another five effects at the global level. This lets you choose, for example, whether to apply a color effect to an individual object or to the composite image at the global level.

After you select a mode using either a **Graphic Object Effect Mode** or a **Global Effect Mode** parameter, you can use the three associated Modifier parameters to adjust the effect. The behavior of the Modifier parameters depends upon the selected effect.

- For a general information on Graphics Control features, see *Graphics Engine Overview* on page 27.
- For a table of Graphic Effects, see *Effect Mode Parameters* on page 50.
- For a table of Global Effects, see *Global Effect Mode Channels* on page 114.
  - NOTE: Both Object and Global Effect parameters include effects for swapping colors to provide quick color conversions. Use the following DMX Values in any of the Effect parameters to make these color conversions.

DMX Value	Color	Color Component Conversion Effect											
7	Red => Blue	Green => Red	Blue => Green										
8	Red => Green	Green => Blue	Blue => Red										
17	Red => Cyan	Green => Magenta	Blue => Yellow										
18	Red => Magenta	Green => Yellow	Blue => Cyan										
19	Red => Yellow	Green => Cyan	Blue => Magenta										
41	Red => Blue	Green => Green	Blue => Red										
42	Red => Red	Green => Blue	Blue => Green										
43	Red => Green	Green => Red	Blue => Blue										

CHAPTER 11 Effect Mode Options Descriptions

## **Effect Mode Color Options**

#### All or Nothing

☑ Object Effect ☑ Global Effect

**Effect Mode** parameter DMX value = 15

This effect reduces all color values to full saturation or no color based on comparison to a set threshold. This effect creates an image with fully saturated color.

**Modifier 1:** Compares the red component of a pixel to the threshold value and converts it to full color if it is greater than the threshold and to black if it is below the threshold.

**Modifier 2:** Compares the green component of a pixel to the threshold value and converts it to full color if it is greater than the threshold and to black if it is below the threshold.

**Modifier 3:** Compares the blue component of a pixel to the threshold value and converts it to full color if it is greater than the threshold and to black if it is below the threshold.



**Original Content** 



Modifier 1 parameter DMX = 125 Modifier 2 parameter DMX = 140 Modifier 3 parameter DMX = 10
Global Effect

Object Effect

#### **Background Color**

Effect Mode parameter DMX value = 131

There is a default black background behind every composite image. You cannot rotate, scale or position the background and it is visible from every viewpoint and position. This effect allows you to apply color to the background. This background color will not affect any of the Graphic Object effects selected.

**Modifier 1:** Defines the red color component from DMX values of 0 = no red to 255 (100%) = maximum red saturation.

**Modifier 2:** Defines the green color component from DMX values of 0 = no green to 255 (100%) = maximum green saturation.

**Modifier 3:** Defines the blue color component from DMX values of 0 = no blue to 255 (100%) = maximum blue saturation.

## Background Color Cycle

Modifier 1 parameter DMX = 220

Modifier 2 parameter DMX = 97Modifier 3 parameter DMX = 0

Effect Mode parameter DMX value = 132

There is a background behind every composite image. You cannot rotate, scale or position the background and it is visible from every viewpoint and position. This effect allows you to cycle a color sequence on the background controlling the transition speed.

**Modifier 1:** Defines the red color component speed. A DMX value of 128 (50%) = default cycle speed. DMX Values above the midpoint increase cycle speed in a forward direction to 255 (100%) = fastest change speed. DMX values below the midpoint increase cycle speed in a backward direction to 0 = fastest change speed.

**Modifier 2:** Defines the green color component speed. A DMX value of 128 (50%) = default cycle speed. DMX Values above the midpoint increase cycle speed in a forward direction to 255 (100%) = fastest change speed. DMX values below the midpoint increase cycle speed in a backward direction to 0 = fastest change speed.

**Modifier 3:** Defines the blue color component speed. A DMX value of 128 (50%) = default cycle speed. DMX Values above the midpoint increase cycle speed in a forward direction to 255 (100%) = fastest change speed. DMX values below the midpoint increase cycle speed in a backward direction to 0 = fastest change speed.

### CMY

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 1

This parameter simulates CMY color by inverting RGB color components. Use this parameter when you want to color mix with a CMY color model instead of RGB color model.

**Modifier 1:** Increases cyan color component from 0 = no adjustment to 255 (100%) = maximum cyan saturation.

**Modifier 2:** Increases magenta color component from 0 = no adjustment to 255 (100%) = maximum magenta saturation.

**Modifier 3:** Increases yellow color component from 0 = no adjustment to 255 (100%) = maximum yellow saturation.



**Original Content** 

Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 255Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 255



Modifier 1 parameter DMX = 255Modifier 2 parameter DMX = 255Modifier 3 parameter DMX = 0

### **CMY Add All Pixels**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 2

This effect increases color values across all pixels including black pixels.

**Modifier 1:** Increases cyan color component from 0 = no adjustment to 255 (100%) = maximum cyan saturation.

**Modifier 2:** Increases magenta color component from 0 = no adjustment to 255 (100%) = maximum magenta saturation.

**Modifier 3:** Increases yellow color component from 0 = no adjustment to 255 (100%) = maximum yellow saturation.





**Original Content** 

Modifier 1 parameter DMX = 255Modifier 2 parameter DMX = 0Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 255Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 255

### **CMY Add Non-black Pixels**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 3

This effect increases color values across all pixels except black pixels.

**Modifier 1:** Increases cyan color component from 0 = no adjustment to 255 (100%) = maximum cyan saturation.

**Modifier 2:** Increases magenta color component from 0 = no adjustment to 255 (100%) = maximum magenta saturation.

**Modifier 3:** Increases yellow color component from 0 = no adjustment to 255 (100%) = maximum yellow saturation.





**Original Content** 

Modifier 1 parameter DMX = 255Modifier 2 parameter DMX = 0Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 255Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 255

#### **Color Cycle**

#### ☑ Object Effect ☑ Global Effect

**Effect Mode** parameter DMX value = 14

The image's color components cycle through RGB, black, and white. When no Red Green or Blue is added, image fades from full white, to normal image, to black. When RGB/CMY is added the image fades from the RGB value, to the image with color added.

**Modifier 1:** Increases red color component from 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases green color component from 0 = no adjustment to 255 (100%) = maximum green saturation.

**Modifier 3:** Increases blue color component from 0 = no adjustment to 255 (100%) = maximum blue saturation.

#### Color DeConverge

Object Effect Global Effect

**Effect Mode** parameter DMX value = 39

This effect separates the different color components of an image and offsets them from the original image position.

**Modifier 1:** Moves the image's red component up from 0 = no adjustment to 255 (100%) = maximum distance from original position.

**Modifier 2:** Moves the image's green component down and right from 0= no adjustment to 255 (100%) = maximum adjustment.

**Modifier 3:** Moves the image's blue component down and left from 0 = no adjustment to 255 (100%) = maximum blue saturation.



**Original Content** 



Modifier 1 parameter DMX = 211 Modifier 2 parameter DMX = 255 Modifier 3 parameter DMX = 67

Axon HD Media Server User Manual

## Colorize Gray Scale

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 44

This effect maps a selected pixel intensity to a selected color scheme. A variety of color schemes simulate effects like thermography. This is especially effective effect when applied to input from the internal camera.

**Modifier 1:** Selects from color schemes along a range of values from 0 - 255.

**Modifier 2:** Sets the zero point of the color intensity level from 0 = no intensity to 255 (100%) = maximum intensity.





**Original Content** 



Modifier 1 parameter DMX = 125 Modifier 2 parameter DMX = 200 Modifier 3 parameter DMX = 100

## **Color to Alpha**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 49

This parameter varies the transparency level of an image's component color values.

**Modifier 1:** Increases the red component opacity or intensity from 0 = no adjustment to 255 (100%) = full red opacity (intensity).

**Modifier 2:** Increases the green component opacity or intensity from 0 = no adjustment to 255 (100%) = full green opacity (intensity).

**Modifier 3:** Increases the blue component opacity or intensity from 0 = no adjustment to 255 (100%) = full blue opacity (intensity).



**Original Content** 



**Original Content** 



Modifier 1 parameter DMX = 60 Modifier 2 parameter DMX = 75 Modifier 3 parameter DMX = 240

### Color to Alpha, Inverted

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 50

This parameter varies the transparency level of the inverse of an image's component color values.

**Modifier 1:** Increases the inverse red component opacity or intensity from 0 = no adjustment to 255 (100%) = full green and blue opacity (intensity).

**Modifier 2:** Increases the green component opacity or intensity from 0 = no adjustment to 255 (100%) = full red and blue opacity (intensity).

**Modifier 3:** Increases the blue component opacity or intensity from 0 = no adjustment to 255 (100%) = full red and green opacity (intensity).



**Object 1Original Content** 



**Object 2 Original Content** 



Modifier 1 parameter DMX = 145Modifier 2 parameter DMX = 215Modifier 3 parameter DMX = 15

#### Color to B/W

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 111

Begins with a white screen and fades to the original image in black and white. All color is converted.

**Modifier 1:** Transitions the image from full white at a DMX value of 0 to black and white at a value of 128 (50%). Increasing values above 50% reveals more of the image in black and white to complete at a value of 255 (100%).

Modifier 2: Not Used

Modifier 3: Not Used

# **DotP and Resample**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 13

This effect applies an algorithm that pixelates, and solarizes the image. It also makes the surface of some 3D objects appear reflective.

Modifiers 1, Modifier 2 and Modifier 3 parameters work together to adjust the algorithm.



**Original Content** 



Modifier 1 parameter DMX = 170Modifier 2 parameter DMX = 64Modifier 3 parameter DMX = 168

## Edge Detect Black and White

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 21

This effect displays only the edges of image components. Edges appear white, everything else is black.

**Modifier 1:** Adjusts horizontal edge search size from 0= no adjustment to 255 (100%) = maximum adjustment.

**Modifier 2:** Adjusts vertical edge search size from 0= no adjustment to 255 (100%) = maximum adjustment.

**Modifier 3:** Adjusts comparison edge threshold from 0= no adjustment to 255 (100%) = maximum adjustment.



**Original Content** 



Modifier 1 parameter DMX value = 184 Modifier 2 parameter DMX value = 114 Modifier 3 parameter DMX value = 62

# Edge Detect Black and White 2

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 92

This effect displays only the edges of image components as either black or white.

**Modifier 1:** Adjusts sample distance from 0 = no adjustment to 255 (100%) = maximum adjustment.

**Modifier 2:** Adjusts comparison edge threshold from 0 = no adjustment to 255 (100%) = maximum adjustment:

**Modifier 3:** Sets the detected edge scaler, 0 - 127 = white edge on black background, 128-255 = black edge on white background.



**Original Content** 



Modifier 1 parameter DMX value = 155 Modifier 2 parameter DMX value = 40 Modifier 3 parameter DMX value = 129

## **Edge Detect Color**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 20

This effect displays only the edges of image components with their color values.

**Modifier 1:** Adjusts horizontal edge search size from 0= no adjustment to 255 (100%) = maximum adjustment.

**Modifier 2:** Adjusts vertical edge search size from 0= no adjustment to 255 (100%) = maximum adjustment.

**Modifier 3:** Adjusts comparison edge threshold from 0= no adjustment to 255 (100%) = maximum adjustment.





**Original Content** 

Modifier 1 parameter DMX = 184Modifier 2 parameter DMX = 114Modifier 3 parameter DMX = 62

# Edge Detect Color 2

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 104

This effect displays only the edges of image components with their color values with a scaler applied.

**Modifier 1:** Adjusts the sample distance from 0 = no adjustment to 255 (100%) = maximum adjustment.

**Modifier 2:** Adjusts the edge threshold comparison from 0= no adjustment to 255 (100%) = maximum adjustment.

**Modifier 3:** Sets the edge from 0= no adjustment to 255 (100%) = maximum adjustment.



**Original Content** 

Modifier 1 parameter DMX = 128 Modifier 2 parameter DMX = 128 Modifier 3 parameter DMX = 120



### Edge Fade Color

□ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 129

This effect applies color to a selected **Edge Fade** parameter, (see *Image Edge Fade* on page 126).

**Modifier 1:** Increases red color component from 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from 0 = no adjustment to 255 (100%) = maximum green saturation.



**Original Content** 



Original Content with Edge Fade effect applied



Modifier 1 parameter DMX = 143 Modifier 2 parameter DMX = 100 Modifier 3 parameter DMX = 25

#### **Exposure Control**

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 114

Exposure Control adjusts the image Black level and Contrast to optimize the projected image for your performance environment. You can use it to easily modify the black level and contrast for a specific application.

Modifier 1: Expands or contracts color.

Modifier 2: Shifts color.

Modifier 3: Not Used

**Tip:** All the factory content provided has been optimized already. This parameter and the Content Optimization option are especially useful for optimizing user content or camera capture.

#### **Fire Gradient**

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 112

This option maps image colors to a Red-to-Yellow gradient creating a fiery effect.

**Modifier 1:** Maps the image color values from no adjustment at a value of 0 to all red to yellow tones at a value of 255 (100%).

Modifier 2: Not Used



**Original Content** 



Modifier 1 parameter DMX value=255 (100%)

#### Glow

☑ Object Effect □Global Effect

Effect Mode parameter DMX value = 73

Glow colorizes and creates a glow on the 3-D object separate from the media texture on it. You can apply this effect to any 3-D object no matter which media file texture is applied to it. This parameter provides an option to view a 3-D object without displaying the associated texture.

**Modifier 1:** Increases red color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum green saturation.



**Original Content** 



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 221 Modifier 3 parameter DMX = 168

## **Glow Color Cycle**

Object Effect Global Effect

Effect Mode parameter DMX value = 74

Glow colorizes and creates a glow on the 3-D object separate from the media texture on it. You can apply this effect to any 3-D object no matter which media file texture is applied to it. This parameter provides an option to view a 3-D object without an associated texture.

**Modifier 1:** Defines the red color component speed. A DMX value of 128 (50%) = default cycle speed. DMX Values above the midpoint increase cycle speed in a forward direction to 255 (100%) = fastest change speed. DMX values below the midpoint increase cycle speed in a backward direction to 0 = fastest change speed.

Modifier 2: Defines the green color component speed in the same way as Modifier 1.

Modifier 3: Defines the blue color component speed in the same way as Modifier 1.

#### Gray maker I

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 108

This effect gradually transitions the color image to a grayscale image. Use the Gray Maker effect when you want to add an undertone of grey to the colors in an image.

## NOTE: If content is already grayscale, there is no effect applied but Modifier 2 can still affect image contrast.

**Modifier 1:** At a DMX value of 0, the image will be full color. As you increase the DMX value, more gray is introduced until, at a DMX value of 255, all color has been replaced with shades of gray.

**Modifier 2:** Adjusts the brightness of the image at the grayscale transition level selected with the Modifier 1 parameter.



**Original Content** 



Modifier1 parameter DMX value=128



Modifier1 parameter DMX value=190 Modifier2 parameter DMX value=255

#### Gray maker 2

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 109

This option converts a color image to grayscale and then lets you adjust black level and contrast.

**Modifier 1:** Adjusts the black level of the grayscale image from a DMX value of 0 = Full brightness to 255 = completely black

**Modifier 2:** Adjusts contrast of the grayscale image from 0 = no adjustment to 255 (100%) = maximum contrast







Modifier1 parameter DMX value=128



Modifier1 parameter DMX value=90 Modifier2 parameter DMX value=175

## **HS Effect Mode Options**

☑ Object Effect ☑ Global Effect

These Object and Global effects map the media file to an HSI color space. This makes it easier to isolate a specific feature in an image such as an individual flower in a landscape.







**Object 2 Background Content** 

#### HS to Gray

Effect Mode parameter DMX value = 87

This effect Maps a selected color coordinate to an HSI color space and turns everything else gray.

**Modifier 1:** Adjusts the Hue color component from 0 = no adjustment to 255 (100%) = maximum hue.

**Modifier 2:** Adjusts the **S**aturation color component from 0 = no adjustment to 255 (100%) = maximum saturation.

**Modifier 3:** Adjusts the color tolerance from 0 = minimum to 255 (100%) = maximum.



Effect Mode parameter = 87 Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 222

#### **HS Selected to Transparent**

Effect Mode parameter DMX value = 89

Maps a selected color coordinate to a HSI color space and turns it transparent and shows graphic objects "behind" it. Everything else is unchanged.

**Modifier 1:** Adjusts the Hue color component from 0 = no adjustment to 255 (100%) = maximum hue.

**Modifier 2:** Adjusts the **S**aturation color component from 0 = no adjustment to 255 (100%) = maximum saturation.

**Modifier 3:** Adjusts the color tolerance from 0 = minimum to 255 (100%) = maximum

#### **HS to Transparent**

Effect Mode parameter DMX value = 88

Maps a selected color coordinate to a HSI color space and turns everything else transparent and shows graphic objects "behind" it.

**Modifier 1:** Adjusts the Hue color component from 0 = no adjustment to 255 (100%) = maximum hue.

**Modifier 2:** Adjusts the **S**aturation color component from 0 = no adjustment to 255 (100%) = maximum saturation.

**Modifier 3:** Adjusts the color tolerance from 0 = minimum to 255 (100%) = maximum



Effect Mode Parameter = 89 Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 38 Modifier 3 parameter DMX = 255



Effect Mode Parameter = 88 Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 38 Modifier 3 parameter DMX = 255

## **Intensity Key**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 45

This effect turns pixels of a selected intensity transparent or applies the reverse effect.

Modifier 1: Selects intensity from a DMX value of 0 = no intensity to 255 (100%) = full intensity.

**Modifier 2:** Selects intensity bandwidth from a DMX value of 0 = narrowest bandwidth to 255 = widest bandwidth.

**Modifier 3:** Turns selected intensity range transparent from 0 = no change to 128 = fully transparent. DMX values above the midpoint of the range change all intensities outside of the selected range transparent from 129 = no transparency to 255 = full reverse transparency.



**Original Content** 



Modifier 1 parameter DMX = 30 Modifier 2 parameter DMX = 75 Modifier 3 parameter DMX = 168

#### **Mask Color**

Effect Mode parameter DMX value = 128

This effect applies color to a selected mask shape

**Modifier 1:** Increases red color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum green saturation.



**Original Content** 



Effect Mode Parameter = 128



Modifier 1 parameter DMX = 47Modifier 2 parameter DMX = 0Modifier 3 parameter DMX = 127

## Mask Color and Edge Fade Color

Object Effect Global Effect

Effect Mode parameter DMX value = 130

This effect applies a color to both the selected Mask shape and any selected Edge parameter. Color can also be applied to Mask shape and Edge parameters separately.

**Modifier 1:** Increases red color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum green saturation.



**Original Content** 



Original Content with Mask Color and Edge Fade Color effect applied



Modifier 1 parameter DMX = 89 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 112

# **Negative Art**

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 113

This option provides a negative of the image and then lets you adjust the amount of color and the red and green color components.

**Modifier 1:** Adjusts the color level from full at a DMX value of 0 to the lowest level at a DMX value of 255.

**Modifier 2:** Default of 128 = no adjustment. Moving toward a DMX value = 0 subtracts Red. Moving toward a DMX value = 255 subtracts Green.

#### Posterizer

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 110

This effect uses the associated **Modifier 1** parameter to posterize by replacing each color in an image with the highest values of that color but expanding it only to the border of that color. There is no bleeding or blending of colors.

**Modifier 1:** Adjusts color polarization level. The higher the value, the more color detail will be removed.

**Modifier 2:** Adjust the image contrast from 0 = no adjustment to 255 (100%) = maximum contrast.



**Original Content** 



Modifier 2 parameter DMX value=255



Modifier1 parameter DMX value=190 Modifier2 parameter DMX value=255

# Push to Sepia

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 106

This option converts all color in the image to sepia tones.

**Modifier 1:** Fades from original color at a DMX value = 0 to a range of sepia shades at a value of 255 (100%)

**Modifier 2:** Adjusts color saturation from no adjustment at a DMX value = 0 to full saturation at a value of 255 (100%)





**Original Content** 

Modifier1parameter DMX value=255



Modifier1 parameter DMX value=190 Modifier2 parameter DMX value=255

## Push to Red

☑ Object Effect ☑ Global Effect

Effect Mode Parameter DMX value = 107

This option reduces colors in the selected image to all Red values

**Modifier 1:** Fades from original color at a DMX value = 0 to a range of red tones at a value of 255 (100%)

**Modifier 2:** Adjusts color saturation from no adjustment at a DMX value = 0 to full saturation at a value of 255 (100%)



**Original Content** 



Modifier1 parameter DMX value=255



Modifier1 parameter DMX value=190 Modifier2 parameter DMX value=255

## **RGB Add, All Pixels**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 4

This effect adds color to all pixels including black using the RGB color model.

**Modifier 1:** Increases red color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum green saturation.



**Original Content** 



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 56 Modifier 3 parameter DMX = 122

## RGB Add2, All Pixels

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 5

This effect adds color to all pixels including black using an alternate RGB color algorithm.

**Modifier 1:** Increases red color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum green saturation.

## **RGB Add to Non-black Pixels**

Object Effect Global Effect

**Effect Mode** parameter DMX value = 6

This effect adds color to all pixels except black using the RGB color model.

**Modifier 1:** Increases red color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases blue color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum blue saturation.

**Modifier 3:** Increases green color component from a DMX value of 0 = no adjustment to 255 (100%) = maximum green saturation.



**Original Content** 



Modifier 1 parameter DMX = 114 Modifier 2 parameter DMX = 185 Modifier 3 parameter DMX = 255

#### **RGB** Invert

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 17

This effect inverts color values to transition the image from an RGB to a CMY color model.

**Modifier 1:** Transitions the red component from no adjustment at a DMX value = 0 to cyan at a value of 255 (100%)

**Modifier 2:** Transitions the green component from no adjustment at a DMX value = 0 to magenta at a value of 255 (100%)

**Modifier 3:** Transitions the blue component from no adjustment at a DMX value = 0 to yellow at a value of 255 (100%)



**Original Content** 



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 34 Modifier 3 parameter DMX = 203

## RGB Invert and Swap to BRG

☑ Object Effect ☑ Global Effect

**Effect Mode** parameter DMX value = 19

This effect swaps the color values from RGB to an inverted BRG color model.

**Modifier 1:** Transitions the red component from no adjustment at a value of 0 to yellow at a value of 255 (100%)

**Modifier 2:** Transitions the green component from no adjustment at a value of 0 to cyan at a value of 255 (100%)

**Modifier 3:** Transitions the blue component from no adjustment at a value of 0 to magenta at a value of 255 (100%).



**Original Content** 



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 34 Modifier 3 parameter DMX = 203

## RGB Invert and Swap to GBR

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 18

This effect swaps the color values from RGB to an inverted GBR color model.

**Modifier 1:** Transitions the red component from no adjustment at a DMX value = 0 to magenta at a value of 255 (100%)

**Modifier 2:** Transitions the green component from no adjustment at a DMX value = 0 to yellow at a value of 255 (100%)

**Modifier 3:** Transitions the blue component from no adjustment at DMX value = 0 to cyan at a value = 255 (100%)



**Original Content** 



Modifier 1 parameter DMX = 255Modifier 2 parameter DMX = 34Modifier 3 parameter DMX = 203

#### **RGB Scale**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 47

Reduce and increase color components in the image as a part of the overall color range.

NOTE: the maximum of Mod1, Mod2 and Mod3 sets overall color range.

**Modifier 1:** Scales Red in the Media file. A DMX Value of 128 = no adjustment. DMX values below 128 (50%) reduce color value. DMX values over 128 increase color value.

**Modifier 2:** Scales Green in the Media file. A DMX Value of 128 = no adjustment. DMX values below 128 (50%) reduce color value. DMX values over 128 increase color value.

**Modifier 3:** Scales Blue in the Media file. A DMX Value of 128 = no adjustment. DMX values below 128 (50%) reduce color value. DMX values over 128 increase color value.

## **RGB Swap to BGR**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 41

This effect allows you to swap colors. All red values become green and all blue values become red. Green values are unaffected.

**Modifier 1:** Transitions red color component to blue from 0 = no color change to 255 (100%) = green

**Modifier 3:** Transitions blue color component to green from 0 = no color change to

Modifier 2: No change to green color component

**Original Content** 

255 (100%) = red



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 192 Modifier 3 parameter DMX = 255

## **RGB Swap to BRG**

☑ Object Effect ☑ Global Effect

**Effect Mode** parameter DMX value = 8

This effect allows you to swap colors. All red values become blue, all green values become red and all blue values become green.

**Modifier 1:** Transitions red color component to blue from 0 = no color change to 255 (100%) = blue

**Modifier 2:** Transitions green color component to red from 0 = no color change to 255 (100%) = red

**Modifier 3:** Transitions blue color component to green from 0 = no color change to 255 (100%) = green



**Original Content** 



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 192 Modifier 3 parameter DMX = 255

## **RGB Swap to GBR**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 7

This effect allows you to swap colors. All red values become green, all green values become blue and all blue values become red.

**Modifier 1:** Transitions red color component to green from 0 = no color change to 255 (100%) = green

**Modifier 2:** Transitions green color component to blue from 0 = no color change to 255 (100%) = blue

**Modifier 3:** Transitions blue color component to red from 0 = no color change to 255 (100%) = red



**Original Content** 



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 192 Modifier 3 parameter DMX = 255
#### **RGB Swap to GRB**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 43

This effect allows you to swap colors. All red values become green and all green values become blue. Blue values are unaffected.

**Modifier 1:** Transitions red color component to green from 0 = no color change to 255 (100%) = green

**Modifier 2:** Transitions green color component to red from 0 = no color change to 255 (100%) = blue



Modifier 3: No change to blue color component

Original Content



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 192 Modifier 3 parameter DMX = 255

#### **RGB Swap to RBG**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 42

This effect allows you to swap colors. All green values become blue and all blue values become green. Red values are unaffected.

Modifier 1: No change to red color component

**Modifier 2:** Transitions green color component to blue from 0 = no color change to 255 (100%) = blue

**Modifier 3:** Transitions blue color component to green from 0 = no color change to 255 (100%) = red



**Original Content** 



Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 192 Modifier 3 parameter DMX = 255

### Scan Line

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 32

Maps image color intensities to the colors in a single horizontal line of the selected texture.

Modifier 1: Selects a line of the media file to scan

Modifier 2: Adjusts the mapping transition

Modifier 3: Not used

#### Sharpen

#### ☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 82

Manipulates edges of image components to sharpen contrast between them.

**Modifier 1:** Selects a sample distance from a minimum at a DMX value = 0 to a maximum at a DMX value = 255

**Modifier 2:** Selects the number of filter passes from a minimum at a DMX value = 0 to a maximum at a DMX value = 255

Modifier 3: Selects the scale sharpen coefficients at DMX values from 0-255





**Original Content** 

Modifier 1 parameter DMX = 128Modifier 2 parameter DMX = 0Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 128Modifier 2 parameter DMX = 30Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 128 Modifier 2 parameter DMX = 30 Modifier 3 parameter DMX = 128

#### Solarize

☑ Object Effect ☑ Global Effect

Each of the Solarize effects remaps colors to a narrow value range and inverts the color below a set threshold using different algorithms. Solarize effects can create strong highlights.

**Modifier 1:** Increases red color component from 0 = no adjustment to 255 (100%) = maximum red saturation. Red color values below the threshold are converted to cyan.

**Modifier 2:** Increases blue color component from 0 = no adjustment to 255 (100%) = maximum blue saturation. Blue color values below the threshold are converted to magenta.

**Modifier 3:** Increases green color component from 0 = no adjustment to 255 (100%) = maximum green saturation. Green color values below the threshold are converted to yellow.

#### Solarize I

Effect Mode parameter DMX value = 9



**Original Content** 



Original Content with Effect Mode = 9



Modifier 1 parameter DMX = 170 Modifier 2 parameter DMX = 137 Modifier 3 parameter DMX = 232

#### Solarize 2

Effect Mode parameter DMX value = 10





Original Content with Effect Mode = 10



Modifier 1 parameter DMX = 212 Modifier 2 parameter DMX = 255 Modifier 3 parameter DMX = 208

#### Solarize 3

Effect Mode parameter DMX value = 11

#### Solarize 4

**Effect Mode** parameter DMX value = 12

#### Solid Color RGB

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 16

Solid Color RGB removes the media file texture and allows you to color mix the 3-D object to one solid color

**Modifier 1:** Increases red color component from 0 = no adjustment to 255 (100%) = maximum red saturation.

**Modifier 2:** Increases green color component from 0 = no adjustment to 255 (100%) = maximum green saturation.

**Modifier 3:** Increases blue color component from 0 = no adjustment to 255 (100%) = maximum blue saturation.

#### **Transparent Color**

✓ Object Effect ✓ Global Effect

These effects remove a color (or small color range) from one graphic image to reveal another "behind" it. The removed color becomes transparent. Modifier parameters define the color you want to select as the transparent color in terms of Red, Green and Blue values set in the Modifier parameters.

**Modifier 1:** Defines the red color component from DMX values of 0 = no red to 255 (100%) = maximum red saturation.

**Modifier 2:** Defines the green color component from DMX values of 0 = no green to 255 (100%) = maximum green saturation.

**Modifier 3:** Defines the blue color component from DMX values of 0 = no blue to 255 (100%) = maximum blue saturation.

#### **Transparent Color Coarse**

Effect Mode parameter DMX value = 28

The Transparent Color Coarse parameter selects a color range  $\pm 40\%$  either side of the defined value.

#### **Transparent Color Fine**

Effect Mode parameter DMX value = 26

The Transparent Color Fine parameter selects a color range  $\pm 15\%$  either side of the defined value.

#### **Transparent Color Medium**

Effect Mode parameter DMX value = 27

The Transparent Color Medium parameter selects a color range  $\pm 25\%$  either side of the defined value.

#### **Transparent Color, Invert**

#### ☑ Object Effect ☑ Global Effect

These effects remove a color (or small color range) from one graphic image to reveal another "behind" it. The removed color becomes transparent. The modifier parameters define the color you want to select as the transparent color in terms of Red, Green and Blue values. An Inverted Transparent Color effect selects a color range either side of the defined value and then sets every other color as transparent.

**Modifier 1:** Defines the red color component from 0 = no red to 255 (100%) = maximum red saturation.

**Modifier 2:** Defines the green color component from 0 = no green to 255 (100%) = maximum green saturation.

**Modifier 3:** Defines the blue color component from 0 = no blue to 255 (100%) = maximum blue saturation.

#### Transparent Color Invert, Coarse

Effect Mode parameter DMX value = 31

The Transparent Color Invert, Coarse effect selects a color range  $\pm 40\%$  either side of the defined value.

#### Transparent Color Invert, Medium

Effect Mode parameter DMX value = 30

The Transparent Color Invert, Medium effect selects a color range  $\pm 25\%$  either side of the defined value.

#### Transparent Color Invert, Fine

Effect Mode parameter DMX value = 29

The Transparent Color Invert, Fine effect selects a color range  $\pm 15\%$  either side of the defined value.

#### **UV Effect Mode Options**

☑ Object Effect ☑ Global Effect

These Object and Global effects map the media file to an YUV color space. This makes it easier to isolate a specific feature in an image such as an individual flower in a landscape.





Graphic Object 2 Background Content

#### UV to Gray

**Effect Mode** parameter DMX value = 84

Maps a selected color coordinate to a YUV color space and turns everything else gray.

**Modifier 1:** Adjusts the U color component from 0 = no adjustment to 255 (100%) = maximum.

**Modifier 2:** Adjusts the V color component from 0 = no adjustment to 255 (100%) = maximum.

**Modifier 3:** Adjusts the color tolerance from 0 = minimum to 255 (100%) = maximum.



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 229 Modifier 3 parameter DMX = 101

#### **UV Selected to Transparent**

Effect Mode parameter DMX value = 86

Maps a selected color coordinate to a YUV color space and turns it transparent. Everything else is unchanged.

**Modifier 1:** Adjusts the U color component from 0 = no adjustment to 255 (100%) = maximum.

**Modifier 2:** Adjusts the V color component from 0 = no adjustment to 255 (100%) = maximum.

**Modifier 3:** Adjusts the color tolerance from 0 = minimum to 255 (100%) = maximum.



Effect Mode parameter DMX value = 85

Maps a selected color coordinate to a YUV color space and turns everything else transparent.

**Modifier 1:** Adjusts the U color component from 0 = no adjustment to 255 (100%) = maximum.

**Modifier 2:** Adjusts the V color component from 0 = no adjustment to 255 (100%) = maximum.

**Modifier 3:** Adjusts the color tolerance from 0 = minimum to 255 (100%) = maximum.



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 229 Modifier 3 parameter DMX = 101



Modifier 1 parameter DMX = 0 Modifier 2 parameter DMX = 229 Modifier 3 parameter DMX = 101

#### Yxy Luminance Scaling

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 101

Mapping the mage to a Luminance Chrominance color space allows brightness adjustment without changing image color.

**Modifier 1:** Scales luminance. Values below the midpoint decrease luminance from 127 to 0 = black. Settings above the midpoint increase luminance from 128 to 255 (100%) = white. A DMX value of 64 allows you to view the image at a minimum luminance.

**Modifier 2:** Scales the x chrominance component. The default DMX value of 128 (50%) = no adjustment. Values below the midpoint scale the x chrominance component down as you approach 0 = minimum. Values above the midpoint up to a maximum. at a value of 255 (100%)

**Modifier 3:** Scales the y chrominance component. The default DMX value of 128 (50%) = no adjustment. Values below the midpoint scale the y chrominance component down as you approach 0 = minimum. Values above the midpoint scale the y chrominance component up to a maximum at a value of 255 (100%).



**Original Content** 



Modifier 1 parameter DMX = 250 Modifier 2 parameter DMX = 128 Modifier 3 parameter DMX = 128

## **Geometric Effect Options**

#### Cartoon Edge

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 38

Outlines the edges of image components to create a rendered effect.

Modifier 1: Adjusts Color reduction from 0= no adjustment to 255 (100%) = maximum.

**Modifier 2:** Adjusts contrast enhancement from 0= no adjustment to 255 (100%) = maximum.

**Modifier 3:** Adjusts ion sensitivity from 0= no adjustment to 255 (100%) = maximum adjustment.



**Original Content** 



Modifier 1 parameter DMX value = 255 Modifier 2 parameter DMX value = 82 Modifier 2 parameter DMX value = 115

#### Chroma Shift

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 60

This effect shifts the red, blue, and green component colors in an image. You can offset color components vertically and or horizontally.

**Modifier 1:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint shift the color components right to a maximum at a value of 0. Values above the midpoint shift the color components left to a maximum at a value of 255 (100%).

**Modifier 2:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint shift the color components down to a maximum at a value of 0. Values above the midpoint shift the color components up to a maximum at a value of 255 (100%).

Modifier 3: Not Used



**Original Content** 



Modifier 1 parameter DMX value = 105 Modifier 2 parameter DMX value = 148 Modifier 2 parameter DMX value = 0

#### Curved Surface Correction

#### 

Effect Mode parameter DMX value = 135-149

Curved Surface Support corrects for shape distortions that occur when you project onto surfaces that aren't flat. This Global effect facilitates projecting onto convex or concave cylinders, angular screens, spheres, and disk shaped surfaces.



You can apply this correction to any media server output including multi-fixture image panoramas created with the Collage Generator Effect, (see *Global Functions: Collage Generator*<sup>TM</sup> *Effect* on page 133).

Use these adjustments in conjunction with Keystone parameters and Ratio parameters to refine the output shape on any of these surfaces.

Effect Mode DMX Value	Surface	
135	Curved Vertical Convex Cylinder (opening toward projector)	
136	Curved Vertical Concave Cylinder (opening away from projector)	
137	Vertical Inside Corner (opening toward projector)	
138	Vertical Outside Corner (opening away from projector)	
139	Sphere	
140	Convex Disk (opening away from projector)	
148	Curved Horizontal Convex Cylinder (opening toward projector)	
149	Curved Horizontal Concave Cylinder (opening away from projector)	

After you have selected the surface, the Modifier parameters operate as described below:

TIP: Modifier channels for Effect Mode 1 are labeled as CMY in the Wholehog system so you can also make use of the color picker, HSI, and other Wholehog functions. Use the CMY parameter controls to adjust the three Effect Mode 1 Modifier parameters for both the Global and Graphic fixture types. The default for Effect Mode 1 is set to CMY1 as well. Modifier channels for Effect Modes 2 and 3 are labeled Mod 1, Mod 2, and Mod 3.

**Modifier 1:** Modifier 1 lets you adjust the amount of correction vertically. A value of 0 = no adjustment. The correction increases as you increase value to maximum at 255 (100%).

**Modifier 2:** In situations where you are projecting from any angle other than perpendicular to the surface, you can use the Modifier 2 to adjust the vertical center of the image. A DMX value of 128 (50%) = no adjustment. Adjusting toward 0 moves the vertical center down to the bottom of the image. Values above the midrange move the vertical center up to the top of the image at a DMX value of 255 (100%).

**Modifier 3:** You can use the Modifier 3 parameter to adjust the image's horizontal center when you're projecting onto a sphere, an inside or an outside corner. A DMX value of 128 (50%) = no adjustment. Adjusting toward 0 moves the horizontal center toward the left edge of the image. Values above the midrange move the horizontal center right toward the edge of the image at a DMX value of 255 (100%).



NOTE: Modifier 3 is not used when projecting onto an inside or outside cylinder

#### **Digital MSpeed and Digital MSpeed 2**

Object Effect Global Effect

Effect Mode parameter DMX value = 103 and 105

In an effort to smooth DMX data for rotation, scaling and position values at the Graphic Object level, historically a crossfading algorithm has been applied to these values. Digital MSpeed allows you to set a crossfade speed to these values to achieve smoother fading. The following rules apply to implementing the Digital MSpeed effect:

- This effect can be applied at the Global level or the Graphic Object level but can only be applied once at any given level. That is to say, if applied twice at the global level, only the first applied (lowest numbered) will have any effect.
- When Digital MSpeed is applied at the global level, the mspeed values are applied to all the Graphic Objects.
- Digital MSpeed applied at the Graphic Object level takes precedence over digital mspeed applied at the Global level. This means you can apply a global value to all the Graphic Objects, and then override that value by assigning a different set of values on a particular Graphic Object.
- Crossfades under digital mspeed control are linear across the fade time. All ramp, snap combinations are set in the control system.

**Modifier 1** : applies MSpeed to rotation values. When DMX = 0, no MSpeed is applied, and traditional crossfading can be used. Crossfade times increase from 0 = slowest to 255 = fastest.

**Modifier 2** : applies MSpeed to scaling values. When DMX = 0, no MSpeed is applied, and traditional crossfading can be used. Crossfade times increase from 0 = slowest to 255 = fastest.

**Modifier 3**: applies MSpeed to position values. When DMX = 0, no MSpeed is applied, and traditional crossfading can be used. Crossfade times increase from 0 = slowest to 255 = fastest.

#### Downward Vertical Streaks

#### ☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 80

This effect lets you convert a portion of the image into vertical streaks. You can also rotate the angle of the streak and fade from the original image to the image with the streak effect applied.

**Modifier 1:** At a DMX value of 0, there is no effect. Increasing the DMX value sets the length of the streak portion of the image from the bottom up to 255 (100%) = the full image converted to streaks.

**Modifier 2:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint move the edge of the streaked portion of the image clockwise as you approach  $0 = 90^{\circ}$ . Values above the midpoint move the edge of the streaked portion of the image counterclockwise as you approach 90° at a value of 255 (100%).

**Modifier 3:** When Modifier 1 has a DMX value > 0, Modifier 3 lets you fade from 0 = the original image to 255 (100%) = the converted image.



Original content



Modifier 1 parameter DMX value = 170 Modifier 2 parameter DMX value = 158 Modifier 3 parameter DMX value = 255

#### **Drop Shadow**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 58

This effect creates a black plane behind the selected media file texture on a flat rectangular object. You can bring the plane from behind positioning it to form a drop shadow. You won't see the shadow until you select a Modifier 1 or 2 DMX value above or below 128 (50%).

**Modifier 1:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint move the "shadow" right as you approach 0 = maximum horizontal shadow width. Values above the midpoint move the "shadow" left to a maximum horizontal shadow width at a value of 255 (100%)

**Modifier 2:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint move the "shadow" down as you approach 0 = maximum vertical shadow width. Values above the midpoint move the "shadow" up to a maximum vertical shadow width at a value of 255 (100%)

**Modifier 3:** Adjusts the shadow's opacity from 0 = full opacity to 255 (100%) = maximum transparency.

**Tip:** To ensure that the shadow remains black and is unaffected by other graphic effects, apply it as the last effect selected for an image.



**Original Content** 



Modifier 1 parameter DMX value=0 Modifier 2 parameter DMX value=255 Modifier 3 parameter DMX value=0

#### **Edge Frame Profiles**

Object Effect Global Effect

Effect Mode parameter DMX value = 133

This effect contains three modes that modify the **Global Image Edge Fade** parameters to frame the global composite image. Modifier 2 and Modifier 3 adjustments vary depending which of the framing modes is selected with Modifier 1.

# NOTE: If the Global Image Edge Fade DMX values are set to Zero, the Framing output will be unseen in modes 0 and 1.

The images below show examples of the first two framing modes. In the image on the left Modifier 1 selects the internal profile framing option, with Modifier 2 selecting the frame pattern.

In the example on the right, Modifier 1 selects the Graphic Object texture framing option, with Modifier 2 selecting the frame pattern. A Modifier 3 DMX value = 10 designates the Frame texture as Graphic Object 2's media file content minus any applied effects.

#### NOTE: Global Image Edge Fade DMX values = 100.







Effect Mode parameter = 133 Modifier 1 parameter DMX = 1 Modifier 2 parameter DMX = 251 Modifier 3 parameter DMX = 10

#### Framing Shutter Emulation

When Modifier 1 is set to a DMX value = 2, Modifier parameters 2 and 3 are not used. Instead, the four **Global Image Edge Fade** parameters control image to emulate framing shutters. In the example to the right, each **Image Edge Fade** parameter has been set to a DMX value = 100.

NOTE: This technique is useful when your are running Version 1 Protocol. Version 2 Protocol provides a much better solution for this situation with eight Framing Shutter channels.



Modifier 1: This parameter allows you to select from three framing modes.

DMX Value	Action
0	Frames the image using an Internal Frame profile to control the Global Fade Edge parameter
	appearance.
1	Frames the image using an Internal Frame profile to control the Global Fade Edge parameter
	appearance. Rendered Graphic Object content is selected at Frame texture using Modifier 3
	parameter
2	Image clipping changing operation of the Global Image Edge Fade parameters to Emulate Framing Shutters

**Modifier 2:** When the Modifier 1 DMX value = 0 or 1, this channel selects from profiles that vary in gradient density or pattern. When Modifier 1 DMX value = 2, this Modifier is not used.

**Modifier 3:** When Modifier 1 DMX Value = 1, this parameter determines how to use the rendered Graphic Object content as a texture for the frame. When Modifier 1 DMX value = 2, this Modifier is not used.

Modifier 1 DMX Value	Modifier 3					
	DMX value	Action				
0	NA	Not Used				
1	0	Graphic Object 1 texture without applied Effects				
	1	Graphic Object 1 texture including its first applied Effect				
	2	Graphic Object 1 texture including its first two applied Effects				
	3	Graphic Object 1 texture including its first three applied Effects				
	10	Graphic Object 2 texture without applied Effects				
	11	Graphic Object 2 texture including its first applied Effect				
	12	Graphic Object 2 texture including its first two applied Effects				
	13	Graphic Object 2 texture including its first three applied Effects				
	20	Graphic Object 3 texture without applied Effects				
	21	Graphic Object 3 texture including its first applied Effect				
	22	Graphic Object 3 texture including its first two applied Effects				
	23	Graphic Object 3 texture including its first three applied Effects				
2	NA	Not Used				

#### Faux LED

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 55

This effect divides the image into a grid of circles that mimic an LED wall. The color of the center pixel in each cell defines the solid color for that circle. You can control "LED" size, background and color peaking.

**Modifier 1:** Controls the "LED" size. The default DMX value of 0 displays a 100 x 100 grid of "LEDs". Increasing the DMX value decreases the grid divisions to a minimum of 10 x 10 at a value of 255 (100%).

NOTE: A small number of larger "LEDs" will also result in reduced color variation.

Adjusts the grid spacing and color around each "LED". A DMX value of 0 = the minimum black line between cells. The spacing increases to a maximum at a DMX value of 127 (49%). At a value of 128 (50%), the space between cells reverts to the minimum spacing and turns white. Increasing the value further increases the white spacing to a maximum at a DMX value of 255 (100%).

**Modifier 3:** Adjusts the color peaking to simulate lighting at the "LED" center. A DMX value of 0 = no adjustment and flat color across the cell. As you increase the DMX value, the peaking increases to a maximum at 255 (100%).



**Original Content** 



Modifier 1 parameter DMX = 202 Modifier 2 parameter DMX = 16 Modifier 3 parameter DMX = 167

#### Faux Tile

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 56

This effect divides the image into a grid of tiles with simulated lighting at the edges. The color of the center pixel in each cell defines the solid color for that tile. You can control the number and spacing of tile, choose between a black and white grid and adjust color peaking.

**Modifier 1:** Controls the tile size. The default DMX value of 0 displays a 100 x 100 grid of tiles. Increasing the DMX value decreases the grid divisions to a minimum of 10 x 10 at a value of 255 (100%).

NOTE: A small number of larger "tiles" will also result in reduced color variation.

**Modifier 2:** Adjusts the grid spacing and color around each tile. A DMX value of 0 = the minimum black line between tiles. The spacing increases to a maximum at a DMX value of 127 (49%). At a value of 128 (50%), the space between tiles reverts to the minimum spacing and turns white. Increasing the value further increases the white spacing to a maximum at a DMX value of 255 (100%).

**Modifier 3:** Adjusts the color peaking to simulate lighting at the tile edges. A DMX value of 0 = no adjustment and flat color across the tile. As you increase the DMX value, the peaking increases to a maximum at 255 (100%).



**Original Content** 



Modifier 1 parameter DMX = 188 Modifier 2 parameter DMX = 139 Modifier 3 parameter DMX = 255

#### Film Burn/Unburn

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 93

This effect creates multiple burn patterns over the image.

**Modifier 1:** Adjust the burn-through rate. A DMX value of 65 begins creating a burn pattern with flames from 64 = slowest to 127 = fasted rate. Values below 65 "unburn the pattern from 63 = slowest to 0 = fastest unburn. Values in the upper half of the range create the burn pattern without flames from 192 = slowest to 255 = fastest burn rate. A value of 191 "unburns" the patterns from 191 = slowest to 128 = fastest "unburn" without flames.

**Modifier 2:** Adjusts the amount of film blackening around the burn areas from 0 = the smallest amount of blackening to 255 (100%) = the largest blackened area.

Modifier 3: Each DMX value selects one of 255 burn patterns.



**Original Content** 



Modifier 1 parameter DMX = 152 Modifier 2 parameter DMX = 234 Modifier 3 parameter DMX = 211

#### Film Noise

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 94

This effect creates the effect of scratches on film. You can adjust the amount of "noise" as well as the tint and "jitter" to give the image an aged film effect.

**Modifier 1:** Adjusts the noise rate. A DMX value of 128 (50%) pauses the noise. Values below the midpoint adjust the rate from 0 = fastest to 127 = slowest. Values above the midpoint adjust the rate from 129 = slowest to 255 (100%) = fastest.

**Modifier 2:** Shifts the color to a sepia tint, 128 = no adjustment, 0 to 127 = full sepia. Values above the midpoint of the range repeat the push to sepia with jitter added from 129 (51%) = full color and no jitter to 255 (100%) = full sepia and maximum jitter.

**Modifier 3:** Reduces the noise level from 0 = maximum noise to 255 (100%) = no noise.



**Original Content** 



Modifier 1 parameter DMX = 157 Modifier 2 parameter DMX = 94 Modifier 3 parameter DMX = 26

#### Film Roll

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 53

This effect scrolls the media file texture horizontally or vertically independent from the 3-D object it overlays, and allows you to control the scrolling speed and image scaling.

**Modifier 1:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint scroll left, increasing in speed as you approach 0. Values above the midpoint scroll right, increasing in speed to 255 (100%).

**Modifier 2:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint scroll down, increasing in speed as you approach 0. Values above the midpoint scroll up, increasing in speed to 255 (100%).

**Modifier 3:** Scales the image from 0 = no adjustment to maximum tiling at 255.

#### Object Effect Global Effect

Effect Mode parameter DMX value = 83

This effect flips the media file texture horizontally or vertically independent from the 3-D object it overlays.

**Modifier 1:** DMX values from 0-127 have no effect. DMX values of 128 (50%) to = 255 (100%) flips the image horizontally.

**Modifier 2:** DMX values from 0-127 have no effect. DMX values of 128 (50%) to = 255 (100%) flips the image vertically.

Modifier 3: Not used

Flip



Original content



Modifier 1 parameter DMX = 128Modifier 2 parameter DMX = 0



Modifier 1 parameter DMX = 128 Modifier 2 parameter DMX = 128

#### Fuzzifier

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 57

This effect offsets multiple images of the media file texture to blur the image, and lets you control image scaling at the same time.

**Modifier 1:** The default DMX value of 0 = no adjustment. Increasing DMX values blur the image horizontally to a maximum at a DMX value of 255 (100%).

**Modifier 2:** The default DMX value of 0 = no adjustment. Increasing DMX values blur the image vertically to a maximum at a DMX value of 255 (100%).

**Modifier 3:** Adjusts the decay level of the blurred edge from 0 = no adjustment to maximum full decay at 255.



**Original Content** 



Modifier 1 parameter DMX =255 (100%) Modifier 2 parameter DMX =255 (100%) Modifier 3 parameter DMX = 0

#### **Gaussian Blur**

Effect Mode parameter DMX value = 81

More precise than Fuzzifier effect, this effect creates a true blur effect utilizing a gaussian curve.

**Modifiers 1** and **Modifier 2** combine to create the effect. When Modifiers 1 and 2 both have a value less than 0, there is no Blur. Increasing Modifier 1 and Modifier 2 values increases the sample distance and number of filter passes.

**Modifier 3:** Applies a range of curve shapes from a DMX value = 0 through 255 (100%).

#### 



Original Content



Modifier 1 parameter DMX = 128, Modifier 2 parameter DMX = 128 Modifier 3 parameter DMX = 128



Modifier 1 parameter DMX = 255, Modifier 2 parameter DMX = 255 Modifier 3 parameter DMX = 255

#### **Gaussian Halo**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 99

This effect blurs the content from around a circular area in the center of the image toward the edges.

# NOTE: Adjusting Mod 3, then Mod 1 and finally Mod 2 will give the best results with the least CPU demand.

**Modifiers 1** : Increases the sample distance to determine the "smoothness" of the blurring from 0 = minimum to 255 (100%) = maximum.

**Modifier 2** : Increases the number of filter passes from 0 = one pass to 255 (100%) = a maximum of sixteen filter passes

**Modifier 3:** Applies a range of curve shapes from 0 = no adjustment to 255 (100%) = maximum adjustment.



**Original Content** 



Modifier 1 parameter DMX = 193, Modifier 2 parameter DMX = 255 Modifier 3 parameter DMX = 255

#### **Horizontal Mirror**

Effect Mode parameter DMX value = 40

This effect duplicates the image vertically and mirrors the image alongside its original.

**Modifier 1:** The default DMX value of 128 (50%) sets the center point of the edge where the duplicate images meet at the center of the screen. Values below the midpoint move the center point toward the left as you approach 0. Values above the midpoint move the center point toward the right as you approach 255 (100%).

Modifier 2: Not Used



**Original Content** 

Modifier 3: Not Used



Effect Mode parameter DMX = 40Modifier 1 parameter DMX = 0



Effect Mode parameter DMX = 40 Modifier 1 parameter DMX = 134

#### Image Scale and Rotate

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 52

This effect lets you scale and rotate the media file texture applied to a 3-D object's surface independent of Graphic Object rotation you set with the Rotation parameters (see *Rotating a 3-D Object* on page 39). This allows scaling and rotating outside the bounds of the 3D object.

**Modifier 1:** Scales the texture. The default DMX value of 0 = no adjustment. As you increase the DMX value to 255 (100%), the single image scales to an increasing number of multiple images similar to tiling.

**Modifier 2:** Sets the texture rotation angle. A DMX value of 128 (50%) = no adjustment. Values above the midpoint rotate clockwise 255 (100%) = maximum rotation. Values below the midpoint rotate counterclockwise to 0=maximum rotation.

Modifier 3: Sets the rotation speed from a DMX value of 0 = static to 255 (100%) = maximum.



**Original Content** 



Modifier 1 parameter DMX = 255Modifier 2 parameter DMX = 0Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 255, Modifier 2 parameter DMX = 81 Modifier 3 parameter DMX = 128

#### **Lens Grid**

☑ Object Effect ☑ Global Effect

**Effect Mode** parameter DMX value = 91

This effect lets you view the image through a grid of virtual convex lenses. You can adjust the number, magnification and edge shading of the lenses over the image.

**Modifier 1:** Controls the horizontal position of the lens' centerpoint from 0 =left edge to 255 (100%) = right edge of output.

Modifier 2: Controls the edge shading.

**Modifier 3:** Controls the number of the lens from DMX values of 0 = many to 255 (100%) = single lens.



**Original Content** 



Modifier 1 parameter DMX = 12 Modifier 2 parameter DMX = 112 Modifier 3 parameter DMX = 33

### Magnifying Lens

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 36

This effect applies spherical overlay that magnifies a portion of the texture to create a virtual convex lens effect over a portion of the image. You can adjust the size of the lens and *move* it over different areas of the image.

**Modifier 1:** Controls the horizontal position of the lens' centerpoint from 0 =left edge to 255 (100%) = right edge of output.

**Modifier 2:** Controls the vertical position of the lens' centerpoint from 0 = top edge to 255 (100%) = bottom edge of output.

**Modifier 3:** Controls the size of the lens from 0 = smallest to 255 (100%) = largest.



**Original Content** 



Modifier 1 parameter DMX = 107 Modifier 2 parameter DMX = 143 Modifier 3 parameter DMX = 61

### Magnifying Lens 2

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 37

This effect applies spherical overlay that magnifies a portion of the texture to create a doubled virtual convex lens over a portion of the image. You can adjust the size of the lens and *move* it over different areas of the image.

**Modifier 1:** Controls the horizontal position of the lens' centerpoint from 0= left edge to 255 (100%) = right edge of output.

**Modifier 2:** Controls the vertical position of the lens' centerpoint from 0=top edge to 255 (100%) = bottom edge of output.

Modifier 3: Controls the size of the lens from 0=smallest to 255 (100%) = largest.

Tip: Zooming in with this lens effect creates an additional effect.



**Original Content** 



Modifier 1 parameter DMX = 107 Modifier 2 parameter DMX = 143 Modifier 3 parameter DMX = 61

#### Mattes

Object Effect Global Effect

#### Effect Mode parameter DMX value = 144

The Global Effect lets you select from a variety of provided patterns to superimpose over the composite image. Modifier parameters select the pattern and effects for a matte.

The images below show two examples of the Mattes effect. In the image on the left, the Modifier 2 value selected the matte pattern. Modifier 1 sets black as transparent. The Modifier 3 value corresponds with a lookup to an internal gradient map to determine the matte color.

In the example on the right, the same Matte is selected by Modifier 2. This time the Modifier 1 value selects white as transparent and uses a graphic object as a texture. A Modifier 3 DMX value of 0 designates the Matte texture as Graphic Object 1's media file content minus any applied effects.



Modifier parameter 1 DMX = 11 Modifier parameter 2 DMX = 13 Modifier parameter 3 DMX = 203



Modifier parameter 1 DMX = 5 Modifier parameter 2 DMX = 13 Modifier parameter 3 DMX = 0

Modifier 1: This parameter determines transparency and color effects for the selected matte:

DMX value	Modifier 1 Action		
0	Black transparent, use matte color		
1	Black transparent, inverting matte color		
2	White transparent, use matte color		
3	White transparent, then invert matte color		
4	Black transparent using a Graphic Object media file content as the matte texture		
5	White transparent using a Graphic Object media file content as the matte texture		
6	Black transparent with grayscale used as alpha		
7	White transparent with grayscale used as alpha		
8	Black transparent with grayscale not used as alpha		
9	White transparent with grayscale not used as alpha		
10	Black transparent, with matte color controlled by Modifier 3 as lookup in internal color gradient map		
11	Black transparent, with matte color controlled by Modifier 3 as lookup in internal color gradient map and inverted		



Modifier 2: The first 20 DMX values are assigned to the following Matte pattern options:

**Modifier 3:** This parameter determines the texture for the Matte mode selected with the Modifier 1 parameter.

Modifior 1	Modifier 3			
DMX Value	DMX value	Action		
0 - 3	NA	Not Used		
	0	Graphic Object 1 texture without applied Effects		
	1	Graphic Object 1 texture including its first applied Effect		
	2	Graphic Object 1 texture including its first two applied Effects		
	3	Graphic Object 1 texture including its first three applied Effects		
	10	Graphic Object 2 texture without applied Effects		
4 0	11	Graphic Object 2 texture including its first applied Effect		
4-9	12	Graphic Object 2 texture including its first two applied Effects		
	13	Graphic Object 2 texture including its first three applied Effects		
	20	Graphic Object 3 texture without applied Effects		
	21	Graphic Object 3 texture including its first applied Effect		
	22	Graphic Object 3 texture including its first two applied Effects		
	23	Graphic Object 3 texture including its first three applied Effects		
10 - 11	0-255	Color selected as a look up value from an internal gradient.		

Axon HD Media Server User Manual

#### Pan and Scan

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 255

This effect Zooms into a still image and then, by changing position, you can pan across the image horizontally and vertically. It only functions on image sizes greater than 1024 x 1024 in at least one direction.

**Modifier 1:** Adjusts the horizontal pan position from 0= left edge to 255 (100%) = right edge of the image. The default DMX value of 128 (50%) = no adjustment.

**Modifier 2:** Adjusts the vertical pan position from 0 = bottom edge to 255 (100%) = top edge of the image. The default DMX value of 128 (50%) = no adjustment.

**Modifier 3:** The default DMX value is 0 = no zoom. Increasing the value, increases the zoom into the image to a maximum at a value of 255 (100%). The total Zoom range is proportional to the image size.

**Tip:** Although you can apply this effect in several different modes (global, graphic and visual), the modifier channel adjustments will only function if there is enough "room" left on the image to move. In most cases the first application of this effect will be the only one to have an effect.
# **Particle System**

#### □ Object Effect ☑ Global Effect

Three Particle System effects operate together to create a particle pattern effect. By using all three effects, you can, in effect, apply nine modifier adjustments.

# NOTE: You must use the Particle System 1 effect. Then you can add Particle System 2 and Particle System 3 for additional Modifier support to the initial effect.

#### **Particle System I**

**Effect Mode** parameter DMX value = 95

This option provides the baseline effect.

**Modifier 1:** Determines emitter pattern that will shape the particle effect. Multiple emitter patterns are available and more will be added in subsequent releases. All DMX values after the last pattern variation default to the first emitter pattern (Random Within Rectangle).

DMX value	Modifier 1 Action	1	DMX value	Modifier 1 Action
0	RandomWithinRectangle		17	SequentialRightToLeft
1	RandomOnRectangle		18	SequentialBottomToTop
2	RandomOnRectangleInward		19	SequentialLeftToRight
3	RandomOnRectangleOutward		20	SequentialClockwise
4	RandomInCircle		21	RandomTopLeftRadial
5	RandomOnCircleInward,		22	RandomTopRightRadial
6	RandomOnCircleOutward,		23	RandomBottomRightRadial
7	RandomAtTop,		24	RandomBottomLeftRadial
8	RandomAtRight,		25	RandomTopLeftRightRadial
9	RandomAtBottom,		26	RandomBottomRightLeftRadia
10	RandomAtLeft,		27	RandomFourCorners
11	RandomAtTopAndRight,	_	28	RandomStaticInsideRectangle
12	RandomAtRightAndBottom,	-	29	RandomStaticOutsideRectang e
13	RandomAtBottomAndLeft,		30	RandomStaticOnRectangle
14	RandomAtLeftAndTop	-	31	RandomStaticInsideCircle
15	RandomAtTopRightBottomLeft	-	32	RandomStaticOutsideCircle
16	SequentialTopToBottom		33	RandomStaticOnCircle

**Modifier 2:** Adjusts the trailing of each particle as it moves across the image from 0 = shortest trail to 255 (100%) = longest.

**Modifier 3:** This parameter determines particle acceleration. A DMX value of 128 (50%) is the default. Values on each side of the midpoint increase the particle acceleration from 0 = slowest to 127 (49%) = fastest and from 129 (51%) = slowest to 255 (100%) = fastest.



**Original Content** 



Content with Particle 1 effect applied. Modifier 1 parameter DMX = 0Modifier 2 parameter DMX = 0Modifier 3 parameter DMX = 0



Modifier 1 parameter DMX = 33 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 0

#### Particle System 2

**Effect Mode** parameter DMX value = 96 This option can be used to add additional modifier adjustments to the baseline effect you set up in the Particle System 1 effect.

**Modifier 1:** Determines the number of particles from 0 = smallest number to 255 (100%) = largest number of particles.

**Modifier 2:** Adjusts particle size from 0 = smallest to 255 (100%) = largest particle size.

TIP: Reducing the particle size enhances any trailing you set in the Particle System 1 effect.



Modifier parameter 1 DMX value = 45 Modifier parameter 2 DMX value = 62 Modifier parameter 3 DMX value = 0

Modifier 3: Adjusts the size of the emitter

shape you selected in the Particle System 1 effect by spreading the source area from 0 = the smallest source area to 255 (100%) = the largest.

# Particle System 3

Effect Mode parameter DMX value = 97

If you have already selected the Particle System 1 and 2 effects, you can further adjust the effect with this option.

**Modifier 1:** Sets the Initial Particle Velocity from 0 = slowest to 255 (100%) = fastest.

**Modifier 2:** Sets the particle rotation. A DMX value of 128 (50%) = no rotation. Values above the midpoint rotate counterclockwise from 129 = slowest to 255 (100%) = fastest. Values below the midpoint rotate clockwise from 0 = fastest to 127 = slowest.

Modifier 3: Sets the particle lifetime from 0 = shortest to 255 (100%) = longest

# **Picture in Picture**

**Original Content** 

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 35

This effect creates a window in the image containing a scaled down version of the same image and then lets you position it anywhere on the output plane.

**Modifier 1:** Controls the horizontal position of the subpicture's centerpoint from 0=left edge to 255 (100%) = right edge of output.

**Modifier 2:** Controls the vertical position of the subpicture's centerpoint from 0=top edge to 255 (100%) = bottom edge of output.



**Modifier 3:** Controls the size of the picture from 0=smallest to 255 (100%) = largest.

M



Modifier parameter 1 DMX value = 176 Modifier parameter 2 DMX value = 76 Modifier parameter 3 DMX value =133

# **Prerotation Translation**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 102

Rotation parameters rotate the center of an image around the x, y or z axis. The Prerotation Translation Effect Mode option allows you to position the image in a virtual 3-dimensional space. Then, when the Rotation parameters for the object are applied, the image will orbit around each axis from this new position.

NOTE: When this option is applied as a Global effect, it will include any prerotation translation selected as an Object effect.

**Modifier 1:** Moves the horizontal position of the image centerpoint from 0 = left edge to 255 (100%) = right edge of output.

**Modifier 2:** Controls the vertical position of the subpicture's centerpoint from 0=top edge to 255 (100%) = bottom edge of output.

Modifier 3: Controls the size of the picture from 0=smallest to 255 (100%) = largest.

#### **Pixelate**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 54

This effects divides the image into rectangles using the center pixel color of each "box" as its color. You can control the number of boxes, and adjust the vertical and horizontal dimensions.

**Modifier 1:** Controls the number of divisions. Fewer, larger boxes will also result in reduced color variations.

**Modifier 2:** Reduces the box size horizontally to centerpoint from 0 = no reduction to 255 (100%) = full reduction. At that point, the image will then be composed of series of horizontal bands.

**Modifier 3:** Reduces the box size vertically to centerpoint from 0 = no reduction to 255 (100%) = full reduction. At that point, the image becomes a series of vertical bands.







Modifier 1 parameter DMX = 93 Modifier 2 parameter DMX = 7 Modifier 3 parameter DMX = 0

# **Pixel Twist**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 34

This effect introduces a twisted area to the image and allows to you size it and move it in the image.

**Modifier 1:** Controls the horizontal position of the twisted area's centerpoint from 0=left edge to 255 (100%) = right edge of output.

**Modifier 2:** Controls the vertical position of the twisted area's centerpoint from 0=top edge to 255 (100%) = bottom edge of output.

**Modifier 3:** Controls the direction and amount of twist. At the midpoint of the range, there is no change in the image. The twist area and size moves counterclockwise from 128 (50%) = smallest area to 0 = largest twist area moving counterclockwise. The twist area and size moves clockwise from 128 (50%) = smallest area to 255 (100%)= largest twist area moving clockwise.



**Original Content** 



Modifier 1 parameter DMX = 134 Modifier 2 parameter DMX = 106 Modifier 3 parameter DMX = 193

# Prism

Effect Mode parameter DMX value = 98

This effect imitates looking at the image through a prism that you define with the Modifier parameters.

**Modifier 1:** Sets the number of facets. A DMX value of 0 = no facets. The number of facets increase from 10 = three facets to 255 (100%) = maximum 16 facets.

**Modifier 2:** Sets the refraction index from 0 = minimum to 255 = maximum

**Modifier 3:** Rotates the prism. The default value is 128 (50%). Values below the midpoint rotate clockwise from 0 = fastest to 127 = slowest rotation. Values above the midpoint rotate counterclockwise from 129 = fastest to 255 = slowest rotation.







Modifier 1 parameter DMX = 255 Modifier 2 parameter DMX = 107 Modifier 3 parameter DMX = 155

# Raindrop

☑ Object Effect ☑ Global Effect

Effects Mode parameter DMX value = 46

This effect simulates a raindrop distortion on a surface.

**Modifier 1:** Controls the drop size from 0 = no drop to 255 (100%) = maximum size.

**Modifier 2:** Sets the random number generator seed number. This lets you create a repeatable random sequence that will synchronize correctly when using the Collage Generator effect, see *page 137*.

**Modifier 3:** Adjusts the raindrop creation rate from 0 = no adjustment to 255 (100%) = maximum rate.



**Original Content** 



Modifier parameter 1 DMX value = 255 Modifier parameter 2 DMX value = 255 Modifier parameter 3 DMX value = 185

# Scene Change

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 100

This effect creates transparency in video content based on the change in pixel color from one frame to the next. Modifiers 1 and 2 use the color difference between the current frame and the previous frame to derive an alpha value for the output frame. Modifier 3 scales the color of the current frame to provide the color of the output frame.

**Modifier 1:** Scales RGB values of the previous frame; from 0 = maximum to 255 = minimum scaling.

**Modifier 2:** Derives an alpha value from color difference between current frame and the result of modifier 1. DMX 0 to 127 act to make darker colors transparent, with DMX 0 resulting in maximum transparency. DMX values 128 to 255 act to make bright colors transparent, with DMX 255 = maximum transparency.

**Modifier 3:** Scales the RGB values of the current frame to provide the output RGB values. DMX 0 provides the brightest output RGB values. DMX 255 = the darkest output RGB values.



**Object 1 Original Content** 



**Object 2 Original Content** 



Modifier parameter 1 DMX value = 0 Modifier parameter 2 DMX value = 255 Modifier parameter 3 DMX value = 185

# ShakeNBake

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 61

This effect randomly vibrates the image. You can control the horizontal and vertical frequency.

**Modifier 1:** Adjusts random horizontal "shake" from the shortest refresh rate at a value = 0 to to a maximum at a DMX value of 255 (100%).

**Modifier 2:** Adjusts random vertical "shake" from the shortest refresh rate at a value = 0 to a maximum at a DMX value of 255 (100%).

**Modifier 3:** Adjusts how much the image is allowed to move from a minimum at a DMX value of 0 to a maximum at a DMX value of 255 (100%).

**Tip:** To get the maximum effect, set a high value for Modifier 3 and low values for Modifiers 1 and 2.

#### Sinewave, Circular

Object Effect

Global Effect

Sinewave, Circular w/X Axis Wobbulation Effect Mode parameter DMX value = 64

#### Sinewave, Circular w/Y Axis Wobbulation

Effect Mode parameter DMX value = 65

#### Sinewave, Circular w/Z Axis Wobbulation

Effect Mode parameter DMX value = 66

These effects create a circular sinewave pattern and then vary the boundaries of the underlying object along the designated axis without affecting the media file that is applied as a texture.

**Modifier 1:** Adjusts the size (amplitude) of the wobble from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the wobble from 0 = no adjustment to 255 (100%) = maximum rate.

**Modifier 3:** Adjusts the offset (phase) of the wobble from 0 = no adjustment to 255 (100%) = maximum offset.

# Sinewave, Horizontal

Object Effect Global Effect

Sinewave, Horizontal w/X Axis Wobbulation Effect Mode parameter DMX value = 67

#### Sinewave, Horizontal w/Y Axis Wobbulation

Effect Mode parameter DMX value = 68

#### Sinewave, Horizontal w/Z axis Wobbulation

Effect Mode parameter DMX value = 69

These effects create a horizontal sinewave pattern and then vary the boundaries of the underlying object along the designated axis without affecting the media file that is applied as a texture.

**Modifier 1:** Adjusts the size (amplitude) of the wobble from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the wobble from 0 = no adjustment to 255 (100%) = maximum rate.

**Modifier 3:** Adjusts the offset (phase) of the wobble from 0 = no adjustment to 255 (100%) = maximum offset.

#### Sinewave, Vertical

Object Effect Global Effect

Sinewave, Vertical w/X Axis Wobbulation Effect Mode parameter DMX value = 70

Sinewave, Vertical w/Y Axis Wobbulation Effect Mode parameter DMX value = 71

#### Sinewave, Vertical w/Z Axis Wobbulation

Effect Mode parameter DMX value = 72

This effect creates a Vertical sinewave pattern and then varies the boundaries of the underlying object along the X axis without affecting the media file that is applied as a texture.

**Modifier 1:** Adjusts the size (amplitude) of the wobble from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the wobble from 0 = no adjustment to 255 (100%) = maximum rate.

**Modifier 3:** Adjusts the offset (phase) of the wobble from 0 = no adjustment to 255 (100%) = maximum offset.

# Slats

# Vertical Slats

Effect Mode parameter DMX value = 62

#### **Horizontal Slats**

Effect Mode parameter DMX value = 63

These effects render the image in offset slats.

**Modifier 1:** Adjusts the number of slats from from a DMX value of 0 = no slats to 255 = the maximum number of slats.

**Modifier 2:** Adjusts the displacement of the slats from a DMX value of 0 = no displacement to 255 = image completely removed from screen.



Global Effect

Object Effect

**Original Content** 

**Modifier 3:** When the DMX value for Modifier 1 > 0, Modifier 3 fades from the original image to the slatted image. A DMX value of 0 = the original image with no effect applied. Increasing the value fades to the slatted image with 255 = the slatted image at full opacity.



Effect Mode parameter DMX = 62 Modifier 1 parameter DMX = 204 Modifier 2 parameter DMX =40 Modifier 3 parameter DMX = 255

**Horizontal Slat Option** 



Effect Mode parameter DMX value = 63 Modifier 1 parameter DMX =204 Modifier 2 parameter DMX =40 Modifier 3 parameter DMX = 255

# Vertical Slat Option

# Spherical Mapping

#### 

Spherical Mapping adjusts a rectangular output to project on a portion of a sphere. It is especially useful for projecting a Collage onto a sphere or a portion of a sphere. Spherical mapping utilizes a total of nine Effect Modifier parameters to adjust positioning. In addition to the three modifiers associated with the Global Effect, two Graphics Object Effects provide six additional Modifier parameters. Use these adjustments in conjunction with Keystone parameters and Ratio parameters to refine the output shape on the spherical surface.

For a more information and a detailed setup guide for Spherical Mapping, see *Mapping a Collage* to a Spherical Surface on page 140.

#### Spherical Mapping, Outside

**Effect Mode** parameter DMX value = 142

This effect corrects shape distortions and controls blending for Collages projected onto the outside surface of a sphere.

#### Spherical Mapping, Inside

**Effect Mode** parameter DMX value = 143

This Global Effect corrects shape distortions and controls blending for Collages projected onto the inside surface of a sphere.

#### Modifier Parameter Adjustments

# When Spherical Mapping is selected, the associated Global Effect Modifier parameters adjust as follows:

**Modifier 1:** Adjusts the longitude (horizontal) angle. A value of 0 = no adjustment. The number of degrees of angle increases as you increase value to maximum at 255 (100%).

**Modifier 2:** Adjusts the latitude (vertical) angle. A value of 0 = no adjustment. The number of degrees of angle increases as you increase value to maximum at 255 (100%).

**Modifier 3:** Adjusts the center of the latitude angle. A value of 128 = no adjustment and assumes the center of the latitude angle is at the "equator". Values below the midpoint move the center of the latitude angle down with 0 = maximum distance below the "equator". Values above the midpoint move the center of the latitude angle up to 255 = maximum distance above the "equator".

# NOTE: When the Spherical Mapping effect is selected in a Global Effect parameter **and** a Graphic Effect parameter's DMX value = 253, the Graphic Effect Modifier parameters make the following Spherical Mapping adjustments:

**Modifier 1:** Controls the vertical offset of the projector. A value of 128 = no adjustment. to maximum at 255 (100%). Values below the midpoint compress the grid toward the "equator". Values above the midpoint stretch the horizontal grid lines away from the "equator".

**Modifier 2:** Adjusts the vertical offset of the sphere. A DMX value of 128 (50%) = no adjustment. Adjusting toward 0 moves the center of the adjustment down toward the bottom of the image. Values above the midrange move the bend center up to the top of the image at a DMX value of 255 (100%).

**Modifier 3:** Adjusts to the size of the sphere. A DMX value of 64 (25%) = no adjustment. Adjusting toward 0 compresses the grid toward the vertical center. Values above the midrange stretch the grid toward the edges of the image at a DMX value of 255 (100%).

When the Spherical Mapping effect is selected in a Global Effect parameter and a Graphic Effect parameter's DMX value = 254, the Graphic Effect Modifier parameters make the following Spherical Mapping adjustments:

**Modifier 1:** Corrects the vertical bend. A value of 0 = no adjustment. Values below the midpoint bend the horizontal lines toward the "equator" to a maximum at 255.

**Modifier 2:** Adjusts the center of the vertical bend. A DMX value of 128 (50%) = no adjustment. Adjusting toward 0 moves the bend center down to the bottom of the image. Values above the midrange move the bend center up to the top of the image at a DMX value of 255 (100%).

**Modifier 3:** Adjusts the center of the horizontal bend. A DMX value of 64 (25%) = no adjustment. Adjusting toward 0 bends the vertical grid lines toward the center of the output. Values above the midrange bends the lines away from the vertical center to a maximum at 255 (100%).

TIP: Modifier channels for Effect Mode 1 are labeled as CMY in the Wholehog system so you can also make use of the color picker, HSI, and other Wholehog functions. Use the CMY parameter controls to adjust the three Effect Mode 1 Modifier parameters for both the Global and Graphic fixture types.

The default for Effect Mode 1 is set to CMY1 as well. Modifier channels for Effect Modes 2 and 3 are labeled Mod 1, Mod 2, and Mod 3.

Global Effect

## **Texture Mixing**

**Effect Mode** parameter DMX value = 51 Use Texture Mixing to mix two media file outputs on one object. With this effect, you can crossfade the texture (media file content) from one active Graphic Object to the texture of another Graphic Object. When the Texture Mixing effect is selected in the example to the right, the media file output of Graphic Object 1 (minus applied effects) is selected and mixed to Graphic Object 2 with opacity = 50%.

**Modifier 1:** Selects the Source file for the texture you want to pull. A DMX value = 1 selects the media content from Graphic Object 1, a value = 2 selects from Graphic Object 2, and a value = 3 selects from Graphic Object 3.

**Modifier 2:** Selects the effect level you want to use for the source file. A DMX value = 0 selects the original file without effects. If effects have been applied to the image, A DMX value = 1 includes the first applied effect; DMX = 2 includes the first two effects and DMX = 3 includes the first three effects.

**Modifier 3:** Adjusts Graphic Object opacity of the source texture from a DMX value of 0 = transparent to 255 (100%) = fully opaque.

### TIP: Use the following steps create a modified Trails effect with the Texture Mixing effect:

- Select two Graphic Objects. The second object can be a solid black screen (Media Folder 1, Media File 1)
- 2. Use Modifier 1 to select the Graphic Object you want to display with a trail effect.
- 3. Set Modifier 2 to a DMX Value = 2
- 4. Set Modifier 3 in a range between a DMX value of 240-254. The closer to 254, the more exaggerated the trail effect appears. If Modifier 3 is set to 255, the output will appear to stall or freeze on an image.



Object Effect

Graphic Object 1 Content



Graphic Object 2 Content



Effect Mode parameter DMX = 51 Modifier 1 parameter DMX = 1 Modifier 2 parameter DMX = 0 Modifier 3 parameter DMX = 128

# Texture Ripple, Asymmetrical Circular

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 25

This effect varies the distance of reference points to the applied media file texture around the Z axis without affecting the underlying object to create an effect of wavy ripples moving out from the object's center.

**Modifier 1:** Adjusts the size (amplitude) of the ripple from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the ripple from 0 = no adjustment to 255 (100%) = maximum rate.

**Modifier 3:** Adjusts the offset (phase) speed and direction. A DMX value of 128 (50%) = no adjustment. DMX Values above the midpoint increase speed in a forward direction to 255 (100%) = fastest speed. DMX values below the midpoint increase speed in a backward direction from no adjustment to 0 = fastest speed.

# **Texture Ripple, Circular**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 24

This effect varies the distance of reference points to the applied media file texture around the Z axis without affecting the underlying object. This creates an effect of concentric rippling out from the object center.

**Modifier 1:** Adjusts the size (amplitude) of the ripple from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the ripple from 0 = no adjustment to 255 (100%) = maximum rate

**Modifier 3:** Adjusts the offset (phase) speed and direction. A DMX value of 128 (50%) = no adjustment. DMX Values above the midpoint increase speed in a forward direction to 255 (100%) = fastest speed. DMX values below the midpoint increase speed in a backward direction from no adjustment to 0 = fastest speed.

# **Texture Ripple, Horizontal**

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 22

This effect varies the distance of reference points to the applied media file texture around the X axis without affecting the underlying object.

**Modifier 1:** Adjusts the size (amplitude) of the ripple from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the ripple from 0 = no adjustment to 255 (100%) = maximum rate.

**Modifier 3:** Adjusts the offset (phase) speed and direction. A DMX value of 128 (50%) = no adjustment. DMX Values above the midpoint increase speed in a forward direction to 255 (100%) = fastest speed. DMX values below the midpoint increase speed in a backward direction from no adjustment to 0 = fastest speed.

# **Texture Ripple, Vertical**

☑ Object Effect ☑ Global Effect

**Effect Mode** parameter DMX value = 23

This effect varies the distance of reference points to the applied media file texture around the Y axis without affecting the underlying object.

**Modifier 1:** Adjusts the size (amplitude) of the ripple from 0 = no adjustment to 255 (100%) = maximum size.

**Modifier 2:** Adjusts the rate (frequency) of the ripple from 0 = no adjustment to 255 (100%) = maximum rate

**Modifier 3:** Adjusts the offset (phase) speed and direction. A DMX value of 128 (50%) = no adjustment. DMX Values above the midpoint increase speed in a forward direction to 255 (100%) = fastest speed. DMX values below the midpoint increase speed in a backward direction from no adjustment to 0 = fastest speed.

# Texture Shift

☑ Object Effect ☑ Global Effect

Effect Mode parameter DMX value = 88

This effect creates offset image elements by shifting the texture based upon selected color values.

Modifier 1: Shifts the texture left to right

Modifier 2: Shifts the texture up to down

**Modifier 3:** Selects a color and scales the shift. Red and green color values (cyan) shift from 0 = maximum to 84 = a minimum shift. Red and blue color values (magenta) shift from 85 = maximum to 170 = a minimum shift. Green and blue color values (yellow) shift from a 171 = maximum to 255 = a minimum shift.



**Original Content** 



Modifier 1 parameter DMX = 24 Modifier 2 parameter DMX = 184 Modifier 3 parameter DMX = 18

# **Tiling On**

#### Object Effect Global Effect

Effect Mode parameter DMX value = 48

Tiling varies the number of times a media file is applied as a texture to an object. This effect works best on objects that have an undisrupted surface area.

**Modifier 1:** Adjusts the size and number of tiles along the x axis. A value of 128 (50%) = no adjustment. Values below the midpoint size a single image to 0 = maximum image magnification. Values above the midpoint increase number of images displayed to 255 (100%) = maximum.

**Modifier 2:** Adjusts the size and number of tiles along the y axis. A value of 128 (50%) = no adjustment. Values below the midpoint size a single image to 0 = maximum image magnification. Values above the midpoint increase number of images displayed to 255 (100%) = maximum.

**Modifier 3:** Adjusts the spacing between tiles. Black spacing between tiles increases from a 0 = a minimum width to 127 = a maximum width. Transparent spacing between tiles increases from 128 = a minimum width to 255 = a maximum width.

# NOTE: The Tiling effect implemented on Effect 1 overrides tiling on both Effect 2 and Effect 3.



**Original Content** 



Modifier 1 parameter DMX = 251 Modifier 2 parameter DMX = 255 Modifier 3 parameter DMX = 97

# **Transparent Wipes**

Effect Mode parameter DMX value = 33

Transparent wipes let you open one graphic to reveal another graphic behind it. You can select from six options and the centerline of the effect.

Modifier 1: Adjusts the area of the wipe from the smallest at a value of 0 to the largest at a value of 255 (100%).

Modifier 2: Selects the center of a wipe effect's separation

Modifier 3: Selects the wipe option. Each option occupies a portion of the DMX value range (see table at right).

# DMX Modifier 3: Wipe Option Value Rectangle wipes from center out horizontally 1-42 Rectangle wipes from 43-84 edges out horizontally Wipes from center out vertically 85-126 Wipes from edges out vertically 127-170 Cross shape wipes from center out

Box shape wipes from edges outward

171-212

212-255

Object Effect

Global Effect

Axon HD Media Server User Manual

# Zoom Blur

Object Effect Global Effect

Effect Mode parameter DMX value = 59

Zooms into a position on the image with a mult-image blurring effect. You can control the position of the zoom center on the image.

**Modifier 1:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint move the horizontal center of the zoom right to 0 = maximum. Values above the midpoint move the horizontal center of the zoom left to 255 = maximum.

**Modifier 2:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint move the vertical center of the zoom down as you approach 0 = maximum. Values above the midpoint move the vertical center of the zoom up to 255 (100%) = maximum.

**Modifier 3:** The default DMX value of 128 (50%) = no adjustment. Values below the midpoint zoom in to the image centerpoint to 0 = maximum image size. Values above the midpoint zoom away from the image centerpoint to 255 = a minimum image size.



**Original Content** 



Modifier 1 parameter DMX = 128 Modifier 2 parameter DMX = 128 Modifier 3 parameter DMX = 255

# Chapter I2:

# Synchronizing Content

After designating a master fixture, you can synchronize the content of other DLHD, Axon HD, Axon, DL.3, or DL.2 fixtures to any Graphic Object on the master in terms of playback time, rotation or both.

# **Network Synchronization Overview**

Network Synchronization allows for certain functions of DL.3, DL.2 or Axon media servers to be synchronized over an Ethernet network. This can be extremely useful in situations such as using the Collage Generator to ensure a seamless image with multiple media servers.

Network Synchronization is done using a reference *master* server that sends certain information about its current playback and output to the other fixtures on the network through Ethernet packets. The other servers, or *slave* servers use this information to set their playback and effects timing the same as the *master* server.

Network Synchronization is not slaving. With slaving, the master fixture's DMX values for synchronized functions would override the DMX values in the slave servers. When you use Network Synchronization, the appropriate DMX channels for all the *slave* fixtures and the *master* fixture must be set to the same values.

# **Network Synchronization Requirements**

In order for Network Synchronization to function properly, there are a few requirements that must be adhered to in the set-up of the fixtures:

- All of the servers must be linked on an Ethernet network. This network can be set up with Auto-IP addresses or DHCP addresses.
- The Fixture ID for each media server in the network must be unique. The Fixture ID is used to assign the *master* and *slave* servers and having multiple media servers with the same ID will cause the Synchronization information being sent over the network to be processed incorrectly.

A fixture ID default of 1 is assigned to every DL.3, DL.2 and Axon server on your Ethernet fixture network. For synchronization to work, you will need to assign each DL.3, DL.2 and Axon server a Unique Fixture ID from 1 to 255 using the CMA.

 All video content to be used in a Synchronization scenario MUST adhere to the High End Systems requirements for encoding custom content for DL.3, DL.2 and Axon servers. If the content is not encoded correctly, not only will the Network Synchronization not function, but other problems with video playback (such as stuttering or jumping in the clips) can occur. CHAPTER 12 Synchronizing Content

# **Network Synchronization Capabilities**

As currently implemented, it is possible to synchronize movie playback as well as certain graphics effects.

Movie Playback Synchronization ensures that movie playback between multiple servers stays Synchronized for either collage applications or where multiple servers are playing the same movie clip on different projection surfaces. It is especially useful for long movie clips and will solve the problems of frame drift that can be associated with media server playback.

Certain effects in the graphics engine can also be synchronized between servers. Effects such as the ripple effects, object wobbulation, or color cycle effects need to be synchronized between servers to appear correctly in Collage usage scenarios.

# **Programming Synchronization**

To program synchronization, first start by deciding which fixture/server will be the master server. This can be any server on the network. However, in a case of mixed computer hardware in the servers, the oldest server should be chosen as the master. This will ensure that all of the servers have the ability to playback content as well as the master server.

# Sync To Parameter

Once you have chosen your master server, the **Sync To** parameter must be set on all of the slave servers. This parameter is found on the first Global Layer of each server. The **Sync To** parameter is set to a value equal to the Fixture ID of your master server. For example, if your master server has a fixture ID of "3", all of the slave servers should have their **Sync To** parameter on Global Layer 1 set to "3".

# Sync Mode Parameter

DMX Default Value: 0 = no sync mode selection

Next, set the **Sync Mode** parameter to its appropriate value. These are for synchronizing movie playback on any Graphic Object. If all Graphic Object 1s need to synchronize together, set the **Sync Type** parameter on all Graphic Object 1s of the slave servers to Graphic Object 1. The same goes for synchronizing all of Graphic Objects 2–9. It is possible to synchronize Graphic Object 1 to Graphic Object 3, etc., as long as all of the appropriate parameters are set correctly.

NOTE: Unlike the Sync To parameter, Sync Mode does function on all graphic object layers and must be set in order for Synchronization to function correctly on that particular layer. When using the Sync Mode parameter, keep the following in mind:

- Any Sync Mode value above 45 (46-255) defaults back to 0
- Any settings affected by the synchronize mode you select need to be mirrored on both objects to Sync correctly.
- Setting a Graphic Object to sync to itself will have no effect

There are three sync mode options available for each of the ten Graphic Object layers:

- Synchronize to Graphic movie time
- Synchronize to Object rotation
- Synchronize to Graphic movie time and Object rotation

See for the DMX values associated with each of these.

# **Effect Synchronization**

Synchronizing Effects happens as soon as the **Sync To** parameter is set on Global Layer of a server. No special **Sync Mode** setting is needed.

# Synchronizing a Server to Itself

Movie playback and effects can be synchronized between a Graphic Object on a single fixture (for example, making sure all Graphic Objects on a single fixture are playing back in sync with one another). This is programmed the same way as Synchronization between servers, except that the **Sync To** parameter is set to its own Fixture ID.

# Synchronizing a Master Server to another Server

Even if a server is functioning as a master server, it is still possible to synchronize this server to another server. This can be useful in cases where multiple collages are playing the same movie. A single server in each collage can act as that collage's master, and then those masters can be synchronized together to ensure all collages are in sync. A master server should not be set to sync to one of its own slave servers, however, as this can cause problems with playback.

CHAPTER 12 Synchronizing Content

# Chapter I3:

# Content Management Application (CMA)

A Content Management Application (CMA) running on an Axon HD media server or a computer connected through an Ethernet network gives you remote control of content, software and configuration management functions.

The CMA software that shipped on removable media with your Axon HD media server is used to:

- · Upload and download custom digital content to digital light fixtures
- Configure units to use in a DMX environment
- · Edit warping of output for display on diverse surfaces
- Update software for multiple units

The CMA can access all media servers connected to the same Ethernet network.



NOTE: If you are using a DMX console and other automated lighting products compatible with Art-Net, this network can also serve as the link for DMX control.

# Launching the CMA

# Installing the CMA on Your Computer

You can download the latest version of the application from the Digital Lighting support section of the High End Systems website <u>www.highend.com/support/digital\_lighting/</u>. A download wizard simplifies installation on your personal computer.

The following are the recommended software requirements for running the CMA:

- Windows XP, Vista, or Windows 7 (32 and 64 bit)
- Microsoft .Net 2
- 100/1000 base Ethernet card (a Gigabit Ethernet card is recommended for fast content uploading of large files)

To automatically install the CMA on your computer's hard drive, insert the CD that shipped with your media server.

# NOTE: If you are running Windows OS and the CMA doesn't automatically install, navigate to the CMA.msi file in your windows browser and double click to install the CMA.

Once the CMA is installed, double clicking on the application icon will launch it and display the CMA Client Window.

# Launching the CMA on Axon

Axon media servers can launch the CMA locally. When you start Axon, the local monitor will display a desktop that gives you access to the CMA.



Press the **Launch CMA** button on the local desktop. The application automatically finds and identifies the **Local Drives** including any connected USB drives, the CD/DVD drive as well as other Axon HD, Axon, DL.3 and DL.2 media servers connected to the same Ethernet network.

NOTE: The AxonHD server supports an onboard DVD drive you can use for copying content into an Axon HD Server as well as burning User content onto DVD/CD.

# Auto Discovery

When a DL.3, DL.2 fixture, an Axon or AxonHD media server is connected to an ethernet network, it sends out "Discovery" messages. These messages are received by other media servers on the link as well as the CMA software. The messages contain information that allows the media servers to communicate with each other, and the CMA to communicate with all the units on the network.

The CMA window will display the IP Address, Fixture ID, the Media Server software version and the server model. Fixtures derive their IP addresses through a router or automatic IP assignment.

# **Fixture Identification**

The Fixture ID is a unique number used in the control protocol to identify specific fixtures for sychronization functions. For more information on Sychronization content playback, see *Chapter 10: Graphic Functions: Synchronizing Content* on page 109.

*NOTE:* To ensure that sychronization works properly, each DL.3, DL.2 or Axon media server should be assigned a unique fixture ID.

# The CMA Client Window

The CMA Client Window provides views of the content and configuration for all DL.3, DL.2 and Axon servers connected to the Ethernet network in the Left pane. Information is displayed in the right pane for any item selected. Access options through the menus at the top of the window or by right clicking in the right pane.

NOTE: You cannot drag folders or files between the left and right panes of the

CMA window				
File Media Folders Help		_	_	
HIGH END SYSTEMS				
All Servers (4 servers)	Name	DMX +	File Count	Date
User Media     User Warps     Stock Media     Stock Objects     Stock Objects     User Media     User Media     User Media     User Objects	A_Luna_Blue Art_Beats Beacon FeedBack_Video Kristine_Schomaker Rabit_Hole_Creative Showfootage William_Strother	2 3 4 5 6 7 8 9	53 13 22 29 23 20 28 35	12/13/2013 4:51:29 PM 12/13/2013 5:01:17 PM 12/13/2013 5:01:25 PM 12/13/2013 4:53:10 PM 12/13/2013 4:58:50 PM 12/13/2013 4:59:15 PM 12/13/2013 4:59:48 PM 12/13/2013 5:01:11 PM 12/13/2013 4:52 PM
→ ☐ User Warps B → ☐ Stock Media → ☐ Stock Objects → 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1	FeedBack_Video_Bodis_Cultaritis FeedBack_Video_Religious HES_Core HES_Digital_Aerials_1 HES_Oils HES_Oils HES_Atmospheric	10 11 12 13 14 15 16	52 37 39 108 14 31	12/13/2013 4:55 25 PM 12/13/2013 4:55 25 PM 12/13/2013 4:55 53 PM 12/13/2013 4:55 53 PM 12/13/2013 4:55 27 PM 12/13/2013 4:55 27 PM 12/13/2013 4:55 24 PM
User Warps     Stock Media     Stock Objects     Monitor Action HDTG (75)     Stock Objects     User Media     User Objects	On_The_Wall_Studios Sean_Bridwell A_Luna_Blue_2 Feedback_Video_2 HES_Texture HES_Foliage	17 18 19 20 21 22	37 19 49 32 10 31	12/13/2013 4:59:00 PM 12/13/2013 4:59:23 PM 12/13/2013 4:51:40 PM 12/13/2013 4:53:16 PM 12/13/2013 4:58:33 PM 12/13/2013 4:58:30 PM
User Warps B C Stock Media Stock Objects All Configuration	HES_Religious HES_Gothic HES_Digital_Aerials_2 HES_Theme_Stills Apollo_Glass	23 24 25 26 27 28	4 11 71 60 29 12	12/13/2013 4:58:29 PM 12/13/2013 4:58:03 PM 12/13/2013 4:57:53 PM 12/13/2013 4:58:35 PM 12/13/2013 4:51:44 PM 12/13/2013 4:52:07 PM
	DHA_TopMac Beacon_Digi_Gobos Amorphous_Digi_Gobos Inlight HES_Lithopatterns_1 HES_Lithopatterns_2	29 30 31 32 33 34	31 7 7 11 151 110	12/13/2013 4:52:58 PM 12/13/2013 4:52:29 PM 12/13/2013 4:51:42 PM 12/13/2013 4:58:46 PM 12/13/2013 4:58:16 PM 12/13/2013 4:58:18 PM
	HES_Logos HES_Hi_Res Nasa_Images Blue_Pony_Digital	35 36 37 38	10 7 36 32	12/13/2013 4:58:19 PM 12/13/2013 4:58:11 PM 12/13/2013 4:58:51 PM 12/13/2013 4:52:43 PM

49 Folders (Disk Free Space: 65.71 GB)

A **Status Bar** at the bottom of the page, indicates the number of files or folders in a selected folder in the left pane, as well as free space on the local computer hard drive and its IP address.

# Viewing Server Identification Information

Selecting the **All Server** view displays all the Digital Light fixtures and Axon servers on the fixture network. In the following example, six servers have been identified on the network. The right pane contains the following details in a table format.

- Server ID number defaults to 1, but can be configured in the CMA or in the DL.3 or DL.2 fixture's Menu system
- Server Name is a name you assign to a Digital Light fixture or Axon server
- IP Address is assigned to that unit by the router or Auto IP
- Software Version Number
- Model identifies the media server as a DL.3, DL.2 , Axon, Axon HD



NOTE: Clicking in a column heading sorts the table according to the values in that column.

In the **All Server** view, the drop down **Servers** menu or right clicking to select a server in the right pane gives you these options:

- Refresh the screen.
- Clone Content replicates the server's user content to one or more other servers on the network, (see page 208).

- Delete Content removes all the user content from the server.
- Create Content Archive lets you back up all the server's user content to a compressed file, (see page 207).
- **Deploy Content Archive** restores user content to the server from the backup, *(see page 207).*
- **Upgrade Software** allows you to upgrade fixture software. For more information on upgrade options, see *Upgrading Software* on page 211.
- DMX Summary provides a web-based summary of a server's content in a table format.
- Download Log provides useful troubleshooting information to Customer Service if needed.
- Identify will cause a fixture to strobe, so you can find it in the rig.

# **Content Organization**

The media server on each fixture has a file system that holds the movies, images, 3-D objects and User Warp files that make up the content that the server uses.

These files, folders, and their DMX values are collectively known as the "Content" on the media server.

The CMA Client Window organizes and identifies content by source (preloaded Stock content or custom User content) and type (Media files or 3-D Object files).



#### Preloaded Stock Content

A large library of **Stock Media** and **Stock Objects** ships on every AxonHD and AxonHD Pro media server and will also be provided through upgrades from High End Systems.

This content is read only. You won't be able to download, edit the DMX values or remove these files from the fixture.

E Servers (3 servers)	Name	DMX +	File Count	Date
🖮 📮 92902AAA (0)	HES_Core_HD_1080p	1	24	12/14/2013 10:10:14 AN
	A_Luna_Blue	2	53	12/14/2013 10:05:20 AN
AxonHDProTG (100)	Art_Beats	3	13	12/14/2013 10:04:15 AN
🕀 🔂 User Media	Beacon	4	22	12/14/2013 10:05:51 AN
Ci User Objects	FeedBack_Video	5	29	12/14/2013 10:06:31 AN
🗀 User Warps	Give Schomaker	6	23	12/14/2013 10:11:35 AN
H Stock Media	Rabit_Hole_Creative	7	20	12/14/2013 10:11:56 AN
Stock Objects	C Showfootage	8	28	12/14/2013 10:12:25 AN
All Configuration	William_Strother	9	35	12/14/2013 10:13:36 AN
	FeedBack_Video_Doors_Curtains	10	10	12/14/2013 10:06:51 AN
	EeedBack_Video_Marriage	11	52	12/14/2013 10:07:35 AN
	FeedBack_Video_Religious	12	37	12/14/2013 10:08:08 AN
	HES_Core	13	39	12/14/2013 10:08:55 AN
	HES_Digital_Aerials_1	14	108	12/14/2013 10:10:30 AN
	HES_Oils	15	14	12/14/2013 10:11:14 AN

#### **Custom User Content**

You can create your own custom **User Media**, **User Objects**, and **User Warps** and upload them to media servers. The Stock Content and User Content reside in separate folders. The High End Systems website (<u>highend.com</u>) and the High End Systems Digital Lighting Community (<u>forums.highend.com</u>) are resources for tips and techniques on creating User Content. See *Custom User Content* on page 283 and Custom User Warps for basic considerations in developing your own content for Axon HD media servers.

#### **Stock Media Files**

Inside **User Image** and **Stock Image** folders are Library folders containing collections of media files. Media files can be still images or video clips in one of the following formats:

.jpg	.gif	.png	.bmp	.mpv	.m1v	.mpg	.m2v

NOTE: AxonHD media servers support .jpg formatted using RGB color. CMYK color files are not currently supported.

P									
ND SYSTEMS									
ervers) Name	Type	DMX +	Size	Width	Height	Frame Count	Frame Rate	Movie Length	Ha
1) Ball-Churn-HD.mpg	mpg	1	33.935 KB	1024	768	417	30	0:13.90	-
ledia Beach-Waves-HD.mpg	pqm	2	68,359 KB	1024	768	840	30	0.28.0	
ijects Blob-Holes-HD.mpg	mpg	3	56,249 KB	1024	768	768	30	0:25.60	
dia 🕞 Breading-Bullets-HD.mpg	mpg	4	78.125 KB	1024	768	960	30	0.32.0	
tore [1] Bubble Texture HD mpg	mpg	5	29.297 KB	1024	768	360	30	0.12.0	
Agrial_Aerials_	mpg	6	29,296 KB	768	576	480	30	0.16.0	
Jis (3) Abuse have a Bubbles mpg	mpg	7	23,437 KB	640	480	480	30	0.16.0	
whospheric (* Bubblescape-HD.mpg	mpg	8	48,930 KB	1024	768	481	24	0.20.4	
Bridwall (C) E Color-Sine-HD mpg	mpg	9	21,972 KB	1024	768	300	30	0.10.0	
a Blue (7) Colored-Crust-HD.mpg	mpg	10	75,358 KB	1024	768	926	30	0:30.86	
ack Video (8) Controls-HD.mpg	mpg	11	27,992 KB	1024	768	344	30	0:11.46	
exture (9) Deep-Down mpg	mpg	12	87.890 KB	640	480	1800	30	1:0.0	
lage [10] Digital-Multi-Color-HD mpg	mpg	13	93.925 KB	1024	768	1127	30	0:37.56	
eligious (11) Digital-Sine-HD.mpg	mpg	14	24.414 KB	1024	768	300	30	0.10.0	
thic (12) El Disco-Ball.mog	mpg	15	17.578 KB	640	480	360	30	0.12.0	
atal_Aerials_ Dunes-HD mpg	mpg	16	93.751 KB	1024	768	1152	30	0:38.40	
heme_Stills (1 Dust-Dial-HD.mpg	mpg	17	78.287 KB	1024	768	962	30	0.32.6	
Glass (15) Explosion.mpg	mpg	18	2.999 KB	640	480	62	30	0.2.6	
s (16) Eve-Cultures-Fades-HD mog	mpg	19	34.863 KB	800	600	504	30	0:16.80	
opMac (17) Fast-Car-Commute mpg	mpg	20	187,255 KB	640	480	3540	30	1:58.0	
n_Digi_Gobos	mpg	21	3.665 KB	1024	768	53	30	0:1.76	
shous_Digi_Gol Flow-Swirls.mpg	mpg	22	50.260 KB	800	600	772	30	0:25.73	
20) El Flower-Fly-Though-HD mpg	mog	23	39.063 KB	800	600	480	30	0.16.0	
Lithopatterns_	mpg	24	13.672 KB	1024	768	168	30	0.5.60	
inopatiens_	mog	25	105.099 KB	1024	768	1105	24	0.46.4	
Hi Ray (24)	mog	26	45.702 KB	1024	768	624	30	0:20.80	
manes (25) Grasse-Field-Re-Be-HD mpg	mpg	27	32.961 KB	800	600	405	30	0:13:50	
Popu Digital (2) B Green-Glass-HD mon	mog	28	67 016 KB	1024	768	732	24	0:30.50	
are 21271 Hour-Glass-HD mog	mog	29	48 827 KB	1440	1024	600	30	0.20.0	
uared Labs (2E E Hudto-Pumo-HD mpg	000	30	44 127 KB	1024	768	482	24	0.20.8	
te Media [2]	mpg	31	78 124 KB	1024	768	960	30	0.32.0	

The stock media files provided by High End Systems have been compressed and optimized for reliable and smooth playback from AxonHD media servers. Each file and folder has an associated DMX value. These values are fixed for Stock Content but must be assigned for all user created content. See *Assigning DMX Values to User Content* on page 199 for more information.

CHAPTER 13 Content Management Application (CMA)

#### **Object Files**

Object files are the 3-D object component files used to build a graphic image. User Warps are .obj files created using the Warp Editor. Axon HD protocol supports a combined total of 255 object files displayed in **Stock Objects**, **User Objects** and **User Warps** folders. As with **Stock Media** files, the **Stock Objects** have a fixed DMX value and cannot be edited. A user-created object file must be assigned a unique DMX value between 150-255.

# Viewing Server Configuration Data

Selecting an individual server from the list in the left pane displays all the configuration values for that server in the right pane. Selecting **All Configuration** displays the combined configuration values for all the servers on the network. For more information on server configuration, see *Viewing Server Configuration* on page 213.

# Viewing Content

You can view information about media folders and files within each folder in a table format.

# NOTE: Clicking on a column heading sorts the table according to the values in that column.

All Servers (3 servers)	Name	DMX +	File Count	Date
🖮 📮 92902AAA (0)	HES_Core_HD_1080p	1	24	12/14/2013 10:10:14 AM
庄 🛄 A9904178 (0)	A_Luna_Blue	2	53	12/14/2013 10:05:20 AM
AxonHDProTG (100)	Art_Beats	3	13	12/14/2013 10:04:15 AM
🗉 🗀 User Media	Beacon	4	22	12/14/2013 10:05:51 AM
Ci User Objects	FeedBack_Video	5	29	12/14/2013 10:06:31 AM
User Warps	Cistine_Schomaker	6	23	12/14/2013 10:11:35 AM
F Stock Media	Rabit_Hole_Creative	7	20	12/14/2013 10:11:56 AM
Stock Objects	C Showfootage	8	28	12/14/2013 10:12:25 AM
All Configuration	William_Strother	9	35	12/14/2013 10:13:36 AM
	FeedBack_Video_Doors_Curtains	10	10	12/14/2013 10:06:51 AM
	FeedBack_Video_Marriage	11	52	12/14/2013 10:07:35 AM
	FeedBack_Video_Religious	12	37	12/14/2013 10:08:08 AM
	HES_Core	13	39	12/14/2013 10:08:55 AM
	HES_Digital_Aerials_1	14	108	12/14/2013 10:10:30 AM
	HES_Oils	15	14	12/14/2013 10:11:14 AM

#### Viewing Folders

Clicking on a media folder in the left pane reveals information about any sub-folders it contains.

- Name of the Media File collection. This value is editable for User content. See *Naming and Deleting User Content Files and Folders* on page 199.
- **DMX** is the currently assigned DMX value for the folder. This value can be auto-assigned and edited for User content. See *Editing User Content DMX Values* on page 200.
- File Count of files in this collection
- · Date the folder was last modified
#### **Viewing Files**

Double clicking on a media folder in the left pane reveals information about its content files.

High End Systems Content Ma	nagement Application										
Eile Media Files Help											
~		, i i i i i i i i i i i i i i i i i i i	í .							í .	
HIGH END SYSTEMS											
		<u>.</u>	<u> </u>			<u> </u>			<u> </u>	<u> </u>	
E Servers (9 servers)	Name	Type	DMX +	Size	Width	Height	Frame Count	Frame Rate	Movie Length	Has Sound?	Date
🖻 📮 DL.3 One (1)	E Bal-Churn-HD mpg	mpg	1	33 935 KB	1024	768	417	30	0:13:90	no	2/19/2008 6:26:04 PM
🗄 🧰 User Media	E Beach-Waves-HD.mpg	mpg	2	68,359 KB	1024	768	840	30	0.28.0	no	2/19/2008 6:26:11 PM
🗀 User Objects	Blob-Holes-HD.mpg	mpg	3	56.249 KB	1024	768	768	30	0:25.60	no	2/19/2008 6:27:04 PM
🖃 🧰 Stock Media	F Breading-Bullets-HD.mpg	mpg	4	78.125 KB	1024	768	960	30	0.32.0	no	2/19/2008 6:27:15 PM
HES_Core (1)	Bubble-Texture-HD.mpg	mpg	5	29.297 KB	1024	768	360	30	0:12.0	no	2/19/2008 6:27:18 PM
HES_Digital_Aerials_	E Bubbles-Rapid.mpg	mpg	6	29,296 KB	768	576	480	30	0:16.0	no	2/19/2008 6:27:21 PM
HES_UIS (3)	E Bubbles.mpg	mpg	7	23,437 KB	640	480	480	30	0:16.0	no	2/19/2008 6:27:39 PM
Personal President Contract Co	Bubblescape-HD.mpg	mpg	8	48,930 KB	1024	768	481	24	0:20.4	no	2/19/2008 6:27:43 PM
Sean Bridwell (6)	E Color-Sine-HD.mpg	mpg	9	21,972 KB	1024	768	300	30	0:10.0	no	2/19/2008 6:27:46 PM
A Lupa Blue [7]	E Colored-Crust-HD.mpg	mpg	10	75,358 KB	1024	768	926	30	0:30.86	no	2/19/2008 6:27:55 PM
- Feedback Video (8)	E Controls-HD.mpg	mpg	11	27,992 KB	1024	768	344	30	0:11.46	no	2/19/2008 6:27:58 PM
- ES_Texture (9)	📋 Deep-Down.mpg	mpg	12	87,890 K.B	640	480	1800	30	1:0.0	no	2/19/2008 6:31:44 PM
ES_Foliage (10)	📋 Digital-Multi-Color-HD.mpg	mpg	13	93,925 KB	1024	768	1127	30	0:37.56	no	2/19/2008 6:31:51 PM
- Canada HES_Religious (11)	📋 Digital-Sine-HD.mpg	mpg	14	24,414 KB	1024	768	300	30	0:10.0	no	2/19/2008 6:31:54 PM
Ca HES_Gothic (12)	E Disco-Ball.mpg	mpg	15	17,578 KB	640	480	360	30	0:12.0	no	2/19/2008 6:31:56 PM
🗀 HES_Digital_Aerials_	📋 Dunes-HD.mpg	mpg	16	93,751 KB	1024	768	1152	30	0:38.40	no	2/19/2008 6:32:49 PM
HES_Theme_Stills (1	📋 Dust-Dial-HD.mpg	mpg	17	78,287 KB	1024	768	962	30	0:32.6	no	2/19/2008 6:46:23 PM
Apollo_Glass (15)	Explosion.mpg	mpg	18	2,999 KB	640	480	62	30	0:2.6	no	2/19/2008 6:32:54 PM
Artbeats (16)	E Eye-Cultures-Fades-HD.mpg	mpg	19	34,863 KB	800	600	504	30	0:16.80	no	2/19/2008 6:32:57 PM
DHA_TopMac (17)	E Fast-Car-Commute.mpg	mpg	20	187,255 KB	640	480	3540	30	1:58.0	no	2/19/2008 6:33:13 PM
Beacon_Digi_Gobos	E Flip-Clock-HD.mpg	mpg	21	3,665 K.B	1024	768	53	30	0:1.76	no	2/19/2008 6:33:21 PM
Amorphous_Dig_Gol	E Flow-Swirls.mpg	mpg	22	50,260 KB	800	600	772	30	0:25.73	no	2/19/2008 6:33:27 PM
HES Liborations 1	E Flower-Fly-Though-HD.mpg	mpg	23	39,063 KB	800	600	480	30	0:16.0	no	2/19/2008 6:33:31 PM
HES_Lithopatterns_1	E Foliage-And-Flowers-HD.mpg	mpg	24	13,672 KB	1024	768	168	30	0:5.60	no	2/19/2008 6:33:32 PM
HES Logos (23)	📋 Gibson-Guitar-HD.mpg	mpg	25	106,099 KB	1024	768	1105	24	0:46.4	no	2/19/2008 6:33:44 PM
HES Hi Bes (24)	📋 Grafx-DJ-HD.mpg	mpg	26	45,702 KB	1024	768	624	30	0:20.80	no	2/19/2008 6:33:49 PM
Nasa Images (25)	📋 Grassy-Field-Fly-By-HD.mpg	mpg	27	32,961 KB	800	600	405	30	0:13.50	no	2/19/2008 6:33:52 PM
- 🛅 Blue_Pony_Digital (2	📋 Green-Glass-HD.mpg	mpg	28	67,016 KB	1024	768	732	24	0:30.50	no	2/19/2008 6:34:14 PM
	📋 Hour-Glass-HD.mpg	mpg	29	48,827 KB	1440	1024	600	30	0:20.0	no	2/19/2008 6:34:19 PM
V_Squared_Labs (28	🕒 Hydro-Pump-HD.mpg	mpg	30	44,127 KB	1024	768	482	24	0:20.8	no	2/19/2008 6:34:26 PM
Virtual_Life_Media (2	E Icebergs-HD.mpg	mpg	31	78.124 KB	1024	768	960	30	0:32.0	no	2/19/2008 6:34:34 PM

- **Name** of the file. This value is editable for User content. See *Naming and Deleting User Content Files and Folders* on page 199.
- Type indicates the file format extension
- **DMX** is the currently assigned DMX value for the folder. This value can be auto-assigned and edited for User content. See *Assigning DMX Values to User Content* on page 199.
- Size of file in kilobytes
- Width in pixels
- Height in pixels
- Frame Count
- Frame Rate in frames per second
- Movie Length in hr.min.sec
- Date the file was last modified

#### CHAPTER 13 Content Management Application (CMA)

You can access several options for displaying files in the right pane through the drop down menu or by right clicking in the right pane when files are being displayed.



## Managing User Media and Object Content

All Stock and User content can be viewed and refreshed but you have additional control over other aspects of your custom content. Within the CMA Client Window, you can:

- · Rename user files and folders
- Delete files and folders
- · Control DMX value assignment to files and folders
- Move files and folders between your local drive and a media server.

## Naming and Deleting User Content Files and Folders

You can **Rename** any user content folder or file displayed in the right pane of the CMA window using the pull down **Media Folders**, **Objects**, or **3D Warp** menu or with a right click selection. Use the standard Windows operating system naming conventions.

You can **Delete** any user content folder or file displayed in the right pane of the CMA window using the pull down **Media Folders**, **Objects**, or **3D Warp** menu or with a right click selection.

NOTE: You cannot Delete a movie if the media server is playing it.

## Assigning DMX Values to User Content

The DMX Value associated with each file and folder makes it easy to use the DMX control protocol to identify a unique media file or object.

There are up to 240 Media file folders with each capable of containing up to 255 image or movie media files. This gives a theoretical total of 61,200 possible locations for Media image or movie files. There is one DMX parameter used to identify a object so 255 DMX values are available between the Stock and User Content to identify objects.

#### Assigning DMX Values Automatically

The CMA can automatically assign a unique DMX value to any file or folder that does not already have a value. This automated assignment is based on alphabetically sorting the existing file/ folder names, and assigning each item a unique consecutive integer.

To automatically assign DMX values to a single file or folder with user content:

- 1. Display the User content folder or file in the right pane of the CMA Window
- 2. Select **AutoSet DMX** from either the **Media Files** folder or **Objects** drop down menu or the right click popup list. The CMA will assign a valid DMX value to the file or the folder.

You can automatically assign DMX values to all folders at once or to all the files within a folder at once. You cannot set both files and folder values at the same time. To automatically assign DMX values to all the User content folders or all files within a User content folder:

- 1. Display the User content folders or the files for a single folder in the right pane of the Content Management window and deselect all files or folders.
- 2. Select **Autoset All DMX** from either the **Media Folders** or **Objects** drop down menu or the right click popup list. The CMA will assign a valid DMX value to all selected files or folders.

Using the same steps, you can also **Reset DMX** for a single file or folder or **Reset All DMX** for all display files or folders displayed in the right pane to zero.

#### **Editing User Content DMX Values**

You can manually assign any valid DMX value to your files or folders by selecting the file or folder in the right pane and then, using the pull down menu or the right click popup, selecting **Edit DMX**. A dialog box will allow you to input the DMX value. If it is a valid value from 0-255, the CMA will change the DMX value displayed for the file or folder.

#### Valid DMX Values

Certain DMX values are **Reserved** for special purposes and are not user assignable. You can change the assigned DMX value for a User Content item to another valid DMX value. A valid DMX value is:

- From 0-255
- · Is not one of the reserved values for that type of content
- · Is unique from other content of its type except for zero

The following table shows valid and reserved values for User Content.

Content Type	DMX Values	Description	Reserved?
Media Folders	0	No Selection	No
(media file collections)	1-55	Default Stock media	Yes
	56-239	User collections	No
	240-254	Reserved	Yes
	255	Internal Camera video feed	Yes
Media Files	0	No Selection	No
	1-255	Media files	No
Objects	0	No selection	No
	1-149	Stock Objects	Yes
	150-255	User Objects	No

#### **Moving User Content Files and Folders**

User content can be easily moved between fixtures or between your local drive and fixtures. Which method you use depends on:

- · How much content you want to move
- · What existing server content you want to preserve
- Whether the client machine is currently connected to the Ethernet fixture link
- · If you want to maintain currently assigned content identification DMX values

There are several methods for moving User content files and media folders between media servers to your local drive:

- Drag and Drop
- Copy and Paste commands
- Cloning transfers the User Content files and their DMX value assignments from one media server to one or more server(s) on the fixture network.
- Creating a Content Archive
- Deploying a Content Archive

Use the following table to determine the best method for your situation.

		Transfer Type		
Fixture Network File-Transfer Method	From Server to Client Machine	From Client Machine to Server(s)	Between Networked Server(s)	Notes
Drag and Drop	Yes	Yes, if format is valid for the destination folder	No	Does NOT preserve DMX Values
Copy and Paste commands	Yes	Yes	No	
Clone	No	No	Yes	Preserves DMX values and
Deploying a Content Archive	No	Yes	No	Replaces any previous User Content on destination drive
Creating a Content Archive	Yes	No	No	Saves assigned DMX values when creating archive from content on a fixture

#### Downloading Content from a Media Server to Your Local Drive

The CMA supports downloading User content files or folders from a media server to your local drive. To download a file or folder of User Content:

- 1. Display the Folder or File that you wish to move in the right pane of the CMA window
- If the destination for the file on your local drive is visible, you can simply drag and drop the folder or file to that location or an external drive connected to your computer.
   OR
- 3. Select Copy from the Media Files or Objects drop down menu or the right click popup list.
- 4. Browse to the destination on your hard drive; then select **Paste** from the **Media Files** or **Objects** drop down menu or the right click popup list.

## Uploading Content from Your Local Drive to a Media Server

You can upload User Content Media files, Media folders and Object files from your hard drive to a DL.3, DL.2 or Axon media server, provided they are:

- A valid file format (.jpg, .gif, .png, .bmp, .avi, .mpg, .m2v for Media Files; .x for Object files)
- · You are uploading them to the appropriate User content folder on the media server
- They have been encoded correctly

To upload content:

- 1. Display the file or folder destination in the right pane of the CMA window
- 2. Browse to the file or folder you want to upload on your hard drive and click on it to select.
- 3. Drag and drop it into the appropriate User content folder **OR**
- 4. Select Copy from the Edit drop down menu or the right click popup list.

5. Select **Paste** from the **Media Files** or **Objects** drop down menu or the right click popup list. As files are uploaded to fixtures, the User interface displays progress information and notifies the user of any naming conflicts in renamed files or encoding problems.

## Content Scanning

Incorrectly encoded content can cause issues with playback performance, network synchronization, and graphics engine stability. To prevent this, the CMA automatically scans content locally on your computer (or the Axon media server) before actually loading it. If no warnings or errors are found, the content is loaded on to the server. If warnings or errors are found, a dialog box describes specific content problems.

**Warnings** are problems that will potentially cause issues with playback of the media on the fixture, but won't affect graphics engine stability. An example would be a movie not being encoded with all I-frames or not having an End-of-Sequence header. The CMA will allow these files to be loaded on to the server, but it will alert you to potential issues by displaying the warnings in a dialog.

**Errors** are more serious problems with content that can create severe stability issues in media server software; for example, content encoded as the wrong type of stream (Transport Stream instead of an Elementary Stream). Errors are caused when content does not adhere to the MPEG2 encoding standard. When an error is found, the CMA will not allow this content to be loaded on to a server at all. A dialog will describe the issue, and after dismissing the dialog, you will find the specific file has not been loaded onto the server.

#### **CMA Interaction**

When you drag a content file (or folder) on to a server, a dialog shows the progress of the file copy process. If there is nothing wrong with the content, it copies to the fixture.

If warnings or errors are found, the CMA compiles the list of issues in the bottom half of the *Copy Files Progress* dialog.



# NOTE: Since the CMA executes the scanning/copying process for the entire group of folders/files in a single operation, it will not stop or pause during the process to dismiss the errors.

After the process has finished, the dialog will indicate the number of issues that it found and a listing of the affected files. After viewing the list, click on the **Dismiss** button to continue working with CMA.

HIGH END SY	STEMS	
		_
nished. 5 errors and 6 warni	ngs found. See below for details	č.
8	22	
File Path	Description	
File Path	Description missing MPEG-2 sequence	
File Path C:\Documents and Setti	Description missing MPEG-2 sequence sequence extensions out o	
File Path C:\Documents and Setti C:\Documents and Setti C:\Documents and Setti	Description missing MPEG-2 sequence sequence extensions out o sequence end code missing	
File Path C:\Documents and Setti C:\Documents and Setti C:\Documents and Setti C:\Documents and Setti	Description missing MPEG-2 sequence sequence extensions out o sequence end code missing movie not I-frame only	

The files with errors in a group of files will not be copied on to the server. Files with warnings will be copied. They will show up highlighted in yellow when viewed in the "Details" view in the CMA to indicate to the user that this file is problematic.

High End Systems Content M	anagement Application						
<u>F</u> ile Media Files <u>H</u> elp							
	5						
🖃 🥏 All Servers (8 servers)	Name	Туре	DMX	Size	Width	Height	Frar 🔺
🖻 📲 DL.3 One (1)	🔋 🗐 0012_indianboatman.mpg	mpg	1	158,894 KB	720	480	
🕀 🧰 User Media	0013choruscars.mpg	mpg	2	15,436 KB	720	480	
User Objects	0014_solo_rollerderby.mpg	mpg	3	22,897 KB	720	480	
Example 2 Stock Media	📋 🗐 0015_solo_roller2.mpg	mpg	4	19,013 KB	720	480	
DL 2 Two (2)	📋 🗊 0016_breakcarcliff.mpg	mpg	5	11,266 KB	720	480	
E C. J Iver Media	📔 0026_solo_a.mpg	mpg	6	14,842 KB	720	480	
Content (40)	📔 0027_solo_b_out.mpg	mpg	7	51,806 KB	720	480	
Content (46)	📔 004_alpha_roll_4.mpg	mpg	8	36,816 KB	720	480	
F G Stock Media	📳 004_mary.mpg	mpg	9	41,270 KB	720	480	
Give Stock Objects	📔 005_breakdown_solo.mpg	mpg	10	61,506 KB	720	480	
🖃 📠 DL.3 Three (3)	📳 005_the end.mpg	mpg	11	2,615 KB	720	480	
🛁 🗋 User Media	📔 005_versebreak.mpg	mpg	12	7,722 KB	720	480	
🗀 User Objects	📔 006_piantmpg	mpg	13	71,860 KB	720	480	
🕀 🧰 Stock Media	📔 007_chorus_3.mpg	mpg	14	27,949 KB	720	480	
🔄 🚞 Stock Objects	📔 007_kindacool.mpg	mpg	15	12,395 KB	720	480	
🕀 🗖 DL.2 Four (4)	📔 013_roll_symbols.mpg	mpg	16	24,861 KB	720	480	
	📔 014_sprocket_50.mpg	mpg	17	21,626 KB	720	480	
+ Axon Two (/)	📔 015_verse_1.mpg	mpg	18	42,822 KB	720	480	
Axon Three (8)	📔 016_verse_1001.mpg	mpg	19	67,992 KB	720	480	
All Configuration	📔 0170E_Final.mpg	mpg	20	268,600 KB	720	480	
	📔 017_alpha_roll_2.mpg	mpg	21	73,728 KB	720	480	
	📔 018Metropolis main.mpg	mpg	22	193,967 KB	720	480	
	📗 🗐 018_chorus_solo.mpg	mpg	23	137,422 KB	720	480	
	E 019_chorus.mpg	mpg	24	28,002 KB	720	480	
	III 020. areenwash moa	mna	25	3 075 KB	720	480	× ×
75 Files (Disk Free Space: 270,77 GB)					Client IP	: 169.254.1	<b>2</b> 9.61
·····							

Double-clicking on the highlighted file will bring up another dialog describing the identified file error.

0013choruscars.mpg	
IIGH END SYSTEMS	
Description	
A sequence end code missing	

## Archiving User Content

An Archive/Image is a compressed file used to store media files, folders and object files along with valid identification DMX values. This Content Archive is used to backup User Content that can be restored to any media server.

## **Using Local Archives to Prepare Content Offline**

You can create a Local Archive of files stored on your hard drive to be deployed to a server at another time. This lets you work on organizing files for a specific show offline and then upload it to a server at a later date.

## **Creating a Local Archive**

To create a Local Archive:

- Under the File menu, select Create Local Archive to launch the archiving wizard.
- 2. Click on Add Media Folder. This will add a media folder to the lefthand column named "MyMedia0". Each successive media folder will be named "MyMedia1, MyMedia2, and so forth. You can rename these folders with a single click on the folder name.

- Song 1	Add	Media Folder	C:\Documents an	d Settings\mat
CADocuments and S		Add Media	C:\Documents an C:\Documente an	d Settings\matt d Settings\matt
Song 2	- Re	move Media	C:\Documents and C:\Documents and	d Settings\mati d Settings\mati
Song 3 Intermission			C:\Documents and	d Settings\mat
- Finale	Add	Objects ->	Contraction (1)	100
<u> </u>	Remo	ve Objects ->		>

- 3. After creating a folder and renaming it (if you wish), highlight the folder to add media files.
- 4. Click Add Media. This will bring up a file browser window that will allow you to navigate to the spot on your hard drive containing the media you want to add. You can add single files or multiple files. To add multiple files, hold down shift and select multiple media files with your mouse.
- 5. Click **Add Objects** if you wish to add custom 3-D objects to the archive. This will again bring up a file browser window to navigate to your 3-D objects. Any 3-D objects added will appear in the right hand column of the wizard. 3-D objects do not get added to folders.
- 6. Click **Next** at the bottom of the wizard. This will take you to another screen where you choose where to save and what to name your archive.
- 7. Click **Browse** to navigate to where you want to save and name your archive.
- 8. Click Next. Your archive will then be created.

NOTES: The Remove Media and Remove Object buttons can be used to remove media files and objects from the wizard when creating the archive. Currently, the archive will not be created unless each media folder created has at least one media file in it.

All media folders, files and objects will be assigned DMX addresses in alphabetical fashion.

#### **Creating Content Backup Archive**

Backups are created using the **Content Archive** feature. An Content Archive file is a compressed file containing all the User Content from a single fixture along with the assigned DMX values for folders and files.

To create a Content Archive:

- 1. In the CMA Client Window select **All Server** in the left pane.
- 2. Select the Server with the content you want to backup in the right pane.
- 3. Select **Create Content Archive** from the **Media Files** or **Objects** drop down menu or the right click popup list.

## **Deploying a Content Archive**

Deploying the Content Archive you created restores the user content to a fixture. To replicate this content to other fixtures on the link, use the **Clone Content** feature (see *Cloning User Content* on page 208).

## Cloning User Content

Cloning is a file transfer operation where all the User Content of a single fixture is replicated across one or more other fixtures. Cloning preserves all user content naming and DMX values. This allows you, for example, to send the custom content for a specific show to all the fixtures used in that show with one operation.

To clone user content:

- 1. In the CMA Client Window select **All Server** in the left pane.
- 2. Select the Server with the content you want to clone in the right pane.
- 3. Select **Clone Content** from the **Media Files** or **Objects** drop down menu or the right click popup list. A Clone Content Wizard lets you select one or more servers on the fixture network as the destination for cloned content.

Name	IP Address	Software Version	Model	17
Axon One	169 254 150 81	2 0 0 2412	Axon	
Axon Four	169 254 122 38	2.0.0.2412	Avon	
Axon Two	169 254 179 247	2 0 0 2412	Axon	
DL 3 One	169 254 153 131	2002412	DI3	
Axon Three	169.254.249.89	2.0.0.2412	Axon	

The cloning process erases all destination server(s) user content and replaces it with the selected server's user content. Stock content is unaffected.

## **Deleting Content**

To delete **all** User Content from a server:

- 1. In the CMA Client Window select **All Server** in the left pane.
- 2. Select the Server with the content you want to delete in the right pane.
- From the drop down menu or the rightclick popup list, select **Delete Content.** A dialog box OKs/cancels the action.



## **DMX Summary**

The DMX Summary lets you view all the content for a single server in a table format with the following details:

- Whether the content is a User Media file/folder, a Stock Media file/folder, or a Object
- The associated Folder Name for media files
- The Folder DMX value for media files
- The File Name for media or object files
- The File DMX value for media or object files

To view the DMX summary table:

- 1. Select All Servers from the left pane of the CMA Client Window.
- 2. Select a Server in the right pane
- 3. Select DMX Summary from the drop down menu or the right-click popup list.

CHAPTER 13 Content Management Application (CMA)

4. Press the  $\ensuremath{\text{Create Table}}$  button on the screen to build the summary table.

alues - Windo	ows Internet Explo	rer				1
🗢 😰 http:/	/169.254.11.144:91	Highend.DL2.Management.Se	rvices/Pages/Dr	nxValues.aspx	😒 😝 🗙 🚰 Google	
gle		👻 🔧 Sear	ch • 🕂 🧒 • 🛛	🐏 · 😭 · 😭 Bookmarks • 🔮	🖗 Check 🔹 🚂 Translate 🔹 🎦 AutoFill 🔹 🌽	<b>≪ •</b> ⊖s
ites 👍 🍊	Suppested Sites •	C Web Sice Galery •				
alues					👌 • 🔂 - 📑 🚔 • Page • Saf	ety • Tools •
						<u>271 2000</u>
one the butte	an ta dicular a tal	ble of DMV unbugs for a	II the contam			
this media :	server. If there is	a lot of content, this cou	ld take a wh	ile.		
	1					
Create Table						
Liew/Stool	Madia/Object	Folder Name	Folder	File Neme	File	
USET/SIDER	Wedda Object	Polder Ivallie	DMX	Fue Ivanie	DMX	
User	Media	batman	40	TDK_TRL2_1080p ReEnc.r	n2v 1	
User	Media	Digital Backgrounds	44	023.ANT112_SD_CR.m2v	1	
User	Media	Digital Backgrounds	44	023.ATT112_SD_CR.m2v	2	
User	Media	Digital Backgrounds	44	023.ATX112H1_SD_CR.m.	2v 3	
User	Media	Digital Backgrounds	44	023 ATX127H2_SD_CR.m.	2v 4	
User	Media	Digital Backgrounds	44	023.CJ112H_SD_CR.m2v	5	
User	Media	Digital Backgrounds	44	023 DR127H_SD_CR.m2v	6	
User	Media	Digital Backgrounds	44	023 GAS112H1_SD_CR.m.	2v 7	
User	Media	Digital Backgrounds	44	023 GAS125H2_SD_CR.m.	2v 8	
User	Media	Digital Backgrounds	44	025 ANT113_SD_CR.m2v	9	
User	Media	Digital Backgrounds	44	025.ATT113_SD_CR.m2v	10	
User	Media	Digital Backgrounds	44	025.ATX113H1_SD_CR.m.	2v 11	
		Digital Backgrounds	44	025 ATX128H2 SD CR.m.	2v 12	
User	Media	In Burgitan Dackgrounds				
User User	Media Media	Digital Backgrounds	44	025.CJ113H_SD_CR.m2v	13	
User User User	Media Media Media	Digital Backgrounds Digital Backgrounds	44	025.CJ113H_SD_CR.m2v 025.GAS113H1_SD_CR.m2	13 2v 14	

## **Upgrading Software**

Upgrade Management lets you upgrade the media server application and system firmware.

## Verifying Software Versions

Running the latest version of both the CMA software and the media server software will ensure that you get the best performance from the fixtures on your network.

Stress Content Ma	nagement A	pplication		
File Servers Help				
Highend WebSite DL2 Manual				
About				
E Servers (6 servers)	Server ID	Server Name	IP Address	Softv
🖻 🦉 DL.2 One (1)	1	DL.2 One	10.2.102.23	1.3.3
🖯 🦾 User Media	04	DL.2 Four	10.2.102.27	1.4.0
Sync test files (40)	1 1 1	DI 2 Terre	10 0 100 05	1 4 4

To verify the CMA version, select **About** from the **Help** drop down menu. The media server software version is displayed for each server on the network in the All Servers view.

#### NOTE: Although running different versions of software on servers is not prohibited, it is highly recommended that all servers on the network be running the same software version.

## Upgrading the CMA Software

Close the CMA before upgrading the CMA software. To Upgrade software:

- Download the latest version of the application from the Support section of the High End Systems website (<u>www.highend.com</u>). A download wizard simplifies installation on your personal computer.
- 2. A dialog box will give you the option to Run or Save the application. Pressing *Run* automatically uninstalls any existing CMA version on your hard drive and installs the new version.

#### **Upgrading Server Software**

The server software for Digital Lights and Axon media servers can only be uploaded to fixtures from the CMA. You must first save the latest version of the software from the High End Systems website (<u>www.highend.com</u>) to your hard drive and then use the CMA to upload it to any media server on your link. To Upgrade Server Software:

- Using your internet browser, select the latest version from the support section of the High End Systems website. A dialog box will give you the option to *Save*.
- Select the location and press *Save* again to put a copy of the Fixture software on your local drive.

CHAPTER 13 Content Management Application (CMA)

			124	121	-	
All Servers (6 servers)	Server I	Server Name	IP Address	Software Version	Model	- U
DL.3 One (1)	21	DL.3 One	169.254.153.131	2.0.0.2412	DL3	
DL.3 Iwo (2)	2	DL.3 Two	169.254.11.144	2.0.0.2412	DL3	
Axon Two (11)	10	Axon One	169.254.150.81	2.0.0.2412	Axon	
Axon Three (12)	11	Axon Two	169.254.179.247	2.0.0.2412	Axon	
Axon Four (13)	12	Axon Three	169.254.249.89	2.0.0.2412	Axon	
			Refresh			
			Clone Content			
			Delete Content			
			Create Content Archi Deploy Content Arch	ve Ve		
			Upgrade Software			
			DMX Summary			
			Download Loo			

3. Click on All Servers in the left pane of the CMA Window.

- Right click anywhere in the CMA Window or use the Server's pull down menu to select Upgrade Software. The Upgrade Wizard will prompt you to browse to the location where you saved a copy of latest version.
- After locating the upgrade file, press Next. The Upgrade Wizard displays a list of all servers connected to the fixture network.
- Click in the box to the left of the server name to select a server(s) for upgrading.
- 7. Click **Next** to continue upgrade. The server will reboot after upgrading the software.

Name	IP Address	Software Version	Model	<u> </u>
DL.3 Two	169.254.11.144	2.0.0.2412	DL3	
DL.3 One	169.254.153.131	2.0.0.2412	DL3	

## Viewing Server Configuration

The CMA lets you remotely view and modify fixture settings.Some settings like Lamp Hours, Software Versions, etc. are view only. Other settings such as Fixture ID, various Projector settings, DMX Start Channel, etc. can be modified (configured).

# NOTE: All of these settings are also available for DL.3 and DL.2 fixtures through the Digital Light onboard menu system.

The CMA also has some additional configuration features that let you:

- Assign a name to servers connected over the network for easier identification of servers on your network.
- Compare all the Configuration Items of a certain type for a group of fixtures. For example, viewing the DMX Start Channels of all the fixtures on a network.
- · Control monitor display settings for Axon media servers.

## Viewing Current Configuration of All Servers

To view configuration information for all Servers on the network, select All Configurations in the left pane. The right pane now displays configuration values for all the media servers on the fixture link in a sortable table. Click in the column heading to sort by that column's values. A + symbol appears in the "sort by" column heading.

High End Systems Content Management Application						
MS						
Fixture ID +	Foture Name	IP Address	Model	Software Version	DMX Start Channel	Lamp Hours
1	DL.2 One	10.2.102.23	DL2	1.3.3.1309	1	261
2	DL.2 Two	10.2.102.26	DL2	1.4.0.1588	171	59
3	DL.2 Three	10.2.102.25	DL2	1.4.0.1588	341	252
4	DL.2 Four	10.2.102.27	DL2	1.4.0.1588	1	939
6	Axon Two	10.2.102.29	Axon	1.4.0.1588	150	
7	Axon Three	10.2.102.28	Axon	1.4.0.1588	299	
	Management App MS Foture ID + 1 2 3 4 5 7	Management Application MS Fixture ID + Fixture Name 1 DL2 One 2 DL2 Two 3 DL2 Two 3 DL2 Three 4 DL2 Four 6 Axon Two 7 Axon Three	Management Application MS Fixture ID + Foture Name IP Address 1 DL 2 One 10 2.102.23 2 DL 2 Two 10 2.102.26 3 DL 2 Three 10 2.102.26 4 DL 2 Four 10 2.102.27 6 Axon Two 10 2.102.29 7 Axon Three 10 2.102.28	Management Application           MS           Fixture ID         Fixture Name         IP Address         Model           1         DL2 One         10.2 102.23         DL2           2         DL2 Two         10.2 102.26         DL2           3         DL2 Two         10.2 102.27         DL2           4         DL2 Four         10.2 102.27         DL2           6         Axon Two         10.2 102.28         Axon           7         Axon Three         10.2 102.28         Axon	Fixture ID         Fixture	Fixture ID         +         Fixture Name         IP Address         Model         Software Version         DMX Start Channel           1         DL 2 One         10 2.102.23         DL2         1.3.3.1309         1           2         DL 2 Two         10 2.102.26         DL2         1.4.0.1588         171           3         DL.2 Twee         10 2.102.27         DL2         1.4.0.1588         341           4         DL.2 Four         10 2.102.27         DL2         1.4.0.1588         150           7         Axon Two         10 2.102.28         Axon         1.4.0.1588         259

The example above contains the following information for one or all servers:

- The Fixture ID from 1-255
- The Fixture Name you have assigned
- The IP Address
- · Model type
- The DMX Start Channel currently assigned to each server
- · The current lamp hours for each server

#### Configuring Columns

Select which columns are present by selecting **Configure Columns** from the **Servers** menu in the menu bar or by right clicking anywhere in the main pane of the CMA.

Once you select **Configure Columns**, you can view a list of all possible columns. Choose which columns to view by either checking or un-checking each selection. Once you have selected the columns you want to display, click on OK.

<b>e</b> H	ligh End Systems Content	Ma	nagement	Appli	ication	
File	Servers Help					
	Refresh					
	Clone Content Delete Content	/15				
	Create Content Archive		Fixture ID	+	Fixture Name	IP Add
	Deploy Content Archive	П	1		DL.3 One	10.2.1
			2		DL.3 Two	10.2.1
	Upgrade Software	11	3		DL.3 Three	10.2.1
		11	4		DL.2 Four	10.2.1
	DMX Summary	11	6		Axon One	10.2.1
	Configure Columns	11	7		Axon Two	10.2.1
	Edit Fixture		8		Axon Three	10.2.1
		1	9		Axon Four	10.2.1

	E Diseland and	E Desirable France Value	Coll Text ) ( des Detters
Available Memory		Frojector Focus value	
CPU Utilization	I Display Opacity	I Projector Input	I Self Test Zoom
Disk Queue	DMX Protocol	Projector Input Selection by DMX	Tilt Invert
DMX Start Channel	DMX Source	Projector Lamp	🔽 Unique Number
Fixture ID	External SVideo Format	Projector Lamp Mode	☐ Windows XPe Version
Fixture Name	Firmware Version	Projector OSD Menu	
IP Address	Fixture Defaults	Projector Rear	
Lamp Hours	Fixture Hours	Projector Type	
Model	Home Motion	Projector Zoom Override Enable	
Software Version	Pan Invert	Projector Zoom Value	
Art-Net Subnet	Pan/Tilt Swap	Secondary Display Parameters	
Art-Net Universe	Frimary Display Parameters	Self Test Focus	
Data Loss Timeout Iris	Projector Ceiling	Self Test Iris	
Disk Free Space	Projector Defaults	Self Test Pan/Tilt	
Display Invert	Projector Focus Override Enable	☐ Self Test Video	
Cancel	UK		

#### **Re-Order Columns**

You also have the option to change the order that the columns are displayed. Left-click on the head of the column you wish to move, hold down the mouse button and drag the column to the desired position. Releasing the mouse button will move that column to the new location.

#### Viewing Individual Fixture Configuration Values

To view configuration information for a individual server, click on **All Servers** in the left pane of the CMA window and select the + to view all the servers on the fixture network. Select a server in the left pane to view its configuration information in the right pane. Configuration information is grouped under tabs in the right pane. Fields are provided for all editable configuration values.

## **AxonHD Media Server Configuration Options**

Axon configuration options are grouped under a Server, Display Connectors, Art-Net & I/O, Info, and Menu Display tabs.

#### Server Tab

Start Channe				
Protoco		Lavers 10	<b>.</b>	
Fixture II	75			
Warp Edi	t Off 👻	Number 1		

#### **DMX Settings**

Configuration Item	Configuration	Value Options
DMX Start Channel	1-512	Identify
DMX Source	DMX512 or Art-Net	
DMX Protocol	HD	Sets graphic objects from 1-10
Fixture ID	1-255	Fixture ID
Warp Editor	Off or On	Number

## Display Connectors Tab

1280x1024	-			
60				
Off 👻				
1				
1				
	60 Off • 1	60 • • • • • • • • • • • • • • • • • • •	60 • • • • • • • • • • • • • • • • • • •	60 V Off V 1

## **Display Connectors**

Configuration Item	Configuration Value Options
Resolution	Options in the drop-down lists are automatically populated by the Axon
Refresh Rates	software for the specific display device attached.
Video Pattern	1 displays graphic object with texture for the number of graphic layers you have defined
Media Folder	Current Selected
Media File	Current Selected

## Info Tab

Model AxonHD Server Name AxonHDTG IP Address 0.0.0 Unique Number 4C64A438 Disk Free Space 74045 Hardware CPU i7-4770 Misc Fixture Default	re 1.0.0.0 7 1.0.0 re 1.0.0.0
Server Name AxonHDTG Softwa IP Address 0.0.00 Unique Number 4C64A438 Disk Free Space 74045 Hardware CPU 17-4770 Misc Fixture Default	re 1.0.0.0 7 1.0.0 re 1.0.0.0
IP Address 0.0.0.0 Unique Number 4C64A438 Disk Free Space 74045 Hardware CPU i7-4770	<b>7</b> 1.0.0 re 1.0.0.0
Unique Number 4C64A438 Disk Free Space 74045 Hardware CPU i7-4770	re 1.0.0.0
Disk Free Space 74045	
lardware CPU i7-4770 Fixture Defaul	
CPU i7-4770 Fixture Defaul	
	<b>™</b> On <b>▼</b>
Motherboard H8/1-PLUS	-
Video Adapter 1 HD7700 Reboot Serve	
	Apply

#### Server Info

Configuration Item	Configuration Value Options
Model	Axon HD
Server Name	Allows fixture name of up to 26 characters
IP Address	Read only assigned to that unit by the router or Auto IP
Unique Number	Read only assigned by factory
Disk Free Space	Read only in MB

#### Version Info

Configuration Item	Configuration Value Options
Software	Read only
WES7	Read only
Firmware	Read only

#### Hardware

Configuration Item	Configuration Value Options
All CPU	Read Only displays current hardware configuration
Motherboard	
Video Adapter 1	

Axon HD Media Server User Manual

#### CHAPTER 13 Content Management Application (CMA)

#### Miscellaneous

Configuration Item	Configuration Value Options
Fixture Defaults	On restores fixture defaults Off displays whenever defaults has been changed
Reboot Server	Check Reboot to restart the internal graphics engine

## ArtNet and I/O Tab

Server	Display Connectors	Art-Net & I/C	Info	Menu Display
Captu	ire Settings			
Art-	Net Settings <b>t-Net 1 Subnet</b> 0	Unive	erse 0	

## ArtNet Settings

Configuration Item	Configuration Value Options
Art-Net Subnet	0-16
Art-Net Universe	0-16

CHAPTER 13 Content Management Application (CMA)

## Menu Display Tab

erver Display Connect Settings	ors Art-Net & I/O Info M	1enu Display	
Menu Display Device Resolution Refresh Rate	DVI DELL U2312HM 1920x1080	Performance 58.0% 5157.0M 0.00	

#### Menu

Configuration Item	Configuration Value Options
Display Device	Read Only
Resolution	
Refresh Rate	

#### Performance

Configuration Item	Configuration Value Options		
CPU Utilization	Gauges display available resources remaining. This can help with		
Available Memory	palancing additional layers with the capabilities for the hardware		
Disk Queue	configuration of this device.		

## Configuration Example

Before programming a Digital Light fixture or the Axon media server from a DMX512 console, you need to:

- Identify the DMX Source for the fixture
- · Select the Protocol type to determine the DMX channel footprint this fixture will utilize
- Select a Fixture Number to identify this Axon on the Ethernet link (required if you will be synchronizing output between fixtures).
- Assign a valid Start Channel (the first channel in the unique range of DMX channels designated by the console for this Axon)

All these selections can be made in the **Server** tab for all models of media servers.

1. To view configuration information for an individual server, click on **All Servers** in the left pane of the CMA window and select the + to view all the servers on the fixture network. Select a server in the left pane to view its configuration information in the right pane.

HIGH END SYSTE	MS	and the second states of the
All Servers (9 servers) DL3one (1) Cuser Objects DL3 Three (3) DL3 Three (3) DL3 Three (3) DL3 Three (3) DL3 Three (3) DL3 Three (3) DL3 Three (3) DL2 four (4) DL2 four (4) DL3 Five (5) Cuser Media DL3 Five (5) DL3 Five (5) DL3 Five (5) DL3 Five (5) Cuser Media Stock Media Stock Media Stock Media Stock Media Stock Objects Cuser Objects Stock Media Stock Objects Stock Media Stock Objects Stock Media Stock Objects Stock Media Stock Objects Stock Objects	Server Fixture Lamp Test/Reset Hardw DMX Settings DMX Start Channel 1 Source Art-Net Artnet Subnet 1 ArtNet Universe 1 DMX Protocol v2 v 9 Server Info Model DL3 Fixture ID 1 Fixture Name DL-3 one IP Address 169.254.153.131 Unique Number 92902AA1 Disk Free Space 279,748 MB	vare I/O Version Information Software 2.0.0.2372 XPe 2.2.0 Firmware 1.5.4.156
Axon three (13) Axon four (14)		Apply
All Configuration		<- Previous Server   Next Server -> Cancel

CHAPTER 13 Content Management Application (CMA)

2. Select a **DMX Source** type by clicking on the down arrow of the Source field to select DMX512 or Art-Net.

If you select Art-Net, assign a universe number from 1–16.

DMX Start Channel	1
Source	Art-Net
Artnet Subnet	DMX512
Artnet Subnet	Art-Net
ArtNet Universe	1
DMX Protocol	w

3. Select a **DMX Protocol** type by choosing **V1**, or **V2** from the drop down list in the option field. and then select the number of Graphic Object layers for your application.

The Protocol you select is based on how many DMX channels are required for your application. For more information on selecting protocol, see *Protocol Options* on page 27 and

DMX Settings		DMX Settings	1946		_
DMX Start Channel	1	DMX Start Channel	1		
Source	Art-Net 💌	Source	Art-Net		-
Artnet Subnet	1	Artnet Subnet	1		_
ArtNet Universe	1	ArtNet Universe	1		_
DMX Protocol	v2 • 9 •	DMX Protocol	v2 💌	9	
	v1 v2			3	
				5	m
				7	
				G	

4. Edit the DMX **Start Channel** by entering a valid Start Channel for the protocol type you have chosen.

For more information on selecting a valid start channel, see *Determining a DMX Start Channel* on page 21.

## Chapter I4: CMA: Warp Editor

User Warps are applied globally to modify the output display shape. This chapter describes the Warp Editor and includes a step by step example for creating a custom warp graphic object.

## Overview

The Warp Editor feature lets you adjust Axon HD, Axon HD Pro and DLHD output to match complex projection surfaces. These forms allow the projection to match irregular surfaces or quickly produce interesting creative results. The warp editor can also edit geometry directly, either to create complex holes in surfaces, or generate new polygons based on neighboring geometry.

You can build a geometrical warp in one of two ways,

- 1. You can modify one of the primitive shapes provided in the editor. Simple surfaces such as fabric screens can be quickly built from these primitives. This concept can extend to more complicated forms, such as rectangular grids with sections cut out, cylindrical surfaces and spherical surfaces.
- 2. You can import and edit an .obj file you have created through another application.

## **Functional Operation**

The warp is applied at the global level, analogous to a keystone operation. Editing the output at the final step retains all layer programming but allows changes to the image as a whole. Consequently, there is no need to perform major changes of the layer positions if the projector has moved.

This also applies to changing the projection surface. If one projector is being used on a flat screen, and, at another time the projector is being used to illuminate a complex form, the warp would be different, but the content programming will be the same. To achieve this, you use the warp editor to generate two different warp files. One file is used for the flat screen and one file for the complex surface. Each of these files would have a unique DMX address associated with it that you can recall via a control board.

## Warp Editing Screen

**User Warps** appears in the **All Servers** view of the CMA along with other content. The number of existing User Warps appears in the lower left of the CMA window. When the **User Warps** file is selected, a popup will display a list of user warps already created.

To open the Warp Editor, Right click on the **User Warps** file in the Content list for the selected server and select **Warp Editor** or select **Warp Editor** from the **3D Warps** drop down menu at the top of the CMA Window.

The selected or new warp will appear in the center panel. The panel on the right of the screen displays the warp editing fields.



## Manipulating the Mesh Display

Once a warp mesh has been selected or a new warp created, you can use the mouse to:

- · Orient the mesh shape within the viewing area of the screen
- Move the scroll wheel of the mouse to zoom in and out on the display area.
- Hold down the SHIFT key and move the scroll wheel to position the display up and down.
- Hold down the CNTR key and move the scroll wheel to position the display right and left.
- Select one or more control points by holding down the left mouse button and dragging over the points you want to manipulate. The selection will 'Latch' to the control point
- De-select the point when you are finished editing it, using the Right Mouse Button.
- · Remove portions of the grid by right clicking on an individual triangle portion of the mesh

## **Editing Fields**

This section describes the editing fields from the left panel of the Warp Editor screen in detail.

#### **Geometry Editing Fields**

Several primitive shapes in the drop down field are available as a starting point for your Warp file. The **Geometry** section of the Editing bar lets you select and configure your starting mesh.

#### Rectangular Grid

The default shape is a Retangular grid. Click on New to establish a rectangular mesh.

#### **Spline Rectangular Grid**

After selecting the Spline Rectangular Grid, set the number of Beziner Control Points for both horizontal and vertical from 2 to 6. Set the Bezier Grid Resolution to determine the smoothness of the bezier curve. Then click **New** to create the mesh.

			•
			•
_)			
			•
Hor	2 -	Ver	2 🗸
	Hor	 Hor 2 _	 Hor 2 Ver

9 🗸

Note: Once you click New, the number of Control Points and Grid Resolution cannot be changed until you create another Spline Rectangular Grid.

**Bezier Grid Resolution:** 

CHAPTER 14 CMA: Warp Editor

#### Sphere

When you select the Sphere shape, you can set the following:

Select Inside Surface if you want to display the sphere as a concave surface.

You can choose the x, y and z coordinates as the spherical mesh's centerpoint.

Geometry:				
Sphere				
New		)	Reset	
For Curved Geome	tries:	Inside	Surface	
Centre [x] , [y] , [z]:		0.0	0.0	0.0
Latitude (Deg):	Start	0 🌻	End	180 🕻
Longitude (Deg):	Start	0 🛟	End	180 🕻

Define the Latitude and Longitude to choose a portion of the sphere.



Sphere Default Geometry

Centre [x] [y] [z]0.00.00.0 Latitude (Deg) Start 65.00End 115.00 Longitude (Deg)Start 75.00End 105.00

Note: Once you click New, the Curved Geometry options cannot be changed unless you click Reset and start a new Sphere mesh.

#### Horizontal Cylinder

When you select the Horizontal shape, you can set the following:

Select Inside Surface if you want to display the sphere as a concave surface.

You can choose the x, y and z coordinates as the cylinder's centerpoint.

Geometry:			
Horiz. Cylinder			
New	]	Reset	
For Curved Geometries:	🚺 Inside	Surface	
Centre [x] , [y] , [z]:	0.0	0.0	0.0
Latitude (Deg): Start	0 🗘	End	180 🗳

Define the Latitude to choose a portion of the cylinder.



Horizontal Cylinder: default geometry



Horizontal Cylinder: Centre [x],[y],[z] 1 1 0 Latitude (Deg) Start 70.00End 105.00

Note: Once you click New, the Curved Geometry options cannot be changed unless you click Reset and start a new Cylinder mesh.

CHAPTER 14 CMA: Warp Editor

#### Vertical Cylinder

When you select the Horizontal shape, you can set the following:

Select Inside Surface if you want to display the sphere as a concave surface.

You can choose the x, y and z coordinates as the cylinder's centerpoint.

Geometry:			
Vert. Cylinder			
New	Reset		
For Curved Geometries:	Inside	Surface	
Centre [x] , [y] , [z]:	0.0	0.0	0.0
Longitude (Deg): Start	0 🍨	End	180 🧘

Define the Longitude to choose a portion of the cylinder.



Note: Once you click New, the Curved Geometry options cannot be changed unless you click Reset and start a new Cylinder mesh.

#### **Cone**

When you select the Cone shape, you can set the following:

Select Inside Surface if you want to display the sphere as a concave surface.

You can choose the x, y and z coordinates as the cone grid's centerpoint.

Geometry:						
Cone			•			
New	Reset					
For Curved Geometries:	Inside Surface					
Centre [x] , [y] , [z]:	0.0	0.0	0.0			
Longitude (Deg): Start	0 🌲	End	180 🗘			

Define the Latitude and Longitude to choose a portion of the cone.



Note: Once you click New, the Curved Geometry options cannot be changed unless you click Reset and start a new Cone mesh.

CHAPTER 14 CMA: Warp Editor

Once you have selected the Geometry and click on **New**, the mesh being edited will be included in the display with control points indicated as black dots.

This current file will be automatically assigned a name in the **File Name** field that will be maintained throughout the editing sessional and can be renamed by the user outside of the editing mode.



#### **Camera Options**

The Camera Options field lets you select the way you want to view the editing grid. The

Camera Options:	
Perspective Camera	

**perspective** view is the option most associated with sketching. An **orthographic** gives a typical drafting view with no perspective indication.

## **Centre of Operations**

When you drag a set of control points to shape the mesh, you can reference the change to the

Centre of operations:	
Figure Centre	•

center of the figure or to the center of the editing points you have selected to move. In the example below, 12 control points were selected and scaled down. The grid on the left shows the

result with the **Centre on Figure** option selected and the figure on the right shows the result when **Centre on Selection** is selected.





## **Rotation**

You can rotate a selection of control points in the x, y and z direction.



First, set the degrees of rotation for each step from .01 to 359. Then you can press the corresponding button to increase or decrease the rotation for X, Y or Z



Rectangular Grid with control point selected.



Rectangular Grid with selection rotated 60.00 in the Y- direction.

Scale:	x	1.1	\$ y:	1.1	\$	Z.	1.1	\$ Ξ
	Scale +		1		S	cale -		

## Scale

You can scale a selection of control points in the x, y and z direction.

CHAPTER 14 CMA: Warp Editor

First, set the size of each step from 1.1 to 2 for each axis. Then you can increase or decrease the Scale of the selection incrementally by clicking the **Scale +** and **Scale -** buttons.



Rectangular Grid with control point selected.



## **Resolution**

You can set the warp density for the Rectangular and the Spline grids in the **Resolution** field.

esolution:		
Vertical +	Horizontal +	Full +
Vertical -	Horizontal -	Full -

Click on **Vertical** and **Horizontal** buttons to increase or decrease the number of grid sections in either direction. or click on **Full** + or

Full - to increase the resolution proportionally in both directions.

Note: In all curved surface shapes, resolution is specified as part of the Geometry selection, see Geometry Editing Fields on page 225.


#### File Name

The **File Name** field contains a drop down list of all existing warps on the selected server. When you create a new warp, it's automatically assigned name is added to this field.

### **Elasticity**

When no elasticity is applied, moving selected points on the grid will affect only those points. When you check the **Enable Elastic Distortion** box, adjacent control points to the ones you

select will also be affected as you move selected points. The amount of change depends on the the proximity of a control point to one that is being moved.



Control Point Moved

#### Draw Wireframe/Vertex

By default, both the **Wireframe** (the gridlines connecting control points on the warp) and the **Vertex** (all of the control points on the warp) are visible. You have the option to deselect and hide either or both the wireframe and vertex.

#### Force Warp Output/Checkerboard

Force Warp Output allows you to see a warp output while actively modifying it.

Force Warp Output	/ Checker	board		
Force Output 1				•
Checkerboard	Off	🔘 Big	O Medium	O Small

## *Note:* Be aware that Force Output has the potential to override the output of the control board.

To display the warp-edited output:

- 1. With the warp editor enabled, select the file from the File Name drop down field to view in the editor. These files are available for recall from the control desk at a later point.
- To display the selected file on Output 1, select the same file from the drop down list, and select force output. The image that is being displayed is being affected by the warp grid.



3. Make changes as needed to the warp by selecting control points, editing, and deselecting.

Note: The map is updated when you let go of the mouse button after dragging, ie. on mouse-up.

The **Checkerboard** is a test pattern view that can be selected for in **Small**, **Medium**, or **Large** format to aid in creating your warp.



## Edit Undo, History and Reset View

You can **Undo** and **Redo** as many steps back and forward in the editing process according to the number set in the **History Size** field.

Undo / Redo:	Undo Redo	Reset View Reset
History Size:	30 🗘	Apply

Clicking the **Reset** button in **Reset View** defaults the grid to the original position in the display pane.

## **Default Values**

Clicking the **Reset** button will default the grid to the original rotation and scale values.

O Default Values: Res	et
-----------------------	----

## Point Size

You can **Decrease** or **Increase** the control point size on your grid by clicking these buttons.

Point Size:	Decrease	Increase

### Getting Started

#### Creating a New Warp

This example shows how to create a simple warp that would be useful for projecting onto a curved fabric screen. This process is the same for other types of surfaces as well. The steps are the same, yet the final results will be much different. This process can be done live, or off-line. The editing steps are similar.

To create a warp for projecting onto a curved fabric screen:

- 1. Launch the warp editor via the CMA, by either right-clicking on the User Warp folder in the drive tree and selecting warp editor, or by choosing 3D Warps from the menu bar. The screen will be blank with a Menu Bar down the right side.
- 2. In the Menu Bar, under the Geometry sub-heading, choose the type of primitive that is going to be used as the building block. We are going to choose Spline Rectangular Mesh. Keep the default values for Bezier Control Points, and Bezier Mesh Resolution.

Note: If you wish to change the Bezier Control Points and Mesh Resolution, you will need to do it before pressing New.

- Pressing New will generate a new file, and this will be displayed in the center window. You
  will notice there are three control points along each edge of the rectangle that has just
  appeared, these are the control points of the warp.
- 4. Select the top center control point, by directly clicking the point or drawing a selection box around it, this operation is completed with the Left Mouse Button. The selection will 'Latch' to the control point. Remember, you must explicitly de-select the point when you are finished editing it, using the Right Mouse Button.
- 5. To edit the point you have just selected, press and hold the Left Mouse Button away from the control point.

Note: The selection and de-selection operation is specifically different from the editing operation to let you look at the projection screen, and not worry about your mouse position on the CMA screen.

Trying to combine the two steps will switch the selection mode between box and direct, while you are actually meaning to edit.

- 6. Repeat the selection, edit, de-selection process for all the control points that need editing.
- 7. Check Force output 1 to view the output in the warp you have just created.

### **Deleting Geometry from Mesh**

While editing a mesh it is possible to add and delete triangles to create masked areas.

Note: This process only works on triangular meshes (rectangular grid, sphere, cylinder and cone), it will not work on the spline mesh type.



To delete a triangle right mouse click over the triangle you wish to delete. The triangle will disappear and a black area will show up on the mesh.

More complex meshes can be created by continuing this deletion process while editing control points.



## Adding Geometry to Mesh

If there is a hole in the mesh, and details need to be created. Faces can be added inside the warp editor. Using the example mesh below, we can illustrate ways to add faces.



By using Shift + Right Mouse Click geometry can be added and the location is determined in multiple ways. 3 points are always needed to determine a new face.

1. By selecting 2 points the face will be created between those two points and the third point will be inferred at the location of the mouse pointer.



2. When selecting 3 points, the face will be created between the three selected points.



3. When selection zero points, the face will be created by subdividing the adjacent lines. This only works when creating a face inside an existing face.





Complex forms can be created by combining and deleting faces.

## Chapter I5:

## **Maintenance and Troubleshooting**

This chapter includes information on maintaining filters, and some basic

troubleshooting procedures.



WARNING: This server must be serviced by qualified personnel. The information listed in this chapter is intended to assist qualified personnel *only*.

## Maintaining the Filtering System

The Axon media server must be kept protected from excessive amounts of glycol fog, mineral oil, and smoke. You must follow these guidelines to ensure continued operation of the fixture:

- Air filters should be checked and cleaned on a regular basis. When used in a closed or fixed environment where fog or haze is used, we recommend at least a weekly check.
- Do not situate Axon in areas of high fog density such as directly in front of a fog machine or mineral oil hazer.
- Minimize the exposure of Axon to both glycol fog and mineral oil.

## **Cleaning and Replacing Filters**

Axon has two filters located in the front of the chassis behind the blue cover plates. Check this filter often for dust or debris that can be caused when using the Axon in environments with confetti or pyrotechnics. *This filter is washable with soap and water, but must be completely dry before re-installing.* 



WARNINGS!

WARNING:

Disconnect power before servicing.

## **Replacing Battery**

If the BIOS battery on the Axon motherboards needs replacement, use a CR2032 battery.



Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries accouding to the instructions. AVERTISSEMENT: Risque d'explosion si la batterie est remplacée par un type incorrect. Jetez les piles usagées accouding les instructions.

## **General Troubleshooting**

The following table shows general troubleshooting suggestions:

Problem	Solution
Won't power on	Verify fixture is plugged in to an appropriately-rated power source .
	Check power cord wiring.
	<ul> <li>If the unit's previous shutdown was done remotely, you may have to manually turn on the power switch located behind the right front cover.</li> </ul>
	<ul> <li>The BIOS battery on the motherboard needs to be replaced</li> </ul>
Powers on but no image	<ul> <li>Make sure a video output is physically attached to the Axon server, and that the video feed is active.</li> </ul>
Powers on but does not display the CMA screen.	<ul> <li>An active display device must be attached to <b>both</b> DVI ports before booting up the system. When only one port is connected, it defaults to display the graphics engine output and will not display the CMA screen.</li> </ul>
Fixture behaves erratically or won't respond to DMX control	• Verify that the last unit on the DMX link is properly terminated, (see <i>page 8</i> ).
	<ul> <li>To control Axon with DMX, you must first enable DMX through the CMA.</li> </ul>

## **LED** Functionality

Four LEDs on the Front panel indicate the actions described in the following table.



The Red and Green LEDs are mirrored on the back panel.

Name	Color	State	Description	
	Red	On	(45 sec On/1.4 sec.Off) Running normal motion-control code	
Status		Fast Blink	Board communication activity; for example, during a software upload	
		Slow Blink	320 processor card in the base housing is receiving code.	
Drive	Amber	Blinking	Hard drive activity	
DMX	Green	Fast Blink	Media Server is receiving DMX	
Server	Blue	Steady	Media Server is receiving power	

### **Restarting Axon**

As with other computers not operating properly, restarting can often reestablish correct functioning. You can reboot Axon by:

- Clicking the Reset button on the Axon monitor desktop
- · Pressing the manual reset button located inside the right front cover on the Axon chassis
- Disconnecting and reconnecting to power source

#### Protocol Viewer on Axon Desktop

To view the DMX settings currently selected for an Axon media server, you can access a Protocol Viewer by clicking the **Launch DMX View** button on the Axon Desktop.

The tabs at the top of the Protocol Viewer let you switch to Global, or any Graphic Object to view the parameter settings.



CHAPTER 15 Maintenance and Troubleshooting

# Chapter I6: Restoring the System

# You can perform a system restore on a DL.3, Axon, or DL.2 Server with your System Restore CD.

A system restore will replace the following components:

- Microsoft Windows Embedded Operating System
- · Application

The system restore does not replace the Settings, the Stock content, or User content.

## Hardware Requirements



#### Caution: Contact High End Systems Support (http://www.highend.com) PRIOR to initiating a Full Restore!

A system restore can be done to replace the O/S partition of the drive, but should only be done as part of a specified upgrade plan. In that case, the XPe image the fixture shipped with will need to be updated.

All system restore operations require the System Restore CD that ships with each media server. If you have misplaced or damaged this CD, you may contact High End Systems (http://www.highend.com) for a replacement.

For a system restore, you will also need:

- External USB CD drive (for DL.3 and DL.2 fixtures only)
- · USB keyboard
- Optional USB mouse, which may require the addition of a USB hub for DL.2 fixtures.

## Performing the System Restore

Use the following steps to perform a system restore.

- 1. Plug your USB CD or DVD drive, keyboard, and mouse (optional) into one of the external USB ports on the media server. On DL.3 and DL.2 fixtures, you may need to use a USB hub, although this should only be a requirement if you wish to use a mouse.
- 2. Power on or reboot the media server. The System Restore menu will display on the Axon monitor or the Menu Screen on DL.3 and DL.2 fixtures.
- 3. When the fixture boots and the High End Systems logo is seen, press F8 (Asus) or F10 (Intel) to enter the boot menu for the respective motherboard.
- 4. Select the appropriate boot device and when you see "Hit any key to boot from CD...", press a key on your keyboard.

CHAPTER 16 Restoring the System

NOTE: Pressing Tab on the keyboard when booting the fixture displays the mother-board information.

5. Allow the System Restore menu to load. Depending on the speed of your USB drive, it will take between 3-5 minutes load. During this time, a number of small windows will appear and disappear. Wait until you see a full-screen menu titled *Axon System Restore Menu* or *DL.2 System Restore Menu*.

## DL2 System Restore Menu

Please click the appropriate restore option, or use <Tab> on your keyboard to highlight the appropriate restore option and hit <Enter>



- 6. Using the <Tab> key on your keyboard or using your mouse, select the system restore option or Exit to cancel the operation.
- 7. The next page will ask you to confirm your selection. Press 'Confirm' and the restore will begin.



8. Allow the restore to run. This will take between 10-30 minutes depending on the speed of your USB drive. Status will be displayed throughout the restore.



©\ C:\WINDOWS\system32\cmd.exe	
Microsoft DiskPart version 5.1.3565	
Copyright (C) 1999-2003 Microsoft Corporation. On computer: IMAGE-BUILDER	
×	
atus:	
Partitioning hard drive	

9. When this part of the restore is completed, the media server will automatically restart.

Restore completed successfully! Your machine will restart automatically in 15 seconds.

NOTE: Please wait until after your device restarts to remove the System Restore media and the USB drive.

10. After allowing a few minutes for the media server to reconfigure, the upgrade is complete, you may remove all your external USB devices.

NOTE: If you encounter an error, press the Return to Main Menu button and start the recovery process again. An error on the second attempt may indicate a hard drive failure or damaged DVD. In that case, contact High End Systems Technical Support at www.highend.com..

## **Error:**

The script has received the error code: 5 From command: cmd /c diskpart /s DL2EWFPart.txt

# **Return to Main Menu**