

# FSN Series



## User's Guide

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- Revision: 01

**BARCO**

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# FSN Series • User's Guide

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**Barco, Inc.**  
11101 Trade Center Drive  
Rancho Cordova, California 95670  
USA

- Phone: (916) 859-2500
- Fax: (916) 859-2515
- Website: [www.barco.com](http://www.barco.com)

**Barco N.V.**  
Noordlaan 5  
8520 Kuurne  
BELGIUM

- Phone: +32 56.36.82.11
- Fax: +32 56.35.16.51

### Technical Support

- **Customer Service Portal** — [www.barco.com/esupport](http://www.barco.com/esupport)
- **(866) 374-7878** — Events (24/7)
- **(866) 469-8036** — Digital Cinema (24/7)

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## Operators Safety Summary

The general safety information in this summary is for operating personnel.

### Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

### Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

### Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

### Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

### Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

### Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

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## Terms In This Manual and Equipment Marking



### WARNING

Highlights an operating procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

### Note

Highlights an essential operating procedure, condition or statement.
--



### CAUTION

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



### AVERTISSEMENT!

Le point d'exclamation dans un triangle équilatéral signale à alerter l'utilisateur qu'il y a des instructions d'opération et d'entretien très importantes dans la littérature qui accompagne l'appareil.



### VORSICHT

Ein Ausrufungszeichen innerhalb eines gleichwinkligen Dreiecks dient dazu, den Benutzer auf wichtige Bedienungs- und Wartungsanweisungen in der dem Great beiliegenden Literatur aufmerksam zu machen.

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## Change History

The table below lists the changes to the FSN Series User's Guide.

**Table 0-1.** Change History

Rev	Date	ECP #	Description	Approved By
00	3/24/09	567874	FSN Series User's Guide	R. Pellicano
01	3/31/10	577427	FSN Series User's Guide revisions: <ul style="list-style-type: none"><li>• New feature summary, explanations, links (Ch. 1)</li><li>• New DVE chapter</li></ul>	R. Pellicano

# Table of Contents

<b>Chapter 1</b>	<b>Introduction .....</b>	<b>17</b>
	In This Chapter .....	17
	Software Version .....	18
	Chapter Structure .....	18
	How to Use This Guide .....	19
	Navigating .....	19
	Table of Contents and Index .....	19
	Conventions .....	19
	Glossary of Switcher Terms .....	20
	About the FSN Series .....	23
	Overview .....	23
	Control Features .....	24
	System Configuration .....	25
	Basic FSN Series System .....	25
	Required Cards .....	25
	Optional Cards .....	26
	M/E Features .....	26
	New Feature Review .....	27
	Version 3.0 Features .....	27
	Connectivity Diagrams .....	30
	System 1 — Basic .....	30
	System 2 — Multiple Destinations .....	31
	Application Questions .....	32
<b>Chapter 2</b>	<b>FSN-1400 Orientation .....</b>	<b>33</b>
	In This Chapter .....	33
	Hardware Description .....	34
	Chassis Overview .....	34
	Card Slot Allocation and System Flexibility .....	35
	Input Flexibility .....	35
	Auxiliary Output Flexibility .....	36
	Chassis Front Door .....	37
	Air Filter .....	38
	Door Removal and Re-installation .....	38
	Chassis Front .....	39
	Chassis Rear .....	41
	Card Descriptions .....	43
	System Card .....	44
	FSN Series Ethernet Connections .....	48
	M/E Card .....	49
	Clean Feed Output Selection .....	52
	Native Input Card .....	53
	Universal Input Card .....	55

## Table of Contents

	Digital Video Effects Card . . . . .	57
	Universal Output Card . . . . .	58
	Native Aux Output Card . . . . .	60
	Multiviewer Card . . . . .	62
	Card LEDs . . . . .	64
	Analog Format Connection Table . . . . .	65
<b>Chapter 3</b>	<b>Control Panel Orientation . . . . .</b>	<b>67</b>
	In This Chapter . . . . .	67
	Control Panel Descriptions . . . . .	68
	FSN-150 Overview . . . . .	68
	FSN-150 Control Panel Sections . . . . .	70
	Functional Control Panel Sections . . . . .	72
	Display Section . . . . .	73
	PGM Bank . . . . .	74
	PGM Transition Section . . . . .	76
	M/E Bank . . . . .	81
	M/E Transition Section . . . . .	83
	Aux Section . . . . .	91
	Custom Control Section . . . . .	93
	Memory Section . . . . .	94
	Joystick . . . . .	98
	Control Panel Rear . . . . .	99
	Control Panel Bottom . . . . .	101
	Touch Screen Connector Panel . . . . .	102
<b>Chapter 4</b>	<b>Installation . . . . .</b>	<b>103</b>
	In This Chapter . . . . .	103
	Safety Precautions . . . . .	104
	Shipping Information . . . . .	104
	Unpacking and Inspection . . . . .	104
	Site Preparation . . . . .	105
	Cable and Adapter Information . . . . .	105
	FSN-1400 Cables . . . . .	105
	FSN-150 Cables . . . . .	105
	Optional Adapters . . . . .	105
	Control Panel Installation . . . . .	106
	Touch Screen Installation . . . . .	107
	Display Mount Options . . . . .	109
	FSN-1400 Rack-Mount Procedure . . . . .	110
	FSN-1400 System Connections . . . . .	112
	Power Cord/Line Voltage Selection . . . . .	115
	Card and Rear Panel Installation . . . . .	116
	Rear Panel Insertion . . . . .	117
	Rear Panel Removal . . . . .	117
	Card Insertion . . . . .	118
	Card Removal . . . . .	120
	Signal Connections . . . . .	121
	Output Connections . . . . .	122
	Aux Output Connections . . . . .	124

External DSK Input Connections . . . . . 125  
 Native Input Connections. . . . . 126  
 Universal Input Connections . . . . . 127  
     Analog Format Connection Table . . . . . 128  
 Multiviewer Connections . . . . . 129

**Chapter 5 Menu Orientation . . . . . 131**

In This Chapter . . . . . 131  
 Menu Tree . . . . . 132  
     High Level Menu Tree . . . . . 132  
     System Menu Tree . . . . . 133  
 Using the Menu System . . . . . 134  
 Buttons, Tables and Matrices . . . . . 136  
     Button Categories and Colors . . . . . 136  
     Latching, Momentary and Conditional Buttons . . . . . 137  
     Value Buttons . . . . . 138  
     Toggle Buttons. . . . . 138  
     Pop-up Buttons . . . . . 139  
     Location Buttons . . . . . 139  
     Summary of Button Types . . . . . 141  
     Tables . . . . . 142  
     Matrices . . . . . 143  
     Notes and Error Messages . . . . . 143  
 Using the Keypad . . . . . 144  
 Using the Pop-up Keyboard . . . . . 147  
 Transition Menu . . . . . 148  
     Transition Menu Access . . . . . 149  
     Transition Rate Adjustment . . . . . 149  
     Transition Curve Adjustment . . . . . 150  
 Wipe Menu . . . . . 151  
     Wipe Menu Access . . . . . 152  
     Wipe Patterns . . . . . 152  
     Wipe Functions and Modifiers . . . . . 152  
         Bank . . . . . 153  
         Direction . . . . . 153  
         Edge . . . . . 155  
         Edge Color . . . . . 156  
 Keyer Menu . . . . . 157  
     Keyer Menu Access . . . . . 158  
     Keyer Status Table . . . . . 158  
     Keyer Functions and Modifiers . . . . . 159  
         Keyer Selection . . . . . 159  
         Type . . . . . 160  
         Clip, Gain, Opacity . . . . . 161  
         Key Fill. . . . . 162  
         DVE Keyer Functions . . . . . 164  
         Swap Key Settings . . . . . 165  
         External Key . . . . . 166  
         Copy Key Settings. . . . . 167  
     Advanced Key Functions . . . . . 168  
 Color Background Menu . . . . . 169

## Table of Contents

Color Background Menu Access . . . . .	170
Color Background Functions . . . . .	170
Color Background Selection . . . . .	170
Color Chips . . . . .	170
Color Wheel . . . . .	171
Fine Tuning . . . . .	171
User Colors . . . . .	172
Color Picker Pop-up . . . . .	173
Memory Menu . . . . .	174
Memory Menu Access . . . . .	175
Memory Menu Description . . . . .	176
Enables Menu Description . . . . .	178
Enable Descriptions . . . . .	180
M/E 1 and M/E 2 Enables . . . . .	180
PGM Enables . . . . .	181
System Enables . . . . .	182
Aux Enables . . . . .	182
DVE Enables . . . . .	183
Selecting Registers . . . . .	183
Naming Registers . . . . .	184
Advanced Memory Functions . . . . .	185
Locking and Unlocking Registers . . . . .	185
Deleting Registers . . . . .	185
Aux Menu . . . . .	186
System Menu . . . . .	188
System Menu Description . . . . .	189
System Menu Access . . . . .	189
System Menu Functions . . . . .	190
Status Tables . . . . .	192
Communications Setup Menu . . . . .	194
Reference and Output Setup Menu . . . . .	197
Input Menu . . . . .	202
Rear I/O View Description . . . . .	203
Connector Colors . . . . .	204
Input Table Description . . . . .	205
Input Menu Functions . . . . .	206
Default Naming Conventions . . . . .	208
Input Setup Menu for Native Inputs . . . . .	209
Input Color Correction Section . . . . .	210
Input Sync Section . . . . .	211
Understanding Sync Mode . . . . .	211
Input Mask Section . . . . .	213
Input Setup Menu for Universal Inputs . . . . .	214
Input Capture and Process Panel . . . . .	215
Input Capture and Timing Section . . . . .	215
Input Processing Section . . . . .	218
Input Sizing and Scaling Panel . . . . .	219
Input Color Correction Panel . . . . .	223
Input Setup Menu Tool Bar Functions . . . . .	223
Input Setup Notes . . . . .	223
Map Buttons Menu . . . . .	224
Button Map Table . . . . .	225
Map Buttons Menu Functions . . . . .	226
Map Buttons Keypad . . . . .	227

Mapping Luma Keys and Linear Keys. . . . .	228
External DSK Setup Menu. . . . .	229
External DSK Table. . . . .	230
DSK Cut Setup . . . . .	230
DSK Fill Setup. . . . .	231
Clean Feed Setup Menu . . . . .	232
Clean Feed Outputs . . . . .	232
Assign Button . . . . .	233
Tally Setup Menu . . . . .	235
Tally Table. . . . .	236
Tally Setup Menu Functions . . . . .	237
DVE Assign Menu . . . . .	238
Multiviewer Setup Menu . . . . .	239
Aux Setup Menu . . . . .	240
Rear I/O View Description . . . . .	241
Aux Table Description . . . . .	241
Aux Setup Menu Functions . . . . .	242
UOC Setup Menu . . . . .	243
Output and Process Panel . . . . .	244
Output Section . . . . .	244
Output Processing Section. . . . .	245
Output Status Section. . . . .	245
Output and Process Tool Bar Functions. . . . .	246
Advanced UOC Output Setup Menu . . . . .	247
Output Sizing and Scaling Panel . . . . .	249
Output Color Correction Panel . . . . .	252
Other Setup Menu . . . . .	253
User Preferences Menu. . . . .	254
User Preferences Table . . . . .	255
User Preferences Functions . . . . .	255
Diagnostics Menu . . . . .	257
T-Bar, Joystick and Knobs . . . . .	258
Calibrate Touch Screen. . . . .	259
LEDs, Buttons and Displays . . . . .	260
Tallies . . . . .	262
GPIO . . . . .	263
View Errors . . . . .	264
View Log . . . . .	266
Software Menu. . . . .	268
Software Table . . . . .	269
Software Functions . . . . .	269
Output Test Patterns Menu . . . . .	270
Lock/Unlock Panel . . . . .	272
Save All . . . . .	272
Backup and Restore Menu . . . . .	273
Reset Menu . . . . .	274
Factory Default Settings . . . . .	275
System Shutdown . . . . .	276
Help Menu and Shortcuts . . . . .	277
Shortcuts . . . . .	278

<b>Chapter 6</b>	<b>System Setup.....</b>	<b>279</b>
	In This Chapter . . . . .	279
	Setup Prerequisites . . . . .	280
	System Setup Sequence . . . . .	281
	Power Up and Status Check . . . . .	282
	Return to Factory Default . . . . .	283
	Touch Screen Calibration . . . . .	284
	Communications Setup . . . . .	285
	Restoring the System . . . . .	286
	Reference Video and Output Setup . . . . .	287
	Output Test Patterns . . . . .	289
	Clean Feed Setup . . . . .	290
	Native Input Setup . . . . .	291
	Universal Input Setup . . . . .	293
	External DSK Input Setup . . . . .	296
	Button Mapping . . . . .	297
	Aux Setup . . . . .	298
	Multiviewer Setup . . . . .	301
	Tally Setup . . . . .	303
	User Preferences Setup . . . . .	304
	Saving the Setup . . . . .	305
	Backing up the System . . . . .	305
<b>Chapter 7</b>	<b>Operations .....</b>	<b>307</b>
	In This Chapter . . . . .	307
	Quick Setup and Operations . . . . .	308
	Quick Function Reference . . . . .	310
	Understanding Button Color . . . . .	311
	Understanding Switcher Layers . . . . .	312
	Understanding Flip-flop Mode . . . . .	314
	Understanding Tally . . . . .	315
	Understanding Error Messages . . . . .	316
	Working with Pop-ups . . . . .	317
	Using the Keypad . . . . .	317
	Understanding Press and Hold . . . . .	318
	Understanding Lookahead Preview . . . . .	319
	Lookahead Preview Overview . . . . .	319
	Lookahead Preview Tutorial . . . . .	320
	Example 1: BG Lookahead . . . . .	320
	Example 2: KEY 1 Lookahead . . . . .	321
	Example 3: KEY 2 Lookahead . . . . .	322
	Example 4: BG Lookahead, Transition Under Key . . . . .	323
	Example 5: Combined Lookahead . . . . .	324
	Example 6: Continued Practice . . . . .	324
	Understanding the T-Bar and Transition LEDs . . . . .	325
	Manual Transitions . . . . .	325
	Automatic Transitions . . . . .	325
	Physical and Virtual T-Bar Position . . . . .	326
	Example 1: Normal T-Bar movement . . . . .	326
	Example 2: T-Bar movement with memory registers . . . . .	327



## Table of Contents

Joystick Control . . . . .	361
DVE Menu Orientation . . . . .	362
DVE Assign Menu . . . . .	363
DVE Main Menu — Size and Position Panel . . . . .	365
Common DVE Menu Components . . . . .	366
Functional Tabs . . . . .	366
DVE Status Table . . . . .	367
Keyframe Editing Section . . . . .	367
Tool Bar Functions . . . . .	368
Size and Position Adjustments . . . . .	369
Size Presets . . . . .	369
Position Presets . . . . .	370
Aspect Ratio . . . . .	370
Manual Size and Position . . . . .	371
Effect Setup Panel . . . . .	372
Pan Zoom Source Panel . . . . .	373
Mask Panel . . . . .	375
Border Shadow Opacity Panel . . . . .	377
Border Section . . . . .	378
Shadow Section . . . . .	379
Opacity Section . . . . .	380
Shot Box Menu . . . . .	381
Advanced DVE Menu — Color Effects Panel . . . . .	383
Advanced DVE Menu — DVE Extras Panel . . . . .	385
Keyframe Freeze Behavior . . . . .	387
DVE Links . . . . .	388
Assigning DVE Channels to Keyers . . . . .	389
Selecting the Keyer Mode . . . . .	390
Programming DVE Effects . . . . .	391
Programming Single Keyframe Effects . . . . .	391
Programming Dual Keyframe Effects . . . . .	392
Creating Dual Keyframe Effects from the Shot Box . . . . .	393
Editing Keyframes . . . . .	394
Automatic DVE Triggering . . . . .	396
Automatic Triggering via the Control Panel . . . . .	397
Trigger Setup and Display . . . . .	398
Trigger Only Transition . . . . .	398
Mix-key-trigger Transition . . . . .	399
Wipe-key-trigger Transition . . . . .	399
Automatic DVE Trigger Rules . . . . .	400
Using Automatic DVE Triggers . . . . .	401
Trigger an Effect on Keyer 1 Only . . . . .	401
Trigger an Effect on Keyer 2 Only . . . . .	402
Trigger Effects on both Keyers . . . . .	402
Mix Key and Trigger an Effect on Keyer 1 . . . . .	403
Mix Key and Trigger an Effect on Keyer 2 . . . . .	403
Mix Key and Trigger Effects on both Keyers . . . . .	404
Mix BG and Keyer 1, and Trigger Effect on Keyer 1 . . . . .	404
Mix BG and Keyer 2, and Trigger Effect on Keyer 2 . . . . .	405
Mix BG and both Keyers, Trigger Effects on both Keyers . . . . .	405
Wipe Trigger Options . . . . .	406
Tap In, Tap Out Functions . . . . .	407
Tap In, Tap Out Rules . . . . .	407

	Tap in, Tap Out Examples . . . . .	408
	Mix KEY 1 and trigger KEY 2 . . . . .	408
	Mix BG, trigger KEY 1, mix-key-trigger KEY 2 . . .	409
	Wipe-key-trigger KEY 1, wipe KEY 2 . . . . .	409
<b>Chapter 9</b>	<b>Multiviewer Operations . . . . .</b>	<b>411</b>
	In This Chapter . . . . .	411
	Introduction to the Multiviewer . . . . .	412
	Multiviewer Menu Orientation . . . . .	414
	Multiviewer Setup Menu . . . . .	415
	Multiviewer Output Setup Menu. . . . .	417
	Select Layout Menu . . . . .	418
	Select Colors Menu . . . . .	420
	Clock Setup Menu . . . . .	421
	Assign Source Keypad . . . . .	422
	Multiviewer Setup . . . . .	423
	Multiviewer Memory . . . . .	423
<b>Chapter 10</b>	<b>Updating Software . . . . .</b>	<b>425</b>
	In This Chapter . . . . .	425
	Software Update Overview . . . . .	426
	Hardware Requirements . . . . .	426
	Downloading Software . . . . .	427
	Via FTP Site . . . . .	427
	Via Web Site . . . . .	428
	Updating Control Panel Software . . . . .	429
	Updating FSN-1400 Software . . . . .	430
	Conditional Updates . . . . .	430
<b>Appendix A</b>	<b>Specifications. . . . .</b>	<b>431</b>
	In This Appendix . . . . .	431
	System Specifications Overview . . . . .	432
	Reference Video Input Specifications . . . . .	433
	Reference Video Output Specifications . . . . .	434
	Physical and Electrical Specifications . . . . .	435
	FSN-1400 . . . . .	435
	FSN-150 . . . . .	435
	Touch Screen Display . . . . .	436
	Touch Screen Display Stand . . . . .	436
	Communications Specifications . . . . .	437
	Agency Specifications . . . . .	437
	Cable Specifications . . . . .	437
	Delay Specifications . . . . .	438
	NIC Delay . . . . .	438
	UIC Delay . . . . .	438
	Pinouts . . . . .	439
	Analog 15-pin D Connector . . . . .	439
	DVI-I Connector . . . . .	440

## Table of Contents

Ethernet Connector .....	441
Serial Connectors .....	442
Tally Connector .....	443
GPIO Connector .....	444
Input and Output Format Tables. ....	445
UIC Input and UOC Output Formats .....	445
NIC Input Formats, UIC Input Formats (BNC) .....	449
Output Formats .....	449
<b>Appendix B</b>	
<b>Contact Information .....</b>	<b>451</b>
In This Appendix. ....	451
Warranty .....	451
Return Material Authorization (RMA) .....	451
Contact Information .....	452
<b>Index</b>	<b>.....453</b>

# 1. Introduction

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## In This Chapter

This chapter is designed to introduce you to the FSN Series User's Guide. Areas to be covered are:

- [Software Version](#)
- [Chapter Structure](#)
- [How to Use This Guide](#)
- [Conventions](#)
- [Glossary of Switcher Terms](#)
- [About the FSN Series](#)
- [New Feature Review](#)
- [Connectivity Diagrams](#)
- [Application Questions](#)

# 1. Introduction

Software Version

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## Software Version

This version of the FSN Series User's Guide is based on software version 3.0.

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## Chapter Structure

The following chapters provide instructions for all aspects of FSN Series operations:

- Chapter 1, "[Introduction](#)" provides a system overview, a list of features, and system connectivity diagrams.
- Chapter 2, "[FSN-1400 Orientation](#)" on page 33 provides detailed explanations of the system's chassis and internal cards.
- Chapter 3, "[Control Panel Orientation](#)" on page 67 provides detailed explanations of each control panel's sections and functions.
- Chapter 4, "[Installation](#)" on page 103 provides comprehensive system installation instructions.
- Chapter 5, "[Menu Orientation](#)" on page 131 provides menu trees, plus comprehensive explanations of each menu and function.
- Chapter 6, "[System Setup](#)" on page 279 provides detailed instructions for setting up system inputs, outputs and communications.
- Chapter 7, "[Operations](#)" on page 307 provides comprehensive system operating instructions.
- Chapter 8, "[DVE Operations](#)" on page 353 provides full instructions on setting up and operating the optional 2D DVE.
- Chapter 9, "[Multiviewer Operations](#)" on page 411 provides full instructions on setting up and operating the optional Multiviewer.
- Chapter 10, "[Updating Software](#)" on page 425 outlines procedures for upgrading system software components.
- Appendix A, "[Specifications](#)" on page 431 lists the FSN Series' specifications.
- Appendix B, "[Contact Information](#)" on page 451 lists important Barco contact, RMA, warranty and technical support details.

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## How to Use This Guide

This section provides important tips for streamlining your use of this User's Guide in its electronic "PDF" form.

### Navigating

Use Acrobat Reader's "bookmarks" to navigate to the desired location. All chapter files have the same bookmark structure for instant navigation to any section. Please note:



- Extensive hyperlinks are provided within the chapters.
- Use Acrobat's "**Go to Previous View**" and "**Return to Next View**" buttons to trace your complete navigational path.
- Use the "**Previous Page**" and "**Next Page**" buttons to go to the previous or next page within a file.
- Use Acrobat's extensive search capabilities, such as the "**Find**" tool and "**Search Index**" tool to perform comprehensive searches as required.

### Table of Contents and Index

Use the **Table of Contents** bookmarks to navigate a desired topic. Click any item to instantly jump to that section of the guide. You can also use the **Index** to jump to specific topics within a chapter. Each page number in the **Index** is a hyperlink.

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## Conventions

The following conventions are used throughout this guide:

- The symbol ■ denotes an operations procedure.
- The symbol ▲ denotes an example.
- Entries written in bold-face letters denote physical buttons, chassis connectors and "sections" on the control panel.
  - ▲ Press **DSK** to ...
- Entries written between braces denote buttons on the Touch Screen.
  - ▲ Press {**Edge Color**} to ...
- A sequence of button presses on the control panel is denoted by the button names, separated by commas.
  - ▲ Press **STORE, M/E 1, #, ENTER** to ...
- A "press and hold" sequence involving two buttons is denoted by the + symbol in between button names.
  - ▲ Press **MIX + FX TRIG** to ...
- A sequence of button presses on the Touch Screen is denoted by the button names, separated by arrows.
  - ▲ Press {**System**} > {**Input Setup**} to ...

# 1. Introduction

## Glossary of Switcher Terms

---

# Glossary of Switcher Terms

The following terms and abbreviations are used throughout this guide:

- **3G** — A 3 Gbit/s serial digital 10-bit or 12-bit video interface (SMPTE 424M and 425M).
- **AUX** (Auxiliary) Bus — AUX buses are extra switching buses that allow video signals connected to the switcher to be routed to external equipment such as VTRs, monitors, projectors, etc.
- **Bank** — a name for the three *combined* individual buses in an M/E, including the PGM bus, the PST bus and the KEY bus.
- **BG** (Background) — The switcher bus on an M/E bank that selects the on-line (or on-air) output signal.
- **Chroma Key** — A type of key where the hole-cutting information is derived from a color rather than from a video level. An common example on television, is when the weatherman appears to be standing in front of a map. The map itself is a video signal, and the weatherman is in fact standing in front of a green (or blue) screen. On the switcher, the Chroma Key process electronically subtracts the color from the foreground image, and replaces it with video from the background image to form a composite image.
- **Clip, Gain, Opacity** — In switcher terminology, the process of fine-tuning a key of any type (luminance, linear, or chroma). Clipping sets the threshold for the hole-cutting circuitry, while "gain" defines the range and sensitivity of adjustment. The "opacity" is the transparency or density of the key, as revealed over a background.
- **Chassis Cards** — In addition to the required **M/E** and **System** cards, the following cards that can be installed in the chassis, enabling you to configure the switcher in many flexible ways. These cards are abbreviated as follows:
  - ~ **NIC** (Native Input Card) — provides eight native video inputs.
  - ~ **UIC** (Universal Input Card) — provides two universal scaler inputs.
  - ~ **UOC** (Universal Output Card) — provides two universal auxiliary outputs.
  - ~ **NAC** (Native Aux Output Card) — provides eight native auxiliary outputs.
  - ~ **DVE** (Digital Video Effects) — provides two "2D" DVE channels.
- **CLN** (Clean Feed) — An output of an M/E that originates upstream of the M/E's keyers. For example, if the output of M/E 1 is Camera 1 plus a key, the "clean" output is Camera 1 only, minus the key.
- **Computer Video** — A generic term indicating video that originates from a computer platform. A progressive scan signal that follows VESA (Video Electronics Standards Association) standards, with typical resolutions of 800 x 600, 1024 x 768, 1280 x 1024, etc.
- **Crosspoint** — The video switch (or button) that selects the input required on a particular switcher bus.
- **Cut** — an instantaneous switch from one video source to another.
- **DA** (Distribution Amplifier) — A video device that inputs one video signal, and outputs multiple "identical" signals.
- **DSK** (Downstream Keyer) — A DSK is a key that is electronically located after all other switcher functions — visually on top of all other layers and buses. Any operations performed "upstream" on the switcher M/Es will not affect the downstream key video.

- **DVE** (Digital Video Effects) — A special effects generator with the ability to create PIP effects, reduce and enlarge images, create borders and shadows around those images, and create keyframes for motion paths. See **PIP** and **Keyframe** for additional information.
- **EXT** (External) — A digital key input that is dedicated to the DSK.
- **Fader** — see **T-Bar**.
- **FTB** (Fade to Black) — The button which enables the TD (Technical Director) to fade everything on Program, including the DSK, to or from black.
- **GPIO** (General Purpose Input/Output) — One or more communications ports that control input and output "triggering." For example, with a **GPI** (input) trigger, an external peripheral device can trigger a specified switcher function. With a **GPO** (output) trigger, the switcher can trigger an external device.
- **GUI** (Graphical User Interface) — A term that describes a status display based on graphics and icons, rather than strictly on numbers and letters.
- **HD-SDI** (High Definition Serial Digital Interface) — a high definition SDI signal (SMPTE 292M). Example formats are 720p, 1080i, and 1080p.
- **Keyframe** — In a PIP "move," a keyframe is a point where an action or change occurs. For example, when a PIP moves from the upper right corner to full screen, keyframe 1 is the upper right position, and keyframe 2 is the full screen position of the PIP.
- **Keying** — The process of superimposing video from one source (the foreground) on top of another source (the background).
- **Key Fill** — The video which fills the hole cut by the keying circuitry. Typically, switchers provide a variety of choices for the fill source — internal mattes, external video, or "self" fill are several examples.
- **Key Mask** — A key modification system that protects a portion of the foreground video from being keyed, using the switcher's internal pattern system.
- **Key Signal** — also known as **Key Source**. The signal that electronically cuts the hole in the background video signal. Key signals typically originate from external inputs such as character generators or cameras.
- **Linear Key** — a keying mode in which the edges of anti-aliased key sources (such as character generators) are reproduced clearly. Typically, two separate signals are required from a linear key source: a cut and a fill.
- **M/E** (Mix/Effects) — The section (or "bank") of a video switcher where video signals are processed to select inputs and create mixes, wipes, keys and other effects. An M/E is essentially a video layer that can be combined with other M/Es (layers) to form the entire output of the switcher.
- **Menu** — A term used to describe buttons and functions on the high-resolution color LCD touch screen.
- **Mix** — also known as a **Dissolve**. A transition between two video sources in which one source fades out as the other fades in.
- **Multiviewer** (MVR) — a monitoring system that enables multiple sources (input and outputs) to be displayed on one or two monitors, eliminating the need for individual source monitors. By utilizing different arrays of PIPs, users can select the preferred multiviewer "look," and streamline control room operations.
- **Native Resolution** — The resolution to which all processing is set within the switcher frame, e.g., SD-SDI (SMPTE 259M, Level C) or HD-SDI (SMPTE 292M).

# 1. Introduction

## Glossary of Switcher Terms

- **NTSC** — National Television Standards Committee. The oldest standard for color picture broadcasting. NTSC is a standard definition format that operates at a frequency of 60Hz, with 525 lines, 60 fields and 30 frames per second.
- **PAL** — Phase Alternating Line. PAL is the predominant TV standard in Europe. PAL is a standard definition format that operates at a frequency of 50Hz, with 625 lines, 50 fields, and 25 frames per second.
- **PGM (Program)** — The switcher bus on the Program bank that selects the on-line (or on-air) output signal from that bank.
- **PGM Bank** — The *entire* PGM bank, including the PGM bus, PST bus, DSK, the PGM transition section and FTB.
- **PIP (Picture-in-Picture)** — An on-screen “look” in which one picture (typically of reduced size) is positioned or keyed over another background image — or another PIP. PIPs can overlap each other, depending on their visual priority.
- **PST (Preset)** — The switcher bus that selects the video that will appear next on-line (or on-air).
- **RGB** — The red, green and blue color signal components.
- **RGBHV** — Defines a connection scheme with five lines: one for red, one for green, one for blue, one for the horizontal sync and one for the vertical sync. This is the standard used in VGA and other analog PC computer monitors.
- **RGBS** — Defines a connection with four signals, to transmit video and sync information. Vertical and horizontal sync are combined on a single channel
- **RGsB** — Defines a connection with three signals, to transmit video and sync information. Here, the sync information is transmitted on the green channel.
- **SD-SDI** — (Standard Definition Serial Digital Interface) — a standard definition SDI signal with a data rate of 270 Mbit/s only (SMPTE 259M). Example formats are 480i and 525i.
- **SDI (Serial Digital Video)** — A digital representation of the video signal that is distributed via a single coaxial cable with BNC connectors.
- **T-Bar** — Also known as a Fader, the T-Bar is the lever on a switcher that manually controls the progress of an effect. The position of the fader controls the amount of the BG (Background) Bus signal and the PST (Preset) Bus signal that contributes to the mix, wipe or key.
- **TD (Technical Director)** — the person who operates the FSN Series switcher.
- **Wipe** — a transition between two video sources that uses a selected pattern to determine the edge between the two sources.
- **Y/C** — A video signal in which color and brightness information is transmitted separately (luminance Y, chrominance C).

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## About the FSN Series

The following topics are discussed in this section:

- [Overview](#)
- [Control Features](#)
- [System Configuration](#)

### Overview

The FSN Series integrates HD, SD and computer sources in a professional multi-format production switcher. General features include:

- The ability to add computer inputs and HD/SD cross-conversion capability to traditional video switcher functionality, with seamless switching and mixing.
- The ability to select the native output video format (e.g., 480i, 576i, 720p, 1080i). In this manner, the switcher can:
  - ~ Operate as an HD-SDI switcher with internal SD and computer video conversion to HD.
  - ~ Operate as an SD-SDI switcher with internal HD and computer video conversion to SD.
- An intuitive control surface, with sections and functions that are familiar to the video production switching community.
- A user-configurable video processor (chassis) that uses field-installable cards, providing superior input and output flexibility.
- All cards, power supplies and fans are front-serviceable and hot-swappable.
- Video reference input, plus auto-timing of reference locked sources (+/- 0.5 lines).
- Six native resolution Aux outputs as standard.
- Minimal video delay for native resolution sources that are locked to reference.
- Built-in test patterns.

Please note:

- To ensure trouble-free orientation, installation and operation of your FSN Series switcher, please follow all procedures in the following chapters:
  - ~ Chapter 2, "[FSN-1400 Orientation](#)" on page 33.
  - ~ Chapter 3, "[Control Panel Orientation](#)" on page 67.
  - ~ Chapter 4, "[Installation](#)" on page 103.
  - ~ Chapter 5, "[Menu Orientation](#)" on page 131.
  - ~ Chapter 6, "[System Setup](#)" on page 279.
  - ~ Chapter 7, "[Operations](#)" on page 307.
  - ~ Chapter 8, "[DVE Operations](#)" on page 353.
  - ~ Chapter 9, "[Multiviewer Operations](#)" on page 411.
- If you have questions regarding the FSN Series, please consult with customer service. Refer to Appendix B, "[Contact Information](#)" on page 451.

# 1. Introduction

About the FSN Series

## Control Features

Two different control surfaces are available for the FSN Series:

- The **FSN-150** is a 1.5 M/E production switcher providing 20 assignable crosspoints (10 buttons plus **SHIFT**).



**Figure 1-1.** FSN-150 Control Panel

- The **FSN-250** is a 2.5 M/E production switcher providing 52 assignable crosspoints (26 buttons plus **SHIFT**).



**Figure 1-2.** FSN-250 Control Panel

Additional control features are listed below:

- A high-resolution color LCD touchscreen for setup and parameter adjustment.
- Programmable “custom” buttons, with LCD displays to indicate the current button assignments.
- Programmable LCD source labels for the switcher bus rows.

**Note**

The **FSN-250** is not available in version 3.0.

## System Configuration

The following topics are discussed in this section:

- [Basic FSN Series System](#)
- [Required Cards](#)
- [Optional Cards](#)
- [M/E Features](#)

### Basic FSN Series System

Because the FSN Series uses modular components, many flexible system configurations can be designed to suit your exact production requirements. The basic system consists of the following:

- One **FSN-150** control panel.
- One **FSN-1400** chassis.
- One **System Card** and one **Crosspoint M/E Card**, both of which are required on all systems. Refer to the "[Required Cards](#)" section below for details.

All other cards are optional, including the **NIC**, **UIC**, **UOC**, **DVE**, **NAC** and **MVR**. Refer to the "[Optional Cards](#)" section on page 26 for details.

### Required Cards

Required FSN Series cards are described below.

- **System Card** — this required card includes:
  - ~ Video reference input and loop through.
  - ~ Configurable video reference output.
  - ~ Ethernet port (10/100).
  - ~ One tally connector (24 contact closures).
  - ~ One GPIO connector (four GPI ports and eight GPO ports).

In Chapter 2, refer to the "[System Card](#)" section on page 44 for details.

- **Crosspoint M/E Card** — This required card includes:
  - ~ Crosspoint matrix.
  - ~ M/E and PGM circuitry.
  - ~ Dedicated DSK cut and fill inputs.
  - ~ Six Aux outputs.
  - ~ Four PGM outputs (PGM [2x], PVW and CLN).
  - ~ Three M/E 1 outputs (PGM 1, PVW 1 and CLN 1).
  - ~ Three M/E 2 outputs (PGM 2, PVW 2 and CLN 2).

In Chapter 2, refer to the "[M/E Card](#)" section on page 49 for details.

# 1. Introduction

About the FSN Series

## Optional Cards

Optional FSN Series cards are described below.

- **NIC** (Native Input Card)  
The **NIC** provides eight native video input channels, which run at the switcher's selected native output resolution. In Chapter 2, refer to the "[Native Input Card](#)" section on page 53 for details.
- **UIC** (Universal Input Card)  
The **UIC** provides two independent universal scaler channels, each of which is used to scale input video to the switcher's selected native output resolution. In Chapter 2, refer to the "[Universal Input Card](#)" section on page 55 for details.
- **UOC** (Universal Output Card)  
The **UOC** provides two independent universal scaler output channels. Each card can output scaled video and/or computer resolutions up to UXGA or 1920 x 1080, or function as an additional native auxiliary output. In Chapter 2, refer to the "[Universal Output Card](#)" section on page 58 for details.
- **DVE** (Digital Video Effects)  
The **DVE** card provides two internal 2-D DVE channels which can be used to create PIPs, and fly PIPs and keys. In Chapter 2, refer to the "[Digital Video Effects Card](#)" section on page 57 for details.
- **NAC** (Native Aux Output Card)  
The **NAC** provides eight auxiliary outputs which run at the system's native resolution. In Chapter 2, refer to the "[Native Aux Output Card](#)" section on page 60 for details.
- **MVR** (Multiviewer Card)  
The **MVR** provides internal multiviewer capability, with the ability to display up to 16 source PIPs in both single and dual monitor configurations. In Chapter 2, refer to the "[Multiviewer Card](#)" section on page 62 for details.

### Important

In Chapter 2, refer to the "[Card Slot Allocation and System Flexibility](#)" section on page 35 for details on maximum card quantities and slot allocations in the FSN-1400 chassis.

## M/E Features

Each M/E processor features the following capabilities:

- A/B background mixer, plus two full function keyers
- Pattern system (wipes)
- PGM, PVW and assignable CLN outputs

Each PGM bank features the following:

- A/B background mixer
- Pattern system (wipes)
- One downstream key (DSK)
- Downstream FTB (Fade to Black)
- PGM (2x), PVW and CLN outputs

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## New Feature Review

The following topics are discussed in this section:

- [Version 3.0 Features](#)

### Version 3.0 Features

This section lists the new hardware and software features that have been implemented in the FSN Series version 3.0 release. Reference links are provided.

- **DVE Functionality**

Version 3.0 supports the optional 2D **DVE** (Digital Video Effects) card, of which two can be installed in FSN-1400 slots 9 and 10. DVE functionality includes:

- ~ Programming of single and dual keyframe DVE effects.
- ~ Ability to create PIPs, and fly PIPs and keys.
- ~ Joystick control of PIPs.
- ~ New **DVE Assign Menu**, accessed via the **Setup Menu**.
- ~ Full compliment of DVE programming menus, accessed via the **{DVE}** button in the **Menu Bar**.

Refer to Chapter 8, "[DVE Operations](#)" on page 353 for details.

- **NAC Functionality**

Version 3.0 supports up to three **NACs** (Native Aux Output Cards) in chassis slots 11, 12 and/or 13. Each **NAC** provides eight aux outputs which run at the system's native resolution. When installed, the associated Aux outputs are automatically enabled on the control panel. In Chapter 2, refer to the "[Native Aux Output Card](#)" section for details.

- **UOC Functionality**

Version 2.0 supports up to three **UOCs** (Universal Output Cards) in slots 11, 12 and/or 13. Each **UOC** provides two independent universal scaler output channels. In Chapter 2, refer to the "[Universal Output Card](#)" section for additional details.

- **MVR Functionality**

Version 2.0 supports one **MVR** (Multiviewer Card) in slot 11. The **MVR** provides internal multiviewer capability with the ability to display up to 16 source PIPs in both single and dual monitor configurations. In Chapter 2, refer to the "[Multiviewer Card](#)" section on page 62 for details.

#### Important

Regarding the **NAC**, **UOC** and **MVR**, refer to the "[Card Slot Allocation and System Flexibility](#)" section for details on maximum card quantities and slot allocations in the chassis.

- **Aux Menu**

Version 2.0 activates the **Aux Menu** and the accompanying **Aux Setup Menu**. Together, these menus enable you to set up, map, name and view all Aux buses. In Chapter 5, refer to the "[Aux Setup Menu](#)" section for setup menu details, and the "[Aux Menu](#)" section for operating details.

# 1. Introduction

## New Feature Review

- **M/E 2 Control**

Version 2.0 supports control of M/E 2 from the FSN-150. All M/E 2 outputs on the FSN-1400 are active, a new **M/E Setup Menu** is provided, and the **M/E 2 button** in the **Memory Section** is active. In Chapter 5, refer to the [“Other Setup Menu”](#) section for setup details. In Chapter 7, refer to the [“M/E 2 Control on the FSN-150”](#) section for M/E 2 operating instructions.

- **NIC Gamma Adjustment**

Gamma adjustment has been added to all **NIC** (Native Input Card) inputs. The adjustment range is 0.5 to 3.0, in .01 increments. In Chapter 5, refer to the [“Input Menu”](#) section on page 202 for details.

- **Ancillary Data Support for SD Rates**

For **SD** (standard definition) formats, for direct **NIC-to-AUX** output routes, ancillary data present on **NIC** inputs is now preserved to SDI Aux outputs. However, if the signal travels through an M/E, a UIC or the DVE, ancillary data is stripped. Please note the following important points:

- ~ In **Frame Sync** mode, if a frame is repeated or dropped, the ancillary data for that frame is also repeated or dropped.
- ~ For **HD** (high definition) video formats, the same rules apply.

- **Video Reference Output**

On the **Reference and Output Setup Menu**, new features are provided:

- ~ Users can adjust the reference video output by toggling the **{Reference Out}** button to either **Black Burst** or **Tri-level Sync**.

**Important**

This change activates the **Ref Out** BNC connector on the **System Card**'s rear panel.

- ~ By pressing **{Reference Output Timing}**, users can adjust H and V phase relative to video reference input.

Please note:

- ~ In Chapter 2, refer to the [“System Card”](#) section on page 44 for information on the **Ref Out** connector.
- ~ The sync out format (as provided on the **Ref Out** BNC) changes, depending on the selected native video format. In Appendix A, refer to the [“Reference Video Output Specifications”](#) section on page 434 for details on each format.

- **Additional Native Video Output Formats**

Three new native video output formats have been added to the system:

- ~ 1920 x 1080p @ 23.98
- ~ 1920 x 1080p @ 24
- ~ 1920 x 1080p @ 25

Please note:

- ~ Use the **Reference and Output Setup Menu** to select the desired native output format. In Chapter 5, refer to the [“Reference and Output Setup Menu”](#) section on page 197 for menu details.
- ~ In Appendix A, refer to the [“Output Formats”](#) section on page 449 for a complete list of all available output formats.

- **Additional Test Pattern**

The **SMPTE RP-219** test pattern has been added to the **Output Test Patterns Menu**.

- **Menu Enhancements**

The following menus have been enhanced with new features:

- ~ **Wipe Menu** — In Chapter 5, refer to the [“Wipe Menu”](#) section on page 151 for menu details.

- ~ **Keyer Menu** — In Chapter 5, refer to the [“Keyer Menu”](#) section on page 157 for menu details.

- **Feature Enhancements**

In the **Memory Section** on the FSN-150, pressing **STORE** now lights all active buttons in the **Module Section** automatically. Module buttons toggle on/off in the normal way. This enhancement enables you to easily store the “entire” switcher. The **RECALL** procedure is identical to the previous version.

- **Analog Format Connection Table — Correction**

In the [Analog Format Connection Table](#) on page 65, the **Chroma** connection for the **S-Video** format has been corrected to indicate Blue, instead of Red.

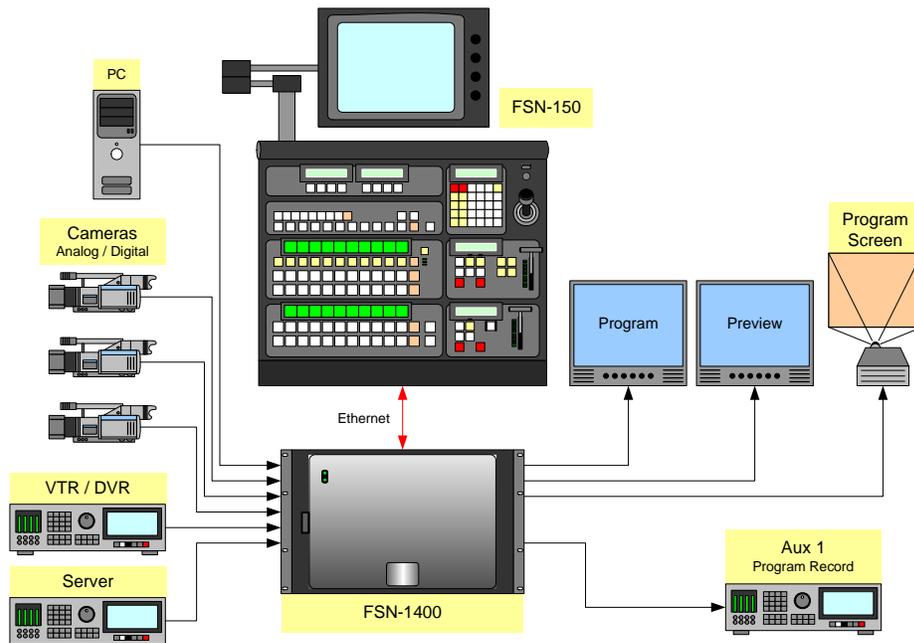
## Connectivity Diagrams

The following connectivity diagrams are provided in this section:

- [System 1 — Basic](#)
- [System 2 — Multiple Destinations](#)

### System 1 — Basic

The figure below illustrates a basic FSN Series system:



**Figure 1-3.** Block diagram, basic FSN Series system (sample)

This configuration is an ideal *basic* setup consisting of multiple inputs, a single destination output and a single Aux output. In the diagram:

- Multiple scaled and un-scaled sources connect to the FSN-1400, including cameras, PCs, VTRs, DVRs and servers.
- The FSN-1400 and FSN-150 control panel connect via Ethernet.
- Program and Preview monitor outputs enable the TD to view the entire output of the switcher, and preview the “look” that’s coming next on all outputs.
- The switcher’s SDI (SD-SDI or HD-SDI) Program output connects to the projector.
- One Aux output is connected to a VTR, providing the ability to record the output of the event.

## System 2 – Multiple Destinations

The figure below illustrates a sample system in which individual Aux outputs are routed to different destinations.

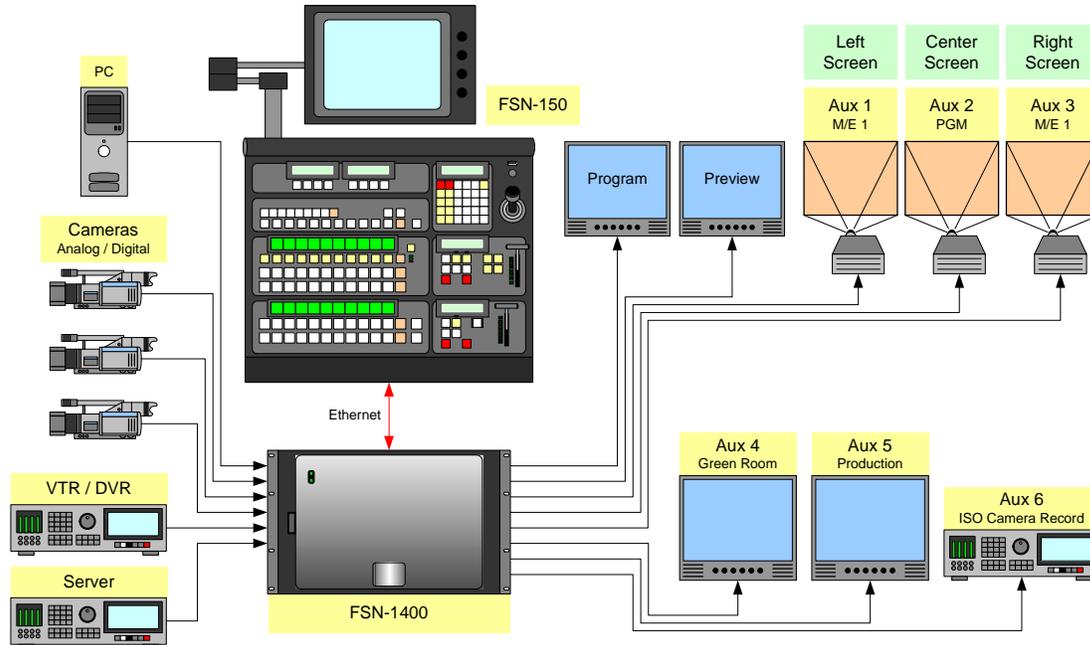


Figure 1-4. Block diagram, multiple destination FSN Series system (sample)

This configuration is ideal for a setup consisting of three projected images behind a podium. The left and right images are identical (as switched on M/E 1), and the center image can be identical, or different from the two “wing” projectors (as switched on the PGM bank). By connecting Aux outputs to different projectors, the TD has complete creative control over the look, with the ability to display different setups on the projectors.

In the diagram:

- Multiple scaled and un-scaled sources connect to the FSN-1400, including cameras, PCs, VTRs, DVRs and servers.
- The FSN-1400 and FSN-150 connect via Ethernet.
- Aux outputs 1, 2 and 3 connect to the three projectors.
- Aux outputs 4, 5 and 6 are connected to peripheral devices, such as monitors and VTRs. In practice, this enables the TD to provide completely independent stage or green room monitors, plus the ability to record the output of the entire event.

## 1. Introduction

### Application Questions

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## Application Questions

At Barco, we take pride in offering unique solutions to demanding technical problems. If you have application questions, require further information or would like to discuss your application requirements in more detail, please call (866) 469-8036. Our Customer Support Engineers will be happy to supply you with the support you need. Refer to Appendix B, "[Contact Information](#)" on page 451 for details.

## 2. FSN-1400 Orientation

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### In This Chapter

This chapter provides detailed explanations of the FSN-1400 chassis, including all front and rear chassis cards.

The following topics are discussed:

- [Hardware Description](#)
- [Card Descriptions](#)
- [Card LEDs](#)
- [Analog Format Connection Table](#)

**Note**

Once you have reviewed all of the sections in this chapter, please continue with Chapter 3, "[Control Panel Orientation](#)" on page 67.

## 2. FSN-1400 Orientation

### Hardware Description

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## Hardware Description

The following topics are discussed in this section:

- [Chassis Overview](#)
- [Card Slot Allocation and System Flexibility](#)
- [Chassis Front Door](#)
- [Chassis Front](#)
- [Chassis Rear](#)

### Chassis Overview

The FSN Series chassis (FSN-1400) permits a high degree of flexibility in terms of the number of inputs and outputs that you can configure. Please note:

- All cards are modular and hot-swappable.
- The 6RU chassis supports:
  - ~ 14 front cards, including required and optional cards.
  - ~ 14 rear slots, the configuration of which depends on the type (and number) of populated front cards.
- An internal “midplane” architecture allows cards to be plugged in from both the front and rear of the chassis.
- There are no active components on the midplane or on the plug-in rear panels.
- The front door provides a seal for air flow and chassis cooling. There are no controls on the door, but two status LEDs are provided. Refer to the “[Chassis Front Door](#)” section on page 37 for details.
- The following additional features are provided:
  - ~ Optional dual redundant hot-swappable power supplies.
  - ~ One tally connector (24 contact closures).
  - ~ One GPIO connector, with four input (GPI) and eight output (GPO) ports.
  - ~ Two serial ports.

### Card Slot Allocation and System Flexibility

Within the FSN-1400 chassis, two card slots are dedicated (**System** and **M/E**). The allocation of the remaining slots is flexible, as illustrated in the following table.

**Table 2-1.** FSN Series chassis card slot allocations

Card Type	Max. # of Cards per Chassis	Slot Number(s)
<b>System (Required card)</b>	1	14
<b>M/E (Required card)</b>	1	8
<b>NIC</b> (Native Input Card), 8-channel	4	1 - 4 (default slot: 1)
<b>UIC</b> (Universal Input Card), 2-channel	5	3 - 7 (default slot: 7)
<b>MVR</b> (Multiviewer Card)	1	11
<b>UOC</b> (Universal Output Card), 2-channel	3	11, 12, 13 (default slot: 12)
<b>NAC</b> (Native Aux Output Card), 8-channel	3	11, 12, 13 (default slot: 13)
<b>DVE</b> (Digital Video Effects) card, 2-channel	2	9, 10

Because different combinations of cards can be installed in the FSN-1400 chassis, input and output combinations are highly flexible. Refer to the following two sections for details:

- [Input Flexibility](#)
- [Auxiliary Output Flexibility](#)

Please note:

- Refer to the “[Chassis Front](#)” section on page 39 and the “[Chassis Rear](#)” section on page 41 for detailed information on all chassis card slots.
- Refer to the “[Card Descriptions](#)” section on page 43 for in-depth information of all cards and their capabilities.

#### Input Flexibility

The following table outlines the system’s input flexibility, based on the numbers of eight channel **NICs** and two channel **UICs** that can be installed:

**Table 2-2.** FSN Series input flexibility

	Total Inputs (Installed NICs + Installed UICs)					
	0 UIC installed	1 UIC installed	2 UICs installed	3 UICs installed	4 UICs installed	5 UICs installed
0 NIC installed	0	2	4	6	8	10
1 NIC installed	8	10	12	14	16	18
2 NICs installed	16	18	20	22	24	26
3 NICs installed	24	26	28	30	32	
4 NICs installed	32	34	36	38		

## 2. FSN-1400 Orientation

### Hardware Description

#### Auxiliary Output Flexibility

The following two tables outline the system's auxiliary output flexibility, based on the number of 2-channel **UOC** cards installed, the number of 8-channel **NAC** cards installed, and whether or not the **MVR** is installed.

The totals listed below include the six standard native Aux outputs on the M/E card, plus the number of outputs on the installed UOCs and NACs.

- With no **MVR** (Multiviewer) installed in slot 11, three chassis slots (11, 12 and 13) are available for Aux output cards. The following combinations of Aux outputs are available:

**Table 2-3.** Auxiliary output flexibility - Multiviewer is not installed

	Total Aux Outputs — Multiviewer Not Installed			
	0 NACs installed	1 NAC installed	2 NACs installed	3 NACs installed
0 UOCs installed	6	14	22	30
1 UOC installed	8	16	24	
2 UOCs installed	10	18		
3 UOCs installed	12			

- When the **MVR** is installed in slot 11, only two slots (12 and 13) are available for Aux output cards. The following combinations of Aux outputs are available:

**Table 2-4.** Auxiliary output flexibility - Multiviewer is installed

	Total Aux Outputs — Multiviewer Installed		
	0 NACs installed	1 NAC installed	2 NACs installed
0 UOCs installed	6	14	22
1 UOC installed	8	16	
2 UOCs installed	10		

Note that when additional Aux output cards are installed, use the **Aux Setup Menu** to map Aux outputs to the control panel, and name Aux outputs (if desired). In Chapter 5, refer to the "[Aux Setup Menu](#)" section on page 240 for details.

## Chassis Front Door

The figure below illustrates a view of the chassis front door:

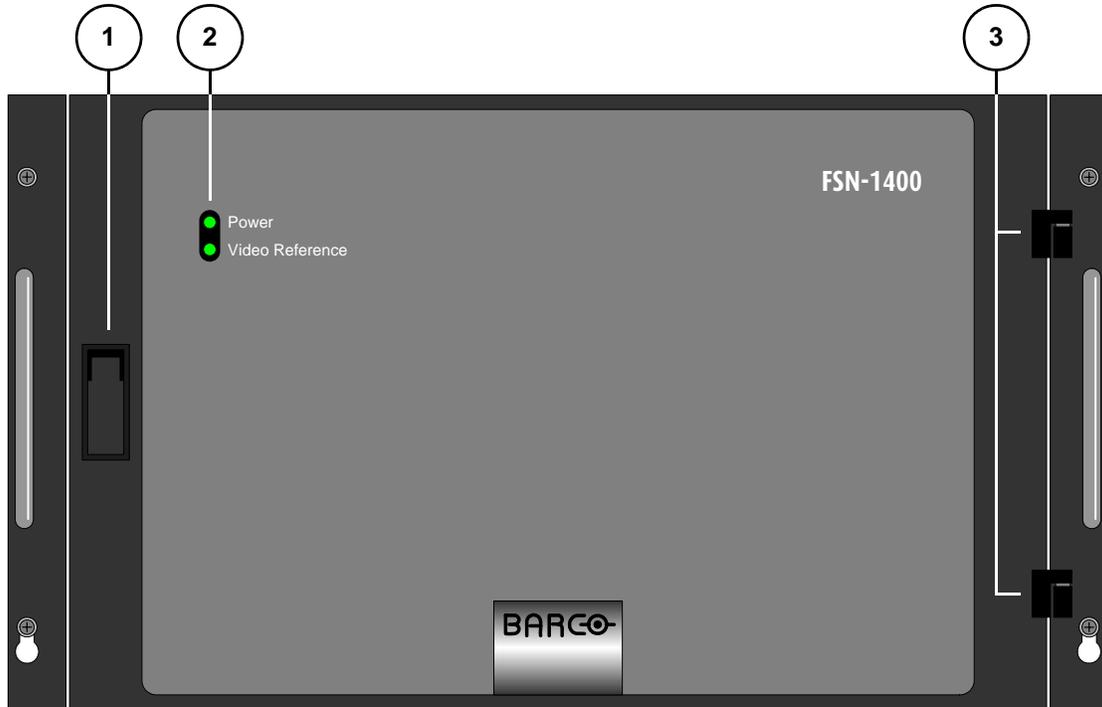


Figure 2-1. FSN Series chassis front door

1) <a href="#">Door Latch</a>	2) <a href="#">System Status LEDs</a>	3) <a href="#">Hinges</a>
-------------------------------	---------------------------------------	---------------------------

Following are descriptions of each section.

### 1) Door Latch

One latch is provided to facilitate door opening and closing. See the [“Door Removal and Re-installation”](#) section on page 38 for instructions.

### 2) System Status LEDs

The two **System Status LEDs** are mounted on the **System Card**, but they are visible through the slot in the front door — via light pipe.

The **Power LED** indicates power status for the chassis and the system card.

- ~ **Green** = the system card has power and the card's software is running.
- ~ **Red** = not used in version 3.0.
- ~ **Off** = one or more of the following conditions are present:
  - There is no power to the FSN-1400.
  - There is no **System Card** in the FSN-1400.
  - The **System Card** has failed.

## 2. FSN-1400 Orientation

### Hardware Description

The **Video Reference LED** indicates the status of the system's analog video reference input, via the **Vid Ref** connector on the **System Card's** rear panel.

- ~ **Green** = the system is configured for **External Reference**, a video reference signal is present and the FSN-1400 is locked to the signal.
- ~ **Red** = the system is configured for **External Reference**, the signal is missing or the FSN-1400 is not locked to the signal.
- ~ **Off** = the system is configured for **Free Run**.

#### Note

If the **Power LED** is off, the **Video Reference LED** will also be off.

### 3) Hinges

Two hinges are provided on the right side of the door, to facilitate door removal and re-installation. See the "[Door Removal and Re-installation](#)" section below for door removal and installation instructions.

### Air Filter

An air filter is located on the inside of the front door, in the bottom half of the door. Using the four thumb nuts, this filter can be easily removed and cleaned periodically, as required.

### Door Removal and Re-installation

- Use the following steps to open and remove the FSN-1400 front door:
  1. On the **Latch**, press inwards on the top label that reads "**Push**."
  2. Lift the lower portion of the **Latch** that reads "**Lift and Turn**."
  3. Turn the **Latch** clockwise, and open the door.
  4. To remove the door, lift it up and off of its hinges.
- Use the following steps to re-install the FSN-1400 front door:
  1. Align the female hinges on the door with the male hinges on the FSN-1400.
  2. Set the door down on the hinges until it is fully seated.
  3. Close the door.
  4. Turn the **Latch** counter-clockwise, then push the **Latch** in to re-seat it.

#### Important

Operating the FSN-1400 without the door fully closed and the filter installed will cause overheating and possible damage.

# Chassis Front

The figure below illustrates a sample front view of a fully-loaded chassis (door removed):



Figure 2-2. FSN Series chassis, front view (sample)

1) <a href="#">Power Supplies</a>	4) <a href="#">Aux and MVR Card Slots</a>	7) <a href="#">Input Card Slots</a>
2) <a href="#">Fan Tray</a>	5) <a href="#">DVE Card Slots</a>	
3) <a href="#">System Card Slot</a>	6) <a href="#">M/E Card Slot</a>	

Following are descriptions of each section. Note that slots are numbered from right to left, to correlate with the associated rear slots.

### 1) Power Supplies

Two slots are provided for dual redundant hot-swappable power supplies, each with a 600W capability. Each supply has two LEDs:

- ~ **DC OK LED:**
  - **Green** = DC power (from the supply) is OK.
  - **Red** = DC power is bad or has failed.
- ~ **AC OK LED:**
  - **Green** = AC power (into the supply) is OK.
  - **Red** = AC power is bad or has failed.

## 2. FSN-1400 Orientation

### Hardware Description

#### 2) Fan Tray

For chassis cooling, one slot is provided for the required hot-swappable fan tray. The integral handle enables the tray to be easily removed and installed.

#### Important

The fan tray must be installed whenever power is applied to the chassis. Operating the unit without the fan tray will cause overheating and possible damage.

#### 3) System Card Slot

Slot 14 is reserved for the required **System Card**. Refer to the "[System Card](#)" section on page 44 for details.

#### 4) Aux and MVR Card Slots

Slots 11, 12 and 13 are reserved for three types of optional cards:

- ~ **UOC** (Universal Output Card). Up to three cards can be installed. See the "[Universal Output Card](#)" section on page 58.
- ~ **NAC** (Native Aux Output Card). Up to three cards can be installed. See the "[Native Aux Output Card](#)" section on page 60.
- ~ **MVR** (Multiviewer Card). One card can be installed in slot 11 only. See the "[Multiviewer Card](#)" section on page 62.

#### 5) DVE Card Slots

Slots 9 and 10 are reserved for optional 2-D **DVE** (Digital Video Effects) cards. Up to two cards can be installed. Refer to the "[Digital Video Effects Card](#)" section on page 57 for details.

#### 6) M/E Card Slot

Slot 8 is reserved for the required **M/E** (Mix/Effects) card. Refer to the "[M/E Card](#)" section on page 49 for details.

#### 7) Input Card Slots

Slots 1 through 7 are reserved two types of input cards:

- ~ **NIC** (Native Input Card). Up to four cards can be installed in slots 1 through 4. See the "[Native Input Card](#)" section on page 53 for details.
- ~ **UIC** (Universal Input Card). Up to five cards can be installed in slots 3 through 7. Refer to the "[Universal Input Card](#)" section on page 55 for details.

### Chassis Rear

The figure below illustrates a rear view of the FSN Series chassis, with all slots fully loaded with both required and optional panels:

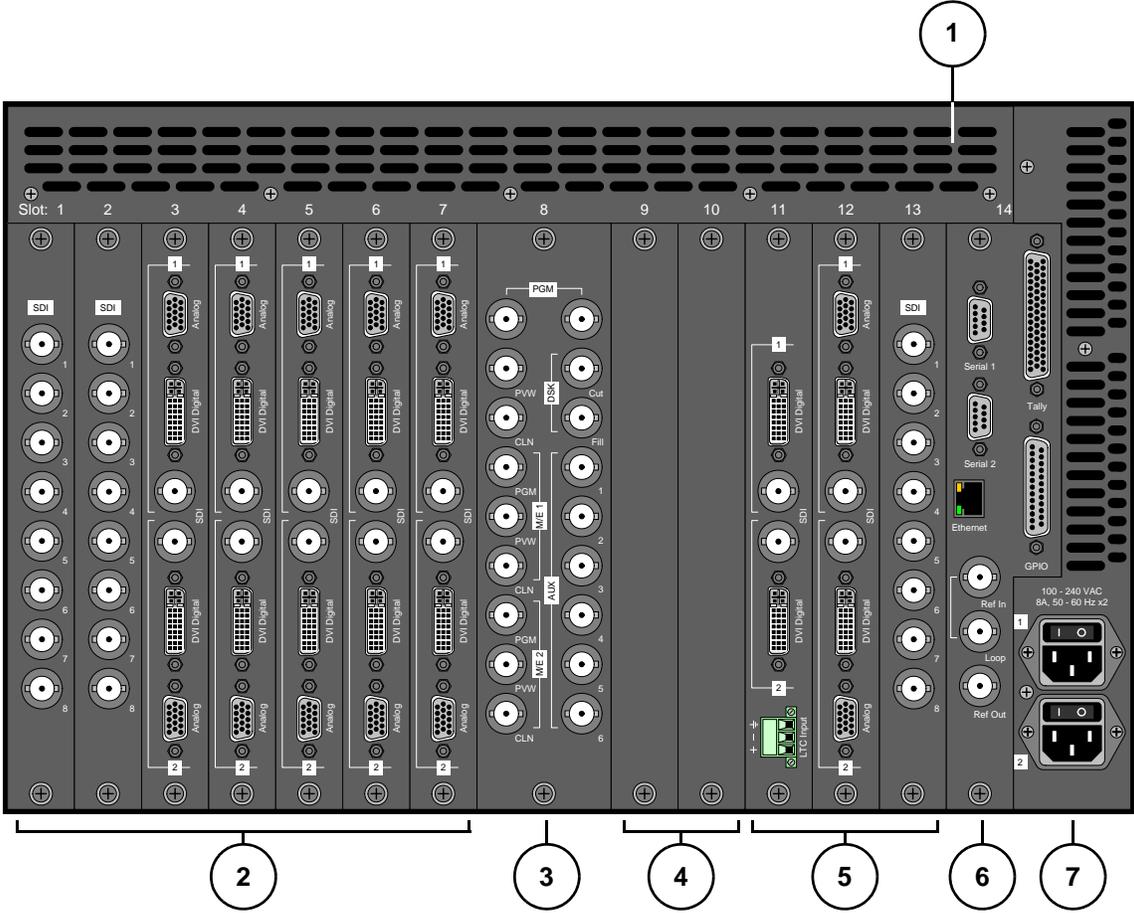


Figure 2-3. Sample FSN Series chassis, rear view

1) <a href="#">Air Vents</a>	4) <a href="#">DVE (Blank) Panel</a>	7) <a href="#">AC Power</a>
2) <a href="#">Input Card Panels</a>	5) <a href="#">Aux and MVR Output Card Panels</a>	
3) <a href="#">M/E Card Panel</a>	6) <a href="#">System Card Panel</a>	

In the descriptions below, slots are numbered from left to right:

1) **Air Vents**

At the top of the chassis, **Air Vents** are provided to assist with cooling. Air flows from the front of the chassis to the rear. To prevent overheating, do not block the air vents.

2) **Input Card Panels**

Slots 1 through 7 are reserved for two types of input card panels:

- ~ **NIC** panels. Up to four panels can be installed in slots 1 through 4. See the "[Native Input Card](#)" section on page 53 for details.

## 2. FSN-1400 Orientation

### Hardware Description

~ **UIC** panels. Up to five panels can be installed in slots 3 through 7. Refer to the "[Universal Input Card](#)" section on page 55 for details.

#### 3) M/E Card Panel

Slot 8 is reserved for the required **M/E** card panel. Refer to the "[M/E Card](#)" section on page 49 for details.

#### 4) DVE (Blank) Panel

Slots 9 and 10 are reserved for blank panels, as the **DVE** card does not require any connectors. See the "[Digital Video Effects Card](#)" section on page 57.

#### 5) Aux and MVR Output Card Panels

Slots 11, 12 and 13 are reserved for three types of optional cards:

~ **UOC** (Universal Output Card). Up to three panels can be installed. See the "[Universal Output Card](#)" section on page 58.

~ **NAC** (Native Aux Output Card). Up to three panels can be installed. See the "[Native Aux Output Card](#)" section on page 60.

~ **MVR** (Multiviewer Card). One panel can be installed in slot 11 only. See the "[Multiviewer Card](#)" section on page 62.

#### 6) System Card Panel

Slot 14 is reserved for the **System** card panel. Refer to the "[System Card](#)" section on page 44 for details.

#### 7) AC Power

The **AC Power** section provides two AC power connectors with integral switches. One connector is provided for each supply, which allows the frame to be powered from two different circuit breakers in a redundant configuration.

#### Note

The default FSN-1400 configuration has one power supply installed in the lower slot. The bottom AC connector is used.

#### Important

Unused rear slots must have blank panels installed for purposes of thermal management and EMI.

---

# Card Descriptions

The following required and optional cards are discussed in this section:

- [System Card](#)
- [M/E Card](#)
- [Native Input Card](#)
- [Universal Input Card](#)
- [Digital Video Effects Card](#)
- [Universal Output Card](#)
- [Native Aux Output Card](#)
- [Multiviewer Card](#)
- [Card LEDs](#)
- [Analog Format Connection Table](#)

**Note**

On all following card descriptions, remember that all physical connectors are located on the associated rear panels. Note also that the **DVE** (Digital Video Effects) card does not have any associated rear panel.

## 2. FSN-1400 Orientation

### Card Descriptions

## System Card

- Card status: **Required**
- Slot number: **14**
- Maximum number of cards per chassis: **1**

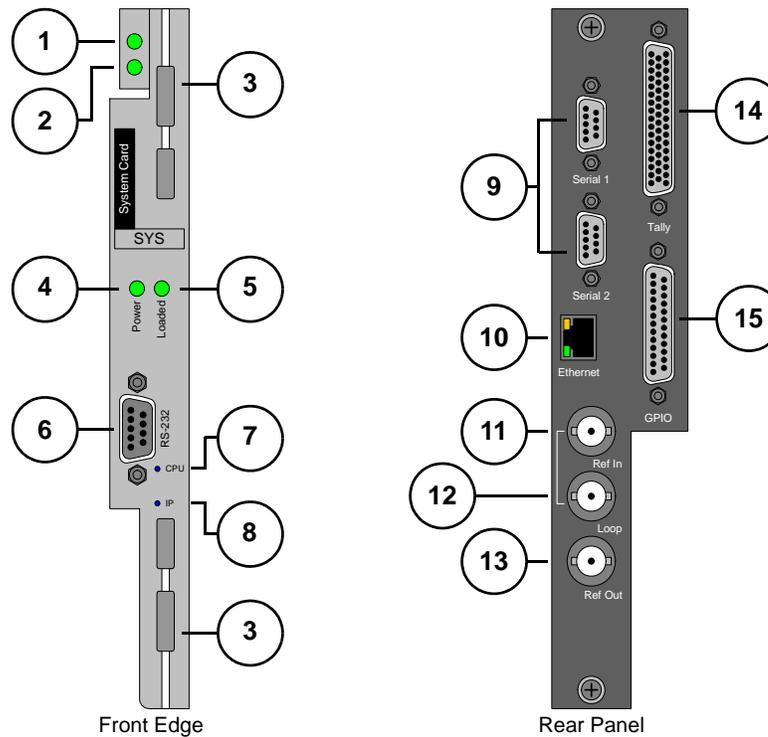
### Important

This card is pre-installed in the FSN-1400. Do not move the card to any other slots.

The **System Card** provides the following functions:

- System control, CPU, timing, and video reference (input, loop and output).
- Ethernet port 10/100, two serial outputs, Tally (24 contact closures).
- GPIO (four input ports, eight output ports).
- RS-232 port (diagnostics only).

The figure below illustrates the **System** card's front edge and rear panel connectors:



**Figure 2-4.** System card front edge and rear panel connectors

1) <a href="#">System Power LED</a>	6) <a href="#">Diagnostic Port</a>	11) <a href="#">Ref In</a>
2) <a href="#">Video Reference LED</a>	7) <a href="#">CPU Reset Switch</a>	12) <a href="#">Loop</a>
3) <a href="#">Ejectors</a>	8) <a href="#">IP Address Reset Switch</a>	13) <a href="#">Ref Out</a>
4) <a href="#">Card Power LED</a>	9) <a href="#">Serial Ports</a>	14) <a href="#">Tally Connector</a>
5) <a href="#">Loaded LED</a>	10) <a href="#">Ethernet Port</a>	15) <a href="#">GPIO Connector</a>

## 2. FSN-1400 Orientation

### Card Descriptions

Following are descriptions of all components on the front edge of the **System** card:

#### 1) System Power LED

The **System Power LED** indicates power status for the chassis and the cards.

- ~ **Green** = all system power is OK.
- ~ **Red** = one or more of the following conditions are present:
  - DC output from one (of the two) chassis power supplies is bad or has failed.
  - Power is bad (or has failed) on one or more of the installed circuit cards.
- ~ **Off** = one or more of the following conditions are present:
  - The chassis is turned off.
  - DC output from all power supplies is bad or has failed.
  - Power has failed on the **System Card**.

Note that this LED is carried through to the front door via light pipe.

#### 2) Video Reference LED

The **Video Reference LED** indicates the status of the system's analog video reference input, via the **Vid Ref** connector on the **System Card**'s rear panel.

- ~ **Green** = the system is configured for **External Reference**, a video reference signal is present and the FSN-1400 is locked to the signal.
- ~ **Red** = the system is configured for **External Reference**, the signal is missing or the FSN-1400 is not locked to the signal.
- ~ **Off** = the system is configured for **Free Run**.

#### Note

If the **Power LED** is off, the **Video Reference LED** will also be off.

Note that this LED is carried through to the front door via light pipe.

#### 3) Ejectors

Use the card's top and bottom **Ejectors** to remove (and re-insert) the card.

#### 4) Card Power LED

The **Card Power LED** indicates power status for the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

#### 5) Loaded LED

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

#### 6) Diagnostic Port

One RS-232 port is provided for diagnostics. This port is not available to the user.

#### 7) CPU Reset Switch

Using a small tool such as a paper clip, press the **CPU Reset Switch** to perform a soft system reset. This function reboots the system, but preserves all setups and memory registers, and maintains all crosspoint selections on the control panel. Please note:

- ~ This is the same as pressing **{Soft Reset System}** on the **Reset Menu**. In Chapter 5, refer to the "[Reset Menu](#)" section on page 274 for details.

## 2. FSN-1400 Orientation

### Card Descriptions

#### 8) IP Address Reset Switch

Using a small tool such as a paper clip, press the **IP Address Reset Switch** for 5 (five) seconds. This action resets the chassis IP address to the default value of **192.168.0.4**, and then performs a factory reset. Please note:

- ~ This is the same as pressing **{Factory Reset}** on the **Reset Menu**. In Chapter 5, refer to the "[Reset Menu](#)" section on page 274 for details.
- ~ Use the **Com Setup Menu** to change the IP address if required. In Chapter 6, refer to the "[Communications Setup](#)" section on page 285 for details.

Following are descriptions of all components on the **System** card's rear panel:

#### 9) Serial Ports

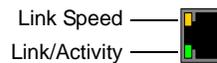
Two DB-9 connectors are provided for **Serial** connections. In Appendix A, refer to the "[Serial Connectors](#)" section on page 442 for details.

#### Note

This function is currently not implemented.

#### 10) Ethernet Port

One RJ-45 connector is provided for a 10/100 **Ethernet** connection between the FSN Series control panel and the FSN-1400. For multiple Ethernet connections, an Ethernet switch is recommended. There are two LEDs on the connector:



**Figure 2-5.** Ethernet Connector

- ~ When a valid link is present, the amber **Link Speed LED** indicates 100mb Ethernet speed when lit, and 10mb speed when off.
- ~ The green **Link/Activity LED** indicates that a link is present when lit, and link activity when blinking.

Please note:

- ~ In Appendix A, refer to the "[Ethernet Connector](#)" section on page 441 for Ethernet connector pinout details.
- ~ Use the **Com Setup Menu** to change the chassis' IP address. In Chapter 6, refer to the "[Communications Setup](#)" section on page 285 for details.
- ~ Refer to the "[FSN Series Ethernet Connections](#)" section on page 48 for more information about Ethernet.

#### 11) Ref In

One BNC is provided for an analog **Reference Input** connection. Accepted video reference signals are black burst, SMPTE bi-level sync and tri-level sync.

#### Note

In Appendix A, refer to the "[Reference Video Input Specifications](#)" section on page 433 for detailed information about the allowed frame rates for the reference input.

## 2. FSN-1400 Orientation

Card Descriptions

### 12) Loop

One BNC connector is provided for a reference **Loop** connection, which enables you to loop the incoming reference signal to the next device in your system. If the reference **Loop** is not used, connect a 75 ohm terminator to the connector.

### 13) Ref Out

One BNC connector is provided for a **Reference Output** signal. Using the **{Reference Out}** button on the **Reference and Output Setup Menu**, this output can be toggled between **Tri-Level Sync** and **Black Burst**.

#### Important

The sync out format (as provided on the connector) changes, depending on the selected native video format. In Appendix A, refer to the "[Reference Video Output Specifications](#)" section on page 434 for details.

### 14) Tally Connector

One DB-50 connector is provided for tally, with 24 contact closures available. In Appendix A, refer to the "[Tally Connector](#)" section on page 443 for pinouts. In Chapter 6, refer to the "[Tally Setup](#)" section on page 303 for setup details.

### 15) GPIO Connector

One DB-25 connector is provided for GPIO, with four input ports and eight output ports. In Appendix A, refer to the "[GPIO Connector](#)" section on page 444.

#### Note

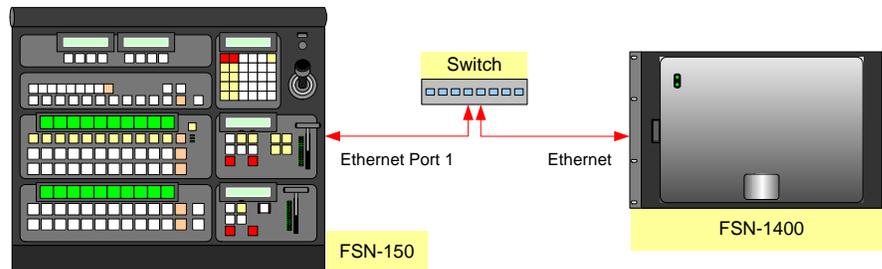
This function is currently not implemented.

## 2. FSN-1400 Orientation

### Card Descriptions

#### FSN Series Ethernet Connections

This section provides information on all FSN Series Ethernet connections.



**Figure 2-6.** Basic system Ethernet diagram

- **FSN-1400**

The FSN-1400 has a single **Ethernet** port located on the **System** card. This port connects to **Ethernet Port 1** on the FSN-150 or FSN-250 control panel, either directly or via an Ethernet switch. By default, the following conditions are set:

- ~ DHCP = **OFF**
- ~ Default IP address: **192.168.0.4**
- ~ Default Netmask: **255.255.255.0**

The user can use the default address, or set a different address.

- **FSN-150 and FSN-250 control panels**

Each control panel has two Ethernet ports located on the rear panel:

- ~ **Ethernet Port 1** connects to the **FSN-1400**, either directly or via an Ethernet Switch. By default, the following conditions are set:
  - DHCP = **OFF**
  - Default IP address: **192.168.0.5**
  - Default Netmask: **255.255.255.0**

The user can use the default address, or set a different address.

- ~ **Ethernet Port 2** can be connected to an outside network, or to your facility's "house" network. By default, the following conditions are set:
  - DHCP = **ON**

An IP address can be obtained automatically from the outside network.

Use the **Com Setup Menu** to change IP addresses. In Chapter 6, refer to the "[Communications Setup](#)" section on page 285 for details.

### M/E Card

- Card status: **Required**
- Slot number: **8**
- Maximum number of cards per chassis: **1**

**Important** This card is pre-installed in the FSN-1400. Do not move.

The **M/E (Mix/Effects) Card** provides the following functions:

- Dedicated DSK cut and fill inputs. These must be locked to video reference.
- Four PGM/PVW outputs (PGM [2x], PVW and CLN).
- Three M/E 1 outputs (PGM, PVW, CLN), three M/E 2 outputs (PGM, PVW, CLN), six native Aux outputs.
- All outputs run at the system's native video format.

The figure below illustrates the **M/E card's** front edge and rear panel connectors:

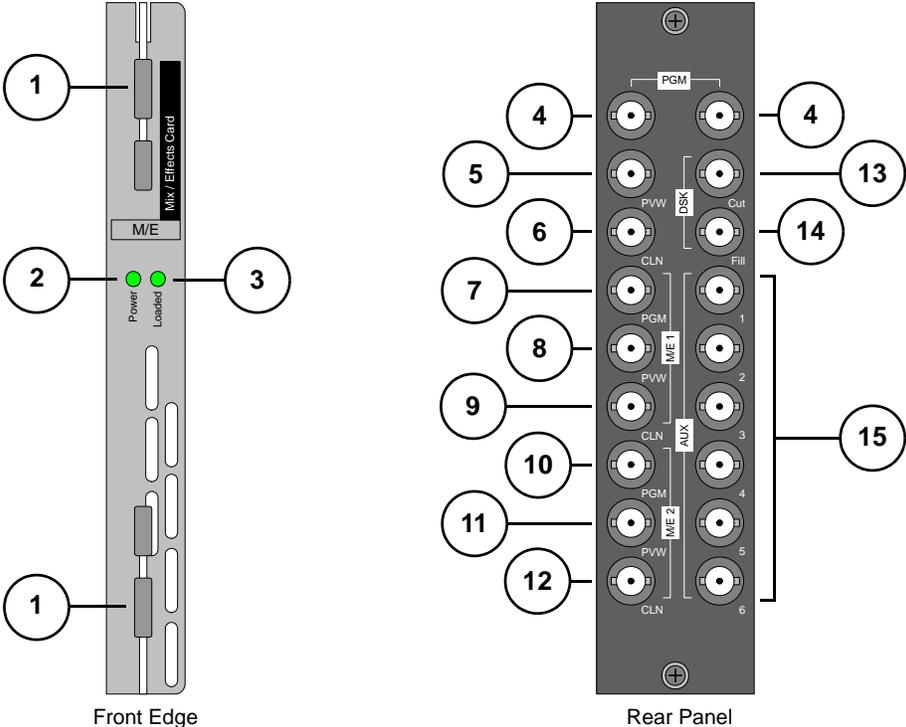


Figure 2-7. M/E card front edge and rear panel connectors

1) <a href="#">Ejectors</a>	6) <a href="#">Clean Feed Out</a>	11) <a href="#">M/E 2 Preview Out</a>
2) <a href="#">Card Power LED</a>	7) <a href="#">M/E 1 Program Out</a>	12) <a href="#">M/E 2 Clean Feed Out</a>
3) <a href="#">Loaded LED</a>	8) <a href="#">M/E 1 Preview Out</a>	13) <a href="#">DSK Cut In</a>
4) <a href="#">Program Out</a>	9) <a href="#">M/E 1 Clean Feed Out</a>	14) <a href="#">DSK Fill in</a>
5) <a href="#">Preview Out</a>	10) <a href="#">M/E 2 Program Out</a>	15) <a href="#">Native Aux Outputs</a>

## 2. FSN-1400 Orientation

### Card Descriptions

Following are descriptions of all **M/E** card components:

1) **Ejectors**

Use the card's top and bottom **Ejectors** to remove (and re-insert) the card.

2) **Card Power LED**

The **Card Power LED** indicates power status for the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

3) **Loaded LED**

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

4) **Program Out**

Two BNC connectors are provided for the system's main **Program Output**. Each output is identical.

5) **Preview Out**

One BNC is provided for the system's main **Preview Output**. This output provides the Program bank's "lookahead" preview output. In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for information.

6) **Clean Feed Out**

One BNC is provided for the system's main **Clean Feed Output**. Refer to the "[Clean Feed Output Selection](#)" section on page 52 for details.

7) **M/E 1 Program Out**

One BNC is provided for the system's **M/E 1 Program Output**.

8) **M/E 1 Preview Out**

One BNC is provided for the system's **M/E 1 Preview Output**. This output provides M/E 1's "lookahead" preview output. In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for information.

9) **M/E 1 Clean Feed Out**

One BNC is provided for the system's **M/E 1 Clean Feed Output**. Refer to the "[Clean Feed Output Selection](#)" section on page 52 for details.

10) **M/E 2 Program Out**

One BNC is provided for the system's **M/E 2 Program Output**.

11) **M/E 2 Preview Out**

One BNC is provided for the system's **M/E 2 Preview Output**. This output provides M/E 2's "lookahead" preview output. In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for information about lookahead preview.

**Note**

On the FSN-150, M/E 2 control must be enabled to fully utilize these outputs. In Chapter 7, refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for details.

12) **M/E 2 Clean Feed Out**

One BNC is provided for the system's **M/E 2 Clean Feed Output**. Refer to the "[Clean Feed Output Selection](#)" section on page 52 for details.

### 13) DSK Cut In

One BNC is provided for a dedicated **DSK Cut Input**. The **DSK Cut** and **DSK Fill** inputs must be locked to the FSN-1400 video reference within  $\pm 0.5$  lines, when the **{Output V-Lock}** button is turned off (on the **Reference and Output Setup Menu**). See the **DSK Fill In** description below for an important note.

### 14) DSK Fill in

One BNC is provided for a dedicated **DSK Fill Input**. The **DSK Cut** and **DSK Fill** inputs must be locked to the FSN-1400 video reference within  $\pm 0.5$  lines, when the **{Output V-Lock}** button is turned off.

#### Important

When the **{Output V-Lock}** button is turned on (on the **Reference and Output Setup Menu**), the position of the **DSK Cut** and **DSK Fill** inputs on screen will change.

- If the user preference "**Black on Invalid Video**" is turned on, the DSK turns off — because of the change in output timing.
- If the user preference "**Black on Invalid Video**" is off, the DSK will be visible — but in a shifted position. In this condition, the video position can be adjusted by changing the output timing of the DSK source itself.

In Chapter 5, refer to the "[User Preferences Menu](#)" section on page 254 for details on the **Black on Invalid Video** mode.

### 15) Native Aux Outputs

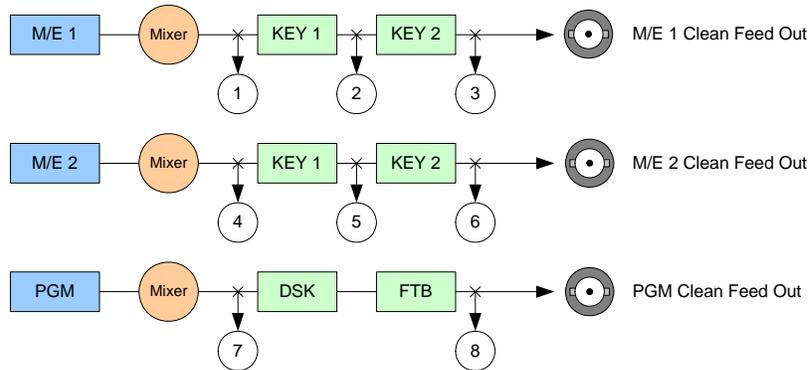
Six BNCs are provided for the system's six **Native Aux Outputs**. Source selection is performed in the **Aux Assign Section** on the panel. In Chapter 3, refer to the "[Aux Section](#)" heading on page 71 for details.

## 2. FSN-1400 Orientation

### Card Descriptions

#### Clean Feed Output Selection

The FSN-1400 provides three **Clean Feed Outputs**, one each for the PGM, M/E 1 and M/E 2 banks. Each output has selectable points from which the clean feed signal can be picked, as illustrated in the following diagram.



**Figure 2-8.** Clean Feed Output selections

The table below describes each output in detail.

**Table 2-5.** Clean Feed Output descriptions

Output	Description
1	M/E 1 clean out — pre KEY 1
2	M/E 1 clean out — pre KEY 2
3	M/E 1 out — post KEY 2
4	M/E 2 clean out — pre KEY 1
5	M/E 2 clean out — pre KEY 2
6	M/E 2 out — post KEY 2
7	Program clean out — pre DSK
8	Program out — Post FTB

In Chapter 7, refer to the [“Selecting Clean Feed Outputs”](#) section on page 347 for details on using the **Clean Feed Assignment Menu**.

### Native Input Card

- Card status: **Optional**
- Installs in slots: **1 - 4**
- Default slot: **1**
- Maximum number of cards per chassis: **4**

The **NIC** (Native Input Card) is an eight-channel input card that provides the following:

- Eight native resolution video inputs (BNC).
- Frame synchronization for sources that are not locked to reference.
- +/- 0.5 line auto-timing for input sources that are locked to video reference.
- HD-SDI and SD-SDI capability.

Refer to the “[Card Slot Allocation and System Flexibility](#)” section on page 35 for details on **NIC** configurations in the FSN-1400.

The figure below illustrates the **NIC**’s front edge and rear panel connectors:

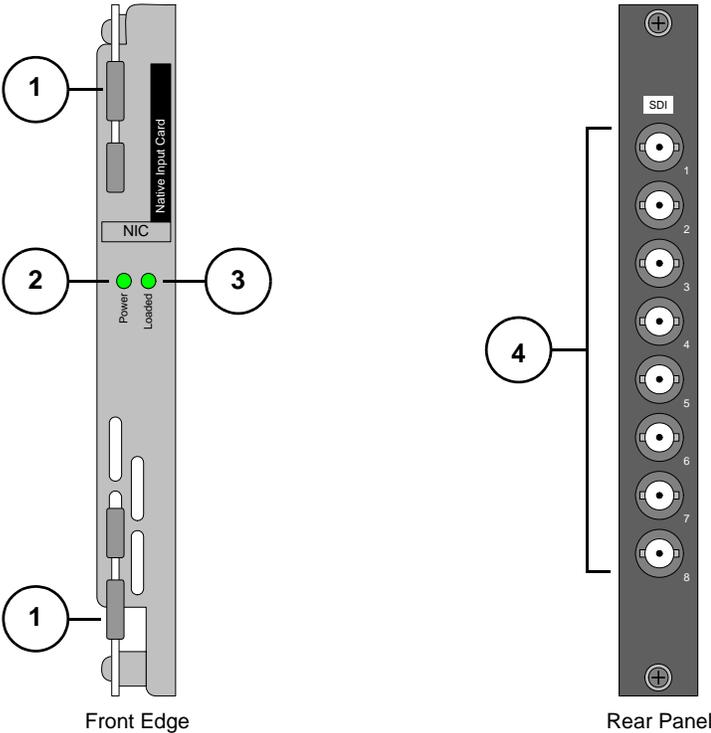


Figure 2-9. NIC front edge and rear panel connectors

1) <a href="#">Ejectors</a>	3) <a href="#">Loaded LED</a>
2) <a href="#">Card Power LED</a>	4) <a href="#">Native Inputs 1 - 8</a>

Following are descriptions of all **NIC** components:

**1) Ejectors**

Use the card’s top and bottom **Ejectors** to remove (and re-insert) the card.

## 2. FSN-1400 Orientation

### Card Descriptions

#### 2) Card Power LED

The **Card Power LED** indicates power status for the card. Refer to the “[Card LEDs](#)” section on page 64 for details.

#### 3) Loaded LED

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the “[Card LEDs](#)” section on page 64 for details.

#### 4) Native Inputs 1 - 8

Eight BNC connectors are provided for **Native Inputs 1 - 8**, and each connector supports HD-SDI and SD-SDI sources. The video standard of all connections to the NIC must be the same as the FSN-1400’s native output resolution.

#### Note

In Appendix A, refer to the “[Delay Specifications](#)” section on page 438 for details on NIC delay.

### Universal Input Card

- Card status: **Optional**
- Installs in slots: **3 - 7**
- Default slot: **7**
- Maximum number of cards per chassis: **5**

The **UIC** (Universal Input Card) is a two-channel card that scales non-native inputs (up to UXGA or 1920 x 1080) to the switcher's native resolution and timing. One **UIC** provides two universal scaled video inputs, plus additional capabilities for native resolution sources:

- Frame synchronization for sources not locked to video reference.
- For SDI inputs that match the native format, +/- 0.5 line auto-timing for input sources that are locked to video reference.

Refer to the “[Card Slot Allocation and System Flexibility](#)” section on page 35 for details on **UIC** configurations in the FSN-1400.

The figure below illustrates the **UIC**'s front edge and rear panel connectors:

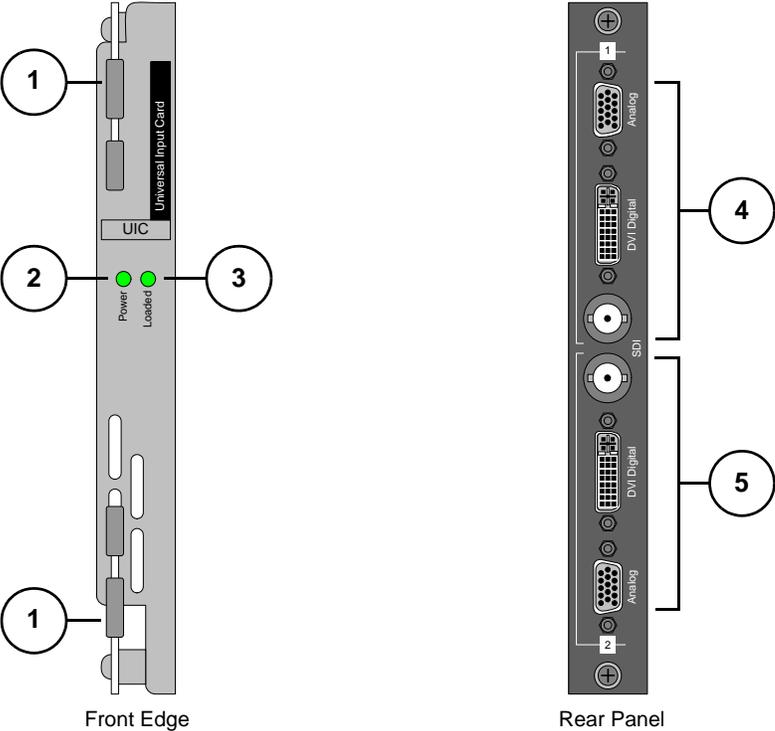


Figure 2-10. UIC front edge and rear panel connectors

1) <a href="#">Ejectors</a>	3) <a href="#">Loaded LED</a>	5) <a href="#">Universal Input 2</a>
2) <a href="#">Card Power LED</a>	4) <a href="#">Universal Input 1</a>	

Following are descriptions of all **UIC** components:

**1) Ejectors**

Use the card's top and bottom **Ejectors** to remove (and re-insert) the card.

## 2. FSN-1400 Orientation

### Card Descriptions

#### 2) Card Power LED

The **Card Power LED** indicates power status for the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

#### 3) Loaded LED

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

#### 4) Universal Input 1

Three connectors are provided for **Universal Input 1** (1 x **HD15**, 1 x **DVI-I**, 1 x **BNC**). Using these connectors, different combinations of inputs can be connected to the FSN-1400, as outlined below, but only one of the three connectors can be used at a time on the control panel.

Cells with check marks denote the connections required for the indicated format.

**Table 2-6.** UIC connector combinations for selected universal input formats

Format	Connectors		
	BNC	DVI-I	HD-15
HD-SDI	✓		
SD-SDI	✓		
DVI *		✓	
CVBS			✓
Y/C			✓
YPbPr **			✓
RGsB			✓
RGBS			✓
RGBHV ***			✓

\* up to 165 MHz

\*\* NTSC, PAL or HD

\*\*\* up to 165 MHz (UXGA)

Please note the following important points regarding the **UIC**:

~ Refer to the "[Analog Format Connection Table](#)" section on page 65 for additional information on using the HD-15 connector.

#### 5) Universal Input 2

Input connections for **Universal Input 2** are identical to Universal Input 1. Refer to the explanation of **Universal Input 1** for details.

#### Note

In Appendix A, refer to the "[Delay Specifications](#)" section on page 438 for details on UIC delay.

### Digital Video Effects Card

- Card status: **Optional**
- Installs in slots: **9, 10**
- Maximum number of cards per chassis: **2**

The **DVE** (Digital Video Effects) card is an optional 2-D two-channel scaler card. When one or two **DVE** cards are installed, the **DVE Assign Menu** enables you to assign DVE channels to any keyer on the control panel. Then, using the **DVE Menu**, you can create single keyframe and two keyframe DVE effects.

The following rules apply:

- One **DVE** card provides two internal DVE channels.
- Two **DVE** cards provide four available internal DVE channels.
- DVE channels can be assigned to a keyer's "**cut**" and/or "**fill**" inputs. This feature provides a great deal of flexibility. For example:
  - ~ To "fly" a PIP or a luma key, one DVE channel is required. Assign a DVE channel to the desired keyer's "cut" signal.
  - ~ To "fly" a linear key, two DVE channels are required. Assign DVE channels to the desired keyer's "cut" and "fill" signals.
  - ~ To "fly" a split key, either one or two DVE channels are required (depending on the effect you want to create). Assign channels to the desired keyer's "cut" and/or "fill" signals.

Please note:

- A rear panel is not required with the **DVE** card — a blank panel is installed instead.
- Because DVE channels are assigned to specific keyers, input selection for the channels is performed on the keyer's associated key bus — in the same way that key sources are selected.
- LEDs on the **DVE** card's front edge provide power and FPGA status. Refer to the "[Card LEDs](#)" section on page 64 for details.

Refer to the "[Card Slot Allocation and System Flexibility](#)" section on page 35 for details on **DVE** card configurations in the FSN-1400. Refer to Chapter 8, "[DVE Operations](#)," for complete information on DVE assignment, DVE menus and operations.

## 2. FSN-1400 Orientation

### Card Descriptions

## Universal Output Card

- Card status: **Optional**
- Installs in slots: **11, 12, 13**
- Default slot: **12**
- Maximum number of cards per chassis: **3**

The **UOC** (Universal Output Card) is an optional two-channel scaler card that creates scaled video and/or computer Aux outputs up to UXGA or 1920 x 1080. Users can set the output resolution to be different from (or the same as) the system's native resolution.

When **UOCs** are installed, use the **Aux Setup Menu** to map Aux outputs to the control panel, and name Aux outputs (if desired). Refer to the "[Card Slot Allocation and System Flexibility](#)" section on page 35 for details on **UOC** configurations in the FSN-1400.

The figure below illustrates the **UOC's** front edge and rear panel connectors:

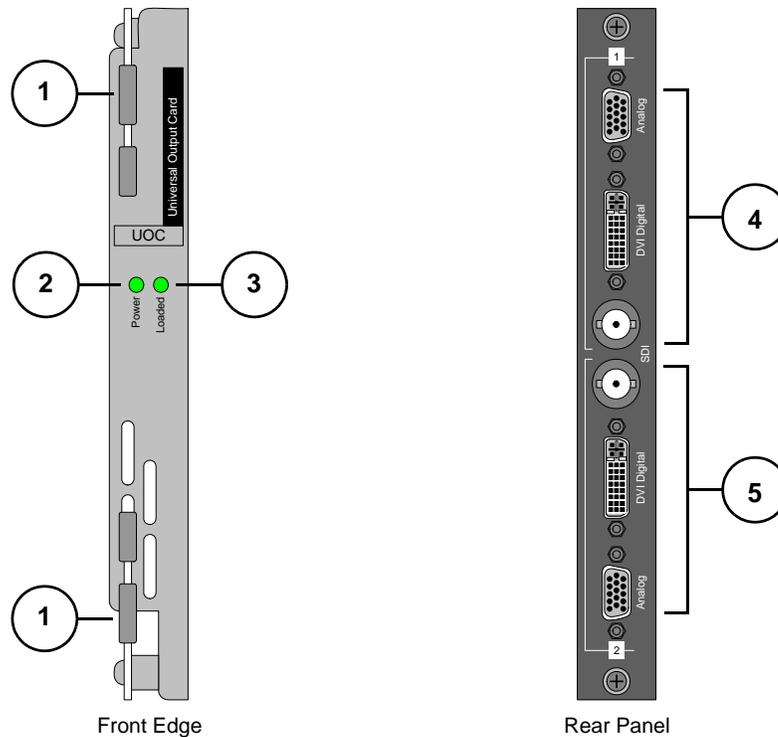


Figure 2-11. UOC front edge and rear panel connectors

1) <a href="#">Ejectors</a>	3) <a href="#">Loaded LED</a>	5) <a href="#">Universal Output 2</a>
2) <a href="#">Card Power LED</a>	4) <a href="#">Universal Output 1</a>	

Following are descriptions of all **UOC** components:

#### 1) Ejectors

Use the card's top and bottom **Ejectors** to remove (and re-insert) the card.

#### 2) Card Power LED

The **Card Power LED** indicates power status for the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

## 2. FSN-1400 Orientation

Card Descriptions

### 3) Loaded LED

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the [“Card LEDs”](#) section on page 64 for details.

### 4) Universal Output 1

Three connectors are provided for **Universal Output 1**:

- ~ 1 x **HD15**
- ~ 1 x **DVI-I**
- ~ 1 x **BNC**

Using these connectors, different combinations of outputs can be connected to the FSN-1400, as outlined below.

#### Note

Multiple outputs on a single **UOC** channel can be active at the same time, provided that the selected format is compatible. For example, 1920 x 1080i @ 59.94 is a compatible format on all three output connectors.

Cells with check marks denote the connections required for the indicated format.

**Table 2-7.** UOC connector combinations for selected universal output formats

Format	Connectors		
	BNC	DVI-I	HD-15
HD-SDI	✓		
SD-SDI	✓		
DVI *		✓	
CVBS			✓
Y/C			✓
YPbPr **			✓
RGsB			✓
RGBS			✓
RGBHV ***			✓

\* up to 165 MHz

\*\* NTSC, PAL or HD

\*\*\* up to 165 MHz (UXGA)

Refer to the [“Analog Format Connection Table”](#) section on page 65 for additional information on using the HD-15 connector.

### 5) Universal Output 2

Output connections for **Universal Output 2** are identical to Universal Output 1. Refer to the explanation of **Universal Output 1** for details.

Note that test patterns can be assigned to any **UOC** output, and a raster box can be turned on or off. In Chapter 5, see the [“Output Test Patterns Menu”](#) section for details.

## 2. FSN-1400 Orientation

### Card Descriptions

## Native Aux Output Card

- Card status: **Optional**
- Installs in slots: **11, 12, 13**
- Default slot: **13**
- Maximum number of cards per chassis: **3**

The **NAC** (Native Aux Output Card) is an optional card that provides eight additional auxiliary outputs that run at the system's native resolution. When **NACs** are installed, use the **Aux Setup Menu** to map Aux outputs to the control panel, and name Aux outputs (if desired). Refer to the "[Card Slot Allocation and System Flexibility](#)" section on page 35 for details on **NAC** configurations.

The following additional features are provided on the **NAC**:

- Aux outputs switch to black on LOS (loss of signal). In Chapter 7, refer to the "[Understanding Error Messages](#)" section on page 316 for more details.
- Aux outputs preserve ancillary data from NIC inputs. In Chapter 1, refer to the "[New Feature Review](#)" section on page 27 for details.
- Test patterns can be assigned to any **NAC** output, and a raster box can be turned on or off. In Chapter 5, see the "[Output Test Patterns Menu](#)" section for details.

The figure below illustrates the **NAC's** front edge and rear panel connectors:

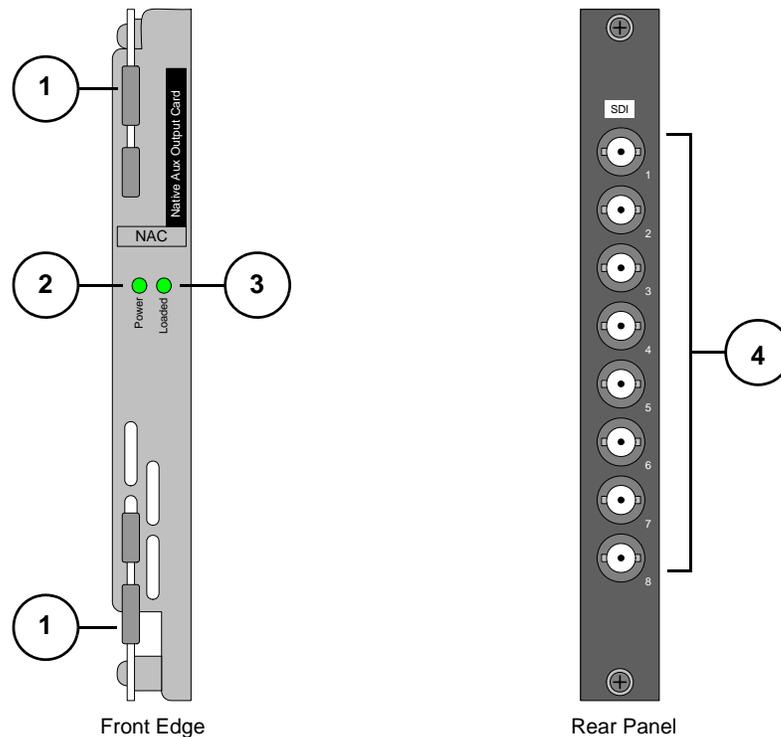


Figure 2-12. NAC front edge and rear panel connectors

1) <a href="#">Ejectors</a>	3) <a href="#">Loaded LED</a>
2) <a href="#">Card Power LED</a>	4) <a href="#">Native Aux Outputs</a>

## 2. FSN-1400 Orientation

### Card Descriptions

Following are descriptions of all **NAC** components:

1) **Ejectors**

Use the card's top and bottom **Ejectors** to remove (and re-insert) the card.

2) **Card Power LED**

The **Card Power LED** indicates power status for the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

3) **Loaded LED**

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

4) **Native Aux Outputs**

Eight BNC connectors are provided for the optional **Native Aux Outputs**.

## 2. FSN-1400 Orientation

### Card Descriptions

## Multiviewer Card

- Card status: **Optional**
- Installs in slot: **11**
- Maximum number of cards per chassis: **1**

The **MVR** (Multiviewer) is an optional card that provides the ability to display up to 16 source PIPs in both single and dual monitor configurations. With the desired monitor(s) connected to the card, users can set the **MVR**'s output resolution, and select from a variety of pre-defined multiviewer layouts.

The figure below illustrates the **MVR**'s front edge and rear panel connectors:

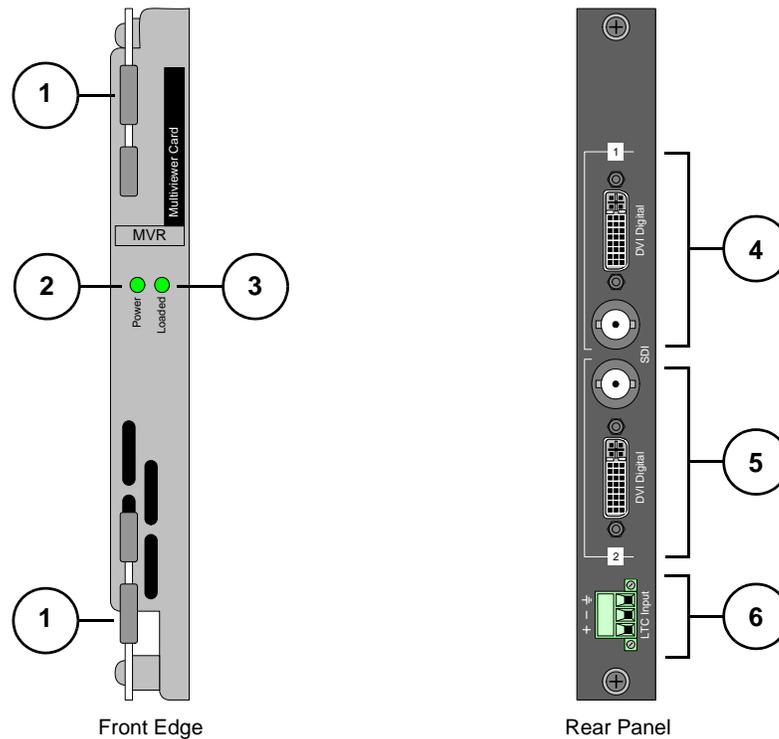


Figure 2-13. MVR front edge and rear panel connectors

1) <a href="#">Ejectors</a>	3) <a href="#">Loaded LED</a>	5) <a href="#">MVR Output 2</a>
2) <a href="#">Card Power LED</a>	4) <a href="#">MVR Output 1</a>	6) <a href="#">LTC Input</a>

Following are descriptions of all **MVR** components:

#### 1) Ejectors

Use the card's top and bottom **Ejectors** to remove (and re-insert) the card.

#### 2) Card Power LED

The **Card Power LED** indicates power status for the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

#### 3) Loaded LED

The **Loaded LED** indicates the status of all FPGAs on the card. Refer to the "[Card LEDs](#)" section on page 64 for details.

### 4) MVR Output 1

In order to provide multiviewer connections to both SDI and DVI compatible monitors, two connectors are provided for **MVR Output 1**:

- ~ 1 x **DVI-I**
- ~ 1 x **BNC**

The same output signal appears on both the **DVI-I** and **BNC** connectors. **MVR Output 1** can be used in both single and dual multiviewer monitor configurations, as selected on the **Multiviewer Setup Menu**:

- ~ In a single monitor layouts, the selected layout appears identically on **MVR Output 1** and **MVR Output 2**.
- ~ In a dual monitor layouts, one half of the selected layout appears on **MVR Output 1**, and the other half appears on **MVR Output 2**.

Please note:

- ~ The output resolution for both **MVR** outputs is set on the **Multiviewer Output Setup Menu**, using the **Output Format Keypad**.
- ~ Both the **BNC** and **DVI-I** connectors can be active at the same time, provided that the selected format is compatible. The valid combinations are fully listed in the **Output Format Keypad**.
- ~ Refer to Chapter 9, "[Multiviewer Operations](#)" on page 411 for full multiviewer setup details.

### 5) MVR Output 2

Output connections for **MVR Output 2** are identical to **MVR Output 1**. See above for details.

### 6) LTC Input

One Phoenix connector is provided for the Multiviewer's **LTC** (Longitudinal Time Code) **Input**.

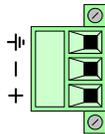


Figure 2-14. LTC Input connector

Two types of time code connections are possible:

- ~ For a differential connection, use the **+**, **-** and **GND** terminals.
- ~ For a single-ended connection, use the **+** and **GND** terminals.

Please note:

- Test patterns can be assigned to any **MVR** output, and a raster box can be turned on or off. In Chapter 5, see the "[Output Test Patterns Menu](#)" section for details.

## 2. FSN-1400 Orientation

### Card LEDs

---

## Card LEDs

On the front edge of all cards, two LEDs indicate the card's FPGA and power status.

### Note

An **FPGA** (field-programmable gate array) is a semiconductor device that can be configured by the engineer after manufacturing — hence the name "field-programmable."

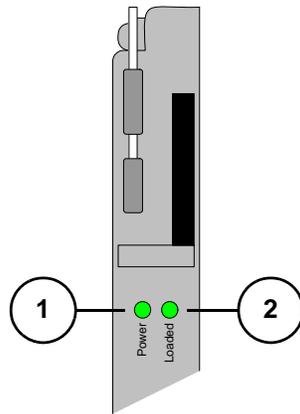


Figure 2-15. Card front edge LEDs

1) <a href="#">Card Power LED</a>	2) <a href="#">Loaded LED</a>
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Following are descriptions of the two LEDs:

### 1) Card Power LED

The **Card Power LED** indicates power status for the card.

- ~ **Green** = card power is OK.
- ~ **Red** = power is bad (or has failed) on the card.
- ~ **Off** = the chassis is turned off or power has failed.

### 2) Loaded LED

The **Loaded LED** indicates the status of all FPGAs on the card.

- ~ **Green** = all FPGAs are loaded successfully.
- ~ **Red** = an FPGA is bad, or software has not properly loaded.
- ~ **Off** = the chassis is turned off or power has failed.

## 2. FSN-1400 Orientation

### Analog Format Connection Table

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## Analog Format Connection Table

Each HD-15 analog connector on both the **UIC** and **UOC** enables you to input (or output) a variety of video formats — including VGA, composite video, S-Video and YUV component video.

- For RGB with H and V sync, use the HD-15 connector directly.
- Using a customer supplied HD-15 to 5 x BNC breakout cable, many combinations are possible. Cells with check marks denote the connections required for the indicated format.

**Table 2-1.** Analog Input and Output Combinations using Breakout Cable

Breakout Cable Wire Color	Composite Video	S-Video (Y/C)	YUV (Y <sub>P</sub> P <sub>b</sub> P <sub>r</sub> )	RGB Sync on Green	RGB Comp Sync	RGB Separate H V
R			✓ (P <sub>r</sub> )	✓	✓	✓
G	✓	✓ (Lum)	✓ (Lum)	✓	✓	✓
B		✓ (Chroma)	✓ (P <sub>b</sub> )	✓	✓	✓
H Sync					✓	✓
V Sync						✓

## 2. FSN-1400 Orientation

Analog Format Connection Table

## 3. Control Panel Orientation

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### In This Chapter

This chapter provides a detailed explanation of the FSN-150 control panel. The following topics are discussed:

- [Control Panel Descriptions](#)
- [Control Panel Rear](#)
- [Control Panel Bottom](#)
- [Touch Screen Connector Panel](#)

**Note**

Once you have reviewed all of the sections in this chapter, please continue with Chapter 4, "[Installation](#)" on page 103.

### 3. Control Panel Orientation

#### Control Panel Descriptions

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## Control Panel Descriptions

The following topics are discussed in this section:

- [FSN-150 Overview](#)
- [FSN-150 Control Panel Sections](#)
- [Functional Control Panel Sections](#)

### FSN-150 Overview

The figures below provide simplified block diagrams of video flow through the FSN-1400, as controlled by the FSN-150. Because M/E 2 control can be enabled or disabled from the panel, two “flow” configurations are available:

- The figure below illustrates video flow with M/E 2 control disabled:

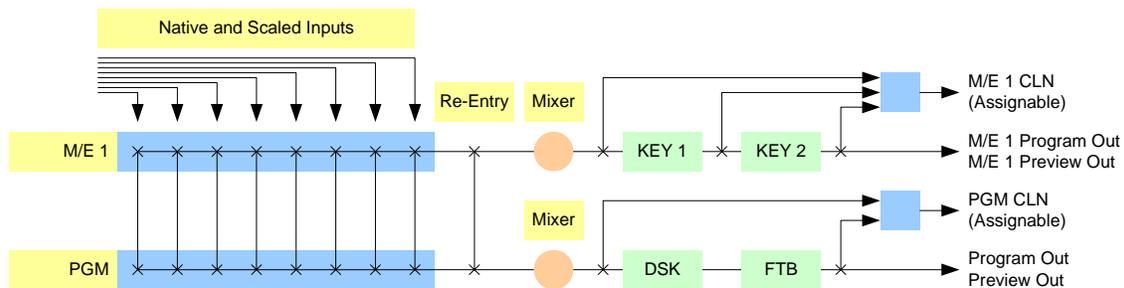


Figure 3-1. Video flow, M/E 2 control disabled

- The figure below illustrates video flow with M/E 2 control enabled:

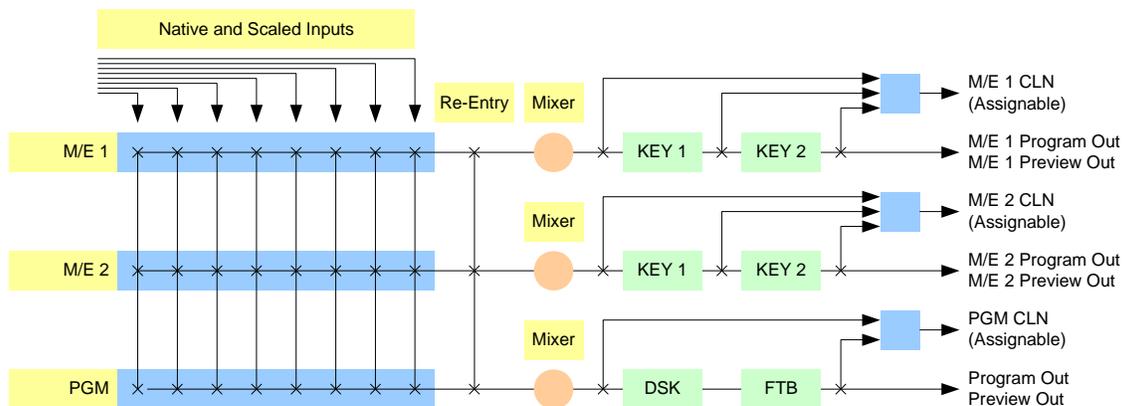


Figure 3-2. Video flow, M/E 2 control enabled

#### Note

When M/E 2 control is enabled on the FSN-150, the buttons on M/E 1 temporarily become the buttons for M/E 2. In Chapter 7, refer to the [“M/E 2 Control on the FSN-150”](#) section on page 349 for details.

### 3. Control Panel Orientation

#### Control Panel Descriptions

FSN-150 features include:

- Standard video production switcher "look and feel."
- 1.5 M/E overall design:
  - ~ Bus rows consist of 20 assignable buttons (10 buttons plus **SHIFT**, Black and re-entry).
  - ~ 1 M/E plus a separate PGM bank.
  - ~ PGM bank supports 1 DSK and FTB.
  - ~ M/E 2 control functionality, within the 1.5 M/E design. In this mode, buttons on M/E 1 temporarily become the buttons for M/E 2.
- Control via high-resolution color touch screen.
- Custom control functionality.
- USB port for software updates, system configuration files, etc.

### 3. Control Panel Orientation

#### Control Panel Descriptions

## FSN-150 Control Panel Sections

The figure below illustrates the FSN-150 front panel:

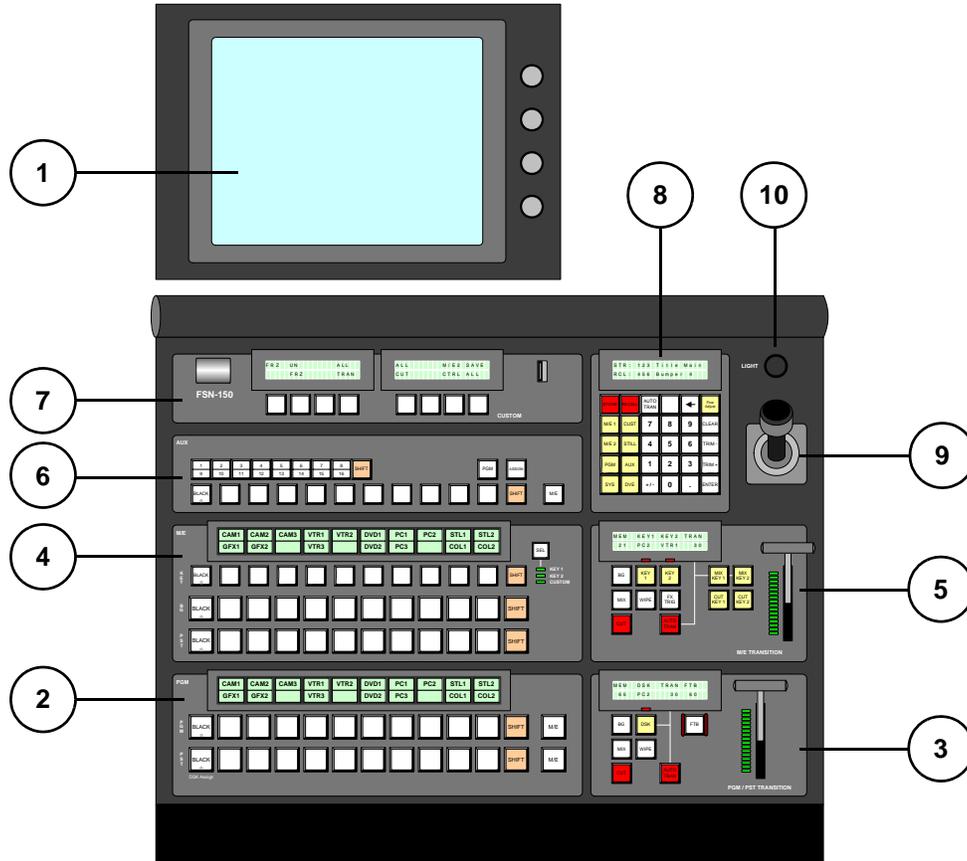


Figure 3-3. FSN-150 Control Panel

1) <a href="#">Display Section</a>	5) <a href="#">M/E Transition Section</a>	9) <a href="#">Joystick</a>
2) <a href="#">PGM Bank</a>	6) <a href="#">Aux Section</a>	10) <a href="#">Light Control</a>
3) <a href="#">PGM Transition Section</a>	7) <a href="#">Custom Control Section</a>	
4) <a href="#">M/E Bank</a>	8) <a href="#">Memory Section</a>	

The FSN-150 provides bus rows with 20 assignable buttons (10 buttons plus **SHIFT**) in a compact 1.5 M/E design. Following are descriptions of each section:

#### 1) Display Section

The **Display Section** includes a high-resolution touch screen that enables you to navigate menus, set up the system, adjust parameters, view status, and manage multiple functions such as wipes and keyers. The display itself can be mounted in a variety of ways. Refer to the “[Display Section](#)” heading on page 73 for details.

#### 2) PGM Bank

The **PGM Bank** provides two buses: **PGM** and **PST**. These buses are the switcher’s primary outputs where you can cut your show directly, or transition to effects on the M/E. Refer to the “[PGM Bank](#)” heading on page 74 for details.

## 3. Control Panel Orientation

### Control Panel Descriptions

#### 3) PGM Transition Section

For the switcher's primary output, the **PGM Transition Section** enables you to perform manual or automatic cuts, mixes, wipes and a DSK (downstream key). A downstream "fade to black" is also provided. Refer to the "[PGM Transition Section](#)" on page 76 for complete details.

#### 4) M/E Bank

On the FSN-150, the **M/E Bank** includes three buses: **BG** (Background), **PST** (Preset) and **KEY**. These buses are the locations where you select sources to include in transitions and effects.

Each button on the M/E bank includes an integral multi-color LED, which is used to indicate various source states. Directly above the top **Key Bus** is a row of displays that you can program with source names. Refer to the "[M/E Bank](#)" section on page 81 for more details.

#### Note

When M/E 2 control is enabled, the buttons on M/E 1 temporarily become the buttons for M/E 2. In Chapter 7, refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for details.

#### 5) M/E Transition Section

The **M/E Transition Section** enables you to perform manual and automatic transitions, such as cuts, mixes, wipes and keys. Refer to the "[M/E Transition Section](#)" heading on page 83 for details.

#### 6) Aux Section

The **Aux Section** enables you to assign sources to Aux buses. The FSN Series includes six "native" Aux bus outputs as standard, and optional Aux outputs (both native and scaled) are available. Refer to the "[Aux Section](#)" heading on page 91 for details.

#### 7) Custom Control Section

The **Custom Control Section** provides the ability to display up to eight switcher functions. See the "[Custom Control Section](#)" heading on page 93 for details.

#### 8) Memory Section

The **Memory Section** enables you to store panel setups (and many other switcher functions) into memory registers, and recall setups from memory back to the panel. One thousand registers are provided (1 through 1000). Refer to the "[Memory Section](#)" heading on page 94 for more details.

#### 9) Joystick

The **Joystick** is a three axis controller (X, Y and Z) that is used to adjust various switcher parameters. Refer to the "[Joystick](#)" section on page 98 for details.

#### 10) Light Control

One **Light Control** is provided, which enables you to adjust the brightness of the script lights that connect to the rear panel.

### 3. Control Panel Orientation

Control Panel Descriptions

## Functional Control Panel Sections

The following topics are discussed in this section:

- [Display Section](#)
- [PGM Bank](#)
- [PGM Transition Section](#)
- [M/E Bank](#)
- [M/E Transition Section](#)
- [Aux Section](#)
- [Custom Control Section](#)
- [Memory Section](#)
- [Joystick](#)

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### Display Section

The figure below illustrates the **Display Section**:

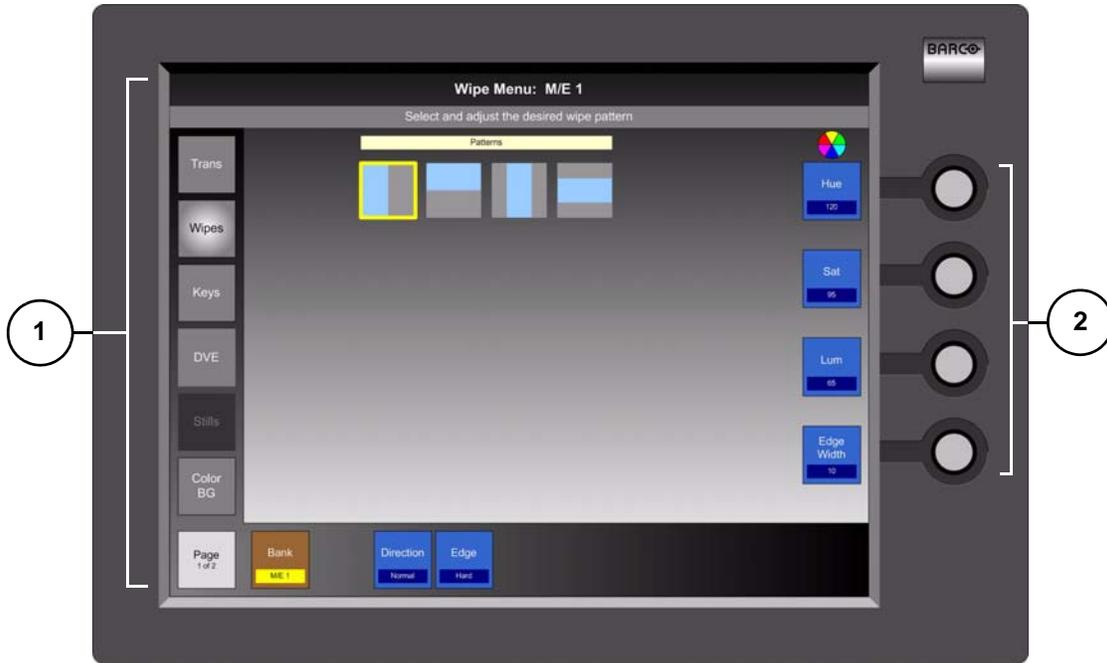


Figure 3-4. Display Section (with sample menu)

1) <a href="#">Touch Screen</a>	2) <a href="#">Knobs</a>
---------------------------------	--------------------------

The **Display Section** provides the controls for adjusting system parameters. The display itself can be mounted in a variety of ways. In Chapter 4, refer to the [“Display Mount Options”](#) section on page 109 for details.

Following are descriptions of each section:

#### 1) Touch Screen

The high-resolution **Touch Screen** is a multi-menu user interface that enables you to set up the switcher, adjust parameters, view status, and manage all functions. Refer to Chapter 5, [“Menu Orientation”](#) on page 131 for details.

#### 2) Knobs

Four **Knobs** are provided to the right of the Touch Screen. When one or more “value buttons” appear on the Touch Screen, or when a line is drawn to a table, the adjacent knob(s) enable you to adjust those specific parameters.

Please note:

- ~ Turning a knob to the right (clockwise) increases a parameter’s value, or in a table, scrolls the highlight down. Turning a knob to the left (counter-clockwise) decreases a value, or scrolls the highlight up.
- ~ If you adjust a numeric value using a **Knob**, you do not need to press **Enter**. Using this method, the new value is *immediately* active.
- ~ If you enter a numeric value using the “on-screen” **Keypad** or the control panel’s **Keypad**, the **Enter** button must be pressed.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### PGM Bank

The **PGM Bank** is the switcher's top video layer. The bank includes two physical buses (**PGM** and **PST**), and one "phantom" **KEY** bus. Together, these buses are the switcher's primary location where you cut your program and transition to M/E setups. Please note:

- The **PGM Bank** has an associated **PGM Transition Section** to its right, where effects and transitions (such as mixes, wipes and keys) are set up using the sources selected in the buses.
- Using the **Memory/Transition Section**, you can store all or part of the PGM bank.
- The **PGM Bank** provides tally indications similar to the M/E. In Chapter 7, refer to the "[Understanding Tally](#)" section on page 315 for details.
- The buses in the **PGM Bank** operate in "flip-flop" mode. In Chapter 7, refer to the "[Understanding Flip-flop Mode](#)" section on page 314 for details.
- Button color has important significance. In Chapter 7, refer to the "[Understanding Button Color](#)" section on page 311 for details.

The figure below illustrates the **PGM Bank** on the FSN-150.

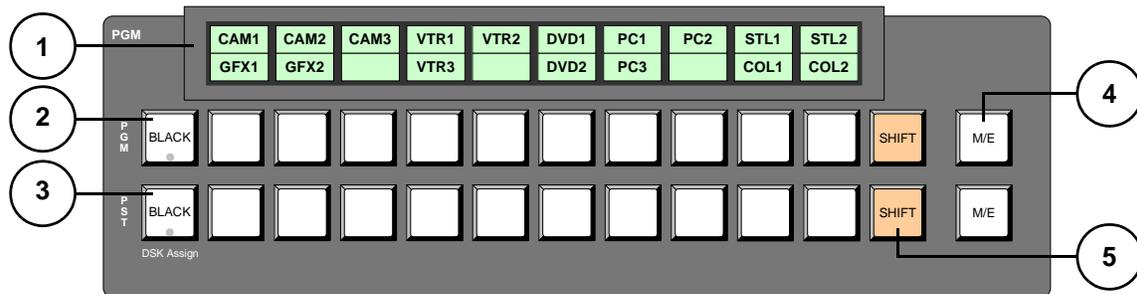


Figure 3-5. PGM Bank, FSN-150

1) <a href="#">Programmable Displays</a>	4) <a href="#">Re-entry Buttons</a>
2) <a href="#">Program Bus</a>	5) <a href="#">SHIFT Buttons</a>
3) <a href="#">Preset and Phantom Key Bus</a>	

Following are descriptions of each section:

#### 1) Programmable Displays

Above each source button on the **PGM Bus**, a **Programmable Display** shows the source names that are assigned during setup (e.g., **CAM1**, **VTR2**, etc.). The labels are dynamic — if the source is mapped to another button, the label follows.

#### Note

In the **Programmable Displays**, the top row is the unshifted source, the bottom row is the shifted source.

If an error occurs to either the shifted or unshifted input, the **Programmable Display** turns red. In Chapter 7, refer to the "[Understanding Error Messages](#)" section on page 316 for full details.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### 2) Program Bus

The **Program Bus (PGM)** is the bank's bottom layer, which is used to select the switcher's primary output video. Please note:

- ~ Except for **SHIFT**, all buttons on the **PGM Bus** are mutually exclusive, including the re-entry button.

#### 3) Preset and Phantom Key Bus

This bus has three functions:

- ~ The **PST Bus** is used to select the next background source.
- ~ Because there is no physical **Key Bus** in the **PGM Bank**, the **PST Bus** doubles as the bank's "phantom" key bus for the downstream keyer. To assign a key source, press and hold the **DSK** button, select the desired key source from the buttons on **PST**, then release the **DSK** button.
- ~ When a DVE channel is assigned to the **DSK**, the phantom key bus enables you to select the input to the DVE channel — in the same manner that DSK sources are selected.

Please note:

- ~ Except for **SHIFT**, all buttons on the **PST Bus** are mutually exclusive, including the re-entry button.
- ~ When a **PST** source is taken to Program with a transition, the source "flips" to **PGM**. In Chapter 7, refer to the "[Understanding Flip-flop Mode](#)" section on page 314 for details.

#### 4) Re-entry Buttons

At the end of each bus, the **Re-entry Button** allows you to combine the program output of the M/E into the video flow of the selected bus. For example:

- ▲ You can re-enter M/E 1 on **PGM**, **PST** or the **Phantom Key Bus**.

This re-entry capability enables you to cut, mix or wipe to an M/E, or use an M/E as a key source.

#### Note

The **Re-entry Button** can be mapped, using the **Map Buttons Menu**. For example, if M/E control is enabled on the FSN-150, you can map **M/E 2** onto the "shifted" M/E re-entry button. In Chapter 5, refer to the "[Map Buttons Menu](#)" section on page 224 for details.

#### 5) SHIFT Buttons

All **SHIFT** buttons are latching. Press to access additional sources as follows:

- ~ Sources 11 through 20 on the FSN-150.

In Chapter 7, refer to the "[Understanding Switcher Layers](#)" section on page 312 for a discussion of video layers within the switcher.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### PGM Transition Section

The **PGM Transition Section** provides controls for creating the switcher's primary output, using cuts, mixes, wipes, a downstream key and a downstream "fade to black." The figure below shows the **PGM Transition Section**:

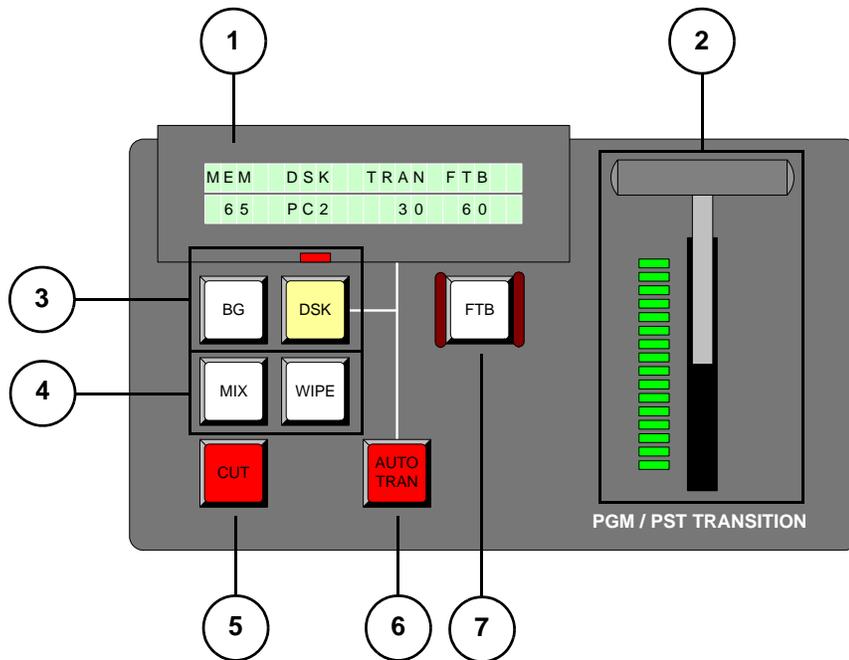


Figure 3-6. PGM Transition Section (sample)

1) <a href="#">PGM Transition Display</a>	4) <a href="#">Effects Group</a>	7) <a href="#">FTB</a>
2) <a href="#">T-Bar and Transition LEDs</a>	5) <a href="#">Cut</a>	
3) <a href="#">Next Transition Group</a>	6) <a href="#">Auto Transition</a>	

Following are descriptions of each section:

#### 1) PGM Transition Display

The **PGM Transition Display** provides the four important status labels:

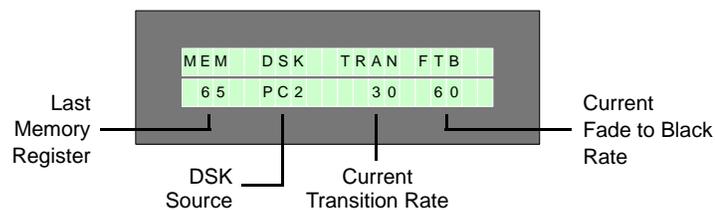


Figure 3-7. PGM Transition Display

From left to right:

- ~ **Last Memory Register** — indicates the last memory register recalled to the PGM bank. When you recall another register using the **Memory Section**, the register updates.

### 3. Control Panel Orientation

#### Control Panel Descriptions

- ~ **DSK Source** — (directly above the **DSK** button), indicates the current source assigned to the downstream keyer. When you select another source on the **Phantom Key Bus**, the source label updates.

#### Note

If a DVE is assigned to the DSK, and the DVE is enabled (either in PIP or KEY mode), this label indicates the source routed to the DVE — in other words, the DVE's input. DVE assignment status is listed on the **DVE Assign Menu**.

In Chapter 8, refer to the "[DVE Assign Menu](#)" section on page 363 for details.

- ~ **Current Transition Rate** — indicates the auto-transition rate loaded in the PGM bank. This rate is used by the **AUTO TRAN** and **DSK** functions. Use the **Transition Menu** to change rates. In Chapter 5, see the "[Transition Menu](#)" section on page 148 for details.
- ~ **Current Fade to Black Rate** — indicates the auto-transition rate for the fade to black (FTB) function. Use the **Transition Menu** to change rates.

#### 2) T-Bar and Transition LEDs

The **T-Bar** provides manual transition control for the layers enabled in the **Next Transition Group**. For both manual and automatic transitions, the **Transition LEDs** always indicate the position of the transition in progress.

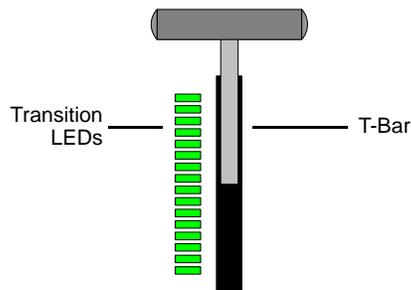


Figure 3-8. T-Bar and Transition LEDs

**T-Bar** functionality is identical for both the M/E bank and the PGM bank. In Chapter 7, refer to the "[Understanding the T-Bar and Transition LEDs](#)" section on page 325 for complete details.

#### 3) Next Transition Group

The two buttons in the **Next Transition Group** indicate which specific combination of layers is armed for the next transition. The state of these buttons affects the bank's "lookahead" preview output.

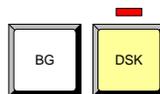


Figure 3-9. Next Transition Group

To use the group, simultaneously press the combination of buttons that you wish to enable. Any combination can be pressed. Whichever combination you enable automatic disables those buttons that were not pressed.

### 3. Control Panel Orientation

#### Control Panel Descriptions

For example:

- ▲ If **BG** and **DSK** are currently lit, pressing **BG** turns the **BG** button on, and turns the **DSK** button off.
- ▲ If **DSK** is currently lit, pressing **BG** and **DSK** turns the **BG** and **DSK** buttons on.

Following are descriptions of each button in the **Next Transition Group**:



- ~ Enable **BG** to arm the background layer for a transition.
  - When **BG** is on, the selected **PST** source appears in the bank's preview monitor output. When the transition is performed, the **PST** source flips to **PGM**.
  - When **BG** is off, the selected **PST** source does not appear in the preview monitor output. The current **PGM** source is held during the next transition — even if a different source is selected on **PST**.



- ~ Enable **DSK** to arm a transition to or from the **DSK** layer, using the source selected on the **Phantom Key Bus**. The red LED above the button lights when the DSK is on.
  - If the **DSK** is currently **off** and you enable it, the next transition turns the key on. The key source appears in the bank's preview output.
  - If the **DSK** is currently **on** and you enable it, the next transition turns the key off. Here, even though the key is on, the key is removed from preview — showing the bank's *next* look.
  - Press and hold **DSK** to display the **Key Menu**, with the DSK highlighted.

If **DSK** is off and **BG** is on, the key will not transition. If the key is currently **off**, it stays off. If the key is currently **on**, it holds.

#### Note

The **Key Menu** can be used at any time to adjust DSK parameters, whether or not the key is on. In Chapter 5, refer to the "[Keyer Menu](#)" section on page 157 for details.

The following rules apply to both buttons in the **Next Transition Group**:

- ~ As you enable or disable buttons in the group, the selected layer appears (or is removed) on the bank's Preview output.
- ~ At the end of a transition (either manual or automatic), all buttons that you enabled in the group remain on. This allows you to transition back to the previous look.
- ~ Both buttons work in combination with the bank's **MIX**, **WIPE**, **CUT**, **AUTO TRAN** button and the **T-Bar**. For example:
  - ▲ If you arm **BG** and **MIX**, and then press **AUTO TRAN**, the transition automatically mixes to the selected source.
  - ▲ If you arm **DSK**, **BG** and **WIPE**, and then move the **T-Bar**, the transition manually wipes to the selected source plus DSK.
  - ▲ If you arm **DSK** and then press **CUT**, the DSK cuts on or off.

In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for additional information about lookahead preview functionality.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### 4) Effects Group

The two buttons in the **Effects Group** indicate which effects are armed for the next transition in the PGM bank.



Figure 3-10. Effects Group

To use the group, press the button for the transition you want to enable. Note that **MIX** and **WIPE** are mutually exclusive.

Following are descriptions of each button in the **Effects Group**:



~ Press **MIX** to arm the PGM bank for a mix, using the layers enabled in the **Next Transition Group**. The mix can be performed manually or automatically. Transition combinations are:

- **MIX + BG**: Background mix
- **MIX + DSK**: Mix DSK, on or off
- **MIX + BG + DSK**: Mix background and DSK

#### Note

After a mix transition has been armed, press and hold **MIX** to display the **Transition Menu**, which lets you to set transition rates and curves. In Chapter 5, refer to the "[Transition Menu](#)" section on page 148 for details.



~ Press **WIPE** to arm the PGM bank for a wipe transition, using the layers enabled in the **Next Transition Group**. The wipe can be performed manually or automatically. Transition combinations are:

- **WIPE + BG**: Background wipe
- **WIPE + DSK**: Wipe DSK, on or off
- **WIPE + BG + DSK**: Wipe background and DSK

#### Note

After a wipe transition has been armed, press and hold **WIPE** to display the **Wipe Menu**, which lets you to choose wipe patterns and adjust parameters. In Chapter 5, refer to the "[Wipe Menu](#)" section on page 151.



#### 5) Cut

Press **CUT** to instantly cut to the PGM bank layers that are enabled in the **Next Transition Section**. For example:

- ▲ **BG** enabled — press **CUT** to cut from **PGM** to **PST**.
- ▲ **DSK** enabled — press **CUT** to cut the DSK on or off.
- ▲ **BG + DSK** enabled — press **CUT** to cut from **PGM** to **PST**, and simultaneously cut the DSK on or off.



#### 6) Auto Transition

Press **AUTO TRAN** to trigger an automatic transition to or from the layers enabled in the **Next Transition Group**. The transition uses the "type" of transition enabled in the **Effects Group**, and the PGM bank's current transition rate. For example:

- ▲ **BG + MIX** enabled — press **AUTO TRAN** to mix from **PGM** to **PST**.

### 3. Control Panel Orientation

#### Control Panel Descriptions

- ▲ **BG + WIPE** enabled — press **AUTO TRAN** to wipe from **PGM** to **PST**.
- ▲ **DSK + MIX** enabled — press **AUTO TRAN** to mix the DSK on or off.
- ▲ **BG + DSK + MIX** enabled — press **AUTO TRAN** to mix from **PGM** to **PST**, and simultaneously mix the DSK on or off.

Press **AUTO TRAN** *during* the transition interval to pause the transition. The **Transition LEDs** indicate the point at which the transition is paused. Press **AUTO TRAN** again to continue in the same direction. You can pause and continue repeatedly.

#### Note

Use the **Transition Menu** to change transition rates and curves. Remember that the bank's transition rate appears in the **Transition Display**. In Chapter 5, refer to the "[Transition Menu](#)" section on page 148 for details.

#### Note

You can use **AUTO TRAN** and the **T-Bar** together. For example, you can start a transition manually, and continue it automatically. In Chapter 7, refer to the "[Working with Mixes](#)" section on page 331 for full details.



#### 7) FTB

The **FTB** (Fade to Black) button enables you to transition the switcher's Program output to black. Please note:

- ~ When pressed, the switcher fades to black, including the DSK. Once in black, the **FTB** button blinks.
- ~ While in black, the PGM and M/E banks are fully functional, and individual switcher outputs are fully functional (e.g., **M/E 1 Out**). Sources can be preset on any bus, and any memory register can be recalled — but the setups will not contribute to the switcher's **Program** output.

#### Note

When the switcher is in black, the button color of the source selected on **PGM** changes to dim red.

- ~ When **FTB** is pressed again, the switcher fades up from black to the current setup. If the DSK is enabled, it remains enabled.
- ~ Use the **Transition Menu** to change the FTB transition rate. The current transition rate appears in the **Transition Display**. In Chapter 5, refer to the "[Transition Menu](#)" section on page 148 for details

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### M/E Bank

An **M/E** bank is essentially a video layer which, in combination with other switcher banks, enables you to create the overall “look” of your program. Please note:

- Three buses are provided for selecting sources: **BG, PST** and **KEY**.
- Sources are the *same* in each vertical column of buttons. For example, if CAM 2 is mapped to button 2, CAM 2 appears on button 2 on *all switcher buses*.
- The M/E bank has an associated **M/E Transition Section** to the right. In this section, you set up “effects” and transitions using the sources selected in the M/E.
- Using the **Memory/Transition Section**, you can store all or part of an M/E bank.
- An M/E bank provides tally indications. In Chapter 7, refer to the [“Understanding Tally”](#) section for details.
- An M/E bank operates in “flip-flop” mode. In Chapter 7, refer to the [“Understanding Flip-flop Mode”](#) section on page 314 for details.
- Button color has important significance. In Chapter 7, refer to the [“Understanding Button Color”](#) section on page 311 for details.

#### Note

When M/E 2 control is enabled on the FSN-150, M/E 1 buttons temporarily become M/E 2 buttons, and operations are identical to M/E 1. In Chapter 7, refer to the [“M/E 2 Control on the FSN-150”](#) section on page 349 for details.

The figure below illustrates the **M/E Bank** on the FSN-150.

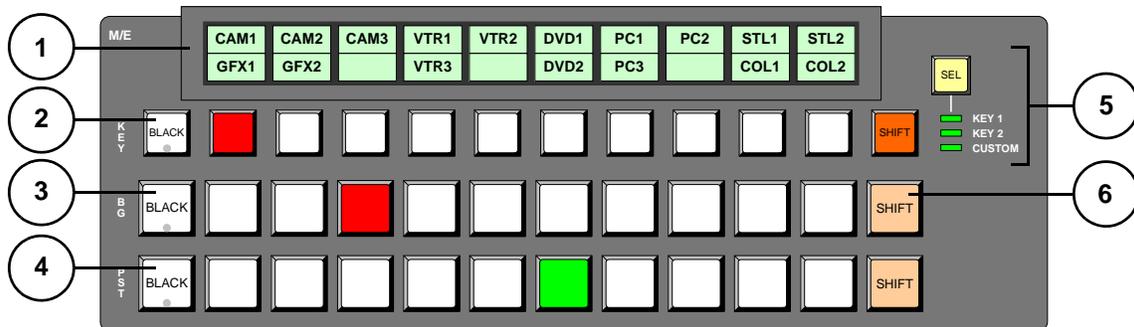


Figure 3-11. M/E Bank, FSN-150 (with sample displays)

1) <a href="#">Programmable Displays</a>	3) <a href="#">Background Bus</a>	5) <a href="#">Key Control Section</a>
2) <a href="#">Key Bus</a>	4) <a href="#">Preset Bus</a>	6) <a href="#">SHIFT Buttons</a>

Following are descriptions of each section:

#### 1) Programmable Displays

Above each button on the **Key Bus**, a **Programmable Display** shows the source names that are assigned during setup. The labels are dynamic — if the source is mapped to another button, the label follows. Please note:

- ~ In the **Programmable Displays**, the top row is the unshifted source, the bottom row is the shifted source.
- ~ When M/E 2 control is enabled on the FSN-150, all **Programmable Displays** turn orange.

### 3. Control Panel Orientation

#### Control Panel Descriptions

- ~ If an error occurs to either the shifted or unshifted input, the associated **Programmable Display** turns red. In Chapter 7, refer to the [“Understanding Error Messages”](#) section on page 316 for full details.

#### 2) Key Bus

The **Key Bus** is the M/E's top layer, which is used to select sources to key over the **BG** and **PST** buses. Please note:

- ~ Except for **SHIFT**, all buttons on the **Key Bus** are mutually exclusive.
- ~ On the M/E, the **Key Bus** is shared between **KEY 1** and **KEY 2**. The **SEL** button chooses the active function, as indicated by the LEDs to the right of the bus. Refer to the [“Key Control Section”](#) heading on page 82 for details.

#### Note

Custom control functionality on the **Key Bus** is not available in version 3.0.

- ~ If a key is on, you can “hot cut” key sources on the bus, provided that the bus is selected (using **SEL**).
- ~ When a DVE channel is assigned to a keyer, the **Key Bus** is used to select inputs to that DVE channel.

#### 3) Background Bus

The **Background Bus** (BG) selects the M/E's bottom layer — the image that is visually behind the M/E's two keyers. Please note:

- ~ Except for **SHIFT**, all buttons on **BG** are mutually exclusive.

#### 4) Preset Bus

The **Preset Bus** (PST) is used to select the M/E's next background. Please note:

- ~ Except for **SHIFT**, all buttons on **PST** are mutually exclusive.
- ~ When a **PST** source is taken to Program, the source “flips” to **PGM**. In Chapter 7, refer to the [“Understanding Flip-flop Mode”](#) section on page 314 for details.

#### 5) Key Control Section

The **Key Bus** is a shared bus. The **SEL** button toggles the bus between **KEY 1** and **KEY 2**. The LEDs indicate the active function.

- ~ When **KEY 1** or **KEY 2** is selected, Key sources can be selected and adjusted for the indicated keyer.

#### Note

Custom control functionality on the **Key Bus** is not available in version 3.0.

#### 6) SHIFT Buttons

All **SHIFT** buttons are latching. Press **SHIFT** to access additional sources as follows:

- ~ Sources 11 through 20 on the FSN-150.

In Chapter 7, refer to the [“Understanding Switcher Layers”](#) section on page 312 for a discussion of video layers within the switcher.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### M/E Transition Section

The **M/E Transition Section** provides the controls for creating transitions such as cuts, mixes, wipes, keys and PIP effects. The figure below illustrates the section:

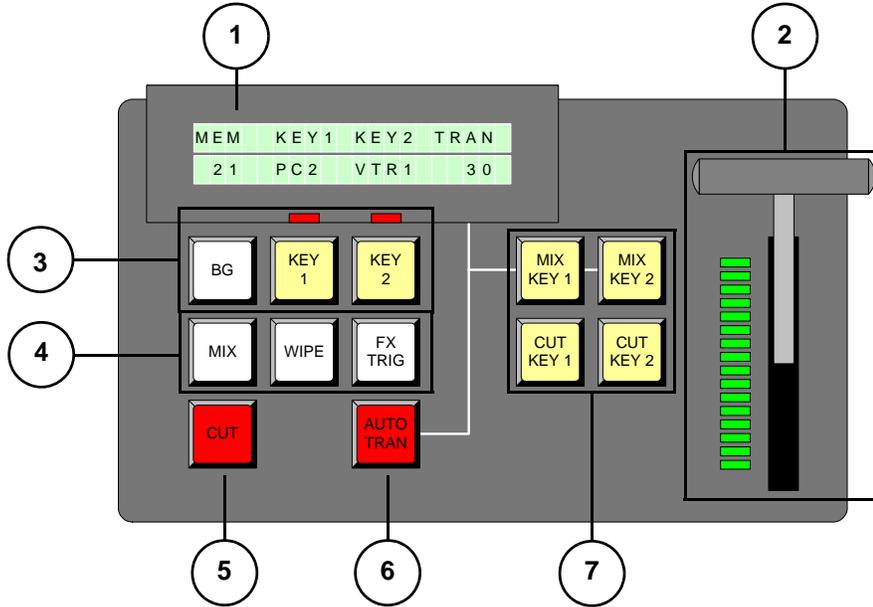


Figure 3-12. M/E Transition Section (sample)

1) <a href="#">M/E Transition Display</a>	4) <a href="#">Effects Group</a>	7) <a href="#">Direct Key Control Group</a>
2) <a href="#">T-Bar and Transition LEDs</a>	5) <a href="#">Cut</a>	
3) <a href="#">Next Transition Group</a>	6) <a href="#">Auto Transition</a>	

Following are descriptions of each section:

#### 1) M/E Transition Display

The **M/E Transition Display** provides four important status fields:

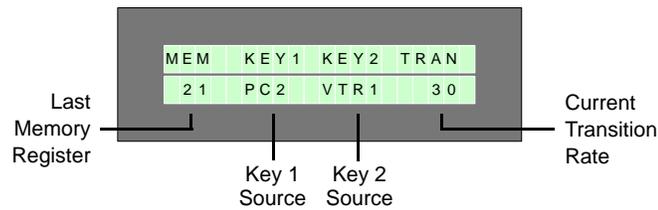


Figure 3-13. M/E Transition Display

From left to right:

- ~ **Last Memory Register** — the top line is the field title: **MEM**. The bottom line indicates the last memory register recalled to the M/E. When another M/E register is recalled using the **Memory Section**, the bottom line updates.

### 3. Control Panel Orientation

#### Control Panel Descriptions

- ~ **Key 1 Source and DVE trigger status** — this field is located directly above the **KEY 1** button. The following indications are provided:
  - In key mode, the top line is the field title: **KEY1**. The bottom line displays the source assigned to the keyer. When you select another source on the **Key Bus**, the bottom label updates.
  - When a DVE channel is assigned to the keyer and a two-keyframe effect is loaded, the top line provides trigger status. Three labels are possible:
    - “**■FX**” indicates that only the DVE effect is armed to trigger.
    - “**■■FX**” indicates that the keyer is armed to mix, and the DVE effect is simultaneously armed to trigger.
    - “**■■FX**” indicates that the keyer is armed to wipe, and the DVE effect is armed to trigger.

In this mode, the bottom line indicates the input source to the assigned DVE channel.
- ~ **Key 2 Source and DVE trigger status** — this field is located directly above the **KEY 2** button. Key source and DVE status indications are identical to those for **KEY 1** — but for **KEY 2** instead.

#### Note

Remember that the **SEL** button chooses the active key bus, as indicated by the **Key Control LEDs**.

- ~ **Current Transition Rate** — indicates the auto-transition rate loaded in the M/E. This rate is used by the following functions:
  - **AUTO TRAN**
  - **MIX KEY 1** and **MIX KEY 2**
  - **DVE** effect duration (for two-keyframe effects)

Use the **Transition Menu** to change rates. In Chapter 5, see the [“Transition Menu”](#) section on page 148 for details.

#### 2) T-Bar and Transition LEDs

The **T-Bar** provides manual transition control for the layers enabled in the **Next Transition Group** — including mixes, wipes and two-keyframe DVE effects. For both manual and automatic transitions, the **Transition LEDs** always indicate the position of the transition in progress.

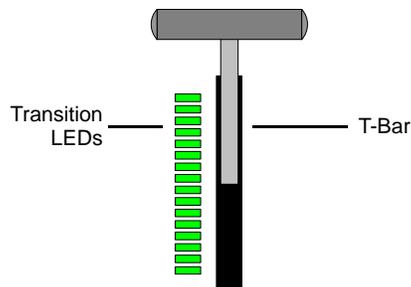


Figure 3-14. T-Bar and Transition LEDs

**T-Bar** functionality is identical for the M/E and PGM banks. In Chapter 7, refer to the [“Understanding the T-Bar and Transition LEDs”](#) section on page 325 for complete details.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### 3) Next Transition Group

The three buttons in the **Next Transition Group** indicate which combination of layers is armed for the next transition. The state of these buttons affects the M/E's "lookahead" preview output.

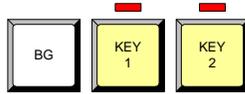


Figure 3-15. Next Transition Group

To use the group, simultaneously press the combination of buttons that you wish to arm. Any combination can be pressed. Whichever combination you enable automatically disables those buttons that were not pressed.

For example:

- ▲ If **BG**, **KEY 1** and **KEY 2** are lit, pressing **BG** turns the **BG** button on, and turns off the **KEY 1** and **KEY 2** buttons.
- ▲ If **KEY 1** is lit, simultaneously pressing **BG** and **KEY 2** turns the **BG** and **KEY 2** buttons on, and **KEY 1** off.

Following are descriptions of each button in the **Next Transition Group**:



- ~ Enable **BG** to arm the background layer for a transition.
  - When **BG** is on, the selected **PST** source appears in the M/E's preview monitor output. When the transition is performed, the **PST** source flips to **BG**.
  - When **BG** is off, the selected **PST** source does not appear in the M/E preview output. The current **BG** source is held during the next transition — even if a different **PST** source is selected.



- ~ Enable **KEY 1** to arm one of the following transitions:
  - When armed in conjunction with **MIX** or **WIPE**, you can transition the **KEY 1** layer. The red LED above the button lights when the key is on.
  - When armed in conjunction with **FX TRIG**, you can trigger a two-keyframe DVE effect. A DVE channel must be assigned to **KEY 1** and a two-keyframe DVE effect must be loaded.
  - When armed in conjunction with **MIX** and **FX TRIG**, you can mix **KEY 1** and simultaneously trigger a DVE effect.
  - When armed in conjunction with **WIPE** and **FX TRIG**, you can wipe **KEY 1** and simultaneously trigger a DVE effect.

Please note the following important points regarding **KEY 1** transitions:

- If **KEY 1** is **off** and you enable it, the next transition turns the key on. The key source appears in the M/E's preview output.
- If **KEY 1** is **on** and you enable it, the next transition turns the key off. The key is removed from preview — showing the M/E's *next* look.
- Press and hold **KEY 1** to display the **Key Menu**, with Key 1 highlighted.
- If **KEY 1** is **off**, the layer will not transition. If the key is currently **off**, it stays off. If the key is currently **on**, it holds.
- If **KEY 1** and **KEY 2** are **off**, you cannot enable **FX TRIG**.

### 3. Control Panel Orientation

#### Control Panel Descriptions



- ~ All transition and arm capabilities for **KEY 2** are identical to those for **KEY 1** — but apply to **KEY 2** instead. The DVE prerequisites are also identical — a DVE channel must be assigned to **KEY 2** and a two-keyframe DVE effect must be loaded.

#### Note

The **Key Menu** can be used at any time to adjust key parameters, whether or not the key is on. In Chapter 5, refer to the "[Keyer Menu](#)" section on page 157 for details.

The following rules apply to all three buttons in the **Next Transition Group**:

- ~ As you enable or disable buttons in the group, the selected layer appears (or is removed) on the M/E's Preview output.
- ~ At the end of a transition (either manual or automatic), all buttons that were enabled in the group remain on. This allows you to transition back to the previous look.
- ~ All three buttons in the **Next Transition Group** work in combination with the M/E's **MIX**, **WIPE**, **CUT**, **FX TRIG**, **AUTO TRAN** button and the **T-Bar**.

For example:

- ▲ If you arm **BG** and **MIX**, press **AUTO TRAN** to automatically mix to the selected source.
- ▲ If you arm **KEY 1**, **BG** and **WIPE**, move the **T-Bar** to manually wipe to the selected source plus key.
- ▲ If you arm **BG** and **KEY 2**, press **CUT** to cut to the selected source and cut the key on or off.
- ▲ If you arm **KEY 1** and **FX TRIG**, press **AUTO TRAN** to trigger the two-keyframe DVE effect (that is loaded into the DVE channel assigned to **KEY 1**).
- ▲ If you arm **KEY 1**, **MIX** and **FX TRIG**, press **AUTO TRAN** to trigger the two-keyframe DVE effect and also mix the **KEY 1** layer.

In Chapter 7, use the following section for reference:

- ~ Refer to the "[Understanding Lookahead Preview](#)" section on page 319 for additional information about lookahead preview functionality.
- ~ Refer to the "[Understanding Switcher Layers](#)" section on page 312 for a discussion of video layers within the switcher.
- ~ In Chapter 8, refer to the "[Automatic DVE Triggering](#)" section on page 396 for complete details.

#### 4) Effects Group

The three buttons in the **Effects Group** indicate which effects are armed for the next transition in the M/E.



Figure 3-16. Effects Group

To use the group, press the button(s) for the transition that you want to arm.

### 3. Control Panel Orientation

#### Control Panel Descriptions

When pressed by themselves, **MIX**, **WIPE** and **FX TRIG** are mutually exclusive:

- ~ Press **MIX** to select a mix effect *only*.
- ~ Press **WIPE** to select a wipe effect *only*.
- ~ Press **FX TRIG** to select an effects trigger *only*. **KEY 1** and/or **KEY 2** must be enabled, and a two-keyframe effect must be loaded in the selected keyer(s).

Two “combination” effects are also possible:

- ~ Simultaneously press **MIX + FX TRIG** to select a mix effect, and simultaneously trigger a two-keyframe DVE effect.
- ~ Simultaneously press **WIPE + FX TRIG** to select a wipe effect, and simultaneously trigger a two-keyframe DVE effect.

Again, with these combination effects, **KEY 1** and/or **KEY 2** must be enabled, and a two-keyframe effect must be loaded in the selected keyer.

Following are detailed descriptions of each button in the **Effects Group**:



- ~ Press **MIX** to arm the M/E for a mix, using the layers enabled in the **Next Transition Group**. The mix can be performed manually with the **T-Bar** or automatically with **AUTO TRAN**.

Please note:

- A **MIX** can be performed with any combination of **BG**, **KEY 1** and **KEY 2**.
- A **MIX + FX TRIG** can only be performed when **KEY 1** and/or **KEY 2** is enabled, and the selected keyer has a two-keyframe effect loaded.

#### Note

After a mix transition has been armed, press and hold **MIX** to display the **Transition Menu**.



- ~ Press **WIPE** to arm the M/E for a wipe transition, using the layers enabled in the **Next Transition Group**. The wipe can be performed manually with the **T-Bar**, or automatically using **AUTO TRAN**.

Please note:

- A **WIPE** can be performed with any combination of **BG**, **KEY 1** and **KEY 2**.
- A **WIPE + FX TRIG** can only be performed when **KEY 1** and/or **KEY 2** is enabled, and the selected keyer has a two-keyframe effect loaded.

#### Note

After a wipe transition has been armed, press and hold **WIPE** to display the **Wipe Menu**.



- ~ The **FX TRIG** (Effects Trigger) button enables you to run two-keyframe DVE effects from the control panel — either individually, or in combination with mix and wipe transitions. When a two-keyframe DVE effect is triggered, it runs forward from keyframe 1 to 2, or backward from

### 3. Control Panel Orientation

#### Control Panel Descriptions

keyframe 2 to 1. Single keyframe DVE effects can only be mixed or wiped up or down — they cannot be triggered.

#### Important

The following criteria must be met in order to enable the **FX TRIG** button:

- One or two DVE cards must be installed.
- A DVE channel must be assigned to the keyer that you wish to use.
- The DVE mode in the **Key Menu** must be “on.”
- **KEY 1** and/or **KEY 2** must be enabled.
- A two-keyframe effect must be loaded in the selected DVE channel.

If any of these criteria are not met, the button will not light.

Because DVE channels are assigned to keyers, there are three ways that you can work with two-keyframe DVE effects:

- **Mix or wipe only**  
Mix or wipe the DVE effect up or down (just like a normal key) — without an effects trigger.  
▲ Press **KEY 1**, press **MIX** (or **WIPE**), press **AUTO TRAN**.
- **Mix or wipe plus trigger**  
Mix or wipe the DVE effect up or down — and simultaneously trigger the effect.  
▲ Press **KEY 1**, press **MIX** (or **WIPE**) + **FX TRIG**, press **AUTO TRAN**.
- **Trigger effect only**  
Trigger the DVE effect only, without a mix or wipe transition.  
▲ Press **KEY 1**, press **FX TRIG**, press **AUTO TRAN**.

In Chapter 8, refer to the “[Automatic DVE Triggering](#)” section on page 396 for complete details.



#### 5) Cut

Press **CUT** to instantly cut to the layers that are enabled in the **Next Transition Section**. For example:

- ▲ **BG** enabled — press **CUT** to cut from **BG** to **PST**.
- ▲ **KEY 1** enabled — press **CUT** to cut Key 1 on or off.
- ▲ **BG + KEY 2** enabled — press **CUT** to cut from **BG** to **PST**, and simultaneously cut Key 2 on or off.



#### 6) Auto Transition

Press **AUTO TRAN** to trigger an automatic transition, an effects trigger, or a combination trigger plus transition — to or from the layers enabled in the **Next Transition Group**. The transition uses the “type” of transition enabled in the **Effects Group**, and the M/E’s current transition rate and curve.

For example:

- ▲ **BG + MIX** enabled — press **AUTO TRAN** to mix from **BG** to **PST**.
- ▲ **BG + WIPE** enabled — press **AUTO TRAN** to wipe from **BG** to **PST**.

### 3. Control Panel Orientation

#### Control Panel Descriptions

- ▲ **KEY 1 + MIX** enabled — press **AUTO TRAN** to mix Key 1 on or off.
- ▲ **BG + KEY 2 + MIX** enabled — press **AUTO TRAN** to mix from **BG** to **PST**, and simultaneously mix Key 2 on or off.
- ▲ **KEY 1 + KEY 2 + WIPE** enabled — press **AUTO TRAN** to wipe Key 1 and Key 2 on or off.
- ▲ **KEY 1 + FX TRIG** enabled — press **AUTO TRAN** to trigger the DVE effect on Keyer 1 only.
- ▲ **KEY 1 + MIX + FX TRIG** enabled — press **AUTO TRAN** to mix the DVE effect up or down — and simultaneously trigger the effect.

Press **AUTO TRAN** *during* the transition interval to pause the transition. The **Transition LEDs** indicate the point at which the transition is paused. Press **AUTO TRAN** again to continue in the same direction. You can pause and continue repeatedly.

#### Note

Use the **Transition Menu** to change transition rates and curves. Remember that the M/E's transition rate appears in the **Transition Display**. In Chapter 5, refer to the "[Transition Menu](#)" section on page 148 for details.

#### Note

You can use **AUTO TRAN** and the **T-Bar** together. For example, you can start a transition manually, and continue it automatically. In Chapter 7, refer to the "[Working with Mixes](#)" section on page 331 for full details.

#### 7) Direct Key Control Group

The four buttons in the **Direct Key Control Group** enable you to *directly* control the two keyers in the M/E, without the need to arm them in the **Next Transition Group**. When you use these buttons, the red LEDs above the **KEY 1** and **KEY 2** buttons function in the normal way.



Figure 3-17. Direct Key Control Group

Following are descriptions of each button in the **Direct Key Control Group**. The functions apply to the selected keyer, whether or not a DVE is assigned.

- ~ Press **MIX KEY 1** to immediately mix **Key 1** fully on or off.
- ~ Press **MIX KEY 2** to immediately mix **Key 2** fully on or off.
- ~ Press **CUT KEY 1** to immediately cut **Key 1** fully on or off.



### 3. Control Panel Orientation

#### Control Panel Descriptions



- ~ Press **CUT KEY 2** to immediately cut **Key 2** fully on or off

Please note the following important points regarding the **Direct Control** buttons:

- ~ Unlike the **AUTO TRANS** button, the two **MIX KEY** buttons cannot be paused. Once pressed, the transition completes fully.
- ~ The buttons cannot be used to trigger DVE effects — but they *can* be used to mix or cut DVE effects on or off.
- ~ When the **T-Bar** is positioned between the **BG** and **PST** buses (off of a limit), *almost* all transitions are possible. For example:
  - ▲ **BG + MIX** enabled — if the **T-Bar** is positioned half-way between the **BG** and **PST** buses (creating a 50% mix), pressing **CUT KEY 1** cuts the key in (or out) over the mix.
  - ▲ **BG + WIPE** enabled — if the **T-Bar** is positioned half-way between the **BG** and **PST** buses (creating a split-screen wipe), pressing **MIX KEY 2** mixes in the key over the split screen.
  - ▲ **KEY 1 + MIX** enabled — if the **T-Bar** is positioned half-way between the **BG** and **PST** buses (creating a 50% mix of the key), pressing **MIX KEY 1** mixes in the key to 100%.
  - ▲ **KEY 1 + WIPE** enabled — if the **T-Bar** is positioned half-way between the **BG** and **PST** buses (wiping the key halfway on), pressing **MIX KEY 1** is inhibited. However, pressing **CUT KEY 1** can be performed.
- ~ The two **MIX KEY** buttons transition at the M/E's auto transition rate. Use the **Transition Menu** to change rates. In Chapter 5, refer to the "[Transition Menu](#)" section on page 148 for complete details.
- ~ The **Transition LEDs** do not change state when **MIX KEY 1** and **MIX KEY 2** are used.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### Aux Section

An Aux output is essentially a destination — a location to which you want to route a source. Examples of Aux destinations are monitors, VTRs, projectors, etc.

The **Aux Section** enables you to perform the following functions:

- Assign sources to native and scaled Aux outputs.
- Route an “assignable” clean feed source to an Aux destination.

The figure below illustrates the **Aux Section** on the model FSN-150:

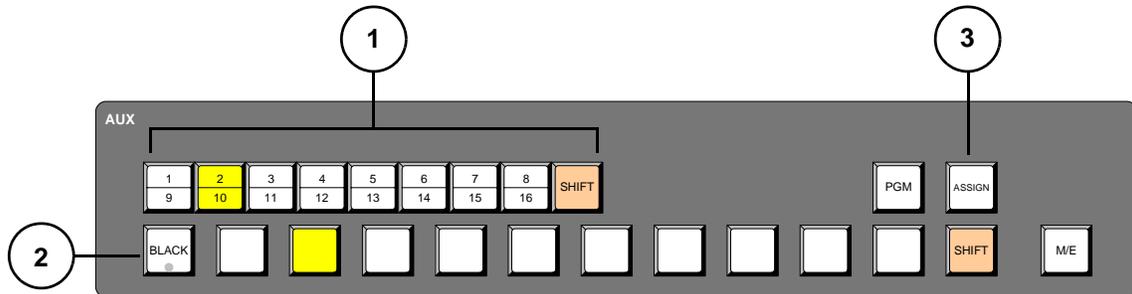


Figure 3-18. Aux Section, FSN-150 (sample)

1) <a href="#">Aux Output Row</a>	3) <a href="#">Assignable Source</a>
2) <a href="#">Aux Source Row</a>	

Following are descriptions of each section:

#### 1) Aux Output Row

The **Aux Output Row** enables you to select the specific Aux output to which you want to route a source. When a source is assigned to an Aux output, that source is immediately switched to the corresponding Aux output connector.

Please note:

- ~ Six native Aux outputs are provided as standard (Aux 1 - 6).
- ~ On the **Aux Output Row**, outputs 1 - 8 are unshifted, while outputs 9 - 16 are accessed via **SHIFT**.
- ~ When additional Aux output cards are installed (**UOCs** and/or **NACs**), use the **Aux Setup Menu** to map Aux outputs to the control panel, and name Aux outputs (if desired). In Chapter 5, refer to the “[Aux Setup Menu](#)” section on page 240 for details.
- ~ Only 16 Aux outputs can be switched from the FSN-150, but up to 30 Aux output channels can be installed. To view all Aux outputs and their source assignments simultaneously, use the **Aux Menu**. In Chapter 5, refer to the “[Aux Menu](#)” section on page 186 for details.
- ~ On the **Aux Output Row**, only one button can be selected at a time. When a button is pressed, the current associated source on the **Aux Source Row** lights.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### 2) Aux Source Row

The **Aux Source Row** provides all the sources available on the switcher's main buses, plus dedicated buttons for the switcher's PGM and M/E outputs. When you select a source, it is routed to the output selected on the **Aux Output Row**.

The following rules apply:

- ~ The sources on the **Aux Source Row** are identical to those on the switcher's main buses. If a button map is changed on the main rows, it also changes on the **Aux Source Row**.
- ~ On the FSN-150, sources 1 through 10 are unshifted. Sources 11 through 20 are accessed via **SHIFT**.
- ~ Source assignments on the row can be changed at any time.
- ~ One clean feed source can be mapped to the **ASSIGN** button. See below for details.
- ~ Only one button on the **Aux Source Row** can be lit at a time. This button shows the source that is assigned to the selected Aux output. In the figure below, source 2 is assigned to Aux output 2:

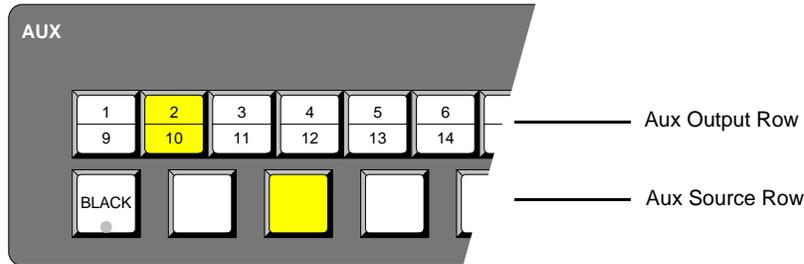


Figure 3-19. Sample source-to-output assignment, FSN-150

#### 3) Assignable Source



In addition to dedicated sources on the **Aux Source Row**, one additional source can be mapped to the **ASSIGN** button, as selected from the following five clean feed sources:

- ~ M/E 1 out clean — pre **KEY 1**
- ~ M/E 1 out clean — pre **KEY 2**
- ~ M/E 2 out clean — pre **KEY 1**
- ~ M/E 2 out clean — pre **KEY 2**
- ~ Program out clean — pre **DSK**

To assign a clean feed source to the **ASSIGN** button, press and hold **ASSIGN**, then use the **Clean Feed Setup Menu**. In Chapter 5, see the "[Clean Feed Setup Menu](#)" section on page 232 for details.

#### Important

Only one clean feed source can be mapped to the **ASSIGN** button for all Aux buses. For example, you cannot map "Pre **KEY 1**" to Aux 1, and "Pre **KEY 2**" to Aux 2.

In Chapter 7, refer to the "[Working with Aux Buses](#)" section for more information.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### Custom Control Section

The **Custom Control Section** provides groups of buttons that can be programmed to perform various switcher functions such as accessing menus, running macros, running “system” functions and triggering GPOs. Pre-programmed functions are also provided.

On the FSN-150, eight custom buttons are provided (two groups of four). The figure below illustrates the **Custom Control Section** on the FSN-150:

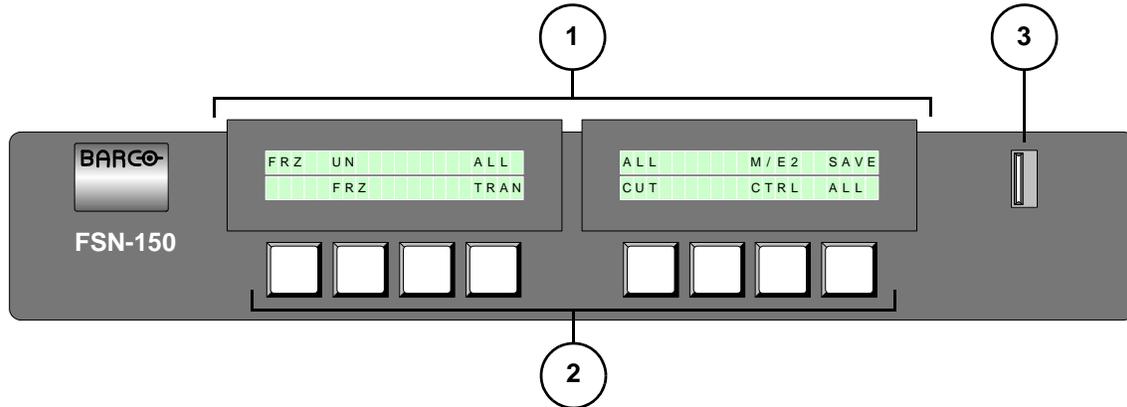


Figure 3-20. Custom Control Section, FSN-150 (sample)

1) <a href="#">Custom Control Displays</a>	2) <a href="#">Custom Control Buttons</a>	3) <a href="#">USB Port</a>
--	---	-----------------------------

Following are descriptions of each section:

#### 1) Custom Control Displays

One **Custom Control Display** is provided for each group of four Custom Control buttons. Each LCD display provides two lines of 20 characters each, enabling each button to be labeled with two lines of four characters.

#### 2) Custom Control Buttons

Each individual **Custom Control Button** represents a pre-programmed or programmable function that you can trigger, such as a GPO or a macro. To trigger the function, press the button, which lights momentarily to confirm.

#### 3) USB Port

Use the **USB Port** to connect a customer-supplied USB thumb drive, for system functions such as backup, restore, and updating software.

Please note the following important points regarding the **Custom Control Section**:

- Additional USB ports are available on the rear of the control panel. Refer to the “[Control Panel Rear](#)” section on page 99 for details.

#### Note

Full Custom Control functionality is not available in version 3.0. Only pre-programmed functions such as **ALL TRAN**, **FRZ** and **UNFRZ** are available. In Chapter 7, refer to the “[Using Custom Control Functions](#)” section for details.

### 3. Control Panel Orientation

#### Control Panel Descriptions

#### Memory Section

The **Memory Section** enables you to store switcher setups to memory, and recall setups from memory back to the panel. One thousand registers are provided (1 through 1000). In Chapter 7, refer to the [“Working with Memory Registers”](#) section on page 337 for details.

The figure below illustrates the **Memory Section**.

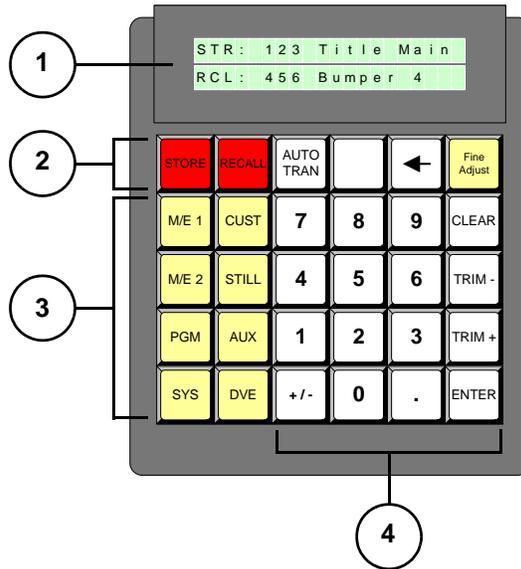


Figure 3-21. Memory Section

1) <a href="#">Memory Display</a>	3) <a href="#">Module Section</a>
2) <a href="#">Function Section</a>	4) <a href="#">Keypad</a>

Following are descriptions of each section:

#### 1) Memory Display

The figure below illustrates the **Memory Display**.



Figure 3-22. Memory Display (sample)

- ~ The top line indicates the last memory register that was stored, e.g., **STR: 123**. The letters **STR** are constant, followed by the “store” entry register, and the register description (as entered via the **Memory Menu**).
- ~ The bottom line indicates the last memory register that was recalled, e.g., **RCL: 456**. The letters **RCL** are constant, followed by the “recall” register, and the register description (as entered via the **Memory Menu**).

The following rules apply:

- ~ When you press **STORE** or **RECALL** and enter numbers from the keypad, the appropriate register clears, and digits shift left as you type.

### 3. Control Panel Orientation

#### Control Panel Descriptions

- ~ If you press **CLEAR**, the appropriate register clears and a dash appears. However, the function (store or recall) remains active, along with the selected modules.
- ~ If you turn off the **STORE** or **RECALL** button prior to pressing **ENTER**, you effectively cancel the operation, and the appropriate register returns to its previous value.

#### 2) Function Section

The two buttons in the **Function Section** determine the memory function that you want to perform. Only one button can be selected at a time.



- ~ To store a switcher setup in memory:
  - Press **STORE**. All active buttons in the **Module Section** light.
  - Toggle **off** the buttons for modules you do *not* want included in the register — leaving those **on** that you want included.
  - Enter a register number and press **ENTER**. The **STORE** button (along with the selected modules) remain **on** after pressing **ENTER**, enabling you to easily store additional registers.



- ~ To recall a switcher setup from memory:
  - Press **RECALL**.
  - Enter a register number and press **ENTER**. The **RECALL** button remains **on** after pressing **ENTER**, enabling you to easily recall additional registers.

#### Note

It is not necessary to select modules for a recall. When you press **RECALL** and enter digits, the module buttons associated with the stored register(s) will automatically light.

- ~ To cancel a “store” or “recall” function, turn the **STORE** or **RECALL** button off, prior to pressing **ENTER**.
- ~ To display the **Memory Menu** on the **Touch Screen**, press and hold either **STORE** or **RECALL**.

In Chapter 7, refer to the [“Working with Memory Registers”](#) section on page 337 for more information.

#### 3) Module Section

The eight buttons in the **Module Section** select the switcher modules and functions to be included in the selected store or recall operation. Please note:

- ~ Each button is a toggle — press to enable, press again to disable. The buttons are *not* mutually exclusive. A lit (enabled) button is included in a store or recall operation.
  - For a **store** procedure, one or more modules must be selected, and any combination can be included in the memory register.
  - For a **recall** procedure, you cannot add modules to a register already stored, but you *can* remove modules from a recall.

Following are descriptions of each button in the **Module Section**:



- ~ Enable **M/E 1** to include the entire M/E 1 bank in a store procedure, or remove the bank from a recall procedure. Using the **Memory Menu**, you can elect to include or exclude certain sub-sections of M/E 1.

### 3. Control Panel Orientation

#### Control Panel Descriptions



- ~ Enable **M/E 2** to include the entire M/E 2 bank in a store procedure, or remove the bank from a recall procedure. Using the **Memory Menu**, you can elect to include or exclude certain sub-sections of M/E 2.

#### Note

On the FSN-150, M/E 2 control must be enabled to fully utilize this memory module. In Chapter 7, refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for details.



- ~ Enable **PGM** to include the entire PGM bank in a store procedure, or remove the bank from a recall procedure. Using the **Memory Menu**, you can elect to include or exclude certain sub-sections of the PGM bank in the procedure.



- ~ Enable **SYS** to include system-related functions (such as input mappings and input setups) in the selected store procedure, or remove the functions from a recall procedure. Using the **Memory Menu**, you can elect to include or exclude certain system sub-functions.



- ~ The **CUST** button is not available in version 3.0.



- ~ The **STILL** button is not available in version 3.0.



- ~ Enable **AUX** to include all Aux bus assignments currently on the panel in a store procedure, or remove the buses from a recall procedure. Using the **Memory Menu**, you can elect to include or exclude certain individual Aux buses.



- ~ Enable **DVE** to include the current DVE effect (that is being programmed on the **DVE Menu**) in a store, or remove the stored effect from a recall. When you store a DVE memory register, all DVE channels currently containing keyframes will be stored. Using the **Memory Menu**, you can include or exclude selected DVE channels from the register.

#### Important

When working with memory registers, the system will not automatically display the **Memory Menu** unless you navigate to the menu on the **Touch Screen**, or press and hold the **STORE** or **RECALL** button.

Please note the following important references:

- ~ In Chapter 5, refer to the "[Memory Menu](#)" section on page 174 for complete details on all switcher memory functions.
- ~ In Chapter 7, refer to the "[Working with Memory Registers](#)" section on page 337 for more information about memory registers.

#### 4) Keypad

The **Keypad** includes buttons that are arranged in a manner similar to the **Touch Screen**'s keypad. The following functions are context sensitive:

- ~ When **STORE** or **RECALL** is lit, you can enter memory registers (from 1 through 1000).
- ~ When a keypad appears on the **Touch Screen**, you can enter and trim values for numeric functions. In this mode, the physical **Keypad** works in

### 3. Control Panel Orientation

#### Control Panel Descriptions

parallel with the **Touch Screen's** keypad — either one can be used for entry, depending on your preference.

Following are descriptions of each **Keypad** button:



- ~ The **AUTO TRAN** button is not available in version 3.0.



- ~ Press **BACKSPACE** (←) during a numeric entry process to clear the register by one digit with each press.



- ~ Press **FINE ADJUST** to change the sensitivity of the knobs and the **Joystick**.
  - When **off**, adjustment is coarse.
  - When **on**, adjustment is fine.



- ~ Press **CLEAR** during a numeric entry process to clear the entire register. A dash (–) appears in the register, but the selected mode (store or recall) and all selected modules remain lit.

Press and hold **CLEAR** to cancel the current store or recall function completely. The **STORE** or **RECALL** button automatically turns off.



- ~ Enter an offset value using the numeric buttons, then press **TRIM -** to subtract from the parameter's current value. For example, if a parameter's value is **100**, press **10**, **TRIM -**, to calculate **90**. Pressing **ENTER** is not required, and the "trim" value remains in the register, enabling you to trim repeatedly by the same offset.

In Chapter 5, see the "[Using the Keypad](#)" section for details.

#### Note

The **TRIM -** function is only applicable when a **Touch Screen Keypad** is active. It does not apply to memory registers.



- ~ Enter an offset using the numeric buttons, then press **TRIM +** to add to the parameter's value. For example, starting with **100**, press **10**, **TRIM +**, to calculate **110**. Pressing **ENTER** is not required. The "trim" remains in the register, enabling you to trim repeatedly by the same offset.

In Chapter 5, see the "[Using the Keypad](#)" section for details.

#### Note

The **TRIM +** function is only applicable when a **Touch Screen Keypad** is active. It does not apply to memory registers.



- ~ Press the numeric buttons **0** through **9** to enter numbers for memory registers and other functions in the normal manner. Numbers shift left in the register as you enter them.



- ~ Press **+/-** to invert the numeric entry in the register. For example, to change the entry from **+ 350** to **- 350**, press **+/-**.

#### Note

The **+/-** button is only applicable when certain **Touch Screen Keypad** functions that accept negative values are active. The **+/-** button does not apply to memory registers.

### 3. Control Panel Orientation

#### Control Panel Descriptions



~ Use the decimal button (.) for numeric entries that accept decimal values.

#### Note

The decimal button is only applicable when certain **Touch Screen** keypad functions that accept decimal values are active. The button does not apply to memory registers.



~ Press **ENTER** to complete a store, recall, or numeric entry function. For store and recall functions, once pressed, the selected modules are stored to memory or recalled to the panel, and all lit buttons in the **Memory Section** turn off.

### Joystick

The **Joystick** is a three axis controller that is used to adjust a variety of switcher parameters. The figure below illustrates the **Joystick** and its three axes of control:

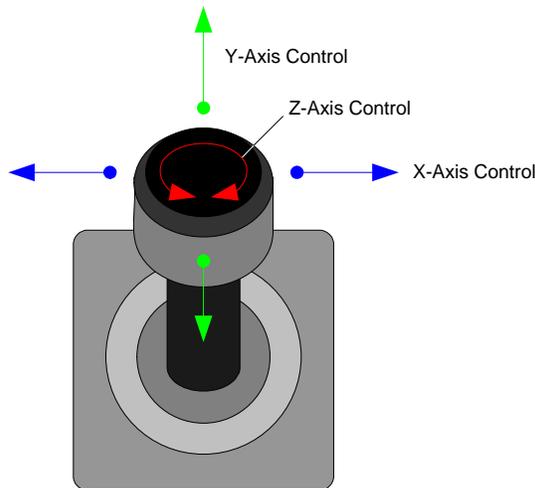


Figure 3-23. Joystick

For example, on the **DVE Menu**, when the **Size and Position Tab** is selected, the **Joystick** manipulates the PIP's size and position as follows:

- **X-Axis Control** — Move the Joystick left and right to move the PIP left and right, respectively.
- **Y-Axis Control** — Move the Joystick up and down to move the PIP up and down.
- **Z-Axis Control** — Twist the Joystick's top knob clockwise to increase PIP size, or counterclockwise to decrease PIP size.

In Chapter 8, refer to the "[Joystick Control](#)" section on page 361 for additional details on specific DVE Joystick control functions.

## Control Panel Rear

The figure below illustrates the rear of the control panel:

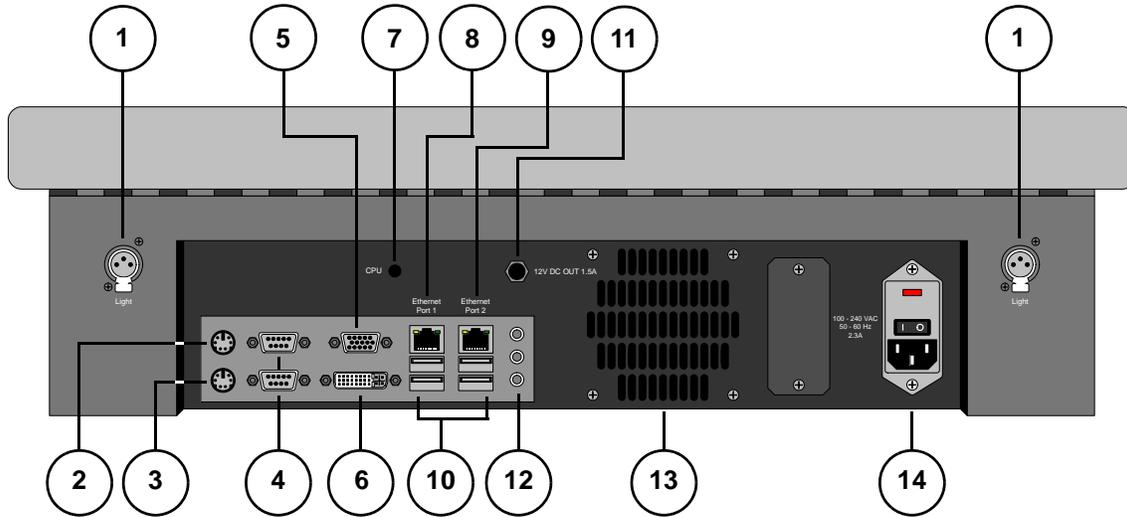


Figure 3-24. Control Panel Rear

1) <a href="#">Light Connectors</a>	6) <a href="#">DVI Connector</a>	11) <a href="#">DC Power Out</a>
2) <a href="#">Mouse Port</a>	7) <a href="#">CPU Switch</a>	12) <a href="#">Audio Connectors</a>
3) <a href="#">Keyboard Port</a>	8) <a href="#">Ethernet Port 1</a>	13) <a href="#">Fan</a>
4) <a href="#">Com Ports</a>	9) <a href="#">Ethernet Port 2</a>	14) <a href="#">AC Power</a>
5) <a href="#">VGA Connector</a>	10) <a href="#">USB Ports</a>	

Following are descriptions of each rear panel connector:

#### 1) Light Connectors

One **XLR Connector** is provided on each side of the rear panel for the low-voltage “script” lights. The knob marked “**Light**” on the top of the control panel adjusts the brightness.

#### 2) Mouse Port

The **Mouse Port** is not supported. If required, use an available **USB** port for a mouse connection.

#### 3) Keyboard Port

The **Keyboard Port** is not supported. If required, use an available **USB** port for a keyboard connection.

#### 4) Com Ports

The two 9-pin D **Com** connectors are not used.

#### 5) VGA Connector

One 15-pin D **VGA** connector is provided for the control panel's analog output. The output enables you to view the menu system on an external non-touch screen monitor, if required. In Appendix A, refer to the “[Analog 15-pin D Connector](#)” section on page 439 for pinout details.

### 3. Control Panel Orientation

#### Control Panel Rear

##### 6) DVI Connector

One **DVI** connector is provided to connect the control panel to the **Touch Screen**. Use the supplied cable harness for interconnection. In Appendix A, refer to the "[DVI-I Connector](#)" section on page 440 for pinout details.

##### 7) CPU Switch

The **CPU Switch** is located inside the small hole. This switch is designed for qualified service personnel only.

##### Important

Do not use this switch unless instructed to do so by Barco Customer Service personnel.
--

##### 8) Ethernet Port 1

One RJ-45 connector is provided for 10/100BaseT **Ethernet** communications. Port 1 connects to the **FSN-1400**, either directly or via an Ethernet Switch. By default, the following conditions are set:

- ~ DHCP = **OFF**
- ~ Default IP address: **192.168.0.5**
- ~ Default Netmask: **255.255.255.0**

The user can use the default address, or set a different address. In Appendix A, see the "[Ethernet Connector](#)" section on page 441 for pinouts.

##### 9) Ethernet Port 2

One RJ-45 connector is provided for 10/100BaseT **Ethernet** communications. Port 2 can be connected to an outside network, or to your facility's "house" network. By default, the following conditions are set:

- DHCP = **ON**

An IP address can be obtained automatically from the outside network. In Appendix A, see the "[Ethernet Connector](#)" section on page 441 for pinouts.

##### 10) USB Ports

Four **USB** ports are provided. Use one of the four ports to connect data to the **Touch Screen**, using the supplied cable harness for interconnection. The remaining ports can be used for connecting customer-supplied USB drives, or if required, to connect a mouse and keyboard.

##### 11) DC Power Out

One **DC Power Out** connector is provided for the **Touch Screen** power. Use the supplied cable harness for interconnection.

##### 12) Audio Connectors

The three audio connectors are not supported.

##### 13) Fan

One **Fan** is provided for control panel cooling. To prevent overheating, do not block the vent.

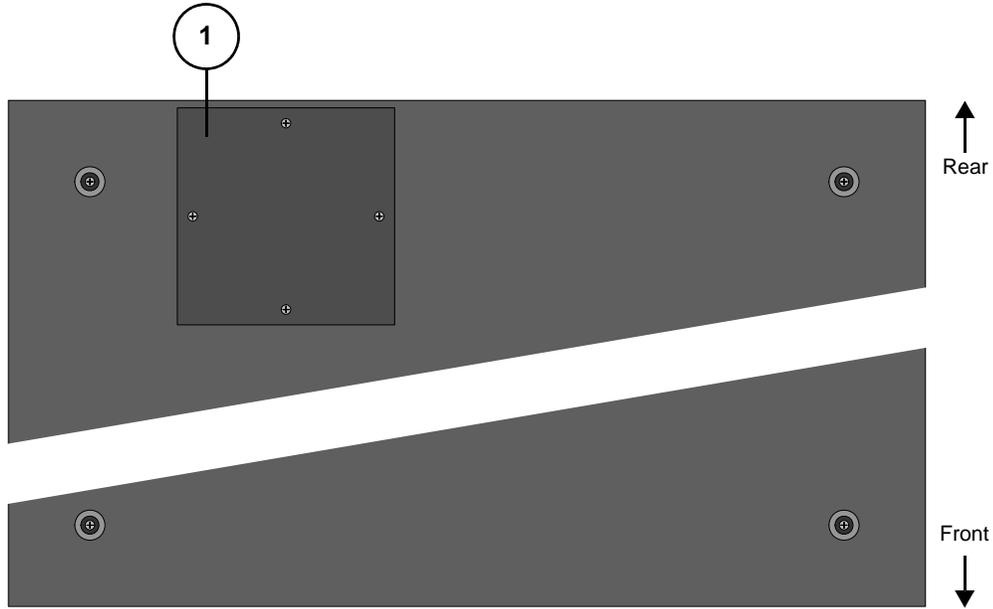
##### 14) AC Power

One **AC Connector** is provided for connecting the control panel to AC. The integral switch turns the panel on and off. In Appendix A, refer to the "[Physical and Electrical Specifications](#)" section on page 435 for power details.

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## Control Panel Bottom

The figure below illustrates the bottom surface of the control panel:



**Figure 3-25.** Control Panel bottom surface

1)	<a href="#">Access Plate</a>	
----	------------------------------	--

Following are descriptions of each bottom surface component:

**1) Access Plate**

One **Access Plate** is provided on the bottom of the control panel. In the event that you need to change the control panel's flash card, contact Barco **Customer Support**. In Appendix B, refer to the "[Contact Information](#)" section on page 452 for details.

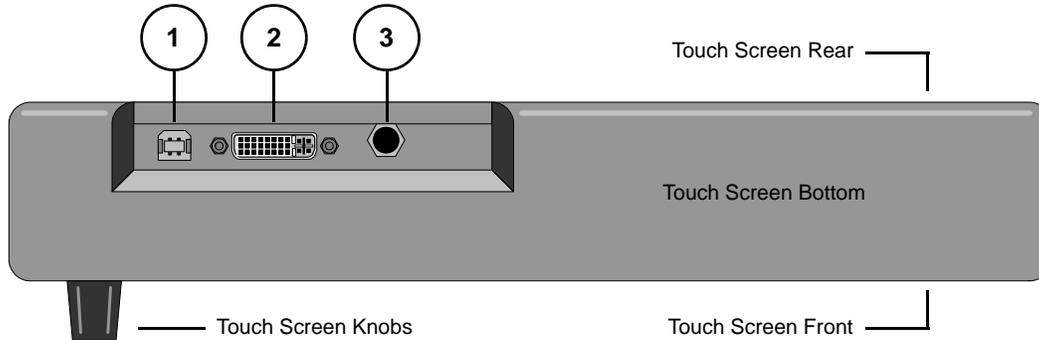
### 3. Control Panel Orientation

Touch Screen Connector Panel

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## Touch Screen Connector Panel

The figure below illustrates the connector panel on the bottom of the **Touch Screen**:



**Figure 3-26.** Touch Screen Connector Panel

1) <a href="#">USB Port</a>	2) <a href="#">DVI Connector</a>	3) <a href="#">CPU Switch</a>
-----------------------------	----------------------------------	-------------------------------

Following are descriptions of each connector:

**1) USB Port**

One **USB Port** is provided for the Touch Screen's data input from the control panel. Use the supplied cable harness for interconnection.

**2) DVI Connector**

One **DVI** connector is provided for the Touch Screen's video input from the control panel. Use the supplied cable harness for interconnection. In Appendix A, refer to the "[DVI-I Connector](#)" section on page 440 for pinout details.

**Note**

This is a digital only input. There are no analog components on the cable.

**3) DC Power In**

One **DC Power In** connector is provided for the Touch Screen's power input. Use the supplied cable harness for interconnection.

# 4. Installation

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## In This Chapter

This chapter provides detailed instructions for installing FSN Series hardware. The following topics are discussed:

- [Safety Precautions](#)
- [Shipping Information](#)
- [Unpacking and Inspection](#)
- [Site Preparation](#)
- [Cable and Adapter Information](#)
- [Control Panel Installation](#)
- [Touch Screen Installation](#)
- [Display Mount Options](#)
- [FSN-1400 Rack-Mount Procedure](#)
- [FSN-1400 System Connections](#)
- [Card and Rear Panel Installation](#)
- [Signal Connections](#)
- [Analog Format Connection Table](#)

Please note the following important points:

- As you follow the installation instructions in this chapter, remember the following important term:
  - ~ **Native Resolution** — The resolution to which all processing is set within the switcher frame, e.g., SD-SDI (SMPTE 259M, Level C) or HD-SDI (SMPTE 292M).
- In Chapter 6, refer to the “[Reference Video and Output Setup](#)” section on page 287 for instructions on setting the native resolution.

**Note**

Once you have reviewed all of the sections in this chapter, please continue with Chapter 5, “[Menu Orientation](#)” on page 131.

## 4. Installation

### Safety Precautions

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## Safety Precautions

For all FSN Series installation procedures, observe the following important safety and handling rules to avoid damage to yourself and the equipment:

- To protect users from electric shock, ensure that the power supplies for each unit connect to earth via the ground wire provided in the AC power cord.
- AC Socket-outlets should be installed near the equipment and be easily accessible.

---

## Shipping Information

All FSN Series systems are shipped in separate boxes as follows:

- **Box 1**
  - ~ Control panel
  - ~ Script Lights
- **Box 2**
  - ~ Touch Screen
  - ~ Touch Screen Stand
- **Box 3**
  - ~ FSN-1400 chassis
  - ~ 1 x **M/E** card
  - ~ 1 x **System** card
  - ~ Blank panels
  - ~ 1 x power supply
- If additional cards are ordered (**NIC, UIC, NAC, UOC, DVE** and/or **MVR**), each is shipped in its own box, along with its associated rear panel.
- If a redundant power supply is ordered, it is shipped in its own box.

---

## Unpacking and Inspection

Inspect the shipping boxes for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open each box, compare its contents against the packing slips. If you find any shortages, contact your Barco sales representative.

Once you have removed all components from their packaging and checked that the listed components are present, inspect each unit to ensure there was no shipping damage. If there is damage, notify the shipping carrier immediately for all claims adjustments.

---

## Site Preparation

The environment in which you install your FSN Series switcher should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

---

## Cable and Adapter Information

The tables below provide information regarding cables and adapters.

- [FSN-1400 Cables](#)
- [FSN-150 Cables](#)
- [Optional Adapters](#)

### FSN-1400 Cables

The following cables are included with the FSN-1400:

**Table 4-1.** FSN-1400 Cables

Cable / Adapter	Description	Quantity
AC Power Cord	7 foot, 10A (US Power Cord)	1
AC Power Cord	7 foot, 10A (European Power Cord)	1

### FSN-150 Cables

The following cables are included with the FSN-150:

**Table 4-2.** FSN-150 Cables

Cable	Description	Quantity
AC Power Cord	7 foot, 10A (US Power Cord)	1
AC Power Cord	7 foot, 10A (European Power Cord)	1
Monitor Cable Harness	2 meter, harness includes 1 x DVI-D, 1 x USB, 1 x Power	1

### Optional Adapters

The following adapters are optional:

**Table 4-3.** Optional adapters

Cable	Description
Tally "Y" Adapter	DB-50 Female to 2 x DB-25 Male

## 4. Installation

### Control Panel Installation

## Control Panel Installation

The figure below illustrates a simplified diagram of the **Control Panel's** rear connectors, and the required cabling. Use this figure for reference during installation.

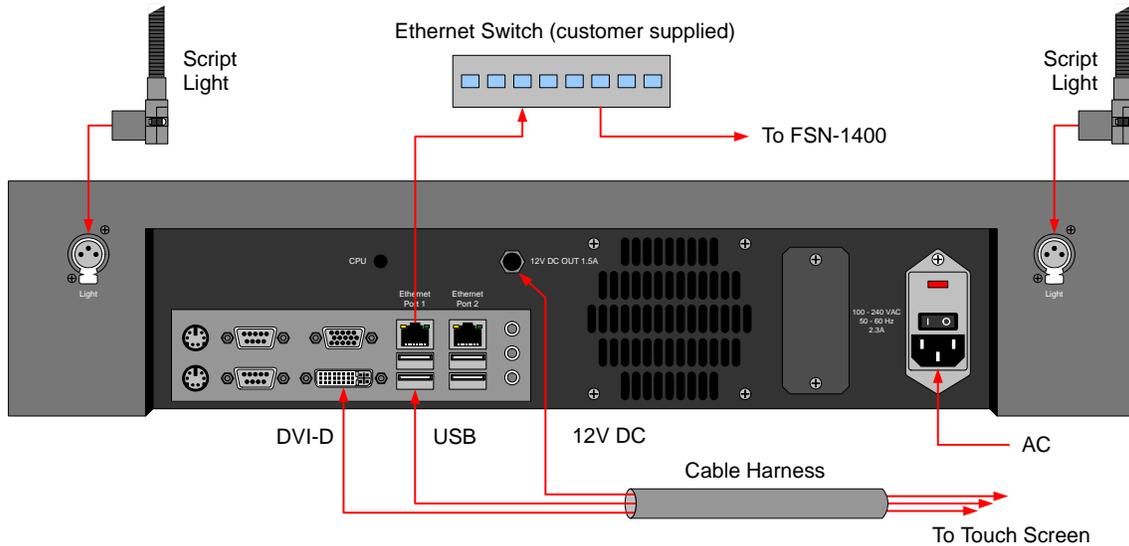


Figure 4-1. Control Panel Installation

■ Use the following steps to install the **Control Panel**:

1. Place the **Control Panel** on your desk or console. Place the assembled **Touch Screen**, stand and cable harness adjacent to the panel, in the desired location.
2. Connect the **USB**, **DVI-D** and **12V DC** cables to their respective connectors on the rear of the **Control Panel**.

#### Note

Although you can use any of the four available **USB** ports for the **USB** cable connection, it is recommended that you use the port closest to the **DVI-D** connector.

3. Using standard Ethernet cables, connect **Ethernet Port 1** on the **Control Panel** to the customer supplied **Ethernet Switch**. Connect the **FSN-1400's Ethernet Port** to the **Ethernet Switch**.

#### Note

Although the use of the **Switch** is recommended, you can use a direct Ethernet connection between the **FSN-1400** and the **Control Panel** as an alternate method.

4. Connect the two supplied **Script Lights** to the XLR connectors on the rear of the **Control Panel**.

## 4. Installation

### Touch Screen Installation

5. Connect the supplied **AC Power Cord** to the AC connector on the rear of the **Control Panel**, and then to an AC outlet.

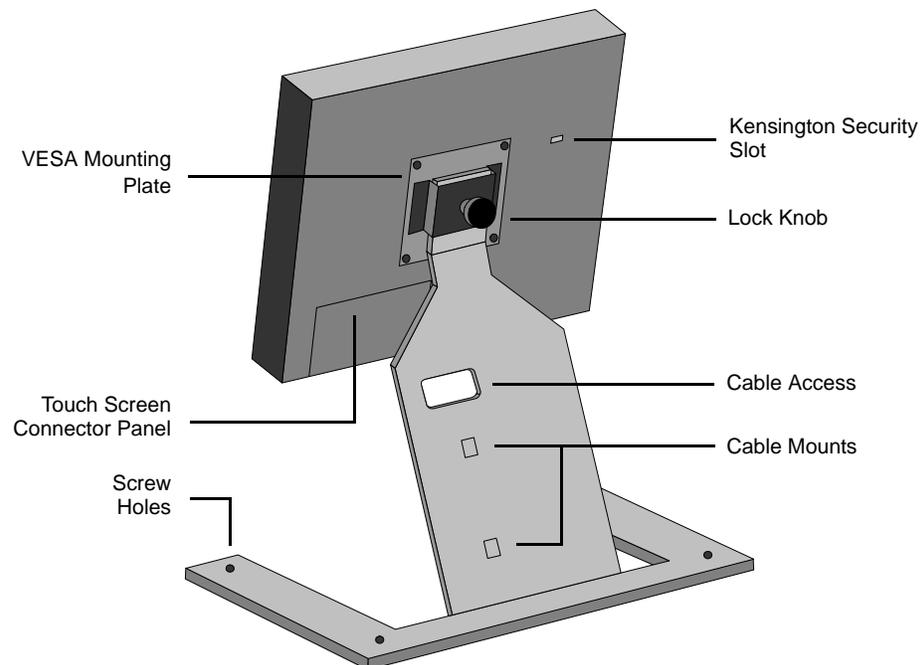
**Note**

Connect the Control Panel to a properly rated supply circuit. Refer to the "[Power Cord/Line Voltage Selection](#)" section on page 115 for details.

---

## Touch Screen Installation

The figure below illustrates a simplified rear view of the **Touch Screen** and the supplied desk stand. Use this figure for reference during the following procedure.



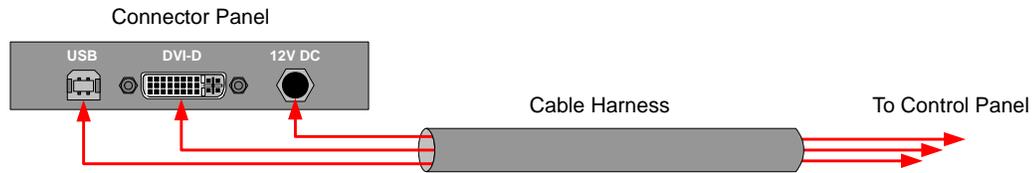
**Figure 4-2.** Touch Screen and Desk Stand

- Use the following steps to install the **Touch Screen** and desk stand:
  1. Using the supplied screws, attach the VESA mounting plate to the rear of the **Touch Screen**.
  2. Thread the supplied cable harness through the cable access hole in the desk stand. Ensure that the end with the large USB connector points towards the **Touch Screen**. Be sure to leave an ample service loop.

## 4. Installation

### Touch Screen Installation

3. Place the **Touch Screen** face down on a table (careful of the knobs), and connect the **USB**, **DVI-D** and **12V DC** cables to their respective connectors on the **Touch Screen's** connector panel.



**Figure 4-3.** Touch Screen Connectors

4. Lift the **Touch Screen**, then carefully slide the top stem of the desk stand through the slot in the VESA mounting plate. Adjust the height of the monitor as required, then secure the mounting plate to the stand using the lock knob.
5. Secure the cable harness to the stand using the cable mounts in the desk stand. Use Velcro<sup>®</sup> or nylon cables ties as required.

#### Note

A Kensington<sup>®</sup> Security Slot is provided on the **Touch Screen's** rear panel. This slot can be used to attach an anti-theft system, such as a lock-and-cable apparatus. Visit your local computer retailer for details.

---

## Display Mount Options

The FSN Series' **Touch Screen** display includes a standard VESA mount. A basic desk stand is provided with the system, but if desired, you can purchase your own VESA mount articulated monitor arm, such as the sample shown below:



**Figure 4-4.** Sample Monitor Arm: Ergotron® LX

For your reference, following is a partial list of manufacturers and distributors, from which you can select a VESA mount monitor arm to suit your requirements:

- **Ergotron:** [www.ergotron.com](http://www.ergotron.com)
- **Humanscale:** [www.humanscale.com](http://www.humanscale.com)
- **LCD Arms:** [www.lcdarms.com](http://www.lcdarms.com)
- **Vartech Systems:** [www.vartechsystems.com](http://www.vartechsystems.com)
- **Peerless Mounts:** [www.peerlessmounts.com](http://www.peerlessmounts.com)

**Note**

An articulated monitor arm is not supplied.

## 4. Installation

### FSN-1400 Rack-Mount Procedure

---

## FSN-1400 Rack-Mount Procedure

The FSN-1400 chassis is designed to be rack mounted and is supplied with front rack-mount hardware. Please note the following important points:

- The FSN-1400 is 6RU in height.
  - When rack mounting the unit, remember that the maximum ambient operating temperature is 40 degrees C.
  - Leave sufficient front and rear space to ensure that airflow through the FSN-1400 is not restricted.
  - When installing equipment into a rack, distribute the units evenly to prevent hazardous conditions that may be created by uneven weight distribution.
  - Connect the FSN-1400 only to a properly rated supply circuit.
  - Reliable grounding (earthing) of rack-mounted equipment should be maintained.
  - Rack mount the FSN-1400 from the front rack ears using four rack screws (not supplied). Threads may be metric or otherwise, depending upon the rack type.
- Use the following steps to rack mount the FSN-1400:
1. At a minimum, an FSN-1400 chassis weighs 35 pounds (15.87 kg). To avoid injury, it is recommended that two people rack mount the chassis.
  2. The FSN-1400 ships with side rails installed, which when properly adjusted, assist with the distribution of chassis (and cable) weight within your rack. Use the following steps to properly adjust the side rails:

- a. Measure and install the two supplied mounting brackets on your rear rack rails.



Figure 4-5. Rear rail mounting bracket

- b. Measure the distance between the front and rear rack rails. Remove the four mounting screws that secure each side rail to the FSN-1400, then adjust the spacing of each side rail as necessary.

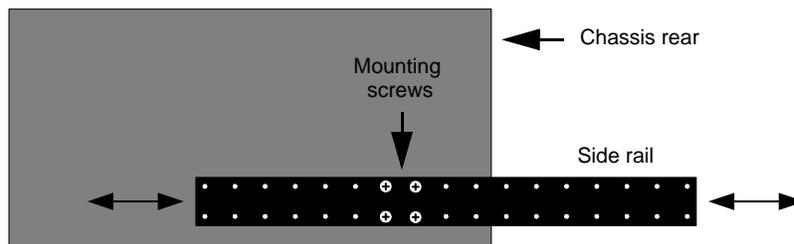


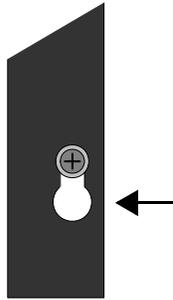
Figure 4-6. Side rail adjustment

- c. Re-install the mounting screws. When properly adjusted, the end of each side rail will protrude through the slot in the rear mounting bracket, once the chassis is rack mounted.

## 4. Installation

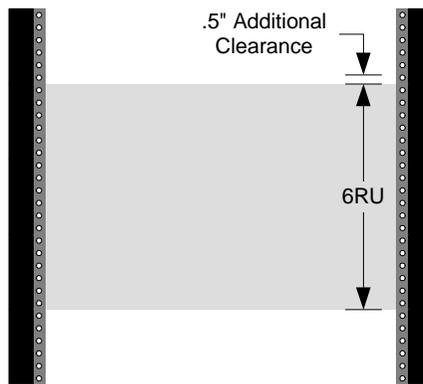
### FSN-1400 Rack-Mount Procedure

3. To facilitate easy rack mounting, each rack ear on the front of the FSN-1400 is equipped with a special “keyhole” slot on the lower hole, as shown below.



**Figure 4-7.** Rack Ear Keyhole

To take advantage of this feature, ensure that there is at least 1/2” of clearance above the chassis’ intended 6RU location.



**Figure 4-8.** Equipment Rack Layout

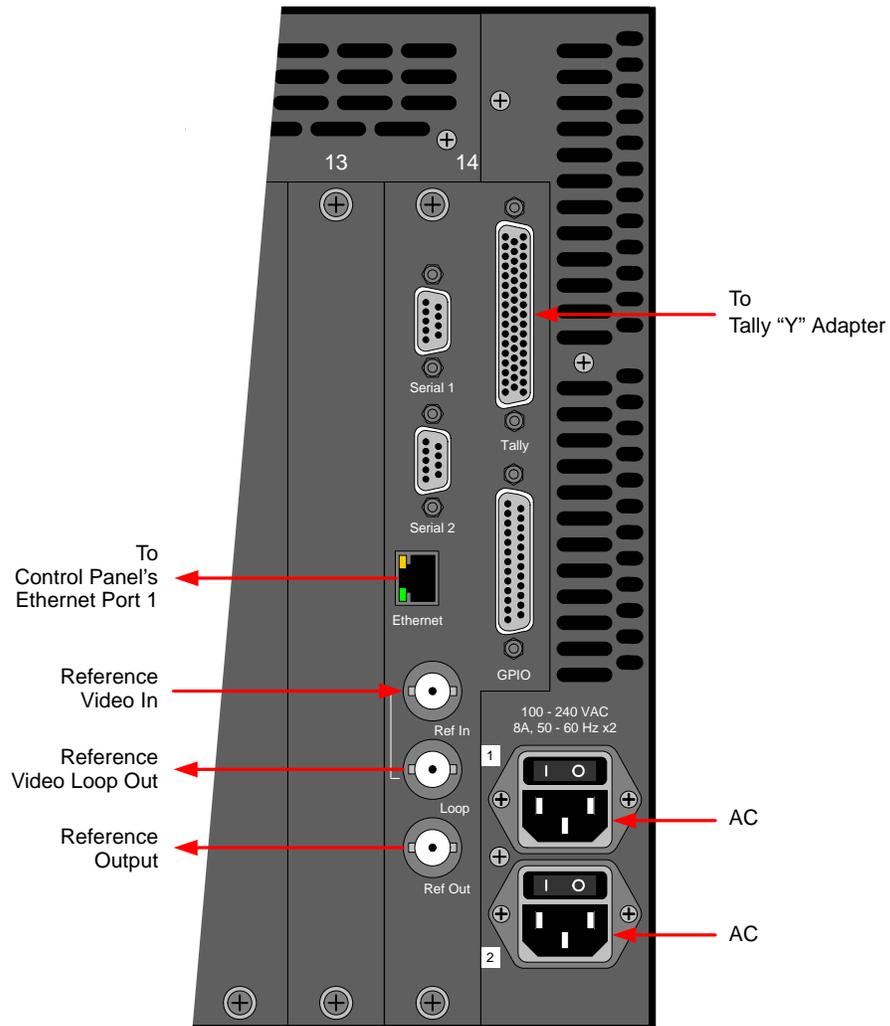
4. For the FSN-1400’s two keyhole slots, measure and install two rack screws in your equipment rack’s front rails. Allow each screw to protrude approximately 3/4” from the surface of the rails.
5. Lift the chassis, and while supporting it, slide the side rails through the slots in the rear mounting brackets.
6. While continuing to support the chassis, slide the screws (in the front rails) through the two keyholes, and let the chassis settle up into the keyhole slots.
7. Tighten the two lower screws, then install and tighten the two uppers screws in the rack rail.

## 4. Installation

### FSN-1400 System Connections

## FSN-1400 System Connections

The figure below illustrates the connections on the **System** card's rear panel, plus the power connections. Use this figure for reference during installation.



**Figure 4-9.** System card and power connections

- Use the following steps to install "system" connections on the **FSN-1400**:
  1. Ensure that the **FSN-1400** is properly rack mounted. If not, refer to the "[FSN-1400 Rack-Mount Procedure](#)" section on page 110 for instructions.
  2. On the **System** card's rear panel, ensure that the **Ethernet Port** is connected to the **Ethernet Switch**, and the **Switch** is connected to **Ethernet Port 1** on the control panel.

#### Note

As an alternate method, you can use a direct Ethernet connection between the **FSN-1400** and the **Control Panel**.

## 4. Installation

### FSN-1400 System Connections

3. (Recommended) Using a BNC cable, connect an analog reference video input to the **Ref In** connector. This connection enables you to genlock the FSN Series to an external reference.
  - ~ Accepted signals are black burst, SMPTE bi-level sync and tri-level sync.
  - ~ Computer sync is not an accepted signal.
  - ~ If you do not elect to connect reference video, you can set the system to “free run” on the **Reference and Output Setup Menu**.

#### Note

In Appendix A, refer to the “[Reference Video Input Specifications](#)” section on page 433 for detailed information about the allowed frame rates for the reference input.

4. (Optional) Using a BNC cable, connect the **Loop** connector to the reference video input on the next device in your video system. This connection enables you to “daisy-chain” reference video to additional devices.

#### Important

If the reference **Loop** connection is not used, connect a 75 ohm terminator to the connector.

5. (Optional) Using a BNC cable, connect the **Ref Out** connector to the reference video input connector on the next video device in your system, or to a reference DA (distribution amplifier) for multiple reference feeds.

#### Important

This connection assumes that the FSN-1400 is the “master” sync source in your system, for distributing an advanced sync signal to additional devices such as cameras.

Please note:

- ~ Using the **{Reference Out}** button on the **Reference and Output Setup Menu**, toggle this output between **Tri-Level Sync** and **Black Burst**.
  - ~ The sync out format (as provided on the connector) changes, depending on the selected native video format. In Appendix A, refer to the “[Reference Video Output Specifications](#)” section on page 434.
6. (Optional) Connect the supplied **Tally “Y” Adapter** to the **Tally** connector. This adapter splits the DB-50 connector into two DB-25 female connectors, to simplify your tally connections. Next, connect the tally relays to your video devices as required. In Appendix A, see the “[Tally Connector](#)” section for pinouts.
  7. For AC connections, one **AC** connector is provided for each FSN-1400 power supply. Please note:
    - ~ One supply is standard, the redundant supply is optional.
    - ~ In a redundant configuration with both supplies installed, the FSN-1400 can be powered from two different circuit breakers.

Open the FSN-1400 front door and note the number of power supplies installed. If only one supply is installed, note its location (in the top or bottom slot).

## 4. Installation

### FSN-1400 System Connections

8. Connect the supplied **AC Power Cord(s)** to the AC connectors on the rear of the FSN-1400, and then to AC outlet(s).
  - ~ If a power supply is installed in the top slot, use **AC Connector 1**.
  - ~ If a power supply is installed in the bottom slot, use **AC Connector 2**.

**Note**

Connect the FSN-1400 to a properly rated supply circuit. Reliable grounding of rack-mounted equipment should be maintained. Refer to the "[Power Cord/Line Voltage Selection](#)" section on page 115 for details.

### Power Cord/Line Voltage Selection

The FSN-1400 is rated to operate with the following specifications:

- **Input Power:** 100-240 VAC, 50-60 Hz
- **Power Consumption:** 800 watts maximum

The FSN-150 is rated to operate with the following specifications:

- **Input Power:** 100-240 VAC, 50-60 Hz
- **Power Consumption:** 150 watts maximum

Each FSN Series component performs line voltage selection automatically, and no user controls are required. The AC power cords must be accessible so that they can be removed during field servicing.



#### Warning

When the FSN-1400 or FSN-150 control panel is used in the 230-volt mode, a UL listed line cord rated for 250 volts at 15 amps must be used and must conform to IEC-227 and IEC-245 standards. This cord will be fitted with a tandem prong-type plug.

The rear panel ON/OFF switch does not disconnect the unit from input AC power. To facilitate disconnection of AC power, the power cord must be connected to an accessible outlet near the unit.

Building Branch Circuit Protection (minimum requirements):  
For 115 V use 20 A, for 230 V use 8 A.



Figure 4-10. Tandem Prong-type Plug

#### Avertissement

La choix de la ligne de voltage se réalise automatiquement par le FSN Series Transformateur Graphique. On n'a pas besoin du controller usager pour la choix de la ligne de voltage.

#### Warnung

Das FSN Series gerät mu beim Anschlu an 240V ~ mit einer vom VDE auf 250V/10A geprüften Netzleitung mit einem Schukostecker ausgestattet sein.

## 4. Installation

### Card and Rear Panel Installation

---

## Card and Rear Panel Installation

The following cards are pre-installed in the FSN-1400 chassis:

- **System** card: slot 14
- **M/E** card: slot 8

Optional cards (e.g., **MVR**, **UIC**, **NIC**, **DVE** and **NAC**) can be installed according to the table below. Please note the following important points:

- Install **UICs** in slot 7, then 6, etc.
- Install **NICs** in slot 1, then 2, etc.

The table below outlines card slot allocation within the FSN-1400 chassis. Use this chart for reference during the following procedures, and remember that all cards and their rear panels are hot-swappable.

**Table 4-4.** FSN Series chassis card slot allocations

Card Type	Max. # of Cards per Chassis	Slot Number(s)
<b>System (Required card)</b>	1	14
<b>M/E (Required card)</b>	1	8
<b>NIC</b> (Native Input Card), 8-channel	4	1 - 4 (default slot: 1)
<b>UIC</b> (Universal Input Card), 2-channel	5	3 - 7 (default slot: 7)
<b>MVR</b> (Multiviewer Card)	1	11
<b>UOC</b> (Universal Output Card), 2-channel	3	11, 12, 13 (default slot: 12)
<b>NAC</b> (Native Aux Output Card), 8-channel	3	11, 12, 13 (default slot: 13)
<b>DVE</b> (Digital Video Effects) card, 2-channel	2	9, 10

Use the procedures in the following sections to insert (and extract) cards, as required:

- [Rear Panel Insertion](#)
- [Rear Panel Removal](#)
- [Card Insertion](#)
- [Card Removal](#)

## Rear Panel Insertion

- To insert a rear panel:
  1. Use [Table 4-4](#) on page 116 to verify the slots in which the cards and their corresponding rear panels can be installed. Front and rear slot numbers will match. For example, if you install a **NIC** in front slot **1**, its corresponding rear panel must be installed in rear slot **1**.
  2. If a blank rear panel is installed in the target slot, loosen the two captive thumb screws in the blank panel, remove it, and store it safely.
  3. Ensure that the selected rear panel is properly oriented:
    - ~ **NIC**: orient the **SDI** label at the top.
    - ~ **UIC**: orient the label “**1**” at the top.
    - ~ **NAC**: orient the **SDI** label at the top.
    - ~ **UOC**: orient the label “**1**” at the top.
    - ~ **MVR**: orient the label “**1**” at the top.
    - ~ **DVE**: A rear panel is not required. Leave the blank panel installed.
  4. Using the nylon guides in the chassis for alignment, carefully insert the rear panel into the chassis. Be sure to push on both the top and bottom thumb screws simultaneously, until the card is fully seated in the chassis connector.

### Caution

Always push both thumb screws simultaneously. If you only push on one, you can damage the panel or bend a pin.

5. Once the panel is fully seated, tighten the two thumb screws.
6. Repeat from step 1 for all additional rear panels that you want to install.

## Rear Panel Removal

- To remove a rear panel:
  1. Loosen the two captive thumb screws in the rear panel, and carefully remove it from the FSN-1400 chassis. Store the panel safely for later use.
  2. Install a blank panel in its place.

### Important

Unused rear slots must always have blank panels installed.

3. Repeat from step 1 for all additional rear panels that you want to remove.

## 4. Installation

### Card and Rear Panel Installation

#### Card Insertion

- To insert a card:
  1. Use [Table 4-4](#) on page 116 to verify the slots in which the card can be installed.
  2. Once verified, open the chassis front door and remove it (if desired). In Chapter 2, refer to the [“Chassis Front Door”](#) section on page 37 for details.
  3. Orient the card so that the label (e.g., **UIC** or **NIC**) is at the top. Ensure that both ejectors are unlatched from the slots in the card's front plate.
  4. Once unlatched, hold the top ejector up, as shown below. The bottom ejector will automatically fall away from the front of the card.

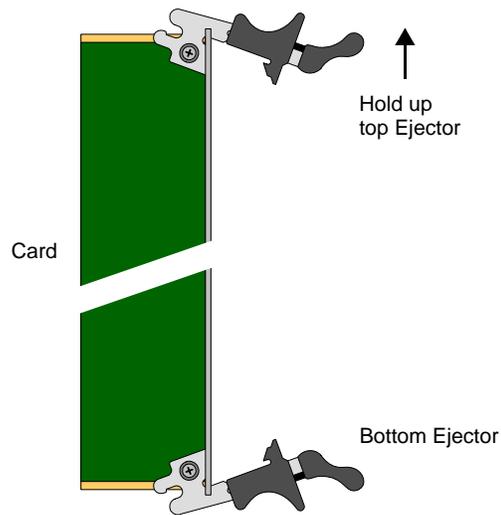


Figure 4-11. Ejector Orientation prior to card insertion

## 4. Installation

### Card and Rear Panel Installation

- Using the nylon guides in the chassis for alignment, carefully insert the card into the chassis until both ejectors engage the rim of the card cage. Each ejector will “automatically” angle towards the middle of the card.

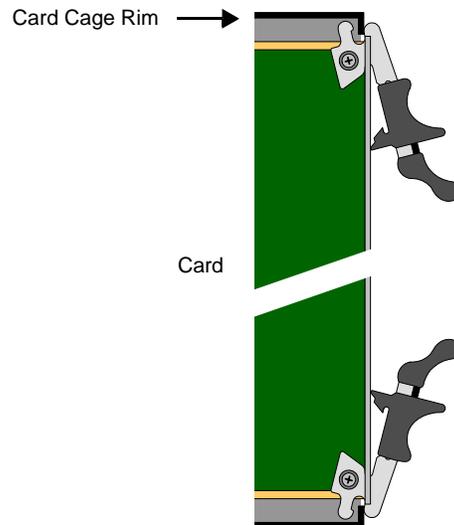


Figure 4-12. Ejectors engaged in card cage rim

- On each ejector, squeeze the two black handles together, then simultaneously push both latches into the slot on the card's front plate — until the card is fully seated in the FSN-1400 chassis.

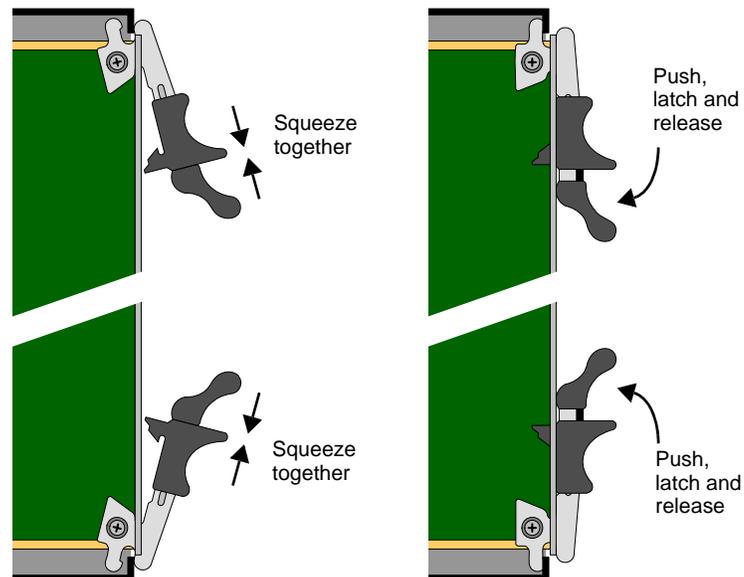


Figure 4-13. Final card insertion

#### Caution

Always push both latches simultaneously. If you only use one latch, you can damage the card.

## 4. Installation

### Card and Rear Panel Installation

7. Release the handles so that they spring back and lock into place.
8. Repeat from step 1 for all additional cards that you want to install.
9. When complete, re-install the chassis front door, close and secure.

## Card Removal

- To remove a card:
  1. Open the chassis front door and remove it (if desired).
  2. For the selected card, simultaneously squeeze the two black handles together on each ejector, then pull the ejectors away from the center of the card.

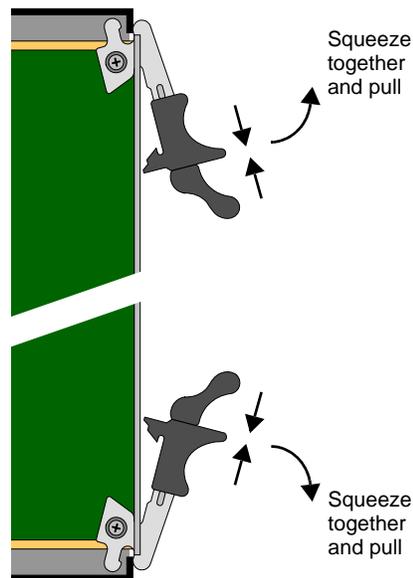


Figure 4-14. Card removal

### Caution

Always pull both latches simultaneously. If you only use one latch, you can damage the card.

3. When both latches have disengaged from the chassis, remove the card completely and store it safely in an anti-static bag.

### Important

Unused rear slots must always have blank panels installed.

4. Repeat from step 2 for all additional cards that you want to remove.
5. When complete, re-install the chassis front door (if required), close and secure.

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# Signal Connections

The following topics are discussed in this section:

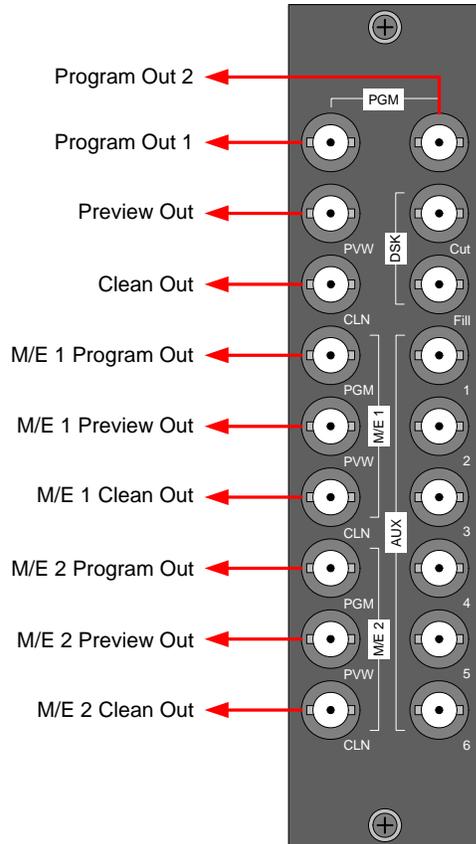
- [Output Connections](#)
- [Aux Output Connections](#)
- [External DSK Input Connections](#)
- [Native Input Connections](#)
- [Universal Input Connections](#)
- [Analog Format Connection Table](#)
- [Multiviewer Connections](#)

## 4. Installation

### Signal Connections

## Output Connections

The figure below illustrates the output connections on the **M/E** card's rear panel:



**Figure 4-15.** Output connections

- Use the following steps to connect the FSN-1400's main **Program** outputs:

#### Note

All connections use BNC cables. All outputs are SDI (either SD-SDI or HD-SDI).

1. The **Program Out 1** and **Program Out 2** signals are identical. Connect to a monitor, and to your target destination device as required.
  2. Connect **Preview Out** to a monitor. This output provides the Program bank's "lookahead" preview video. In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for additional information.
  3. Connect **Clean Out** to a monitor or the desired destination. This output provides the system's main clean feed signal. In Chapter 2, refer to the "[Clean Feed Output Selection](#)" section on page 52 for details.
- Use the following steps to connect the FSN-1400's **M/E 1** outputs:
    1. Connect **M/E 1 Program Out** to a monitor or the desired destination. This output provides M/E 1's program output signal.

## 4. Installation

### Signal Connections

2. Connect **M/E 1 Preview Out** to a monitor. This output provides the bank's "lookahead" preview video. In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for additional information.
  3. Connect **M/E 1 Clean Out** to a monitor or the desired destination. This output provides M/E 1's clean feed signal. In Chapter 2, refer to the "[Clean Feed Output Selection](#)" section on page 52 for details.
- Use the following steps to connect the FSN-1400's **M/E 2** outputs:
1. Connect **M/E 2 Program Out** to a monitor or the desired destination. This output provides M/E 2's program output signal.
  2. Connect **M/E 2 Preview Out** to a monitor. This output provides the bank's "lookahead" preview video. In Chapter 7, refer to the "[Understanding Lookahead Preview](#)" section on page 319 for additional information.
  3. Connect **M/E 2 Clean Out** to a monitor or the desired destination. This output provides M/E 2's clean feed signal. In Chapter 2, refer to the "[Clean Feed Output Selection](#)" section on page 52 for details.

Please note the following important points:

- On the FSN-150, M/E 2 control must be enabled to fully utilize the M/E 2 outputs. In Chapter 7, refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for details.
- All outputs run at the system's selected native output resolution.
- In Chapter 6, refer to the "[Reference Video and Output Setup](#)" section on page 287 for instructions on setting the native resolution.

## 4. Installation

### Signal Connections

## Aux Output Connections

Aux (auxiliary) buses are extra switching buses that allow video signals to be routed from the FSN-1400 to external equipment. The figure below illustrates the Aux output connections on the **M/E** card's rear panel, and the optional **NAC** and **UOC** rear panel:

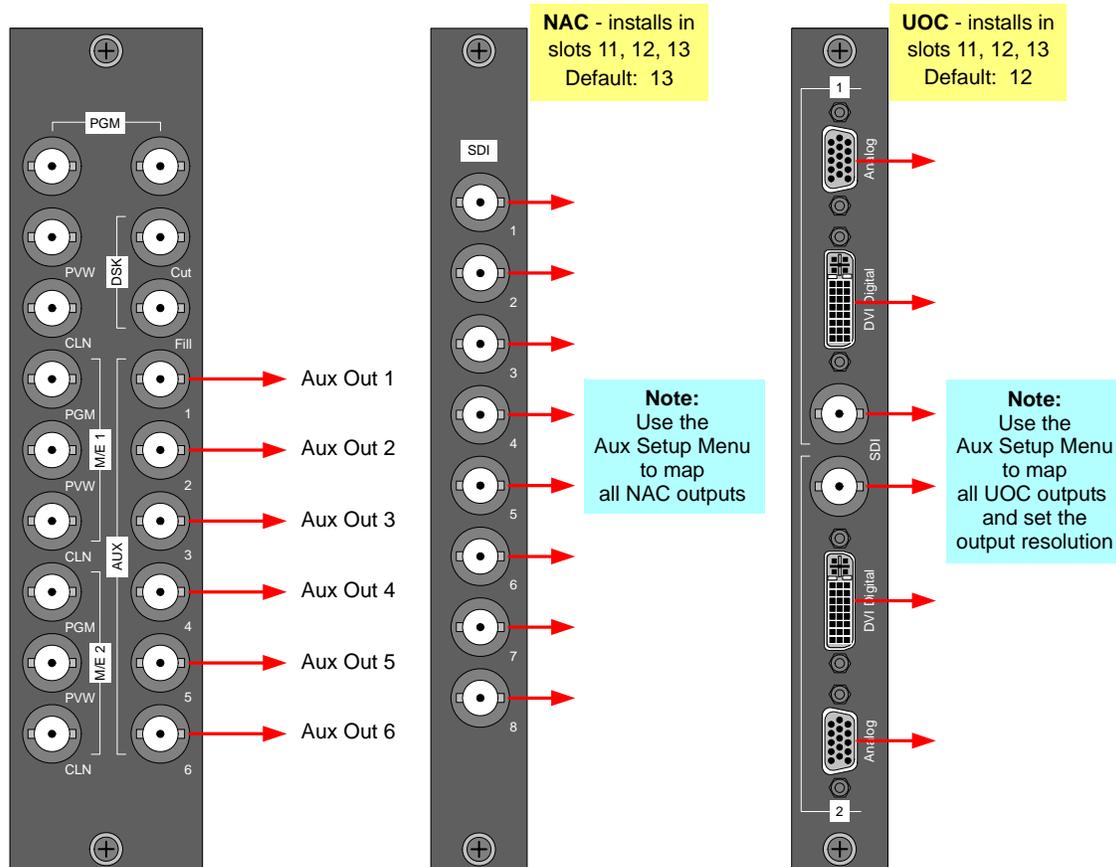


Figure 4-16. Aux output connections

- Use the following steps to connect Aux outputs from the **M/E**, **NAC(s)** and **UOC(s)**.
  1. Using BNC cables, connect **Aux Outputs 1** through **6** to your target auxiliary devices or monitors. These six outputs run at the system's native resolution.
  2. If one or more optional **NACs** are installed, use BNC cables to connect **NAC** outputs (as required) to your target devices or monitors. **NAC** outputs run at the system's native resolution.
  3. If one or more optional **UOCs** are installed, use BNC, DVI or HD-15 cables (as required) to connect outputs to your target devices. Use the **Aux Setup Menu** to set the output resolution for each **UOC** output. In Chapter 5, refer to the "[Aux Setup Menu](#)" section for setup details. In Appendix A, refer to the "[UIC Input and UOC Output Formats](#)" section for a list of available output formats.

Please note:

- Use the **Aux Setup Menu** to map **NAC** and **UOC** Aux outputs to the control panel, and name Aux outputs (if desired). In Chapter 5, refer to the "[Aux Setup Menu](#)" section on page 240 for setup details.

## External DSK Input Connections

The figure below illustrates external DSK input connections on the **M/E** card's rear panel:

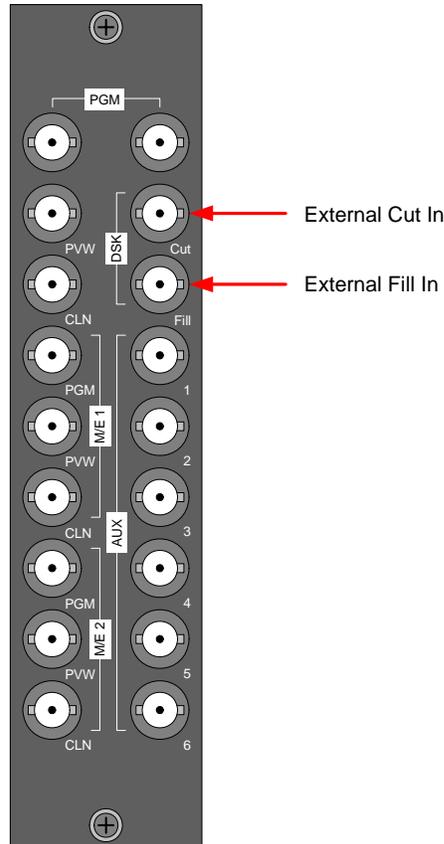


Figure 4-17. External DSK cut and fill connections

■ Use the following steps to connect external DSK cut and fill signals to the **M/E** card. All connections use BNC cables.

1. Connect an external cut signal to the **Cut** connector. This type of signal typically originates from a character generator's **Cut** or **Key** output.
2. Connect an external fill signal to the **Fill** connector. This type of signal typically originates from a character generator's **Fill** or **Video** output.

Please note the following important points:

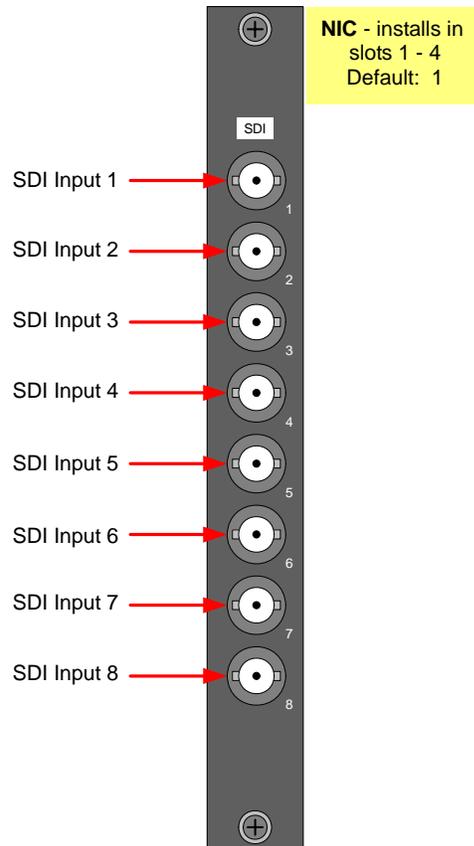
- The DSK Cut and Fill inputs must be locked to the same video reference as the FSN-1400 chassis. SAV (start of active video) must be within +/- 0.5 lines of frame reference.
- The DSK Cut and Fill signals must be set to the system's native resolution.
- Use the **External DSK Setup Menu** to set up the signals. In Chapter 5, refer to the "[External DSK Setup Menu](#)" section on page 229 for menu details.
- In Chapter 6, refer to the "[External DSK Input Setup](#)" section on page 296 for step-by-step setup instructions.

## 4. Installation

### Signal Connections

## Native Input Connections

The figure below illustrates native input connections on a **NIC**'s rear panel:



**Figure 4-18.** Native input connections

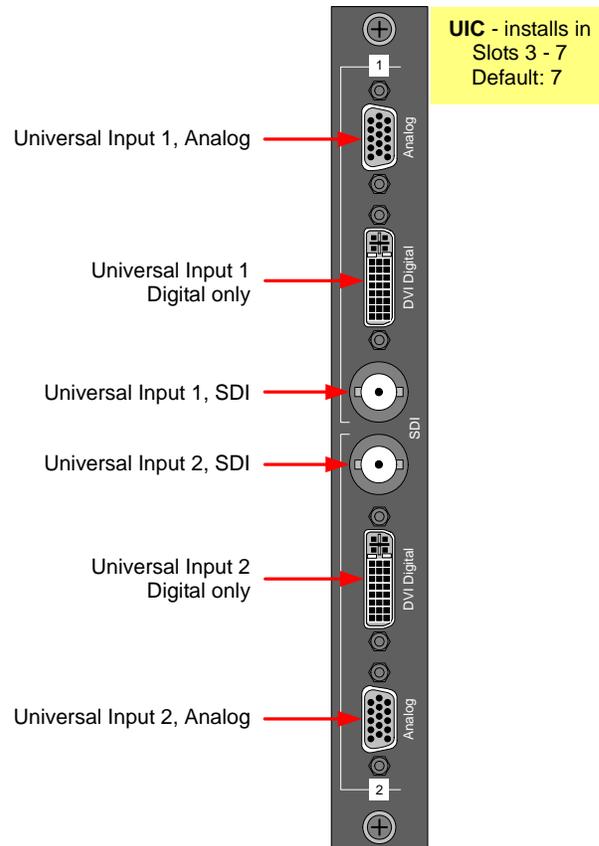
- Use the following steps to connect native inputs to a **NIC**. All connections use BNC cables.
  1. Connect SD-SDI or HD-SDI input signals to the **NIC**'s SDI inputs **1** through **8**. All signals must match the system's native resolution, as set on the **Output Setup Menu**. In Chapter 6, refer to the "[Reference Video and Output Setup](#)" section on page 287 for instructions on setting the native resolution.

Please note the following important points:

- Use the **Input Setup Menu** to set up native SDI input signals. In Chapter 5, refer to the "[Input Menu](#)" section on page 202 for menu details.
- In Chapter 6, refer to the "[Native Input Setup](#)" section on page 291 for step-by-step setup instructions.
- If you want to connect an input to the FSN-1400 whose resolution is different than the system's native resolution, use a **UIC**. Refer to the "[Universal Input Connections](#)" section on page 127 for details.

## Universal Input Connections

The figure below illustrates universal input connections on a **UIC**'s rear panel:



**Figure 4-19.** Universal input connections

- Use the following steps to connect universal inputs to a **UIC**.
  1. Using an HD-15 cable directly, or an HD-15 to 5 x BNC breakout cable, connect the desired analog input to the **Universal Input 1, Analog** connector.
  2. Using a standard DVI cable, connect the desired digital input to the **Universal Input 1, Digital** connector. The connector accepts digital signals only.
  3. Using a BNC cable, connect the desired SDI signal to the **Universal Input 1, SDI** connector.
  4. Using an HD-15 cable directly, or an HD-15 to 5 x BNC breakout cable, connect the desired analog input to the **Universal Input 2, Analog** connector.
  5. Using a standard DVI cable, connect the desired digital input to the **Universal Input 2, Digital** connector. The connector accepts digital signals only.
  6. Using a BNC cable, connect the desired SDI signal to the **Universal Input 2, SDI** connector.

Please note the following important points:

- You can connect three signals to **UIC Input 1**, and three signals to **UIC Input 2**, but you can only use one signal at a time for each input. However, you can also store setup files for different input combinations, and recall the desired setup to

## 4. Installation

### Signal Connections

the panel. Use the **Input Setup Menu** to set up universal input signals. In Chapter 5, refer to the **“Input Menu”** section on page 202 for setup details.

- In Chapter 6, refer to the **“Universal Input Setup”** section on page 293 for step-by-step setup instructions.
- Refer to the **“Analog Format Connection Table”** section on page 128 for a chart of analog formats available when using a customer supplied breakout cable.
- In Appendix A, refer to the **“Input and Output Format Tables”** section on page 445 for a list of available input formats for the FSN Series.
- The two SDI inputs enable you to connect SD-SDI sources to an HD-SDI system (and vice versa), and scale the source up (or down) to the native resolution.

### Analog Format Connection Table

Each HD-15 analog connector on the **UIC** enables you to input a variety of video formats — including VGA, composite video, S-video and YUV component video.

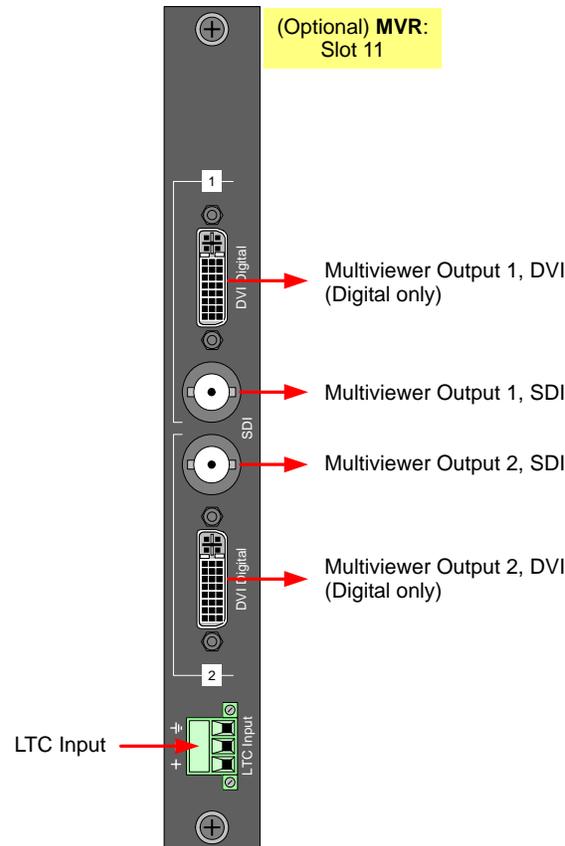
- For RGB with H and V sync, use the HD-15 connector directly.
- Using a customer supplied HD-15 to 5 x BNC breakout cable, several input combinations are possible. Cells with check marks denote the connections required for the indicated format.

**Table 4-1.** Analog Input Combinations using Breakout Cable

Breakout Cable Wire Color	Composite Video	S-Video (Y/C)	YUV (Y <sub>P</sub> B <sub>P</sub> R <sub>r</sub> )	RGB Sync on Green	RGB Comp Sync	RGB Separate H V
R			✓ (P <sub>r</sub> )	✓	✓	✓
G	✓	✓ (Lum)	✓ (Lum)	✓	✓	✓
B		✓ (Chroma)	✓ (P <sub>b</sub> )	✓	✓	✓
H Sync					✓	✓
V Sync						✓

## Multiviewer Connections

The figure below illustrates monitor output connections on the **MVR**'s rear panel:



**Figure 4-20.** Universal input connections

Please note:

- In both single and dual monitor configurations (as selected on the **Multiviewer Setup Menu**), the same signal appears on both the **DVI-I** and **BNC** connectors.
- Use the following steps to connect **MVR** outputs to your monitor(s).
  1. In single monitor configurations, use DVI and/or BNC cables to connect the DVI and/or SDI multiviewer output(s) to your monitor(s). The same signal appears on outputs 1 and 2.
  2. In dual monitor configurations:
    - ~ Use DVI and/or BNC cables to connect the DVI and/or SDI multiviewer **Monitor 1** output(s) to your assigned “left” monitor(s).
    - ~ Use DVI and/or BNC cables to connect the DVI and/or SDI multiviewer **Monitor 2** output(s) to your assigned “right” monitor(s).
  3. If you want to display time on the Multiviewer from an external LTC source, connect the output of your time code source (e.g., time code generator) to the **LTC Input** as follows:
    - ~ For a differential connection, use the **+**, **-** and **GND** terminals.
    - ~ For a single-ended connection, use the **+** and **GND** terminals.

## 4. Installation

Signal Connections

# 5. Menu Orientation

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## In This Chapter

This chapter describes all system menus, including the functions that are available, and descriptions of each menu tree (in block diagram format).

The following topics are discussed:

- [Menu Tree](#)
- [Using the Menu System](#)
- [Buttons, Tables and Matrices](#)
- [Using the Keypad](#)
- [Using the Pop-up Keyboard](#)
- [Transition Menu](#)
- [Wipe Menu](#)
- [Keyer Menu](#)
- [Color Background Menu](#)
- [Memory Menu](#)
- [Aux Menu](#)
- [System Menu](#)
- [Help Menu and Shortcuts](#)

**Note**

Once you have reviewed all of the sections in this chapter, please continue with Chapter 6, "[System Setup](#)" on page 279.

## 5. Menu Orientation

### Menu Tree

## Menu Tree

Two menu trees are provided in this section. Please use these diagrams for reference as you learn how to operate the system.

- [High Level Menu Tree](#)
- [System Menu Tree](#)

### High Level Menu Tree

The figure below illustrates a high-level view of the menu tree.

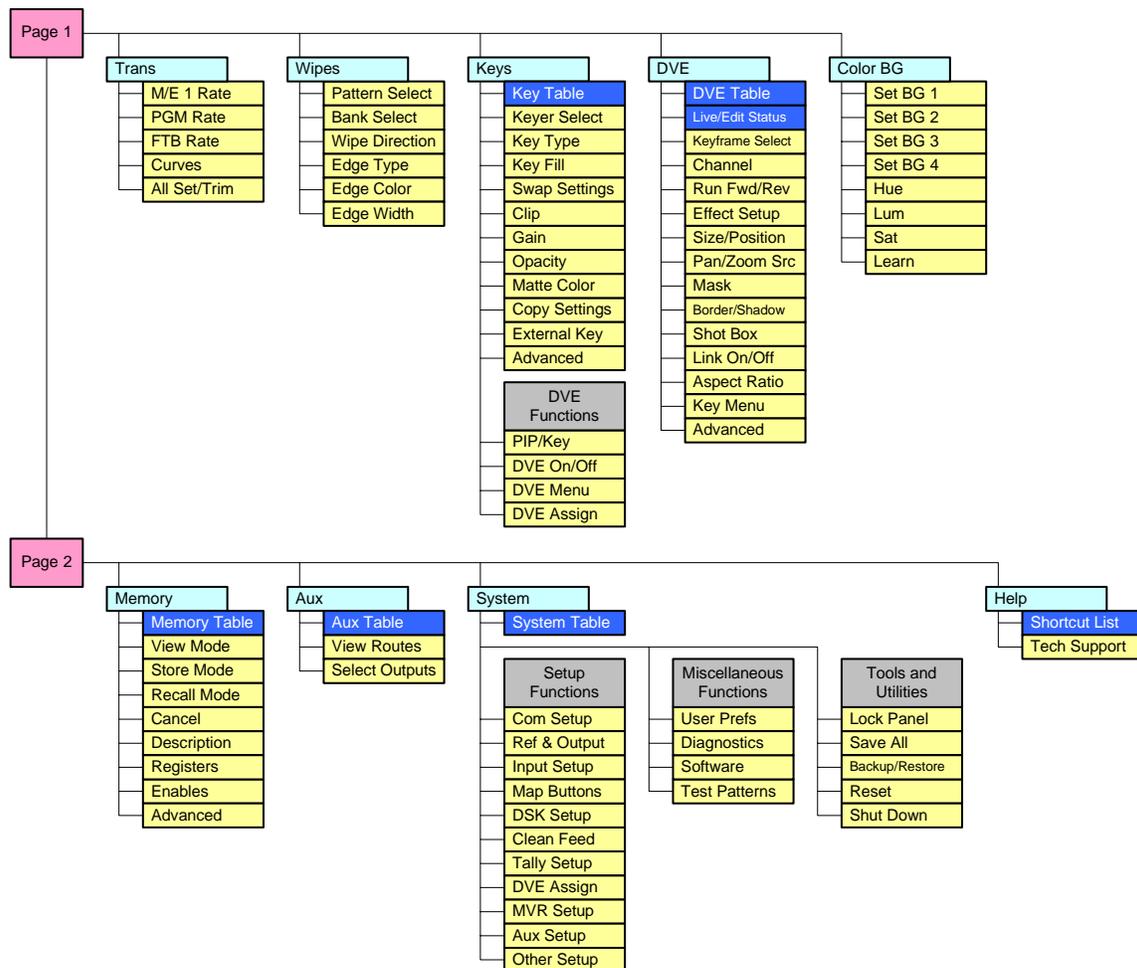


Figure 5-1. FSN Series Menu Tree

For a detailed and expanded view of the **System Menu**, refer to the [“System Menu Tree”](#) diagram on the next page.

# System Menu Tree

The figure below illustrates an expanded view of the **System Menu**.

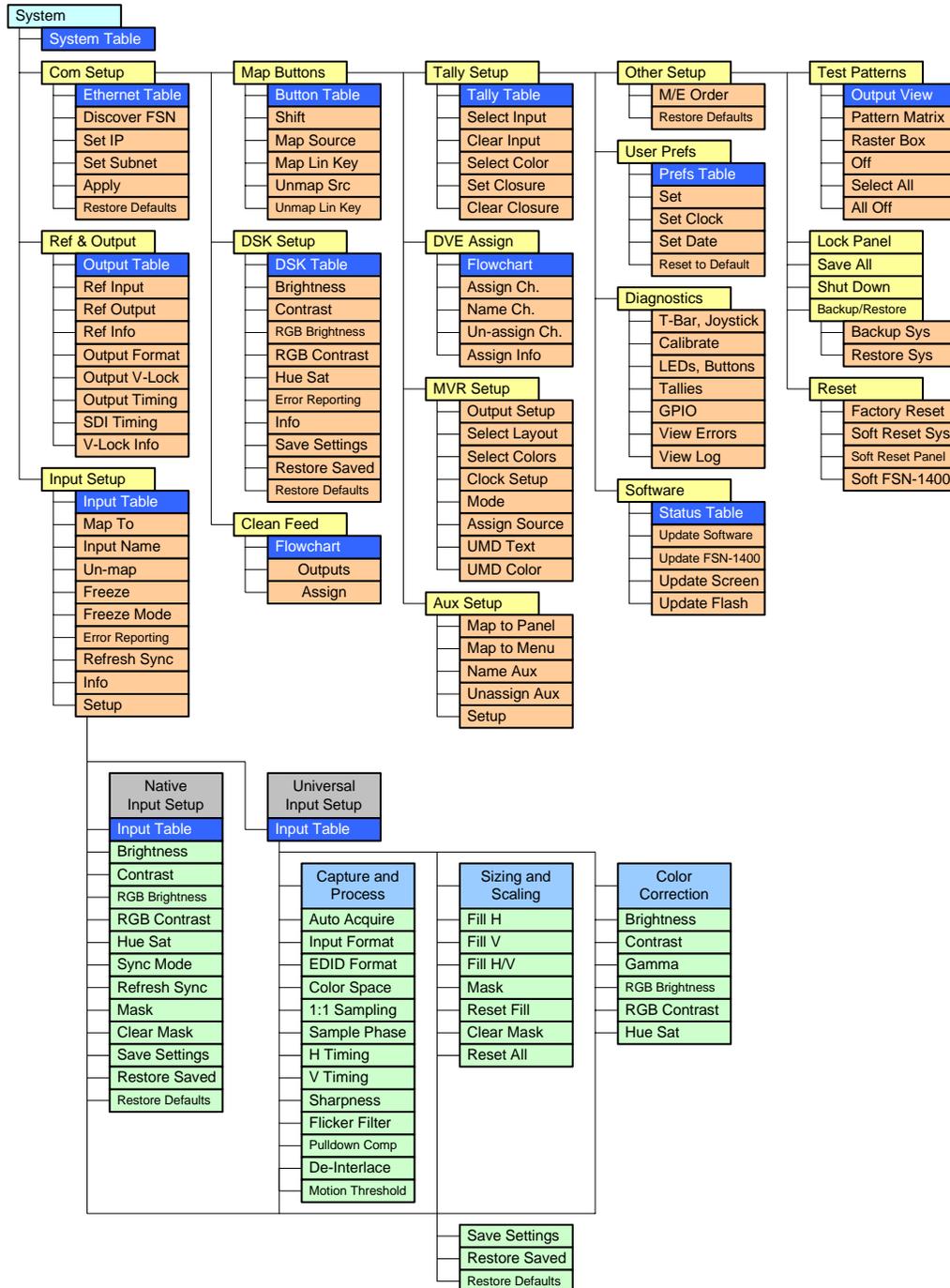


Figure 5-2. FSN Series System Menu

## 5. Menu Orientation

Using the Menu System

### Using the Menu System

This section lists the rules and conventions for using FSN Series menus. For orientation purposes only, the figure below illustrates the various menu sections.

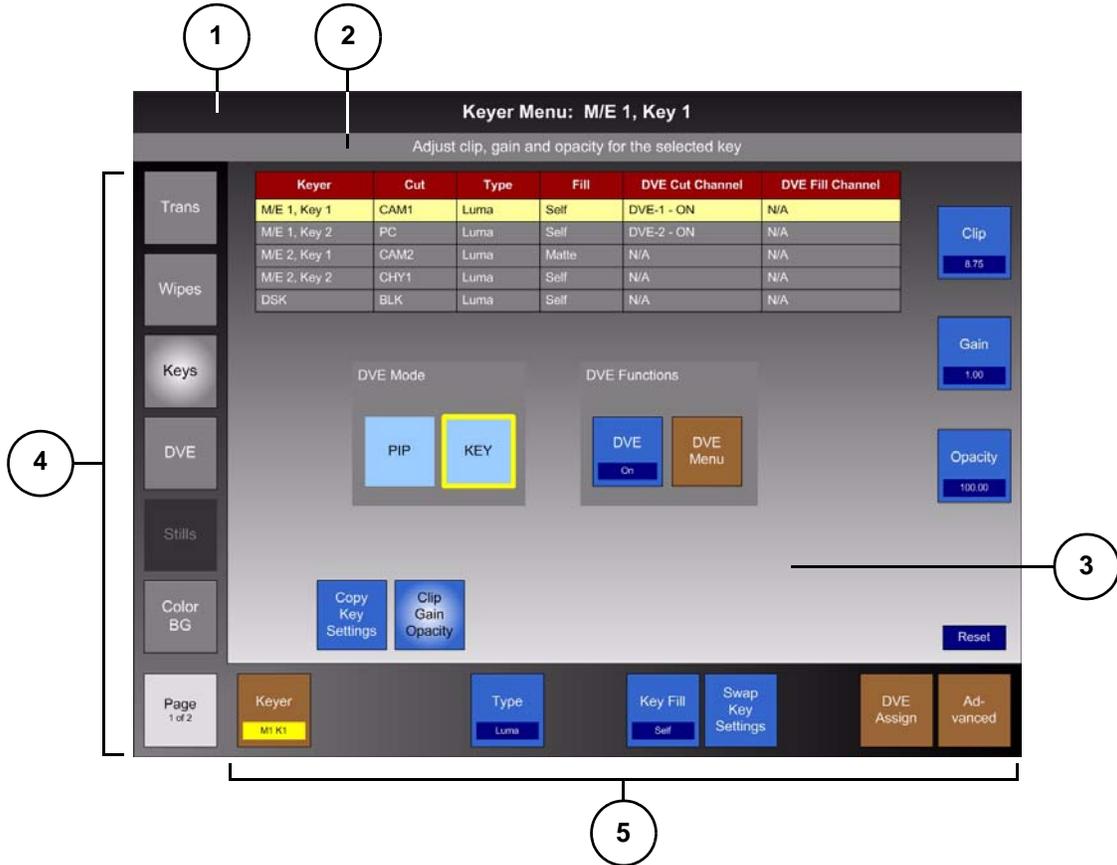


Figure 5-3. Sample Menu Layout

1) <a href="#">Title Bar</a>	3) <a href="#">Palette</a>	5) <a href="#">Tool Bar</a>
2) <a href="#">Prompt Bar</a>	4) <a href="#">Menu Bar</a>	

Following are descriptions of each section and each type of button:

#### 1) Title Bar

At the top of each menu, the **Title Bar** always names the current menu. When sub-menus are displayed, the convention of “**Parent Menu > Sub Menu**” will be used, e.g., **Keyer Menu > Advanced**.

#### 2) Prompt Bar

Immediately below the **Title Bar**, the **Prompt Bar** provides a line of “help text” for each menu. The prompt changes according to the various functions selected on the menu.

## 5. Menu Orientation

Using the Menu System

### 3) Palette

In the center of the menu, the **Palette** provides an area for menu-specific and function-specific buttons, graphics and tables.

### 4) Menu Bar

Along the left side, the **Menu Bar** provides instant access to all primary menus. Each button is latching, and mutually exclusive with all other navigation buttons. When pressed, the button “lights” and the selected menu is displayed.

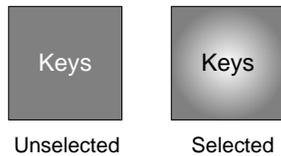


Figure 5-4. Navigation button selection

The **Menu Bar** does *not* scroll. Instead, press the **Page** button at the bottom of the bar to change navigation pages in groups of six buttons with each press.



Figure 5-5. Page button

The **Page** button itself indicates which page you are viewing:

▲ Page 1 of 2

▲ Page 2 of 2

### 5) Tool Bar

The **Tool Bar** at bottom edge of the menu displays up to 10 primary functions and options for the selected menu.

#### Note

There are many types of buttons that can appear on the **Tool Bar** and in the **Palette**. Refer to the [“Buttons, Tables and Matrices”](#) section on page 136 for details.

## 5. Menu Orientation

Buttons, Tables and Matrices

---

# Buttons, Tables and Matrices

There are a variety of button “types” that can appear in the menus, and there are also general rules that apply to button categories, colors, tables and matrices. Detailed explanations are provided below.

- [Button Categories and Colors](#)
- [Latching, Momentary and Conditional Buttons](#)
- [Value Buttons](#)
- [Toggle Buttons](#)
- [Pop-up Buttons](#)
- [Location Buttons](#)
- [Summary of Button Types](#)
- [Tables](#)
- [Matrices](#)
- [Notes and Error Messages](#)

## Button Categories and Colors

General button categories and color schemes are outlined below:

- **Menu Bar Buttons** are always gray. When pressed, the button lights and the selected menu is displayed in the **Palette**.



**Figure 5-6.** Menu Bar Buttons

- **Function Buttons** are always blue, and there are many different types such as “pop-ups” and “toggles.” Each type performs a specific function on the current menu, and behaves in a specific manner. See below for details.



**Figure 5-7.** Function Buttons

Note that in some cases, a button may be “grayed out,” indicating that the function is currently not available.



**Figure 5-8.** Grayed Out Button

## 5. Menu Orientation

Buttons, Tables and Matrices

- **Navigation Buttons** are brown, and when pressed, they take you to a new location in the menu tree. For example:
  - ~ Press to switch to a sub-menu beneath the current “parent” menu. In the sub-menu, the **{Back}** button appears in the **Tool Bar**, enabling you to go “back” up one level in the menu tree.
  - ~ Press to switch to a completely different menu, or a special navigation pop-up, that enables you to choose the next destination menu.



Figure 5-9. Navigation Buttons

### Note

Because its function remains constant throughout the entire menu system, the **{Back}** button will not be explained any further in this chapter.

## Latching, Momentary and Conditional Buttons

Latching, momentary and conditional buttons are explained below:

- **Latching**

The figure below illustrates both states of a **Latching** function button. The name of the function is written on the button itself.

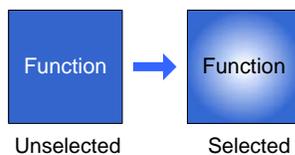


Figure 5-10. Latching button states

- ~ When **OFF**, the button is unselected, unlit, and the function is inactive.
- ~ When **ON**, the button is selected, lit, and the function is active.

- **Momentary**

Both “function” and “navigation” buttons can be momentary:

- ~ A **Momentary** blue “function” button lights briefly when pressed, performs the selected function, then returns to its default “off” condition.



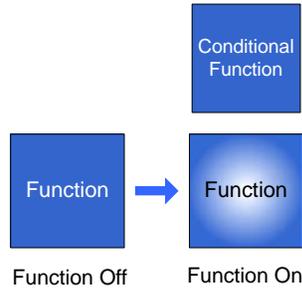
Figure 5-11. Momentary Function Button Sequence

## 5. Menu Orientation

Buttons, Tables and Matrices

- **Conditional**

The figure below illustrates both states of a **Conditional** function button.



**Figure 5-12.** Conditional button states

Conditional buttons appear when certain conditional functions are required. They can be either momentary or latching, depending on the required function.

## Value Buttons

The figure below illustrates a **Value** button.



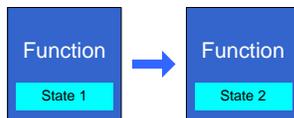
**Figure 5-13.** Value button

When certain functions are enabled in a menu, value buttons appear adjacent to the four knobs on the right side of the **Touch Screen**. These buttons let you to enter values for the selected parameter. The parameter's current value appears within the button's dark blue insert. There are three ways to adjust the value:

- Rotate the knob clockwise to increment the value.
- Rotate the knob counter-clockwise to decrement the value.
- Press the value button itself. When pressed, the button latches and the **Keypad** appears. Refer to the [“Using the Keypad”](#) section on page 144 for details.

## Toggle Buttons

The figure below illustrates both states of a **Toggle** button.

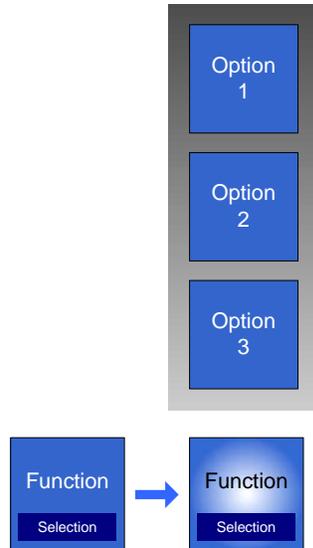


**Figure 5-14.** Toggle button states

**Toggle** buttons are two-state “function” buttons with a cyan colored insert, and the current state appears within the insert (e.g., **On** or **Off**). Pressing the button changes the state of the selected function.

## Pop-up Buttons

The figure below illustrates both states of a **Pop-up** button.



**Figure 5-15.** Pop-up button states (sample)

A **Pop-up** button has a dark blue colored insert, and just like a **Toggle**, the current selection appears within the insert. When pressed, the button latches, and a pop-up appears (on top of the **Palette**) with an array of options.

When you select an option, the pop-up clears and the selection appears within the insert. To cancel without making a change, simply press the pop-up button again to cancel the operation.

## Location Buttons

The figure below illustrates a **Location** button.



**Figure 5-16.** Location button

A **Location** button is a type of **Navigation** button that takes you to a new location in the menu tree, but because the button behaves like a pop-up, there is a choice of locations within the same “parent” menu.

When pressed, the button latches, and a pop-up appears. When you select a location, the pop-up clears and the new location appears within the yellow insert.

To cancel without making a change, simply press the pop-up button again to cancel the operation.

## 5. Menu Orientation

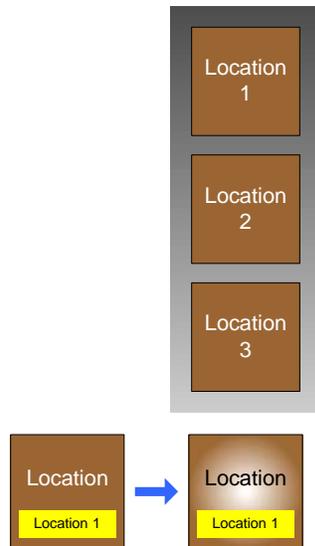
### Buttons, Tables and Matrices

When the switcher location changes, the label in the **Title Bar** also changes.

For example:

- ▲ On the **Wipe Menu**, the location button enables you to access and adjust wipes on M/E 1 and PGM — without leaving the menu.
- ▲ On the **Keyer Menu**, the location button enables you to access all keyers (e.g., **M/E 1 Key 1**, **M/E 1 Key 2**, **DSK**) without leaving the menu.

The figure below illustrates both states of a **Location** button.



**Figure 5-17.** Location button states (sample)

## 5. Menu Orientation

Buttons, Tables and Matrices

### Summary of Button Types

The table below summarizes buttons types, attributes, colors and functions.

**Table 5-1.** Button types, colors and functions

	Type	Attributes	Color	Insert	Function
	Menu Bar	Latching	Gray	—	Provides direct access to all primary menus.
	Function	Latching	Blue	—	Enables and disables the selected function. May have an associated "Conditional" button that appears when the function button is latched.
	Function	Momentary	Blue	—	Performs the selected function, then returns to its default "off" state.
	Navigation	Momentary	Brown	—	Changes your view to a new location in the menu tree.
	Value	Latching	Blue	Dark Blue	Appears adjacent to the knobs, on the right side of the Touch Screen. Enables entry of values for the selected parameter.
	Toggle	Momentary	Blue	Cyan	Toggles between two states only, for the selected function.
	Pop-up	Latching	Blue	Dark Blue	Provides a choice of two or more options for the selected function.
	Location	Latching	Brown	Yellow	Provides a choice of locations within the same "parent" menu.

## 5. Menu Orientation

Buttons, Tables and Matrices

### Tables

The FSN Series user interface makes extensive use of tables, for a variety of functions such as keys, memory registers, tallies, etc. The figure below illustrates a sample table:

Heading	Heading	Heading	Heading
Data	Data	Data	Data
Data	Data	Data	Data
Data	Data	Data	Data
Data	Data	Data	Data

Figure 5-18. Sample Table

Each table includes a heading row at the top, and multiple data rows beneath. The “highlighted” yellow row indicates that functions can be performed to the device (or parameter) that is shown on this row.

The yellow highlight can be scrolled automatically or manually. For example:

- On the **Input Setup Menu**, the highlight *automatically* jumps to a certain row, when you touch the associated graphic of a rear-panel connector.
- On the **Memory Menu**, you can *manually* scroll the highlight to a particular register using the adjacent knob. Or, you can simply touch the desired register to highlight the desired row. With this type of table, a thin line is drawn from the table to the “active” knob.

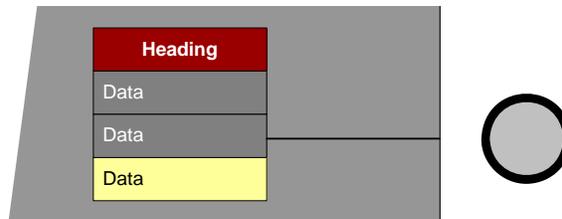


Figure 5-19. Manual table, with scrolling via knob or via direct touching

In some cases, a label appears over the thin line, to help specify the current scrolling function.

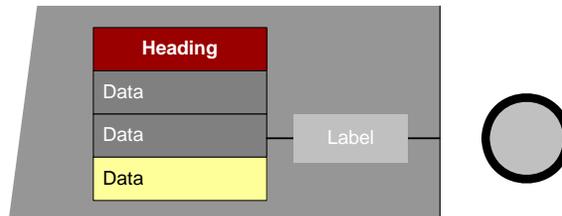


Figure 5-20. Manual table with specific label

### Matrices

On certain menus such as the **Wipe Menu** and the **Output Test Pattern Menu**, matrices are provided that enable you to choose a particular item (from a large group of items). A sample matrix is shown below:



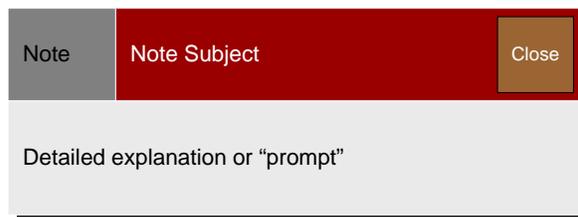
**Figure 5-21.** Sample Matrix

In the matrix, each function is a mutually exclusive button. To select a function, touch the desired button. The yellow border indicates the current selection. Note that in some cases (as shown above), a function may be grayed out.

### Notes and Error Messages

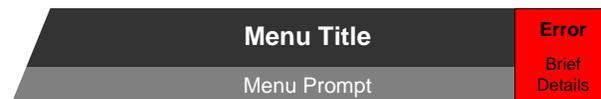
In certain cases, notes will pop-up that provide important information about a process, a function, or a “prompt” for further action. Each note has a title box, a subject line, an “explanation” section and a **Close** button — which clears the note from the menu. Some notes also include buttons for various choices, such as “**Yes**” or “**No**.”

A sample note is shown below.



**Figure 5-22.** Sample note

If an error occurs, a red “**Error**” button will appear in the top right corner of the menu — superimposed over the **Title Bar**. If this occurs, press the **Error** button to display a note for more information. A sample error message is shown below.



**Figure 5-23.** Sample error message

If an “**LOS**” or “**Invalid Signal**” error occurs to an input, the **Programmable Display** turns red, and the red “**Error**” button appears. These error messages can be turned off, if desired. In Chapter 7, refer to the “[Understanding Error Messages](#)” section on page 316 for full details.

## 5. Menu Orientation

Using the Keypad

### Using the Keypad

When a value button is pressed, the **Keypad** appears. The figure below illustrates a sample **Keypad**:

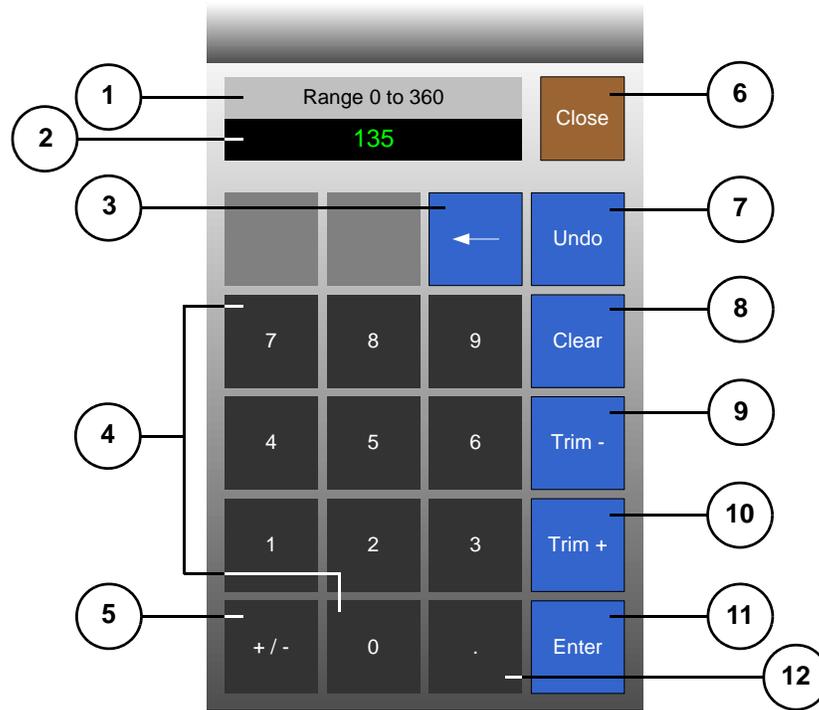


Figure 5-24. Keypad (sample)

1) <a href="#">Function Bar</a>	5) <a href="#">+/-</a>	9) <a href="#">Trim -</a>
2) <a href="#">Register</a>	6) <a href="#">Close</a>	10) <a href="#">Trim +</a>
3) <a href="#">Backspace</a>	7) <a href="#">Undo</a>	11) <a href="#">Enter</a>
4) <a href="#">Numerics</a>	8) <a href="#">Clear</a>	12) <a href="#">Decimal</a>

Following are descriptions of each section and each type of button in the **Keypad**:

#### 1) Function Bar

The **Function Bar** displays the selected parameter's range, and when required, provides a mini-prompt for the function that you are entering. For example:

▲ If you press the **{Hue}** value button, the prompt reads:

**Range:** 0 - 360

▲ If you press the **{Brightness}** value button, the prompt reads:

**Range:** 1 - 100

#### 2) Register

The **Register** displays a parameter's *current* value when the **Keypad** first appears. This enables you to "trim" existing values or enter new values. The

## 5. Menu Orientation

### Using the Keypad

register clears when you begin entering numbers, and digits shift left as you enter them. You must press **{Enter}** to complete an entry.

#### 3) Backspace

Press **Backspace** {←} during a numeric entry process to clear the register by one digit with each press.

#### 4) Numerics

Press the numeric buttons **{0 - 9}** to enter values. Digits shift left in the **Register** as you enter them. Use the **{Decimal}** button as required for entries that include decimal values.

#### 5) +/-

Press **{+/-}** to invert the numeric entry in the **Register** (if applicable). For example, press **{+/-}** to change **+350** to **-350**.

#### Note

The **{+/-}** button is only applicable when certain **Keypad** functions that accept negative values are active.

#### 6) Close

Press **{Close}** to clear the **Keypad** from the **Touch Screen**, and “un-latch” the selected value button.

#### Note

If you press **{Close}** prior to pressing **{Enter}**, **{Trim +}** or **{Trim -}**, the **Keypad** clears, and the previous value is maintained.

#### 7) Undo

Prior to pressing **{Enter}**, press **{Undo}** at any point during the numeric entry process to restore the original value, even if **{Clear}** or **{+/-}** was pressed.

#### Note

If **{Enter}** is pressed, that value becomes the new value to which the register will return, if **{Undo}** is pressed.

#### 8) Clear

Press **{Clear}** during a numeric entry process to clear the register to **0** (zero).

#### 9) Trim -

Enter an offset value using the numeric buttons, then press **{Trim -}** to subtract from the parameter's current value. Pressing **{Enter}** is not required, and the “trim” value remains in the register, enabling you to trim repeatedly by the same offset. Once the value is trimmed, you can close the **Keypad**, or perform addition trims or entries in the normal way.

For example:

- ▲ To subtract 5 frames from a transition rate, press the **Rate** button for the desired M/E, then in the **Keypad**, press **{5, Trim -}**.
- ▲ To subtract 25 pixels from a mask value, press the desired mask edge (e.g., **{Mask Top}**), then in the **Keypad**, press **{25, Trim -}**.

## 5. Menu Orientation

### Using the Keypad

#### 10) Trim +

Enter an offset value using the numeric buttons, then press **{Trim +}** to add to the parameter's current value. Pressing **{Enter}** is not required, and the "trim" value remains in the register, enabling you to trim repeatedly by the same offset. Once the value is trimmed, you can close the **Keypad**, or perform addition trims or entries in the normal way.

For example:

- ▲ To add 10 frames to a transition rate, press the **Rate** button for the desired M/E, then in the **Keypad**, press **{1, 0, Trim +}**.
- ▲ To add 2 pixels to a mask value, press the desired mask edge (e.g., **{Mask Bottom}**), then in the **Keypad**, press **{2, Trim +}**.

#### 11) Enter

Press **{Enter}** to accept a new value. When pressed, the **Keypad** remains open, and the new value is immediately active.

#### 12) Decimal

Press the decimal button **{.}** as required for numeric entries that accept decimal values.

#### Note

The decimal button is only applicable when certain **Keypad** functions that accept decimal values are active.

Please note the following important points regarding the **Keypad**:

- Certain **Keypad** buttons may be grayed out, if their function is not applicable for the current operation.
- On several **Keypads** throughout the system, a "**Default Value**" button appears. When pressed, the parameter's values are returned to their defaults, and the **Keypad** remains open.
- Other types of **Keypads** are used in various system modes, to present arrays of functions from which to select, and to present lists from which you can select various items. For example:
  - ▲ When selecting output formats on the **Output Setup Menu**, a special "list" **Keypad** enables you to select the desired output format from a list of all available output formats.
  - ▲ When mapping sources to buttons, using the **Map Buttons Menu**, a special "list" **Keypad** enables you to select the source that you want to map to the selected control panel button.

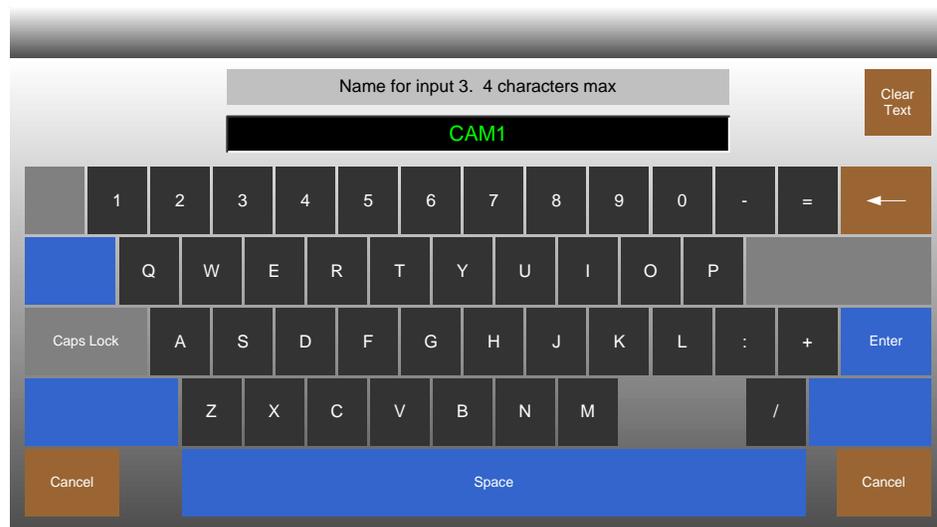
Each of these "special" **Keypads** will be discussed in context with their respective features.

## Using the Pop-up Keyboard

In several switcher menus, you can use a pop-up **Keyboard** to enter names and descriptions for various switcher functions. For example:

- ▲ On the **Input Setup Menu**, the **Keyboard** is used to name inputs, as they'll appear on the programmable displays.
- ▲ On the **Memory Menu**, the **Keyboard** is used to enter brief descriptions of memory registers.

The figure below illustrates a sample **Keyboard**, in “name” entry mode:



**Figure 5-25.** Keyboard (sample)

Please note:

- The top bar provides a prompt for the current action, e.g., entering a name or entering a description.
- Below the prompt is the entry register, where letters appear as you type.
- To use the keyboard, enter the desired text in the normal manner.
  - ~ Press **{Enter}** to complete an entry and close the **Keyboard**.

**Note**

In the **Memory Menu** (in **Store Mode**), the new entry will not immediately appear in the register table. Refer to the [“Naming Registers”](#) section on page 184 for details.

~ Press **{Clear Text}** to clear the entry register.

~ Press **{Cancel}** to cancel an entry and close the **Keyboard**.

- Press **{Caps Lock}** to switch between upper and lower case, where applicable.

**Note**

In some modes, such as input name entry, **{Caps Lock}** remains on, and not all letters and symbols are available.

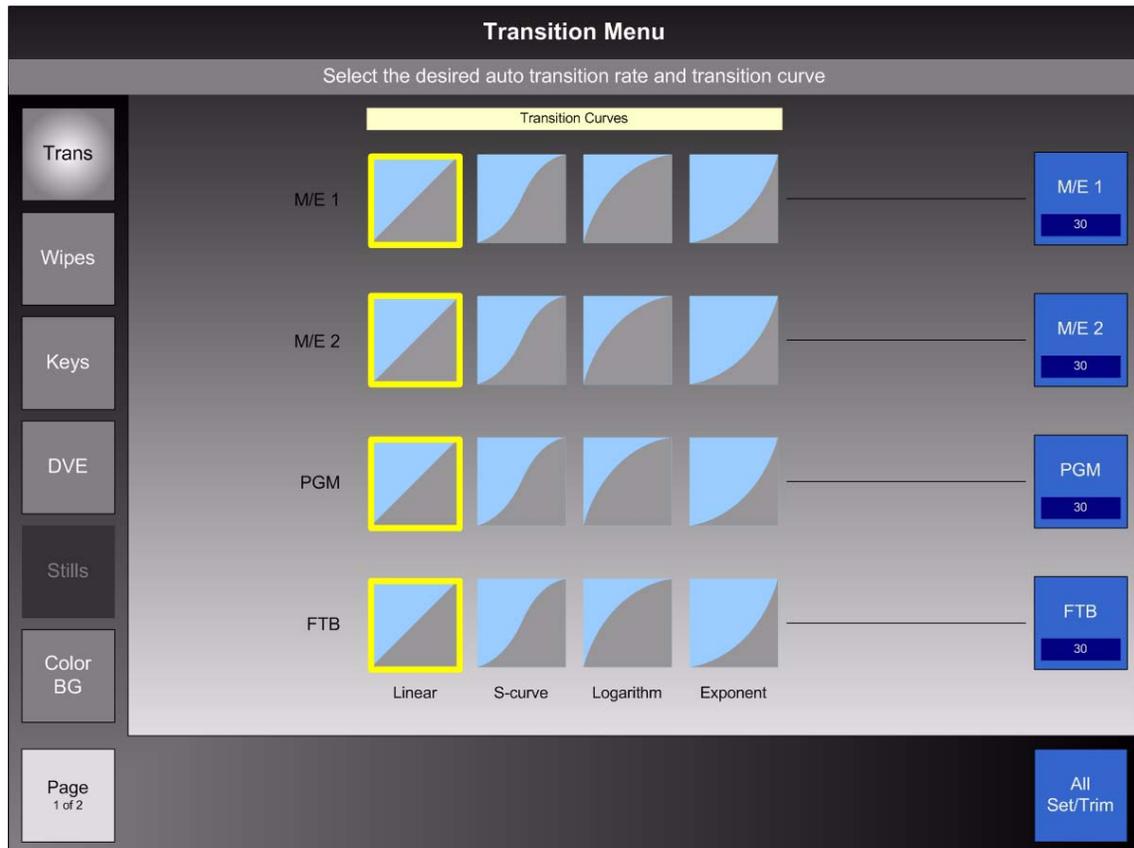
## 5. Menu Orientation

### Transition Menu

---

## Transition Menu

The **Transition Menu** enables you to change auto transition rates and adjust transition “curves” throughout the switcher. The figure below illustrates a sample **Transition Menu**:



**Figure 5-26.** Transition Menu (sample)

On the menu, value buttons are provided for each location where a rate can be changed — either via **Knob** or **Keypad**. Each button displays the function’s current rate. Transition rates and curves can be changed individually or simultaneously.

The following topics are discussed in this section:

- [Transition Menu Access](#)
- [Transition Rate Adjustment](#)
- [Transition Curve Adjustment](#)

## Transition Menu Access

There are two ways to access the **Transition Menu**:

- In the **Menu Bar**, press **{Page}** to display page **1** (if required). Then, press the **{Trans}** button.
- Press and hold any **MIX** button on the control panel (e.g., **MIX** in the M/E 1 bank or the PGM bank).

## Transition Rate Adjustment

Transition rates can be adjusted from **1** to **999** frames, in 1 frame increments. There are two ways to adjust rates individually:



- Turn the **Knob** adjacent to the any value button to adjust the auto transition rate (in frames) for that specific location (**M/E 1**, **M/E 1**, **PGM** or **FTB**).
  - ~ The value on the button changes as you adjust, and the associated **Transition Display** (on the panel) updates.
  - ~ Changes in rates take effect immediately.
- To “key in” an auto transition rate, press any value button to display the **Keypad** for that specific location. Enter a new rate (in frames) and press **{Enter}**, or trim the current rate using **{Trim -}** or **{Trim +}**.

You can also enter or trim all transition rates simultaneously:



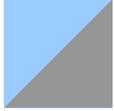
- To set all rates to the same value, press **{All/Set Trim}**. All value buttons light. Next, press any value button to display the keypad.
  - ~ To set all rates to the value in the keypad’s register, press **{Enter}**.
  - ~ To set all rates to a new value, enter the new value and press **{Enter}**.
- To trim all rates simultaneously as offsets to their current values, press **{All/Set Trim}**. All value buttons light. There are two ways to trim the value:
  - ~ Turn any **Knob** to increment or decrement all rates.
  - ~ Press any value button to display the keypad. Enter the desired “trim” value and press **{Trim +}** or **{Trim -}** as desired.

## 5. Menu Orientation

### Transition Menu

## Transition Curve Adjustment

There are four **Transition Curve** buttons for each section of the switcher. The buttons in each row are mutually exclusive:



- **Linear Curve** — Press the **{Linear}** button to apply a linear ramp to the transition. The transition rate is constant throughout the transition.



- **S Curve** — Press the **{S Curve}** button to apply a smooth curve to the transition. The transition starts slow, accelerates, then decelerates at the end.



- **Logarithm** — Press the **{Logarithm}** button to apply a transition curve that starts fast, and slows down at the end.



- **Exponent** — Press the **{Exponent}** button to apply a transition curve that starts slow, and accelerates at the end.

## Wipe Menu

The **Wipe Menu** enables you to select and modify wipe patterns. In Chapter 1, refer to the [“Glossary of Switcher Terms”](#) section on page 20 for a definition of “wipe.”

The figure below illustrates a sample **Wipe Menu**:

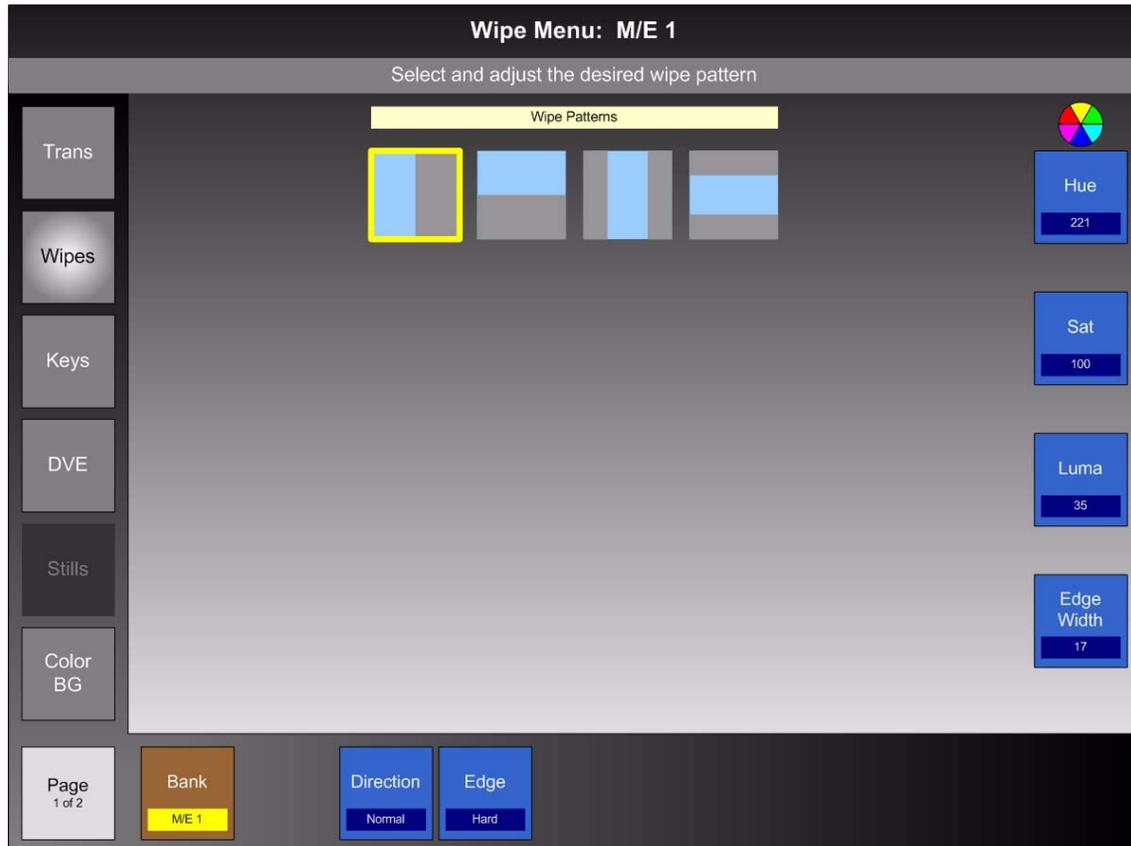


Figure 5-27. Wipe Menu (sample)

The **Wipe Menu** is the same for all switcher banks, and using the **{Bank}** button, you can adjust wipes on all banks without leaving the menu. On the menu itself, a matrix of wipe patterns are provided in the **Palette**, and wipe modifiers are available on the **Tool Bar** with their associated value buttons.

The following topics are discussed in this section:

- [Wipe Menu Access](#)
- [Wipe Patterns](#)
- [Wipe Functions and Modifiers](#)

## 5. Menu Orientation

### Wipe Menu

## Wipe Menu Access

There are two ways to access the **Wipe Menu**:

- In the **Menu Bar**, press **{Page}** to display page 1 (if required). Then, press the **{Wipes}** button. The parameters for the last selected or modified wipe are displayed.
- Press and hold any **WIPE** button on the control panel (e.g., **WIPE** in the M/E 1 bank or the PGM bank). The parameters for that specific location are displayed, and named in the menu's **Title Bar** (e.g., **Wipe Menu: M/E 1**).

## Wipe Patterns



The **Palette** provides a matrix of Wipe pattern buttons, which are all mutually exclusive. When a wipe button is pressed, the button is highlighted with a yellow border, and the selected pattern is now available for use and modification on the selected bank.

When you perform a wipe, video on the **BG** bus is replaced by video on the **PST** bus, using the selected pattern to “reveal” PST bus video. Each button represents the split between **BG** and **PST** video, with the **T-Bar** at approximately 50%, as shown below:



Figure 5-28. Wipe button representation

## Wipe Functions and Modifiers

In the **Wipe Menu**, the buttons on the **Tool Bar** and in the **Palette** allow you to modify the wipe pattern in a variety of creative ways.

### Important

All wipe modifiers are additive. This means that you can enable as many modifiers as desired for a selected pattern, without cancelling out any previous ones.

The following modifiers are discussed:

- [Bank](#)
- [Direction](#)
- [Edge](#)
- [Edge Color](#)

### Bank

The **{Bank}** button is a “location” button that enables you to select and modify wipes on any switcher bank, without leaving the menu. Refer to the [“Location Buttons”](#) section on page 139 for additional details. Press **{Bank}** to display the **Bank Selection Pop-up**, which lists all available switcher banks.



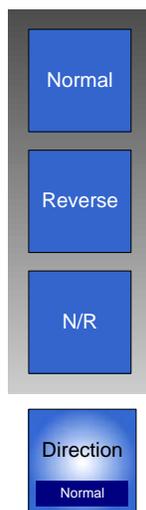
**Figure 5-29.** Wipe bank pop-up

When you select another bank, the following actions occur:

- The pop-up clears, and the name of the new bank appears on the button label and in the **Title Bar**.
- All selections and functions for the new bank appear on the **Wipe Menu**.

### Direction

The **{Direction}** button is a pop-up that determines which direction the selected wipe travels when the **T-Bar** is moved, or when **AUTO TRAN** is pressed.



**Figure 5-30.** Wipe direction pop-up

## 5. Menu Orientation

### Wipe Menu

Press **{Direction}** to display the **Direction Pop-up**, which offers three options:

- **{Normal}** — Each time **AUTO TRAN** is pressed, or each time the **T-Bar** is moved from limit to limit, wipes always travel from the left to right (for vertical wipes), or from the top to the bottom (for horizontal wipes).



**Figure 5-31.** Normal wipe direction

- **{Reverse}** — Each time **AUTO TRAN** is pressed, or each time the **T-Bar** is moved from limit to limit, wipes always travel from right to left (for vertical wipes), or from the bottom to the top (for horizontal wipes).



**Figure 5-32.** Reverse wipe direction

- **{N/R}** — On the first **AUTO TRAN** or **T-Bar** movement, direction is **Normal**. On the next **AUTO TRAN** or **T-Bar** movement (after the buses flip-flop), the direction is **Reverse** — and so on.

Once you select a wipe direction, the pop-up clears, and the new wipe direction appears on the button label.

### Edge

The **{Edge}** function enables you to modify the edge of the wipe pattern and adjust its width. Press **{Edge}** to display the **Edge Pop-up**, which offers two options.



**Figure 5-33.** Wipe Edge Pop-up

- **{Hard}** — The wipe edge that divides **BG** and **PST** is a hard edge.



**Figure 5-34.** Hard edge wipe

- **{Soft}** — The wipe edge that divides **BG** and **PST** is a soft edge blend.



**Figure 5-35.** Soft edge wipe

## 5. Menu Orientation

### Wipe Menu



- **{Edge Width}** — Use this value button to adjust the width of the hard or soft edge — from thick to thin, as desired.



Figure 5-36. Wipe edge adjustment

Edge widths can be adjusted from 0 (zero) to the current horizontal and/or vertical output resolution of the system.

### Edge Color

When a hard edge is selected, use the three value buttons or the **{Color Picker}** button to select the edge color. When a soft edge is selected, the buttons do not appear.

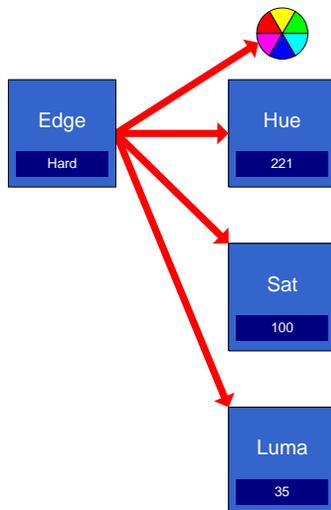


Figure 5-37. Edge color value buttons and Color Picker button

The following adjustments are available:

- **{Hue}** — Adjust the hue of the edge. **Range:** 0 to 360
- **{Sat}** — Adjust the color saturation of the edge. **Range:** 0 to 100
- **{Luma}** — Adjust the luminance of the edge. **Range:** 0 to 100
- **{Color Picker}** — Press to display the **Color Picker Pop-up**. Refer to the [“Color Picker Pop-up”](#) section on page 173 for details.

## Keyer Menu

The **Keyer Menu** enables you to modify all keyers on the control panel. Key sources are selected on the **Key Bus** in an M/E and on the **Phantom Key Bus** on the PGM bank. In Chapter 1, refer to the "[Glossary of Switcher Terms](#)" section on page 20 for definitions of the various key terms.

The figure below illustrates a sample **Keyer Menu**:

**Keyer Menu: M/E 1, Key 1**

Adjust clip, gain and opacity for the selected key

Keyer	Cut	Type	Fill	DVE Cut Channel	DVE Fill Channel
M/E 1, Key 1	CAM1	Luma	Self	DVE-1 - ON	N/A
M/E 1, Key 2	PC	Luma	Self	DVE-2 - ON	N/A
M/E 2, Key 1	CAM2	Luma	Matte	N/A	N/A
M/E 2, Key 2	CHY1	Luma	Self	N/A	N/A
DSK	BLK	Luma	Self	N/A	N/A

**Trans**

**Wipes**

**Keys**

**DVE**

**Stills**

**Color BG**

**Page 1 of 2**

**Keyer** M1 K1

**Type** Luma

**Key Fill** Self

**Swap Key Settings**

**DVE Assign**

**Advanced**

**Clip** 8.75

**Gain** 1.00

**Opacity** 100.00

**Reset**

**Copy Key Settings** **Clip Gain Opacity**

**DVE Mode** PIP KEY

**DVE Functions** DVE On DVE Menu

**Figure 5-38.** Keyer Menu (sample)

The **Keyer Menu** is virtually identical for all keyers, and using the **{Keyer}** button, you can adjust keyers on all banks without leaving the menu. A status table is provided in the Keyer Menu's **Palette**, and key modifiers are available on the **Tool Bar** along with their associated value buttons to the right. Note that if a DVE channel is assigned to a keyer, a different set of functions are available on the **Palette**.

The following topics are discussed in this section:

- [Keyer Menu Access](#)
- [Keyer Status Table](#)
- [Keyer Functions and Modifiers](#)
- [Advanced Key Functions](#)

## 5. Menu Orientation

### Keyer Menu

## Keyer Menu Access

There are two ways to access the **Keyer Menu**:

- In the **Menu Bar**, press **{Page}** to display page 1 (if required). Then, press the **{Keys}** button. The parameters for the last selected keyer are displayed.
- Arm the desired keyer first, then press and hold that Keyer button (e.g., **KEY 1** or **KEY 2** in the M/E 1 bank, or the **DSK** button in the PGM bank). The parameters for that specific keyer are displayed, and the location is named in the **Title Bar** (e.g., **Keyer Menu: M/E 1, Key 1**).

## Keyer Status Table

A **Keyer Status Table** is displayed at the top of the **Palette**, as shown below:

Keyer	Cut	Type	Fill	DVE Cut Channel	DVE Fill Channel
M/E 1, Key 1	CAM1	Luma	Self	DVE-1 - ON	N/A
M/E 1, Key 2	PC	Luma	Self	DVE-2 - ON	N/A
M/E 2, Key 1	CAM2	Luma	Matte	N/A	N/A
M/E 2, Key 2	CHY1	Luma	Self	N/A	N/A
DSK	BLK	Luma	Self	N/A	N/A

**Figure 5-39.** Keyer Status Table (sample)

In the table, rows are provided for each keyer on the panel, and the yellow highlight shows the active keyer. This highlight changes automatically when different keyers are selected. The following columns of information are provided:

- **Keyer** — Indicates the name of each keyer on the panel.
- **Cut** — Indicates the key's cut source, as selected on the bank's **Key Bus**.
- **Type** — Indicates the key type, either **Luma** or **Linear**, as selected with the **{Type}** button. Refer to the "[Type](#)" section on page 160 for details.
- **Fill** — Indicates the key's fill source, either **Self**, **Split**, **Matte** or **PST** (Preset Bus), as selected with the **{Key Fill}** button. If the key is split, the name of the split fill source appears in the cell. Refer to the "[Key Fill](#)" section on page 162 for details.
- **DVE Cut Channel** — Indicates the name of the DVE channel assigned to the keyer's cut signal, as performed on the **DVE Assign Menu**. Please note:
  - ~ The status of the assigned DVE channel (either ON or OFF) is appended to the DVE channel's name.
  - ~ The field reads "**N/A**" if no DVE is assigned to the keyer.
- **DVE Fill Channel** — Indicates the name of the DVE channel assigned to the keyer's fill signal, as performed on the **DVE Assign Menu**.
  - ~ The status of the assigned DVE channel (either ON or OFF) is appended to the DVE channel's name.
  - ~ The field reads "**N/A**" if no DVE is assigned to the keyer.

### Note

Refer to Chapter 8, "[DVE Operations](#)" on page 353 for details on assigning DVE channels.

## Keyer Functions and Modifiers

In the **Keyer Menu**, the buttons on the **Tool Bar** and in the **Palette** allow you to modify the selected keyer in a variety of creative ways. The following modifiers are discussed:

- [Keyer Selection](#)
- [Type](#)
- [Clip, Gain, Opacity](#)
- [Key Fill](#)
- [DVE Keyer Functions](#)
- [Swap Key Settings](#)
- [External Key](#)
- [Copy Key Settings](#)

### Keyer Selection

The **{Keyer}** button is a “location” button that enables you to select and modify keys on any switcher bank, without leaving the menu. Refer to the “[Location Buttons](#)” section on page 139 for additional details on location buttons. Press **{Keyer}** to display the **Keyer Selection Pop-up**, which lists all available keyers on the panel.



**Figure 5-40.** Keyer selection pop-up

When you select another keyer, the following actions occur:

- The pop-up clears. The name and location of the new keyer appear on the button label and in the **Title Bar**. Note that the yellow button label is abbreviated, e.g., **M/E 1, Key 2** appears as **M1 K2** on the button.

## 5. Menu Orientation

### Keyer Menu

- All selections and functions for the new keyer appear on the **Keyer Menu**.

#### Important

If you select a keyer that has a DVE channel assigned, DVE-specific functions appear on the **Palette**. Refer to the “[DVE Keyer Functions](#)” section on page 164 for details.

### Type

The **{Type}** button is a pop-up that enables you to select the processing mode for the selected keyer.

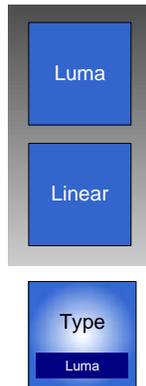


Figure 5-41. Key type pop-up

Press **{Type}** to display the **Key Type Pop-up**, which offers two options:

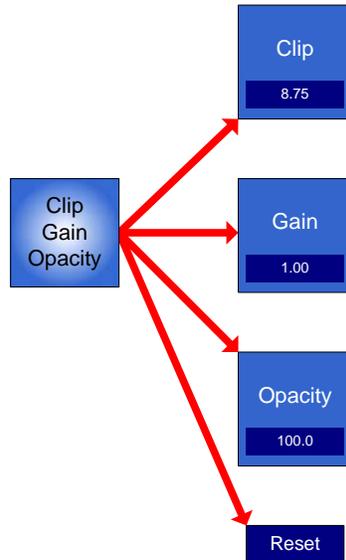
- **{Luma}** — Enables the **Luminance Key** mode, in which the hole-cutting information is derived from the luminance (brightness) level of the key source.
- **{Linear}** — Enables the **Linear Key** mode, which allows the edges of anti-aliased key sources (such as character generators) to be reproduced clearly. Two separate signals are required from a linear key source: a cut and a fill. Refer to the “[Map Buttons Menu](#)” section on page 224 for mapping details.

#### Note

When **Linear Key** mode is selected, the **{Key Fill}** button is grayed out. This occurs because the linear key cut and fill signals are pre-determined on the **Map Buttons Menu**.

## Clip, Gain, Opacity

Press **{Clip Gain Opacity}** to display the **{Clip}**, **{Gain}** and **{Opacity}** value buttons.



**Figure 5-42.** Clip, Gain and Opacity adjustments

Use these controls to adjust the appearance of the selected key:

- **{Clip}** — Adjust the threshold of the video that “cuts” into the background. A hole will be cut into the background anywhere that foreground luminance is greater than the clip level.  
**Range:** 0.00 to 100.00, in .01 increments  
**Default:** 50.00
- **{Gain}** — Adjust the sensitivity of the keyer, enabling you to change the sharpness of the keyed image. Gain only affects the edge of the key hole, as set by the clip.  
**Range:** 0.00 to 100.00, in .01 increments  
**Default:** 1.00
- **{Opacity}** — Adjusts the opacity of the keyed image, from fully opaque to fully transparent.  
**Range:** 0.00 to 100.00, in .01 increments  
**Default:** 100.00
- **{Reset}** — Press to return all clip, gain and opacity settings to their default values.

**Important**

If a DVE channel is assigned to a keyer, and the keyer is in **PIP** mode, the **{Clip}**, **{Gain}** and **{Opacity}** controls are grayed out.

## 5. Menu Orientation

### Keyer Menu

#### Key Fill

Once the selected **Key Source** cuts the electronic hole in the background video, use the **{Key Fill}** button to determine the source of the video that fills the hole.

#### Note

These controls are only available when **Self Key** is selected. When **Linear Key** is selected, **{Key Fill}** is grayed out.



Figure 5-43. Key fill pop-up

Press **{Key Fill}** to display the **Key Fill Pop-up**, which offers four options:

- **{Self}** — Video from the key source itself fills the hole.
- **{PST}** — Video from the bank's **PST** (Preset) bus fills the hole.
- **{Split}** — Video from another selected source (other than the key source) fills the hole. When **{Split}** is selected, the **{Key Bus}** button appears in the Palette:



Figure 5-44. Key Bus button, with Split Fill selected

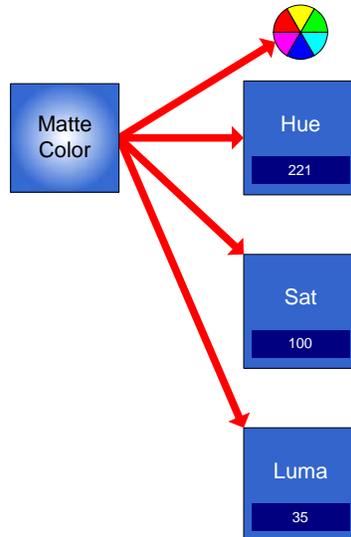
The **{Key Bus}** button is a toggle that changes the function of the bank's **Key Bus**, enabling you to select separate cut and fill signals.

- ~ When **{Cut}** is selected, use the **Key Bus** to select the cut video.
- ~ When **{Fill}** is selected, use the **Key Bus** to select the fill video.

## 5. Menu Orientation

### Keyer Menu

- **{Matte}** — Video from an internal matte generator fills the hole. When **{Matte}** is selected, the matte color is fully adjustable using the three value buttons or the **{Color Picker}** button.



**Figure 5-45.** Matte color value buttons and color picker button

Use these buttons to adjust the matte fill color:

- ~ **{Hue}** — Adjust the hue of the matte fill. **Range:** 0 to 360
- ~ **{Lum}** — Adjust the luminance of the matte fill. **Range:** 0 to 100
- ~ **{Sat}** — Adjust the color saturation of the matte fill. **Range:** 0 to 100
- ~ **{Color Picker}** — Press to display the **Color Picker Pop-up**. Refer to the [“Color Picker Pop-up”](#) section on page 173 for details.

## 5. Menu Orientation

### Keyer Menu

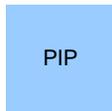
#### DVE Keyer Functions

When a keyer is selected that has a DVE channel assigned (either to the cut signal, the fill signal or both signals), four DVE-specific functions appear on the **Palette**, as shown below. When a keyer is selected that does not have a DVE assigned, the functions do not appear.



Figure 5-46. DVE Keyer function buttons (sample)

In the **DVE Mode** section, two mutually-exclusive functions are available:



- Press **{PIP}** to place the keyer in **PIP** mode. In this mode:
  - ~ The assigned DVE channel defaults to **On**, and the **{DVE}** button is grayed out.
  - ~ The **{Clip}**, **{Gain}**, **{Opacity}**, **{Type}** and **{Key Fill}** controls are automatically grayed out.
  - ~ The key source (the input to the assigned DVE channel) is selected on the key bus in the normal manner. The source appears within the PIP, which can now be manipulated on the **DVE Menu**.



- Press **{KEY}** to place the keyer in **Key** mode. In this mode:
  - ~ The DVE channel can be turned **On** or **Off** using the **{DVE}** button.
    - When **On**, the key source is routed through the DVE. The source can be manipulated with the **DVE Menu**, but it can not be bordered or shadowed.
    - When **Off**, the keyer functions normally, with no DVE in line.
  - ~ The **{Clip}**, **{Gain}**, **{Opacity}**, **{Type}** and **{Key Fill}** controls are active.

In the **DVE Functions** section, two buttons are available:



- Use the **{DVE}** button to turn the assigned DVE channel **On** or **Off**. The button is only active when the keyer is in **Key** mode. In **PIP** mode, the button is grayed out and the DVE channel defaults to **On**.



- Press **{DVE Menu}** to switch to the **DVE Menu** for the selected DVE channel (that is assigned to the selected keyer) — enabling you to size, position, and manipulate the key. The button is active in both **PIP** and **Key** modes.

In the **Tool Bar**, one additional DVE-related function is available:



- Press **{DVE Assign}** to switch to the **DVE Assign Menu**, which enables you to assign DVE channels to keyers. For complete information on DVE assignments and effect programming, refer to Chapter 8, [“DVE Operations”](#) on page 353.

## Swap Key Settings

Swap  
Key  
Settings

The **{Swap Key Settings}** button swaps the settings between **KEY 1** and **KEY 2**. The function is not available for the DSK.

Please note:

- **KEY 2** is always “over” **KEY 1** in the M/E — visually on top of, and electronically downstream of **KEY 1**, as shown below.



**Figure 5-47.** Key Settings, KEY 2 over KEY 1

- When **{Swap Key Settings}** is pressed, the settings of the two keyers are swapped. The key source that was previously in **KEY 2** moves to **KEY 1**, and now appears “under” the other key source.



**Figure 5-48.** Key Settings swapped

- Press **{Swap Key Settings}** again to swap the settings back.

### Important

If a DVE channel is assigned to either keyer, a pop-up will appear, alerting you that DVE channel assignments will be changed if you proceed. For example, if DVE channel 1 is assigned to Keyer 1, it will be assigned to Keyer 2 after the “swap” is performed.

## 5. Menu Orientation

### Keyer Menu

#### External Key

When the **DSK** is selected, the **{External Key}** button appears in the **Tool Bar**, adjacent to the **{Type}** button, as shown below:

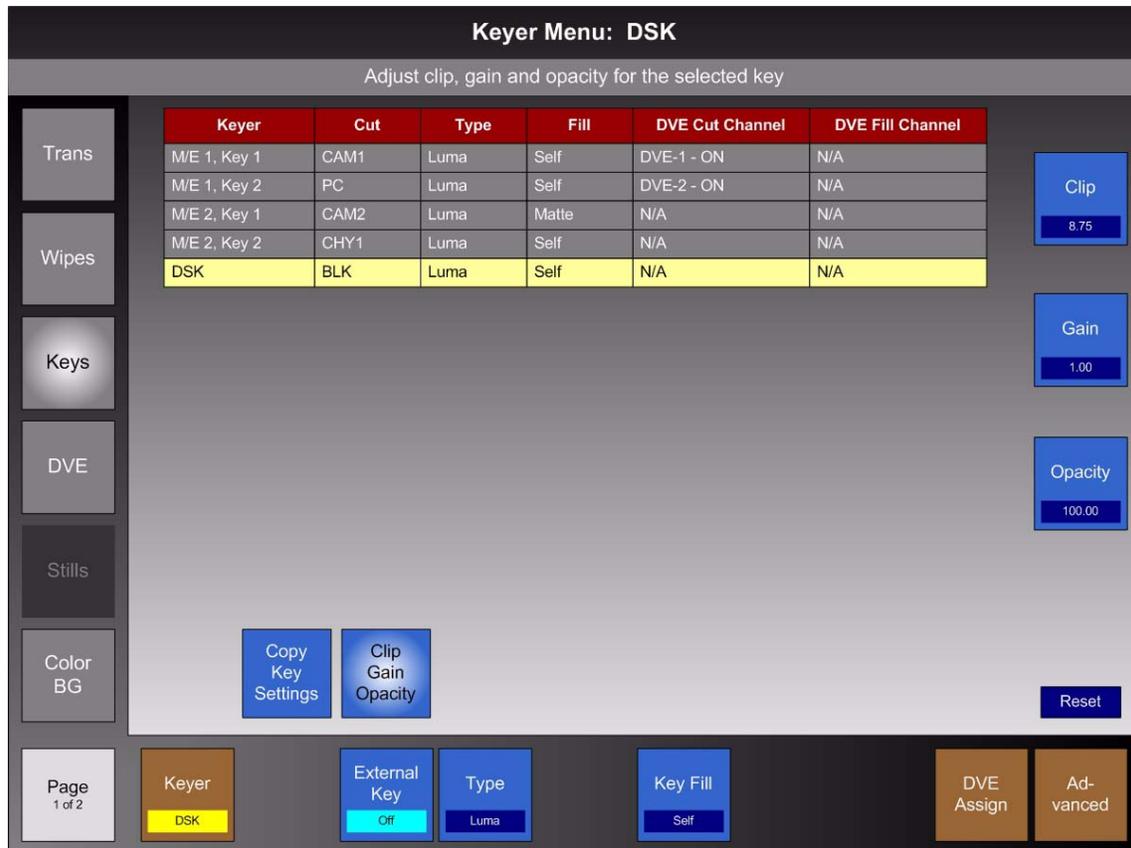


Figure 5-49. Keyer Menu: DSK (sample)



The **{External Key}** button is a toggle that enables or disables the ability to key using the external DSK **Cut** and **Fill** connections on the **M/E** card's I/O panel. In Chapter 4, refer to the [“External DSK Input Connections”](#) section on page 125 for details.

- Select **{On}** to activate both external key connections.
  - ~ The label in the **PGM Transition Display** reads **“EXT.”**
  - ~ For the DSK, the labels in the **Cut** and **Fill** columns of the **Keyer Status Table** change to **“EXTERNAL.”**
  - ~ Video from the **DSK Cut** connector cuts the key hole, and video from the **DSK Fill** connector fills the hole.
  - ~ The **Type** and **Key Fill** buttons are grayed out.

#### Note

In this mode, when you press and hold **DSK**, no buttons are lit on the **Phantom Key Bus (PST)**. However, when you make a selection on the **Phantom Key Bus**, the external key is automatically turned off and the new key source is accepted.

## 5. Menu Orientation

### Keyer Menu

- Select **{Off}** to turn off the external key connections. Key sources are selected in the normal manner using the **Phantom Key Bus**.

#### Important

If **Free Run** is selected on the **Reference and Output Setup Menu**, the external **Cut** and **Fill** DSK inputs can not be used, and the **{External Key}** button will be grayed out.

### Copy Key Settings

The **{Copy Key Settings}** button enables you to copy key parameters from one keyer to another. Press **{Copy Key Settings}** to display the **Copy Key Settings Keypad**.

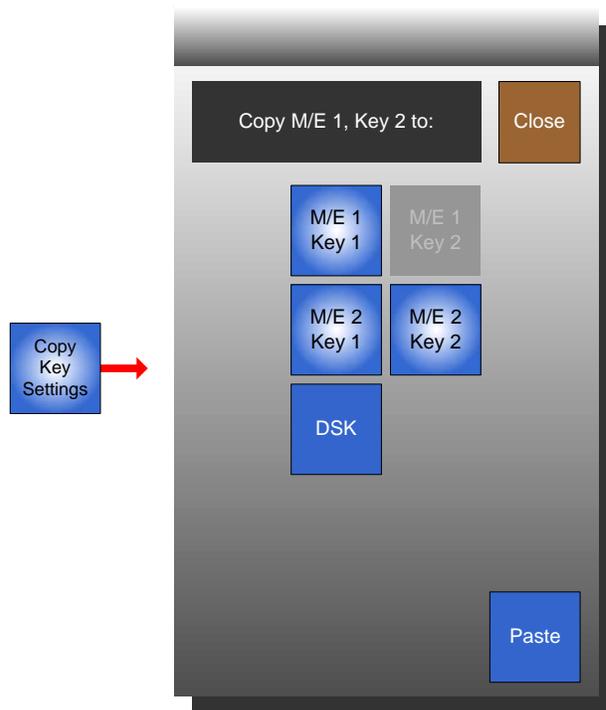


Figure 5-50. Copy Key Settings Keypad (sample)

The **Copy Key Settings Keypad** is context sensitive. The current keyer (from which you are copying) is grayed out, and the “prompt” section at the top confirms the source keyer.

To copy key parameters, press the button(s) for the keyer(s) to which you want to copy, then press **{Paste}**. Please note:

- Press **{Close}** to cancel safely without copying, and close the keypad.
- The copy function copies all parameters, including clip, gain, opacity, source, etc.
- In some cases, a keyer cannot be copied. For example, if the **External Key** is enabled in the DSK, the keyer’s parameters cannot be copied to an M/E keyer, because the **External Key** is electronically restricted to the DSK.

#### Note

The **{Copy Key Settings}** button is grayed out when the **{External Key}** function is enabled in the DSK.

## 5. Menu Orientation

### Keyer Menu

When a copy is requested and DVE channels are involved, please note the following important points:

- All parameters on the **Keyer Menu** are copied, provided that DVE channels are assigned to both the source and destination keyers. If there is an incompatibility between keyers, the **{Paste}** button will be grayed out, and a message will appear in the keypads' "prompt" section.
- All parameters on the **DVE Assign Menu** are *not* copied.
- All parameters on the **DVE Menu** are copied (e.g., the DVE effect as programmed).
- The DVE "arm" state in the control panel's **M/E Transition Section** is copied.

## Advanced Key Functions

From the **Keyer Menu**, press **{Advanced}** to display the **Advanced Keyer Menu**. For the selected keyer, the following advanced functions are provided on the **Tool Bar**:



Restore  
Default  
Settings

- Press **{Restore Default Settings}** to return the selected keyer to its default settings, as follows:
  - ~ **Clip, Gain and Opacity** are reset to defaults.
  - ~ **Key Type** is reset to **Luma**.
  - ~ **Key Fill** is reset to **Self**.
  - ~ **DVE Mode** (if applicable) is reset to **Key**.
  - ~ **DVE Mode enable** (if applicable) is reset to **On**.
  - ~ The **Key Source** does not change.

---

## Color Background Menu

The **Color Background Menu** enables you to select the full screen color for each color background signal that is currently mapped to the panel. You can also learn up to six “user” colors, which carry over to the **Color Picker Pop-up**, as well.

Color backgrounds are internally generated signals, and up to four can be mapped to the panel using the **Map Buttons Menu**. Refer to the “[Map Buttons Menu](#)” section on page 224 for menu details.

The figure below illustrates a sample **Color Background Menu**:

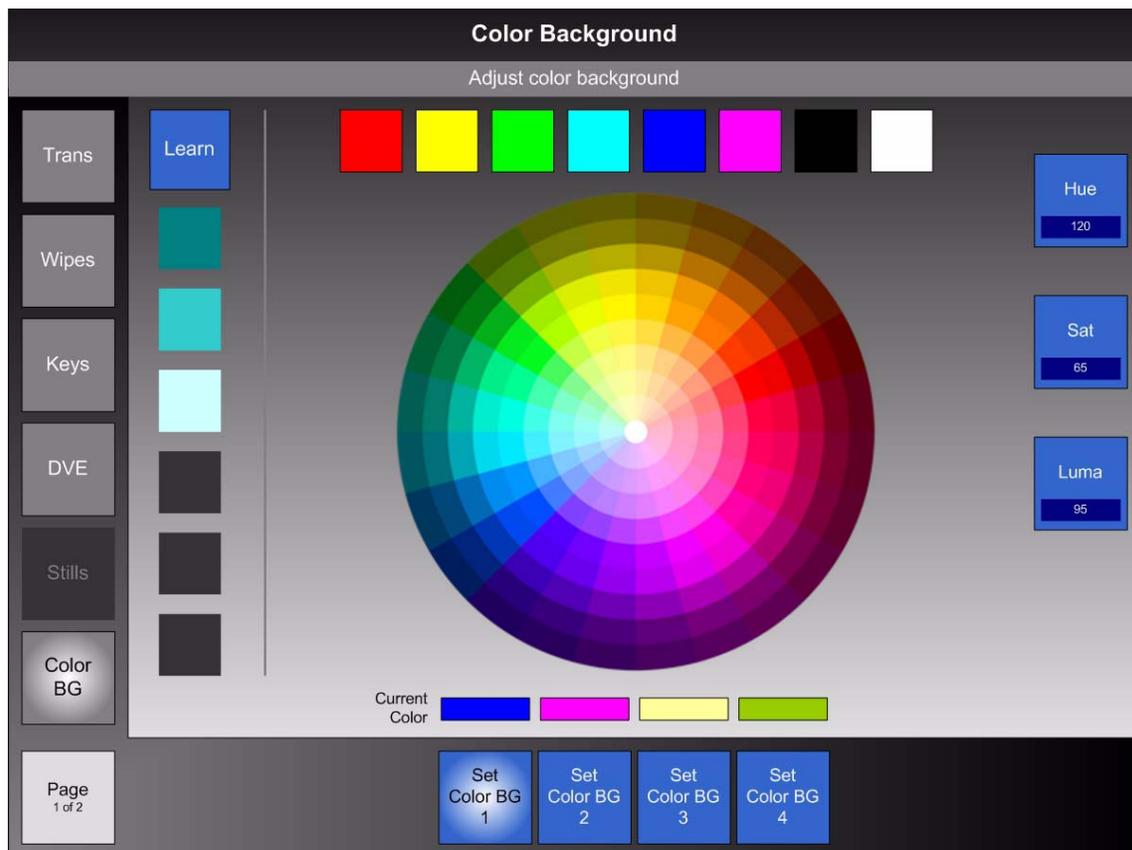


Figure 5-51. Color Background Menu (sample)

The following topics are discussed in this section:

- [Color Background Menu Access](#)
- [Color Background Functions](#)

## 5. Menu Orientation

### Color Background Menu

## Color Background Menu Access

To access the **Color Background Menu**:

- In the **Menu Bar**, press **{Page}** to display page 1 (if required). Then, press the **{Color BG}** button.

## Color Background Functions

The **Color Background Menu** provides several ways to select and modify colors. The following functions are discussed in this section:

- [Color Background Selection](#)
- [Color Chips](#)
- [Color Wheel](#)
- [Fine Tuning](#)
- [User Colors](#)

### Color Background Selection

Four **Color Background Selection** buttons are provided in the **Tool Bar**, one for each color background signal that can be mapped to the panel. To adjust a specific color background signal, press its button to associate the entire menu with that color.

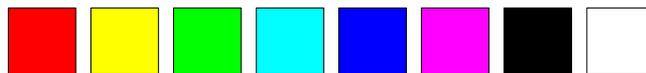


**Figure 5-52.** Color Background Selection buttons (sample)

Each button has a “**Current Color**” box directly above. This box shows the currently selected color, and the box updates as different colors are selected or fine-tuned.

### Color Chips

At the top of the **Color Background Menu**, a line of eight **Color Chips** are provided:



**Figure 5-53.** Color Chips

These chips provide one-touch access to the six primary colors, plus black and white. To choose a color, simply touch the desired chip. The “**Current Color**” box updates, and the values in the **{Hue}**, **{Lum}** and **{Sat}** controls also update.

#### Color Wheel

The **Color Wheel** enables you to select a color from the full 360 degree spectrum.



Figure 5-54. Color Wheel

To choose a color, simply touch the desired color on the wheel. The “**Current Color**” box updates, and the values in the **{Hue}**, **{Lum}** and **{Sat}** controls also update.

#### Fine Tuning

Three “fine tuning” controls are provided, enabling you to adjust the current color’s **Hue**, **Luminance** and **Saturation**.



Figure 5-55. Color Fine Tuning Controls

Use these value buttons to adjust the selected color background. The “**Current Color**” box updates as you adjust.

- **{Hue}** — Adjust the color background’s hue. **Range:** 0 to 360
- **{Lum}** — Adjust the color background’s luminance. **Range:** 0 to 100
- **{Sat}** — Adjust the color background’s saturation. **Range:** 0 to 100

## 5. Menu Orientation

### Color Background Menu

#### User Colors

Along the left side of the **Color Background Menu**, the **User Colors Section** enables you to store (and apply) up to six favorite colors.

#### Note

These colors are also retained in the **Color Picker Pop-up**, which can be displayed in several different menus such as the **Wipe Menu**, **Key Menu** and the **DVE Menu**. Refer to the [“Color Picker Pop-up”](#) section on page 173 for details.



**Figure 5-56.** User Colors Section (sample)

To learn a color:

- Select a color background signal (1 - 4).
- Select the desired color in the normal way — either with the color chips, color wheel, or the fine-tuning controls.
- Press **{Learn}**, then press any one of the six “user” chips. Once a chip is selected, the color appears in the chip, and the procedure is complete. You can also overwrite a chip in the same manner.

To apply a “user” color back into a color background signal:

- Select a color background signal (1 - 4).
- Select the desired color chip in the **User Colors Section**.

## Color Picker Pop-up

The **Color Picker Pop-up** enables you to use the color wheel, the color chips, and up to six “user” colors in a variety of locations throughout the menu system. These locations are:

- **Wipe Menu** — when a hard edge is selected.
- **Keyer Menu** — when {**Matte**} is selected as the fill, and {**Matte Color**} is pressed.
- **DVE Menu** — when {**Border Width Color**} is selected on the **Border Shadow Opacity Panel**.

In each of these menu locations and conditions, the {**Color Picker**} button appears above the top value button.



Figure 5-57. Color Picker Button

Press the {**Color Picker**} button to display the **Color Picker Pop-up**.

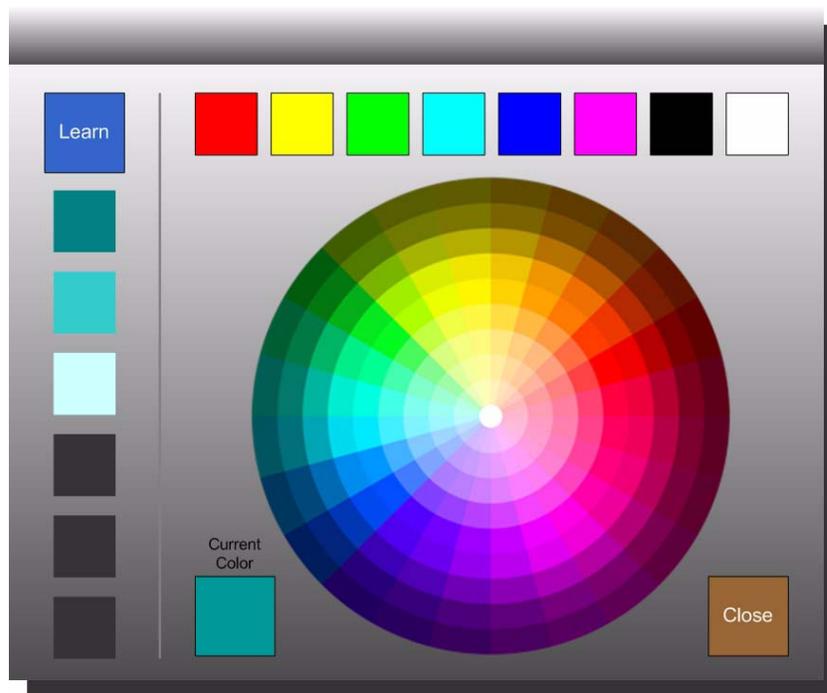


Figure 5-58. Color Picker Pop-up (sample)

Operating the **Color Picker Pop-up** is identical to selecting colors on the **Color Background Menu** — except that you are selecting one color (for a specific function such as matte), instead of selecting colors for four color background signals. Using the functions in the **User Colors Section** is also identical.

Refer to the “[Color Chips](#),” “[Color Wheel](#),” and “[User Colors](#),” sections for complete operating details.

## 5. Menu Orientation

### Memory Menu

---

## Memory Menu

The **Memory Menu** enables you to manage your memory registers. This includes the ability to view, name, lock and delete registers, plus the ability to enable or disable Memory Modules, and the sub-sections within each module called “**Enables.**” Remember, however, that the storage and recall modes can only be entered by pressing **STORE** or **RECALL** on the control panel.

The **Memory Menu** includes two different screens:

- The **Memory Menu** itself provides a table of all 1000 memory registers. Refer to the “[Memory Menu Description](#)” section on page 176 for details.
- The **Enables Menu** provides a close-up view of one register only, and all of its associated Enables. Refer to the “[Enables Menu Description](#)” section on page 178 for details.



The term “**Memory Modules**” itself refers to the eight yellow buttons in the control panel’s **Memory Section**, and the corresponding columns in the Memory Menu’s table of registers. These buttons select the large categories of switcher functions to be included in the selected store or recall operation.

There are three modes in which both of the menus described above can be used:

- In the **View Mode**, you can look at all memory registers, name registers, and view the status of all modules and Enables. You cannot modify the modules or Enables within a register, but you can lock registers and delete registers.
- In the **Store Mode**, you can name registers, modify modules and Enables, but you cannot lock or delete registers.
- In the **Recall Mode**, you can modify modules and Enables, but only those that were initially stored. You cannot name, lock or delete registers.

The table below summarizes the functions you can perform in each mode:

**Table 5-2.** Memory Menu modes and functions

Memory Menu Mode	Name Registers	Modules	Enables	Lock Registers	Delete Registers
View	Yes	View Only	View Only	Yes	Yes
Store	Yes	Modify	Modify	No	No
Recall	No	Modify	Modify	No	No

The following topics are discussed in this section:

- [Memory Menu Access](#)
- [Memory Menu Description](#)
- [Enables Menu Description](#)
- [Selecting Registers](#)
- [Naming Registers](#)
- [Advanced Memory Functions](#)

## Memory Menu Access

There are two ways to access the **Memory Menu**:

- In the **Menu Bar**, press **{Page}** to display page **2** (if required). Then, press the **{Memory}** button.
- Press and hold either the **STORE** or **RECALL** button in the control panel's **Memory Section**.

When either of the two methods above are used, the following rules apply:

- If neither the **STORE** nor the **RECALL** button is lit, you will access the menu in **View Mode**.
- If **STORE** is lit, you will access the menu in **Store Mode**.
- If **RECALL** is lit, you will access the menu in **Recall Mode**.

### Note

Regardless of the mode, you will always return to the last menu used, either the **Memory Menu** or the **Enables Menu**. For example, if you are working on the **Enables Menu** and you jump over to the **Transition Menu**, you will return to the **Enables Menu**.

### Important

Remember that you can store and recall memory registers by using the **Memory Section** on the control panel only — without accessing the **Memory Menu**. In this “panel only” mode, you can select registers and modules, but you cannot modify any Enables. Please note:

- If you store a register using the control panel's **Keypad** only (without using the **Memory Menu**), all Enables will be on.
- If you recall a register using the control panel's **Keypad** only (without using the **Memory Menu**), all Enables will be on — exactly as stored in the register.

## 5. Menu Orientation

### Memory Menu

## Memory Menu Description

The figure below illustrates a sample **Memory Menu** in the **View Mode**.

Memory Menu

Press **STORE** on the panel to store a new register, or **RECALL** to recall a register

Reg	Lock	Description	Modules								
			M/E 1	M/E 2	PGM	SYS	Cust	Still	AUX	DVE	
121	x	Show Open	x		x					x	
122	x	Bump 1 to Break	x		x					x	
123	x	Bump 2 to Break	x		x					x	x
124		Computer 1 to Aux 5								x	
125		Computer 2 to Aux 5								x	
126	x	VTR 1 to all banks	x		x						
127	x	Logo to all banks	x		x						
128		Key lock 1, M/E 1	x								
129		Key lock 2, M/E 1	x								
130		Register_130	x		x					x	x
131		Register_131	x		x					x	x
132											
133											
134		System Map 1					x				
135		System Map 2					x				

Page 2 of 2

Description

Enables

Advanced

Memory Register 123

**Figure 5-59.** Memory Menu, View Mode (sample)

The **Memory Menu** provides a table of all 1000 memory registers, using a view of 15 rows of registers at a time. The large register table itself is divided into two sections:

- The three left-hand columns list register numbers, locks and descriptions.
  - ~ **Reg** — indicates the register number, from 1 to 1000. Refer to the [“Selecting Registers”](#) section on page 183 for more information.
  - ~ **Lock** — indicates whether or not the register is locked, as set on the **Advanced Memory Menu**. An “x” indicates “locked.” Registers can only be locked and unlocked in **View Mode**.
  - ~ **Description** — displays a brief description (or name) of the register, as entered via the **{Description}** button. Descriptions can only be entered in **View** and **Store** modes.

### Note

The space above these three columns is reserved for the large **STORE** and **RECALL** labels, which confirm each specific mode of operation. When no label is present, the menu is in **View** mode.

## 5. Menu Orientation

### Memory Menu

- The eight right-hand columns (under the **Modules** heading) indicate which modules are included in each register. These columns correspond to the eight categories of modules available on the panel: **M/E 1**, **M/E 2**, **PGM**, **SYS** (System), **Cust** (Custom), **Still**, **Aux** and **DVE**. In Chapter 3, refer to the [“Memory Section”](#) heading on page 94 for a description of each module.

Please note:

- ~ An “**x**” in a cell indicates that the module is included in the register. The “**x**” does not indicate the status of the Enables within the module.
- ~ A blank cell indicates that the module is not part of the register.
- ~ If a column heading is grayed out, that module is not currently available.

#### Note

The **Cust** and **Still** modules are not available in version 3.0.

- In the table, the yellow highlight indicates the selected register. There are many ways that you can select registers, including touching, scrolling with the top knob, and pressing the **{Memory Register}** value button. Refer to the [“Selecting Registers”](#) section on page 183 for details on all selection methods.
- Press **{Description}** to display the keyboard, which enables you to enter a register description (or name). Refer to the [“Naming Registers”](#) section on page 184 for details.
- Press **{Enables}** to display the **Enables Menu**, which allows you to view or modify the Enables within each module. Refer to the [“Enables Menu Description”](#) section on page 178 for details.
- Press **{Advanced}** to display the **Advanced Memory Menu**, which allows you to delete and lock registers. Refer to the [“Advanced Memory Functions”](#) section on page 185 for details.

## 5. Menu Orientation

### Memory Menu

## Enables Menu Description

From the **Memory Menu**, press **{Enables}** to display the **Enables Menu**, as shown below in the **View Mode**.

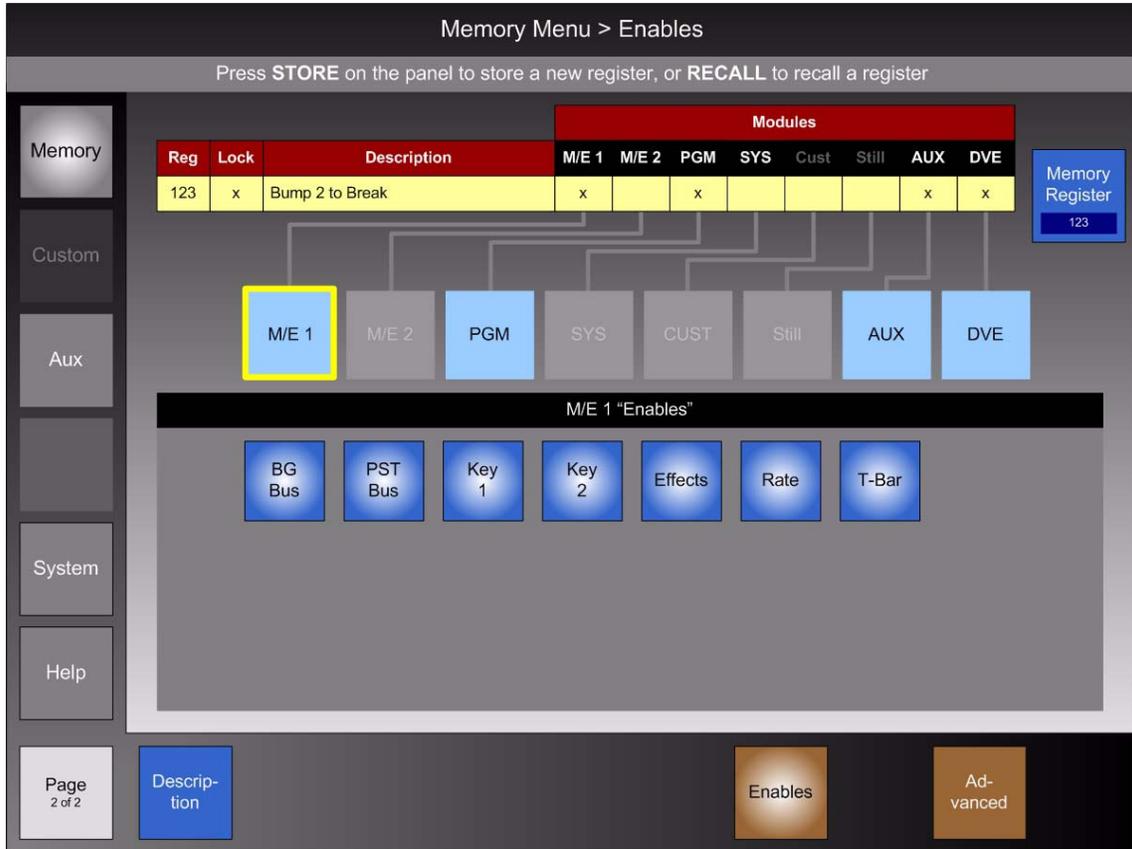


Figure 5-60. Enables Menu, View Mode (sample)

The **Enables Menu** provides a close-up view of the “selected” register only, and all of its associated Enables. The menu can be accessed in all modes (**View**, **Store** and **Recall**), but not all functions are available, depending on the mode.

Within an individual module, **Enables** themselves are arrays of sub-functions which can be toggled on or off as desired. For example:

- If you store a register that includes the M/E 1 module, there are seven Enables within that module that divide the M/E into its various functional components.
- You can elect to leave all enables on (and thus store or recall the *entire* M/E), or you can elect to turn specific Enables on or off (and thus store or recall only a *portion* of the M/E). Refer to the [“Enable Descriptions”](#) section on page 180 for a complete explanation of each module’s Enables.

The **Enables Menu** is divided into three sections:

- **Register Table** — The top portion of the menu provides the same table as the **Memory Menu**, but only the selected register is shown on a single line. All column headings are identical, including the space above the three left-hand columns — which is reserved for the large **STORE** and **RECALL** labels.

## 5. Menu Orientation

### Memory Menu

- **Module Section** — Below the table is a matrix of buttons, one for each module. Lines are drawn to the corresponding cells in the table for reference. Please note:
  - ~ For version 3.0, the **CUST** and **STILL** buttons are grayed out.
  - ~ In **Store Mode**, the **M/E 1**, **PGM**, **SYS**, **AUX** and **DVE** buttons are always blue, indicating their availability for storage or modification. When selected, the button is bordered in yellow, and its corresponding Enables appear in the **Enables Section**.
  - ~ In **Recall** and **View** modes, if a button is grayed out, that module was not stored in the selected register. If a button is blue, it can be selected and modified (in **Recall** mode), or viewed (in **View** mode).

- **Enables Section** — When a blue button is selected in the **Module Section**, the bottom portion of the menu shows all available Enables for that module. The title of this section (in the black bar) changes as different modules are selected.

Depending on the mode, the Enables can be viewed (only), or modified:

- ~ In **View Mode**, Enables can only be viewed.
- ~ In **Store Mode**, Enables can be modified. All Enables will be on by default, when you enter the **Store Mode**.
- ~ In **Recall Mode**, Enables can be modified — but only those that were originally “enabled” in the selected register.

When an Enable is modified, it can be toggled on or off as desired.

- ~ When toggled **On**, the Enable is included in the selected memory **Store** or **Recall** operation.
- ~ When toggled **Off**, the Enable is excluded from the selected memory **Store** or **Recall** operation.
- ~ When an Enable is grayed out, it was not included in a previous memory **Store** operation.

Refer to the “[Enable Descriptions](#)” section on page 180 for explanations of each category of Enables.

The following functions are also available:

- Registers can be selected with the top knob, or by pressing the **{Memory Register}** value button. Refer to the “[Selecting Registers](#)” section on page 183 for details.
- Press **{Description}** to display the keyboard, which enables you to enter a register description (or name). Refer to the “[Naming Registers](#)” section on page 184 for details.
- Press **{Advanced}** to display the **Advanced Memory Menu**, which allows you to delete and lock registers. The menu is only available in **View Mode**. Refer to the “[Advanced Memory Functions](#)” section on page 185 for details.
- On the **Enables Menu**:
  - ~ Press **{All On}** to toggle all Enables on during a **Store** or **Recall** operation.
  - ~ Press **{All Off}** to toggle all Enables off during a **Store** or **Recall** operation.

## 5. Menu Orientation

### Memory Menu

#### Enable Descriptions

This section provides descriptions of each module's Enables.

#### Note

All Enables can be toggled on or off, without restriction.

The following topics are discussed:

- [M/E 1 and M/E 2 Enables](#)
- [PGM Enables](#)
- [System Enables](#)
- [Aux Enables](#)
- [DVE Enables](#)

#### M/E 1 and M/E 2 Enables

The figure below illustrates the available Enables when the **M/E 1** or **M/E 2** module is selected. Both sets of Enables are identical — only the section title changes.

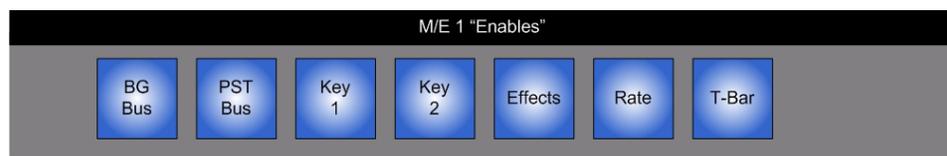


Figure 5-61. M/E 1 and M/E 2 Enables

#### Note

Remember that on the FSN-150, M/E 2 control must be enabled to utilize the M/E 2 memory module. In Chapter 7, refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for details.

Following are descriptions of each M/E 1 and M/E 2 Enable:

- **{BG Bus}** — stores or recalls the source selected on the M/E's BG bus.

#### Note

The **{BG Bus}** button does not store or recall input settings. It only stores or recalls the source. Use "**System**" enables to store and recall input settings.

- **{PST Bus}** — stores or recalls the source selected on the M/E's PST bus.
- **{Key 1}** — stores or recalls all settings for Keyer 1, plus the selected key source.
- **{Key 2}** — stores or recalls all settings for Keyer 2, plus the selected key source.

## 5. Menu Orientation

### Memory Menu

- **{Effects}** — stores or recalls the selections in the M/E's **Effects Group** and **Next Transition Group**.

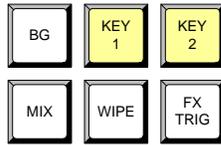


Figure 5-62. Effects Enables, M/E 1 and M/E 2

- **{Rate}** — stores or recalls the M/E's transition rate.
- **{T-Bar}** — stores or recalls the position of the T-Bar.

#### Note

There is no separate “enable” for **color background** settings. Each time you store the contents of the M/E, color background settings are automatically stored.

### PGM Enables

The figure below illustrates the available Enables when the **PGM** module is selected:

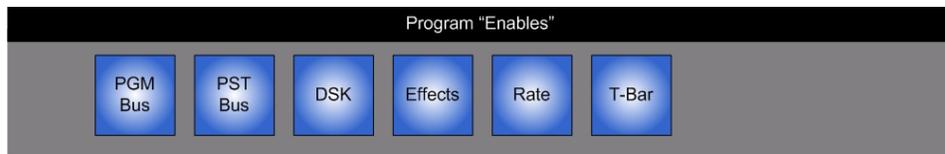


Figure 5-63. PGM Enables

Following are descriptions of each PGM Enable:

- **{PGM Bus}** — stores or recalls the source selected on the PGM bank's PGM bus.
- **{PST Bus}** — stores or recalls the source selected on the PGM bank's PST bus.
- **{DSK}** — stores or recalls all settings for the DSK, plus the selected key source.
- **{Effects}** — stores or recalls the selections in the PGM bank's **Effects Group** and **Next Transition Group**.



Figure 5-64. Effects Enables, PGM

- **{Rate}** — stores or recalls the PGM bank's transition rate.
- **{T-Bar}** — stores or recalls the position of the T-Bar in the PGM bank.

#### Note

There is no separate “enable” button for **color background** settings. Each time you store the contents of the M/E, color background settings are automatically stored.

## 5. Menu Orientation

### Memory Menu

#### System Enables

The figure below illustrates the Enables when the **SYS** (System) module is selected:

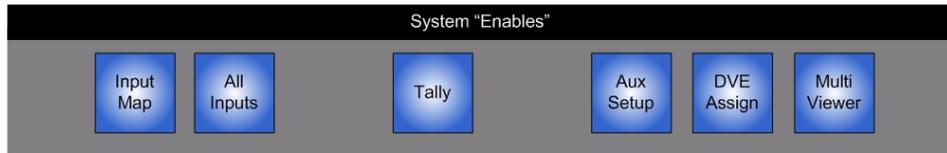


Figure 5-65. SYS Enables

Following are descriptions of each System Enable:

- **{Input Map}** — stores or recalls the panel's current input mapping, as set on the **Map Buttons Menu**. Refer to the "[Map Buttons Menu](#)" section for details.
- **{All Inputs}** — stores or recalls all input setup parameters (including the name) for both native and universal inputs, as set on the **Input Setup Menu**. Refer to the "[Input Menu](#)" section on page 202 for a menu description.
- **{Tally}** — stores or recalls all tally settings, as set on the **Tally Setup Menu**. Refer to the "[Tally Setup Menu](#)" section on page 235 for a menu description.
- **{Aux Setup}** — stores or recalls all Aux bus settings, as configured on the **Aux Setup Menu**. This Enable does *not* store Aux routes. Refer to the "[Aux Setup Menu](#)" section on page 240 for additional details.
- **{DVE Assign}** — stores or recalls all DVE assignments, as set on the **DVE Assign Menu**. Refer to Chapter 8, "[DVE Operations](#)" for details.
- **{Multi Viewer}** — stores or recalls all multiviewer settings, as set on the **Multiviewer Setup Menu**. Refer to the "[Multiviewer Setup Menu](#)" section on page 239 for menu details.

#### Aux Enables

The figure below illustrates the available Enables when the **Aux** module is selected. Note that if optional **NACs** and **UOCs** are installed, different combinations of additional Aux buses will be enabled. If an Enable is grayed out, the Aux card is either not installed, or the Aux output has been re-mapped using the **Aux Setup Menu**.

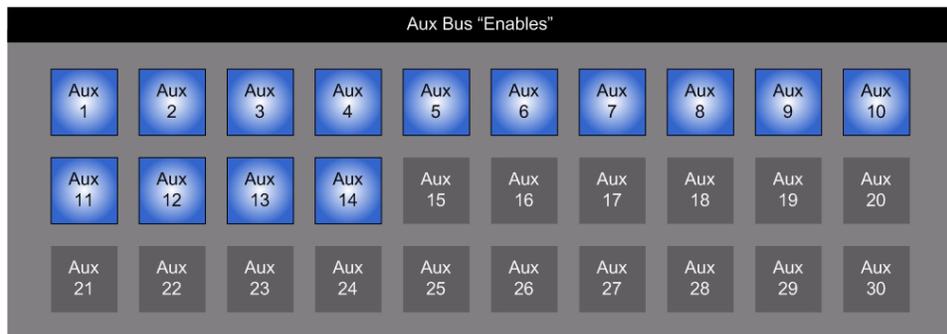


Figure 5-66. Aux Enables (sample)

Following are descriptions of each Aux Enable:

- **{Aux 1}** through **{Aux 30}** — stores or recalls the source assignment on the selected Aux Bus. For example, if **CAM 1** is assigned to **Aux 2**, that association will be stored or recalled in the memory register.

Please note:

- If a memory register is saved *without* any **NACs** or **UOCs** installed, only Aux 1 through 6 will be saved. If this register is recalled later *with* some combination of **NACs** and/or **UOCs** installed, only Aux 1 through 6 will change — the remaining Aux buses will not change.
- If a memory register is saved *with* some combination of **NACs** and/or **UOCs** installed, all enabled Aux buses will be saved. If this register is recalled later *without* the previous **NACs** and/or **UOCs** installed, all installed Aux buses will change, but the crosspoints for all missing Aux buses will be remembered. If the missing **NACs** and/or **UOCs** are inserted later in the frame, the outputs will be set to the crosspoints from this register.

### DVE Enables

The figure below illustrates the available Enables when the **DVE** module is selected. All four Enables are present, regardless of the number of DVE channels physically installed.

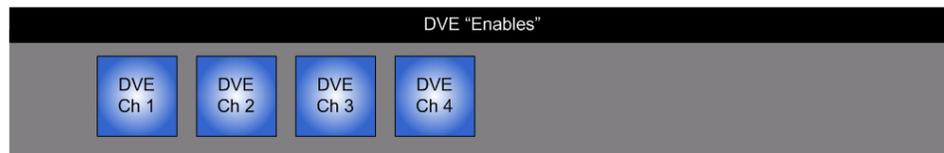


Figure 5-67. DVE Enables

Following are descriptions of each DVE Enable:

- **{DVE Ch 1}** through **{DVE Ch 4}** — stores or recalls the entire effect associated with the selected DVE channel — as currently programmed on the **DVE Menu**.

## Selecting Registers

The following methods are available for selecting memory registers:

- **Control Panel Selection** — in both **Store** and **Recall** modes, you can select registers using the **Memory Section**'s keypad. If the **Memory Menu** is visible, the highlight jumps to the new register.
- **Memory Menu, Table Selection** — In the **Store**, **Recall** and **View** modes, you can select a register simply by touching any of the 15 visible rows in the register table. The highlight jumps to the selected register.
- **Memory Menu, Knob Selection** — In the **Store**, **Recall** and **View** modes, on both the **Memory Menu** and the **Enables Menu**, you can select a register by turning the knob adjacent to the **{Memory Register}** value button.
  - ~ Turn clockwise to scroll down the list, incrementing register numbers.
  - ~ Turn counter-clockwise to scroll up, decrementing register numbers.

On the **Memory Menu**, note that when the highlight reaches the top or bottom of the screen, it remains there — and the entire table scrolls.

### Note

The **Fine Adjust** button in the **Memory Section** affects the scrolling rate. When **Fine Adjust** is **Off**, turning the knob scrolls in very large increments. When **On**, turning the knob scrolls in small increments.

## 5. Menu Orientation

### Memory Menu



- **Memory Menu, Value Button Selection** — In the **Store**, **Recall** and **View** modes, on both the **Memory Menu** and the **Enables Menu**, you can select a register by pressing the **{Memory Register}** value button. When the **Keypad** appears, enter the desired register and press **{Enter}**. The highlight jumps to the selected register.

Please note the following important points regarding register selection and tracking:

- As you enter register numbers using the physical **Keypad**, the highlight in the table tracks the register accordingly — for each digit entered. For example, if the target register is **123**, the highlight jumps to register **1** when the first digit is entered, register **12** when the second digit is entered, and register **123** when you complete the entry.
- As you enter register numbers using the physical **Keypad** in both **Store** and **Recall** modes, the module buttons track in the **Memory Section** — for each digit entered. For example, if the target register is **123**:
  - ~ When the first digit (**1**) is entered, the modules already stored in that register light (if any).
  - ~ When the second digit (**2**) is entered, the modules already stored in register **12** light (if any). These modules may be different than those in register **1**.
  - ~ When the third digit (**3**) is entered, the modules already stored in register **123** light (if any). Again, these modules may be different than those stored in register **12**.

## Naming Registers



The “name register” feature is available in the following memory modes only:

- **View Mode**
- **Store Mode**

By default, new registers are named **Register\_[n]**, where **[n]** is the number of the selected register. As desired, you can enter a custom description of a register.

To use the feature:

- Access the **Pop-up Keyboard**:
  - ~ From the **Memory Menu**, highlight the desired register in the table, and then press **{Description}**.
  - ~ From the **Enables Menu**, press **{Description}**.
- Enter a brief description, then press **{Enter}** to close the **Keyboard**.

### Note

In **View Mode**, the new (or edited) description appears immediately in the register table. In **Store Mode**, the new (or edited) description will not appear in the table until the **ENTER** button is pressed on the **Keypad**.

Refer to the [“Using the Pop-up Keyboard”](#) section on page 147 for more information about the **Keyboard**.

## Advanced Memory Functions

Advanced

The **Advanced Memory Menu** provides access to the following memory functions:

- [Locking and Unlocking Registers](#)
- [Deleting Registers](#)

Please note the following important points regarding the **Advanced Memory Menu**:

- the **Advanced Memory Menu** is only available in **View Mode**.
- If you initiate a **Store** or **Recall** function and you are not in the **Advanced Memory Menu**, the **{Advanced}** button is grayed out.
- If you initiate a **Store** or **Recall** function and you are already in the **Advanced Memory Menu**, the system automatically takes you back to the **Memory Menu**.

These functions occur to prevent you from locking, unlocking or deleting a memory register during a **Store** or **Recall** operation.

### Locking and Unlocking Registers

Lock  
Unlock

The “lock/unlock register” feature is available in the following memory mode only:

- **View Mode**

By default, a newly stored memory register is unlocked. As desired, you can lock a register to prevent accidental deletion, or accidental over-writing.

To use the feature:

- From the **Memory Menu**, highlight the desired register in the table, and then press **{Advanced}**.
- From the **Enables Menu**, press **{Advanced}**.

On the **Advanced Memory Menu**, press the **{Lock Unlock}** button to toggle the mode.

- If currently unlocked, pressing **{Lock Unlock}** locks the register, and an “X” appears in the appropriate table cell under the **Lock** heading. If you attempt to delete or over-write the register, an error message pops up on screen.
- If currently locked, pressing **{Lock Unlock}** unlocks the register and removes the “X” from the table cell.

### Deleting Registers

Delete  
Register

The “delete register” feature is available in the following memory mode only:

- **View Mode**

All registers except “locked” registers can be deleted. This action clears the selected memory register completely. To use the feature:

- From the **Memory Menu**, highlight the desired register in the table, and then press **{Advanced}**.
- From the **Enables Menu**, press **{Advanced}**.

On the **Advanced Memory Menu**, ensure that the register is unlocked. Then, press the **{Delete Register}** button to delete the register. You will be asked to confirm.

## 5. Menu Orientation

### Aux Menu

## Aux Menu

The figure below illustrates a sample **Aux Menu**.

The screenshot shows the 'Aux Menu' interface with a title bar 'Aux Menu' and a subtitle 'Route a source to Aux 6'. On the left is a vertical menu with buttons for 'Memory', 'Custom', 'Aux' (highlighted), 'System', 'Help', and 'Page 2 of 2'. The main area contains a table with three columns: 'Aux', 'Name', and 'Source'. The table is divided into three sections of 10 rows each. The first row in the second section (Aux 6) is highlighted in yellow.

Aux	Name	Source	Aux	Name	Source	Aux	Name	Source
1	VTR 1	PROGRAM	11	AUX 11	BLK	21	AUX 21	BLK
2	VTR 2	PROGRAM	12	AUX 12	BLK	22	AUX 22	BLK
3	Down 1	M/E1 PGM	13	AUX 13	BLK	23	AUX 23	BLK
4	Down 2	M/E2 PGM	14	AUX 14	BLK	24	AUX 24	BLK
5	Green Rm	PROGRAM	15	DVD 1	PROGRAM	25	AUX 25	BLK
6	SAT 1	CLN FEED	16	DVD 2	PROGRAM	26	AUX 26	BLK
7	SAT 2	PROGRAM	17	AUX 17	BLK	27	AUX 27	BLK
8	AUX 8	PROGRAM	18	AUX 18	BLK	28	AUX 28	BLK
9	AUX 9	CAM 1	19	AUX 19	BLK	29	AUX 29	BLK
10	AUX 10	CAM 2	20	AUX 20	BLK	30	AUX 30	BLK

**Figure 5-68.** Aux Menu (sample)

The **Aux Menu** provides status-at-a-glance for all installed Aux outputs, plus the ability to select a specific Aux bus on which to switch sources. To access the menu, press **{Page}** in the **Menu Bar** to display page 2 (if required). Then, press the **{Aux}** button.

The **Aux Table** provides three columns:

- The **Aux** column lists each installed (or mapped) Aux output, in ascending order. If an Aux bus is mapped (or re-mapped) on the **Aux Setup Menu**, that change is reflected in this column.
- The **Name** column lists each Aux output's default or custom name. Default names are "AUX #." Custom names can be up to eight characters in length.
- The **Source** column displays the names of the sources routed to each Aux output. The column displays system-generated names (such as **Program**) as well as user-defined names as configured on the **Input Setup Menu**.

#### Note

All setup, mapping and naming of Aux outputs is performed on the **Aux Setup Menu**. Refer to the "[Aux Setup Menu](#)" section on page 240 for details.

## 5. Menu Orientation

### Aux Menu

Please note:

- In the Aux table, buses are displayed as follows:
  - ~ Active Aux buses are displayed in gray.
  - ~ The highlighted Aux bus (on which sources can be switched) is displayed in light yellow.
  - ~ Aux buses that are not mapped, or for which physical Aux output cards are not installed, are grayed out.
- The **Aux Menu** and the Aux section on the panel work in sync with each other — selections on the physical Aux bus are reflected in the menu, and vice-versa (including the behavior of the **SHIFT** button). For example:
  - ~ When you press **Aux 2** on the **Aux Output Row**, Aux 2 will become highlighted in the menu.
  - ~ When you press **Aux 14** on the menu, Aux 14 on the **Aux Output Row** will light, along with the **SHIFT** button.
- To select an Aux bus, press the desired bus on the **Touch Screen**, or select the desired bus on the control panel's **Aux Output Row**.
- Aux outputs **1** through **16** on the menu are identical to Aux bus buttons **1** through **16** (with **SHIFT**) on the panel, but note that Aux outputs **17** through **30** only appear on the **Aux Menu**.
- Source switching is performed on **Aux Source Row** in the normal manner.

## 5. Menu Orientation

### System Menu

---

## System Menu

The following topics are discussed in this section:

- [System Menu Description](#)
- [Communications Setup Menu](#)
- [Reference and Output Setup Menu](#)
- [Input Menu](#)
- [Map Buttons Menu](#)
- [External DSK Setup Menu](#)
- [Clean Feed Setup Menu](#)
- [Tally Setup Menu](#)
- [DVE Assign Menu](#)
- [Multiviewer Setup Menu](#)
- [Aux Setup Menu](#)
- [Other Setup Menu](#)
- [User Preferences Menu](#)
- [Diagnostics Menu](#)
- [Software Menu](#)
- [Output Test Patterns Menu](#)
- [Lock/Unlock Panel](#)
- [Save All](#)
- [Backup and Restore Menu](#)
- [Reset Menu](#)
- [System Shutdown](#)

## System Menu Description

The figure below illustrates a sample **System Menu**.

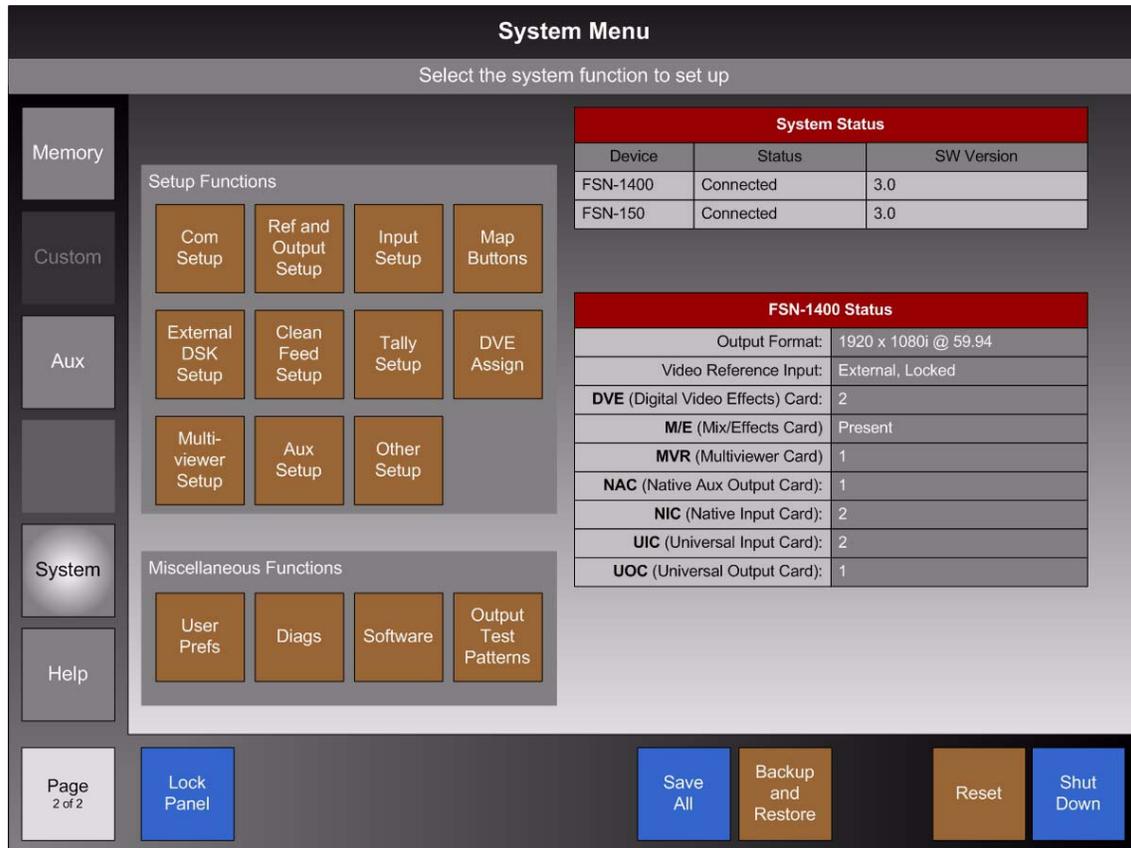


Figure 5-69. System Menu (sample)

The **System Menu** provides access to all setup functions, plus convenient status tables.

### Important

For all startup conditions, the **System Menu** is always displayed first.

The following topics are discussed in this section:

- [System Menu Access](#)
- [System Menu Functions](#)
- [Status Tables](#)
- [Lock/Unlock Panel](#)

### System Menu Access

To access the **System Menu**:

- In the **Menu Bar**, press **{Page}** to display page 2 (if required). Then, press the **{System}** button.

## 5. Menu Orientation

### System Menu

#### System Menu Functions

On the **System Menu**, navigation buttons are arranged in three groups:

- **Setup Functions** (at the top of the **Palette**)
- **Miscellaneous Functions** (at the bottom of the **Palette**)
- **Tool Bar** functions

#### Note

In the **Setup Functions** group, buttons are arranged in the *recommended* order in which the individual setup procedures should initially be performed — from left to right, and from top to bottom.

The following functions are provided in the **Setup Functions** group:

Com  
Setup

- Press **{Com Setup}** to display the **Communications Setup Menu**, which enables you to “discover” an FSN-1400 chassis (if required), and set up Ethernet. Refer to the [“Communications Setup Menu”](#) section on page 194 for details.

Ref and  
Output  
Setup

- Press **{Ref and Output Setup}** to display the **Reference and Output Setup Menu**, which enables you to set up the system’s video reference input, native resolution and output timing mode. Refer to the [“Reference and Output Setup Menu”](#) section on page 197 for details.

Input  
Setup

- Press **{Input Setup}** to display the **Input Setup Menu**, which enables you to set up both native and universal switcher inputs. Refer to the [“Input Menu”](#) section on page 202 for details.

Map  
Buttons

- Press **{Map Buttons}** to display the **Map Buttons Menu**, which enables you to map inputs and internal sources to the control panel. Refer to the [“Map Buttons Menu”](#) section on page 224 for details.

External  
DSK  
Setup

- Press **{External DSK Setup}** to display the **External DSK Setup Menu**, which enables you to set up the **DSK Cut** and **DSK Fill** inputs. Refer to the [“External DSK Setup Menu”](#) section on page 229 for details.

Clean  
Feed  
Setup

- Press **{Clean Feed Setup}** to display the **Clean Feed Setup Menu**, which enables you to set clean feed outputs and the source for the **ASSIGN** button. Refer to the [“Clean Feed Setup Menu”](#) section on page 232 for details.

Tally  
Setup

- Press **{Tally Setup}** to display the **Tally Setup Menu**, which enables you to set all tally relay closures. Refer to the [“Tally Setup Menu”](#) section on page 235 for complete details.

DVE  
Assign

- Press **{DVE Assign}** to display the **DVE Assign Menu**, which enables you to assign DVE channels to keyers, and name the channels. Refer to the [“DVE Assign Menu”](#) section on page 238 for complete details.

## 5. Menu Orientation

### System Menu

Multi-  
viewer  
Setup

- Press **{Multiviewer Setup}** to display the **Multiviewer Setup Menu**, which enables you to set up all aspects of the optional Multiviewer. Refer to the [“Multiviewer Setup Menu”](#) section on page 239 for complete details.

Aux  
Setup

- Press **{Aux Setup}** to display the **Aux Setup Menu**, which enables you to set up and map standard and optional Aux outputs. Refer to the [“Aux Setup Menu”](#) section on page 240 for complete details.

Other  
Setup

- Press **{Other Setup}** to display the **Other Setup Menu**, which enables you to set the priority of M/E 2 on the FSN-150. Refer to the [“Other Setup Menu”](#) section on page 253 for complete details.

The following functions are provided in the **Miscellaneous Functions** group:

User  
Prefs

- Press **{User Prefs}** to display the **User Preferences Menu**, which enables you to set a variety of important user preferences and options. Refer to the [“User Preferences Menu”](#) section on page 254 for details.

Diags

- Press **{Diags}** to display the **Diagnostics Menu**, which enables you to perform a variety of diagnostic tests to the system and view system error logs. Refer to the [“Diagnostics Menu”](#) section on page 257 for details.

Software

- Press **{Software}** to display the **Software Menu**, which enables you to update the FSN-1400 and control panel with the latest software version. Refer to the [“Software Menu”](#) section on page 268 for details.

Output  
Test  
Patterns

- Press **{Output Test Patterns}** to display the **Output Test Patterns Menu**, which enables you to select and display test patterns on all system outputs. Refer to the [“Output Test Patterns Menu”](#) section on page 270 for details.

The following functions are provided in the **Tool Bar**:

Lock  
Panel

- Press **{Lock Panel}** to lock and unlock the control panel. Refer to the [“Lock/Unlock Panel”](#) section on page 272 for details.

Save  
All

- Press **{Save All}** to save all system input and output setup parameters to non-volatile memory. Refer to the [“Save All”](#) section on page 272 for details.

Backup  
and  
Restore

- Press **{Backup and Restore}** to display the **Backup and Restore Menu**, which enables you to backup and restore the system to/from a USB drive. Refer to the [“Backup and Restore Menu”](#) section on page 273 for details.

## 5. Menu Orientation

### System Menu



- Press **{Reset}** to display the **Reset Menu**, which enables you to perform both soft and factory resets. Refer to the "[Reset Menu](#)" section on page 274 for details.
- Press **{Shut Down}** to display a prompt for performing a system shutdown. Refer to the "[System Shutdown](#)" section on page 276 for details.

### Status Tables

The **System Menu** includes two status tables, as described below.

- The **System Status Table** provides device, status and software version information:

System Status		
Device	Status	SW Version
FSN-1400	Connected	3.0
FSN-150	Connected	3.0

**Figure 5-70.** System Status Table (sample)

Column descriptions are as follows:

- ~ **Device** — lists the two system devices: FSN-1400 and the control panel.
  - ~ **Status** — provides device status, either **Connected** or **Not Connected**.
  - ~ **SW Version** — lists the device's software version.
- The **FSN-1400 Table** lists important system configuration information:

FSN-1400 Status	
Output Format:	1920 x 1080i @ 59.94
Video Reference Input:	External, Locked
<b>DVE</b> (Digital Video Effects) Card:	2
<b>M/E</b> (Mix/Effects Card)	Present
<b>MVR</b> (Multiviewer Card)	1
<b>NAC</b> (Native Aux Output Card):	1
<b>NIC</b> (Native Input Card):	2
<b>UIC</b> (Universal Input Card):	2
<b>UOC</b> (Universal Output Card):	1

**Figure 5-71.** FSN-1400 Table (sample)

Row descriptions are as follows:

- ~ **Output Format** — lists the system's native resolution.

## 5. Menu Orientation

### System Menu

- ~ **Video Reference Input** — lists the system's video reference input and "lock" status.

#### Note

Refer to the "[Reference and Output Setup Menu](#)" section on page 197 for details on setting up the **Output Format** and the **Video Reference Input**.

- ~ **DVE** — lists the number of optional **DVE Cards** in the chassis.
- ~ **M/E** — lists if the **M/E (Mix/Effect) Card** is missing or present.
- ~ **MVR** — lists if the optional **Multiviewer Card** is installed.
- ~ **NAC** — lists the number of optional **NAC Cards** in the chassis.
- ~ **NIC** — lists the number of standard and optional **Native Input Cards** in the FSN-1400 chassis.
- ~ **UIC** — lists the number of standard and optional **Universal Input Cards** in the chassis.
- ~ **UOC** — lists the number of optional **Universal Output Cards** installed.

## 5. Menu Orientation

### System Menu

## Communications Setup Menu

From the **System Menu**, press **{Com Setup}** to display the **Communications Setup Menu**, which enables you to “discover” an FSN-1400 chassis, and set up Ethernet.

The figure below illustrates a sample **Communications Setup Menu**.



Figure 5-72. Communications Setup Menu (sample)

At the top of the menu, the **Ethernet Status Table** provides system Ethernet information, along with an important note reminding you to set both the **IP address** and the **Subnet Mask**, prior to pressing **{Apply}**.

Use the top **Knob** to scroll the yellow highlight. Changes can be made to the ports shown on the highlighted row. The following columns of information are provided:

- **Connection** — lists the two control panel Ethernet ports, and the single FSN-1400 Ethernet port.
- **Status** — provides Ethernet port status, either “**Connected**” or “**Not Connected**.”
- **DHCP** — lists DHCP status, either **ON** or **OFF**.

#### Note

DHCP status cannot be changed in version 3.0.

- **IP Address** — lists the IP address of the associated Ethernet port. This address can be changed using the **{Set IP Address}** button.

## 5. Menu Orientation

System Menu

- **Subnet Mask** — lists the subnet mask of the associated Ethernet port. This address can be changed using the **{Set Subnet Mask}** button.
- **MAC** — lists the MAC address of the associated Ethernet port.

In the **Tool Bar**, the following operations can be performed on the highlighted port:

- If the **Status** column in the **Ethernet Status Table** reads **“Not Connected”** for any reason, use the “discover” process to locate the IP address(es) of all **FSN-1400** units within your local network. This action might be required, for example, if the IP address of a particular unit was changed.

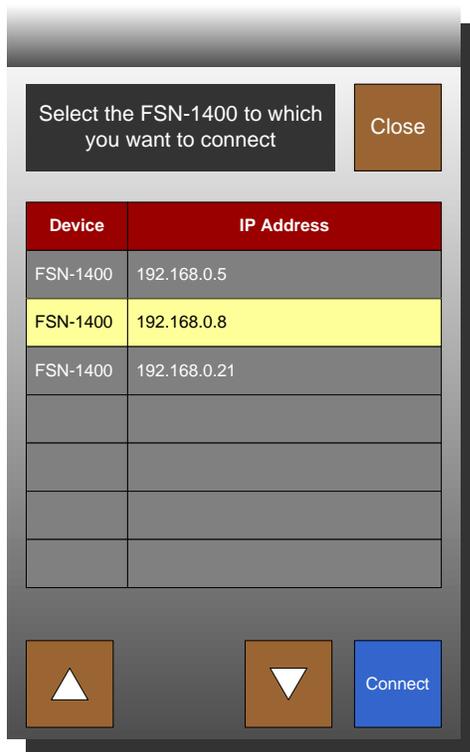
Press **{Discover FSN-1400}** to display the following pop-up:

Discover  
FSN-  
1400



**Figure 5-73.** Discover FSN-1400 pop-up

During this interval, the system searches the network for **FSN-1400** systems, and the **FSN-1400 Selection Keypad** appears:



**Figure 5-74.** FSN-1400 selection keypad (sample)

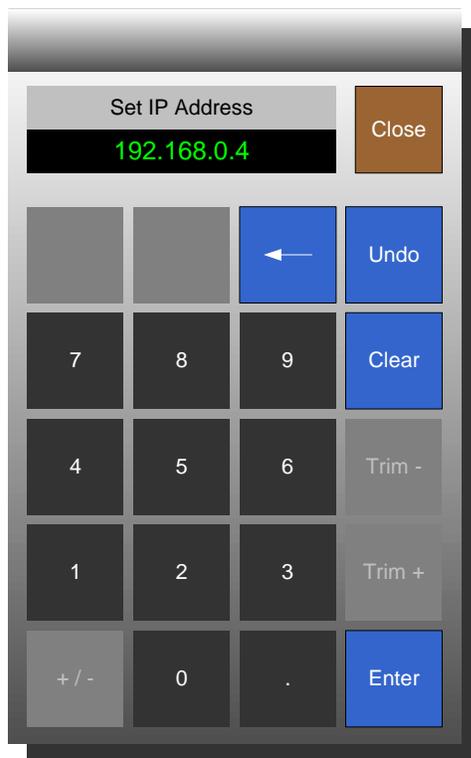
In the **Keypad**, touch the desired **FSN-1400**, and then press **{Connect}**.

## 5. Menu Orientation

### System Menu

Set IP  
Address

- To change the **IP address** of a highlighted port, press **{Set IP Address}** to display the **IP Address Keypad**:



**Figure 5-75.** IP Address keypad (sample)

Enter the desired IP address using the decimal point as the separator between the four “octets,” and press **{Enter}**.

#### Note

You do not have to enter all three digits in a particular octet. For example, you can enter **4** instead of **004**.

Set  
Subnet  
Mask

Apply

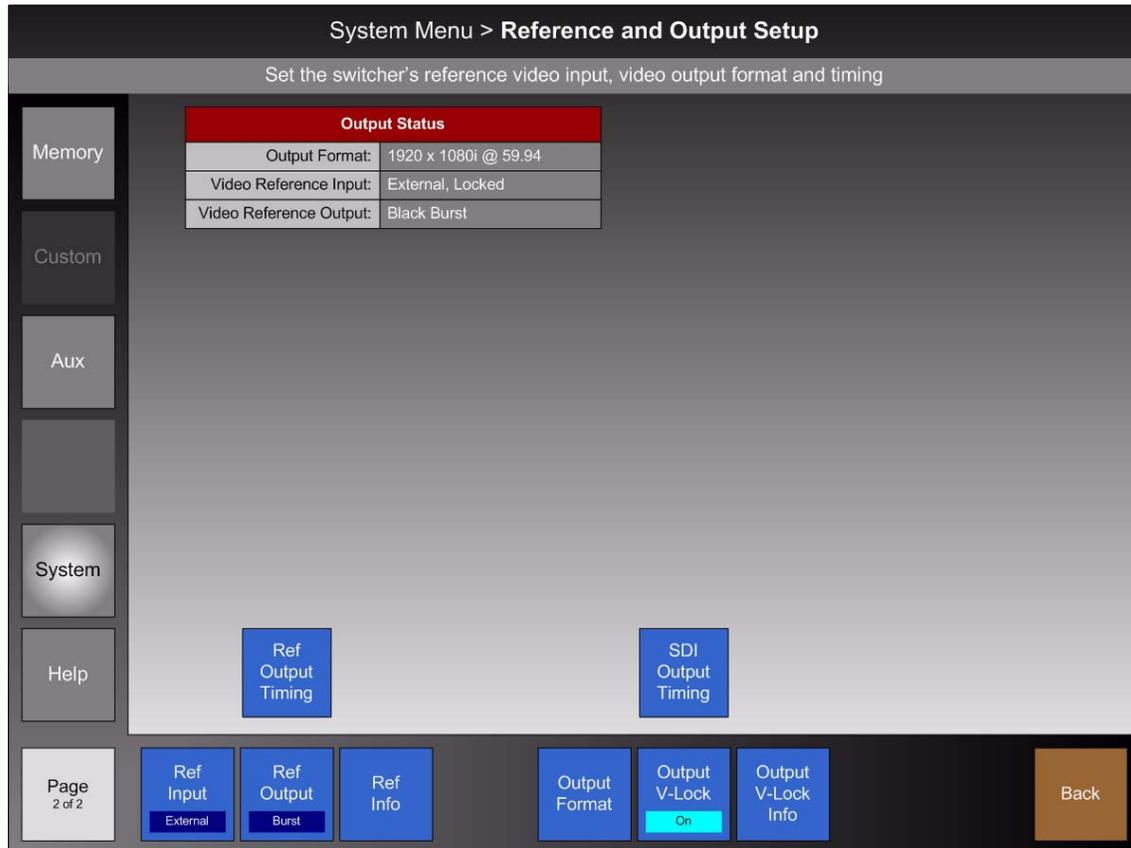
Restore  
Default  
Settings

- To change the **Subnet Mask** of a highlighted port, press **{Set Subnet Mask}** to display the **Subnet Mask Keypad**. Enter the desired subnet mask using the decimal point as the separator between the four “octets,” and press **{Enter}**.
- After setting both the **IP address** and the **Subnet Mask**, press **{Apply}** to complete the procedure.
- To return the highlighted port’s IP address and Subnet Mask to their factory default values, press **{Restore Default Settings}**.

### Reference and Output Setup Menu

From the **System Menu**, press **{Ref and Output Setup}** to display the **Reference and Output Setup Menu**, which enables you to set up the system's video reference input, output format (native resolution), and the output V-Lock setting.

The figure below illustrates a sample **Reference and Output Setup Menu**.



**Figure 5-76.** Reference and Output Setup Menu (sample)

At the top of the menu, the **Output Status Table** lists the status of the output format (native resolution), the reference video input and the reference video output.

Output Status	
Output Format:	1920 x 1080i @ 59.94
Video Reference Input:	External, Locked
Video Reference Output:	Black Burst

**Figure 5-77.** Output Status Table (sample)

The following rows of information are provided:

- **Output Format** — lists the current output format (native resolution).
- **Video Reference Input** — lists the current reference video input. Please note:
  - ~ If **Free Run** is selected with the **{Ref Input}** button, the label “**Free Run**” will be shown.

## 5. Menu Orientation

### System Menu

- ~ If **External** is selected with the **{Ref Input}** button, one of three different labels will be shown.
  - **External, Locked @ [rate]** — if reference video is detected and locked.

#### Note

If the reference is locked but the rate is incorrect (for the selected native format), the entire field will be red. In Appendix A, refer to the [“Reference Video Input Specifications”](#) section on page 433 for additional information about valid video reference frame rates.

- **External, Missing** — if reference video is missing. In this case, the field will be red.
- **External, Not Locked** — if a signal is detected but not locked. In this case, the field will be red.
- **Video Reference Output** — lists the reference video signal that is currently available on the **REF OUT** connector, on the **System** card’s I/O. Please note:
  - ~ If **Tri-level** is selected with the **{Ref Output}** button, “**Tri-level**” is shown in the table.
  - ~ If **Burst** is selected, “**Black Burst**” is shown in the table.

The following functions are provided in the **Tool Bar**:



- Press **{Ref Input}** to display a pop-up which offers two reference options:
  - ~ **Free Run** — selects the FSN-1400’s internal sync generator as the reference source.

#### Important

If **Free Run** is selected, the external **Cut** and **Fill** DSK inputs can not be used. In this condition, the **{External Key}** button on the **Keyer Menu** for the DSK will be grayed out.

- ~ **External** — selects the **REF IN** connector on the **System Card**. One of three external signals can be connected, as shown in the following table:

**Table 5-3.** External video reference input signals

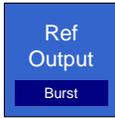
Reference Signal	Requirements
Bi-level sync	Signal meets SMPTE 170M timing requirements.
Tri-level sync	Signal meets SMPTE 274M timing requirements for analog sync for 1080i standards, and SMPTE 296M timing requirements for analog sync for 720p standards.
Black burst	Signal meets SMPTE 170M timing requirements.

#### Note

If **External** is selected, ensure that the proper signal is connected to the **REF IN** connector on the **System Card**. In Appendix A, refer to the [“Reference Video Input Specifications”](#) section on page 433 for detailed information about the allowed frame rates for the reference input.

## 5. Menu Orientation

System Menu



- Press **{Ref Output}** to change the reference video signal that is currently available on the **REF OUT** connector. Two options are available:
  - ~ **Tri-level** — selects a tri-level signal as the reference output.
  - ~ **Burst** — selects a black burst signal as the reference output.

As shown in the following table, note that the **{Ref Output}** button is grayed out when certain output formats are selected, and a default signal is automatically provided on the **REF OUT** connector.

**Table 5-4.** Reference output format exceptions

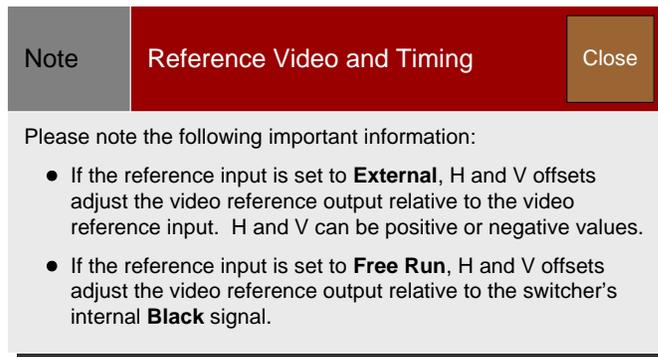
Output Format	Format Automatically Selected on REF OUT
NTSC (480i)	Black Burst
PAL (576i)	Black Burst
1080p @ 23.98	Tri-level
1080p @ 24	Tri-level



- Press **{Ref Output Timing}** to set the **H** and **V** offsets of the selected reference output. Two value buttons appear:
  - ~ Press **{Ref H Offset}** or use the adjacent **Knob** to set the desired amount of horizontal offset (in pixels).
  - ~ Press **{Ref V Offset}** or use the adjacent **Knob** to set the desired amount of vertical offset (in lines).



- Press the **{Ref Info}** button to display a pop-up with important information regarding the ability to change the reference output offsets.



**Figure 5-78.** Reference Output Information Pop-up

## 5. Menu Orientation

### System Menu



- Press **{Output Format}** to display the **Output Format Keypad**, which lists all available output resolutions.



**Figure 5-79.** Output Format Keypad

Each entry is listed using the following convention: **Format @ Fv (Hz)**. Select the desired format and press **{Apply}** to set the system's native resolution.

#### Important

After you press **{Apply}**, the system displays a pop-up, asking that you confirm or cancel the procedure.

In Appendix A, refer to the "[Output Formats](#)" section on page 449 for a complete list of all available output formats.



- Press the **{Output V-Lock}** button to toggle the **Output V-Lock** mode on or off. This button only appears when the **{Reference Input}** button is set to **External**.
  - ~ **On** — In this mode, the **{SDI Output Timing}** button appears, enabling you to set offsets anywhere relative to the external video reference input, with positive or negative values.

#### Important

When **{Output V-Lock}** is **On**, all native inputs are forced to **Frame Sync** mode, and up to one frame of delay will be incurred on all native inputs. In addition, on the **Input Setup Menu**, the **{Sync Mode}** button is grayed out. Refer to the "[Input Menu](#)" section on page 202 for more information.

### Important

When **{Output V-Lock}** is **On**, the position of the **DSK Cut** and **DSK Fill** inputs on screen will change.

- If the user preference “**Black on Invalid Video**” is turned on, the DSK turns off — because of the change in output timing.
- If the user preference “**Black on Invalid Video**” is off, the DSK will be visible — but in a shifted position. In this condition, the video position can be adjusted by changing the output timing of the DSK source itself.

~ **Off** — In this mode, you can not set H and V offsets, and the **{Sync Mode}** button is active on the **Input Setup Menu**.

### Note

When **{Output V-Lock}** is turned **Off**, after having been **On**, all inputs return to **Auto Mode** on the **Input Setup Menu**.

### Important

When **{Output V-Lock}** is **Off**, the least amount of video delay is provided through the switcher. The **DSK Cut** and **DSK Fill** inputs must be within  $\pm 0.5$  line of video reference.

SDI  
Output  
Timing

- When **{Output V-Lock}** is **On**, press **{SDI Output Timing}** to set **SDI H** and **V** offsets, anywhere relative to video reference. Two value buttons appear:
  - ~ Press **{SDI H Offset}** or use the adjacent **Knob** to set the desired amount of horizontal offset (in pixels) from video reference.
  - ~ Press **{SDI V Offset}** or use the adjacent **Knob** to set the desired amount of vertical offset (in lines) from video reference.
- Press the **{Output V-Lock Info}** button to display a pop-up with important information regarding the **Output V-Lock** mode. This button only appears when the **{Reference Input}** button is set to **External**.

Output  
V-Lock  
Info

Note
Output V-Lock Information
Close

Please note the following important information:

- When **Output V-Lock** is on, H and V offsets can be set anywhere relative to the external video reference input. All native inputs are forced to **Frame Sync** mode, and one frame of delay will be incurred on all native inputs. On the **Input Setup Menu**, the **Sync Mode** button is grayed out.
- When **Output V-Lock** is off, you can not set H and V offsets. On the **Input Setup Menu**, the **Sync Mode** button is active.

Figure 5-80. Output V-Lock Information Pop-up

## 5. Menu Orientation

### System Menu

## Input Menu

From the **System Menu**, press **{Input Setup}** to display the **Input Menu**, which enables you to set up both native and universal switcher inputs. The figure below illustrates a sample **Input Menu**.

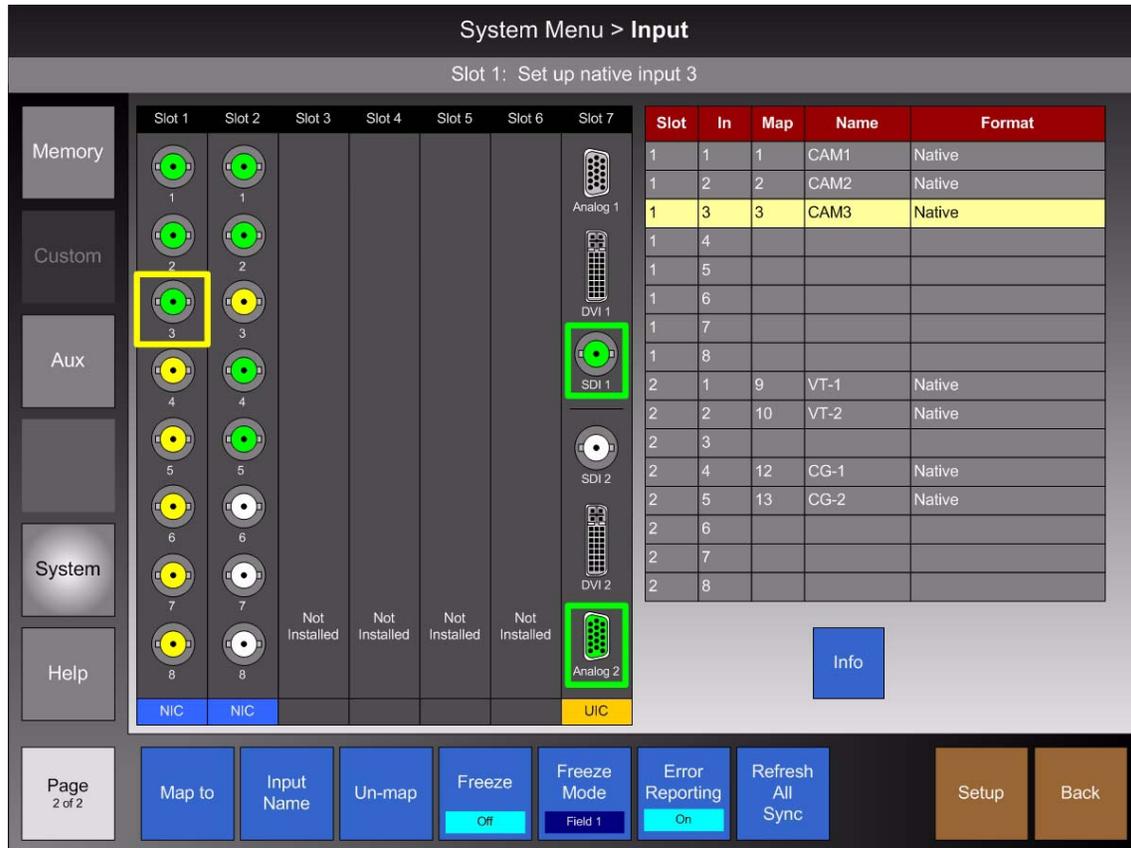


Figure 5-81. Input Menu (sample)

The **Input Menu** is divided in half. The left side of the **Palette** shows the **Rear I/O View**, while the right side shows the **Input Table**.

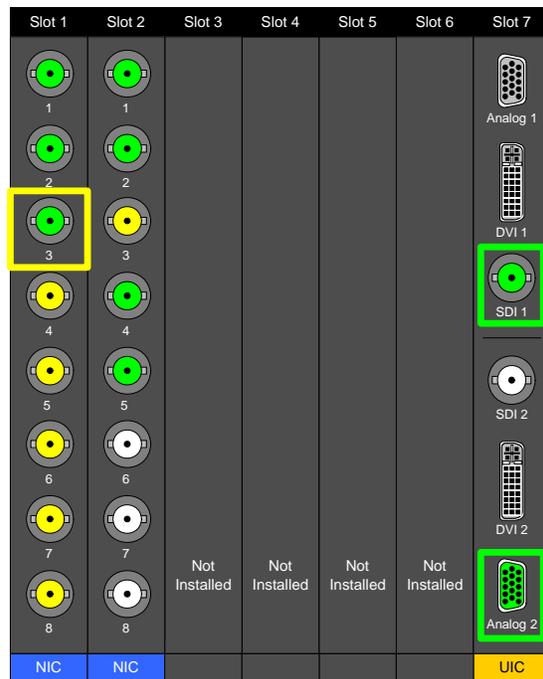
To set up an input, press the desired connector in the **Rear I/O View**. In the **Input Table**, the selected input is automatically highlighted. Once selected, you can name the input, map it to the control panel, and set up a variety of input parameters.

The following topics are discussed in this section:

- [Rear I/O View Description](#)
- [Connector Colors](#)
- [Input Table Description](#)
- [Input Menu Functions](#)
- [Input Setup Menu for Native Inputs](#)
- [Input Setup Menu for Universal Inputs](#)
- [Input Setup Menu Tool Bar Functions](#)
- [Input Setup Notes](#)

### Rear I/O View Description

The figure below illustrates a sample **Rear I/O View** on the **Input Menu**:



**Figure 5-82.** Input Menu, Rear I/O View (sample)

The **Rear I/O View** shows the I/O panels for FSN-1400 slots 1 through 7, which can be used for input cards. This view always matches your system configuration exactly — based on the installed cards. Please note:

- The number of each slot is shown along the top.
- The type of each installed card is shown along the bottom (e.g., **NIC**, **UIC**).
- If a card is not installed, the label “**Not Installed**” appears in the slot.
- To set up a native input, press the desired connector on a **NIC**. The yellow border indicates that the connector is selected, and in the **Input Table**, the input is automatically highlighted.
- To set up a universal input:
  - ~ Press any of the top three connectors to select **Input 1**, or any of the bottom three connectors to select **Input 2**. The selected input is highlighted with a yellow border around all three connectors.
  - ~ Next, press the desired connector (either **Analog**, **DVI** or **SDI**) to highlight it with a green border. This indicates that the connector is selected, and in the **Input Table**, the input is automatically highlighted.

Please note:

- ~ When you switch connectors on the **UIC**, freeze will always be turned off. If “**Black on Invalid Video**” is turned on, the input will go black as it acquires the new input.

Refer to the “[Connector Colors](#)” section on page 204 for important information about **Rear I/O View** connectors.



## 5. Menu Orientation

### System Menu

#### Connector Colors

On the **Rear I/O Views** of the **UIC**, **NIC** and **M/E** panels, the color of the individual input connectors is significant:



- **Green** indicates that the input is mapped to the control panel, and the signal is OK.



- **Red** indicates that the mapped input has an "LOS" or "Invalid Signal" error. In this situation, the input's **Programmable Display** turns red, and the red "Error" button appears in the top right corner of the **Touch Screen**. Press the **{Error}** button to learn more. Refer to the "[Notes and Error Messages](#)" section on page 143 for details.

#### Note

For the input connectors on the **NIC** and **UIC**, this "red" condition only occurs if the input has been mapped to the panel, and the signal was previously OK.

#### Note

If desired, use the **{Error Reporting}** button to turn the red error message off, and return the **Programmable Display** to green. In this mode, the connector remains red. In Chapter 7, refer to the "[Understanding Error Messages](#)" section on page 316 for full details.



- **Yellow** indicates that the input is un-mapped, and a signal is present.



- **White** indicates that the input is un-mapped, and no input signal has been detected.

Info

The above "color" information is always available on the **Input Menu** and **External DSK Setup Menu**. Press **{Info}** to display the **Input Color Legend Pop-up**:



Figure 5-83. Input Color Legend pop-up

### Input Table Description

The figure below illustrates a sample **Input Table** on the **Input Menu**:

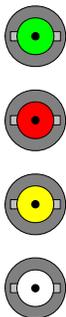
Slot	In	Map	Name	Format
1	1	1	CAM1	Native
1	2	2	CAM2	Native
1	3	3	CAM3	Native
1	4			
1	5			
1	6			

**Figure 5-84.** Input Table (sample)

The **Input Table** provides information about each input, and the yellow highlight automatically tracks the selected input connector in the **Rear I/O View**.

The following columns of information are provided:

- **Slot** — indicates the selected input card slot (1 through 7).
- **In** — indicates the selected input (1 through 8 for a **NIC**, 1 or 2 for a **UIC**).
- **Map** — indicates the control panel button to which the input is mapped, as defined with the **{Map to}** button. Unshifted locations are 1 through 10. Shifted locations are 11 through 20.
  - ~ If the cell is blank, the input is not mapped to the panel.
  - ~ If a “+” appears after the map location (e.g, **2+**), the input is mapped to more than one location on the panel.
- **Name** — indicates the input’s name, as defined with the **{Input Name}** button.
- **Format** — displays the following information:
  - ~ When the associated connector is green, the format is shown:
    - For a **NIC**, “**Native**” is shown.
    - For a **UIC**, the input’s resolution is shown (e.g., **1920 x 1080i @ 59.94**).
  - ~ When the associated connector is red, the label “**Error**” is shown.
  - ~ When the associated connector is yellow, the cell is blank.
  - ~ When the associated connector is white, the cell is blank.



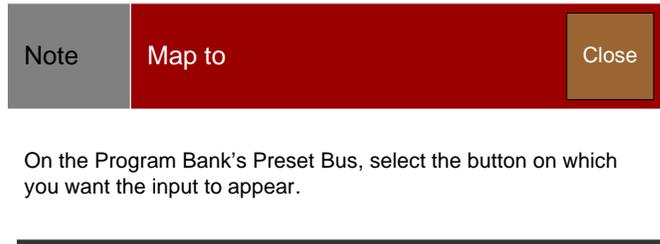
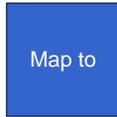
## 5. Menu Orientation

### System Menu

#### Input Menu Functions

The following functions are available in the **Tool Bar**:

- Press **{Map to}** to map the selected input to the control panel. When pressed, the **Map To Pop-up** appears.



**Figure 5-85.** Map To Pop-up

On the Program Bank's **Preset Bus**, press the button on which you want the input to appear. Once selected, the button mapping appears in the table's "**Map**" column, and the input can now be selected on the panel.

#### Note

Inputs can be mapped to more than one location on the panel. In this configuration, the "+" symbol appears in the Input Table's **Map** column.



- Press **{Input Name}** to associate a four-character name with the selected input. When pressed, the pop-up **Keyboard** appears. Enter the desired name and press **{Enter}** on the **Keyboard**. On the panel, the name appears on the display above the selected input. In the table, the name appears in the "**Name**" column.

See the "[Using the Pop-up Keyboard](#)" section on page 147 for more details about the keyboard, and the "[Default Naming Conventions](#)" section on page 208 for details about default input names.



- Press **{Un-Map}** to remove the selected input mapping from the panel. When pressed, the input is removed, and its name is also removed from the programmable display. Please note:
  - ~ If the input is mapped to more than one panel location, all locations are un-mapped and removed.
  - ~ When an input is un-mapped, the input name and all associated setup parameters are retained. Only the mapping is removed from the panel.



- For both native and universal inputs, press **{Freeze}** to toggle the freeze "state" of the selected input.
  - ~ Select **On** to freeze the input.
  - ~ Select **Off** to un-freeze the input.

#### Note

The button's state (**On** or **Off**) changes automatically if you perform a freeze or un-freeze using the control panel's **FRZ** and **UN FRZ** custom control functions. In Chapter 7, refer to the "[Using Custom Control Functions](#)" section on page 348 for details.

## 5. Menu Orientation

System Menu



- For interlaced native resolutions only, press **{Freeze Mode}** to display the **Freeze Mode Pop-up**. The following “freeze mode” options are available:
  - ~ **Field 1** — freezes the source on field 1.
  - ~ **Field 2** — freezes the source on field 2.
  - ~ **Frame** — freezes an entire frame. Note that with this selection, interfield motion may be present in the frozen image.

### Note

The **{Freeze Mode}** button does not appear when a progressive native resolution is set, nor does it appear when a **UIC** input is selected.



- Use the **{Error Reporting}** button to toggle error reporting on or off on a connector by connector basis.
  - ~ When **on**, if an input experiences an error, the associated BNC turns red on the rear I/O view. In addition, the input's **Programmable Display** turns red, and the “**Error**” button appears.
  - ~ When **off**, the input's **Programmable Display** remains green, the red “**Error**” button does not appear, and the error message is removed from the list in the **View Errors Menu**. The connector, however, remains red.

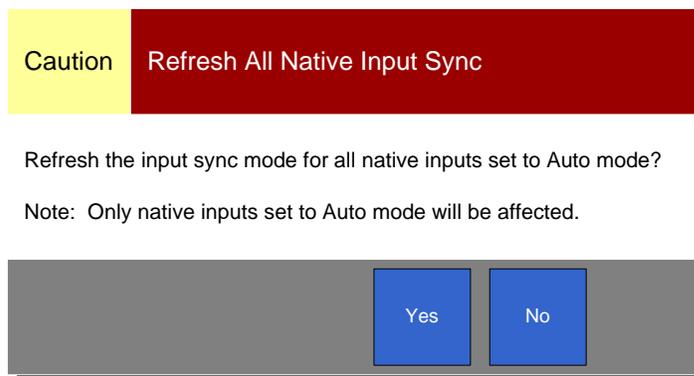
### Note

You can also use this button to turn error reporting off, after an error has occurred and you have acknowledged it.

In Chapter 7, refer to the “[Understanding Error Messages](#)” section on page 316 for more information.



- Press **{Refresh All Sync}** to display the **Refresh Sync Pop-up**, which can be used to refresh the input sync processing for all native inputs.



**Figure 5-86.** Refresh Sync Pop-up

- ~ Press **{Yes}** to refresh the sync processing for all native inputs whose sync mode is set to **Auto** (on the **Input Setup Menu**). Native inputs that are set to **Frame Sync** or **Minimum Delay** modes will not be affected.
- ~ Press **{No}** to cancel the procedure safely.

## 5. Menu Orientation

### System Menu



- Press **{Setup}** to display the **Input Setup Menu** for the selected input. Note that the display is different, depending if a native input is selected on a **NIC**, or a universal input is selected on a **UIC**.
  - ~ Refer to the "[Input Setup Menu for Native Inputs](#)" section for details on the menu functions for native inputs.
  - ~ Refer to the "[Input Setup Menu for Universal Inputs](#)" section for details on the menu functions for universal inputs.

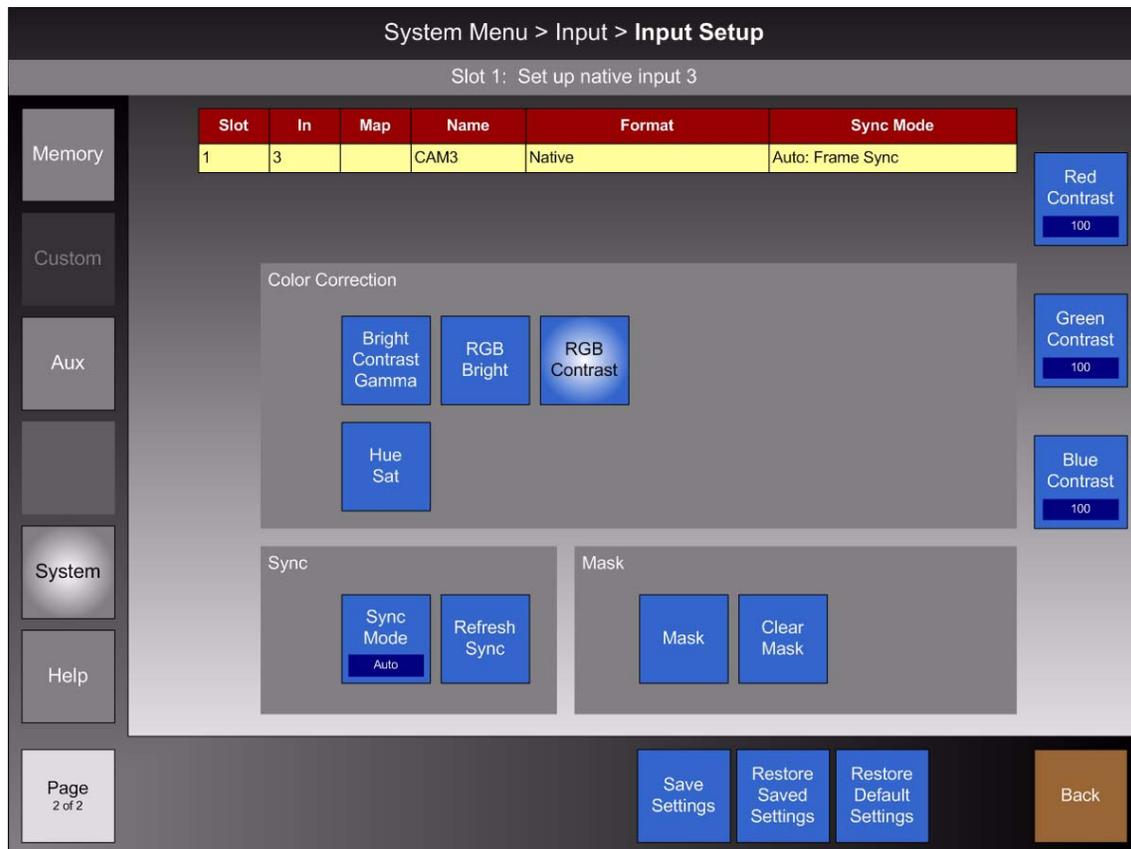
#### Default Naming Conventions

Each **NIC** and **UIC** input has a default name which can be left on the panel when inputs are mapped, or changed using the **{Input Name}** function.

- For **NIC** inputs, the convention is **N [slot #] - [input #]**. For example, **N2-3** indicates NIC in slot 2, input 3.
- For **UIC** inputs, the convention is **U [slot #] - [input #]**. For example, **U4-1** indicates UIC in slot 4, input 1.

## Input Setup Menu for Native Inputs

The figure below illustrates a sample **Input Setup Menu** when a native input is selected:



**Figure 5-87.** Input Setup Menu for native inputs (sample)

The top portion of the menu displays the same information as the **Input Table** on the **Input Menu** — but only the selected input is shown. Please note:

- The first five columns of information are identical.
- The **Sync Mode** column lists the mode selected with the **{Sync Mode}** button — either **Auto**, **Frame Sync** or **Minimum Delay**.
- If you select **Auto** mode for the input, the system-selected mode will be appended to the “**Auto**” prefix.

The bottom portion is divided into three sections, and additional functions are provided in the **Tool Bar**. Refer to the following sections for details:

- [Input Color Correction Section](#)
- [Input Sync Section](#)
- [Understanding Sync Mode](#)
- [Input Mask Section](#)

## 5. Menu Orientation

### System Menu

#### Input Color Correction Section

The figure below illustrates the **Input Color Correction Section**. Note that the controls are identical for both native and universal inputs.



**Figure 5-88.** Input Color Correction Section

The following input adjustments are provided:

Bright  
Contrast  
Gamma

- Press **{Bright Contrast Gamma}** to adjust overall brightness, contrast and Gamma. Three value buttons appear:
  - ~ Use the **{Bright}** button (or knob) to set brightness.
  - ~ Use the **{Contrast}** button (or knob) to set contrast.

**Range:** 50% to 150%

**Default:** 100%

- ~ Use the **{Gamma}** button (or knob) to set gamma.

**Range:** 0.50 to 3.00 (in .01 increments)

**Default:** 1.00

RGB  
Bright

- Press **{RGB Bright}** to adjust RGB brightness. Three value buttons appear:
  - ~ Use the **{Red Bright}** button (or knob) to set red brightness.
  - ~ Use the **{Green Bright}** button (or knob) to set green brightness.
  - ~ Use the **{Blue Bright}** button (or knob) to set blue brightness.

**Range:** 50% to 150%

**Default:** 100%

RGB  
Contrast

- Press **{RGB Contrast}** to adjust RGB contrast. Three value buttons appear:
  - ~ Use the **{Red Contrast}** button (or knob) to set red contrast.
  - ~ Use the **{Green Contrast}** button (or knob) to set green contrast.
  - ~ Use the **{Blue Contrast}** button (or knob) to set blue contrast.

**Range:** 50% to 150%

**Default:** 100%

Hue  
Sat

- Press **{Hue Sat}** to adjust hue and color saturation. Two value buttons appear:

- ~ Use the **{Hue}** button (or knob) to set the hue.

**Range:** -90 to +90

**Default:** 0

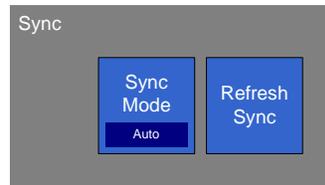
- ~ Use the **{Sat}** button (or knob) to set the saturation.

**Range:** 0 to 125

**Default:** 100

### Input Sync Section

The figure below illustrates the **Input Sync Section** for native inputs:



**Figure 5-89.** Input Sync Section, Native Inputs



- Press **{Sync Mode}** to display the **Sync Mode Pop-up**, which enables you to set the selected native input's sync mode. Refer to the "[Understanding Sync Mode](#)" section below for details.
- When the selected native input's sync mode is set to **Auto** and the system switches to **Auto: Frame Sync**, the system stays in that mode until the sync detection is manually refreshed. Press **{Refresh Sync}** to refresh the sync detection process for the selected native input.

This procedure enables the **Auto** mode to switch back to **Minimum Delay** mode — provided that the signal is within range. Please note:

- ~ The button only appears when the selected input is set to **Auto** mode.
- ~ In **Auto: Minimum Delay** mode, the button is grayed out.
- ~ In **Auto: Frame Sync** mode, the button is active.

#### ■ Understanding Sync Mode

The **{Sync Mode}** button enables you to set the selected native input's sync mode, for both native inputs (on **NICs**) and the two native external DSK inputs. The button is only enabled under certain configurations:

- When the reference video input is set to **{External}** and **{Output V-Lock}** is **On** (on the **Reference and Output Setup Menu**), all native inputs are forced to **Frame Sync** mode and the **{Sync Mode}** button is grayed out. The button's insert reads "**Frame Sync.**"
- When the reference video input is set to **{External}** and **{Output V-Lock}** is **Off**, the **{Sync Mode}** button is enabled.

Refer to the "[Reference and Output Setup Menu](#)" section on page 197 for more information on the **Reference and Output Setup Menu**.

The following three options are available in **Sync Mode Pop-up**:

- **Auto** — In this mode, the system automatically selects either **Frame Sync** or **Minimum Delay** mode, based on the input signal's relationship to the external reference video signal.
  - ~ If the input is equal to or less than  $\pm$  one-half line from video reference, **Minimum Delay** mode is automatically selected. The **Sync Mode** column in the table displays **Auto: Minimum Delay**.

## 5. Menu Orientation

### System Menu

- ~ If the input is greater than  $\pm$  one-half line from video reference, **Frame Sync** mode is automatically selected. The **Sync Mode** column in the table displays **Auto: Frame Sync**.

#### Important

If **Frame Sync** mode is selected automatically, the **{Refresh Sync}** button is enabled. See the [“Input Sync Section”](#) heading for details.

- **Frame Sync** — In this mode, the system synchronizes the selected input to the external video reference. One frame of delay is added to the input.
- **Minimum Delay** — In this mode, the selected input must be within  $\pm$  one-half line for minimum delay to function properly. If the input video is outside this range, the video signal may tear or go to black — depending on how the **Black on Invalid Video** function is set. Refer to the [“User Preferences Menu”](#) section on page 254 for details.

#### Important

**Minimum Delay** mode is recommended for system setup only. It is recommended that you use **“Auto”** mode during your production.

The table below summarizes the amount of delay incurred for a selected native input in each of the three sync modes:

**Table 5-5.** Input delay for selected sync modes

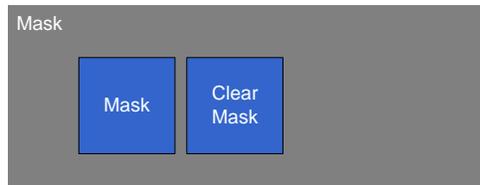
Sync Mode	Input Delay	
	Input video is $\leq \pm 1/2$ line of reference	Input video is $\geq \pm 1/2$ line of reference
<b>Auto</b>	Minimum delay	1 frame delay *
<b>Frame Sync</b>	1 frame delay	1 frame delay
<b>Minimum Delay</b>	Minimum delay	Invalid video behavior **

\* Remember that in **Auto** mode, if the system switches to **Frame Sync**, the system stays in the mode. To return to **Minimum Delay** mode, press the **{Refresh Sync}** button. See below for details.

\*\* Invalid video will either tear, or go to black, depending on how the **Black on Invalid Video** function is set on the **User Preferences Menu**. Refer to the [“User Preferences Menu”](#) section on page 254 for details.

### Input Mask Section

The figure below illustrates the **Input Mask Section** for native inputs:



**Figure 5-90.** Input Mask Section, Native Inputs

The following adjustments are provided:



- Press **{Mask}** to mask one or more edges of the video signal, if required. When a mask is applied on a selected edge, black is revealed in each masked section. Four value buttons appear:

~ Use the **{Mask Top}** button or knob to mask the top edge.

~ Use the **{Mask Bottom}** button or knob to mask the bottom edge.

**Range:** 0 to the image's maximum number of vertical lines

**Default:** 0

~ Use the **{Mask Left}** button or knob to mask the left edge.

~ Use the **{Mask Right}** button or knob to mask the right edge.

**Range:** 0 to the image's maximum number of horizontal pixels

**Default:** 0

**Note**

The range shown in the **Keypad's** top **Function Bar** is dynamic. For example, if you press **{Mask Left}** and mask 100 pixels from the image's left edge, when you press **{Mask Right}**, the maximum range is now 100 pixels less.



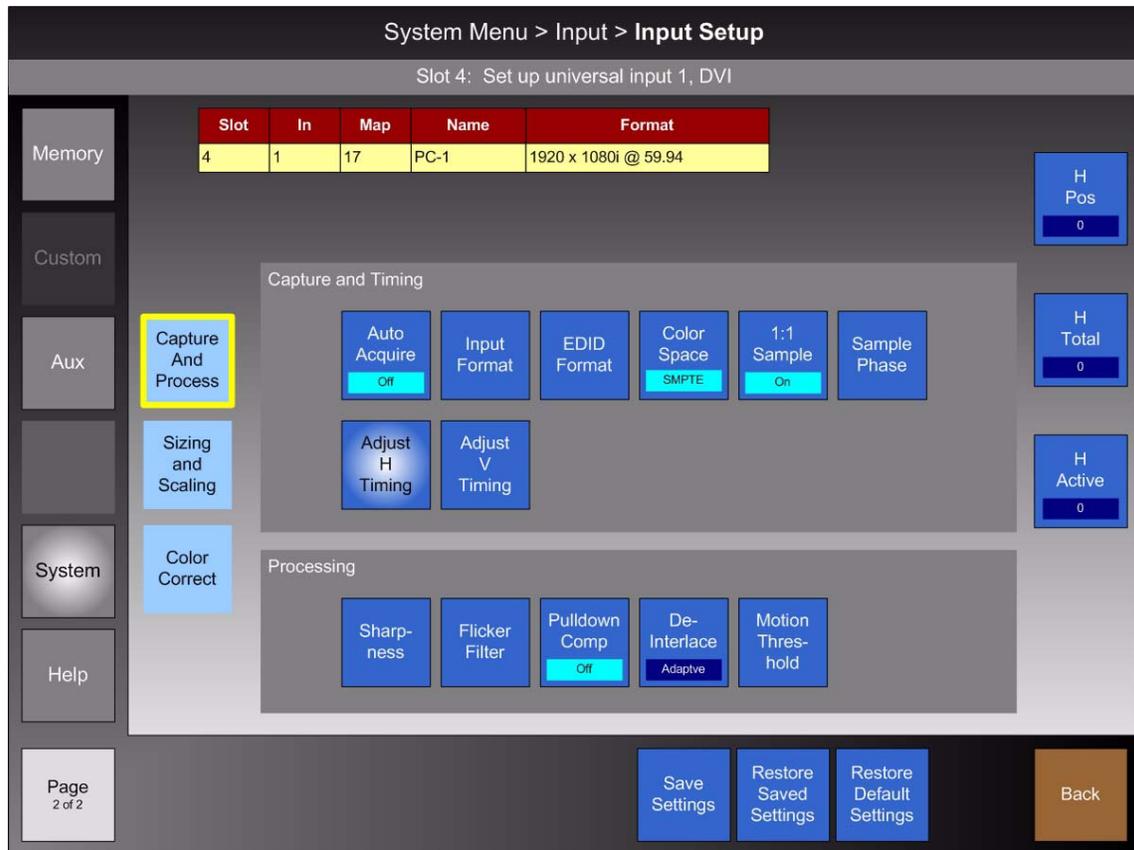
- Press **{Clear Mask}** to clear all four mask values back to 0 (zero).

## 5. Menu Orientation

### System Menu

#### Input Setup Menu for Universal Inputs

The figure below illustrates a sample **Input Setup Menu** when a universal input is chosen on the **Input Menu**. The **Capture and Process Panel** is selected:



**Figure 5-91.** Input Setup Menu for universal inputs (sample)

The top portion of the menu displays the same information as the **Input Table** on the **Input Menu** — but only the selected input is shown. The columns of information are identical.

The bottom portion consists of three panels. Each panel, in turn, is divided into sections that pertain to specific adjustment parameters.

Refer to the following sections for details:

- [Input Capture and Process Panel](#)
- [Input Sizing and Scaling Panel](#)
- [Input Color Correction Panel](#)

Capture  
And  
Process

### Input Capture and Process Panel

On the **Input Setup Menu** for universal inputs, press **{Capture and Process}** to display the **Input Capture and Process Panel**.

The panel is divided into two sections:

- [Input Capture and Timing Section](#)
- [Input Processing Section](#)

#### ■ Input Capture and Timing Section

The figure below illustrates the **Input Capture and Timing Section**:



**Figure 5-92.** Input Capture and Timing Section, Universal Inputs

The following adjustments are provided:

Auto  
Acquire  
Off

- Press **{Auto Acquire}** to toggle the **Auto Acquire** mode **On** or **Off**. This function is per connector on the **UIC**, and not per input.
  - ~ When **Off**, you can manually set the resolution of the incoming source using the **{Input Format}** button.
  - ~ When **On**, the system attempts to detect the input resolution. As the system auto-acquires, it compares the incoming signal to the formats stored in the **Input Format Table**. When an exact match is found, the format is applied and the **Format** field in the table is updated.

#### Note

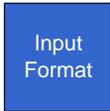
If an exact match cannot be found, you may need to use **{Input Format}** button to set the format manually.

Please note the following important points regarding **Auto Acquire**:

- ~ Once the system acquires a new input format, it automatically scales the input up (or down) to the current native resolution.
- ~ The input's aspect ratio is fully maintained in this process, and no masking will be applied. For example:
  - ▲ If a 1024 x 768 input is scaled up to 1920 x 1080 (HD/1080i), the system fills vertically, leaving black pillars on either side.
  - ▲ If a 1920 x 1080 input is scaled down to 1280 x 720 (HD/720p), the system fills horizontally, leaving black bars on the top and bottom.
- ~ After the input has been acquired, you can manually change the method by which the system fills the screen, and you can also mask any edge and re-scale the input. Refer to the "[Input Sizing and Scaling Panel](#)" section on page 219 for details.

## 5. Menu Orientation

### System Menu



- Press **{Input Format}** to display the **Input Format Keypad**. Use the up (▲) and down (▼) arrows to locate the desired format in the list, then press **{Apply}** to accept. In Appendix A, refer to the [“Input and Output Format Tables”](#) section on page 445 for the complete list of formats.
- Press **{EDID Format}** to display the **EDID Format Keypad**, which enables you to update the preferred EDID (Extended Display Identification Data) resolution for the selected input. EDID is a VESA standard data format that contains information about a display device and its capabilities, including the preferred (as well as the allowed) device resolutions.

#### Note

This function is available for analog and DVI inputs only. The button does not appear when an SDI input is selected on the **UIC**.

The selected input's EDID file is stored in non-volatile memory. This file is read by a computer's DVI graphics card during boot-up, when its DVI output is connected to a DVI-I input connector on the FSN-1400. The FSN-1400 must be powered on first for the EDID information to be read.

#### Important

This feature is designed for advanced users only. Do not program the EDID unless it is necessary.

In the **EDID Format Keypad**, use the up (▲) and down (▼) arrows to locate the desired EDID format in the list, then press **{Apply}** to program the EDID.

Please note the following additional important points:

- ~ The EDID on the **UIC** will be reprogrammed under the following circumstances:
  - EDID settings are changed on the **UIC Input Setup Menu**.
  - Factory defaults are restored on the system.
  - A “**SYS**” memory register is recalled which contains different EDID settings.
  - A previous system configuration is restored in which different EDID settings are present.
  - When a **UIC** is replaced, the EDID on the new **UIC** will be changed to match the previous card's EDID.
  - When the **System Card** is hot-swapped.
- ~ The EDID on the **UIC** will not be reprogrammed when the **{Restore Default Settings}** button is pressed, in the **UIC Input Setup Menu**.
- Press **{Color Space}** to toggle between **SMPTE** and **RGB** processing. Note that the system automatically sets the Color Space based on the selected format, but the color space can be changed if desired.
  - ~ Select **SMPTE** to process the input signal in the SMPTE color space (4:2:2), in which the two chroma components are sampled at half the sample rate of luminance component. This mode is commonly used for cameras, video servers, etc.



## 5. Menu Orientation

System Menu

- ~ Select **RGB** to process the input signal in RGB color space (4:4:4), in which the individual red, green and blue signals are sampled at the same rate. The **RGB** mode is typically used for computer and graphic sources.

### Note

This function is available for DVI and analog inputs only, with the exception of NTSC and PAL. The button does not appear when an SDI, NTSC or PAL input is selected on the **UIC**.



- Press **{1:1 Sample}** to toggle the 1:1 sampling mode on or off.
  - ~ Select **On** to process the input with pixel-for-pixel sampling to provide better image quality.
  - ~ Select **Off** to process the input with multiple samples for every pixel. This mode generally results in a "softer" image.

### Note

This function is available for analog inputs only, with the exception of NTSC and PAL. The button does not appear when SDI, DVI, NTSC or PAL inputs are selected on the **UIC**.



- Press **{Sample Phase}** to display the **Sample Phase** value button. Use the button (or knob) to adjust the input's A/D converter, allowing you to select where pixels are sampled (ideally, on the pixel's peak).

**Range:** -16 to 15

**Default:** 0

For optimum visual results when adjusting high-resolution sources, output a burst test pattern from the source, and adjust for minimum noise.

### Note

This function is available for analog inputs only, with the exception of NTSC and PAL. The button does not appear when SDI, DVI, NTSC or PAL inputs are selected on the **UIC**.



- Press **{Adjust H Timing}** to adjust the image's horizontal timing. Three value buttons appear:
  - ~ Use the **{H Pos}** button (or knob) to set the start of the active area's horizontal offset from H sync.
  - ~ Use the **{H Active}** button (or knob) to set the width of the active area.
  - ~ Use the **{H Total}** button (or knob) to set the total pixel count per line.

### Note

This function is available for analog inputs only, with the exception of NTSC and PAL. The button does not appear when SDI, DVI, NTSC or PAL inputs are selected on the **UIC**.



- Press **{Adjust V Timing}** to adjust the image's vertical timing. Two value buttons appear:
  - ~ Use the **{V Pos}** button (or knob) to set the start of the active area's vertical offset from V sync.
  - ~ Use the **{V Active}** button (or knob) to set the number of vertical lines in the image.

## 5. Menu Orientation

### System Menu

#### Note

This function is available for analog inputs only, with the exception of NTSC and PAL. The button does not appear when SDI, DVI, NTSC or PAL inputs are selected on the **UIC**.

#### Note

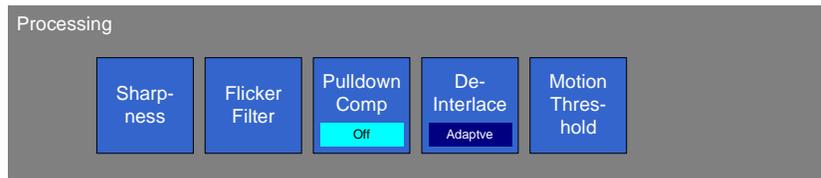
**V Total** is a fixed value which cannot be adjusted.

#### Important

Any time that input timing adjustments are made, the mask settings for the selected input will automatically be reset to their default values — without any notification on screen.

### ■ Input Processing Section

The figure below illustrates the **Input Processing Section** for universal inputs:



**Figure 5-93.** Input Processing Section, Universal Inputs

The following adjustments are provided:



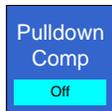
- Press **{Sharpness}** to display the **Sharpness** value button. Use the button (or knob) to set the input's sharpness.

**Range:** -16 (very smooth) to 15 (very sharp)

**Default:** 0



- Press **{Flicker Filter}** to display the **Flicker Filter** value button. Use the button (or knob) to adjust the filter for interlaced inputs.



- Press **{Pulldown Comp}** to toggle the Pulldown Compensation mode on or off.

~ Select **On** to apply pulldown compensation, in order to process video derived from film material.

~ Select **Off** to disable the mode. This is the default mode.

#### Note

This function applies only for standard video (component, s-video, composite) inputs.



- Press **{De-Interlace}** to display the **De-Interlace Pop-up**. If the input is interlaced, this function enables you to set how the system processes the input. The following options are available:

~ Select **Motion Adaptive** to use motion adaptive de-interlacing. In this mode, the **{Motion Threshold}** button appears. See below for details.

## 5. Menu Orientation

System Menu

- ~ Select **Field to Frame** to use field-to-frame de-interlacing. This mode avoids motion artifacts by converting individual input fields to progressive output frames.

### Note

This function is available for interlaced formats only. The button does not appear for progressive scan inputs.

Motion  
Thresh-  
hold

- If **Motion Adaptive** de-interlacing is selected, press **{Motion Threshold}** to adjust the threshold of the motion adaptive de-interlacer. Because adjustment is rarely required, it is recommended that you leave the function at its default setting.

**Range:** 0 to 15

**Default:** 15

### Input Sizing and Scaling Panel

Sizing  
and  
Scaling

On the **Input Setup Menu** for universal inputs, press **{Sizing and Scaling}** to display the **Input Sizing and Scaling** section. This panel enables you to scale a non-native resolution input up (or down) to the system's native resolution, set the image's sizing and scaling, pan and zoom the image, and set a mask if required.

The panel has one section, as shown below, plus additional sections that appear, depending on your selection.



**Figure 5-94.** Input Sizing and Scaling section

Size  
and  
Position

- In the **Input Sizing and Scaling** section, press **{Size and Position}** to display four size/position value buttons, plus the convenient **Quick Adjust** section.

- ~ Press **{H Size}** or use the knob to change the universal input's horizontal size. Remember that **{H Size}** and **{V Size}** track together if the **{Lock}** is enabled.

- ~ Press **{V Size}** or use the knob to change the universal input's vertical size.

- ~ Press the **{Lock}** button to lock or unlock **H** and **V** tracking. When locked, both parameters track together. When unlocked, H and V can be adjusted independently.

- ~ Press **{H Position}** or use the knob to change the universal input's horizontal position along the X axis.

- ~ Press **{V Position}** or use the knob to change the universal input's vertical position along the Y axis.

- ~ Press **{Reset}** to reset all size and position values to default (including those performed from the **Quick Adjust Section**). Any Mask values present in the image will not be affected.



Reset

## 5. Menu Orientation

### System Menu

The figure below illustrates the **Quick Adjust** section, which appears when **{Size and Position}** is pressed:



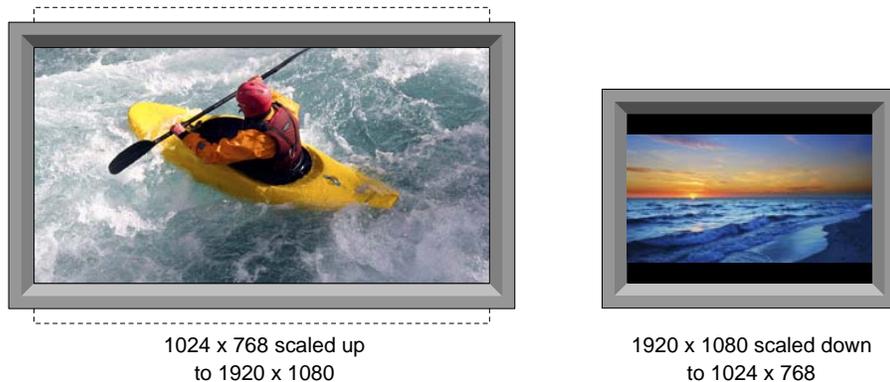
**Figure 5-95.** Quick Adjust Section

The following adjustments are provided:



- ~ Press **{Fill H}** to scale the selected universal input up (or down) to the current native **horizontal** resolution. Please note:
  - Aspect ratio is maintained. Manual size/position adjustments using the four value buttons are maintained.
  - If the left and/or right edges of the image are manually masked, those edges are used for the **Fill H** calculations.
  - Black bars are visible above and below an image, for example, when a 16:9 image is scaled down to 4:3.
  - The top and bottom portions of an image may fall outside of the raster, for example, when a 4:3 image is scaled up to 16:9.

The images below represent two examples of **Fill H**.



**Figure 5-96.** Fill H examples



- ~ Press **{Fill V}** to scale the selected universal input up (or down) to the current native **vertical** resolution. Please note:
  - Aspect ratio is maintained. Manual size/position adjustments using the four value buttons are maintained.
  - If the top and/or bottom edges of the image are manually masked, those edges are used for the **Fill V** calculations.
  - Black pillars are visible to the left and right of an image, for example, when a 4:3 image is scaled up to 16:9.
  - The left and right portions of an image may fall outside of the raster, for example, when a 16:9 image is scaled down to 4:3.

## 5. Menu Orientation

### System Menu

The images below represent two examples of **Fill V**.



**Figure 5-97.** Fill V examples

Fill  
H/V

- ~ Press **{Fill H/V}** to scale the selected universal input up (or down) to the current native **horizontal** and **vertical** resolutions. Please note:
  - Aspect ratio is not maintained. Non-proportional image stretching or compression will occur.
  - If any edges of the image are manually masked, those edges are used for the **Fill H/V** calculations.

The images below represent two examples of **Fill V**.



**Figure 5-98.** Fill HV examples

Pan  
Zoom  
Source

- ~ Use the **{Reset}** function to reset all size and position values to default.
- In the **Input Sizing and Scaling** section, press **{Pan Zoom Source}** to display four value buttons that enable you to size and position the video *within* the boundaries of the image's current sizing. In this mode, the outside boundaries remain constant, but you can pan and zoom the video inside, as desired.

#### Note

The **Pan Zoom Source** function does not allow you to reveal video that is outside of the input's active area.

The following functions are provided:

- ~ Press **{Source H Size}** or use the knob to change the source image's horizontal size. Remember that **{Source H Size}** and **{Source V Size}** track together if the **{Lock}** is enabled.

## 5. Menu Orientation

### System Menu

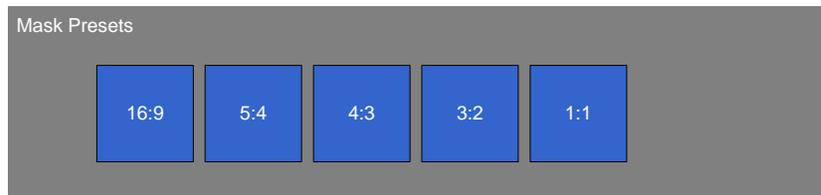


- ~ Press **{Source V Size}** or use the knob to change the source image's vertical size.
- ~ Press the **{Lock}** button to lock or unlock **H** and **V** source size tracking. When locked, both parameters track together. When unlocked, **H** and **V** can be adjusted independently.
- ~ Press **{Source H Pos}** or use the knob to change the source image's horizontal position along the X axis.
- ~ Press **{Source V Pos}** or use the knob to change the source image's vertical position along the Y axis.
- ~ Press **{Reset}** to reset all source pan and zoom values to default.
- In the **Input Sizing and Scaling** section, press **{Mask}** to display four “manual” mask value buttons, plus the convenient **Mask Presets** section. These functions enable you to mask (crop) the top, bottom, left, and right edges of the universal input. When a mask is applied on a selected edge, black is revealed in each masked section. All values are in percent, and the range is **0.00** to **100.0**.

The following manual mask controls are provided:

- ~ Press **{Mask Top}** or use the adjacent knob to manually mask the top edge of the universal input.
- ~ Press **{Mask Bottom}** or use the knob to manually mask the bottom edge of the universal input.
- ~ Press **{Mask Left}** or use the knob to manually mask the left edge of the universal input.
- ~ Press **{Mask Right}** or use the knob to manually mask the right edge of the universal input.
- ~ Press **{Reset}** to reset all mask values to default.

The figure below illustrates the **Mask Presets** section, which appears when **{Mask}** is pressed:



**Figure 5-99.** Mask Presets Section

#### Note

All mask presets are additive. For example, if you mask to **16:9** and then press **4:3**, the system creates the **4:3** mask using the previous **16:9** image as a base.

The following preset functions are provided:

- ~ Press **{16:9}** to mask the input to a 16:9 aspect ratio.
- ~ Press **{5:4}** to mask the input to a 5:4 aspect ratio.
- ~ Press **{4:3}** to mask the input to a 4:3 aspect ratio.
- ~ Press **{3:2}** to mask the input to a 3:2 aspect ratio.
- ~ Press **{1:1}** to mask the input to a 1:1 aspect ratio.

## 5. Menu Orientation

System Menu

Remember that once the image is masked as desired, you can use the **{Fill H}**, **{Fill V}** or **{Fill H/V}** functions to scale the image to full screen.

### Note

For each mask function, the range shown in the **Keypad's** top **Function Bar** is dynamic. For example, if you press **{Mask Left}** and mask 100 pixels from the image's left edge, when you press **{Mask Right}**, the maximum range is now 100 pixels less.

### Important

Any time that input timing adjustments are made, the mask settings for the selected input will automatically be reset to their default values — without any notification on screen.

### Input Color Correction Panel

Color  
Correct

On the **Input Setup Menu** for universal inputs, press **{Color Correct}** to display the **Input Color Correction Panel**. All functions are identical to those for native inputs. Refer to the ["Input Color Correction Section"](#) heading on page 210 for details.

### Input Setup Menu Tool Bar Functions

For both native and universal inputs, the following functions are provided in the **Tool Bar**:

Save  
Settings

- Press **{Save Settings}** to save the selected input's setup parameters in non-volatile memory.

Restore  
Saved  
Settings

- Press **{Restore Saved Settings}** to recall the selected input's setup parameters from non-volatile memory. This function effectively allows you to return to the saved settings, after making temporary adjustments.

Restore  
Default  
Settings

- Press **{Restore Default Settings}** to recall the selected input's default setup parameters back into the input's "temporary" settings. This function does not over-write the "saved" settings.

### Input Setup Notes

Please note the following important points regarding input setup:

- Because you can install and set up either a **NIC** or a **UIC** in input slots **3** and **4**, many creative input combinations are possible. However, if you move or change input card assignments in these two slots during the setup procedure, the setup is invalidated, and must be repeated once the final card configuration is reached.

## 5. Menu Orientation

### System Menu

## Map Buttons Menu

From the **System Menu**, press **{Map Buttons}** to display the **Map Buttons Menu**, which enables you to map inputs, test patterns and color background signals to buttons on the control panel. The figure below illustrates a sample menu.

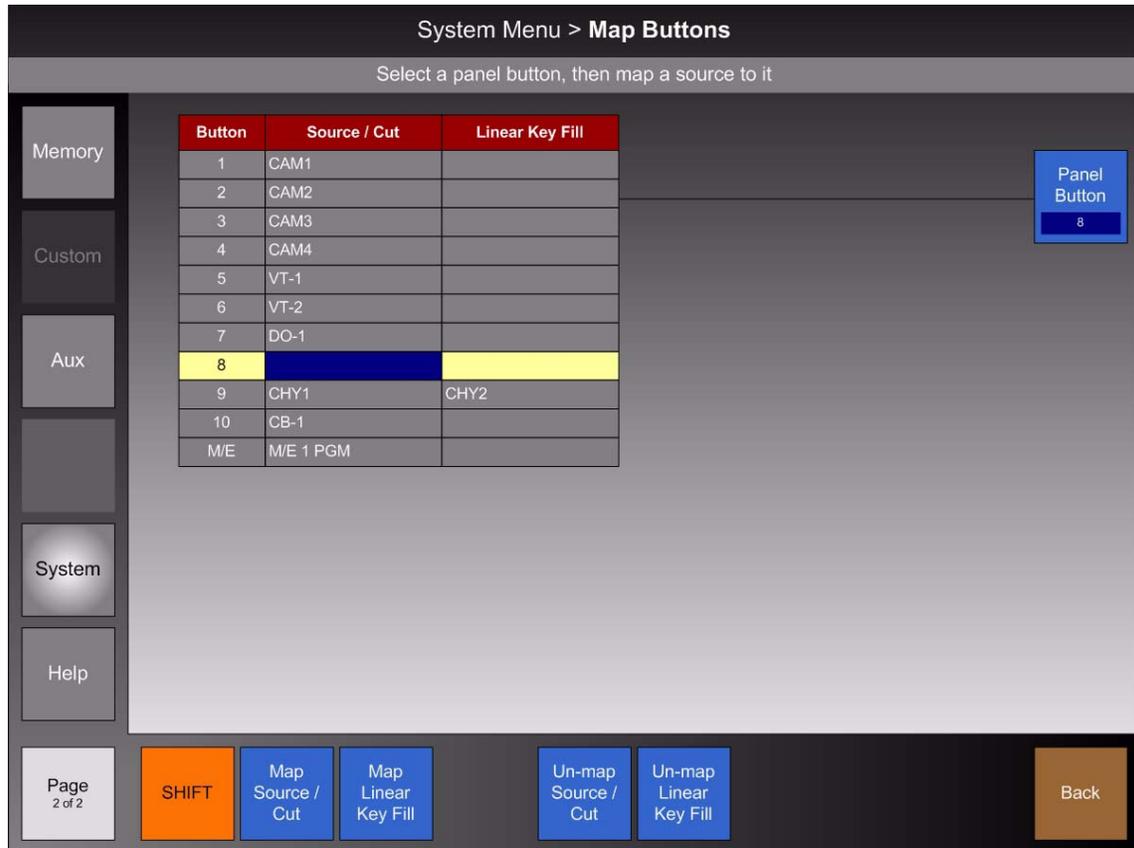


Figure 5-100. Map Buttons Menu (sample)

Although individual inputs can be mapped to the panel (one at a time) using the **Input Menu**, the **Map Buttons Menu** gives you mapping access to the entire control panel on one menu. In addition, the menu also enables you to map linear key cut and fill signals, test patterns and color background signals.

The following topics are discussed in this section:

- [Button Map Table](#)
- [Map Buttons Menu Functions](#)
- [Map Buttons Keypad](#)
- [Mapping Luma Keys and Linear Keys](#)

## Button Map Table

The figure below illustrates the **Button Map Table**:

Button	Source / Cut	Linear Key Fill
1	CAM1	
2	CAM2	
3	CAM3	
4	CAM4	
5	VT-1	
6	VT-2	
7	DO-1	
8		
9	CHY1	CHY2
10	CB-1	
M/E	M/E 1 PGM	

**Figure 5-101.** Button Map Table (sample)

On the **Palette**, the **Button Map Table** lists the current mapping for all shifted and unshifted buttons, plus the M/E button. Please note:

- The yellow highlight indicates the selected shifted or unshifted button to which a source can be mapped. The highlight tracks the selection that is made with the **{Panel Button}** knob.
- The blue highlight indicates whether you are mapping a source/cut or a linear key fill. This highlight tracks the two button selections in the **Tool Bar** — **{Map Source/Cut}** and **{Map Linear Key Fill}**.

The following columns of information are provided in the table:

- **Button** — indicates the selected shifted or unshifted button, plus the **M/E** button. Press **{SHIFT}** to change the column labels from **1 - 10** to **11 - 20**.

### Note

You can map a source to both the un-shifted and shifted function of the **M/E** button.

- **Source/Cut** — displays the source (or linear key “cut” signal) that is mapped to the selected panel button. Press **{Map Source/Cut}** to select and highlight the field in blue.
- **Linear Key Fill** — displays the linear key “fill” signal that is mapped to the selected panel button. Press **{Map Linear Key Fill}** to select and highlight the field in blue.

See the [“Mapping Luma Keys and Linear Keys”](#) section on page 228 for more details.

## 5. Menu Orientation

### System Menu

#### Map Buttons Menu Functions

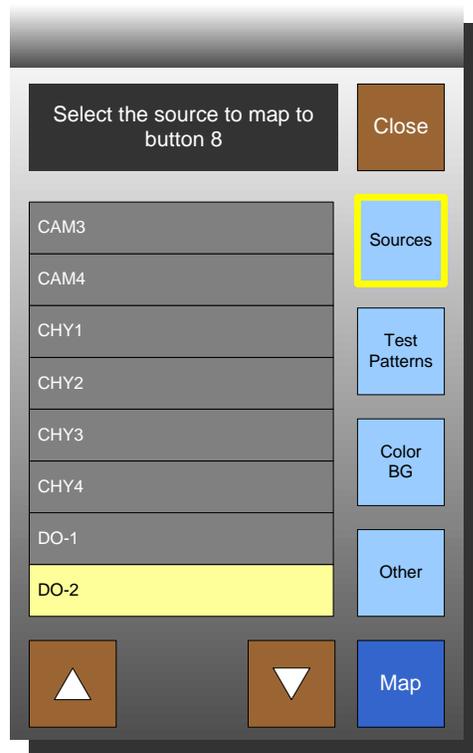
The following adjustments are provided in the **Map Buttons Menu**:



- Press **{Panel Button}** (or use the knob) to select the button that you wish to map. Note that selecting buttons in this manner automatically affects the state of the **{SHIFT}** button.
- Press **{SHIFT}** to switch between mapping un-shifted and shifted buttons:
  - ~ When **{SHIFT}** is off, you can map buttons **1 - 10** plus **M/E**, and the labels in the **Button** column read **1 - 10** plus **M/E**.
  - ~ When **{SHIFT}** is on, you can map buttons **11 - 20** plus **M/E**, and the labels in the **Button** column read **11 - 20** plus **M/E**.
- Press **{Map Source/Cut}** to map an input (source) or a linear key “cut” signal to the selected panel button. On the highlighted row in the table, the cell under the **Source/Cut** column highlights in blue, and the **Map Buttons Keypad** appears. Refer to the [“Map Buttons Keypad”](#) section below for details.
- Press **{Map Linear Key Fill}** to map a linear key “fill” signal to a panel button. On the highlighted table row, the cell under the **Linear Key Fill** column highlights in blue, and the **Map Buttons Keypad** appears. Refer to the [“Map Buttons Keypad”](#) and [“Mapping Luma Keys and Linear Keys”](#) sections for details.
- On the highlighted row, press **{Un-map Source/Cut}** to un-map the source in the **Source/Cut** column. Once pressed, the source is removed from the panel.
- On the highlighted row, press **{Un-map Linear Key Fill}** to un-map the source in the **Linear Key Fill** column. Once pressed, the source is removed from the panel.

## Map Buttons Keypad

The figure below illustrates the **Map Buttons Keypad** with the **{Sources}** button selected.



**Figure 5-102.** Map Buttons Keypad (sample)

The keypad appears when either the **{Map Source/Cut}** button or the **{Map Linear Key Fill}** button is pressed. Please note:

- The left hand side of the **Keypad** provides a list of available sources.
- The right side provides buttons that enable you to show different source lists.
  - ~ Press **{Sources}** to display sources only.
  - ~ Press **{Test Patterns}** to display internal test patterns only.
  - ~ Press **{Color BG}** to display the four internal color background signals.
  - ~ Press **{Other}** to display additional sources such as the M/E 1 and M/E 2 program returns.
- Use the up (▲) and down (▼) arrows to navigate through pages of sources and internal test patterns.
- Press **{Map}** to map the selected source to the selected panel button.

When test patterns are mapped to the panel, a set of abbreviated names are used in the

## 5. Menu Orientation

### System Menu

programmable displays, as listed in the table below:

**Table 5-6.** Test pattern panel abbreviations

Test Pattern Name	Panel Abbreviation
100% Color Bars	BARS
75% Color Bars	75CB
SMPTE Bars	SMPT
16 x 16 Grid	GRD1
32 x 32 Grid	GRD2
50% Gray	GRAY
Black	BLK
Burst	BRST
Gray Steps 1	GRY1
Gray Steps 2	GRY2
H Ramp	HRMP
V Ramp	VRMP
White	WHT

### Mapping Luma Keys and Linear Keys

You can perform two types of keys on the FSN Series:

- A **Luma (Luminance) Key** is one in which the hole-cutting information is derived from the luminance (brightness) level of the key source. Please note:
  - ~ Any source on the **Key Bus** can be selected as the “cut.”
  - ~ On the **Keyer Menus**, you can select **Self**, **Matte**, **Preset Bus** or **Split** for the “fill” source. When **Split** is selected, any source on the **Key Bus** other than the cut can be selected to fill the key hole.

#### Note

When mapping **Luma** key sources to the control panel, use the **{Map Source/Cut}** button. With **Luma** keys, only one signal is needed to cut (and typically, fill) the key.

Refer to the “[Keyer Functions and Modifiers](#)” section on page 159 for more information on keying.

- A **Linear Key** is a type of split key in which one video source is designated as the “cut” and a second source is designated as the “fill.” However, with **Linear Keys**, both sources are mapped to one button on the panel for convenience.

#### Note

When mapping **Linear** key sources to the control panel, use the **{Map Source/Cut}** button to map the cut signal, and the **{Map Linear Key Fill}** button to map the fill signal.

## External DSK Setup Menu

From the **System Menu**, press **{External DSK Setup}** to display the **External DSK Setup Menu**, which enables you to set up the **DSK Cut** and **Fill** inputs on the **M/E Card**. These two inputs are only used on the **DSK** when **{External Key}** is enabled.

The figure below illustrates a sample menu with the **DSK Cut** connector selected.

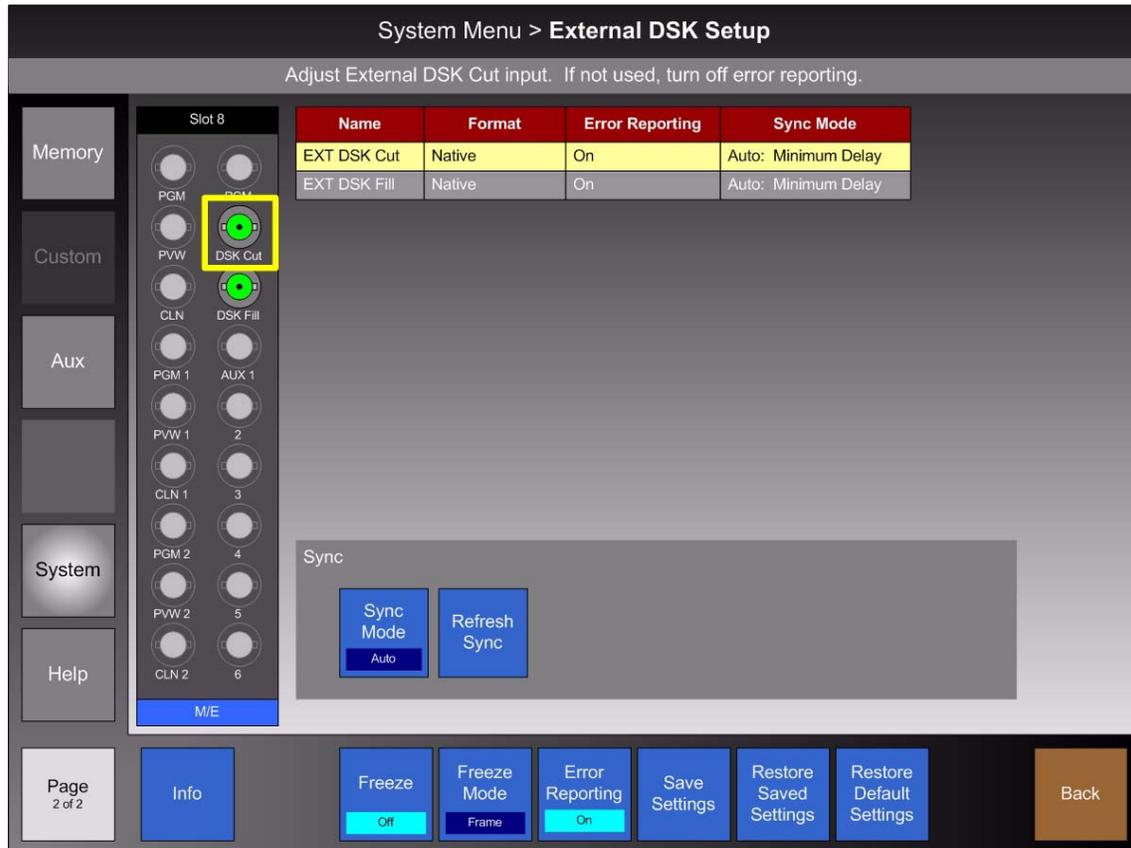


Figure 5-103. External DSK Setup Menu, DSK Cut selected (sample)

The **External DSK Setup Menu** is divided in half:

- The left side of the **Palette** shows the **Rear I/O View**, in which only the two **DSK** input connectors are active. All other output connectors are grayed out.
- The right side of the **Palette** shows the **External DSK Table**, which provides setup functions for each input.

To set up an external DSK input, press the desired connector in the **Rear I/O View**. In the **External DSK Table**, the selected input is automatically highlighted.

The following topics are discussed in this section:

- [External DSK Table](#)
- [DSK Cut Setup](#)
- [DSK Fill Setup](#)

## 5. Menu Orientation

### System Menu

#### External DSK Table

The **External DSK Table** provides information about each input. The yellow highlight automatically tracks the selected input connector in the **Rear I/O View**.

Name	Format	Error Reporting	Sync Mode
EXT DSK Cut	Native	On	Auto: Minimum Delay
EXT DSK Fill	Native	On	Auto: Minimum Delay

Figure 5-104. External DSK Table (sample)

The following columns of information are provided:

- **Name** — indicates the name of the selected connector (**DSK Cut** or **DSK Fill**).
- **Format** — displays the input's format.
- **Error Reporting** — “**On**” indicates that the connector is enabled and error reporting is active. “**Off**” indicates that error reporting is prevented. Use the **{Error Reporting}** toggle button to toggle the function.
- **Sync Mode** — lists the mode selected with the **{Sync Mode}** button — either **Auto**, **Frame Sync** or **Minimum Delay**.

#### DSK Cut Setup

To set up the **DSK Cut** input, touch its connector in the **Rear I/O View**. The menu changes to display the input's setup functions.

In the **Sync** section, two functions are available:

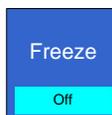
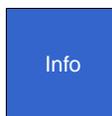
- Press **{Sync Mode}** to display the **Sync Mode Pop-up**, which enables you to set the selected DSK input's sync mode. Refer to the “[Understanding Sync Mode](#)” section on page 211 for complete details.
- When the selected DSK input's sync mode is set to **Auto** and the system switches to **Auto: Frame Sync**, the system *stays* in that mode until the sync detection is manually refreshed. Press **{Refresh Sync}** to refresh the sync detection process for the selected native input.

This procedure enables the **Auto** mode to switch back to **Minimum Delay** mode — provided that the signal is within range. Please note:

- ~ The button only appears when the selected input is set to **Auto** mode.
- ~ In **Auto: Minimum Delay** mode, the button is grayed out.
- ~ In **Auto: Frame Sync** mode, the button is active.

In the **Tool Bar**, the following adjustments are provided:

- Press **{Info}** to display the **Input Color Legend Pop-up**. Refer to the “[Connector Colors](#)” section on page 204 for details.
- Press **{Freeze}** to toggle the freeze “state” of the selected input.
  - ~ Select **On** to freeze the input.
  - ~ Select **Off** to un-freeze the input.



## 5. Menu Orientation

System Menu



- For interlaced native resolutions only, press **{Freeze Mode}** to display the **Freeze Mode Pop-up**. The following options are available:
  - ~ **Field 1** — freezes the input on field 1.
  - ~ **Field 2** — freezes the input on field 2.
  - ~ **Frame** — freezes an entire frame.

### Note

The **{Freeze Mode}** button does not appear when a progressive native resolution is set.



- Toggle the **{Error Reporting}** button to either **On** or **Off**:
  - ~ When on, the label "**On**" appears in the table in the **Error Reporting** column, and error reporting is active.
  - ~ When off, the label "**Off**" appears in the table, and error reporting is prevented.



- Press **{Save Settings}** to save the selected input's setup parameters in non-volatile memory.



- Press **{Restore Saved Settings}** to recall the selected input's setup parameters from non-volatile memory.



- Press **{Restore Default Settings}** to recall the selected input's default setup parameters.

### DSK Fill Setup

To set up the **DSK Fill** input, touch its connector in the **Rear I/O View**. The menu changes to display the input's setup functions.

In the **Tool Bar** and **Sync** section, all functions are identical to those for the **DSK Cut** connector. Refer to the "[DSK Cut Setup](#)" section on page 230 for details.

## 5. Menu Orientation

### System Menu

## Clean Feed Setup Menu

From the **System Menu**, press **{Clean Feed Setup}** to display the **Clean Feed Setup Menu**, which enables you to set clean feed outputs and the source for the **ASSIGN** button (in the control panel's **Aux Section**).

The figure below illustrates a sample **Clean Feed Setup Menu**.

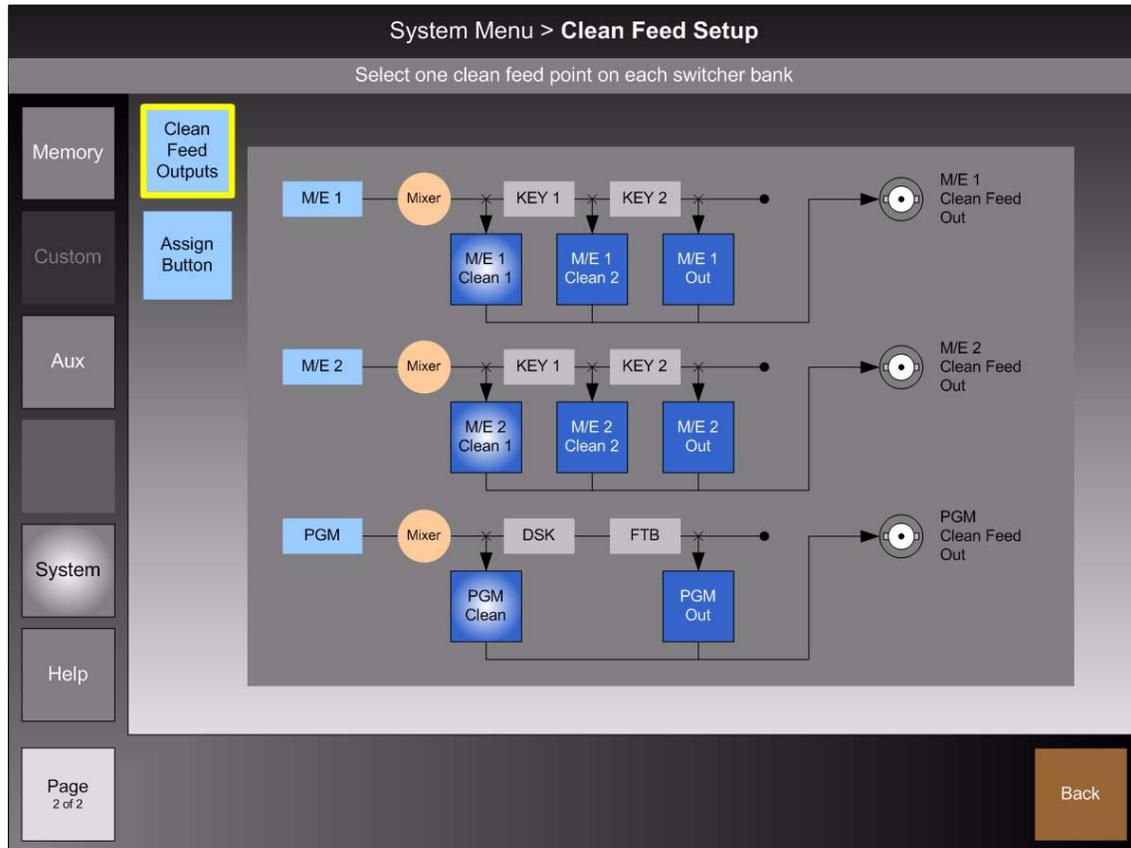


Figure 5-105. Clean Feed Setup Menu (sample)

The **Clean Feed Setup Menu** has two panels:

- [Clean Feed Outputs](#)
- [Assign Button](#)

### Clean Feed Outputs

#### Clean Feed Outputs

Press **{Clean Feed Outputs}** to set up all physical clean feed outputs on the FSN-1400's M/E Card. The graphic on the **Palette** is a "flow-chart." It illustrates the clean feed points that can be mapped to the clean feed output connectors, with buttons provided for each selection point.

Three mutually exclusive clean feed points are provided for M/E 1's clean feed output:

- Press **{M/E 1 Clean 1}** to select the clean feed point prior to Keyer 1.
- Press **{M/E 1 Clean 2}** to select the clean feed point prior to Keyer 2.
- Press **{M/E 1 Out}** to select the M/E 1 program output.

## 5. Menu Orientation

### System Menu

Three mutually exclusive clean feed points are provided for M/E 2's clean feed output:

- Press **{M/E 2 Clean 1}** to select the clean feed point prior to Keyer 1.
- Press **{M/E 2 Clean 2}** to select the clean feed point prior to Keyer 2.
- Press **{M/E 2 Out}** to select the M/E 2 program output.

Two mutually exclusive points are provided for the PGM bank's clean feed output.

- Press **{PGM Clean}** to select the clean feed point prior to the DSK.
- Press **{PGM Out}** to select the program output (after the DSK).

### Assign Button

Assign Button

Press **{Assign Button}** to select the clean feed source that is mapped to the **ASSIGN** button in the control panel's **Aux Section**. This feature enables you to place a clean feed source on the **Aux Source Row**, and select it (just as you would any other available source), and send it to an Aux bus destination.

When **{Assign Button}** is pressed, the **Palette** changes to display a different "flow-chart." This diagram represents the clean feed points that can be mapped to the **ASSIGN** button, with buttons provided for each selection point.

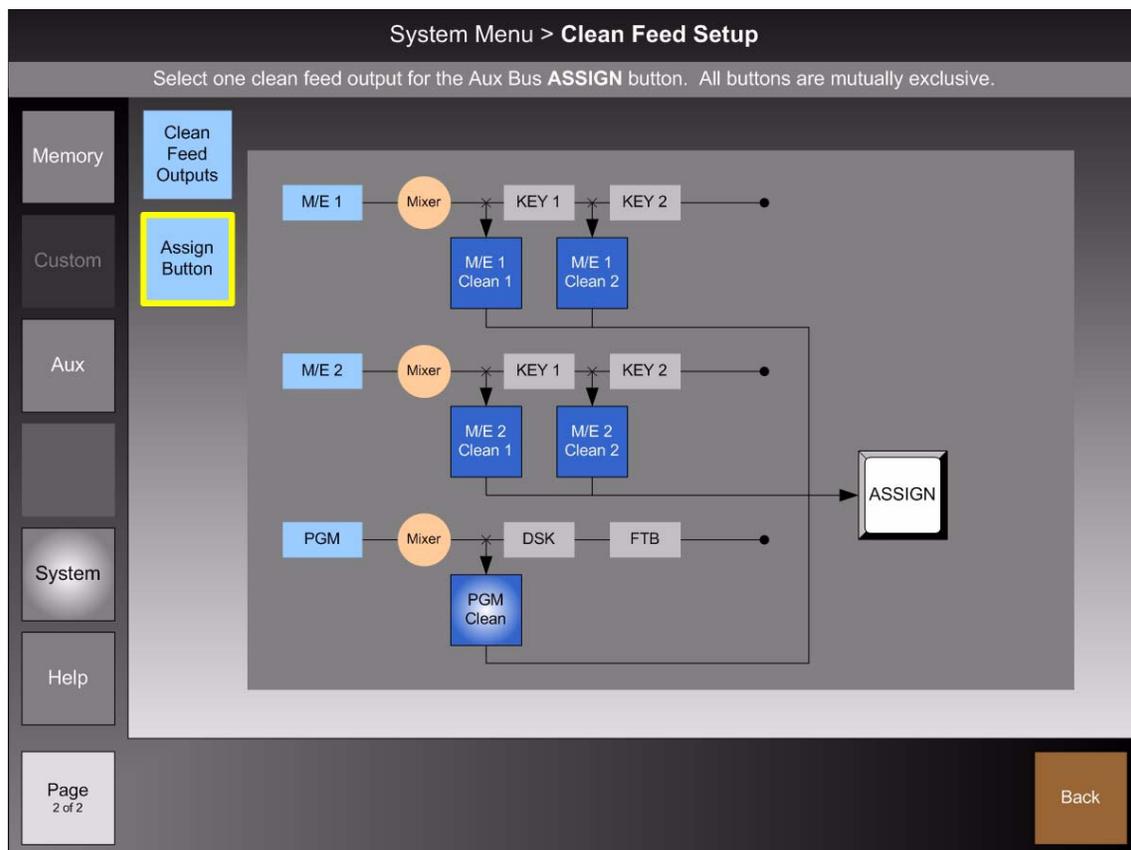


Figure 5-106. Clean Feed Setup Menu, Assign Button selection (sample)

One of three mutually exclusive clean feed points can be mapped to the **ASSIGN** button:

- Press **{M/E 1 Clean 1}** to select the clean feed point prior to M/E 1, Keyer 1.
- Press **{M/E 1 Clean 2}** to select the clean feed point prior to M/E 1, Keyer 2.

## 5. Menu Orientation

### System Menu

- Press **{M/E 2 Clean 1}** to select the clean feed point prior to M/E 2, Keyer 1.
- Press **{M/E 2 Clean 2}** to select the clean feed point prior to M/E 2, Keyer 2.
- Press **{PGM Clean}** to select the clean feed point prior to the DSK.

Please note the following important points regarding the mapping of the **ASSIGN** button:

- The clean feed selection is *global* for all Aux outputs. If you change the mapping for one output, it changes for *all* outputs. For example:
  - ▲ On the **Aux Output Row**, select **Aux 1**.
  - ▲ On the **Aux Source Row**, select **ASSIGN**.
  - ▲ On the **Clean Feed Setup Menu**, press **{Assign Button}** and select **{M/E 1 Clean 1}**.
  - ▲ Now, select **Aux 2**, **ASSIGN**, and on the **Clean Feed Setup Menu**, select **{PGM Clean}**. The output on **Aux 1** also changes to **{PGM Clean}**.
- To quickly display the **Assign Button Panel** on the **Clean Feed Setup Menu**, press and hold the **ASSIGN** button.



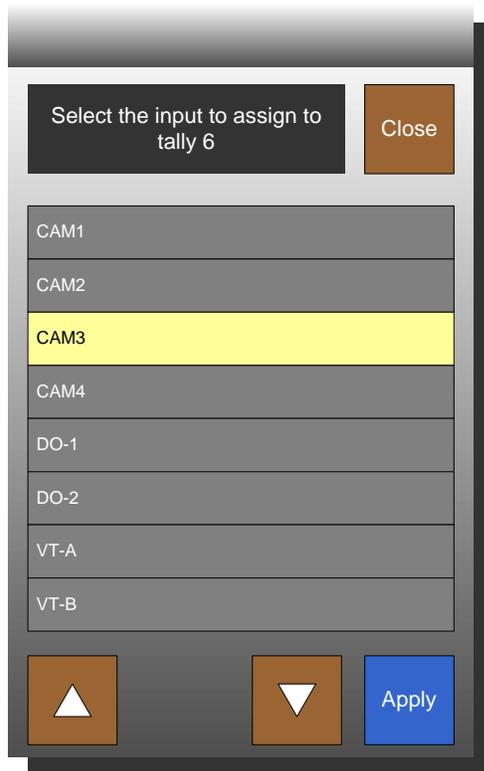


### Tally Setup Menu Functions

The following functions are provided on the **Tally Setup Menu**'s tool bar:

- To associate an input with a tally on the highlighted row, press **{Select Input}** to display the **Input Selection Keypad**.

Select  
Input



**Figure 5-109.** Input Selection Keypad (sample)

Use the use the up (▲) and down (▼) arrows to locate the desired input, then press **{Apply}** to accept. Once accepted, the input is displayed in the table.

- To clear the input-to-tally association on the highlighted row, press **{Clear Input}** to remove the input from the table.
- Press **{Select Color}** to display the **Select Color Pop-up**, which enables you to choose a red, green or amber color block to place in the column adjacent to the tally number. You can also select “**Clear**” to remove the color block.

Clear  
Input

Select  
Color

#### Note

This function is designed only to assist the engineer who is setting up tallies. It provides a visual indication on the menu of the type of tally you are configuring — red, green or amber. The function does not affect how the tally operates.

## 5. Menu Orientation

### System Menu

Set Tally Closure

- Press **{Set Tally Closure}** to set a relay closure for the highlighted output. An “x” in the highlighted cell indicates that a closure is set. In this condition, when the assigned input (e.g., **CAM1**) appears on any of the designated outputs (e.g., **PGM**), the relay closes.

Clear Tally Closure

- Press **{Clear Tally Closure}** to clear the “x” from the highlighted output.

## DVE Assign Menu

The **DVE Assign Menu** enables you to assign DVE channels to keyers. The figure below illustrates a sample menu.

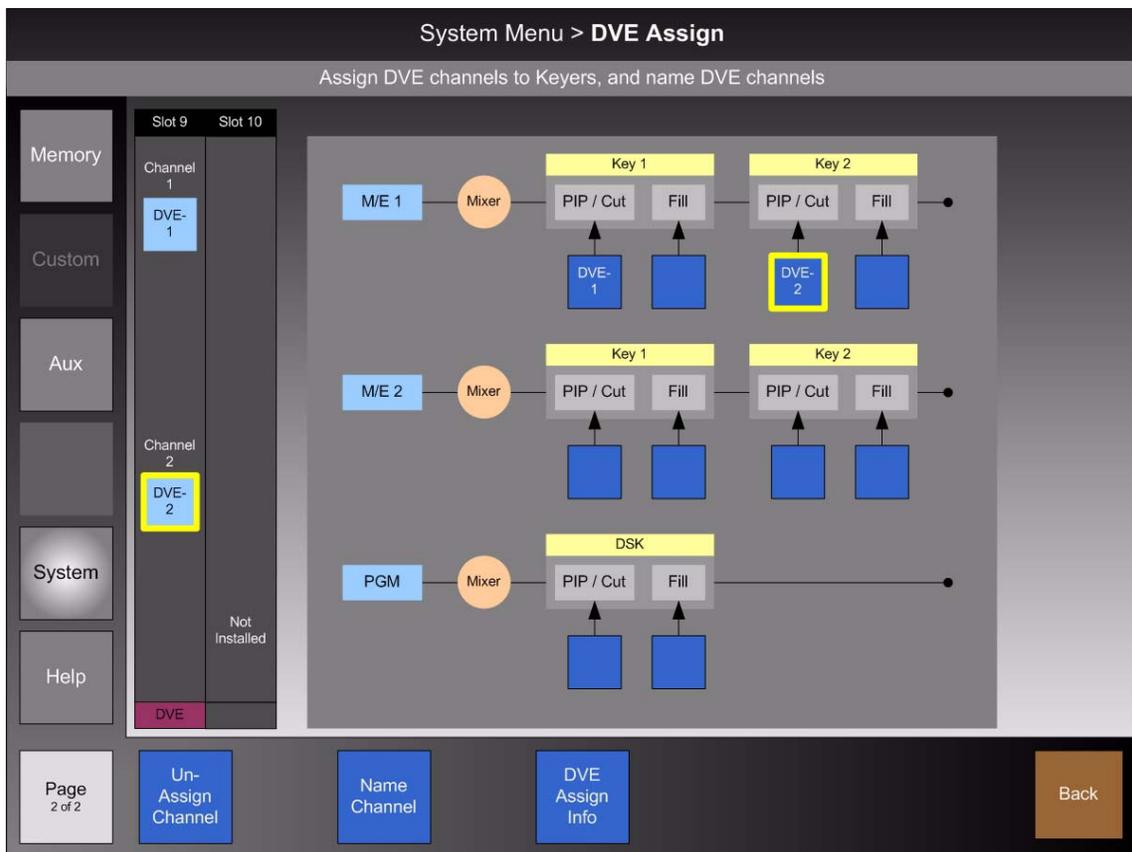


Figure 5-110. DVE Assign Menu (sample)

For complete information on DVE assignments and effect programming, refer to Chapter 8, “[DVE Operations](#)” on page 353.

### Multiviewer Setup Menu

From the **System Menu**, press **{Multiviewer Setup}** to display the **Multiviewer Setup Menu**. The figure below illustrates a sample menu.

**System Menu > Multiviewer**

Setup selected monitor layout.

Memory

Custom

Aux

System

Help

**Format: 1920 x1080i @ 59.94**

Single Layout 1

Monitor 1 and 2

PIP #	Mode	Source	UMD Text	Color
1	On	PREVIEW	PREVIEW	UMD1
2	On	PROGRAM	PROGRAM	UMD1
3	On	M/E1 PVW	M/E1 PVW	UMD1
4	On	M/E1 PGM	M/E1 PGM	UMD1
5	On	AUX 1	STG LFT	UMD1
6	On	AUX 2	STG RGT	UMD1
7	On	AUX 3	AUX 3	UMD1
8	On	AUX 4	AUX 4	UMD1
9	On	AUX 5	AUX 5	UMD1
10	On	CAM 1	C1-JIM	UMD1
11	On	CAM 2	C2-DAVE	UMD1
12	On	CAM 3	C3-ROB	UMD1
13	On	CAM 4	CAM 4	UMD1
14	On	PC-1	PC-1	UMD1
15	On	PC-2	PC-2	UMD1
16	On	DVR	DVR	UMD1

Page  
2 of 2

Output Setup

Select Layout

Select Colors

Clock Setup

Mode  
ON

Assign Source

UMD Text

UMD Color  
UMD 1

Back

**Figure 5-111.** Multiviewer Setup Menu (sample)

The **Multiviewer Setup Menu** enables you to set up all aspects of the optional Multiviewer, including the layout (single or dual), the output resolution, PIP and background colors, UMD (Under Monitor Display) text, and PIP source assignments.

For complete information on Multiviewer setup, refer to Chapter 9, "[Multiviewer Operations](#)" on page 411.

## 5. Menu Orientation

### System Menu

## Aux Setup Menu

From the **System Menu**, press {**Aux Setup**} to display the **Aux Setup Menu**. The figure below illustrates a sample menu.

System Menu > **Aux Setup**

Set up, name, map and group Aux outputs

Slot	Out	Map	Name	Format
8	1	1	VTR 1	Native
8	2	2	VTR 2	Native
8	3	3	Down 1	Native
8	4	4	Down 2	Native
8	5	5	GreenRm	Native
8	6	6	SAT 1	Native
11	1	7	SAT 2	Native
11	2	8	AUX 8	Native
11	3	9	AUX 9	Native
11	4	10	AUX 10	Native
11	5	11	AUX 11	Native
11	6	12	AUX 12	Native
11	7	13	AUX 13	Native
11	8	14	AUX 14	Native
12	1	15	DVD 1	NTSC (480i)
12	2	16	PROJ 2	1920 x 1080i @ 59.94

Figure 5-112. Aux Setup Menu (sample)

The **Aux Setup Menu** enables you to name and map both standard and optional Aux outputs, and set the format for universal Aux outputs.

To set up an Aux output, press the desired connector in the **Rear I/O View**. In the **Aux Table**, the selected output is automatically highlighted. Once selected, you can name the Aux, map it to the control panel or the **Aux Menu**, and set up a variety of parameters for universal Aux outputs (on any installed **UOCs**).

The following topics are discussed in this section:

- [Rear I/O View Description](#)
- [Aux Table Description](#)
- [Aux Setup Menu Functions](#)
- [UOC Setup Menu](#)

### Rear I/O View Description

The **Rear I/O View** for the **Aux Setup Menu** shows the I/O panels for slots **8**, **11**, **12** and **13**. Slot **8** (the **M/E** card) contains the six standard Aux outputs. Slots **11** through **13** will show all installed optional **UOCs** and **NACs**. This view matches your system configuration exactly — based on the installed cards. Please note:

- The number of each slot is shown along the top.
- Only Aux output connectors will be active in the view — all other connectors will be grayed out, including those on the Multiviewer (if installed in slot **11**).
- The type of each installed card is shown along the bottom (e.g., **NAC**, **UOC**).
- If a card is not installed, the label “**Not Installed**” appears in the slot.
- To set up a native Aux output, press the desired connector on the **M/E** card or on an installed **NAC**. The yellow border indicates that the connector is selected, and in the **Aux Table**, the output row is automatically highlighted.
- To set up a universal Aux output on a **UOC**, press any of the top three connectors to select **Output 1**, or any of the bottom three connectors to select **Output 2**. The selected output is highlighted with a yellow border around all three connectors.

#### Note

**UOC** connectors that are not outputting video will be grayed out (e.g., for an un-supported video format).

### Aux Table Description

The figure below illustrates a portion of the **Aux Table** on the **Aux Setup Menu**:

Slot	Out	Map	Name	Format
8	1	1	VTR 1	Native
8	2	2	VTR 2	Native
8	3	3	Down 1	Native
8	4	4	Down 2	Native
8	5	5	GreenRm	Native
8	6	6	SAT 1	Native
11	1	7	SAT 2	Native

**Figure 5-113.** Aux Table (sample)

The **Aux Table** provides information about each Aux output, and the yellow highlight automatically tracks the selected Aux connector in the **Rear I/O View**. Because more than 16 Aux outputs can be installed (and because the table is only 16 rows in length), the table automatically scrolls as required.

The following columns of information are provided:

- **Slot** — indicates the selected card slot (**8**, **11**, **12** or **13**).
- **Out** — indicates the selected Aux output:
  - ~ 1 through 6 on the **M/E** card.
  - ~ 1 through 8 for a **NAC**.
  - ~ 1 or 2 for a **UOC**.

## 5. Menu Orientation

### System Menu

- **Map** — indicates one of the following locations to which the output is mapped:
  - ~ A control panel button on the **Aux Output Row** (shifted or un-shifted), as defined with the **{Map Aux to Panel}** button.
  - ~ A menu button on the **Aux Menu**, as defined with the **{Map Aux to Menu}** button.
  - ~ If a “+” symbol appears after the map location (e.g., **2+**), the output is mapped to more than one location, either on the panel, the menu or both.

If the cell is blank, the output is not mapped to the panel or the menu, or the output has been unassigned, as defined with the **{Unassign Aux}** button.

- **Name** — this column indicates the Aux output’s default name (e.g., **AUX 1**), or custom name as defined with the **{Aux Name}** button. Custom names can be up to eight characters in length.
- **Format** — this column displays the following information:
  - ~ For an output on the **M/E** card or a **NAC**, “**Native**” is shown.
  - ~ For a **UOC** output, the resolution is shown (e.g., **NTSC(480i)**).

### Aux Setup Menu Functions

The following functions are available in the **Tool Bar**:



- Press **{Map Aux to Panel}** to map the selected Aux output to a physical button on the panel’s **Aux Output Row**. When pressed, the **Map To Pop-up** appears. On the **Aux Output Row**, press the shifted or un-shifted button on which you want the Aux to appear. Once selected, the mapping appears in the table’s “**Map**” column, and the output is available for use.
- Press **{Map Aux to Menu}** to map the selected Aux output to a button on the **Aux Menu**. When pressed, the **Map Aux Keypad** appears, with a list of all 30 menu positions. Select the desired menu position and press **{Apply}**. Once selected, the mapping appears in the **Aux Menu**, and the output is available for use.

#### Note

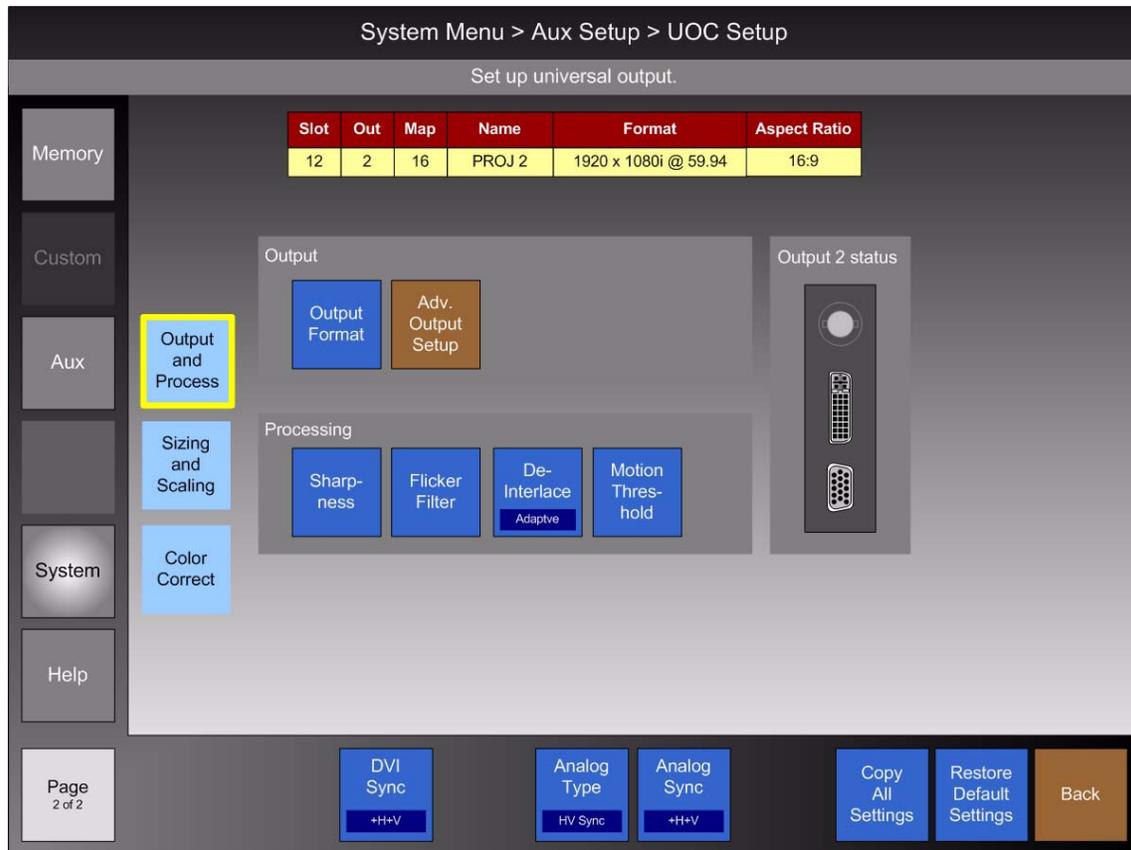
Aux outputs can be mapped to more than one location, either on the panel, menu, or both. In this configuration, the “+” symbol appears in the Aux Table’s **Map** column.



- Press **{Aux Name}** to associate a name (up to eight characters in length) with the selected Aux output. When pressed, the pop-up **Keyboard** appears. Enter the desired name and press **{Enter}** on the **Keyboard**. The name appears in the Aux Table’s “**Name**” column, replacing the default name. See the “[Using the Pop-up Keyboard](#)” section on page 147 for details about the keyboard.
- Press **{Unassign Aux}** to remove the selected Aux mapping from the panel’s **Aux Output Row** and/or the **Aux Menu**. Please note:
  - ~ If the Aux output is mapped to more than one location (e.g., both a physical button and a menu button), all locations are un-assigned.
  - ~ When an Aux is un-mapped, the custom Aux name and all associated setup parameters are retained. Only the mapping is un-assigned.
- Press **{Setup}** to display the **UOC Setup Menu**. The button is grayed out when native Aux outputs are selected. Refer to the “[UOC Setup Menu](#)” section below for details on the setup menu functions for universal Aux outputs.

## UOC Setup Menu

The figure below illustrates a sample **UOC Setup Menu**, which enables you to set all parameters for universal Aux outputs. The **Output and Process Panel** is selected.



**Figure 5-114.** UOC Setup Menu for universal Aux outputs (sample)

The top portion of the menu displays the same information as the **Aux Table** on the **Aux Setup Menu** — but only the selected output is shown. The columns are identical.

The bottom portion consists of three panels. Each panel, in turn, is divided into sections that pertain to specific adjustment parameters.

Refer to the following sections for details on each panel:

- [Output and Process Panel](#)
- [Output Sizing and Scaling Panel](#)
- [Output Color Correction Panel](#)

## 5. Menu Orientation

### System Menu

Output  
and  
Process

#### Output and Process Panel

From the **UOC Setup Menu**, press **{Output and Process}** to display the **Output and Process Panel**, which is divided into three sections plus several tool bar functions. Each section is explained below.

- [Output Section](#)
- [Output Processing Section](#)
- [Output Status Section](#)
- [Output and Process Tool Bar Functions](#)
- [Advanced UOC Output Setup Menu](#)

#### ■ Output Section

The figure below illustrates the **Output Section** on the **Output and Process Panel**:



Figure 5-115. Output Section, Output and Process Panel

The following adjustments are provided:

Output  
Format

Adv.  
Output  
Setup

- Press **{Output Format}** to display the **Output Format Keypad**. Use the up (▲) and down (▼) arrows to locate the desired output format in the list, then press **{Apply}** to set the new Aux output format. In Appendix A, see the [“Input and Output Format Tables”](#) section on page 445 for the complete list of formats.
- Press **{Advanced Output Setup}** to display the **Advanced UOC Setup Menu**, which enables you to adjust advanced UOC output parameters. Refer to the [“Advanced UOC Output Setup Menu”](#) section on page 247 for details.

#### Caution

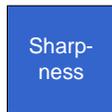
The **Advanced UOC Setup Menu** is designed for advanced users who are completely familiar with all aspects of output timing adjustments. Do not use this menu if you are uncertain about any output timing parameter.

### ■ Output Processing Section

The figure below illustrates the **Output Processing Section**:



**Figure 5-116.** Output Processing Section, Output and Process Panel



- Press **{Sharpness}** to display the **Sharpness** value button. Use the button (or knob) to set the Aux output's sharpness.



- For interlaced Aux outputs only, press **{Flicker Filter}** to display the **Flicker Filter** value button. Use the button (or knob) to adjust the filter.



- For interlaced Aux outputs only, press **{De-Interlace}** to display the **De-Interlace Pop-up**. This function enables you to set how the system processes the Aux output. The following options are available:

- ~ Select **Motion Adaptive** to use motion adaptive de-interlacing. In this mode, the **{Motion Threshold}** button appears. See below for details.
- ~ Select **Field to Frame** to use field-to-frame de-interlacing. This mode avoids motion artifacts by converting fields to progressive output frames.



- If **Motion Adaptive** de-interlacing is selected, press **{Motion Threshold}** to adjust the threshold of the motion adaptive de-interlacer. Because adjustment is rarely required, it is recommended that you leave the function at its default setting.

### ■ Output Status Section

The figure below illustrates the **Output Status Section** on the **Output and Process Panel**:



**Figure 5-117.** Output Status Section, Output and Process Panel (sample)

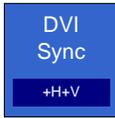
This section mirrors the selected **UOC** connector on the **Rear I/O View** — either output 1 or output 2 will be listed. Connectors that are not outputting video will be grayed out.

## 5. Menu Orientation

### System Menu

#### ■ Output and Process Tool Bar Functions

On the **Output and Process Panel**, the following functions are provided in the **Tool Bar**:



- Press **{DVI Sync}** to select the polarity of the digital sync output on the DVI connector. The following options are available in the pop-up:

- ~ **+H+V**
- ~ **+H-V**
- ~ **-H+V**
- ~ **-H-V**



- Press **{Analog Type}** to choose the type of analog sync output desired on the HD-15 connector. The following options are available in the pop-up:

- ~ **CVBS**
- ~ **Y/C**
- ~ **SOG/Y**
- ~ **CSync**
- ~ **HV Sync**



- If **{HV Sync}** is selected on the **{Analog Type}** button, press **{Analog Sync}** to select the polarity of the analog sync output on the HD-15 connector. The following options are available in the pop-up:

- ~ **+H+V**
- ~ **+H-V**
- ~ **-H+V**
- ~ **-H-V**



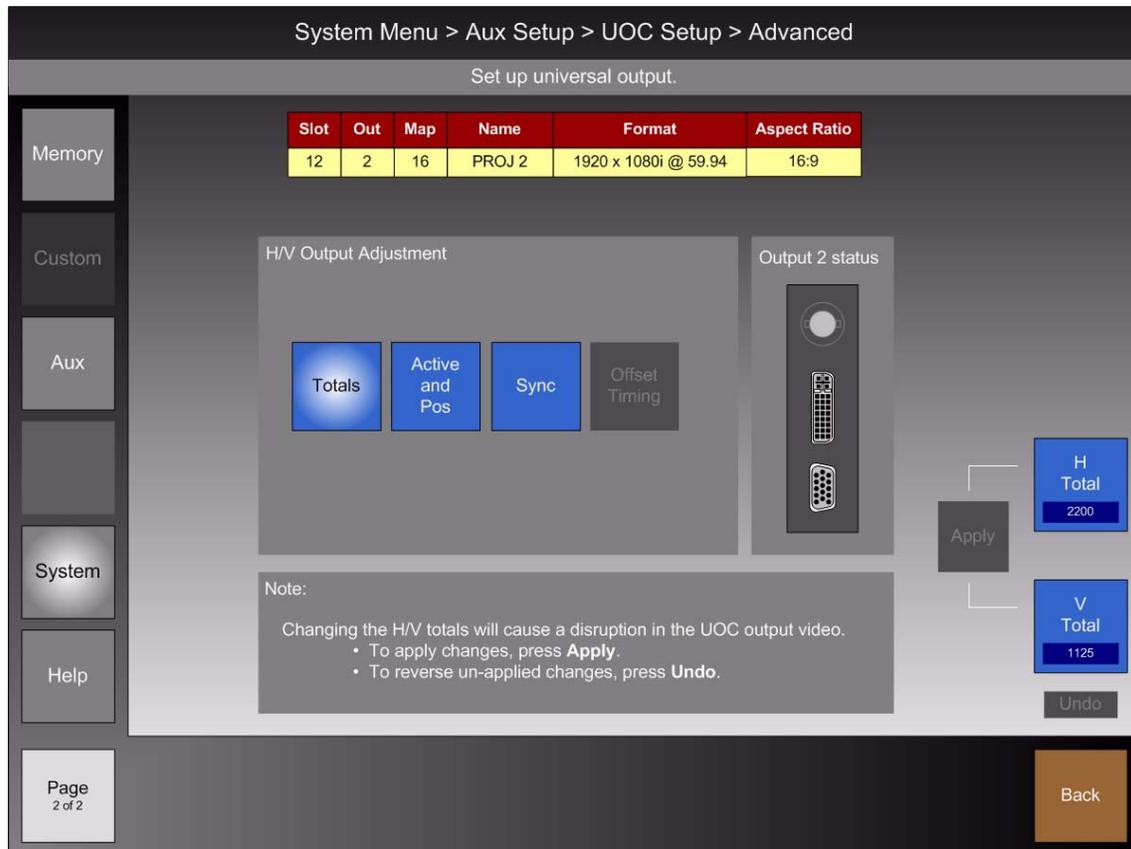
- Press **{Copy All Settings}** to copy all settings on the current UOC channel to another UOC output channel. The **Copy Settings Keypad** appears, which lists all other UOC channels in the frame — except the current channel. Select the desired Aux output, then press **{Copy}** to complete the process.



- Press **{Restore Default Settings}** to recall the selected Aux output's default setup parameters back into the output's "temporary" settings on the menu. Note that all settings on the **Advanced UOC Setup Menu** are also set to default.

### ■ Advanced UOC Output Setup Menu

From the **UOC Setup Menu**, press **{Advanced Output Setup}** to display the **Advanced UOC Setup Menu**, a sample of which is shown below:



**Figure 5-118.** Advanced UOC Setup Menu (sample)

This menu enables you to adjust UOC output parameters, in order to create a “custom” output format. Please note:

- The top portion displays the same information as the **Aux Table** on the **Aux Setup Menu** — for the selected output.
- The **Output Status Section** is identical to that on the **UOC Setup Menu**.

#### Caution

The **Advanced UOC Setup Menu** is designed for advanced users who are familiar with all aspects of output timing adjustments. Do not use this menu if you are uncertain about any output timing parameter.

The following functions are available in the **H/V Output Adjustment** section:

- Press **{Totals}** to set the total number of horizontal pixels and vertical lines. Two value buttons appear:
  - ~ Press **{H Total}** or use the adjacent **Knob** to set the desired total number of horizontal pixels in the output image.



## 5. Menu Orientation

### System Menu

- ~ Press **{V Total}** or use the adjacent **Knob** to set the desired total number of vertical lines in the output image.

#### Important

Changing the H and V Totals will cause a disruption to the UOC's output video. Press **{Apply}** to apply changes, or **{Undo}** to reverse un-applied changes.

#### Active and Pos

- Press **{Active and Pos}** to set the H and V active area, and the H and V position. Four value buttons appear:
  - ~ Press **{H Pos}** or use the adjacent **Knob** to set the start of the active area's horizontal offset from H sync, in pixels.
  - ~ Press **{V Pos}** or use the adjacent **Knob** to set the start of the active area's vertical offset from V sync, in lines.
  - ~ Press **{H Active}** or use the adjacent **Knob** to set the width of the active area, in pixels.
  - ~ Press **{V Active}** or use the adjacent **Knob** to set the number of active vertical lines in the output.

#### Sync

- Press **{Sync}** to adjust the horizontal and vertical sync pulse width. Two value buttons appear:
  - ~ Press **{H Sync}** or use the adjacent **Knob** to adjust the horizontal sync pulse width, in pixels.
  - ~ Press **{V Sync}** or use the adjacent **Knob** to adjust the vertical sync pulse width, in lines.

#### Offset Timing

- Press **{Offset Timing}** to adjust the UOC output's video timing relative to the system's native resolution. Please note:
  - ~ If the selected UOC output format is vertically locked to the native resolution's vertical sync, the **{Offset Timing}** button is active.
  - ~ If the selected UOC format is not vertically locked to the native resolution's vertical sync, the **{Offset Timing}** button is grayed out.

When **{Offset Timing}** is pressed, two value buttons appear, along with the **{Offset Timing Info}** button:

- ~ Press **{H Offset}** or use the adjacent **Knob** to offset the output's horizontal timing (in pixels), relative to the timing of the system's native resolution. The adjustment range is +/- 1/2 line.
- ~ Press **{V Offset}** or use the adjacent **Knob** to offset the output's vertical horizontal timing (in lines), relative to the timing of the system's native resolution. The adjustment range is +/- 1/2 frame.
- Press **{Offset Timing Info}** to display a pop-up with the following important information on video output offset timing:
  - ~ If the reference input is set to **External**, H and V offsets adjust the video output relative to the video reference input. H and V can be positive or negative values.
  - ~ If the reference input is set to **Free Run**, H and V offsets adjust the video output relative to the switcher's internal Black signal.

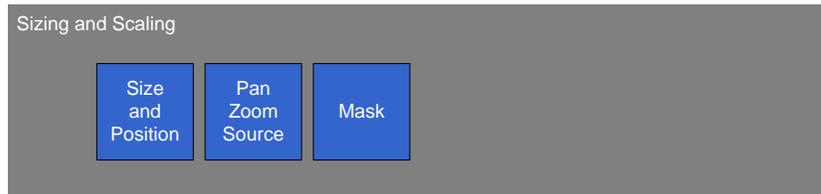
Note that the system's reference input is set on the **Reference and Output Setup Menu**. Refer to the "[Reference and Output Setup Menu](#)" section on page 197 for details.

### Output Sizing and Scaling Panel

Sizing  
and  
Scaling

From the **UOC Setup Menu**, press **{Sizing and Scaling}** to display the **Output Sizing and Scaling Panel**. This panel enables you to size and scale the universal output to a different size, position, resolution and mask, as required.

The panel has one **Output Sizing and Scaling** section, (as shown below) plus additional sections that appear, depending on your selection.



**Figure 5-119.** Output Sizing and Scaling section

Size  
and  
Position



Reset

- Press **{Size and Position}** to display four “manual” size/position value buttons, plus the convenient **Quick Adjust** section.
  - ~ Press **{H Size}** or use the knob to change the universal output's horizontal size. Remember that **{H Size}** and **{V Size}** track if the **{Lock}** is enabled.
  - ~ Press **{V Size}** or use the knob to change the output's vertical size.
  - ~ Press the **{Lock}** button to lock or unlock **H** and **V** tracking. When locked, both parameters track together. When unlocked, H and V can be adjusted independently.
  - ~ Press **{H Position}** or use the knob to change the output's horizontal position along the X axis.
  - ~ Press **{V Position}** or use the knob to change the universal output's vertical position along the Y axis.
  - ~ Press **{Reset}** to reset all size and position values to default (including those performed from the **Quick Adjust Section**). Any Mask values present in the image will not be affected.

The figure below illustrates the **Quick Adjust** section, which appears when **{Size and Position}** is pressed:



**Figure 5-120.** Quick Adjust Section

The following adjustments are provided:

- ~ Press **{Fill H}** to scale the output up (or down) to the selected **horizontal** resolution. Please note:
  - Aspect ratio is maintained. Manual size/position adjustments using the four value buttons are maintained.
  - If the left and/or right edges of the image are manually masked, those edges are used for the **Fill H** calculations.

## 5. Menu Orientation

### System Menu

- Black bars are visible above and below an image, for example, when a 16:9 image is scaled down to 4:3.
  - The top and bottom portions of an image may fall outside of the raster, for example, when a 4:3 image is scaled up to 16:9.
- ~ Press **{Fill V}** to scale the output up (or down) to the selected **vertical** resolution. Please note:
- Aspect ratio is maintained. Manual size/position adjustments using the four value buttons are maintained.
  - If the top and/or bottom edges of the image are manually masked, those edges are used for the **Fill V** calculations.
  - Black pillars are visible to the left and right of an image, for example, when a 4:3 image is scaled up to 16:9.
  - The left and right portions of an image may fall outside of the raster, for example, when a 16:9 image is scaled down to 4:3.
- ~ Press **{Fill H/V}** to scale the output up (or down) to the selected **horizontal** and **vertical** resolutions. Please note:
- Aspect ratio is not maintained. Non-proportional image stretching or compression will occur.
  - If any edges of the image are manually masked, those edges are used for the **Fill H/V** calculations.
- ~ Use the **{Reset}** function to reset all size and position values to default.

When **{Size and Position}** is selected, one additional function is available in the **Tool Bar**:

- ~ Press **{Aspect Ratio}** to display the **Aspect Ratio Pop-up**. This function affects the output's H dimension only. Choices are 16:9, 5:4, 4:3, 3:2, 1:1 and Custom.

When **{Custom}** is selected, the **{Adjust Custom Aspect}** button appears in the **Tool Bar**. Press to display the **{Custom Aspect}** value button. Unlatch to re-display size and position adjustments.

- In the **Output Sizing and Scaling** section, press **{Pan Zoom Source}** to display four buttons which enable you to size and position the video *within* the boundaries of the output's current sizing. In this mode, the output's outside boundaries remain constant, but you can pan and zoom the video inside, as desired.

#### Note

The **Pan Zoom Source** function does not allow you to reveal video that is outside of the output's active area.

The following functions are provided:

- ~ Press **{Source H Size}** or use the knob to change horizontal size inside the output's boundaries. Remember that **{Source H Size}** and **{Source V Size}** track together if the **{Lock}** is enabled.
- ~ Press **{Source V Size}** or use the knob to change vertical size inside the output's boundaries.
- ~ Press the **{Lock}** button to lock or unlock **H** and **V** source size tracking. When locked, both parameters track together. When unlocked, **H** and **V** can be adjusted independently.
- ~ Press **{Source H Pos}** or use the knob to change the horizontal position inside the output's boundaries along the X axis.



## 5. Menu Orientation

### System Menu

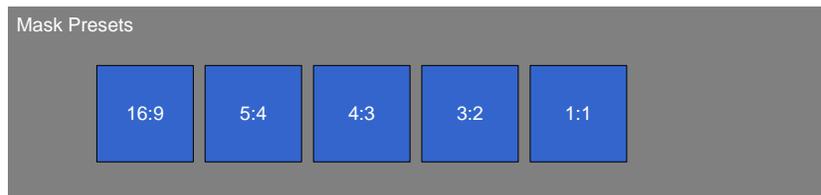


- ~ Press **{Source V Pos}** or use the knob to change the vertical position inside the output's boundaries along the Y axis.
- ~ Press **{Reset}** to reset all pan and zoom values to default.
- In the **Output Sizing and Scaling** section, press **{Mask}** to display four “manual” mask value buttons, plus the convenient **Output Mask Presets** section. These functions enable you to mask (crop) the top, bottom, left, and right edges of the universal output. When a mask is applied on a selected edge, black is revealed in each masked section. All values are in percent, and the range is **0.00** to **100.0**.

The following manual mask controls are provided:

- ~ Press **{Mask Top}** or use the adjacent knob to manually mask the top edge of the universal output.
- ~ Press **{Mask Bottom}** or use the knob to manually mask the bottom edge of the universal output.
- ~ Press **{Mask Left}** or use the knob to manually mask the left edge of the universal output.
- ~ Press **{Mask Right}** or use the knob to manually mask the right edge of the universal output.
- ~ Press **{Reset}** to reset all mask values to default.

The figure below illustrates the **Output Mask Presets** section, which appears when **{Mask}** is pressed:



**Figure 5-121.** Output Mask Presets Section

#### Note

All mask presets are additive. For example, if you mask to **16:9** and then press **4:3**, the system creates the **4:3** mask using the previous **16:9** image as a base.

The following preset functions are provided:

- ~ Press **{16:9}** to mask the output to a 16:9 aspect ratio.
- ~ Press **{5:4}** to mask the output to a 5:4 aspect ratio.
- ~ Press **{4:3}** to mask the output to a 4:3 aspect ratio.
- ~ Press **{3:2}** to mask the output to a 3:2 aspect ratio.
- ~ Press **{1:1}** to mask the output to a 1:1 aspect ratio.

Remember that once the image is masked, you can use the **{Fill H}**, **{Fill V}** or **{Fill H/V}** functions to scale the image to the selected output resolution.

## 5. Menu Orientation

System Menu

Color  
Correct

### Output Color Correction Panel

From the **UOC Setup Menu**, press **{Color Correct}** to display the **Output Color Correction Panel**, which includes one section, as shown below:



**Figure 5-122.** Output Color Correction Section

The following input adjustments are provided:

- Press **{Bright Contrast Gamma}** to adjust the output's overall brightness, contrast and Gamma. Three value buttons appear:
  - ~ Use the **{Bright}** button (or knob) to set brightness.
  - ~ Use the **{Contrast}** button (or knob) to set contrast.
  - ~ Use the **{Gamma}** button (or knob) to set gamma.
- Press **{RGB Bright}** to adjust the output's RGB brightness. Three value buttons appear:
  - ~ Use the **{Red Bright}** button (or knob) to set red brightness.
  - ~ Use the **{Green Bright}** button (or knob) to set green brightness.
  - ~ Use the **{Blue Bright}** button (or knob) to set blue brightness.
- Press **{RGB Contrast}** to adjust the output's RGB contrast. Three value buttons appear:
  - ~ Use the **{Red Contrast}** button (or knob) to set red contrast.
  - ~ Use the **{Green Contrast}** button (or knob) to set green contrast.
  - ~ Use the **{Blue Contrast}** button (or knob) to set blue contrast.
- Press **{Hue Sat}** to adjust hue and color saturation. Two value buttons appear:
  - ~ Use the **{Hue}** button (or knob) to set the hue.
  - ~ Use the **{Sat}** button (or knob) to set the saturation.

### Other Setup Menu

From the **System Menu**, press **{Other Setup}** to display the **Other Setup Menu**. Only one function is currently provided on the menu.



- When M/E 2 control is enabled on the FSN-150, press **{M/E Order}** to display the **M/E Order Pop-up**, which enables you to set the priority of the two M/E banks:
  - ~ When **{1 > 2}** is selected, M/E 2 is downstream of M/E 1. Operationally, you can re-enter M/E 1 into M/E 2 (on both the M/E 2 and PGM banks), but you can not re-enter M/E 2 back into M/E 1.
  - ~ When **{2 > 1}** is selected, M/E 1 is downstream of M/E 2. Operationally, you can re-enter M/E 2 into M/E 1 (on both the M/E 1 and PGM banks), but you can not re-enter M/E 1 back into M/E 2.

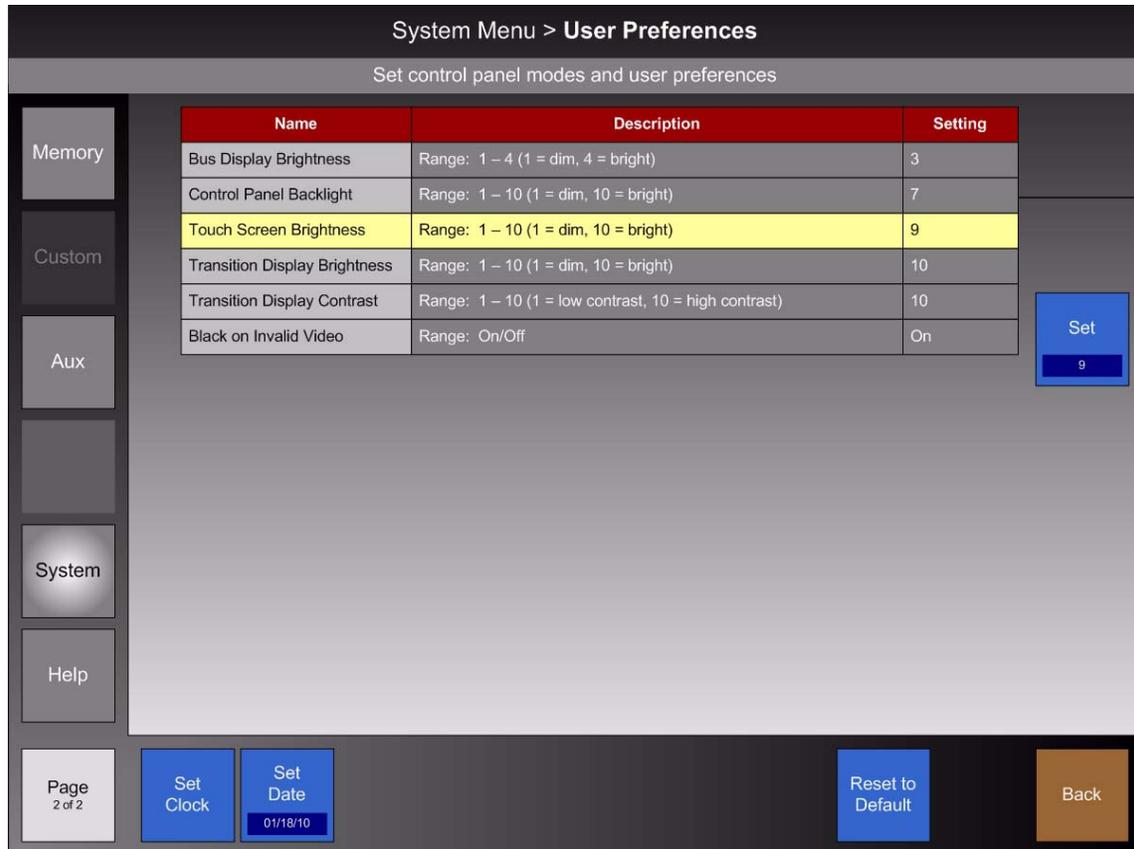
In Chapter 7, refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for details on M/E 2 control.

## 5. Menu Orientation

### System Menu

## User Preferences Menu

From the **System Menu**, press **{User Prefs}** to display the **User Preferences Menu**. The figure below illustrates a sample menu.



**Figure 5-123.** User Preferences Menu (sample)

The **User Preferences Menu** enables you to set various control panel and Touch Screen modes, plus other important system preferences.

The following topics are discussed in this section:

- [User Preferences Table](#)
- [User Preferences Functions](#)

## User Preferences Table

The figure below illustrates a sample **User Preferences Table**.

Name	Description	Setting
Bus Display Brightness	Range: 1 – 4 (1 = dim, 4 = bright)	3
Control Panel Backlight	Range: 1 – 10 (1 = dim, 10 = bright)	7
Touch Screen Brightness	Range: 1 – 10 (1 = dim, 10 = bright)	9
Transition Display Brightness	Range: 1 – 10 (1 = dim, 10 = bright)	10
Transition Display Contrast	Range: 1 – 10 (1 = low contrast, 10 = high contrast)	10
Black on Invalid Video	Range: On/Off	On

**Figure 5-124.** User Preferences table (sample)

The **User Preferences Table** lists all available preferences, except for those provided in the **Tool Bar**. The yellow highlight indicates the preference that can be changed. To move the highlight, touch any row or use the top knob.

The following columns of information are provided:

- **Name** — lists the name of the user preference.
- **Description** — lists the range of the selected user preference.
- **Setting** — lists the preference's current setting.

The **{Set}** button always applies to the highlighted preference, and the value shown in the button's insert *changes* as different preferences are selected. Press **{Set}** to display the keypad for the selected preference in the table, enabling you to change its value.



## User Preferences Functions

The following user preferences are provided:

- **Bus Display Brightness** — controls the brightness of the programmable displays above the PGM and M/E banks.  
**Range:** 1 (dim) to 4 (bright)
- **Control Panel Backlight** — controls the overall brightness of all buttons on the control panel.  
**Range:** 1 (dim) to 10 (bright)
- **Touch Screen Brightness** — controls the brightness of the Touch Screen.  
**Range:** 1 (dim) to 10 (bright)
- **Transition Display Brightness** — controls the brightness of the LCD displays above the **M/E Transition Section**, **PGM Transition Section**, **Memory Section** and **Custom Section**.  
**Range:** 1 (dim) to 10 (bright)
- **Transition Display Contrast** — controls the contrast of the LCD displays above the **M/E Transition Section**, **PGM Transition Section**, **Memory Section** and **Custom Section**.  
**Range:** 1 (low contrast) to 10 (high contrast)

## 5. Menu Orientation

### System Menu

- **Black on Invalid Video** — when an input is selected on a bus, this preference controls how the system behaves when the input becomes invalid — such as when the input loses sync or video.
  - ~ **On** — shows black in place of the input signal, when the selected signal becomes invalid.
  - ~ **Off** — shows the input signal as is, when the selected signal becomes invalid. In this mode, non-synchronous and/or non-stable video will appear on the switcher's output.

#### Important

It is highly recommended that you leave the **Black on Invalid Video** preference **On** during production. The **Off** mode may be useful during setup mode only.



- Press **{Set Clock}** to set the system's internal clock, which is used for various logging, reporting and other time-stamping functions. The clock is also used on various Multiviewer layouts.

When pressed, the **Set Clock Keypad** appears, with special keypad functions:

- ~ Ensure that you use the **HH:MM:SS** format to set the clock (Hours:Minutes:Seconds).
- ~ Use the **{:}** button as a separator between digits.
- ~ Press **{AM/PM}** to switch between AM and PM as required.
- ~ Press **{12 HR / 24 HR}** to switch between 12 and 24 hour modes.



- Press **{Set Date}** to set the system's internal calendar, which is also used for various logging, reporting and other date-stamping functions.

When pressed, the **Set Date Keypad** appears, with special keypad functions:

- ~ Ensure that you use the **MM/DD/YYYY** format to set the date (Month:Day:Year).
- ~ Use the **{/}** button as a separator between digits.



- Press **{Reset to Default}** to return a highlighted preference to its default value.

## Diagnostics Menu

From the **System Menu**, press **{Diags}** to display the **Diagnostics Menu**, as shown below.

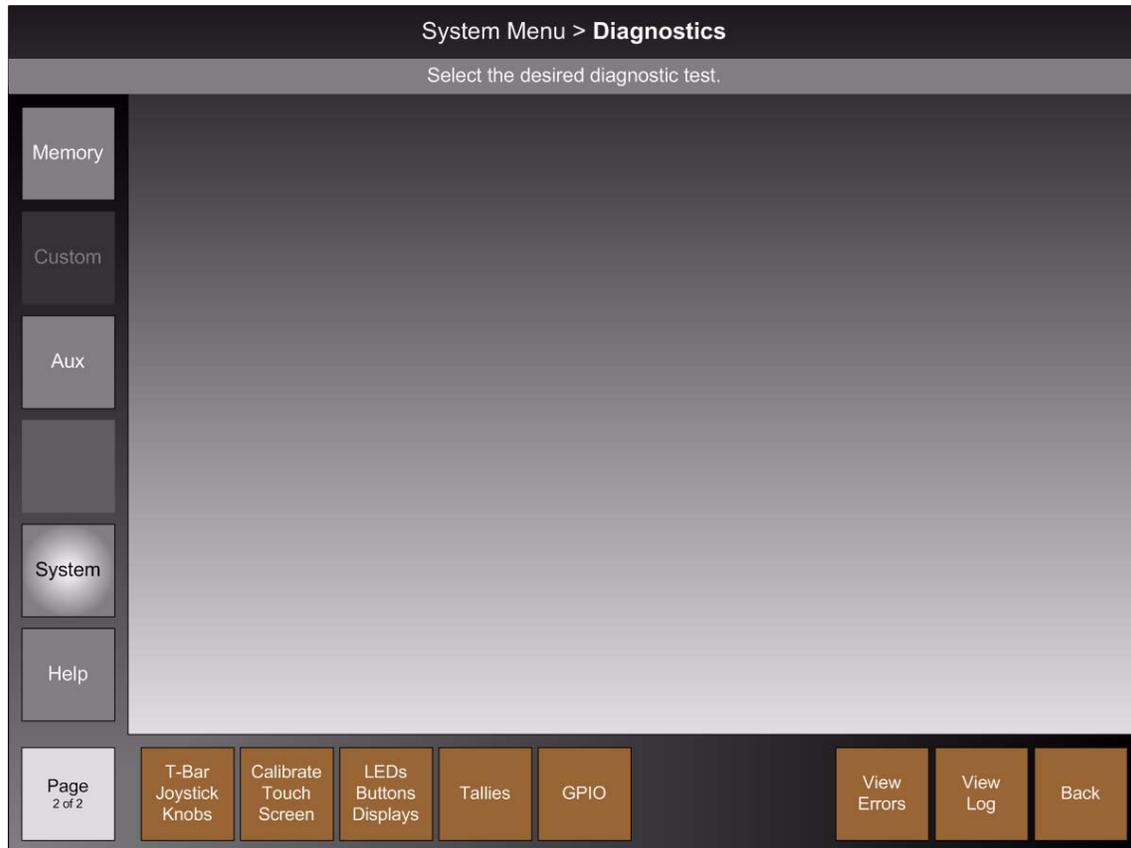


Figure 5-125. Diagnostics Menu

The **Diagnostics Menu** enables you to perform a variety of diagnostic tests. The following topics are discussed in this section:

- [T-Bar, Joystick and Knobs](#)
- [Calibrate Touch Screen](#)
- [LEDs, Buttons and Displays](#)
- [Tallies](#)
- [GPIO](#)
- [View Errors](#)
- [View Log](#)

## 5. Menu Orientation

### System Menu

#### T-Bar, Joystick and Knobs

T-Bar  
Joystick  
Knobs

From the **Diagnostics Menu**, press **{T-Bar Joystick Knobs}** to display the **T-Bar, Joystick, Knobs Menu**. The figure below illustrates a sample menu.

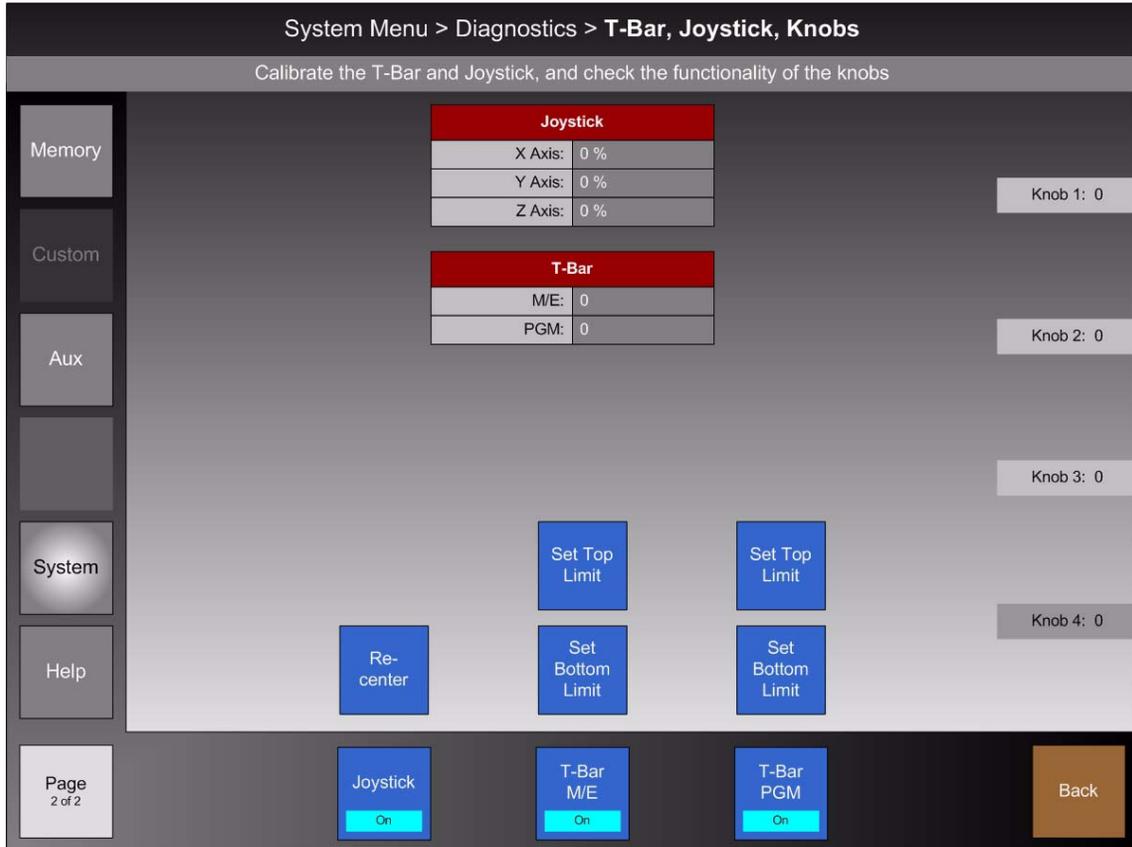


Figure 5-126. T-Bar, Joystick, Knobs Menu (sample)

The **T-Bar, Joystick, Knobs Menu** enables you to perform diagnostic tests on the **T-Bar, Joystick** and the four knobs. The two tables at the top provide **Joystick** and **T-Bar** data.

- **Joystick Table** — data is listed for the **X, Y** and **Z** axes. As you move the **Joystick** to its maximum limit along each axis, the proper range is **-100%** to **100%**. If the **Joystick** does not reach these values, or does not display **0%** when fully at rest, use the **{Re-center}** button. See below for details.
- **T-Bar Table** — data is listed for each bank's **T-Bar**. As you move each **T-Bar** to its top and bottom limits, the proper range is **0** to **100**. If the **T-Bar** does not display these values at each limit, use the **{Set Top Limit}** and **{Set Bottom Limit}** buttons. See below for details.

The following diagnostic functions are provided on the menu:

- **Knobs** — one data field is provided for each knob. As you rotate a knob, the associated value should range between **+ 7** and **-7**, as you rotate the knob clockwise and counter-clockwise, respectively.

## 5. Menu Orientation

System Menu



- Press **{Joystick}** to toggle the **Joystick** on and off. When you toggle the **Joystick** off, a pop-up asks you to confirm the procedure. When off, the **Joystick** no longer functions, and the **{Re-center}** button is grayed out.

### Note

It is recommended that you leave the **Joystick** on.



- Ensure that the **Joystick** is fully at rest, then press **{Re-center}** to re-center the **X**, **Y** and **Z** axes. Use this function only if the **Joystick** does not display **0%** on all axes when fully at rest.



- Press **{T-Bar M/E}** to toggle the M/E's **T-Bar** on and off. When you toggle it off, a pop-up asks you to confirm the procedure. When off, the **T-Bar** no longer functions on the control panel, and the **{Set Top Limit}** and **{Set Bottom Limit}** buttons are grayed out.

### Note

It is recommended that you leave the **T-Bar** on.

### Note

The **{T-Bar PGM}** button performs the identical function for the PGM bank's **T-Bar**.



- A **{Set Top Limit}** button is provided for each **T-Bar** on the switcher. Move the selected **T-Bar** to its top limit, then press **{Set Top Limit}** to calibrate the T-Bar's top position. In the pop-up, press **{Calibrate}**.



- A **{Set Bottom Limit}** button is provided for each **T-Bar** on the switcher. Move the selected **T-Bar** to its bottom limit, then press **{Set Bottom Limit}** to calibrate the T-Bar's bottom position. In the pop-up, press **{Calibrate}**.

## Calibrate Touch Screen



From the **Diagnostics Menu**, press **{Calibrate Touch Screen}** to run the Touch Screen's interactive calibration routine. A special calibration screen appears, on which you will be asked to touch certain areas, and then accept the new calibration. After you accept the calibration, the system will return to the FSN Series menus.

### Tip

For a more accurate calibration, use a pencil eraser instead of your finger tip.

### Important

As an alternate method, if required, you can start the **Touch Screen** calibration procedure by simultaneously pressing the **FINE ADJUST** and **ENTER** buttons on the **Keypad**.

## 5. Menu Orientation

### System Menu

#### LEDs, Buttons and Displays

LEDs  
Buttons  
Displays

From the **Diagnostics Menu**, press **{LEDs Buttons Displays}** to display the **LEDs, Buttons and Displays Menu**. The figure below illustrates a sample menu.

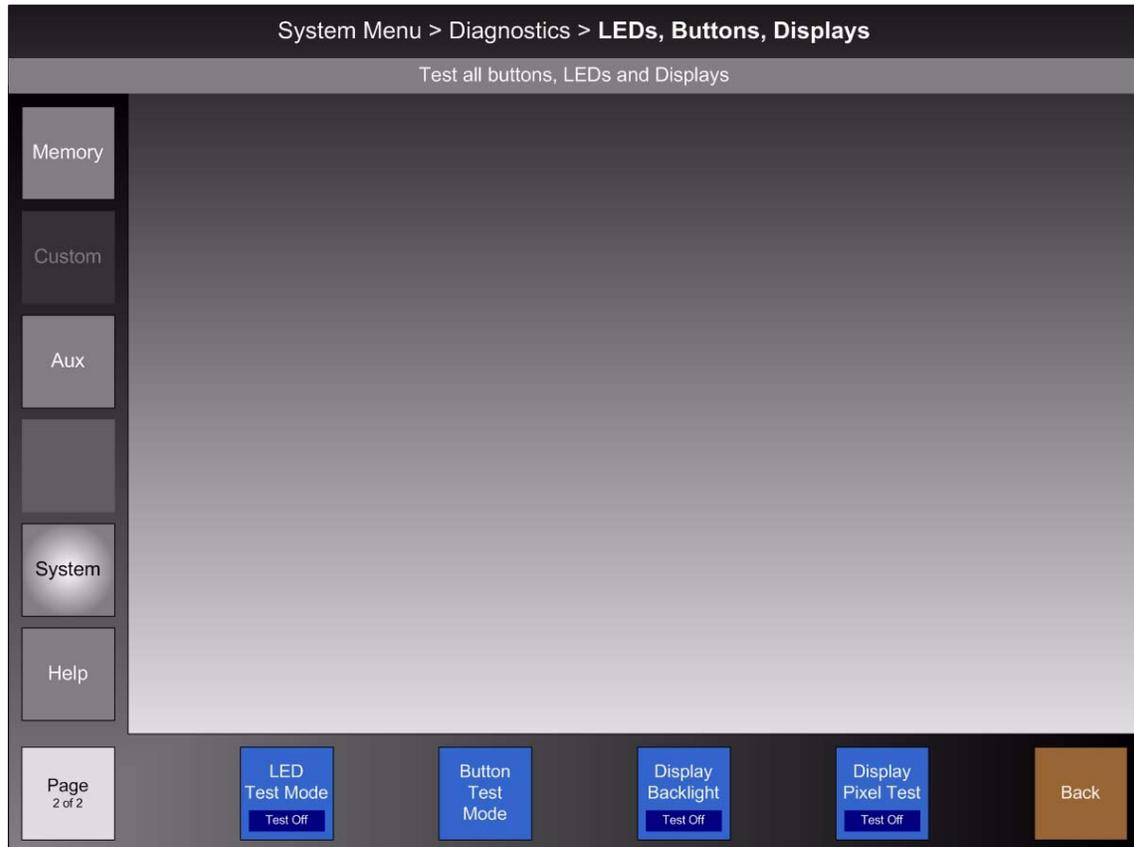
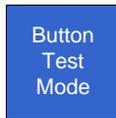


Figure 5-127. LEDs, Buttons and Displays Menu (sample)

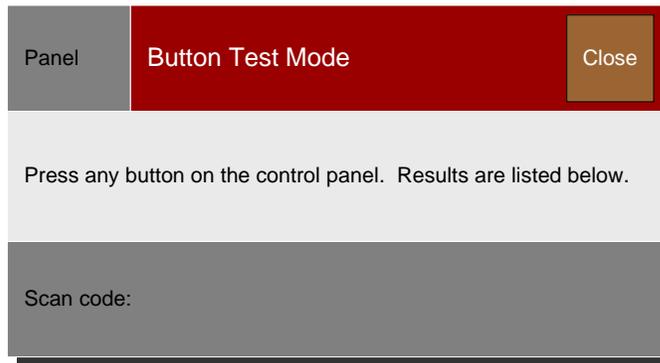
The **LEDs, Buttons and Displays Menu** enables you to perform diagnostic tests on the control panel's LEDs, buttons, transition displays and bus displays. The following diagnostic functions are provided on the menu:



- Press **{LED Test Mode}** to display the **LED Test Mode Pop-up**, which enables you to test all LEDs on the control panel. The following options are available:
  - ~ Press **{Green}** to turn all multi-color LEDs bright green.
  - ~ Press **{Blue}** to turn all multi-color LEDs bright blue.
  - ~ Press **{Red}** to turn all multi-color LEDs bright red.
  - ~ Press **{White}** to turn all multi-color LEDs bright white.
  - ~ Press **{All On}** to turn all LEDs on the panel on.
  - ~ Press **{Test Off}** to conclude the test, and return all LEDs to their previous state, prior to test mode.



- Press **{Button Test Mode}** to display the **Button Test Mode Pop-up**.



**Figure 5-128.** Button Test Mode Pop-up

Press any button on the panel to display its scan code in the pop-up. Press **{Close}** to conclude the test.



- Press **{Display Backlight}** to show the **Display Backlight Pop-up**, which enables you to test the backlight of all control panel displays. The following options are available:
  - ~ Press **{All On}** to turn all displays on at full brightness.
  - ~ Press **{All Off}** to turn all displays off.
  - ~ Press **{Red On}** to turn all bus displays bright red. The transition displays do not have a red component.
  - ~ Press **{Green On}** to turn all displays bright green, including the transition displays.
  - ~ Press **{Test Off}** to conclude the test, and return all displays to their previous state, prior to test mode.

**Note**

In this test mode, the **{Display Pixel Test}** button is grayed out.



- Press **{Display Pixel Test}** to show the **Display Pixel Test Pop-up**, which enables you to test the pixels on all control panel displays. The following options are available:
  - ~ Press **{All Pixels On}** to turn all pixels on all displays on.
  - ~ Press **{All Pixels Off}** to turn all pixels on all displays off.
  - ~ Press **{Test Off}** to conclude the test, and return all displays to their previous state, prior to test mode.

**Note**

In this test mode, the **{Display Backlight}** button is grayed out.

## 5. Menu Orientation

### System Menu

#### Tallies



From the **Diagnostics Menu**, press **{Tallies}** to display the **Tally Diagnostics Menu**. The figure below illustrates a sample menu.

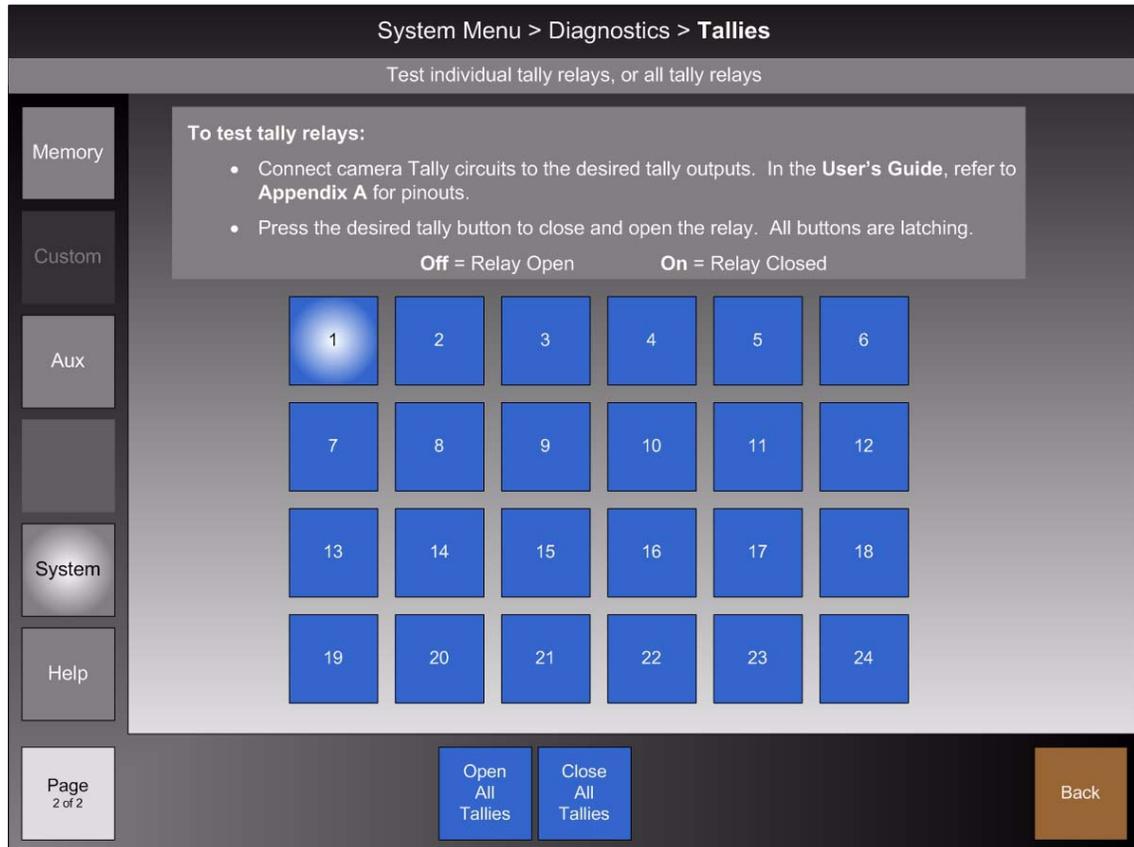


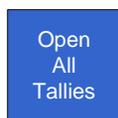
Figure 5-129. Tally Diagnostics Menu (sample)

The **Tally Diagnostics Menu** enables you to test all 24 tally relays. The **Palette** provides a brief set of instructions for conducting the tests. Please note:

- When you enter the **Tally Diagnostics Menu**, the current on/off state of all tallies are shown. While working within the menu, all settings on the **Tally Setup Menu** are disregarded.

The following diagnostic functions are provided on the menu:

- On the **Palette**, press any combination of buttons to close or open the selected tally relay. Each numbered button represents the associated tally relay. In Appendix A, refer to the "[Tally Connector](#)" section on page 443 for pinouts.
- Press **{Open All Tallies}** to open all tally relays.



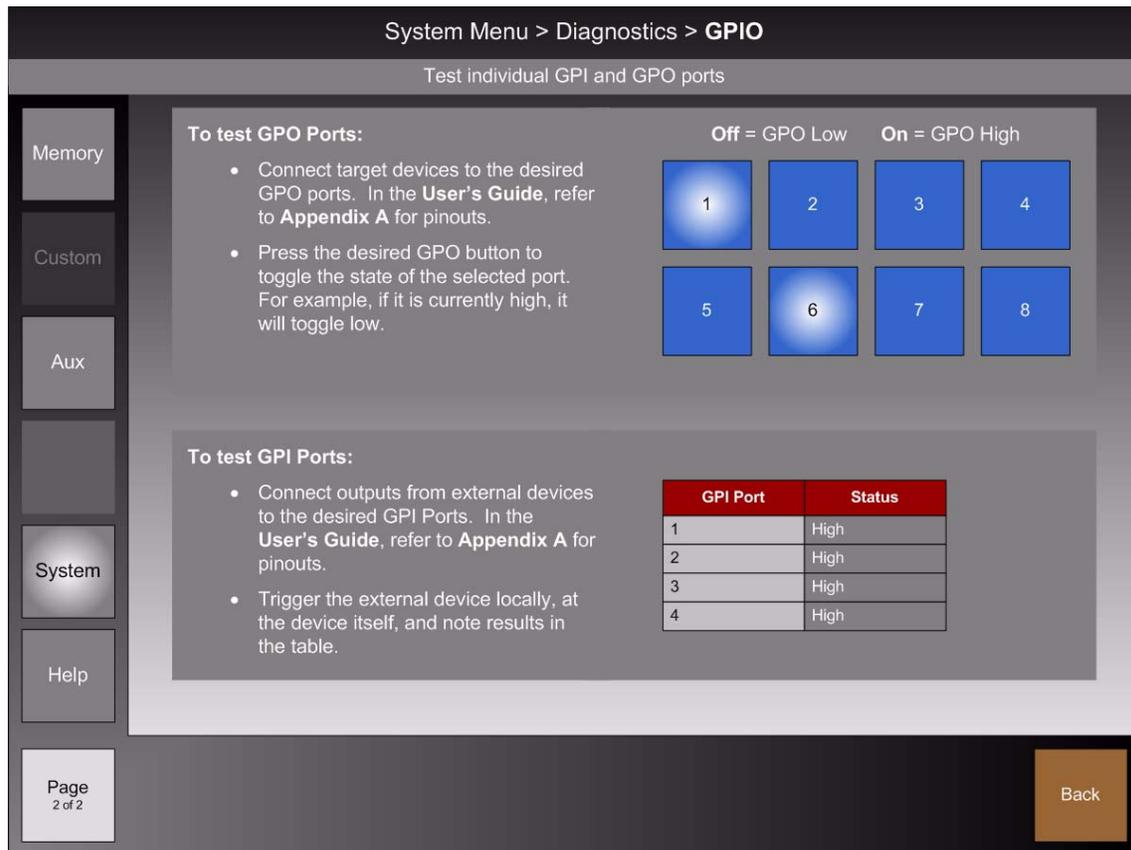


- Press **{Close All Tallies}** to close all tally relays.

### GPIO



From the **Diagnostics Menu**, press **{GPIO}** to display the **GPIO Diagnostics Menu**. The figure below illustrates a sample menu.



**Figure 5-130.** GPIO Diagnostics Menu (sample)

The **GPIO Diagnostics Menu** enables you to test all **GPI** (General Purpose Input) ports and **GPO** (General Purpose Output) ports. The **Palette** provides a brief set of instructions for conducting the tests.

Please note

- When you enter the **GPIO Diagnostics Menu**, the current on/off state of all GPI and GPO ports are shown.



## 5. Menu Orientation

System Menu

- **Date/Time** — lists the date and time that the error occurred.

### Note

The table is sorted by **Priority** first, then by **Date/Time**.

- **Error #** — all error “types” are assigned unique numbers. This feature is designed to assist Technical Support personnel.
- **Description** — provides a brief description of the error.

The following additional functions are provided on the **View Errors Menu**:

- Press **{Tech Support}** to display the **Technical Support Pop-up**, which provides the technical support phone number and email address.

Tech Support



Figure 5-132. Technical Support Pop-up

- If additional troubleshooting details are available for a highlighted error message in the table, the **{Show Info}** button automatically appears. Press **{Show Info}** to display a pop-up with the associated troubleshooting information.
- Press **{Page Up}** to scroll up one page of messages.
- Press **{Page Down}** to scroll down one page of messages.
- Press **{Go to Top}** to take the highlight to the top of the error list.
- Press **{Go to Bottom}** to take the highlight to the bottom of the error list.
- Ensure that a USB drive is inserted into the Control Panel's USB port, then press **{Save to USB}** to save the current error list to a USB drive. Once completed, the system creates an **"Error\_log.txt"** file on the drive.

Show Info

Page Up

Page Down

Go to Top

Go to Bottom

Save to USB

## 5. Menu Orientation

### System Menu

#### View Log



From the **Diagnostics Menu**, press **{View Log}** to display the **View Log Menu**. The figure below illustrates a sample menu.

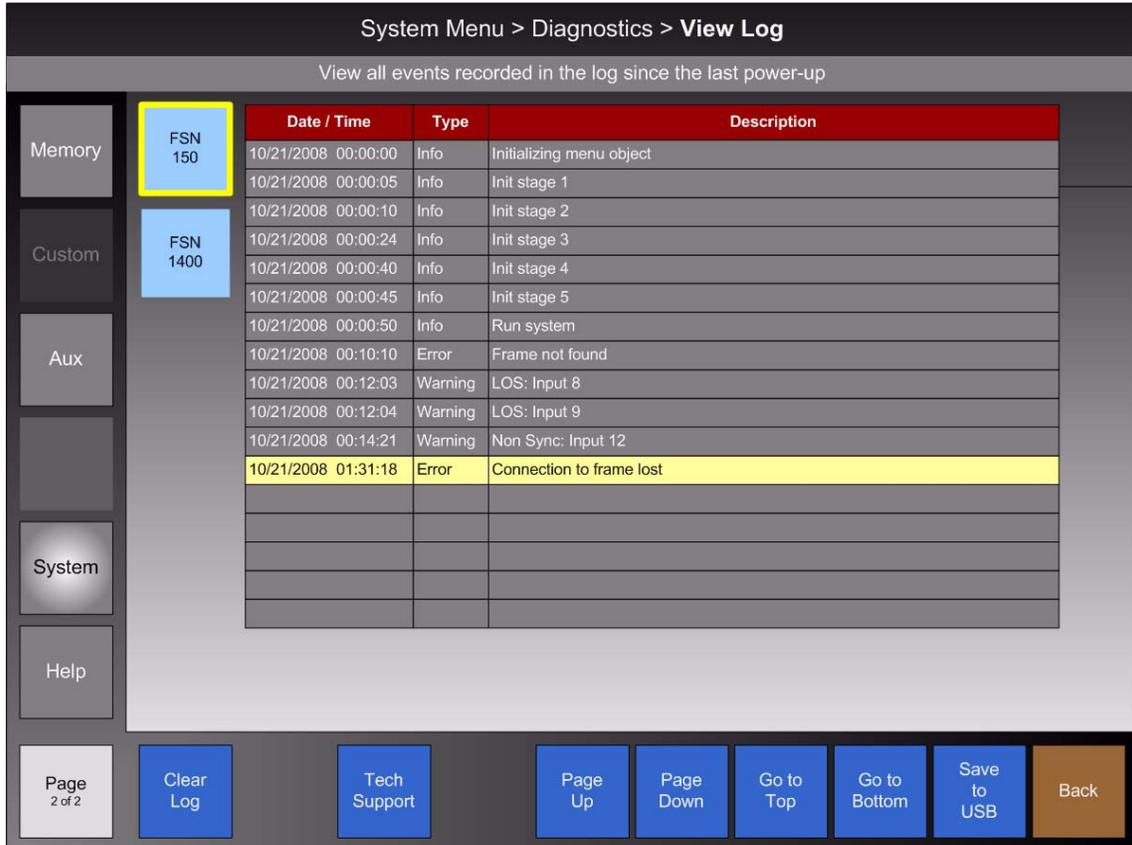
The screenshot shows the "View Log" menu. At the top, it says "System Menu > Diagnostics > View Log". Below that, it says "View all events recorded in the log since the last power-up". On the left side, there are several menu items: "Memory", "Custom", "Aux", "System", and "Help". The "Memory" and "Custom" items are highlighted in blue. The "Memory" item is further highlighted with a yellow border and contains the text "FSN 150". The "Custom" item contains the text "FSN 1400". The main area of the screen is a table with the following columns: "Date / Time", "Type", and "Description". The table contains several rows of log entries. The last row is highlighted in yellow and reads: "10/21/2008 01:31:18 Error Connection to frame lost". At the bottom of the screen, there are several buttons: "Page 2 of 2", "Clear Log", "Tech Support", "Page Up", "Page Down", "Go to Top", "Go to Bottom", "Save to USB", and "Back".

Figure 5-133. View Log Menu (sample)

The **View Log Menu** provides a comprehensive scrolling list of all events recorded in the log since the last power up. Two logs can be displayed — one for the FSN-1400 and one for the control panel. In the **Log Table**, four columns of information are provided:

- **Date/Time** — lists the date and time that the event was logged.
- **Type** — all log events are assigned one of four unique categories: Info, Debug, Warning or Error.
- **Description** — provides a brief description of the event.

## 5. Menu Orientation

### System Menu

The following additional functions are provided:

FSN  
150

- Press **{FSN-150}** to switch the **Log Table** to a list of events from the FSN-150 control panel.

FSN  
1400

- Press **{FSN-1400}** to switch the **Log Table** to a list of events from the FSN-1400.

Clear  
Log

- Press **{Clear Log}** to clear the entire log. You will be asked to confirm this procedure in a pop-up.

Tech  
Support

- Press **{Tech Support}** to display the **Technical Support Pop-up**, which provides the technical support phone number and email address.

Page  
Up

- Press **{Page Up}** to scroll up one page of messages.

Page  
Down

- Press **{Page Down}** to scroll down one page of messages.

Go to  
Top

- Press **{Go to Top}** to take the highlight to the top of the log.

Go to  
Bottom

- Press **{Go to Bottom}** to take the highlight to the bottom of the log.

Save  
to  
USB

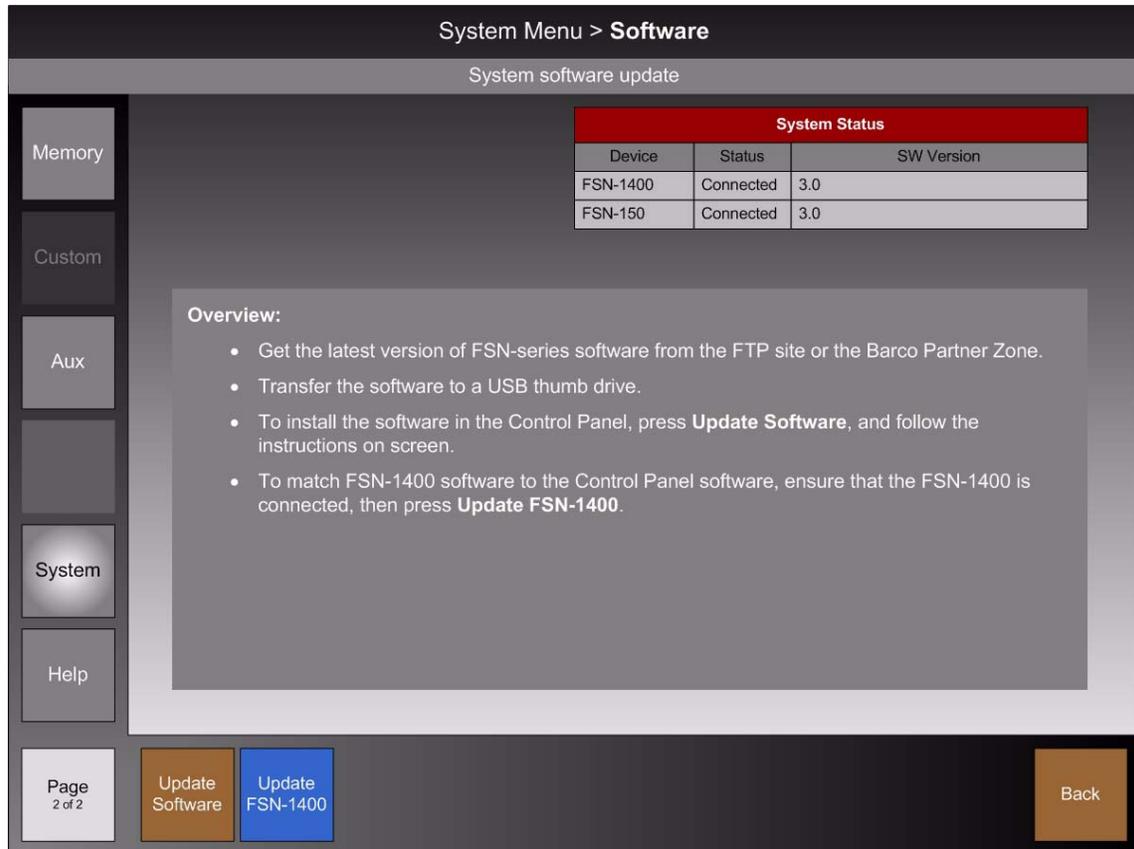
- Ensure that a USB drive is inserted into the Control Panel's USB port, then press **{Save to USB}** to save the current log to a USB drive. Once completed, the system creates an **"Ctrl\_log.txt"** file on the drive.

## 5. Menu Orientation

### System Menu

## Software Menu

From the **System Menu**, press **{Software}** to display the **Software Menu**. The figure below illustrates a sample menu.



**Figure 5-134.** Software Menu (sample)

The **Software Menu** enables you to update the FSN-1400 and control panel with the latest software version. The menu's palette provides a table of software versions, plus concise software update instructions.

The following topics are discussed in this section:

- [Software Table](#)
- [Software Functions](#)

## Software Table

The figure below illustrates a sample **Software Table**.

System Status		
Device	Status	SW Version
FSN-1400	Connected	3.0
FSN-150	Connected	3.0

**Figure 5-135.** Software table (sample)

The **Software Table** lists the current versions of software in the FSN-1400 and control panel. The following columns of information are provided:

- **Device** — lists the system devices.
- **Status** — provides status for the device (e.g., **Connected**, **Not Connected**, **Software Mis-match**).
- **SW Version** — lists the device's software version.

### Note

When the message "**Software Mismatch**" appears on the FSN-1400 line, you must update the FSN-1400 software.

## Software Functions

The following software functions are provided:

- Press **{Update Software}** to install the latest version of FSN Series software in the control panel. In Chapter 10, refer to the "[Updating Control Panel Software](#)" section on page 429 for instructions.
- Press **{Update FSN-1400}** to match FSN-1400 software to the control panel software. In Chapter 10, refer to the "[Updating FSN-1400 Software](#)" section on page 430 for instructions.

The following two buttons are conditional. They only appear if a software mismatch occurs in either the Touch Screen or the control panel's flash memory. If there is no mismatch, the buttons do not appear.

- Press **{Update Touch Screen}** to update the software in the **Touch Screen**, if required. In Chapter 10, refer to the "[Updating FSN-1400 Software](#)" section on page 430 for instructions.
- Press **{Update FSN-150 Flash}** to update the control panel's flash memory, if required. In Chapter 10, refer to the "[Updating FSN-1400 Software](#)" section on page 430 for instructions.

Update  
Software

Update  
FSN-1400

Update  
Touch  
Screen

Update  
FSN-150  
Flash

## 5. Menu Orientation

### System Menu

## Output Test Patterns Menu

From the **System Menu**, press {**Output Test Patterns**} to display the **Output Test Patterns Menu**, which enables you to select and display test patterns. Any test pattern can be sent to any output (including Multiviewer outputs), or one test pattern can be sent to all outputs simultaneously.

The test pattern selection does not alter the outputs selected on the control panel, because in the flow of video, test patterns are inserted downstream of the outputs. Once a test pattern is turned off, the originally selected video output returns.

The figure below illustrates a sample **Output Test Patterns Menu**.

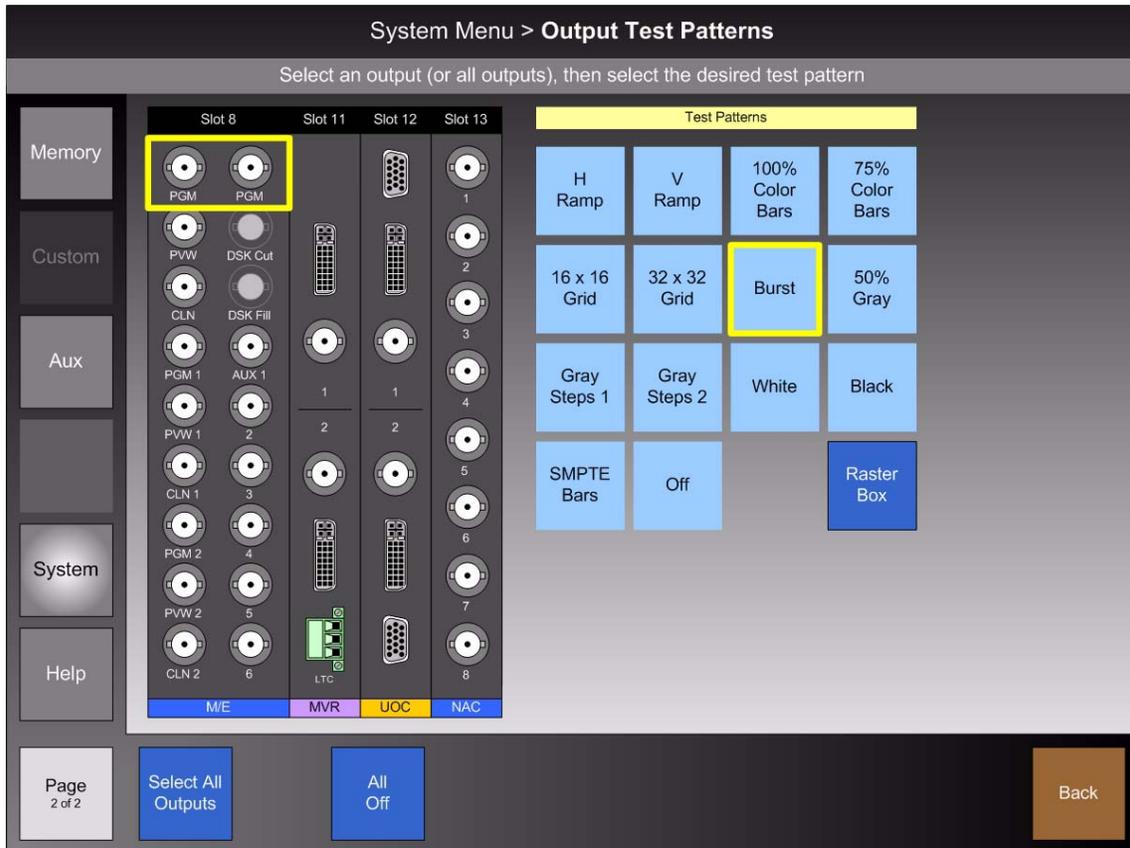


Figure 5-136. Output Test Patterns Menu (sample)

The left side of the **Palette** shows the **Rear I/O View** — specifically, slots **8**, **11**, **12** and **13** which include output connectors. This view will match your system configuration exactly. To select an output, touch the desired BNC to highlight it with a yellow border.

Please note:

- The number of each slot is shown along the top of the **Rear I/O View**, and the type of each card is shown along the bottom (e.g., **M/E**).
- If a card is not installed, the label “**Not Installed**” appears in the slot.
- If a BNC connector is not an output (e.g., **DSK Cut**, **DSK Fill**), those BNCs will be grayed out.

The right side of the **Palette** provides a matrix of all available test patterns, plus specific buttons for {**Off**} and {**Raster Box**}.

## 5. Menu Orientation

### System Menu

To send a test pattern to an output, touch the desired BNC in the **Rear I/O View** section, then touch the desired test pattern in the matrix.

The following 13 **Test Patterns** are provided in the matrix:

- H Ramp
- V Ramp
- 100% Color Bars
- 75% Color Bars
- SMPTE RP-219 Color Bars
- 16 x 16 Grid
- 32 x 32 Grid
- Burst
- 50% Gray
- Gray Steps 1
- Gray Steps 2
- White
- Black
- SMPTE Bars

The following functions are provided in the matrix:

- Press **{Off}** to turn off the test pattern for the selected output.
- Press **{Raster Box}** to enable or disable a raster box for the selected output. The raster box width is fixed at 1 pixel. Note that the raster box can be enabled even if the test pattern is off.

The following functions are provided in the **Tool Bar**:

- Press **{Select All Outputs}** to highlight all outputs in the **Rear I/O View** section. When you select a test pattern in the matrix, that pattern is sent to all outputs.
- Press **{All Off}** to turn off all test patterns and all raster boxes on all outputs simultaneously.

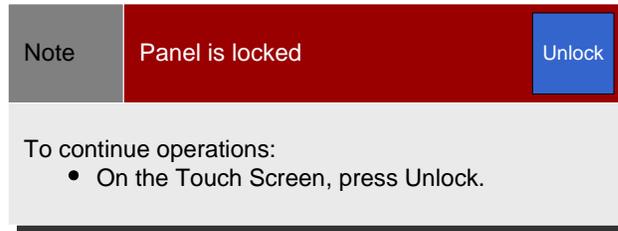
A blue rectangular button with the text "Select All Outputs" in white.A blue rectangular button with the text "All Off" in white.

## 5. Menu Orientation

### System Menu

## Lock/Unlock Panel

On the **System Menu**, press **{Lock Panel}** to display the following pop-up:



**Figure 5-137.** Panel Lockout pop-up

In this mode, the control panel and **Touch Screen** are locked out, and the pop-up remains on display. To unlock the control panel and **Touch Screen**, press **{Unlock}**.

## Save All

On the **System Menu**, press **{Save All}** to save all system setup parameters to non-volatile memory. When pressed, a pop-up confirms the save:



**Figure 5-138.** Save All Pop-up

The following functions are saved when **{Save All}** is pressed:

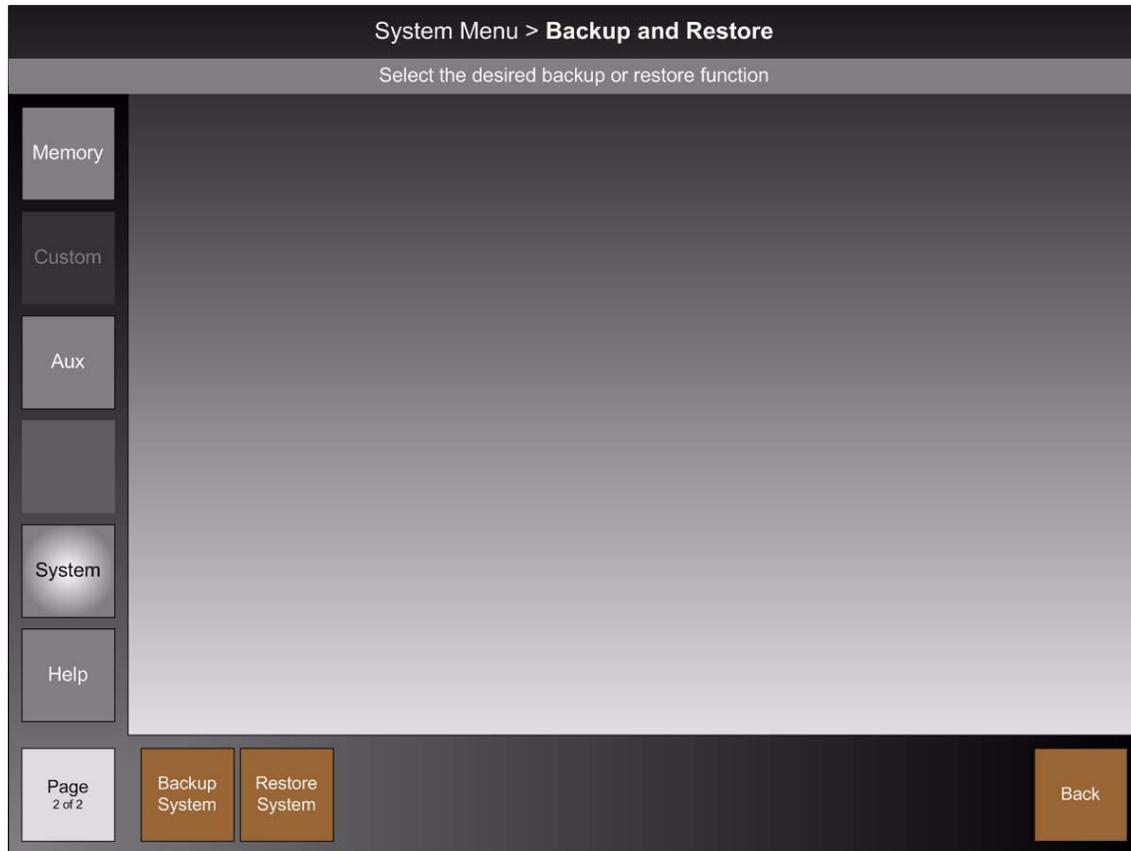
- Input setups, output setups, DSK settings, and reference video settings
- Communications setups
- Clean Feed assignments, including the **ASSIGN** source association
- Button mappings
- Tally assignments
- User Preferences
- DVE assignments, shotbox registers, and the current effects being programmed
- All Aux assignments
- All six “user” colors, from the **Color Background Menu**

### Note

The **{Save All}** button in the **Custom Control Section** is identical to the **{Save All}** button on the **System Menu**.

## Backup and Restore Menu

From the **System Menu**, press **{Backup and Restore}** to display the **Backup and Restore Menu**, which enables you to back up and restore the system to/from a USB drive.



**Figure 5-139.** Backup and Restore Menu

The following functions are provided on the **Backup and Restore Menu**:



- Press **{Backup System}** to initiate the system backup procedure. Ensure that a USB drive is inserted into the **USB Port** on the top of the control panel. Once the drive is detected, you will be prompted to continue or cancel the procedure.



- Press **{Restore System}** to initiate the system restore procedure. Ensure that a USB drive that includes a system backup file is inserted into the **USB Port** on the control panel. Once the restore process is complete, you will be prompted to press **{Restart}**, which restarts the FSN-1400 and control panel.

In Chapter 7, refer to the "[Backing Up and Restoring the System](#)" section on page 350 for complete backup and restore instructions.

## 5. Menu Orientation

### System Menu

## Reset Menu

From the **System Menu**, press **{Reset}** to display the **Reset Menu**, which enables you to perform a factory reset and several types of “soft” resets.

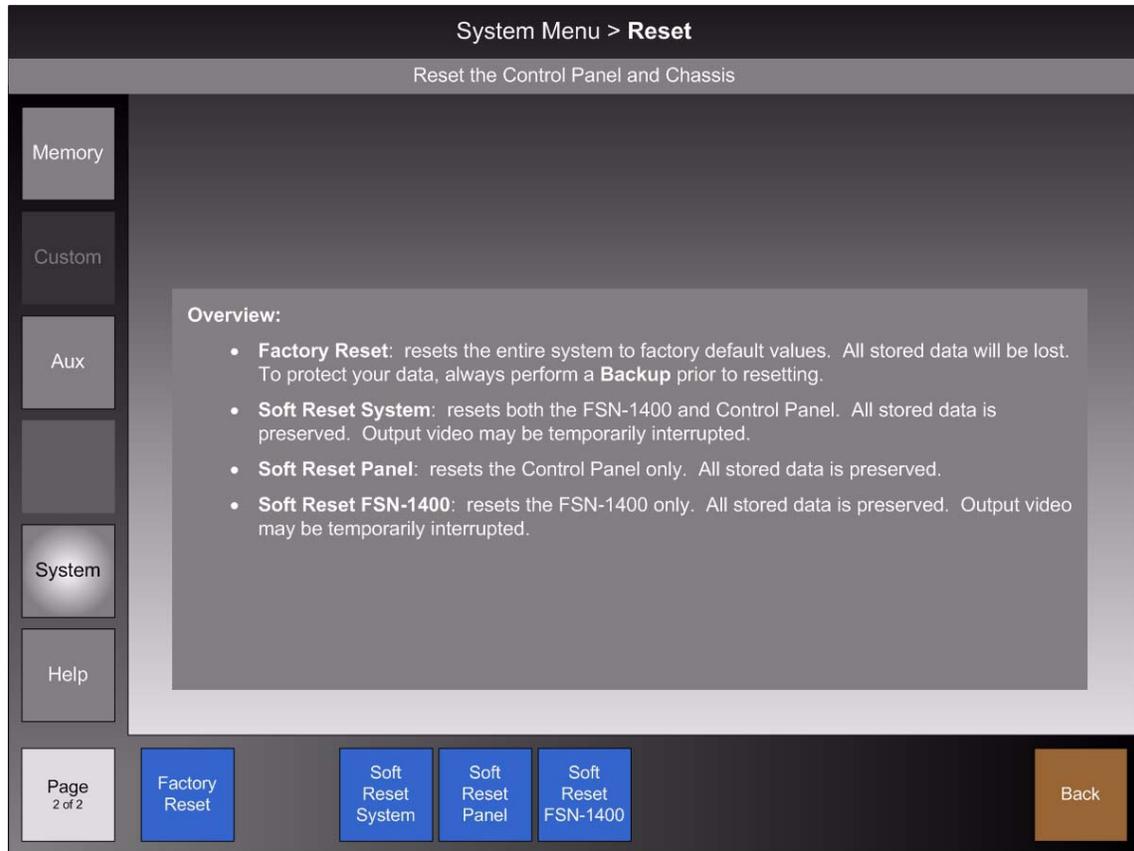


Figure 5-140. Reset Menu

On the **Palette**, brief instructions are provided for each type of reset procedure.

The following functions are provided on the **Reset Menu**:



- Press **{Factory Reset}** to reset the entire system to its factory default values. All data will be lost. After pressing the button, the **Factory Reset Pop-up Menu** appears with three options:
  - ~ Reset and save IP settings.
  - ~ Reset all IP settings to factory default values.
  - ~ Cancel the procedure

If you elect to perform one of the two factory reset options, always ensure that you have backed up your system. Refer to the [“Factory Default Settings”](#) section on page 275 for factory reset details.



- Press **{Soft Reset System}** to perform a “soft” reset on both the FSN-1400 and control panel. All stored data is preserved, but output video may be temporarily interrupted. After pressing the button, you will be prompted to continue or cancel the procedure.

## 5. Menu Orientation

System Menu

Soft  
Reset  
Panel

Soft  
Reset  
FSN-1400

- Press **{Soft Reset Panel}** to perform a “soft” reset on the control panel only. All stored data is preserved. After pressing the button, you will be prompted to continue or cancel the procedure.
- Press **{Soft Reset FSN-1400}** to perform a “soft” reset on the FSN-1400 only. All stored data is preserved, but output video may be temporarily interrupted. After pressing the button, you will be prompted to continue or cancel the procedure.

### Factory Default Settings

When you perform a factory reset, defaults are set in multiple switcher locations, as listed in the following table:

**Table 5-7.** Factory default settings

Switcher Location	Default Setting
All switcher buses	Black
All transitions, rates, curves	Mix, 30 frames, linear
Output format	1920 x 1080i @ 59.94
NIC #1	All inputs mapped to the panel, default names, e.g., N1-1, N1-2.
All other NICs and UICs	Not mapped
Ethernet parameters	Returned to factory defaults or saved — depending on selection in the Factory Reset Pop-up Menu.
Reference input	External
Output V-Lock	Off
Reference output	Tri-level
Native input sync mode	Auto
Universal inputs auto-acquire	On
Black on invalid video	On (User Preferences Menu)
Colors	Backgrounds 1-4 set to Black, User Colors 1-6 set to Black
Keyer types and fills	All types set to Luma, all fills set to Self
External key	Off
Wipe direction, edge, width	Normal, soft, 100
DVE assignments, names	No assignments, default names, e.g., DVE_9_1, DVE_9_2
DVE Menu	All channels set to keyframe 1, all full screen

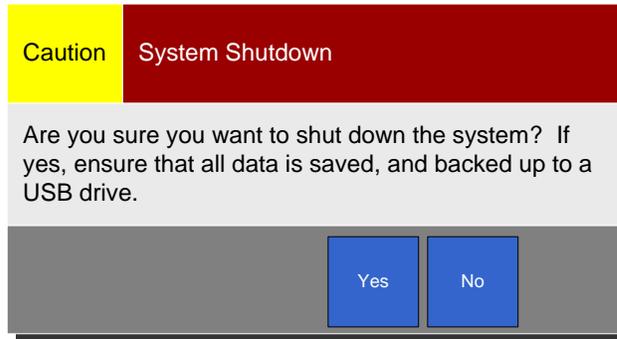
## 5. Menu Orientation

### System Menu

## System Shutdown



From the **System Menu**, press **{Shut Down}** to shut down the control panel. Once the button is pressed, you will be prompted to continue or cancel the procedure.



**Figure 5-141.** System Shutdown Pop-up

Once the control panel shuts down, turn off the power switch on the back of the control panel.

## Help Menu and Shortcuts

The figure below illustrates the **Help Menu**:

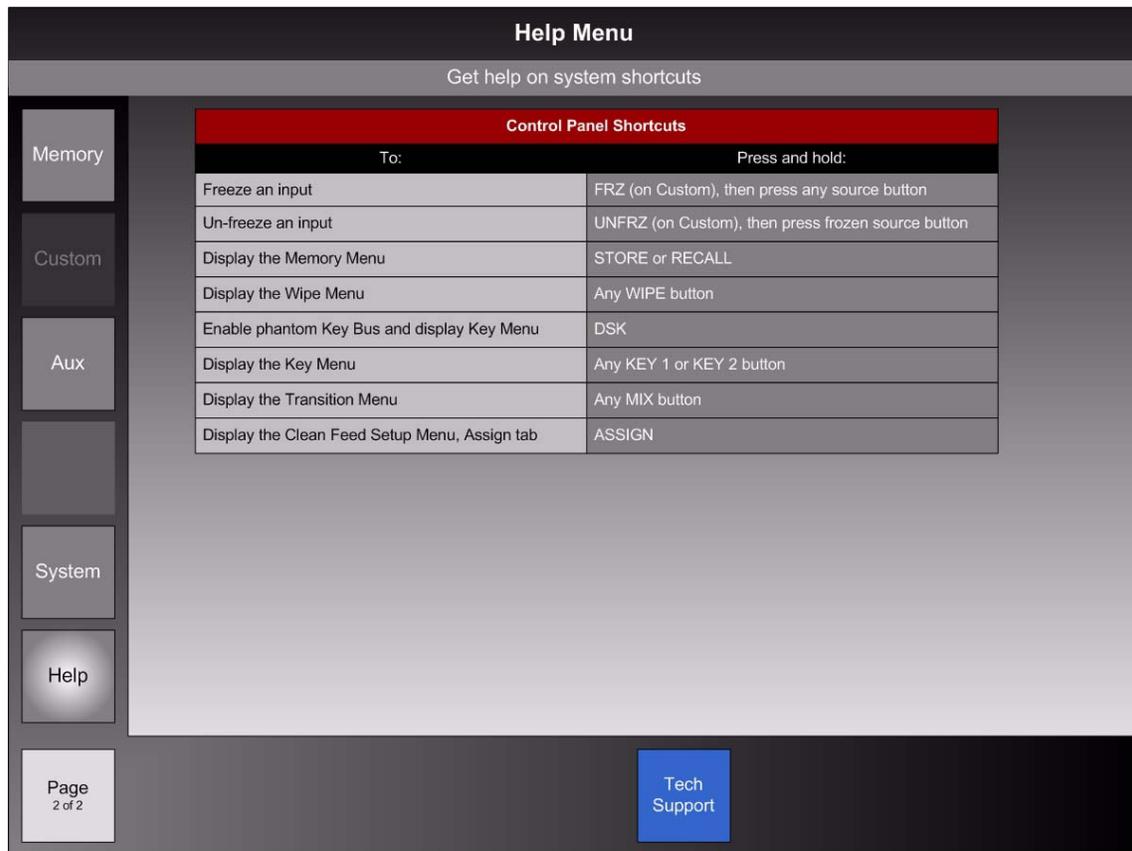


Figure 5-142. Help Menu

The **Help Menu** provides a convenient table of control panel and menu shortcuts, plus technical support information.

To access the **Help Menu**:

- In the **Menu Bar**, press **{Page}** to display page 2 (if required). Then, press the **{Help}** button.

The following functions are provided on the **Help Menu**:

- Press **{Tech Support}** to display the **Technical Support Pop-up**, which provides the technical support phone number and email address.



## 5. Menu Orientation

Help Menu and Shortcuts

### Shortcuts

The table below summarizes control panel and menu shortcuts:

**Table 5-8.** Menu Shortcuts

To:	Press and hold:
Display the <b>Clean Feed Setup Menu, Assign Panel</b>	
Freeze an input	 in the <b>Custom Control</b> section, then press any source button 
Un-freeze an input	 in the <b>Custom Control</b> section, then press any frozen source button 
Display the <b>Memory Menu</b>	 or 
Display the <b>Wipe Menu</b>	 on any bank
Enable the phantom <b>Key Bus</b> and display the <b>Keyer Menu</b> . (Key must be armed first)	
Display the <b>Transition Menu</b>	 on any bank
Display the <b>Keyer Menu</b> . (Key must be armed first)	 or 

# 6. System Setup

---

## In This Chapter

This chapter provides detailed instructions for setting up the FSN Series switcher. The following topics are discussed:

- [Setup Prerequisites](#)
- [System Setup Sequence](#)
- [Power Up and Status Check](#)
- [Return to Factory Default](#)
- [Touch Screen Calibration](#)
- [Restoring the System](#)
- [Communications Setup](#)
- [Reference Video and Output Setup](#)
- [Output Test Patterns](#)
- [Clean Feed Setup](#)
- [Native Input Setup](#)
- [Universal Input Setup](#)
- [External DSK Input Setup](#)
- [Button Mapping](#)
- [Aux Setup](#)
- [Multiviewer Setup](#)
- [Tally Setup](#)
- [User Preferences Setup](#)
- [Saving the Setup](#)
- [Backing up the System](#)

**Note**

Once you have reviewed all of the sections in this chapter, please continue with Chapter 7, "[Operations](#)" on page 307.

## 6. System Setup

### Setup Prerequisites

---

## Setup Prerequisites

Before setting up your FSN Series switcher, please review the following prerequisites:

- Ensure that you are familiar with the FSN-1400. Refer to Chapter 2, "[FSN-1400 Orientation](#)" on page 33 for details.
- Ensure that you are familiar with the FSN-150, including the functions of all buttons within the various sections. Refer to Chapter 3, "[Control Panel Orientation](#)" on page 67 for details.
- Ensure that all hardware is properly installed, and that all sources and peripherals are properly connected. Refer to Chapter 4, "[Installation](#)" on page 103 for complete details.
- Ensure that you are familiar with all menus and sub-menus.
  - ~ Refer to Chapter 5, "[Menu Orientation](#)" on page 131 for details on all menus, except DVE and Multiviewer.
  - ~ Refer to Chapter 8, "[DVE Operations](#)" on page 353 for details on all DVE menus.
  - ~ Refer to Chapter 9, "[Multiviewer Operations](#)" on page 411 for details on all Multiviewer menus.

---

## System Setup Sequence

This section provides a top level view of the entire FSN Series setup procedure, plus links to each individual sequence.

**Important**

For the optimum FSN Series setup, it is recommended that you follow all procedures in the order outlined below.

1. [“Power Up and Status Check,”](#) page 282.
2. [“Return to Factory Default,”](#) page 283.
3. [“Touch Screen Calibration,”](#) page 284.
4. [“Restoring the System,”](#) page 286.
5. [“Communications Setup,”](#) page 285.
6. [“Reference Video and Output Setup,”](#) page 287.
7. [“Output Test Patterns,”](#) page 289.
8. [“Clean Feed Setup,”](#) page 290.
9. [“Native Input Setup,”](#) page 291.
10. [“Universal Input Setup,”](#) page 293.
11. [“External DSK Input Setup,”](#) page 296.
12. [“Button Mapping,”](#) page 297.
13. [“Aux Setup,”](#) page 298.
14. [“Multiviewer Setup,”](#) page 301.
15. [“Tally Setup,”](#) page 303.
16. [“User Preferences Setup,”](#) page 304.
17. [“Saving the Setup,”](#) page 305.
18. [“Backing up the System,”](#) page 305.

All of the above procedures are covered in the sections that follow in this chapter.

**Note**

Refer to Chapter 8, [“DVE Operations”](#) on page 353 for details on setting up the DVE.

## 6. System Setup

### Power Up and Status Check

---

# Power Up and Status Check



FSN Series system setup: **Step 1.**

- Use the following steps to power up your system and check system status.
  - ▲ **Prerequisite** — Ensure that your system is properly installed and cabled. In Chapter 4, refer to the following sections for details:
    - ~ “[Control Panel Installation](#),” page 106.
    - ~ “[Touch Screen Installation](#),” page 107.
    - ~ “[FSN-1400 System Connections](#),” page 112.
  - ▲ **Prerequisite** — Ensure that you are familiar with the **System Menu**. In Chapter 5, refer to the “[System Menu Description](#)” section on page 189 for complete details.
- 1. Power up the FSN-1400.
- 2. Power up the FSN-150 control panel. The **System Menu** is automatically displayed after boot up.

#### Important

If communication is not properly set up, numerous buttons will be grayed out on the **System Menu**. These buttons will activate once communication is properly set.

- 3. Power up all additional peripherals, such as monitors and sources.
- 4. On the **System Menu**:
  - ~ In the **System Status Table**, ensure that all devices are connected. If not, re-check all Ethernet connections. After checking connections, if devices still report “**Not Connected**,” use the “[Communications Setup](#)” procedure on page 285.
  - ~ Ensure that the software versions for the control panel and FSN-1400 match. If not, you may need to update control panel software or match the FSN-1400’s software to the installed control panel software. Refer to Chapter 10, “[Updating Software](#)” on page 425 for details.

#### Note

If the software versions on the control panel and FSN-1400 match, you do not need to upgrade.

- ~ In the **FSN-1400 Status Table**, ensure that all installed **NIC**, **UIC**, **NAC** and **DVE** cards are recognized. If not, you may need to re-seat the boards in the FSN-1400.

---

# Return to Factory Default

## 2

FSN Series system setup: **Step 2.**

Prior to performing any setup procedures, it is recommended that you perform a factory reset — in order to reset all input, output and source mappings to their default values.

Particularly for customers in the events and rental marketplace, this procedure guarantees that any previous input setups and memory registers (e.g., those that may have been programmed by other users) are completely cleared from system memory.

### Note

If you are continuing an event (for example, day two of a three-day event), you do not need to perform a factory reset. However, if you do elect to perform a factory reset, ensure that you have backed up your system. Refer to the “[Backing up the System](#)” section on page 305 for details.

▲ **Prerequisite** — Ensure that you are familiar with the **Reset Menu**. In Chapter 5, refer to the “[Reset Menu](#)” section on page 274.

■ Use the following steps to return the system to factory default values:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Reset}** to display the **Reset Menu**.
3. Press **{Factory Reset}** to reset the entire system to its factory default values. Remember that all data will be lost.
4. When the **Reset Confirmation Pop-up** appears, you can choose to **{Reset and Save IP}**, or **{Reset All}**.

### Note

In Chapter 5, refer to the “[Factory Default Settings](#)” section on page 275 for a list of factory default settings.

## 6. System Setup

### Touch Screen Calibration

---

# 3

FSN Series system setup: **Step 3.**

The calibration procedure is an excellent starting point prior to performing a comprehensive system setup.

▲ **Prerequisite** — Ensure that you are familiar with the **Diagnostics Menu**. In Chapter 5, refer to the [“Diagnostics Menu”](#) section on page 257.

■ Use the following steps to calibrate your Touch Screen:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Diags}** to display the **Diagnostics Menu**.
3. Press **{Calibrate Touch Screen}**, then follow the prompts on screen to perform the calibration.

#### Tip

For a more accurate calibration, use a pencil eraser instead of your finger tip.

---

## Communications Setup

### 4

FSN Series system setup: **Step 4**

In this procedure, you will set up communication between the FSN-1400 and the control panel.

▲ **Prerequisite** — Ensure that you are familiar with the **Communications Setup Menu**. In Chapter 5, refer to the “[Communications Setup Menu](#)” section on page 194.

■ Use the following steps to set up communications:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.

#### Important

If communication is not properly set up, numerous buttons will be grayed out on the **System Menu**. These buttons will activate once communication is properly set.

2. Press **{Com Setup}** to display the **Communications Setup Menu**.
3. Review the data in the **Ethernet Status Table**, and ensure the following:
  - ~ FSN-150 Ethernet 1: **Connected**
  - ~ FSN-1400 Ethernet: **Connected**

If status is “**Connected**,” communication is properly set up. Please continue with the “[Reference Video and Output Setup](#)” procedure on page 287.
4. If status is “**Not Connected**,” press **{Discover FSN-1400}** to locate the IP address(es) of all FSN-1400 units within your local network.
  - ~ If the pop-up alerts you that no FSN-1400 units have been discovered, check all Ethernet connections, then press **{Discover FSN-1400}** again to re-try the procedure.
  - ~ If FSN-1400 units are discovered, the **FSN-1400 Selection Keypad** appears. Select the desired **FSN-1400**, and press **{Connect}**.
5. **(Advanced)** If you need to change the IP address of a highlighted port, for example, if your system is connected to a house network, press **{Set IP Address}** to display the **IP Address Keypad**. Enter the desired address and press **{Enter}**.
6. **(Advanced)** If you need to change the subnet mask of a highlighted port, press **{Set Subnet Mask}** to display the **Subnet Mask Keypad**. Enter the desired subnet mask and press **{Enter}**.
7. **(Advanced)** If you need to return a highlighted port’s IP address and Subnet Mask to their factory default values, press **{Return to Default}**.

## 6. System Setup

### Restoring the System

---

# 5

FSN Series system setup: **Step 5** (optional)

In this procedure, you will restore your system configuration from a USB drive — provided that you previously backed up your system to a USB drive.

▲ **Prerequisite** — Ensure that you are familiar with the **Backup and Restore Menu**. In Chapter 5, refer to the “[Backup and Restore Menu](#)” section on page 273.

■ Use the following steps to restore your system from the USB Drive:

1. Ensure that your USB drive is properly inserted in the control panel’s **USB Port**.
2. In the **Menu Bar**, press **{System}** to access the **System Menu**.
3. Press **{Backup and Restore}** to display the **Backup and Restore Menu**.
4. Press **{Restore System}** to display the **Restore Menu**.
5. In the directory, highlight (touch) the file that you wish to restore.
6. Press **{Restore System}** to initiate the system restore procedure. Once the restore process is complete, you will be prompted to press **{Restart}**, which restarts the FSN-1400 and the control panel.

At the conclusion of this procedure, your system is completely set up — exactly the way that you left it when you performed a complete system “backup.” No further setup operations are required.

Please continue with system operations. Refer to Chapter 7, “[Operations](#)” on page 307 for details.

---

## Reference Video and Output Setup

### 6

FSN Series system setup: **Step 6**

In this procedure, you will set up the system's video reference input, output format (native resolution), and the output V-Lock setting.

▲ **Prerequisite** — Ensure that you are familiar with the **Reference and Output Setup Menu**. In Chapter 5, refer to the "[Reference and Output Setup Menu](#)" section on page 197.

■ **Set up reference** — Use the following steps to set up video reference input:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Ref and Output Setup}** to display the **Reference and Output Setup Menu**.
3. Press **{Reference Input}** to display two reference options:
  - ~ Press **{Free Run}** to select the FSN-1400's internal sync generator as the reference.
  - ~ Press **{External}** to select the **REF IN** connector on the **System Card**. One of three external signals can be connected:
    - SMPTE bi-level sync
    - Tri-level sync
    - Black burst

#### Note

If **External** is selected, ensure that the proper signal is connected to the **REF IN** connector on the **System Card**. In Appendix A, refer to the "[Reference Video Input Specifications](#)" section on page 433 for detailed information about the allowed frame rates for the reference input.

■ **Set up format** — Use the following steps to set up the output format:

1. On the **Reference and Output Setup Menu**, press **{Output Format}** to display the **Output Format Keypad**.
2. Select the desired format and press **{Apply}**. In the confirmation pop-up, click **{Set Output Format}** to confirm.

#### Important

Remember that all input settings will be reset to their default values when you change output formats.

## 6. System Setup

### Reference Video and Output Setup

- **Set up V-Lock and Timing** — Use the following steps to set the output V-Lock mode and SDI output timing, if desired.

#### Note

Remember that this mode can only be set when the **Reference Input** is set to **External**.

1. Press the **{Output V-Lock}** button to toggle the **Output V-Lock** mode on or off.
  - ~ When **On**, the **{SDI Output Timing}** button appears. All native inputs are forced to **Frame Sync** mode, and one frame of delay will be incurred on all native inputs. In addition, on the **Input Setup Menu**, the **{Sync Mode}** button is grayed out.
  - ~ When **Off**, you can not set H and V offsets, and the **{Sync Mode}** button is active on the **Input Setup Menu**. This mode provides the least amount of delay through the switcher.

#### Important

When **{Output V-Lock}** is **On**, the position of the **DSK Cut** and **DSK Fill** inputs on screen will change.

- If the user preference “**Black on Invalid Video**” is turned on, the DSK turns off — because of the change in output timing.
- If the user preference “**Black on Invalid Video**” is off, the DSK will be visible — but in a shifted position. In this condition, the video position can be adjusted by changing the output timing of the DSK source itself.

Refer to the “[User Preferences Setup](#)” section on page 304 for User Preference Setup instructions.

2. If **{Output V-Lock}** is **On**, press **{SDI Output Timing}** to set **SDI H** and **V** offsets. Use the **{SDI H Offset}** and **{SDI V Offset}** controls to set the offsets as desired.
- **Set up reference output** — Use the following steps to set the reference video output:
    1. On the **Reference and Output Setup Menu**, press **{Ref Output}** to change the reference video signal that is currently available on the **REF OUT** connector.
    2. Select either **Tri-level** or **Burst**, as required.

#### Note

The **{Ref Output}** button is grayed out when certain output formats are selected, and a default signal is automatically provided on the **REF OUT** connector. In Chapter 5, refer to the “[Reference and Output Setup Menu](#)” section on page 197 for details.

---

## Output Test Patterns

### 7

FSN Series system setup: **Step 7** (optional)

In this procedure, you can display test patterns on selected system outputs (or all system outputs), typically for purposes of setting up external devices.

▲ **Prerequisite** — Ensure that you are familiar with the **Output Test Patterns Menu**. In Chapter 5, refer to the [“Output Test Patterns Menu”](#) section on page 270.

■ Use the following steps to select and display output test patterns:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Output Test Patterns}** to display the **Output Test Patterns Menu**.
3. To display a test pattern on one output:
  - a. Press the desired output connector in the **Rear I/O View** on the left side of the menu.
  - b. Press the desired test pattern in the matrix on the right side of the menu.
  - c. Press **{Raster Box}** to enable or disable the raster box as desired.
  - d. When complete, press **{Off}** to turn the test pattern off.

**Note**

Remember that you can set a different test pattern on each output.

4. To display a test pattern on all outputs:
  - a. Press **{Select All Outputs}**.
  - b. Press the desired test pattern in the matrix on the right side of the menu.
  - c. Press **{Raster Box}** to enable or disable the raster box as desired.
  - d. When complete, press **{All Off}**.

**Important**

Ensure that you press **{All Off}** after you have finished using any output test pattern.

## 6. System Setup

### Clean Feed Setup

# 8

FSN Series system setup: **Step 8**

In this procedure, you can set clean feed outputs, and select a source for the **ASSIGN** button (in the control panel's **Aux Section**).

▲ **Prerequisite** — Ensure that you are familiar with the **Clean Feed Setup Menu**. In Chapter 5, refer to the "[Clean Feed Setup Menu](#)" section on page 232.

■ **Clean Feed Setup** — Use the following steps to set clean feed outputs:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Clean Feed Setup}** to display the **Clean Feed Setup Menu**.
3. Press **{Clean Feed Outputs}** to display the **Clean Feed Outputs Chart**.
4. On the chart, select the desired clean feed point for M/E 1's clean feed output:
  - ~ Press **{M/E 1 Clean 1}** to select the point prior to Keyer 1 on M/E 1.
  - ~ Press **{M/E 1 Clean 2}** to select the point prior to Keyer 2 on M/E 1.
  - ~ Press **{M/E 1 Out}** to select the point after Keyer 2 on M/E 1.
5. On the chart, select the desired clean feed point for M/E 2's clean feed output:
  - ~ Press **{M/E 2 Clean 1}** to select the point prior to Keyer 1 on M/E 2.
  - ~ Press **{M/E 2 Clean 2}** to select the point prior to Keyer 2 on M/E 2.
  - ~ Press **{M/E 2 Out}** to select the point after Keyer 2 on M/E 2.
6. Select the desired clean feed point for the PGM bank's clean feed output:
  - ~ Press **{PGM Clean}** to select the point prior to the DSK.
  - ~ Press **{PGM Out}** to select the point after the DSK.

■ **ASSIGN Setup** — Use the following steps to select the clean feed source that is mapped to the **ASSIGN** button in the control panel's **Aux Section**:

7. Press **{Assign Button}** to display the **Assign Button Chart**.
8. Select one of three mutually exclusive clean feed points for the button:
  - ~ Press **{M/E 1 Clean 1}** to select the point prior to Keyer 1 on M/E 1.
  - ~ Press **{M/E 1 Clean 2}** to select the point prior to Keyer 2 on M/E 1.
  - ~ Press **{M/E 2 Clean 1}** to select the point prior to Keyer 1 on M/E 2.
  - ~ Press **{M/E 2 Clean 2}** to select the point prior to Keyer 2 on M/E 2.
  - ~ Press **{PGM Clean}** to select the point prior to the DSK.

Please note:

- The clean feed selection is *global* for all Aux routes. If you change the mapping for one route, it changes for *all* routes.
- To quickly display the **Assign Button Panel**, press and hold the **ASSIGN** button.

## Native Input Setup

### 9

FSN Series system setup: **Step 9**

In this procedure, you will perform a complete setup on all native switcher inputs. Ensure that your inputs are properly connected to the selected **NIC** before continuing.

- ▲ **Prerequisite** — Ensure that you are familiar with the following menus:
  - ~ **Input Menu** — Chapter 5, “[Input Menu](#),” page 202.
  - ~ **Connector Colors** — Chapter 5, “[Connector Colors](#),” page 204.
  - ~ **Input Setup Menu (Native Inputs)** — Chapter 5, “[Input Setup Menu for Native Inputs](#),” page 209.

■ **Native Input Setup** — Use the following steps for basic native input setup:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Input Setup}** to display the **Input Menu**.

#### Note

After a factory reset, all inputs on **NIC #1** are mapped to the control panel, in a 1-1 layout to unshifted buttons **1** through **8**. Default names are assigned. No other inputs are mapped.

3. In the **Rear I/O View**, press the connector on the **NIC** that you want to set up. In the **Input Table**, the input is highlighted.
4. Press **{Map to}** to map the selected input to the control panel, or re-map it to another button. When the **Map To Pop-up** appears, on the Program Bank's **Preset Bus**, press the button on which you want the input to appear.

#### Important

The system allows you to map an input to more than one button. If an input is already mapped to a button and you wish to map it to another location, use the **{Un-map}** function to remove the button from the unwanted location.

5. Press **{Input Name}** to name (or re-name) the selected input. When the pop-up **Keyboard** appears, enter the desired name and press **{Enter}** on the **Keyboard**.
6. If required, press **{Un-map}** to remove the selected input from the panel. Note that the name and all associated setup parameters are retained.
7. Press **{Error Reporting}** to turn error reporting on or off.
  - ~ When **on**, if an input experiences an error, the input's BNC turns red on the rear I/O view, the input's **Programmable Display** turns red, and the “**Error**” button appears.
  - ~ When **off**, the input's **Programmable Display** remains green and the red “**Error**” button does not appear. The connector remains red.

#### Note

The **{Error Reporting}** function works on a connector by connector basis. You can have reporting on for one connector, and off for another.

## 6. System Setup

### Native Input Setup

8. After a factory reset, the **Sync Mode** for all native inputs is set to **Auto Sync**. In this mode, the system automatically determines whether to set **Auto: Minimum Delay** mode or **Auto: Frame Sync** mode for each input. If **Auto: Frame Sync** is set, the system will not return to **Auto: Minimum Delay** mode until the sync processing is refreshed for the input.

To refresh sync for all inputs, press **{Refresh All Sync}**. Next, in the pop-up, press **{Yes}**. Native inputs set to **Frame Sync** or **Minimum Delay** modes will not be affected. Only inputs set to **Auto: Frame Sync** mode will be affected.

#### Note

If you want to refresh sync for just a selected native input, use the **{Refresh Sync}** button on the **Input Setup Menu**.

#### Note

This function does not apply to universal inputs.

- **Color Correction** — Use the following steps to set up native input color correction:
  1. Press **{Setup}** to display the **Input Setup Menu** for the selected native input.
  2. To adjust the input's brightness, contrast and gamma, press **{Bright Contrast Gamma}**. Use the **{Bright}**, **{Contrast}** and **{Gamma}** controls as desired.
  3. To adjust the input's RGB brightness, press **{RGB Bright}**. Use the **{Red Bright}**, **{Green Bright}** and **{Blue Bright}** controls as desired.
  4. To adjust the input's RGB contrast, press **{RGB Contrast}**. Use the **{Red Contrast}**, **{Green Contrast}** and **{Blue Contrast}** controls as desired.
  5. To adjust hue and color saturation, press **{Hue Sat}** and adjust as desired.
- **Sync Setup** — Use the following steps to set up native input sync:
  1. Press **{Sync Mode}** to set the input's synchronization mode. In the pop-up, select **{Auto}**, **{Minimum Delay}** or **{Frame Sync}** mode. In Chapter 5, refer to the "[Understanding Sync Mode](#)" section on page 211 for complete details.
  2. Press **{Refresh Sync}** to refresh sync for the selected input only. This function is only required in **Auto Sync** mode. If the system switches from **Auto: Minimum Delay** to **Auto: Frame Sync**, the system will not return to **Auto: Minimum Delay** until the sync processing is refreshed.
- **Mask Setup** — Use the following steps to set up native input mask:
  1. Press **{Mask}** to mask one or more edges of the video signal, if required. Use the **{Mask Top}**, **{Mask Bottom}**, **{Mask Left}** and **{Mask Right}** controls as required. When a mask is applied on an edge, black is revealed.
  2. If required, press **{Clear Mask}** to clear all four masks to their default settings.
- **Save Settings** — Use the following steps to save input settings:
  1. Press **{Save Settings}** to save the selected input's setup parameters.
  2. Press **{Back}** to return to the **Input Menu**.
  3. Repeat from step 3 for each additional input that you wish to set up.

#### Important

Because you can install either a **NIC** or a **UIC** in slots 3 and 4, if you move or change card assignments in these two slots during setup, the setup is invalidated, and must be repeated once the final card configuration is reached.

## Universal Input Setup

### 10

FSN Series system setup: **Step 10**

In this procedure, you will perform a complete setup on all universal switcher inputs. Ensure that your inputs are properly connected to the selected **UIC** before continuing.

- ▲ **Prerequisite** — Ensure that you are familiar with the following menus:
  - ~ **Input Menu** — Chapter 5, “[Input Menu](#),” page 202.
  - ~ **Connector Colors** — Chapter 5, “[Connector Colors](#),” page 204.
  - ~ **Input Setup Menu (Universal Inputs)** — Chapter 5, “[Input Setup Menu for Universal Inputs](#),” page 214.

■ **Universal Input Setup** — Use the following steps for basic universal input setup:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Input Setup}** to display the **Input Menu**.

#### Note

Remember that after a factory reset, **UIC** inputs are not mapped to the panel, but default names are assigned.

3. In the **Rear I/O View**, press the input connector on the **UIC** that you want to set up. A yellow highlight is placed around all three input connectors, and in the **Input Table**, the input is highlighted.
4. Select the individual **UIC** connector — either the **BNC**, **HD-15** or **DVI**. A green highlight indicates the selection.
5. Press **{Map to}** to map the selected input to the control panel, or re-map it to another button. When the **Map To Pop-up** appears, on the Program Bank’s **Preset Bus**, press the button on which you want the input to appear.

#### Important

The system allows you to map an input to more than one button. If an input is already mapped to a button and you wish to map it to another location, use the **{Un-map}** function to remove the button from the unwanted location.

6. Press **{Input Name}** to name (or re-name) the selected input. When the pop-up **Keyboard** appears, enter the desired name and press **{Enter}** on the **Keyboard**.
7. If required, press **{Un-map}** to remove the selected input from the panel. Note that the name and all associated setup parameters are retained.
8. Press **{Error Reporting}** to turn error reporting on or off.
  - ~ When **on**, if an input experiences an error, the connector turns red on the rear I/O view, the input’s **Programmable Display** turns red, and the “**Error**” button appears.
  - ~ When **off**, the input’s **Programmable Display** remains green and the red “**Error**” button does not appear. The connector remains red.

#### Note

The **{Error Reporting}** function works on a connector by connector basis.

## 6. System Setup

### Universal Input Setup

- **Capture and Timing** — Use the following steps to set up universal input capture and timing parameters:

1. Press **{Setup}** to display the **Input Setup Menu** for the selected universal input.
2. Press **{Capture and Process}** to display the **Capture and Process Panel**.
3. Press **{Auto Acquire}** to toggle the **Auto Acquire** mode **On** or **Off** as required.
  - ~ When **Off**, you can set the resolution using the **{Input Format}** button.
  - ~ When **On**, the system attempts to detect the resolution. When a match is found, the format is applied and the **Format** field in the table is updated. Once the system acquires a new format, it automatically scales the input up (or down) to the current native resolution.

#### Note

If an exact match cannot be found, you may need to use **{Input Format}** button to set the format manually.

4. If required, press **{Input Format}** to display the **Input Format Keypad**. Locate the desired format and press **{Apply}**.
5. **Analog and DVI inputs only** — Press **{EDID Format}** to display the **EDID Format Keypad**. Locate the EDID format and press **{Apply}** to program EDID.

#### Important

This function is designed for advanced users only. Do not program the EDID unless it is necessary.

6. **Analog and DVI inputs only** — Press **{Color Space}** to toggle between **SMPT**E and **RGB** processing, as required.
  7. **Analog inputs only** — Press **{1:1 Sampling}** to toggle the 1:1 sampling mode on or off, as required.
  8. **Analog inputs only** — Press **{Sample Phase}**, and use the **Sample Phase** control to adjust the input's A/D converter. For optimum visual results when adjusting high-resolution sources, output a burst test pattern from the source, and adjust for minimum noise.
  9. **Analog inputs only** — Press **{Adjust H Timing}** to adjust the image's horizontal timing. Use the **{H Pos}**, **{H Active}** and **{H Total}** controls as required.
  10. **Analog inputs only** — Press **{Adjust V Timing}** to adjust the image's vertical timing. Use the **{V Pos}** and **{V Active}** controls as required.
- **Processing Setup** — Use the following steps to set up universal input processing parameters:
    1. Press **{Sharpness}**, and use the **Sharpness** control to set the input's sharpness.
    2. **Component, S-video and composite inputs only** — Press **{Pull-down Comp}** to toggle the **Pull-down Compensation** mode on or off, as required.
    3. **Interlaced formats only** — Press **{De-Interlace}** to display the **De-Interlace Pop-up**. Choose either **Motion Adaptive** or **Field to Frame** mode.
    4. If **Motion Adaptive** de-interlacing is selected, press **{Motion Threshold}** and use the control to adjust the threshold of the motion adaptive de-interlacer, if required.
  - **Sizing and Scaling** — Use the following steps to set up sizing and scaling:
    1. Press **{Sizing and Scaling}** to display the **Sizing and Scaling Panel**.

## 6. System Setup

### Universal Input Setup

2. Use the **{Mask Top}**, **{Mask Bottom}**, **{Mask Left}** and **{Mask Right}** controls to mask selected portions of the image, as required.
  3. Select the method by which you want to size and scale the image. Masked edges are taken into account.
    - ~ Press **{Fill H}** to scale the selected universal input up (or down) to the current native **horizontal** resolution. Aspect ratio is maintained.
    - ~ Press **{Fill V}** to scale the input up (or down) to the current native **vertical** resolution. Aspect ratio is maintained.
    - ~ Press **{Fill H/V}** to scale the input up (or down) to the current native **horizontal** and **vertical** resolutions. Aspect ratio is not maintained.
  4. If required, press **{Reset Fill}** to return the input to its previous scaling. Mask settings are retained.
  5. If required, press **{Clear Mask}** to return all mask settings to 0 (zero). Scaling is maintained.
  6. Press **{Reset All}** to return the input to its previous scaling, and return all mask settings to 0 (zero).
- **Color Correction** — Use the following steps to set up universal input color correction:
1. To adjust the selected input's overall brightness and contrast, press **{Bright Contrast}**. Use the **{Bright}** and **{Contrast}** controls as desired.
  2. To adjust the input's RGB brightness, press **{RGB Bright}**. Use the **{Red Bright}**, **{Green Bright}** and **{Blue Bright}** controls as desired.
  3. To adjust the input's RGB contrast, press **{RGB Contrast}**. Use the **{Red Contrast}**, **{Green Contrast}** and **{Blue Contrast}** controls as desired.
  4. To adjust hue and color saturation, press **{Hue Sat}**. Use the **{Hue}** and **{Sat}** controls as desired.
- **Save Input Settings** — Use the following steps to save input settings:
1. Press **{Save Settings}** to save the selected input's setup parameters.
  2. Press **{Back}** to return to the **Input Menu**.
  3. Repeat from step 3 for each additional input that you wish to set up.

#### Important

Because you can install either a **NIC** or a **UIC** in slots **3** and **4**, if you move or change card assignments in these two slots during setup, the setup is invalidated, and must be repeated once the final card configuration is reached.

## 6. System Setup

### External DSK Input Setup

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## External DSK Input Setup

11

FSN Series system setup: **Step 11**

In this procedure, you will set up the external DSK inputs.

- ▲ **Prerequisite** — Ensure that you are familiar with the following menus:
  - ~ **External DSK Setup Menu** — Chapter 5, “[External DSK Setup Menu](#),” page 229.
  - ~ **Connector Colors** — Chapter 5, “[Connector Colors](#),” page 204.
- **Error Reporting** — Use the following steps to set external DSK error reporting:
  1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
  2. Press **{External DSK Setup}** to display the **External DSK Setup Menu**.
  3. In the **Rear I/O View**, press the **DSK Cut** connector.
  4. Toggle the **{Error Reporting}** button either **On** or **Off**, as desired. The table’s **Error Reporting** column indicates your selection.
    - ~ If you elect not to use the external DSK input, turn error reporting off to prevent error messages.
    - ~ If you elect to use the input, ensure that your source is properly connected to the FSN-1400.
  5. Press the **DSK Fill** connector, and repeat step 4.
- **Input Sync** — Use the following steps to set up external DSK input sync:
  1. In the **Rear I/O View**, press the **DSK Cut** connector.
  2. Press **{Sync Mode}**. In the pop-up, select **{Auto}**, **{Minimum Delay}** or **{Frame Sync}**. In Chapter 5, see the “[Understanding Sync Mode](#)” section for details.
  3. If required, press **{Refresh Sync}**. This function is only required in **Auto Sync** mode. If the system switches from **Auto: Minimum Delay** to **Auto: Frame Sync**, the system will not return to **Auto: Minimum Delay** until sync is refreshed.
  4. Press the **DSK Fill** connector, and repeat steps 2 and 3.
- **Save Settings** — Use the following steps to save DSK input settings:
  1. Press **{Save Settings}** to save all DSK input setup parameters.
  2. Press **{Back}** to return to the **System Menu**.

## Button Mapping

### 12

FSN Series system setup: **Step 12**

This procedure enables you to map inputs, sources, linear key cut and fill signals, test patterns, color background signals, and re-entry crosspoints to the panel.

▲ **Prerequisite** — Ensure that you are familiar with the **Map Buttons Menu**. In Chapter 5, refer to the “[Map Buttons Menu](#)” section on page 224.

■ Use the following steps to map buttons:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Map Buttons}** to display the **Map Buttons Menu**.
3. Use the **{Panel Button}** control to select the button you wish to map. Press **{SHIFT}** to map the button’s shifted position. The table changes accordingly.
4. To map an input (source) or a linear key “cut” signal to the selected button, press **{Map Source/Cut}**. The **Map Buttons Keypad** appears.
  - ~ To map a source, press **{Source}** to display sources only. Select the desired source and press **{Map}**.
  - ~ To map a test pattern, press **{Test Patterns}** to display internal test patterns only. Select the desired test pattern and press **{Map}**.
  - ~ To map a color background signal, press **{Color BG}** to display the four internal color backgrounds. Select the desired signal and press **{Map}**.
  - ~ To map an M/E program output (a re-entry crosspoint), press **{Other}** to display the two M/E program returns. Select the desired signal and press **{Map}**.
5. To map a linear key “fill” signal to the selected button, press **{Map Linear Key Fill}**. Follow the same procedure outlined in step 4.

#### Note

If you elect to use M/E 2, ensure that the M/E order is properly set using the **Other Setup Menu**. In Chapter 5, refer to the “[Other Setup Menu](#)” section on page 253 for details.

6. To clear a source from the panel, select the button you wish to clear, then press **{Clear Source/Cut}**.
7. To clear a linear key fill source from the panel, select the button you wish to clear, then press **{Clear Linear Key Fill}**.

Please note the following important points:

- When a source is mapped to a button on which another source is already mapped, the previous source is overwritten and un-assigned. On the **Input Menu**, the previous source’s BNC turns yellow, but its name remains in the table.

## 6. System Setup

### Aux Setup

# 13

FSN Series system setup: **Step 13**

This procedure enables you to name and map both standard and optional Aux outputs, and set up a variety of parameters for universal Aux outputs (on any installed **UOC**). Aux outputs can be mapped to the control panel or the **Aux Menu**.

▲ **Prerequisite** — Ensure that you are familiar with the **Aux Setup Menu**. In Chapter 5, refer to the “[Aux Setup Menu](#)” section on page 240.

■ **Map and Name** — Use the following steps to map and name Aux outputs:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Aux Setup}** to display the **Aux Setup Menu**.
3. In the **Rear I/O View**, press the Aux connector that you want to map and name. In the **Aux Table**, the Aux output is highlighted.

#### Note

Aux outputs can be mapped to more than one location, either on the panel, menu, or both. In this configuration, the “+” symbol appears in the Aux Table’s **Map** column.

4. **Map to Panel** — Press **{Map Aux to Panel}** to map the Aux output to a physical button on the panel’s **Aux Output Row**. When the **Map To Pop-up** appears, press the desired shifted or un-shifted button on the **Aux Output Row**.
  5. **Map to Menu** — Press **{Map Aux to Menu}** to map the selected output to a button on the **Aux Menu**. When the **Map Aux Keypad** appears, select the desired menu position and press **{Apply}**.
  6. **Remove Aux from Panel or Menu** — Press **{Unassign Aux}** to remove the selected Aux mapping from the panel and/or the **Aux Menu**. All instances of the mapping will be removed.
  7. **Name Aux** — Press **{Aux Name}** to associate a name (up to eight characters in length) with the selected Aux output. When the pop-up **Keyboard** appears, enter the desired name and press **{Enter}** on the **Keyboard**.
  8. Repeat from step 3 for all Aux outputs that you wish to map and name.
- **Format and Processing** — Use the following steps to set the universal Aux output format, and preliminary processing parameters:
1. On the **Aux Setup Menu**, press the **UOC** Aux connector that you want to set up.
  2. Press **{Setup}** to display the **UOC Setup Menu** for the selected Aux output.
  3. Press **{Output and Process}** to display the **Output and Process Panel**.
  4. Press **{Output Format}** to display the **Output Format Keypad**. Locate the desired output format and press **{Apply}**.
  5. Press **{Advanced Output Setup}** to display the **Advanced UOC Setup Menu**, which enables you to adjust advanced UOC output parameters. See below for details and instructions.
  6. Press **{Sharpness}**, and use the **Sharpness** control to set the input’s sharpness.
  7. Press **{Flicker Filter}**, and use the **Flicker Filter** control to adjust the flicker.

## 6. System Setup

### Aux Setup

8. For interlaced Aux outputs only, press **{De-Interlace}** to display the **De-Interlace Pop-up**. Select **Motion Adaptive** or **Field to Frame** as required.
9. If **Motion Adaptive** is selected, press **{Motion Threshold}** and use the control to adjust the threshold of the motion adaptive de-interlacer.
10. Press **{DVI Sync}**, and select the desired polarity of the digital sync output on the DVI connector.
11. Press **{Analog Type}**, and select the desired type of analog sync output on the HD-15 connector.
12. If **{HV Sync}** is selected on the **{Analog Type}** button, press **{Analog Sync}** and select the desired polarity of the analog sync output on the HD-15 connector.
13. If you want to copy settings to another UOC channel, press **{Copy All Settings}**. In the **Copy Settings Keypad**, select the desired channel, and press **{Copy}** to complete the process.
14. If you want to set the channel's settings to their default value, press **{Restore Default Settings}**.
15. Press **{Back}** to return to the **Aux Setup Menu**. Repeat from step 1 to set up additional Aux outputs.

■ **Advanced Setup** — Use the following steps to set advanced UOC output parameters:

1. On the **Output and Process Panel**, press **{Advanced Output Setup}** to display the **Advanced UOC Setup Menu**.

#### Caution

The **Advanced UOC Setup Menu** is designed for advanced users who are familiar with all aspects of output timing adjustments. Do not use this menu if you are uncertain about any output timing parameter.

2. On the **Advanced UOC Setup Menu**, press the **UOC** Aux connector that you want to set up.
3. Press **{Totals}**, and use the **{H Total}** and **{V Total}** controls to set the total number of horizontal pixels and vertical lines in the output.

#### Important

Changing the H and V Totals will cause a disruption to the UOC's output video. Press **{Apply}** to apply changes, or **{Undo}** to reverse un-applied changes.

4. Press **{Active and Pos}**, and use the **{H Pos}**, **{V Pos}**, **{H Active}** and **{V Active}** controls to set the output's H and V active area, and the H and V position.
5. Press **{Sync}**, and use the **{H Sync}** and **{V Sync}** controls to adjust the output's horizontal and vertical sync pulse width.
6. If the selected UOC output format is vertically locked to the native resolution's vertical sync, press **{Offset Timing}**. Use the **{H Offset}** and **{V Offset}** controls to adjust the UOC output's video timing relative to the system's native resolution.
7. Press **{Back}** to return to the **Output and Process Panel**, then press **{Back}** to return to the **Aux Setup Menu**.

## 6. System Setup

### Aux Setup

- **Sizing and Scaling** — Use the following steps to set up UOC sizing and scaling:
  1. On the **Aux Setup Menu**, press the **UOC** Aux connector that you want to set up.
  2. Press **{Setup}** to display the **UOC Setup Menu** for the selected output.
  3. Press **{Sizing and Scaling}** to display the **Output Sizing and Scaling Panel**.
  4. Press **{Size and Position}**, then use the **{H Size}**, **{V Size}**, **{H Position}** and **{V Position}** controls to adjust the output's size and position.
  5. If desired, in the **Quick Adjust** section, use the **{Fill H}**, **{Fill V}** and/or **{Fill H/V}** controls to scale the output.
  6. If desired, press **{Aspect Ratio}**, then select the desired aspect ratio in the **Aspect Ratio Pop-up**.
  7. To size and position the video *within* the boundaries of the output, press **{Pan Zoom Source}**. Use the **{Source H Size}**, **{Source V Size}**, **{Source H Pos}** and **{Source V Pos}** controls to size and position the video.
  8. Press **{Mask}**, then use the **{Mask Top}**, **{Mask Bottom}**, **{Mask Left}** and **{Mask Right}** controls to mask selected portions of the output, as required.
  9. If desired, in the **Output Mask Presets** section, select the desired preset — and remember that all mask presets in this section are additive.
  10. Press **{Back}** to return to the **Aux Setup Menu**.
- **Color Correction** — Use the following steps to set up UOC color correction:
  1. On the **Aux Setup Menu**, press the **UOC** Aux connector that you want to set up.
  2. Press **{Setup}** to display the **UOC Setup Menu** for the selected output.
  3. Press **{Color Correct}** to display the **Output Color Correction Panel**.
  4. To adjust the output's brightness, contrast and gamma, press **{Bright Contrast Gamma}**. Use the **{Bright}**, **{Contrast}** and **{Gamma}** controls as desired.
  5. To adjust the output's RGB brightness, press **{RGB Bright}**. Use the **{Red Bright}**, **{Green Bright}** and **{Blue Bright}** controls as desired.
  6. To adjust the output's RGB contrast, press **{RGB Contrast}**. Use the **{Red Contrast}**, **{Green Contrast}** and **{Blue Contrast}** controls as desired.
  7. To adjust hue and color saturation, press **{Hue Sat}**. Use the **{Hue}** and **{Sat}** controls as desired.
  8. Press **{Back}** to return to the **Aux Setup Menu**.

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## Multiviewer Setup

### 14

FSN Series system setup: **Step 14**

This procedure enables you to set up all aspects of the Multiviewer.

#### ▲ Prerequisites —

- ~ Ensure that the Multiviewer is properly connected. In Chapter 4, refer to the “[Multiviewer Connections](#)” section on page 129.
- ~ Ensure that you are familiar with all Multiviewer menus and features. Refer to Chapter 9, “[Multiviewer Operations](#)” on page 411 for details.

■ **Output Setup** — Use the following steps to set up the Multiviewer’s output:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Multiviewer Setup}** to display the **Multiviewer Setup Menu**.
3. Press **{Output Setup}** to display the **Multiviewer Output Setup Menu**.
4. Press **{Output Format}** to display the **Multiviewer Output Format Keypad**. Select the format supported by the monitor(s) connected to the Multiviewer’s rear panel. Press **{Apply}** to accept, then press **{Close}** to close the pop-up.
5. If you are using the Multiviewer card’s DVI output connector(s), press **{DVI Sync}** and select the desired sync mode.
6. Press **{Back}** to return to the **Multiviewer Setup Menu**.

■ **Layout** — Use the following steps to select the Multiviewer’s layout:

1. On the **Multiviewer Setup Menu**, press **{Select Layout}** to display the **Select Layout Menu**.
2. Press **{Single Output Layouts}** or **{Dual Output Layouts}** as required.
3. Select one of the pre-configured single or dual screen layouts from the menu.
4. Press **{Back}** to return to the **Multiviewer Setup Menu**.

■ **Color Setup** — Use the following steps to configure the Multiviewer’s color scheme:

1. On the **Multiviewer Setup Menu**, press **{Select Colors}**.
2. Press **{BG Color}** to change the Multiviewer’s background color. Use the Knobs or the **Color Picker** to select the desired color.
3. Press **{Clock BG Color}** to change the background color of the clock (if enabled on your selected layout). Use the Knobs or the **Color Picker** to select the color.
4. Press **{Border Color}** to change the border color for all PIPs. Use the Knobs or the **Color Picker** to select the color.
5. Press **{UMD Color 1}** to change the UMD 1 color selection. Use the Knobs or the **Color Picker** to select. Note that this unique color can be applied to one or more UMDs, using the **UMD Color Pop-up**. Repeat this step for all four UMD colors.
6. Press **{Back}** to return to the **Multiviewer Setup Menu**.

■ **Clock Setup** — Use the following steps to set up the clock:

1. If a clock is configured in your selected layout, press **{Clock Setup}**.
2. Press **{Clock Source}** and choose the clock’s source, either internal or LTC.
3. Press **{Clock Display}** and choose the display mode, either 12 or 24 hour.

## 6. System Setup

### Multiviewer Setup

4. To set the clock time, use the **User Preferences Menu**. Refer to the "[User Preferences Setup](#)" section on page 304 for instructions.
5. Press **{Back}** to return to the **Multiviewer Setup Menu**.
- **Source Selection** — Use the following steps to assign sources to PIPs in the layout:
  1. On the **Multiviewer Setup Menu**, note the "index" numbers inside the PIPs in the selected monitor graphic.
  2. Using the index numbers for reference, touch the associated PIP line in the **PIP Table**, or use the top knob to scroll to the desired line.
  3. Press **{Assign Source}** to display the **Assign Source Pop-up**.
  4. Next, in the pop-up:
    - a. To assign a video source to the PIP, press **{Sources}**, and select a source from the list. Press **{Apply}** to accept.
    - b. To assign an aux output to the PIP, press **{Aux}**, and select an aux output from the list. Press **{Apply}** to accept.
    - c. To assign a program, preview or clean feed output to the PIP, press **{Other}**, and select the desired output from the list. Press **{Apply}**.
  5. Repeat from step 2 to assign sources to all other PIPs in the layout.
  6. Press **{Close}** to close the pop-up, when complete.
- **UMD Text Modification** — Use the following steps to modify UMD text:
  1. On the **Multiviewer Setup Menu**, note the "index" numbers inside the PIPs.
  2. Using the index numbers for reference, touch the associated PIP line in the **PIP Table**, or use the top knob to scroll to the desired line.
  3. Press **{UMD Text}**. When the pop-up **Keyboard** appears, enter the desired UMD text (eight characters maximum), and press **{Enter}** on the **Keyboard**.
  4. Repeat from step 2 to modify UMD text for all other PIPs in the layout, as needed.
  5. Press **{Close}** to close the pop-up, when complete.
- **UMD Color Modification** — Use the following steps to assign unique UMD colors to specific PIPs:
  1. Ensure that you have pre-configured a set of four unique colors on the **Select Colors Menu**. Refer to the previous "**Color Setup**" section for details.
  2. On the **Multiviewer Setup Menu**, note the "index" numbers inside the PIPs.
  3. Using the index numbers for reference, touch the associated PIP line in the **PIP Table**, or use the top knob to scroll to the desired line.
  4. Press **{UMD Color}** to display the pop-up, then select the color that you wish to assign to the UMD text box.
  5. Repeat from step 2 to modify UMD color for all other PIPs in the layout.

Please note the following important points regarding UMD color:

- The assigned UMD color will be over-ridden by the color **RED** when the selected source appears on the main Program output.
- The assigned UMD color will be over-ridden by the color **GREEN** when the selected source appears on any Preset output (Main, M/E 1 or M/E 2).
- The assigned UMD color will be over-ridden by the color **AMBER** when the selected source appears on the M/E 1 or M/E 2 Program output.

## Tally Setup

### 15

FSN Series system setup: **Step 15**

This procedure enables you to assign inputs to the system's 24 tally relays, set tally markers, and set individual tally closures.

▲ **Prerequisite** — Ensure that you are familiar with the following menus and connector specifications:

~ **Tally Setup Menu** — Chapter 5, "[Tally Setup Menu](#)," page 235.

~ **Tally Connector** — Appendix A, "[Tally Connector](#)," page 443.

■ **Set up Tallies** — Use the following steps to set up tallies:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Tally Setup}** to display the **Tally Setup Menu**.
3. Use the **Select Tally** control to select the tally you wish to set up (1 through 24).
4. Press **{Select Input}** to display the **Input Selection Keypad**. Select the desired input that you wish to tally, and press **{Apply}**.
5. Press **{Select Color}** to display the **Select Color Pop-up**, and choose a red, green or amber color block to identify the tally.

#### Note

Remember that this function is designed only to assist the engineer who is setting up tallies. It provides a visual menu indication of the type of tally, but the function does not affect tally operation.

6. Use the **Select Output** control to select the output for which you want to set a relay closure. All outputs are grouped in the table.
7. Press **{Set Tally Closure}** to set a relay closure for the highlighted output. An "x" in the highlighted cell indicates that a closure is set.
8. Repeat steps 6 and 7 for all outputs that you wish to set tally closures.
9. Ensure that the physical tally output is properly connected to the target device's tally input, e.g., on the camera's CCU. In Appendix A, refer to the "[Tally Connector](#)" section on page 443 for pinouts.
10. Repeat from step 3 to set additional tallies.

■ **Clear Tallies** — Use the following steps to clear tallies:

1. Use the **Select Tally** control to select the tally you wish to clear.
2. Press **{Clear Input}** to remove the input from the table.
3. Use the **Select Output** control to select the output that you wish to clear.
4. Press **{Clear Tally Closure}** to clear the "x" from the highlighted output.
5. Repeat from step 11 to clear additional tallies.

## 6. System Setup

### User Preferences Setup

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# User Preferences Setup

16

FSN Series system setup: **Step 16**

This procedure enables you to set a variety of important user preferences and options.

- ▲ **Prerequisite** — Ensure that you are familiar with the **User Preferences Menu**. In Chapter 5, refer to the [“User Preferences Menu”](#) section on page 254.
- Use the following steps to set user preferences:
  1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
  2. Press **{User Prefs}** to display the **User Preferences Menu**.
  3. Use the top knob to select the “preference” that you wish to change, or simply touch the desired line in the table.
    - ~ Set **Bus Display Brightness**, from 1 (dim) to 10 (bright).
    - ~ Set **Control Panel Backlight**, from 1 (dim) to 10 (bright).
    - ~ Set **Touch Screen Brightness**, from 1 (dim) to 10 (bright).
    - ~ Set **Transition Display Brightness**, from 1 (dim) to 10 (bright).
    - ~ Set **Transition Display Contrast**, from 1 (low contrast) to 10 (high contrast).
    - ~ Set **Black on Invalid Video** on or off.
  4. Press **{Set Clock}** to display the **Set Clock Keypad**:
    - ~ Ensure that you use the **HH:MM:SS** format to set the time.
    - ~ Use the **{:}** button as a separator between digits.
    - ~ Press **{AM/PM}** to switch between AM and PM as required.
    - ~ Press **{12 HR / 24 HR}** to switch modes as required.
  5. Press **{Set Date}** to display the **Set Date Keypad**.
    - ~ Ensure that you use the **MM/DD/YYYY** format to set the date.
    - ~ Use the **{/}** button as a separator between digits.
  6. If required, press **{Reset to Default}** to return a highlighted preference to its default value.

---

### Saving the Setup

17

FSN Series system setup: **Step 17**

This procedure enables you to save all system setup parameters to non-volatile memory.

▲ **Prerequisite** — Ensure that you are familiar with the **Save All** function. In Chapter 5, refer to the [“Save All”](#) section on page 272.

■ Use the following steps to save all system setup parameters:

1. In the **Menu Bar**, press **{System}** to access the **System Menu**.
2. Press **{Save All}** to display the confirmation pop-up.
3. Press **{Close}** to clear the pop-up.

---

### Backing up the System

18

FSN Series system setup: **Step 18**

In this procedure, you will back up your system configuration to a USB drive.

▲ **Prerequisite** — Ensure that you are familiar with the **Backup and Restore Menu**. In Chapter 5, refer to the [“Backup and Restore Menu”](#) section on page 273.

■ Use the following steps to back up your system to a USB Drive:

1. Ensure that your USB drive is properly inserted in the control panel's **USB Port**.
2. In the **Menu Bar**, press **{System}** to access the **System Menu**.
3. Press **{Backup and Restore}** to display the **Backup and Restore Menu**.
4. Press **{Backup System}** to display the **Backup Menu**.
5. If required, create a new folder or rename a folder.
6. Press **{Backup System}** to initiate the system backup procedure. Once the drive is detected, you will be prompted to continue or cancel the procedure. At the conclusion of this procedure, your system is completely backed up.

## 6. System Setup

Backing up the System

# 7. Operations

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## In This Chapter

This chapter provides comprehensive operating instructions for the FSN Series. The following topics are discussed:

- [Quick Setup and Operations](#)
- [Quick Function Reference](#)
- [Understanding Button Color](#)
- [Understanding Switcher Layers](#)
- [Understanding Flip-flop Mode](#)
- [Understanding Tally](#)
- [Understanding Error Messages](#)
- [Working with Pop-ups](#)
- [Using the Keypad](#)
- [Understanding Press and Hold](#)
- [Understanding Lookahead Preview](#)
- [Understanding the T-Bar and Transition LEDs](#)
- [Using Re-entry](#)
- [Working with Cuts](#)
- [Setting Transition Rates and Curves](#)
- [Working with Mixes](#)
- [Working with Wipes](#)
- [Working with Keys](#)
- [Working with Memory Registers](#)
- [Working with Aux Buses](#)
- [Selecting Clean Feed Outputs](#)
- [Using Custom Control Functions](#)
- [M/E 2 Control on the FSN-150](#)
- [Backing Up and Restoring the System](#)

## 7. Operations

### Quick Setup and Operations

---

## Quick Setup and Operations

For the optimum speed in setting up and operating your FSN Series switcher, use the following steps. For reference, links are provided to the appropriate sections in this guide.

#### Note

Many of these steps were already covered in Chapter 4 and Chapter 6. As required, use the following list as an easy check-list for all quick setup requirements.

- 1. Connect power** — Ensure that power is properly connected to all FSN Series components.
  - ~ Chapter 4, [“Control Panel Installation,”](#) page 106
  - ~ Chapter 4, [“Touch Screen Installation,”](#) page 107
  - ~ Chapter 4, [“FSN-1400 System Connections,”](#) page 112
- 2. Connect inputs** — Connect all input sources to the FSN Series. (Chapter 4, [“Signal Connections,”](#) page 121.)
- 3. Connect outputs** — Connect the output(s) of the FSN Series to your target devices. (Chapter 4, [“Signal Connections,”](#) page 121.)
- 4. Turn on power** — Turn on power to all FSN Series components, and to all peripheral equipment. (Chapter 6, [“Power Up and Status Check,”](#) page 282.)
- 5. Factory reset** — If you are using the FSN Series for the first time, or if you are using a system that has just returned from another event, perform a full factory reset. (Chapter 6, [“Return to Factory Default,”](#) page 283.)
- 6. Set reference video** — Set the desired reference video mode. (Chapter 6, [“Reference Video and Output Setup,”](#) page 287.)
- 7. Set output format** — Set the desired output resolution and frame rate. (Chapter 6, [“Reference Video and Output Setup,”](#) page 287.)
- 8. Set clean feeds** — Set the desired clean feed output points. (Chapter 6, [“Clean Feed Setup,”](#) page 290.)
- 9. Enable test patterns** — If required, use test patterns to verify outputs and make the necessary adjustments. When complete, turn off the test patterns. (Chapter 6, [“Output Test Patterns,”](#) page 289.)
- 10. Set up native inputs** — As required, set up all native inputs, and perform the necessary adjustments. (Chapter 6, [“Native Input Setup,”](#) page 291.)
- 11. Set up universal inputs** — As required, set up all universal inputs, and perform the necessary adjustments. (Chapter 6, [“Universal Input Setup,”](#) page 293.)
- 12. Set up external DSK inputs** — As required, set up the external DSK inputs, and perform the necessary adjustments. (Chapter 6, [“External DSK Input Setup,”](#) page 296.)
- 13. Complete button mapping** — Complete the button mapping on the control panel, including all inputs, color background signals and test patterns. (Chapter 6, [“Button Mapping,”](#) page 303.)
- 14. Complete tally connections** — Complete all system tally relay connections. (Chapter 6, [“Tally Setup,”](#) page 303.)
- 15. Set up user preferences** — Complete all user preference choices, as required. (Chapter 6, [“User Preferences Setup,”](#) page 304.)

## 7. Operations

### Quick Setup and Operations

16. **Save system configuration** — After completing all “system” setups, save the configuration and back up the system.
  - ~ Chapter 6, [“Saving the Setup,”](#) page 305.
  - ~ Chapter 6, [“Backing up the System,”](#) page 305.
17. **Set up Aux buses** — As required, map all aux buses, and set up all Aux bus routes to peripheral destinations. ([“Working with Aux Buses,”](#) page 346.)
18. **Set up Multiviewer** — As required, set up the Multiviewer and assign sources to Multiviewer PIPs. ([“Multiviewer Operations,”](#) page 411.)
19. **Set up transition rates** — As required, set up all transition rates for all banks and FTB. ([“Setting Transition Rates and Curves,”](#) page 330.)
20. **Set up wipes** — Select the desired wipe patterns, and adjust direction and border type. ([“Working with Wipes,”](#) page 332.)
21. **Set up keys** — Select the desired key sources, and adjust type, fill, clip, gain and opacity as required. ([“Working with Keys,”](#) page 333.)
22. **Set up and program DVE effects** — If the optional DVE card(s) are installed, assign DVE channels to keyers and program the desired DVE effects. (Chapter 8, [“DVE Operations,”](#) page 353.)
23. **Set up memory registers** — Set up the desired “looks” for your show, and store them in memory registers as required. ([“Working with Memory Registers,”](#) page 337.)
24. **Ready to roll** — With all output, input and system configurations saved, and all of your important “looks” stored in memory, put on your headsets and get busy!

#### Note

For detailed system operating procedures, specific system “tweaks” and operating descriptions on every feature, please start with the [“Quick Function Reference”](#) section on page 310, and select the function that you wish to perform.

## 7. Operations

### Quick Function Reference

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## Quick Function Reference

Use the following table to quickly access the proper section for specific operating instructions. Both hyperlinks and page numbers are provided.

**Table 7-1.** FSN Series Quick Function Reference Table

To learn about:	Use the Following Section:	Page
Aux buses	<a href="#">Working with Aux Buses</a>	346
Button colors	<a href="#">Understanding Button Color</a>	311
Clean feed outputs	<a href="#">Selecting Clean Feed Outputs</a>	347
Custom Control functions	<a href="#">Using Custom Control Functions</a>	348
Cuts	<a href="#">Working with Cuts</a>	329
DVE Operations	<a href="#">DVE Operations</a>	353
Error messages	<a href="#">Understanding Error Messages</a>	316
Flip-flop mode	<a href="#">Understanding Flip-flop Mode</a>	314
Keypad operations	<a href="#">Using the Keypad</a>	317
Keys	<a href="#">Working with Keys</a>	333
Lookahead preview	<a href="#">Understanding Lookahead Preview</a>	319
M/E 2 Control (on FSN-150)	<a href="#">M/E 2 Control on the FSN-150</a>	349
Memory registers	<a href="#">Working with Memory Registers</a>	337
Mixes (Dissolves)	<a href="#">Working with Mixes</a>	331
Multiviewer operations	<a href="#">Multiviewer Operations</a>	411
Pop-ups	<a href="#">Working with Pop-ups</a>	317
Press and hold functions	<a href="#">Understanding Press and Hold</a>	318
Quick setup and operation	<a href="#">Quick Setup and Operations</a>	308
Re-entry	<a href="#">Using Re-entry</a>	328
Switcher layers	<a href="#">Understanding Switcher Layers</a>	312
Switcher tally on each bank	<a href="#">Understanding Tally</a>	315
T-Bar and Transition LED operations	<a href="#">Understanding the T-Bar and Transition LEDs</a>	325
Transition rates and transition curves	<a href="#">Setting Transition Rates and Curves</a>	330
Wipes	<a href="#">Working with Wipes</a>	332

## Understanding Button Color

The tables in this section explain the use of color on the buttons in the **M/E** bank and the **PGM** bank. The rules apply to the buttons on each bank's **PGM**, **PST** and **KEY** buses.

- **PGM Bank Rules**

Table 7-1. PGM bank button rules

	Button Color	Description
	Off	The button is not mapped.
	Dim Amber	The button is mapped but not selected. Brightness in this state is set by the <b>Control Panel Backlight</b> function on the <b>User Preference Menu</b> .
	Green	<ul style="list-style-type: none"> <li>• The button is selected on <b>PST</b>.</li> <li>• The bus is not contributing to <b>PGM</b> bank output.</li> </ul>
	Red	<ul style="list-style-type: none"> <li>• The button is selected on <b>PGM</b>, which always contributes to the output of the bank.</li> <li>• The button is selected on <b>PST</b>, and the bus is contributing to the <b>PGM</b> bank output — e.g. during a mix or a wipe.</li> <li>• <b>Note:</b> The button is dim red when <b>FTB</b> is on.</li> </ul>

- **M/E Bank Rules**

Table 7-2. M/E bank button rules

	Button Color	Description
	Off	The button is not mapped.
	Dim Amber	The button is mapped but not selected. Brightness level in this state is set by the <b>Control Panel Backlight</b> function on the <b>User Preference Menu</b> .
	Green	<ul style="list-style-type: none"> <li>• The button is selected on the M/E's <b>PST</b> and/or <b>KEY</b> bus.</li> <li>• The bus is not contributing to the output of the <b>M/E</b> bank or the <b>PGM</b> bank (via re-entry).</li> </ul>
	Coral	<ul style="list-style-type: none"> <li>• The button is selected on the M/E's <b>BG</b> and/or <b>KEY</b> bus, and the bus is contributing to the <b>M/E</b> bank's output only.</li> <li>• The button is selected on the M/E's <b>PST</b> bus, and the bus is contributing to the <b>M/E</b> bank's output only — for example, during a mix or a wipe.</li> </ul>
	Red	<ul style="list-style-type: none"> <li>• The button is selected on the M/E's <b>BG</b> and/or <b>KEY</b> bus, and the bus is contributing to the <b>PGM</b> bank's output via re-entry.</li> <li>• The button is selected on the M/E's <b>PST</b> bus, and the bus is contributing to the <b>PGM</b> bank's output via re-entry — for example, during a mix or a wipe.</li> <li>• <b>Note:</b> The button is dim red when <b>FTB</b> is on.</li> </ul>

## 7. Operations

### Understanding Switcher Layers

## Understanding Switcher Layers

To help you understand FSN Series architecture from a production perspective, and to assist with the creation of switcher “looks,” the diagram below illustrates how the various switcher banks are layered on the FSN-150.

- **M/E 2 Off** — The diagram below shows layering when M/E 2 control is **disabled**:

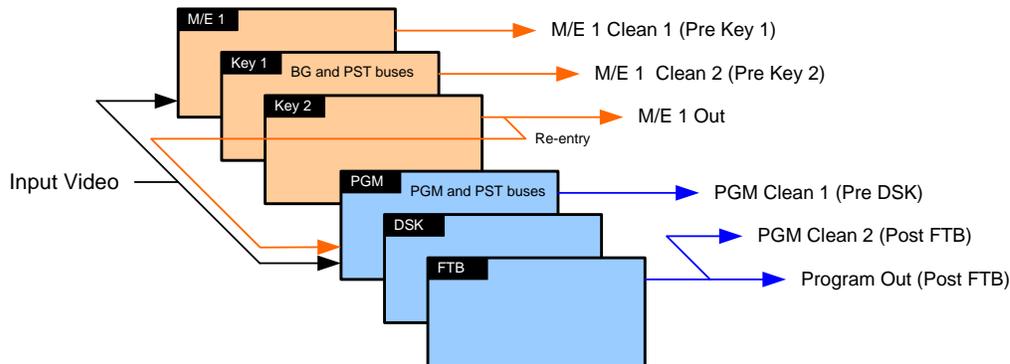


Figure 7-1. Switcher layers, FSN-150 — M/E 2 control disabled

- **M/E 2 On** — The diagram below shows layering when M/E 2 control is **enabled**:

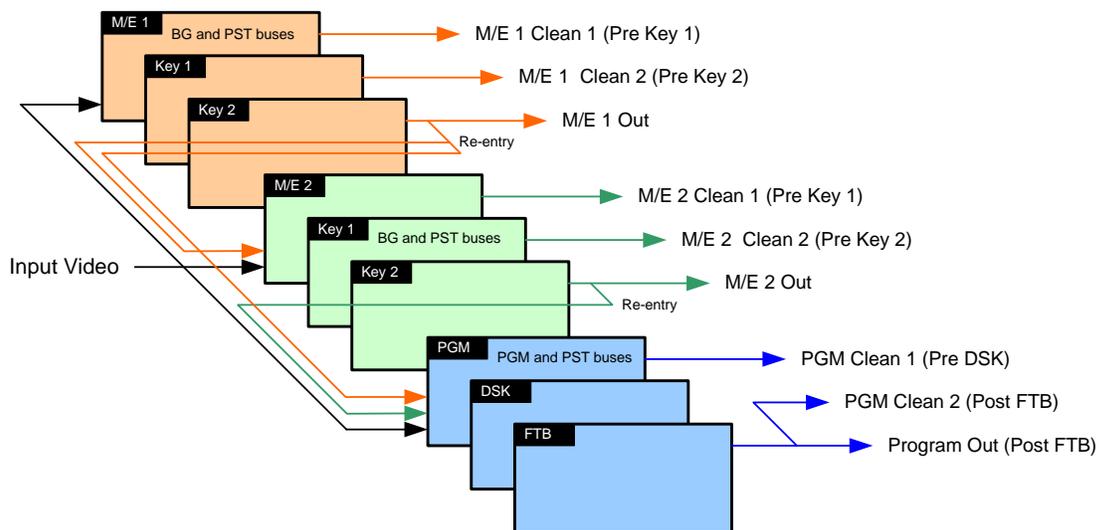


Figure 7-2. Switcher layers, FSN-150 — M/E 2 control enabled

The following rules apply:

- Input video from the FSN-1400 flows into the M/E and PGM banks across the crosspoint matrix.
- Both M/E 1 and M/E 2 consist of Background (BG) and Preset (PST) buses, and two layers of keys (Key 1 and Key 2).
- Each M/E bank provides Program, Preview and Clean Feed outputs.
- M/E 1 provides a “re-entry” output that flows into M/E 2 and the PGM bank.

## 7. Operations

### Understanding Switcher Layers

- M/E 2 provides a “re-entry” output that flows into the PGM bank.
- Please note:
  - ~ On each M/E, the BG and PST buses comprise the background layer — the farthest layer upstream, and visually, the layer that’s behind Key 1 and Key 2.
  - ~ Key 1 is downstream of the BG and PST layer, but upstream of Key 2. Keys created on Key 1 are visually “over” the BG and PST layer, but “under” Key 2.
  - ~ Key 2 is the farthest layer downstream on an M/E. Keys created on Key 2 are visually “over” BG, PST and Key 1.
  - ~ Even if you swap key settings by pressing the **{Swap Key Settings}** button, the priority of the layers does not change.
- The PGM bank consist of Program (PGM) and Preset (PST) buses, and a single layer of keying (DSK). The bank provides Program, Preview and Clean Feed outputs. Please note:
  - ~ The entire PGM bank is downstream of M/E 1 and M/E 2 — visually on top of all effects created on the M/Es.
  - ~ The PGM and PST buses comprise the bank’s background layer — the farthest layer upstream in the bank, and visually, the layer that’s behind the DSK.
  - ~ The DSK is downstream of the PGM and PST layer, but upstream of the FTB (fade to black) function. Keys created on the DSK are visually “over” PGM and PST.
  - ~ FTB is the farthest function downstream in the switcher. This function enables you to fade the entire switcher (including DSK) to black
- In the default “priority” layering of the switcher when M/E 2 control is enabled, the M/E 1 bank is upstream of M/E 2, and M/E 2 is upstream of PGM. Thus, M/E 1 is visually behind, M/E 2 is in the middle, and PGM is visually on top.

However, using the **Other Setup Menu** (located on the main **System Menu**) you can change the priority of the two M/E banks using the **{M/E Order}** function. In Chapter 5, refer to the [“Other Setup Menu”](#) section on page 253 for details.

## 7. Operations

### Understanding Flip-flop Mode

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## Understanding Flip-flop Mode

On the FSN Series, the M/E and PGM banks operate in flip-flop mode. This means that when you execute a **CUT**, **WIPE** or **MIX** transition in which **BG** is enabled, the sources on **BG** and **PST** exchange places when the transition completes. For example:

- Prior to the transition, CAM3 is on **BG** and CAM1 is on **PST**.

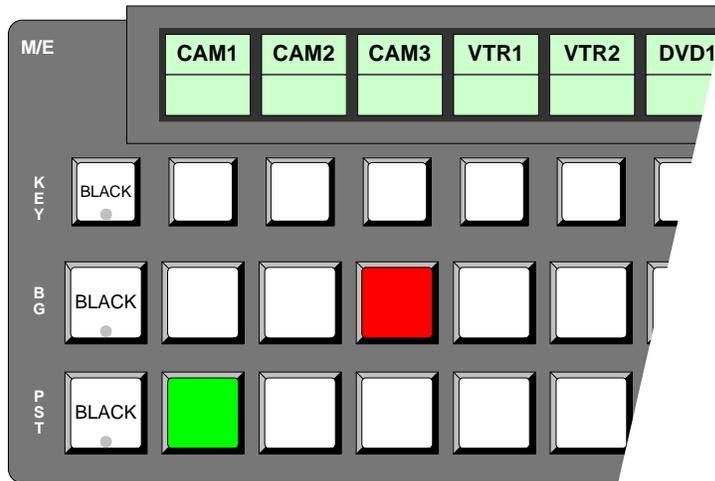


Figure 7-3. M/E prior to transition

- After the transition, the buses flip-flop. CAM1 is on **BG** and CAM3 is on **PST**.

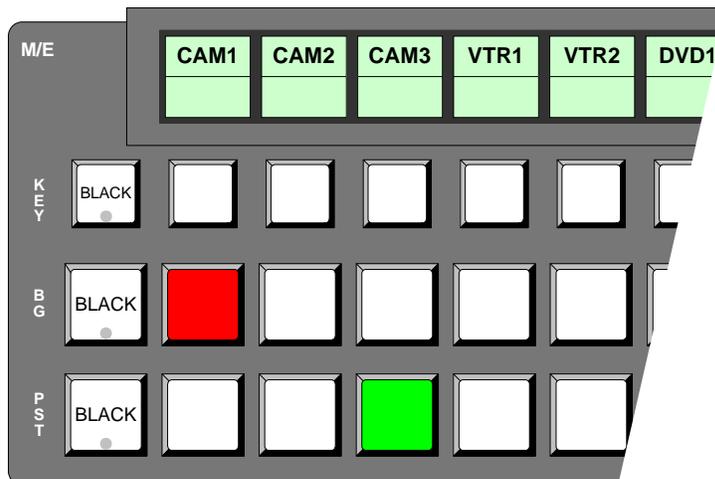


Figure 7-4. M/E after transition

In this way, if you continue to press **CUT** or **AUTO TRAN**, the last-selected **BG** source will always be available on **PST** as the next *source* — until you change that source as required.

---

## Understanding Tally

Buttons on the **KEY**, **BG** and **PST** buses obey the following rules with regard to tally:

- **Backlight** — All buttons in the bus rows are normally dim, at the selected backlight level (as set on the **User Preferences Menu**). When a button is selected, it turns bright.
- **Tally — PGM Bank**
  - ~ Selected buttons on **PGM** are bright red.
  - ~ Selected buttons on **PST** are bright green.
  - ~ Selected buttons on the phantom key bus are bright green when the **DSK** is **off**, and bright red when the **DSK** is **on**.
  - ~ During the transition interval of a **MIX** or **WIPE**, buttons on **PST** are bright red. The source turns red the moment the **PST** bus contributes to the bank's output, and stays red until the transition completes.

### Note

The red LED above the DSK button (in the **Next Transition Group**) turns bright when the DSK is on and contributing to the bank's output.

- **Tally — M/E Bank (no re-entry into PGM)**
  - ~ Selected buttons on **BG** are bright coral.
  - ~ Selected buttons on **PST** are bright green.
  - ~ Selected buttons on the **KEY** bus are bright green when the key is **off**, and bright coral when the key is **on**.
  - ~ During the transition interval of a **MIX** or **WIPE**, buttons on **PST** are bright coral. The source turns coral the moment the **PST** bus contributes to the bank's output, and stays coral until the transition completes.
- **Tally — M/E Bank (re-entry into PGM)**
  - ~ Selected buttons on **BG** are red.
  - ~ Selected buttons on **PST** are bright green.
  - ~ Selected buttons on the **KEY** bus are bright green when the key is **off**, and bright red when the selected key is **on**.
  - ~ During the transition interval of a **MIX** or **WIPE**, buttons on **PST** are bright red. The source turns red the moment the **PST** bus contributes to the bank's output, and stays red until the transition completes.

### Note

For both re-entry and non re-entry conditions, the red LEDs above the Key 1 and Key 2 buttons (in the **Next Transition Group**) turn bright when keys are on, and contributing to the bank's output.

## 7. Operations

### Understanding Error Messages

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## Understanding Error Messages

Please note the following important rules regarding error messages.

#### Note

For the input connectors on the **NIC** and **UIC**, the “red” error conditions only occur if the input has been mapped to the panel, and the signal was previously OK.

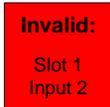


- **LOS** (loss of signal): On occasion, you can experience **LOS** (loss of signal) — typically due to a poor video connection or computer connection.

If this condition occurs:

- ~ A red **Error** button appears in the upper left corner of the **Touch Screen**.
- ~ The input's **BNC** turns red in the rear I/O view.
- ~ The input's **Programmable Display** turns red.

During an LOS condition, if the user preference “**Black on Invalid Video**” is turned on, black will replace the lost output video. In Chapter 5, refer to the “[User Preferences Menu](#)” section on page 254 for details.



- **Invalid Video**: On occasion, this message can appear if the input format does not match the selected native resolution, or if the input signal is not locked to the system's video reference input.

If this condition occurs:

- ~ A red **Error** button appears in the upper left corner of the **Touch Screen**.
- ~ The input's **BNC** turns red in the rear I/O view.
- ~ The input's **Programmable Display** turns red.

#### Note

For both **LOS** and **Invalid Video** conditions, you can also navigate to the **Input Menu**, and check the color of the connector in question to verify the physical input's condition.

If one of these types of error occurs, you have several options:

- Leave the **Error** button and red **Programmable Display** as is.
- Press the **Error** button to display a pop-up with options for more information. The pop-up also has a **{View Error Info}** button, which when pressed, takes you to the **View Errors Menu**.
- Navigate to the **Input Menu**, and note the red BNC that is experiencing the error. Press the **{Error Reporting}** button to toggle error reporting **Off** for the selected input. When **Off**, the red error message turns off, the **Programmable Display** returns to green, and the error is removed from the list in the **View Errors Menu**. In this mode, however, the connector remains red.



#### Note

The **{Error Reporting}** function works on a connector by connector basis. You can have reporting on for one connector, and off for another.

---

## Working with Pop-ups

Please note the following important rules regarding pop-ups:

- When a pop-up includes a button, or a series of buttons (e.g., **{Yes}** or **{No}**) you must acknowledge the pop-up with a decision before any other operations can be performed on the **Touch Screen**.
- When a pop-up does not include a button, you must wait until the pop-up clears before any other operations can be performed on the **Touch Screen**. This condition only occurs on several menus, including:
  - ~ **System Menu** (during system initialization procedures)
  - ~ **Software Menu** (during the software update procedure)
  - ~ **Backup and Restore Menu** (during backup and restore procedures)
  - ~ **Reset Menu** (during various reset procedures)
- When any pop-up is displayed, physical buttons on the control panel still function properly.

---

## Using the Keypad

There are two types of **Keypads** in the system:

- **Touch Screen Keypad** — When any **Value Button** is pressed on the **Touch Screen**, the **Keypad** appears, enabling you to make numeric entries. In this mode, you can enter, trim, clear and undo entries with accuracy. In Chapter 5, refer to the [“Using the Keypad”](#) section on page 144 for details.
- **Control Panel Keypad** — Any time that the **Keypad** is displayed on the **Touch Screen**, you can also use the **Keypad** on the control panel. Here, the “physical” **Keypad** works in parallel with the **Touch Screen Keypad** — either can be used for entry, depending on your preference.

All **Keypad** functions are the same, with the following exceptions:

- ~ The **{Undo}** button is not present on the control panel’s **Keypad**.
- ~ The **AUTO TRAN** button is not available in version 3.0.
- ~ Press **FINE ADJUST** to change the sensitivity of the knobs and the **Joystick**.
  - When **off**, adjustment is coarse.
  - When **on**, adjustment is fine.

### Note

The only time the **Control Panel Keypad** is used exclusively, is for storing and recalling memory registers. Refer to the [“Working with Memory Registers”](#) section on page 337 for full details.

## 7. Operations

### Understanding Press and Hold

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## Understanding Press and Hold

Several buttons on the control panel offer “press and hold” functionality. These functions are essentially menu short-cuts. Please note the following important points:

- A “press and hold” function always takes you directly to the requested new menu, regardless of your current location in the menu system.
- If a pop-up is displayed, the selected “press and hold” function also takes you to the requested new menu. Essentially, this is the same as pressing **{No}** or **{Close}** in a pop-up, then navigating to the new menu.
- All “press and hold” functions take effect after the selected control panel button is held down for 1.5 seconds.

Following are descriptions of each “press and hold” function:



- After a mix transition has been armed in the PGM or M/E bank, press and hold the **MIX** button to display the **Transition Menu**.
- After a wipe transition has been armed in the PGM or M/E bank, press and hold the **WIPE** button to display the **Wipe Menu**.
- In **M/E 1**, first enable **KEY 1** to “arm” the key, then press and hold **KEY 1** to display the **Keyer Menu** for M/E 1, Key 1. If the key is not armed, the system will not jump to the **Keyer Menu**.
- In **M/E 1**, first enable **KEY 2** first to “arm” the key, then press and hold **KEY 2** to display the **Keyer Menu** for M/E 1, Key 2. If the key is not armed, the system will not jump to the **Keyer Menu**.
- First enable **DSK** to “arm” the key, then press and hold **DSK** to display the **Keyer Menu** for the DSK, and display the phantom key bus. If the key is not armed, the system will not jump to the **Keyer Menu**, nor will the phantom key bus be displayed.
- Press and hold **STORE** to display the **Memory Menu**.
- Press and hold **RECALL** to display the **Memory Menu**.
- Press and hold the **ASSIGN** button to display the **Clean Feed Setup Menu**.
- In the **Custom Control** section, press and hold **FRZ**, then press any source button to freeze that source.
- In the **Custom Control** section, press and hold **UNFRZ**, then press any source button to un-freeze that source.

## Understanding Lookahead Preview

The following topics are discussed in this section:

- [Lookahead Preview Overview](#)
- [Lookahead Preview Tutorial](#)

### Lookahead Preview Overview

Each bank's **PVW** (Preview) output serves as a versatile "lookahead" output. These outputs work in conjunction with the buttons in each bank's **Next Transition Group** to show you exactly how the bank's layers will appear — after the next **CUT**, **MIX**, **KEY**, **WIPE**, or **AUTO TRAN** is performed.

The figure below illustrates the **Next Transition Group** on the M/E and PGM banks:

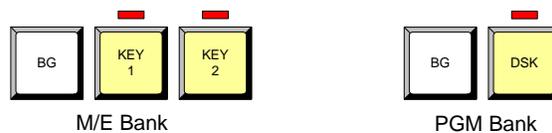


Figure 7-5. Next Transition Groups

In each **Next Transition Group**, the buttons that you enable determine the combination of layers that are "armed" for the next transition, and also determine what you "see" on each bank's **PVW** monitor. If a layer is armed, it will appear on **PVW**.

#### Important

A monitor must be connected to the bank's **PVW** output in order to view the "lookahead" video output.

To use the **Next Transition Group**, simultaneously press the combination of buttons that you wish to enable. Any combination of buttons can be pressed. Whichever combination you enable automatically disables those buttons that were not pressed.

- In Chapter 3, refer to the "[M/E Transition Section](#)" heading on page 83 for details on the M/E bank's **Next Transition Group**.
- In Chapter 3, refer to the "[PGM Transition Section](#)" heading on page 76 for details on the Program bank's **Next Transition Group**.

The tutorial in the next section provide examples of how selections in the **Next Transition Group** affect the lookahead preview output. In the tutorial, you'll need four sources, for example:

- A **BG** source (e.g., CAM1)
- A **PST** source (CAM2)
- A **KEY 1** source (GFX)
- A **KEY 2** source (LOGO).

## 7. Operations

### Understanding Lookahead Preview

## Lookahead Preview Tutorial

This tutorial provides examples of **PGM**, **PST** and **KEY** bus selections, in combination with button selections in the bank's **Next Transition Group**. The steps illustrate how these selections affect the lookahead preview output.

### Tip

Follow along with the tutorial at the switcher's control panel. If you follow each step, you'll see first-hand how the **PVW** output shows you what's coming next.

The tutorial also applies to the **PGM** bank. To follow along with the tutorial on the PGM bank, use the **DSK** instead of **KEY 1**.

### Example 1: BG Lookahead

- Use the following steps to learn how the **BG** button affects lookahead preview.
  1. Select **CAM1** on the **PGM** bus.
  2. Select **CAM2** on the **PST** bus.
  3. In the **Next Transition Group**, press **BG**. This action arms the background layer to transition.



Figure 7-6. M/E Bank: BG lookahead

Please note:

- ~ With **BG** selected, only the background will transition.
- ~ The **PVW** output shows the source selected on **PST**.

4. Press **CUT** or **AUTO TRAN** to cut, mix or wipe **CAM2** from **PST** to the **BG** bus.

### Example 2: KEY 1 Lookahead

- Use the following steps to learn how the **KEY 1** button affects lookahead preview.
  1. Press **SEL** to switch the key bus to **KEY 1**.
  2. Select **GFX** on the key bus.
  3. In the **Next Transition Group**, press **KEY 1**. This action arms the KEY 1 layer to transition.



Figure 7-7. M/E Bank: KEY 1 lookahead

Please note:

- ~ With **KEY 1** selected and **BG** turned off, **KEY 1** will transition over the *current BG* source. The **PST** bus will not transition.
- ~ The source selected on **PST** does not appear on **PVW** — because it's not part of the next transition.
- ~ The lookahead **PVW** output shows the **KEY 1** source keyed over **BG**. This is the perfect time to clip and adjust the key.

#### Note

Once **KEY 1** is pressed (and armed), press and hold **KEY 1** to jump to the **Keyer Menu** for M/E 1, Key 1, where you can clip and adjust the key on preview.

4. Press **CUT** or **AUTO TRAN** to cut, mix or wipe **KEY 1** over the **BG** bus.

## 7. Operations

### Understanding Lookahead Preview

#### Example 3: KEY 2 Lookahead

- Use the following steps to learn how the **KEY 2** button affects lookahead preview.
  1. Press **SEL** to switch the key bus to **KEY 2**.
  2. Select **LOGO** on the key bus.
  3. In the **Next Transition Group**, press **KEY 2**. This action arms the KEY 2 layer to transition.

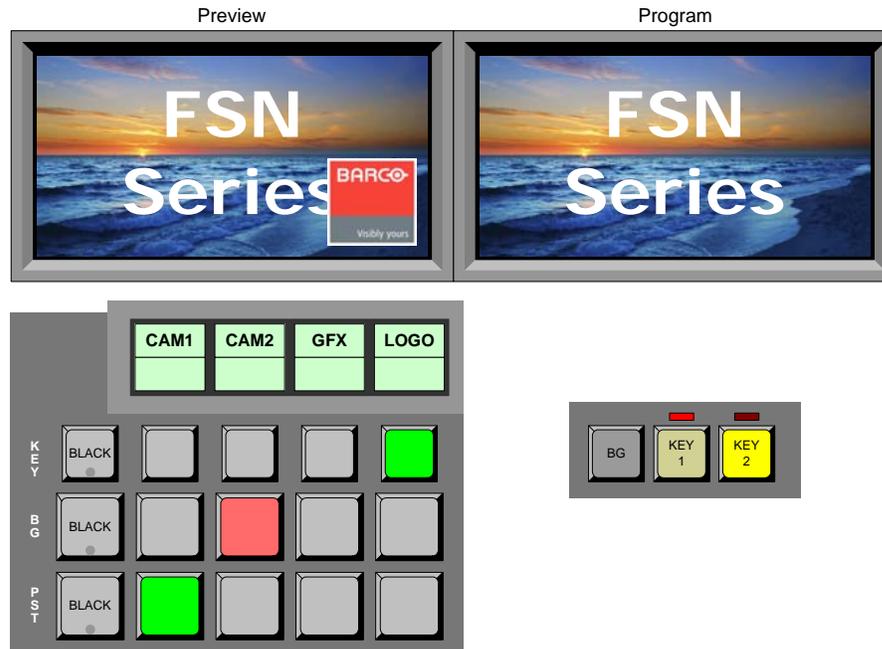


Figure 7-8. M/E Bank: KEY 2 Lookahead

Please note:

- ~ With **KEY 2** selected, and **BG** and **KEY 1** turned off, **KEY 2** will transition over the *current* **BG** and **KEY 1** source. In effect, by selecting **KEY 2** only, you are “holding” the **BG** and **KEY 1** sources.
- ~ The source selected on **PST** does not appear on **PVW** — because it’s not part of the next transition.
- ~ The lookahead **PVW** output shows the **KEY 2** source keyed over **BG** and **KEY 1**. This is the perfect time to clip and adjust the second key.

#### Note

Once **KEY 2** is pressed (and armed), press and hold **KEY 2** to jump to the **Keyer Menu** for M/E 1, Key 2, where you can clip and adjust the key on preview.

4. Press **CUT** or **AUTO TRAN** to cut, mix or wipe **KEY 2** over **BG** and **KEY 1**.

### Example 4: BG Lookahead, Transition Under Key

- Use the following steps to see how the **BG** button affects lookahead preview, when one or more keys are on.
  1. Select **CAM 1** on the **PST** bus (it should still be selected).
  2. In the **Next Transition Group**, press **BG**. This action arms the background layer to transition.



**Figure 7-9.** M/E Bank: BG Lookahead when keys are enabled

Please note:

- ~ With **BG** selected, and both **KEY 1** and **KEY 2** turned off, the **PST** bus will transition *under* the two keys. In effect, by selecting **BG** only, you are “holding” **KEY 1** and **KEY 2**.
  - ~ The source selected on **PST** appears on **PVW** — because it is a part of the next transition.
  - ~ The lookahead **PVW** output shows the next **BG** source underneath **KEY 1** and **KEY 2**.
3. Press **CUT** or **AUTO TRAN** to cut, mix or wipe **BG** under **KEY 1** and **KEY 2**.

## 7. Operations

### Understanding Lookahead Preview

#### Example 5: Combined Lookahead

- Use the following steps to see how a combination of buttons in the **Next Transition Group** affects lookahead preview.

1. In the **Next Transition Group**, press **BG**, **KEY 1** and **KEY 2**. This action arms all three layers to transition.



Figure 7-10. M/E Bank: Combined Lookahead

Please note:

- ~ With **BG**, **KEY 1** and **KEY 2** selected, all three layers will transition. The background transitions, and both keys will turn off.
- ~ The source selected on **PST** appears on **PVW**.
- ~ The lookahead **PVW** output shows the next **BG** source clean, with no keys, because both keys will transition off.

2. Press **CUT** or **AUTO TRAN** to cut, mix or wipe all three layers.

#### Example 6: Continued Practice

Continue to practice using various sources, in combination with the buttons in the **Next Transition Group**, until you are totally familiar with lookahead preview. Be sure to try some of the following combinations:

- Transition **BG** only.
- Transition **BG** and **KEY 1**.
- Transition **BG** and **KEY 2**.
- Crossfade **KEY 1** and **KEY 2** (bring one up, bring one down).
- Transition all three layers.

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## Understanding the T-Bar and Transition LEDs

This section describes the functionality of the **T-Bar** and **Transition LEDs**, which are identical for the M/E and PGM banks.

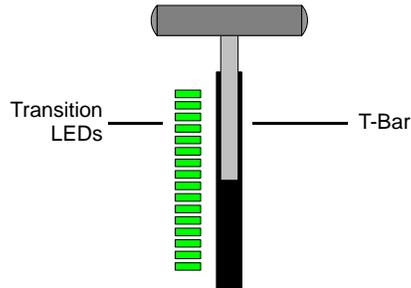


Figure 7-11. T-Bar and Transition LEDs

The **T-Bar** provides manual transition control for the layers enabled in the **Next Transition Group**. For both manual and automatic transitions, the **Transition LEDs** indicate the position of the transition in progress.

The following topics are discussed in this section:

- [Manual Transitions](#)
- [Automatic Transitions](#)
- [Physical and Virtual T-Bar Position](#)
- [Transition LED Notes](#)

### Manual Transitions

When a manual transition is performed, the **T-Bar** controls the transition direction — away from (or back towards) the end-limit. Please note:

- In general, when the **T-Bar** is resting at either the top or bottom limit and all **Transition LEDs** are off, the bank's output is full **BG** (or **PGM**) bus, and the various key layers are completely on or off.
- From either limit (when **BG** is armed), moving the **T-Bar** *always* transitions from the **BG** (or **PGM**) bus towards the **PST** bus.
- When the **T-Bar** is manually moved, the **Transition LEDs** always move in the same direction as **T-Bar** movement. The LEDs indicate the transition's position between the **BG** (or **PGM**) and **PST**.

### Automatic Transitions

This section provides information about automatic transitions, and their flexibility. Please note the following important points:

- When an automatic transition is performed, the **Transition LEDs** indicate the transition's position, but the direction is always towards the **PST** bus.
- If the **T-Bar** is at a limit, the **Transition LEDs** always move away from the **T-Bar**'s position — towards **PST**.

## 7. Operations

### Understanding the T-Bar and Transition LEDs

- Automatic transitions can be paused:
  - ~ Press **AUTO TRAN** to start the transition.
  - ~ Press **AUTO TRAN** again, during the interval, to pause the transition. Note that the **Transition LEDs** are paused in between the limits.
  - ~ Press **AUTO TRAN** to resume the transition.
  - ~ You can pause and resume repeatedly.
- Transitions can be started automatically, paused, and finished manually.
  - ~ Press **AUTO TRAN** to start the transition.
  - ~ Press **AUTO TRAN** again, during the interval, to pause the transition.
  - ~ Move the **T-Bar** to continue the transition manually.
- Transitions can be started automatically, and over-ridden manually.
  - ~ Press **AUTO TRAN** to start the transition.
  - ~ During the interval, move the **T-Bar** in the same direction as the **Transition LEDs** are moving, to continue the transition manually.
- Transitions can be started manually, and finished automatically.
  - ~ Move the **T-Bar** to perform a manual transition.
  - ~ Stop the **T-Bar** at any point before the end-limit.
  - ~ Press **AUTO TRAN** to complete the transition automatically.

#### Note

Using **AUTO TRAN**, you cannot return to the **BG** (or **PGM**) bus, as you can with manual transitions, unless you manually “match” physical and virtual positions, and return manually to **BG** (or **PGM**). Refer to the [“Physical and Virtual T-Bar Position”](#) section below for additional details.

## Physical and Virtual T-Bar Position

The **Transition LEDs** next to the **T-Bar** reflect the state of the transition, not the position of the physical **T-Bar**. Often they will be the same — but sometimes, the physical **T-Bar** position and the “virtual” **T-Bar** position may not match.

To learn about physical and virtual **T-Bar** positions, please practice the following examples.

### Example 1: Normal T-Bar movement

- Use the following steps to demonstrate physical vs. virtual **T-Bar** position, in normal “auto-trans” mode:
  1. In the M/E or the PGM bank, start with the **T-Bar** at the bottom limit.
  2. Press **AUTO TRAN** to begin the auto transition.
  3. Press **AUTO TRAN** again (during the interval) to pause the transition at 50%. Physical and virtual **T-Bar** positions do not match. In this situation, the **T-Bar** has no effect on the video unless you move it up to 50%, and match the physical position with the virtual position.
  4. Move the **T-Bar** to 50%. The **T-Bar** is now “live” again, and physical and virtual positions are matched. You can move it up or down as required.
  5. Move the **T-Bar** to 75%. The **Transition LEDs** match the position of the **T-Bar**.

6. Press **AUTO TRAN** to complete the transition. The **Transition LEDs** are all off, but the physical **T-Bar** remains at 75%. In this situation, the **T-Bar** has no effect on the video until you move it to either limit.

#### Example 2: T-Bar movement with memory registers

- Use the following steps to demonstrate physical vs. virtual **T-Bar** position, in conjunction with the recalling of memory registers:
  1. In the M/E or the PGM bank, start with the **T-Bar** at the bottom limit.
  2. Manually move the **T-Bar** to 25%. The **Transition LEDs** match the position.
  3. For the bank in which you are working, save the bank in memory register 100. This memory register stores the **T-Bar** position by default. The register also stores the direction in which the **T-Bar** was moving.
  4. Move the **T-Bar** to 75%. The **Transition LEDs** match the position of the **T-Bar**.
  5. Recall memory register 100 (in which the **T-Bar** position was saved at 25%). The **Transition LEDs** are at 25% and the physical **T-Bar** position is at 75%. Physical and virtual positions are not matched.
    - ~ If you move the **T-Bar** to the top limit (the direction in which the transition was originally going), it has no effect on the video — because the **T-Bar**'s physical position is already past its virtual position.
    - ~ If you move the **T-Bar** back down towards the bottom limit, you will match physical and virtual positions at 25% — at which point the **T-Bar** will again be live.

#### Tip

Always use the **Transition LEDs** to determine the **T-Bar**'s true virtual position.

## Transition LED Notes

Please note the following important points regarding the **Transition LEDs**.

- **(M/E bank only)** The **Transition LEDs** are not affected when the two “mix” buttons in the **Direct Key Control Group** are used: **MIX KEY 1** and **MIX KEY 2**. For example:
  - ~ In the M/E bank, press **AUTO TRAN** to start an automatic transition, and then press **AUTO TRAN** again to pause the transition. The **Transition LEDs** are now paused between the limits.
  - ~ Press **MIX KEY 1** to mix on **KEY 1**. The **Transition LEDs** remain at their current location.

Refer to the “[Working with Keys](#)” section on page 333 for more details on the buttons in the **Direct Key Control Group**.

- **(PGM bank only)** The **Transition LEDs** are not affected when the **FTB** (Fade to Black) button is used. For example:
  - ~ In the PGM bank, press **AUTO TRAN** to start an automatic transition, and then press **AUTO TRAN** again to pause the transition. The **Transition LEDs** are now paused between the limits.
  - ~ Press **FTB**. The **Transition LEDs** remain at their current location.

## 7. Operations

### Using Re-entry



The **Re-entry** buttons on the **PGM** bank enable you combine the contents of the M/E bank into the switcher's output. This holds true for the **PGM**, **PST** and **KEY** buses:

- When **M/E** is selected on the **PGM** bus, the entire output of the M/E bank is on program. This enables you to cut to the M/E — in the same way that you cut between cameras and other sources.
- When **M/E** is selected on the **PST** bus, the entire output of the M/E bank is available on preset. This enables you to preset the M/E, and transition to it — in the same way that you mix, cut and wipe to cameras and other sources.

#### Tip

In practice, user's will preset the M/E, recall a memory register to the M/E only, and then transition to the new look. Once complete, you can transition back to a straight source on PGM, and free the M/E for the next memory register recall.

- When **M/E** is selected on the **KEY** bus, the entire output of the M/E bank is available as a key source. This enables you to create a "look" on the M/E, and key that look over the PGM source.
- When **M/E 2 Control** is enabled on the FSN-150, by default, the three **M/E** buttons in the **PGM** bank remain mapped in the normal manner. However, additional re-entry buttons for **M/E 1** and **M/E 2** are not mapped into the bus rows. These additional mappings would enable you to re-enter M/E 1 into M/E 2, for example. To create these additional mappings, use the **Map Buttons Menu**.
  - ~ In Chapter 6, refer to the "[Button Mapping](#)" section on page 297 for button mapping instructions.
  - ~ Refer to the "[M/E 2 Control on the FSN-150](#)" section on page 349 for instructions on M/E 2 control.

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## Working with Cuts



A **Cut** is an instant switch (or “take”) between two sources. There are two different ways to perform a cut:

- Use the following steps to perform a cut, without first previewing the next source:
  1. On any **PGM** or **BG** bus, simply press the button for the desired source. Use the **SHIFT** button if required to select a shifted source. Remember that on the PGM bank, the **M/E** (re-entry) button can be selected in the same way.
- Use the following steps to perform a cut using lookahead preview:
  1. In the **Next Transition Group**, press **BG**.
  2. On any **PST** bus, press the button for the desired “next” source. Use the **SHIFT** button if required to select a shifted source. Remember that on the PGM bank, the **M/E** (re-entry) button can be preset in the same way.
  3. Press **CUT**. The source on **PST** instantly cuts to **PGM** (or **BG**) and the buses flip-flop.
  4. Press **CUT** again to return to the previous source, or select a new source on **PST** and repeat the procedure.

**Note**

You can also press **ALL CUT** (in the **Custom Control Section**) to perform a cut on all buses simultaneously.

## 7. Operations

### Setting Transition Rates and Curves

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## Setting Transition Rates and Curves

The **Transition Menu** enables you to change auto transition rates and transition curves.

▲ **Prerequisite** — Ensure that you are familiar with the **Transition Menu**. In Chapter 5, refer to the “[Transition Menu](#)” section on page 148.

■ Use the following steps to set transition rates and curves:



1. Navigate to the **Transition Menu**, either by pressing and holding any **MIX** button, or by using the **Menu Bar**.
2. To adjust transition rates with the knobs:
  - ~ Turn the knob adjacent to the **M/E 1** or **M/E 2** button to adjust the rate.
  - ~ Turn the knob adjacent to the **PGM** button to adjust the PGM rate.
  - ~ Turn the knob adjacent to the **FTB** button to adjust the FTB rate.
3. To adjust transition rates with the **Keypad**:
  - ~ Press the **M/E 1** or **M/E 2** button to display the **Keypad**. Enter or trim the transition rate for the M/E, then press **{Enter}** to accept.
  - ~ Press the **PGM** button to display the **Keypad**. Enter or trim the transition rate for the PGM bank, then press **{Enter}** to accept.
  - ~ Press the **FTB** button to display the **Keypad**. Enter or trim the transition rate for the FTB, then press **{Enter}** to accept.
4. To adjust all transition rates simultaneously, press **{All/Set Trim}**.
  - ~ To “set” a new rate, press any value button to display the **Keypad**.
    - To set all rates to the value in the register, press **{Enter}**.
    - To set all rates to a value, enter the value and press **{Enter}**.
  - ~ To trim all rates simultaneously as offsets to their current values:
    - Turn any **Knob** to increment or decrement all rates.
    - Press any value button to display the **Keypad**. Enter the desired “trim” value and press **{Trim +}** or **{Trim -}** as desired.

#### Note

The M/E 1 transition rate applies to the buttons in the **Direct Key Control Group (MIX KEY 1 and MIX KEY 2)**.

5. Transition curves are applied when you press **AUTO TRAN** in a selected bank, or the **FTB** button. To select transition curves:
  - ~ For M/E 1 or M/E 2, press the **{Linear}**, **{S Curve}**, **{Exponential}**, or **{Logarithmic}** button in the row adjacent to the desired button.
  - ~ For the PGM bank curve, press the **{Linear}**, **{S Curve}**, **{Exponential}**, or **{Logarithmic}** button in the row adjacent to the **PGM** button.
  - ~ For the FTB curve, press the **{Linear}**, **{S Curve}**, **{Exponential}**, or **{Logarithmic}** button in the row adjacent to the **FTB** button.

#### Note

Transition curves also apply to the buttons in the **Direct Key Control Group (MIX KEY 1 and MIX KEY 2)**.

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## Working with Mixes



A **Mix** (or “dissolve”) is a transition in which one video signal fades out as another fades in. The transition is always from the source on **PGM** (or **BG**) to the source on **PST**.

The following topics are discussed in this section:

- [Manual Mix](#)
- [Automatic Mix](#)

### Manual Mix

■ Use the following steps to perform a manual mix:

1. In the **Next Transition Group**, press **BG**.
2. On any **PST** bus, press the button for the desired “next” source. Use the **SHIFT** button if required to select a shifted source. Remember that on the PGM bank, the **M/E** (re-entry) button can be preset in the same way.
3. Press **MIX**.
4. Use the **T-Bar** to perform the manual mix.

### Automatic Mix

■ Use the following steps to perform an automatic mix:

1. Set the desired auto transition rate and curve. Refer to the [“Setting Transition Rates and Curves”](#) section on page 330 for details.
2. In the **Next Transition Group**, press **BG**.
3. On any **PST** bus, press the button for the desired “next” source. Use the **SHIFT** button if required to select a shifted source. Remember that on the PGM bank, the **M/E** (re-entry) button can be preset in the same way.
4. Press **MIX**.
5. Press **AUTO TRAN**.

Please note the following important points regarding mixes:

- You can also press **ALL TRAN** (in the **Custom Control Section**) to perform a mix on all buses simultaneously.
- Remember that there are a wide variety of auto-transition combinations available to you. Refer to the [“Automatic Transitions”](#) section on page 325 for details.

## 7. Operations

### Working with Wipes

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## Working with Wipes



A **Wipe** is a transition in which one video signal is replaced with another signal, using a selected pattern to determine the edge between the two sources. The transition is always from the source on **PGM** (or **BG**) to the source on **PST**.

- ▲ **Prerequisite** — Ensure that you are familiar with the **Wipe Menu**. In Chapter 5, refer to the “[Wipe Menu](#)” section on page 151.

The following topics are discussed in this section:

- [Wipe Setup](#)
- [Manual Wipe](#)
- [Automatic Wipe](#)

### Wipe Setup

- Use the following steps to set up the wipe:
  1. Navigate to the **Wipe Menu**, either by pressing and holding the **WIPE** button in the desired bank, or by using the **Menu Bar**.
  2. Select the desired wipe pattern, direction, edge type, edge width, and edge color (if **Hard Edge** is selected).
  3. Set the desired auto transition rate and curve.

### Manual Wipe

- Use the following steps to perform a manual wipe:
  1. In the **Next Transition Group**, press **BG**.
  2. On any **PST** bus, press the button for the desired “next” source. Remember that on the PGM bank, the **M/E** (re-entry) button can be preset in the same way.
  3. Press **WIPE**.
  4. Use the **T-Bar** to perform the manual wipe.

### Automatic Wipe

- Use the following steps to perform an automatic mix:
  1. In the **Next Transition Group**, press **BG**.
  2. On any **PST** bus, press the button for the desired “next” source. Remember that on the PGM bank, the **M/E** (re-entry) button can be preset in the same way.
  3. Press **WIPE**.
  4. Press **AUTO TRAN**.

Please note the following important points regarding wipes:

- You can also press **ALL TRAN** (in the **Custom Control Section**) to perform a wipe on all buses simultaneously.
- Remember that there are a wide variety of auto-transition combinations available to you. Refer to the “[Automatic Transitions](#)” section on page 325 for details.

## Working with Keys



A **Key** is a transition in which one video signal is superimposed over a background video signal. One signal “cuts” the hole in the background, and another signal “fills” the hole.

### ▲ Prerequisites

- ~ Ensure that you are familiar with the **Keyer Menu**. In Chapter 5, refer to the “[Keyer Menu](#)” section on page 157.
- ~ If you are using linear keys, ensure that the key cut and fill signals are properly mapped. In Chapter 5, refer to the “[Map Buttons Menu](#)” section on page 224.

Please note:

- Using the buttons in the **Next Transition Group**, a variety of transitions are possible with full lookahead:
  - ~ Cut key on/off
  - ~ Mix key on/off
  - ~ Wipe key on/off
- Using the buttons in the **Direct Key Control Group**, two transitions are possible without lookahead:
  - ~ Cut key on/off
  - ~ Mix key on/off

### Important

All examples and procedures described in the following sections apply to all DVE effects, which are treated *exactly* the same way as keys — in terms of transitions.

However, dual keyframe DVE effects require triggers to run them — automatically from the panel (using **FX TRIG**), or manually from the menu. Note that the **FX TRIG** button is only available in the **M/E**, and not for the **DSK**.

Refer to Chapter 8, “[DVE Operations](#)” on page 353 for complete details on DVE effects and triggers.

The following topics are discussed in this section:

- [Key Setup](#)
- [Manual Mix Key](#)
- [Automatic Mix Key](#)
- [Manual Wipe Key](#)
- [Automatic Wipe Key](#)
- [Direct Control Keys](#)

## 7. Operations

### Working with Keys

## Key Setup

- Use the following steps to set up the key:
  1. Navigate to the **Keyer Menu** using one of the following two methods:
    - ~ Arm the keyer that you wish to transition (**KEY 1**, **KEY 2** or **DSK**). Then, press and hold that specific **Key** button. This action places the key on the PVW output for the selected bank.
    - ~ In the **Menu Bar**, press **{Page}** to jump to page 1 (if required), then press **{Keys}**. Remember that you can change keyers with the **{Keyer}** button.
  2. Select the desired key “cut” source:
    - ~ To set up **Key 1** on the M/E, press **SEL** to switch the key bus to **KEY 1**. Select the desired source on the bus.
    - ~ To set up **Key 2** on the M/E, press **SEL** to switch the key bus to **KEY 2**. Select the desired source on the bus.
    - ~ To set up the **DSK**, press and hold **DSK** to change the PST bus to the phantom key bus. Select the desired source on the bus, then release the **DSK** button. Remember that the M/E can be a key source.
  3. If a **DVE** channel is assigned to the keyer:
    - a. Ensure your DVE effect is programmed (on the **DVE** menu).
    - b. Select the desired DVE mode: **{PIP}** or **{Key}**.
      - If **{Key}** is selected, continue with step 4.
      - If **{PIP}** is selected, continue with step 5.

**Note** Remember that if a DVE channel is assigned to a keyer, the DVE “source” is selected on the key bus in the normal way (as in step 2 above).

  4. On the **Keyer Menu**:
    - a. Select the desired key type: luma or linear.
    - b. Select the desired key fill: self, matte, preset or split.
      - If a matte fill is selected, set the desired matte color.
      - If a preset fill is selected, select the desired fill source on the bank’s PST bus.
      - If split key is selected, select the split cut and fill sources.
    - c. Set the key’s clip, gain and opacity.
  5. Set the desired auto transition rate and curve.
  6. Repeat for all other keys that you wish to transition.

### Manual Mix Key

- Use the following steps to perform a manual mix key:
  1. Ensure that the key(s) you wish to transition are properly set up. Refer to the [“Key Setup”](#) section for details.
  2. In the **Next Transition Group**, select the layers that you wish to transition:
    - ~ On the M/E, enable **KEY 1** and/or **KEY 2** as desired. If you want the background to transition along with the selected key, enable **BG**.
    - ~ On the PGM bank, enable **DSK**. If you want the background to transition along with the DSK, enable **BG**.
  3. Use the **T-Bar** to perform the manual mix key. The selected key(s) will transition up or down, depending on their current state.

### Automatic Mix Key

- Use the following steps to perform an automatic mix key:
  1. Ensure that the key(s) you wish to transition are properly set up. Refer to the [“Key Setup”](#) section for details.
  2. In the **Next Transition Group**, select the layers that you wish to transition:
    - ~ On the M/E, enable **KEY 1** and/or **KEY 2** as desired. If you want the background to transition along with the selected key, enable **BG**.
    - ~ On the PGM bank, enable **DSK**. If you want the background to transition along with the DSK, enable **BG**.
  3. Press **AUTO TRAN**.

Please note the following important points regarding automatic mix keys:

- You can also press **ALL TRAN** (in the **Custom Control Section**) to perform the transition on all buses simultaneously.
- Remember that there are a wide variety of auto-transition combinations available. Refer to the [“Automatic Transitions”](#) section on page 325 for details.

### Manual Wipe Key

- Use the following steps to perform a manual wipe key:
  1. Ensure that the key(s) you wish to transition are properly set up. Refer to the [“Key Setup”](#) section for details.
  2. In the **Next Transition Group**, select the layers that you wish to transition:
    - ~ On the M/E, enable **KEY 1** and/or **KEY 2** as desired. If you want the background to transition along with the selected key, enable **BG**.
    - ~ On the PGM bank, enable **DSK**. If you want the background to transition along with the DSK, enable **BG**.
  3. On the **Wipe Menu**, select the desired pattern, direction, edge type, edge width, and edge color (if a **Hard Edge** wipe is selected).
  4. Use the **T-Bar** to perform the manual wipe key. The selected key(s) will transition up or down, depending on their current state.

## 7. Operations

### Working with Keys

## Automatic Wipe Key

- Use the following steps to perform an automatic wipe key:
  1. Ensure that the key(s) you wish to transition are properly set up. Refer to the [“Key Setup”](#) section for details.
  2. In the **Next Transition Group**, select the layers that you wish to transition:
    - ~ On the M/E, enable **KEY 1** and/or **KEY 2** as desired. If you want the background to transition along with the selected key, enable **BG**.
    - ~ On the PGM bank, enable **DSK**. If you want the background to transition along with the DSK, enable **BG**.
  3. On the **Wipe Menu**, select the desired pattern, direction, edge type, edge width, and edge color (if a **Hard Edge** wipe is selected).
  4. Press **AUTO TRAN**.

Please note the following important points regarding automatic wipe keys:

- You can also press **ALL TRAN** (in the **Custom Control Section**) to perform the transition on all buses simultaneously.
- Remember that there are a wide variety of auto-transition combinations available. Refer to the [“Automatic Transitions”](#) section on page 325 for details.

## Direct Control Keys

In the M/E, the four buttons in the **Direct Key Control Group** enable you to *directly* control the two keyers, without the need to “arm” them in the **Next Transition Group**. The red LEDs above the **KEY 1** and **KEY 2** buttons function in the normal manner.

### Note

Remember that you can use these “direct” functions regardless of where the **T-Bar** is currently positioned.

- Use the following steps to perform a direct cut key:
  1. Ensure that the key(s) you wish to transition are properly set up. Refer to the [“Key Setup”](#) section for details.
  2. Press **CUT KEY 1** to cut Key 1 on or off (depending on its current state).
  3. Press **CUT KEY 2** to cut Key 2 on or off (depending on its current state).
- Use the following steps to perform a direct mix key:
  1. Ensure that the key(s) you wish to transition are properly set up. Refer to the [“Key Setup”](#) section for details.
  2. Press **MIX KEY 1** to mix Key 1 on or off (depending on its current state).
  3. Press **MIX KEY 2** to mix Key 2 on or off (depending on its current state).

Please note the following important points regarding the **Direct Control** buttons:

- Unlike the **AUTO TRANS** button, the two **MIX KEY** buttons cannot be paused. Once pressed, the “direct” transition completes fully.
- When the **T-Bar** is positioned between the **BG** and **PST** buses (off of a limit), almost all “direct” transitions are available. In Chapter 3, refer to the [“M/E Transition Section”](#) heading on page 83 for details.

## Working with Memory Registers

This section provides instructions for working with memory registers. Three modes are available: Store, Recall and View.

- ▲ **Prerequisite** — Ensure that you are familiar with the **Memory Menu**. In Chapter 5, refer to the “**Memory Menu**” section on page 174.

The following topics are discussed in this section:

- [Memory Register Overview](#)
- [Storing Memory Registers](#)
- [Recalling Memory Registers](#)
- [Viewing Memory Registers](#)
- [Locking and Unlocking Memory Registers](#)
- [Deleting Memory Registers](#)

### Memory Register Overview

To understand how the memory system works on FSN Series switchers, you can think of each memory register as having a number of individual storage compartments — one for each of the available modules. These modules can be stored or recalled individually, or in combination with other modules.

In addition, each module is comprised of multiple sub-sections called “Enables” which can be toggled on or off as desired. This feature allows you to store one or more individual parts of a module, rather than the entire module.

When you use the memory system, you can elect to use (or bypass) the “Enables” feature.

- **Store — Panel only.** If you store a register using the control panel’s **Keypad** only (without using the **Memory Menu**), all Enables will be on by default.
- **Recall — Panel only.** If you recall a register using the control panel’s **Keypad** only (without using the **Memory Menu**), all Enables will be on — exactly as originally stored in the register.
- **Store — Panel + Menu.** If you store a register and you elect to set Enables using the **Memory Menu**, you can store all or part of any selected module.
- **Recall — Panel + Menu.** If you recall a register and you elect to adjust Enables using the **Memory Menu**, you can recall all or part of any selected module — but only those components that were originally stored in the register.

#### Note

To quickly access the **Memory Menu**, press and hold either the **STORE** or **RECALL** button.

Any combination of modules can be stored in a memory register. Please note the following important points regarding modules:

- **PGM Memory Functions**

When you include the **PGM** button in a store function, you are taking a precise snapshot of the Program bank’s complete look, including all crosspoint selections, the **T-Bar** position, wipe patterns, key parameters — and most important, the state



## 7. Operations

### Working with Memory Registers

of the buttons in the **Program Transition Section**. This snapshot is assigned a memory register number, from 1 to 1000.

When you include the **PGM** button in a recall function, the system *immediately* replaces all (or a portion of) the current Program bank setup, based on your “enables.” You can also modify the Enables, prior to pressing **ENTER**.



- **M/E Memory Functions**

When you include an **M/E** button (**M/E 1** and/or **M/E 2**) in a store function, you are taking a precise snapshot of the M/E bank’s complete look, including all crosspoint selections, the **T-Bar** position, wipe patterns, key parameters — and most important, the state of the buttons in the **M/E Transition Section**. This snapshot is assigned a memory register number, from 1 to 1000.

When you include an **M/E** button in a recall, the system *immediately* replaces all (or a portion of) the current M/E setup, based on your “enables.” You can also modify the Enables, prior to pressing **ENTER**.



- **Aux Memory Functions**

When you include the **Aux** button in a store function, you are taking a precise snapshot of all Source-to-Aux assignments in the **Aux Section**. If you bypass the **Memory Menu**, all Aux routes on the panel will be stored. If you use the Aux “Enables,” you can elect to store any combination of Aux routes.

When you include the **Aux** button in a recall function, the system *immediately* replaces all (or a portion of) the current Aux assignments on the panel, based on your “enables.” You can also modify the Enables, prior to pressing **ENTER**.



- **DVE Memory Functions**

When you include the **DVE** button in a store function, you are taking a snapshot of all four DVE channels, and all effects currently programmed on the **DVE Menu**. If you bypass the **Memory Menu**, all four DVE channels will be stored. If you use the DVE “Enables,” you can elect to store any combination of the four channels.

When you include the **DVE** button in a recall, the system *immediately* replaces all (or a selected number) of DVE effects on the panel, based on your “enables” and based on the current DVE assignments. You can also modify the Enables, prior to pressing **ENTER**.

**Note**

The **DVE** memory function does not store DVE assignments, nor does it store the DVE shot box keyframes. DVE assignments are stored via the **SYS** button. Shot Box keyframes are only stored when you back up the system.



- **System Memory Functions**

When you include the **SYS** button in a store function, you are taking a precise snapshot of all system-related functions (such as input mappings, input setups, output settings, tallies, DVE assignments, Multiviewer layouts, etc.). Using the System “Enables,” you can elect to include or exclude certain system sub-functions.

When you include the **SYS** button in a recall function, the system *immediately* replaces all (or a portion of) the current System settings, based on your “enables.” You can also modify the Enables, prior to pressing **ENTER**.

The table below summarizes the functions you can perform in each mode:

**Table 7-3.** Memory Menu modes and functions

Memory Menu Mode	Name Registers	Modules	Enables	Lock Registers	Delete Registers
View	Yes	View Only	View Only	Yes	Yes
Store	Yes	Modify	Modify	No	No
Recall	No	Modify	Modify	No	No

## Storing Memory Registers

When you store a memory register, you take a “snapshot” of the switcher and the selected modules. Once stored, you can *not* add data to that register — you can only overwrite it with new data.

- ▲ If you store **M/E 1** into register 100, you can not add **AUX** data into that register. However, you could overwrite register 100 with new data.

Storing a memory register and bypassing the Enables is an easy equation. This method stores the entire contents of the selected module(s).

- **STORE, [enable/disable modules], [select register #], ENTER**

Storing a memory register and setting Enables is also an easy equation. This method stores partial contents of the selected module(s).

- **STORE, [enable/disable modules], [select register #], [set Enables], ENTER**

The following topics are discussed in this section:

- [Store, Bypass Enables, Use Default Name](#)
- [Store, Bypass Enables, Enter Custom Name](#)
- [Store, Set Enables, Enter Custom Name](#)
- [Memory Store Notes](#)

### Store, Bypass Enables, Use Default Name

- Use the following steps to store a memory register, bypass the Enables menu, and use the default register name:

1. Set up the switcher in the exact configuration that you want stored.
2. On the **Keypad**, press **STORE**. By default, all available modules light in the keypad's **Module Section**.
3. Select the desired modules to include (or exclude) in the register. If you don't take any action, all modules remain enabled.
4. Enter the desired register number.
5. Press **ENTER**. The register is stored in memory with all Enables are on, and a default description is assigned (**reg-#**). Above the **Keypad**, the selected register number and the default description “**reg-#**” appear in the **Memory Display**, adjacent to the prefix “**STR:**”

## 7. Operations

### Working with Memory Registers

#### Store, Bypass Enables, Enter Custom Name

- Use the following steps to store a memory register, bypass the Enables menu, and enter a custom register description:
  1. Set up the switcher in the exact configuration that you want stored.
  2. On the **Keypad**, press **STORE**. By default, all available modules light in the keypad's **Module Section**.
  3. Select the desired modules to include (or exclude) in the register. If you don't take any action, all modules remain enabled.
  4. Enter the desired register number.
  5. Navigate to the **Memory Menu**. The selected register will be highlighted in the table, and the "**STORE**" banner will be lit red.
  6. Press **{Description}** to display the **Pop-up Keyboard**.
  7. Enter the desired description and press **{Enter}**.

#### Note

In **Store Mode**, the description will not appear in the register table until **ENTER** is pressed on the **Keypad**.

8. Press **ENTER** on the **Keypad**. The register is stored with all Enables are on, along with the custom description. Above the **Keypad**, the selected register number and the custom description appear in the **Memory Display**, adjacent to the prefix "**STR:**"

#### Store, Set Enables, Enter Custom Name

- Use the following steps to store a memory register, set Enables, and enter a custom register description:
  1. Set up the switcher in the exact configuration that you want stored.
  2. On the **Keypad**, press **STORE**. By default, all available modules light in the keypad's **Module Section**.
  3. Select the desired modules to include (or exclude) in the register. If you don't take any action, all modules remain enabled.
  4. Enter the desired register number.
  5. Navigate to the **Memory Menu**. The selected register will be highlighted in the table, and the "**STORE**" banner will be lit red.
  6. Press **{Enables}** to display the **Enables Menu**.
  7. On the modules row, press the light blue button for the first module in which you want to set Enables.
  8. In the "Enables" box, toggle the desired Enables on or off, as required. By default, they are all on, when you first store a register. Remember that you can also use the **{All On}** and **{All Off}** functions.
  9. Repeat steps 7 and 8 for all remaining modules in which you want to set Enables.
  10. Press **{Description}** to display the **Keyboard**.

11. Enter the desired description and press **{Enter}**.

**Note**

In **Store Mode**, the description will not appear in the register table until **ENTER** is pressed on the **Keypad**.

12. Press **ENTER** on the **Keypad**. The register is stored, the Enables are set, and the custom description is also stored. Above the **Keypad**, the selected register number and the custom description appear in the **Memory Display**, adjacent to the prefix "**STR:**"

### Memory Store Notes

Please note the following important points regarding memory register storage:

- If you are in the midst of a **Store** procedure, the **{Advanced}** button is grayed out. This feature prevents you from locking, unlocking, or deleting registers in the midst of the procedure.
- At any point, prior to pressing **ENTER**, you can add or remove modules within a pending **Store** operation — even if the module buttons were not originally selected in the Keypad's **Module Section**.

For example:

- ▲ You originally selected the **M/E 1** module only, and you now wish to add one or two **Aux** routes to the register.
- ▲ You originally selected the **M/E 1** and **PGM** modules, but now you want to remove **M/E 1** from the register.

To add modules (prior to pressing **ENTER**):

- ~ In the **Enables Menu**, press the light blue button for module you wish to add (even if it was not originally selected). All Enables will be off initially, but as soon as you toggle any Enable on, the associated module button in the **Keypad** lights. You can also press **{All On}**.
- ~ At any time in the pending **Store** procedure, simply light the desired module button in the **Keypad**. This action turn all Enables in the selected module on, then you can "set" them in the normal way.

To remove modules (prior to pressing **ENTER**):

- ~ In the **Enables Menu**, press the light blue button for module you wish to remove, and press **{All Off}**. The associated module button in the **Keypad** turns off.
  - ~ At any time in the pending **Store** procedure, simply turn off the desired module button in the **Keypad**. This action turn all Enables in the selected module off — effectively removing the module from the register.
- Remember that once **ENTER** is pressed, the module's contents are set — and you can no longer add to the register. On recall, however, you can elect to recall all of the register's contents, or part of the contents by using your Enables.

## 7. Operations

### Working with Memory Registers

## Recalling Memory Registers

When you recall a memory register, you are recalling all (or part) of the stored register's contents back to the switcher.

Recalling a memory register and bypassing the Enables is an easy equation. This method recalls the entire contents of the selected module(s).

- **RECALL, [select register #], ENTER**

Recalling a memory register and adjusting Enables is also an easy equation. This method recalls partial contents of the selected module(s).

- **RECALL, [select modules], [adjust Enables], ENTER**

The following topics are discussed in this section:

- [Recall, Bypass Enables](#)
- [Recall, Adjust Enables](#)
- [Memory Recall Notes](#)

### Recall, Bypass Enables

■ Use the following steps to recall a memory register and bypass Enables:

1. On the **Keypad**, press **RECALL**.
2. Enter the desired register number. Note that the module buttons will light for the exact modules contained in the register.
3. Press **ENTER**. The entire memory register is now recalled to the panel.

Please note:

- ~ Above the **Keypad**, the selected register number and the register description appear in the **Memory Display**, adjacent to the prefix "**RCL:**"
- ~ If the register was recalled to an **M/E**, the **PGM** bank or both, the selected register number appears in the respective **Transition Display**, below the label "**MEM.**"

### Recall, Adjust Enables

■ Use the following steps to recall a memory register and adjust the Enables:

1. On the **Keypad**, press **RECALL**.
2. Enter the desired register number. Note that the module buttons will light for the exact modules contained in the register.
3. Navigate to the **Memory Menu**. The selected register will be highlighted in the table, and the "**RECALL**" banner will be lit red.
4. Press **{Enables}** to display the **Enables Menu**.
5. On the modules row, press the light blue button for the first module in which you want to adjust Enables.

- ~ Note that only the "stored" modules will be blue. All other modules will be grayed out.
- ~ In the "Enables" box, note that the enables will appear exactly as stored. All those that were not enabled will be grayed out.

6. Toggle the desired Enables on or off, as required. Remember that you can also use the **{All On}** and **{All Off}** functions.

7. Repeat steps 5 and 6 for all remaining modules in which you want to adjust Enables.
8. Press **ENTER** on the **Keypad**. The register is now recalled, using the adjusted Enables. Above the **Keypad**, the custom description appears in the **Memory Display**, adjacent to the prefix “**RCL:**”

### Memory Recall Notes

Please note the following important points regarding memory register storage:

- If you are in the midst of a **Recall** procedure, the **{Advanced}** button is grayed out. This feature prevents you from locking, unlocking, or deleting registers in the midst of the procedure.
- At any point, prior to pressing **ENTER**, you can add or remove modules within a pending **Recall** operation — but only if the modules were originally included in the register. For example:
  - ▲ You originally stored the **M/E 1** and **PGM** modules, you removed **PGM**, but you now wish to add it back in.
  - ▲ You originally stored the **M/E 1** and **PGM** modules, you adjust **M/E 1** Enables, and then you decide to remove **M/E 1** entirely.

To add modules back into the **Recall** (prior to pressing **ENTER**):

- ~ In the **Enables Menu**, if you have toggled any Enables off, simply re-enable them, press **{All On}**, or light the module button itself — but only if the module(s) had originally been stored in the register.

To remove modules from the **Recall** (prior to pressing **ENTER**):

- ~ In the **Enables Menu**, press the light blue button for module you wish to remove, and press **{All Off}**. The associated module button in the **Keypad** turns off.
  - ~ At any time in the pending **Recall** procedure, simply turn off the desired module button(s) in the **Keypad**. This action turn all Enables in the selected module off — effectively removing the module from the register.
- When you recall a register from memory to an **M/E** or the **PGM** bank, the input mapping will be recalled to the crosspoints — exactly as stored. This means that if the input mapping changes, the recall will *not* follow the input to its new location. In addition, if there is no longer an input in the recalled crosspoint location, black will be shown. For example:
    - ▲ Store a register that includes **VTR1** on button 5. Now, change the input mapping, and map **GFX1** to button 5. When you recall the register, **GFX1** will be selected.
    - ▲ Store a register that includes **VTR1** on button 5. Now, un-map **VTR1** from the panel, leaving the button blank. When you recall the register, **Black** will be selected.

## 7. Operations

### Working with Memory Registers

## Viewing Memory Registers

In the **View Mode**, you can look at all memory registers, enter register descriptions, and view the status of all modules and Enables. You cannot modify the modules or the Enables within a register, but you *can* lock, unlock and delete registers.

- Use the following steps to view a memory register:
  1. Navigate the **Memory Menu** using one of the following methods:
    - ~ In the **Menu Bar**, press **{Page}** to display page 2 (if required). Then, press the **{Memory}** button.
    - ~ Press and hold either the **STORE** or **RECALL** button in the control panel's **Memory Section**.
  2. Select the desired register that you want to view. Two methods are available:
    - ~ Turn the knob adjacent to the **{Memory Register}** button to scroll to the desired register.
    - ~ Press the **{Memory Register}** button, then on the keypad, enter the desired register and press **{Enter}**.
  3. In the main **Memory Table**, note the register's lock/unlock mode, description, and the exact modules stored in the register.
  4. If desired, press **{Description}** to change the register's description.
  5. If desired, press **{Advanced}** to display the **Advanced Memory Menu**, where you can lock, unlock, and delete registers. Refer to the "[Locking and Unlocking Memory Registers](#)" and "[Deleting Memory Registers](#)" sections below for details.
  6. If desired, press **{Enables}** to switch to the **Enables Menu**. There, you can view the module's Enables, enter or change the description, and switch to the **Advanced Memory Menu**. If desired, you can also view other registers within the **Enables Menu**, using the same methods outlined in step 2 above.

## Locking and Unlocking Memory Registers

The **View Mode** is the only mode in which you can lock and unlock registers.

- Use the following steps to lock and unlock memory registers:
  1. Ensure that you are *not* in the **Store** or **Recall** modes. If so, cancel the mode.
  2. Navigate the **Memory Menu** using one of the following methods:
    - ~ In the **Menu Bar**, press **{Page}** to display page 2 (if required). Then, press the **{Memory}** button.
    - ~ Press and hold either the **STORE** or **RECALL** button in the control panel's **Memory Section**.
  3. Select the register that you want to lock or unlock. Two methods are available:
    - ~ Turn the knob adjacent to the **{Memory Register}** button to scroll to the desired register.
    - ~ Press the **{Memory Register}** button, then on the keypad, enter the desired register and press **{Enter}**.
  4. Press **{Advanced}** to display the **Advanced Memory Menu**.
  5. Press the **{Lock Unlock}** button to toggle the register's mode.

- ~ If currently unlocked, press **{Lock Unlock}** to lock the register. An “X” appears in the table cell under the **Lock** heading. The register can not be deleted or over-written.
  - ~ If currently locked, press **{Lock Unlock}** to unlock the register and remove the “X” from the table cell. The register can now be deleted and over-written.
6. Repeat from step 3 to lock or unlock additional registers.

## Deleting Memory Registers

The **View Mode** is the only mode in which you can delete registers.

- Use the following steps to delete memory registers:
  1. Ensure that you are not in the **Store** or **Recall** modes. If so, cancel the mode.
  2. Navigate the **Memory Menu** using one of the following methods:
    - ~ In the **Menu Bar**, press **{Page}** to display page **2** (if required). Then, press the **{Memory}** button.
    - ~ Press and hold either the **STORE** or **RECALL** button in the control panel's **Memory Section**.
  3. Select the register that you want to delete. Two methods are available:
    - ~ Turn the knob adjacent to the **{Memory Register}** button to scroll to the desired register.
    - ~ Press the **{Memory Register}** button, then on the keypad, enter the desired register and press **{Enter}**.
  4. Press **{Advanced}** to display the **Advanced Memory Menu**.
  5. Ensure that the register is unlocked. If not, unlock it using **{Lock Unlock}**.
  6. Press the **{Delete Register}** button to delete the register. When the “confirm” pop-up appears, press **{Yes}**.
  7. Repeat from step 3 to lock or unlock additional registers.

## 7. Operations

### Working with Aux Buses

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## Working with Aux Buses

The switcher's **Aux Section** enables you to route input sources and selected outputs to various “destinations.”

### ▲ Prerequisites

- ~ Ensure that you are familiar with mapping and naming Aux outputs. In Chapter 6, refer to the [“Aux Setup”](#) section on page 298 for instructions.
  - ~ Ensure that you are familiar with the **Aux Section** on the control panel. In Chapter 3, refer to the [“Aux Section”](#) heading on page 91 for details.
- Use the following steps to assign sources to Aux bus outputs:
1. Ensure that your Aux outputs are mapped and named to your satisfaction.
  2. On the **Aux Bus Row**, select the Aux output that you want to assign.
  3. On the **Aux Source Row**, select one of the following:
    - ~ Select a new source or program output (e.g., PGM, M/E).
    - ~ Select **Black**.
    - ~ Select an output (e.g., **M/E 1**, **PGM**).
    - ~ Select a clean feed source by pressing **ASSIGN**, and choosing the desired source from the **Clean Feed Setup Menu**. Refer to the [“Selecting Clean Feed Outputs”](#) section below for details.

### Note

Remember that only one clean feed source can be mapped to the **ASSIGN** button for all Aux buses. For example, you cannot map “**Pre KEY 1**” to Aux 1, and “**Pre KEY 2**” to Aux 2.

4. Repeat the procedure from step 2 to make additional assignments.

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## Selecting Clean Feed Outputs

The **Clean Feed Setup Menu** enables you to set clean feed outputs, and the source for the **ASSIGN** button (in the control panel's **Aux Section**).

### ▲ Prerequisites

- ~ Ensure that you are familiar with the **Aux Section**. In Chapter 3, refer to the "[Aux Section](#)" heading on page 91 for details.
  - ~ Ensure that you are familiar with the **Clean Feed Setup Menu**. In Chapter 5, refer to the "[Clean Feed Setup Menu](#)" section on page 232.
- Use the following steps to select clean feed outputs and the **ASSIGN** button source:
1. Navigate to the **System Menu**:
    - ~ In the **Menu Bar**, press **{Page}** to display page 2 (if required). Then, press the **{System}** button.
  2. Press **{Clean Feed Setup}** to display the **Clean Feed Setup Menu**.
  3. To set clean feed outputs:
    - ~ Press the blue **{Clean Feed Outputs}** button. The **Palette** changes to the **Clean Feed Outputs** flowchart.
    - ~ Select the desired clean feed point for each output.
  4. To set the **ASSIGN** button source:
    - ~ Press **{Assign Button}**. The **Palette** changes to the **Assign Button** flowchart.
    - ~ Select the desired clean feed point for the **ASSIGN** button.

### Note

Remember that only one clean feed source can be mapped to the **ASSIGN** button for all Aux buses. For example, you cannot map "**Pre KEY 1**" to Aux 1, and "**Pre KEY 2**" to Aux 2.

## 7. Operations

### Using Custom Control Functions

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## Using Custom Control Functions

The **Custom Control Section** provides groups of buttons that can be programmed to perform various switcher functions.

- ▲ **Prerequisites** — Ensure that you are familiar with the **Custom Control Section**. In Chapter 3, refer to the “[Custom Control Section](#)” heading on page 93 for details.

#### Note

In version 3.0, only pre-programmed “system” functions such as **ALL TRAN**, **FRZ**, **UNFRZ**, etc., are available.

- Use the following steps to use **Custom Control** functions:
  1. To freeze a source:
    - ~ Press and hold **FRZ**, then press the desired source button (on any bus). Note that this is the same as toggling the **{Freeze}** button to “On” — on the **Input Menu**.
  2. To un-freeze a source:
    - ~ Press and hold **UNFRZ**, then press the button for the frozen source (on any bus). Note that this is the same as toggling the **{Freeze}** button to “Off” — on the **Input Menu**.
  3. To perform an auto transition on all banks simultaneously:
    - ~ Press **ALL TRAN**. All banks will transition, each at their own selected transition rate.
  4. To perform a cut on all banks simultaneously:
    - ~ Press **ALL CUT**. All banks will cut immediately.
  5. To enable or disable M/E 2 control on the FSN-150:
    - ~ Toggle the **M/E2 CTRL** button:
      - When enabled, the **Custom Control** button lights solid, and all **Programmable Displays** on the M/E turn orange. Refer to the “[M/E 2 Control on the FSN-150](#)” section on page 349 for operating instructions.
      - When disabled, the **Custom Control** button turns off, and all **Programmable Displays** on the M/E turn green.

#### Important

When M/E 2 control is off, it simply means that the bank’s buttons are not physically on the FSN-150 panel. You still have the ability to recall all stored M/E 2 memory registers in the normal manner.

6. To save all system settings:
  - ~ Press **SAVE ALL**. All parameters under the **System Menu** will be saved to non-volatile memory. Note that this function is the same as pressing **{Save All}** on the **System Menu**. In Chapter 5, refer to the “[Save All](#)” section on page 272 for a list of the functions that are saved.

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## M/E 2 Control on the FSN-150

M/E 2 control can be enabled or disabled on the FSN-150 using the **M/E2 CTRL** button in the **Custom Control Section**. When M/E 2 control is enabled on the FSN-150, you have complete access to more creative switcher “looks,” including the use of five keyers, up to four layers of DVE channels, advanced re-entry effects, and complete storage and recall of M/E 2 effects using the memory system.

### ▲ Prerequisites

- ~ Ensure that you are familiar with the **Custom Control Section**. In Chapter 3, refer to the [“Custom Control Section”](#) heading on page 93.
- Use the following steps to use M/E 2 on the FSN-150:
1. Before using M/E 2 in production:
    - a. Use the {**M/E Order**} function on the **Other Setup Menu** to select the priority of M/E 2 in the switcher’s flow of video. In Chapter 5, refer to the [“Other Setup Menu”](#) heading on page 253 for details.
    - b. Per the requirements of your production, map **M/E 1** and **M/E 2** re-entry crosspoints to the panel. By default, the M/E 1 re-entry crosspoint is mapped to the **M/E** button in the **PGM** bank, but you must manually map additional re-entry crosspoints as required. In Chapter 6, refer to the [“Button Mapping”](#) heading on page 297 for mapping instructions.
    - c. Per the requirements of your production, assign DVE channels to keyers in M/E 2 as required. In Chapter 8, refer to the [“Assigning DVE Channels to Keyers”](#) section on page 389 for instructions.
  2. Press the **M/E2 CTRL** button in the **Custom Control Section** to enable M/E 2 control. The **Custom Control** button lights solid when control is enabled.
    - ~ All **Programmable Displays** on the M/E turn orange for easy identification of M/E 2.
    - ~ M/E 2 functionality is now available for use in the normal manner, including keys, DVE assignments, and all memory register storage and recall functions.
  3. Press the **M/E2 CTRL** button again to disable M/E 2 control. The **Custom Control** button turns off, and all **Programmable Displays** on the M/E turn green.

### Important

When M/E 2 control is off, it simply means that the bank’s buttons are not physically on the FSN-150 panel. You still have the ability to recall all stored M/E 2 memory registers in the normal manner.

## 7. Operations

### Backing Up and Restoring the System

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## Backing Up and Restoring the System

The following topics are discussed in this section:

- [Backing Up the System](#)
- [Restoring the System](#)

### Backing Up the System

The system backup procedure enables you to store the entire system setup to a USB drive, including all memory registers and the DVE shot box.

#### Note

You can only write one backup file in a selected folder. If you wish to store multiple backup files on a single USB drive, create additional folders as required.

■ Use the following steps to back up the system:

1. Navigate to the **System Menu**:
  - ~ In the **Menu Bar**, press **{Page}** to display page **2** (if required). Then, press the **{System}** button.
2. Press **{Backup and Restore}** to display the **Backup and Restore Menu**.
3. Insert a USB drive into the **USB Port** on the top of the control panel.
4. Press **{Backup System}** to display the **Backup Menu**.
5. In the directory, navigate to the folder in which you want to store a backup file.

#### Tip

Touch the desired location on the touch screen, or for more accuracy, use the eraser end of a pencil.

- ~ To open or close a highlighted folder, press **{Open/Close}** as required.
  - ~ If required, press **{Create New Folder}** to create a new folder at the current location in the directory.
  - ~ As required, press **{Rename Folder}** to rename the highlighted folder.
6. Press **{Backup System}** to create the backup file. If the selected directory already contains a backup file, you will be asked to confirm an “overwrite,” or cancel the operation.

Please note:

- You cannot delete, move or copy files (or folders) using the touch screen interface. To accomplish these functions, use your PC.

## Restoring the System

The system restore procedure enables you to restore the entire system setup from a USB drive back to the panel, including all memory registers and the DVE shot box.

■ Use the following steps to restore the system:

1. Navigate to the **System Menu**:
  - ~ In the **Menu Bar**, press **{Page}** to display page **2** (if required). Then, press the **{System}** button.
2. Press **{Backup and Restore}** to display the **Backup and Restore Menu**.
3. Insert a USB drive into the **USB Port** on the top of the control panel.
4. Press **{Restore System}** to display the **Backup Menu**.
5. In the directory, navigate to the folder from which you want to restore the system, and highlight the backup file.

### Tip

Touch the desired location on the touch screen, or for more accuracy, use the eraser end of a pencil.

~ To open or close a highlighted folder, press **{Open/Close}** as required.

6. Press **{Restore System}** to begin the “restore” procedure.

## 7. Operations

Backing Up and Restoring the System

## 8. DVE Operations

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### In This Chapter

This chapter provides orientation and operating instructions for the FSN Series' optional internal DVE (digital video effects) capability. The following topics are discussed:

- [Introduction to the DVE](#)
- [DVE Menu Orientation](#)
- [Assigning DVE Channels to Keyers](#)
- [Selecting the Keyer Mode](#)
- [Programming DVE Effects](#)
- [Editing Keyframes](#)
- [Automatic DVE Triggering](#)

## 8. DVE Operations

Introduction to the DVE

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# Introduction to the DVE

This section provides an overview of the DVE. The following topics are discussed:

- [DVE Workflow Overview](#)
- [DVE Modes and Features](#)
- [Multiple Ways to Trigger](#)
- [DVE Effect Durations](#)
- [DVE Morphing](#)
- [DVE Coordinate Space](#)
- [Joystick Control](#)

## DVE Workflow Overview

The FSN Series' optional DVE provides up to four channels of internal 2D special effects. You can create PIPs, size and position images, add borders and shadows, and create single or dual keyframe effects. Up to two DVE cards can be installed in the chassis.

Understanding DVE workflow is a simple four-step process:

1. **Assign DVE Channels** — Using the **DVE Assign Menu**, assign available DVE channels to specific keyers on the panel. This paradigm enables you to treat DVE channels just like key sources, in terms of source selection and transitions.

### Note

Once your channel assignments have been made, you may not need to change them during your production. However, as required, you can store different sets of DVE channel assignments by using the **SYS** category in the memory system — and change them as needed during a show.

Refer to the “[Assigning DVE Channels to Keyers](#)” section on page 389 for expanded instructions on assigning DVE channels.

2. **Select the Keyer Mode** — On the **Keyer Menu**, select a keyer that has a DVE channel assigned, and enable or disable the DVE.
  - ~ **DVE Off** — If the DVE is disabled, the keyer behaves in the normal way. Key sources that you select on the associated **Key Bus** cannot be sized, positioned or placed in a PIP.
  - ~ **DVE On** — If the DVE is enabled, Key sources that you select on the **Key Bus** are routed through the DVE. Two modes are available:
    - In **Key Mode**, the **Keyer Menu**'s clip, gain and fill controls are enabled as normal. Using the **DVE Menu**, you have *partial* effect functionality. The key can be sized and positioned, and keyframes can be programmed, but you cannot PIP, border, or shadow the key.
    - In **PIP Mode**, the **Keyer Menu**'s clip, gain and fill controls are disabled, and the key source is placed in a PIP. Using the **DVE Menu**, you have *full* effect functionality.

Refer to the “[Selecting the Keyer Mode](#)” section on page 390 for expanded instructions on choosing the right keyer mode.

## 8. DVE Operations

### Introduction to the DVE

3. **Program DVE Effects** — Using all available DVE tools, program and edit the desired effects on the **DVE Menu**. The best, most efficient method is:
  - ~ Store and name “shot box” keyframes for all of your desired positions, locations and looks.
  - ~ Create effects (either single or dual keyframe effects) from the shot box keyframes, and store them in memory. Remember that each **DVE** memory register stores all four channels currently being programmed, but using Enables, you can store any combination of channels.

Refer to the “[Programming DVE Effects](#)” section on page 391 for expanded instructions on programming and editing DVE effects.

4. **Transition the Effect** — On the panel, arm the desired keyer(s) in the M/E and/or in the PGM bank, and transition the effect(s) on or off. Please note:
  - ~ All DVE effects can be transitioned up or down in the normal way — using cuts, mixes and wipes.
  - ~ If a dual keyframe effect is programmed in an M/E keyer, the effect can be triggered either manually (with the DVE Menu), or automatically using the **FX TRIG** button in combination with the **AUTO TRAN** button.

Refer to the “[Automatic DVE Triggering](#)” section on page 396 for expanded instructions on triggering DVE effects.

## DVE Modes and Features

Following is a complete list of all DVE modes and features.

### Note

All DVE modes and features are available in both **Key** and **PIP** modes (as selected on the **Keyer Menu**), except where noted below.

- **DVE Channel Assignment**
  - ~ Assign DVE channels to keyers, with independent cut/fill assignments
  - ~ Name DVE channels
  - ~ Un-assign DVE channels
- **Keyer Mode**
  - ~ Enable keyer mode or PIP mode for selected DVE channel
  - ~ Adjustable key gain, clip, and opacity
  - ~ Selectable key fill
- **DVE Effects Setup**
  - ~ Channel selection
  - ~ Create new effect
  - ~ Clear current keyframe
  - ~ Add keyframe
  - ~ Delete keyframe
- **Keyframe Editing and Status**
  - ~ Keyframe selection

## 8. DVE Operations

### Introduction to the DVE

- ~ Keyframe on-air status
- ~ Shot box assignment status
- ~ Live (on-air) editing of “next” keyframe
- ~ Joystick, knob, or numeric function control
- **Adjustable PIP Size and Position**
  - ~ Size and position presets
  - ~ Independent horizontal and vertical PIP size adjustments
  - ~ Independent horizontal and vertical PIP position adjustments
  - ~ Aspect ratio lock / unlock
- **Adjustable Source Pan / Zoom** (the image inside PIP)
  - ~ Independent horizontal and vertical source size adjustments
  - ~ Independent horizontal and vertical source position adjustments
  - ~ Aspect ratio lock / unlock
- **Adjustable Mask**
  - ~ Mask presets
  - ~ Independent top, bottom, left and right mask adjustments
- **Adjustable Border** (these features are not available in **Key Mode**)
  - ~ Six selectable border types
  - ~ HSL border color adjustments
  - ~ Adjustable border width
  - ~ Selectable border calculation in percent or pixels
  - ~ **Note:** The feature is disabled when channels are linked.
- **Adjustable Shadow and Opacity** (these features are not available in **Key Mode**)
  - ~ Selectable shadow position
  - ~ Shadow aspect ratio lock / unlock
  - ~ Adjustable shadow luminance
  - ~ Adjustable shadow width and opacity
  - ~ Adjustable overall PIP opacity
  - ~ **Note:** The feature is disabled when channels are linked.
- **Effects Triggers** (for two keyframe effects)
  - ~ Manual run forward / reverse
  - ~ Trigger via **AUTO TRAN**, run forward / reverse
- **Shot Box**
  - ~ Save up to 128 keyframes (shots)
  - ~ Name keyframe, delete keyframe
  - ~ Assign selected keyframe to current effect keyframe
- **Link Mode**
  - ~ Enable / disable links to any channel
  - ~ Clear all links

- **Adjustable Color Effects**
  - ~ Keyframe overall brightness and contrast control
  - ~ Individual RGB brightness and contrast control
  - ~ Monochrome mode
  - ~ Hue and saturation control
  - ~ Invert mode on / off
- **Adjustable Image Processing**
  - ~ De-interlace mode: adaptive or field-to-frame
  - ~ Adjustable motion threshold
- **Adjustable Image Effects**
  - ~ Horizontal and vertical flip
  - ~ Keyframe freeze, freeze on run
  - ~ Strobe mode with adjustable rate

### Multiple Ways to Trigger

The following topics are discussed in this section:

- [M/E Bank Triggers](#)
- [PGM Bank Triggers](#)

#### M/E Bank Triggers

There are three ways to trigger dual keyframe DVE effects on the M/E bank:

- **Manual trigger** — simplified procedure:
  - ~ Program the dual keyframe effect.
  - ~ Enable the associated keyer on the M/E.
  - ~ Select the desired transition (e.g., mix key, wipe key, etc.). If you don't enable **MIX** or **WIPE**, only the effect will run.
  - ~ Enable the **FX TRIG** button.
  - ~ Run the effect manually with the **T-Bar**.
- **Menu trigger** — simplified procedure:
  - ~ Program the dual keyframe effect.
  - ~ Enable the associated keyer on the M/E.
  - ~ Run the effect using the forward (▶) and backward (◀) buttons on the **DVE menu**.

#### Note

Please note the following important points:

- This method only runs the DVE effect.
- The **FX TRIG** button does not have to be enabled.
- The effect cannot be paused during the run interval.

## 8. DVE Operations

### Introduction to the DVE

- **Automatic trigger** — simplified procedure:
  - ~ Program the dual keyframe effect.
  - ~ Enable the associated keyer on the M/E.
  - ~ Select the desired transition (e.g., mix key, wipe key, etc.). If you don't enable **MIX** or **WIPE**, only the effect will run.
  - ~ Enable the **FX TRIG** button.
  - ~ Press **AUTO TRAN**.

#### Note

Please note the following important points:

- This method runs the DVE effect plus any associated transition (e.g., mix key, wipe key).
- The **FX TRIG** button must be enabled.
- The effect can be paused by pressing **AUTO TRAN** during the run interval.

Refer to the “[Automatic DVE Triggering](#)” section on page 396 for expanded instructions on triggering DVE effects on the M/E.

### PGM Bank Triggers

Because there is no **FX TRIG** button in the PGM bank's **Transition Section**, there is only one way to trigger a dual keyframe DVE effect on this bank:

- **Menu trigger** — simplified procedure:
  - ~ Program the dual keyframe effect.
  - ~ Enable the DSK.
  - ~ Run the effect using the forward (▶) and backward (◀) buttons on the **DVE menu**.

#### Note

Please note the following important points:

- This method only runs the DVE effect.
- The effect cannot be paused during the run interval.

### DVE Effect Durations

The following rules apply to DVE effect durations:

- Each switcher bank and M/E has its own unique transition rate and curve, as controlled on the **Transition Menu**. This rate governs how fast (or slow) you can mix, wipe and key the various layers when **AUTO TRAN** is pressed.
- The M/E transition rate and curve *also* applies to the DVE:
  - ~ The transition rate governs the effect duration for dual keyframe DVE effects — that is, how fast (or slow) keyframe 1's parameters transition to keyframe 2's parameters.
  - ~ The transition curve determines the type of motion path that the effect obeys (linear, S-curve, logarithm or exponent).
- To change the DVE effect duration, change the M/E transition rate.
- To change the DVE motion path, change the curve.
- By providing one rate and one curve for all transitioning parameters on the M/E, there are no conflicts when you pause and resume transitions using **AUTO TRAN**, and no conflicts when you use the **T-Bar** for manual transitions.
- If an M/E transition involves an effect (e.g., mix or wipe) plus a DVE effect, both always start and end simultaneously.

### DVE Morphing

The term “morph” essentially means to “transform.” The FSN Series DVE enables you to smoothly morph between a wide variety of parameters, from keyframe to keyframe.

The following list outlines morphing parameters.

- PIP position and size
- Source pan and zoom
- Mask
- Border width, color and edge type (e.g., hard, soft, halo, inside halo, outside halo)
- Shadow size and position
- Shadow edge width, luminance and opacity
- Image brightness, contrast, hue and saturation
- Monochrome

All other parameters do not morph. Instead, the system “cuts” to the requested effect when the keyframe containing those parameters is reached in a dual keyframe effect.

## 8. DVE Operations

Introduction to the DVE

### DVE Coordinate Space

The “world” in which the DVE channels (PIPs) live is a true mathematical coordinate space. For example:

- When the output format is set to 480i, the background space is 720 (w) x 487 (h) pixels in dimension.
- When the output format is set to 1920 x 1080i, the background space is 1920 (w) x 1080 (h) pixels in dimension.

The figure below illustrates the coordinate space in which PIPs live:

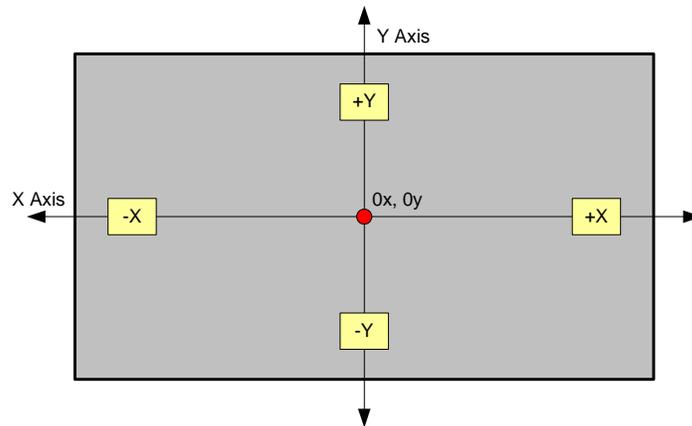


Figure 8-1. DVE coordinate space

Please note:

- The **X** axis is the horizontal dimension. The **Y** axis is the vertical dimension. Both axes extend beyond the boundaries of the background space, enabling you to position PIP on (or off) screen with numeric precision.
- The center point of the screen where both the **X** and **Y** axes meet is the zero point — coordinate **0x, 0y**.
- The position of a PIP is defined as the PIP's center relative to the center of the screen. Thus, when a PIP is at position **0x, 0y**, its center is in the middle of the screen. Here, the PIP's upper left corner may (or may not) be touching the upper left corner of the screen — depending on the PIP's size.
- When a PIP is moved to the left of center, along the **X** axis, it moves into negative X-axis space. When a PIP is moved to the right of center, it moves into positive X-axis space.
- When a PIP is moved above center, along the **Y** axis, it moves into positive Y-axis space. When a PIP is moved below center, it moves into negative Y-axis space.
- Screen-specific values such as **Position** pertain to the position of the PIP in coordinate space.
- Image-specific values such as **Size** and **Mask** pertain to the boundaries of the PIP itself, independent of the screen.

Your knowledge of coordinate space will assist with accurate and repeatable image placement, if you wish to program and edit “by the numbers.”

### Joystick Control

When the **DVE Menu** is active, the **Joystick** controls many (but not all) image manipulation parameters. The following table details **Joystick** control in the various modes. Use the figure below for reference.

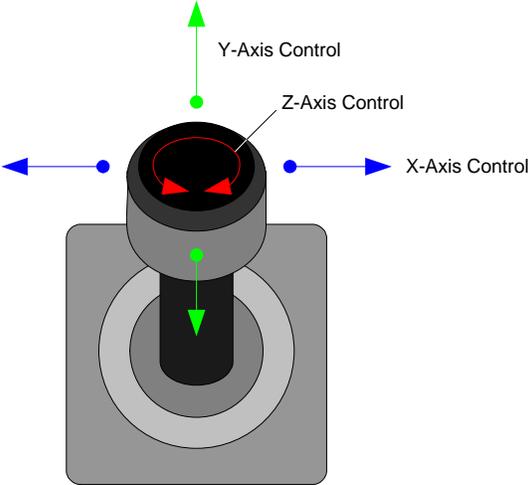


Figure 8-2. Joystick Axes

Table 8-1. Joystick Control Modes

DVE Mode	Joystick Movement		
	X Axis	Y Axis	Z Axis
Size and Position	Left / right PIP movement	Up / down PIP movement	PIP size *
Pan / Zoom source **	Left / right source position inside PIP	Up / down source position inside PIP	Source size inside PIP
Mask ***	Left / right mask movement	Up / down mask movement	Mask size
Shadow Size and Position	Left / right shadow movement	Up / down shadow movement	Shadow size

\* Current aspect ratio is maintained.  
 \*\* PIP size and position remains constant. Manipulations can not exceed the boundaries of the source image, e.g., you can not reduce source size below 1:1.  
 \*\*\* Aspect ratio of the mask is maintained. Manipulation stops when an edge reaches zero.

## 8. DVE Operations

### DVE Menu Orientation

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## DVE Menu Orientation

This section provides a detailed explanation of all DVE menus and features. The following topics are discussed:

- [DVE Assign Menu](#)
- [DVE Main Menu — Size and Position Panel](#)
- [Effect Setup Panel](#)
- [Pan Zoom Source Panel](#)
- [Mask Panel](#)
- [Border Shadow Opacity Panel](#)
- [Shot Box Menu](#)
- [Advanced DVE Menu — Color Effects Panel](#)
- [Advanced DVE Menu — DVE Extras Panel](#)
- [DVE Links](#)

**Tip**

It is highly recommended that you thoroughly learn all features and functions on all DVE menus, prior to continuing with the operations sections in this chapter.

## DVE Assign Menu

From the **System Menu**, press {DVE Assign} to display the **DVE Assign Menu**:

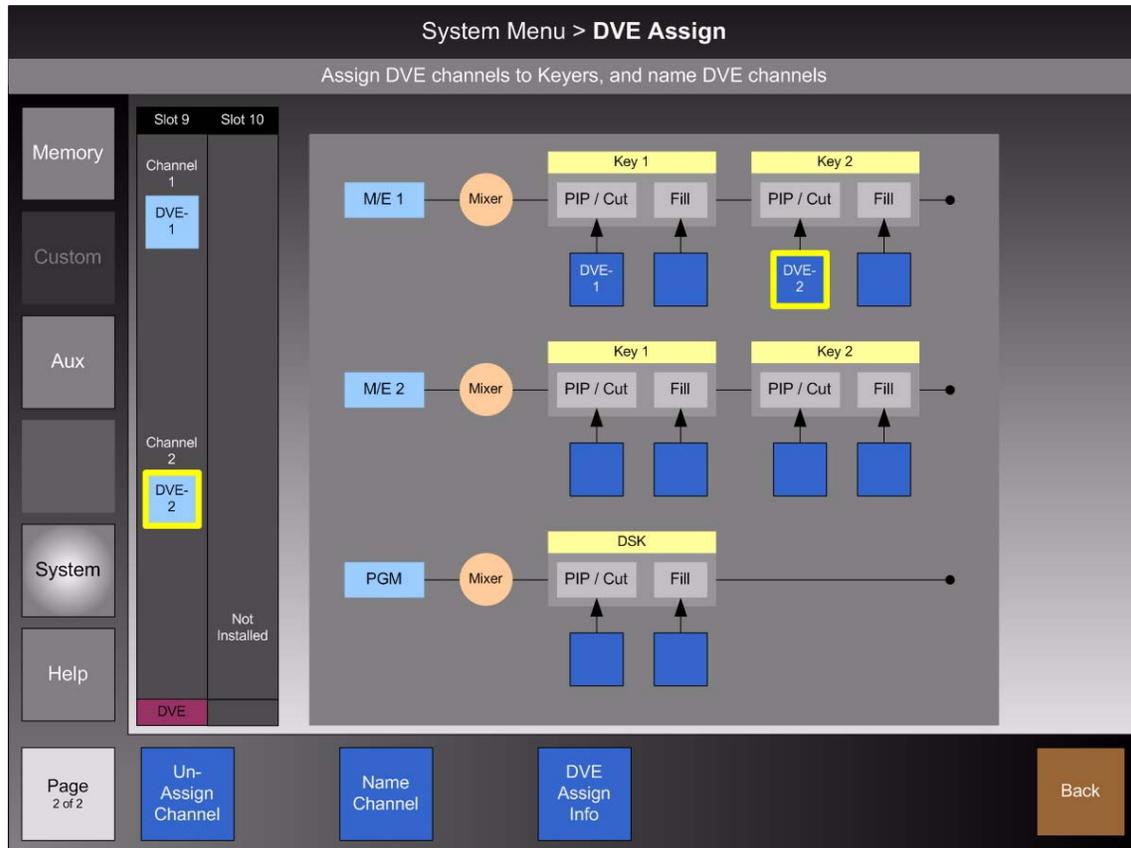


Figure 8-3. DVE Assign Menu (sample)

The **DVE Assign Menu** enables you to assign DVE channels to keyers. Once assigned, you can elect to use the DVE or bypass the DVE — simply by selecting the desired mode on the associated keyer's **Keyer Menu**.

DVE assignment is highly flexible. You can:

- Assign, un-assign and name DVE channels.
- Fly PIPs, luma keys, linear keys and split keys. Refer to the **DVE Assignment Information Pop-up** below for details.

On the menu, the left side of the **Palette** shows the **Rear I/O View**, while the right side shows the **DVE Assignment Table**. Please note:

- Two chassis slots (**9** and **10**) are provided for DVE cards, each of which provides two DVE channels — for a maximum of four channels on line.
- DVE channels **1** and **2** are dedicated to slot **9**. Channels **3** and **4** are dedicated to slot **10**. If a DVE card is only installed in slot **10**, only channels **3** and **4** are available. If a DVE card is not installed, the slot label reads **"Not Installed."**
- On each card, each channel is a button that is used for DVE assignment and naming channels.

## 8. DVE Operations

### DVE Menu Orientation

- In the **DVE Assignment Table**, a flow chart of all keyers is provided. For each keyer, you can assign a DVE channel to the “**cut**” signal, to the “**fill**” signal, or to both — depending on your requirements. A button is provided for each signal.

To assign a DVE channel to a keyer:

- Press the desired keyer button in the **DVE Assignment Table**. The button is highlighted in yellow.
- Press the DVE channel that you want to dedicate to that Keyer. The name assigned appears in the chart.

To un-assign a DVE channel:

- Press the desired keyer button in the **DVE Assignment Table**.
- Press **{Un-Assign Channel}**. The assignment clears.

DVE channels have default “system” names: **DVE\_9\_1**, **DVE\_9\_2**, **DVE\_10\_1**, and **DVE\_10\_2**. However, to custom-name a DVE channel:

- Press **{Name Channel}** to enter the naming mode.
- Press the desired channel button in the **Rear I/O View**.
- When the keyboard appears, enter the desired name (maximum eight characters) and press **{ENTER}**.
- When finished, press **{Name Channel}** to exit the mode.

To get on-line information about DVE assignment, press **{DVE Assign Info}** to display the **DVE Assignment Information Pop-up**.

Un-Assign Channel

Name Channel

DVE Assign Info

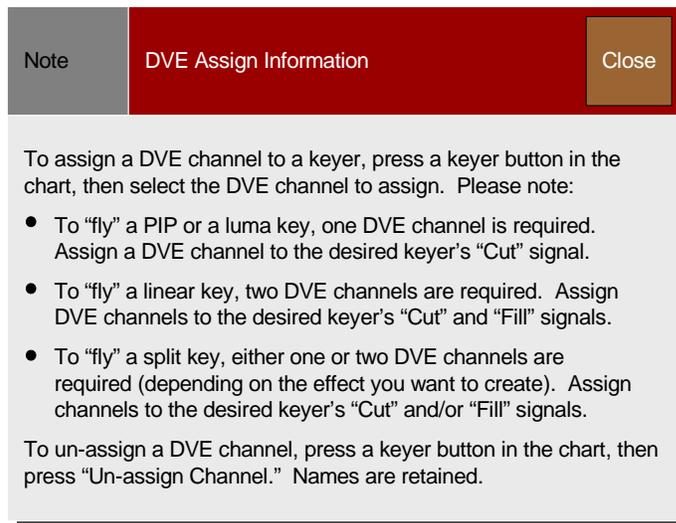


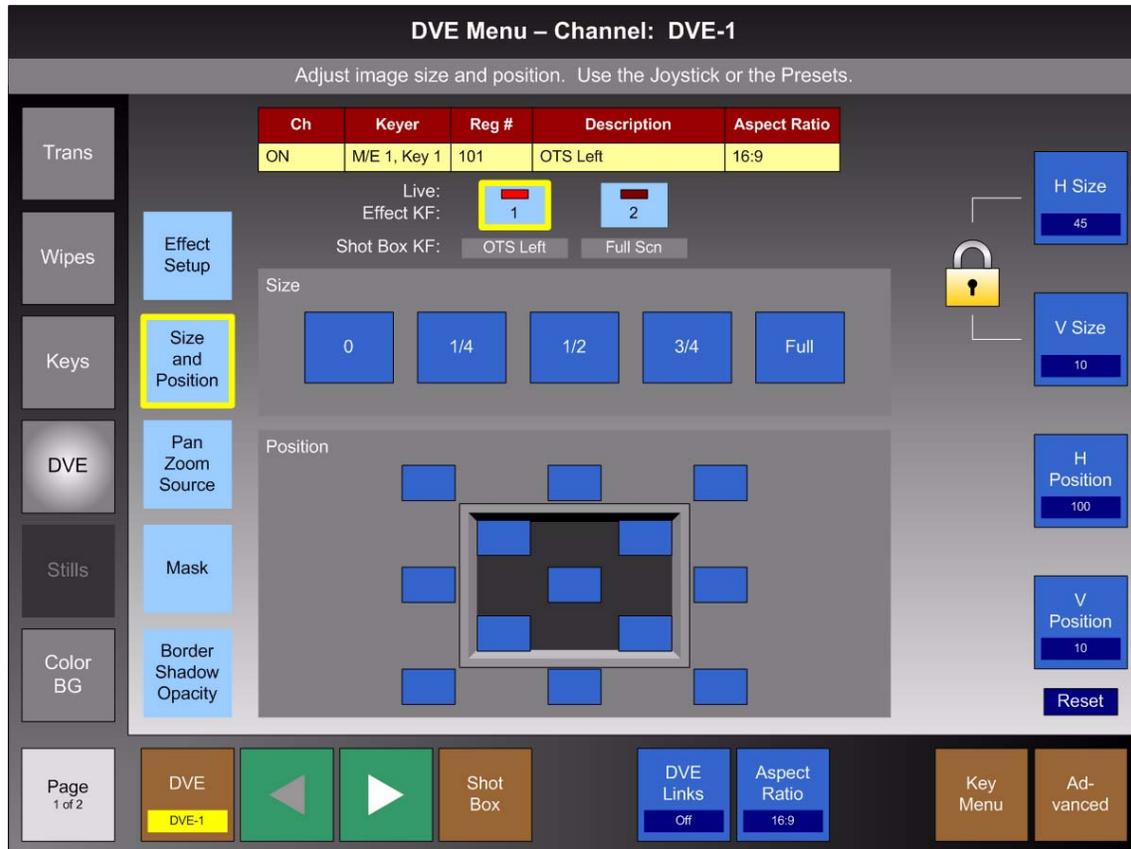
Figure 8-4. DVE Assignment Information Pop-up

#### Important

DVE assignments can be stored and recalled using the **SYS** category in the memory system. A specific “enable” button **{DVE Assign}** is provided on the **Enables Menu**. In Chapter 5, refer to the “[System Enables](#)” section for details.

## DVE Main Menu – Size and Position Panel

In the **Menu Bar**, press the {DVE} button to display the main DVE menu — the **Size and Position Panel**:



**Figure 8-5.** DVE Main Menu — Size and Position Panel (sample)

The DVE Menu's **Size and Position Panel** enables you to adjust the selected DVE channel's size, position and aspect ratio. Please note:

- When you first enter the **DVE Menu**, the **Size and Position Panel** is the default selection. Thereafter, if you leave the menu, you will return to the same menu and panel from which you left.
- If no DVE Cards are installed in the chassis, the {DVE} button is grayed out.

### Note

The menu's **Title Bar** always lists the name of the channel that you are currently controlling (e.g., **DVE-1**), as named on the **DVE Assign Menu**. When you change the channel using the {DVE} button, the name changes accordingly.

The following topics are discussed in this section:

- [Common DVE Menu Components](#)
- [Size and Position Adjustments](#)

## 8. DVE Operations

### DVE Menu Orientation

#### Common DVE Menu Components

The **DVE Menu** consists of five primary tabs along the Palette's left hand side, a **DVE Status Table** and **Keyframe Editing Section** (common to all tabs) at the top, and various common functions in the **Tool Bar**. Two additional tabs are also accessible via the **Advanced DVE Menu**. The following sections describe all common functions:

- [Functional Tabs](#)
- [DVE Status Table](#)
- [Keyframe Editing Section](#)
- [Tool Bar Functions](#)

#### Functional Tabs

Five functional tabs are provided on the **DVE Menu**, and two more are provided on the **Advanced DVE Menu**. Press the desired button to highlight it, and access the panel:

- |                       |  |
|-----------------------|--|
| Effect Setup          | • Press <b>{Effect Setup}</b> to display the <b>Effect Setup Panel</b> on the <b>Palette</b> . This panel enables you to create new DVE effects, add and delete keyframes, and clear keyframes. Refer to the " <a href="#">Effect Setup Panel</a> " section on page 372 for details.             |
| Size and Position     | • Press <b>{Size and Position}</b> to display the <b>Size and Position Panel</b> , which enables you to adjust the selected DVE channel's size, position and aspect ratio. Refer to the " <a href="#">Size and Position Adjustments</a> " section on page 369 for details.                       |
| Pan Zoom Source       | • Press <b>{Pan Zoom Source}</b> to display the <b>Pan Zoom Source Panel</b> , which enables you to size and position the source image within the boundaries of the PIP. Refer to the " <a href="#">Pan Zoom Source Panel</a> " section on page 373 for details.                                 |
| Mask                  | • Press <b>{Mask}</b> to display the <b>Mask Panel</b> , which enables you to mask (crop) the top, bottom, left, and right edges of the PIP or key. Refer to the " <a href="#">Mask Panel</a> " section on page 375 for details.   |
| Border Shadow Opacity | • Press <b>{Border Shadow Opacity}</b> to display the <b>Border Shadow Opacity Panel</b> , which enables you to add borders and shadows to the PIP, and adjust opacity. Refer to the " <a href="#">Border Shadow Opacity Panel</a> " section on page 377 for details.                            |
| Ad-<br>vanced         | Press <b>{Advanced}</b> to display the <b>Advanced DVE Menu</b> , which provides two additional functional DVE tabs:   |
| Color Effects         | • Press <b>{Color Effects}</b> to display the <b>Color Effects Panel</b> , which enables you to adjust the source's brightness and contrast, and create mono and invert effects. Refer to the " <a href="#">Advanced DVE Menu — Color Effects Panel</a> " section on page 383 for details.       |
| DVE Extras            | • Press <b>{DVE Extras}</b> to display the <b>DVE Extras Panel</b> , which enables you to adjust advanced image processing functions, and control source freeze, flip and strobe effects. Refer to the " <a href="#">Advanced DVE Menu — DVE Extras Panel</a> " section on page 385 for details. |

### DVE Status Table

The figure below illustrates the **DVE Status Table**:

Ch	Keyer	Reg #	Description	Aspect Ratio
ON	M/E 1, Key 1	101	OTS Left	16:9

**Figure 8-6.** DVE Status Table (sample)

At the top of all DVE menus, the **DVE Status Table** provides the following information:

- **Ch** — Indicates the channel's on/off status, as set on the associated **Keyer Menu**. Remember that the channel name currently under control is listed in the **Title Bar**. This field is blank if the DVE channel is not assigned to any keyers.
- **Keyer** — Indicates the associated keyer. This field is blank if the DVE channel is not assigned to any keyers.
- **Reg #** — Indicates the memory register where the effect has been stored (or recalled). This field goes blank if the recalled DVE effect has been modified in any way — and therefore does not match the stored register.
- **Description** — Indicates the memory register description associated with the stored or recalled effect, as entered on the **Memory Menu**. This field also goes blank if the recalled DVE effect has been modified in any way.
- **Aspect Ratio** — Lists the current aspect ratio of the PIP (or key), as set with the **{Aspect Ratio}** button.

### Keyframe Editing Section

Below the status table, the highly important **Keyframe Editing Section** provides status for which keyframe is live, which keyframe is currently being edited, and which shotbox effect is currently applied to a selected keyframe.

#### **Important**

Knowledge of the controls in this section directly affect your ability to edit keyframes accurately, both with on air and off air effects. Refer to the [“Editing Keyframes”](#) section on page 394 for more details.



**Figure 8-7.** Keyframe Editing Section (sample)

The following controls and indications are provided in the section:

## 8. DVE Operations

### DVE Menu Orientation



- The **Live LED** indicates the keyframe's state:
  - ~ **OFF** = The keyframe is not on PGM or PST
  - ~ **GRN** = The keyframe is on PST
  - ~ **RED** = The keyframe is on PGM
- The **Effect KF** control (either **1** or **2**) is a button. Pressing the blue button moves the yellow border from keyframe to keyframe, and activates the selected keyframe for editing.
  - ~ Press button **1** to edit keyframe 1
  - ~ Press button **2** to edit keyframe 2

If button **2** is grayed out, the effect is currently a "single keyframe" effect — or, keyframe 2 has not yet been added.

#### Important

The keyframe that is shown on **PST** or **PGM** does *not* change when the **Effect KF** buttons are pressed. To "see" a keyframe in a dual keyframe effect, use the **DVE Run** buttons (see below for details).

- The **Shot Box KF** field indicates the shot box keyframe currently applied to either keyframe **1** or **2**. If the associated field is blank, no shot box keyframe has been applied, or the shot box effect (that was *previously* applied) has been modified.

### Tool Bar Functions

The following common DVE functions are provided on the **Tool Bar**.



- Press **{DVE}** to change the DVE channel under control. When pressed, all DVE names appear in the pop-up, as assigned on the **DVE Assign Menu**. When a new channel is selected, the new name appears in the button's insert. The

## 8. DVE Operations

### DVE Menu Orientation



current panel is retained, but all parameters for the new channel appear on the panel.

- For dual keyframe effects, press **{Run Reverse}** to run the effect from keyframe 2 to 1. The button is grayed for single keyframe effects, and grayed out when the effect is on keyframe 1.
- For dual keyframe effects, press **{Run Forward}** to run the effect from keyframe 1 to 2. The button is grayed for single keyframe effects, and grayed out when the effect is on keyframe 2.
- Press **{Shot Box}** to display the **Shot Box Menu**, which enables you to store and name up to 128 individual keyframes, and apply them to any selected effect keyframe. Refer to the [“Shot Box Menu”](#) section on page 381 for details.
- Press **{DVE Links}** to display the **DVE Links Keypad**, which enables you link multiple DVE channels together, and program them as one. Refer to the [“DVE Links”](#) section on page 388 for details.
- Press **{Key Menu}** to return to the **Keyer Menu** associated with the selected DVE channel. This function is useful, for example, when you want to change the key mode from **PIP** to **Key**. In Chapter 5, refer to the [“Keyer Menu”](#) section on page 157 for details.
- Press **{Advanced}** to display the **Advanced DVE Menu**, which enables you to create color effects, flips, freezes and more. Refer to the [“Advanced DVE Menu — Color Effects Panel”](#) section on page 383, and the [“Advanced DVE Menu — DVE Extras Panel”](#) section on page 385 for details.

### Size and Position Adjustments

On the **Size and Position Panel**, the central **Palette** provides two easy preset areas — one for size and one for position. Controls are also provided for aspect ratio and manual size and position adjustments.

#### Size Presets

The **Size Preset** section enables you to set PIP or key size without affecting position.



Figure 8-8. DVE Size Presets

Each preset sets the PIP or Key's **H Size** to the listed fraction of the native resolution's **H Size**. To maintain the current aspect ratio, **V Size** is modified accordingly. The PIP or key's position is not affected, and all other parameters are retained (e.g., crop, border, etc.).

- Press **{0}** to set H Size to zero (infinity).
- Press **{1/4}** to set H Size to one-quarter native resolution H Size.

## 8. DVE Operations

### DVE Menu Orientation

- Press **{1/2}** to set H Size to one-half native resolution H Size.
- Press **{3/4}** to set H Size to three-quarters native resolution H Size.
- Press **{Full}** to set H Size to the native resolution's H Size.

### Position Presets

The **Position Preset** section enables you to set PIP or key position without affecting the current size. In the figure below, letters have been added to assist with each button's description. These letters do not appear on the **Palette**.

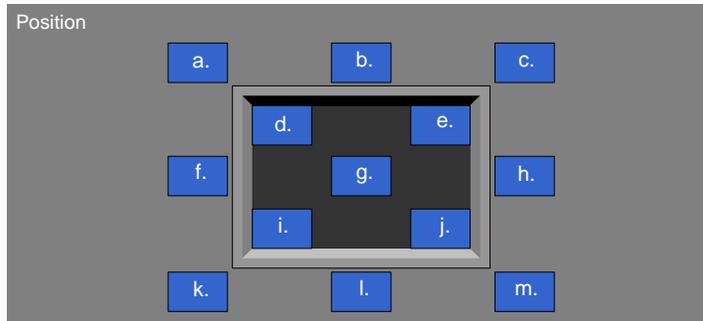


Figure 8-9. DVE Size Presets

The central frame represents the screen raster.

- **Off Screen Corners** — Press buttons **a**, **c**, **k** and **m** to position the PIP (plus its border and shadow), completely off screen by 1 pixel — in the corner as indicated. The PIP or Key's current size is not affected.
- **Over the Shoulder, Under the Shoulder** — Press buttons **d**, **e**, **i** and **j** to position the PIP and its border **N** pixels from the H and V edge of the active picture area. **N** is defined as 5% of the H active value for the current output resolution. The shadow is ignored when using these four buttons.
- **Off Screen Center, Top and Bottom** — Press buttons **b** and **l** to set the PIP's H position to 0 (zero) along the X Axis, and the PIP's V position (including its border and shadow), completely off screen by 1 pixel along the Y Axis.
- **Off Screen Center, Left and Right** — Press buttons **f** and **h** to set the PIP's V position to 0 (zero) along the Y Axis, and the PIP's H position (including its border and shadow), completely off screen by 1 pixel along the X Axis.
- **Center Screen** — Press button **g** to set the PIP's H and V position to 0 (zero) along both axes.

### Aspect Ratio



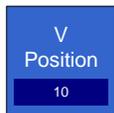
- To change the PIP or key's aspect ratio, press **{Aspect Ratio}** to display the **Aspect Ratio Pop-up**. This function affects the H dimension only. Choices are 16:9, 5:4, 4:3, 3:2, 1:1 and Custom.

When **{Custom}** is selected, the **{Adjust Custom Aspect}** button appears in the **Tool Bar**. Press to display the **{Custom Aspect}** value button. Unlatch to re-display size and position adjustments.

## 8. DVE Operations

### DVE Menu Orientation

#### Manual Size and Position



- Press **{H Size}** or use the knob to change the PIP or key's horizontal size. Remember that **{H Size}** and **{V Size}** track together if the **{Lock}** is enabled.
- Press **{V Size}** or use the knob to change the PIP or key's vertical size. Remember that **{H Size}** and **{V Size}** track together if the **{Lock}** is enabled
- Press the **{Lock}** button to lock or unlock **H** and **V** tracking. When locked, both parameters track together. When unlocked, H and V can be adjusted independently. Note that lock/unlock status is maintained for each DVE channel.
- Press **{H Position}** or use the knob to change the PIP or key's horizontal position along the X axis.
- Press **{V Position}** or use the knob to change the PIP or key's vertical position along the Y axis.
- Press **{Reset}** to reset all size and position values to default. Please note:
  - ~ If all **Mask** values are **0.00**, the PIP or key will become a full screen image at coordinates 0x, 0y.
  - ~ If any **Mask** values are other than **0.00**, the PIP or key will not fill the screen.

## 8. DVE Operations

### DVE Menu Orientation

## Effect Setup Panel

The figure below illustrates the DVE's **Effect Setup Panel**:

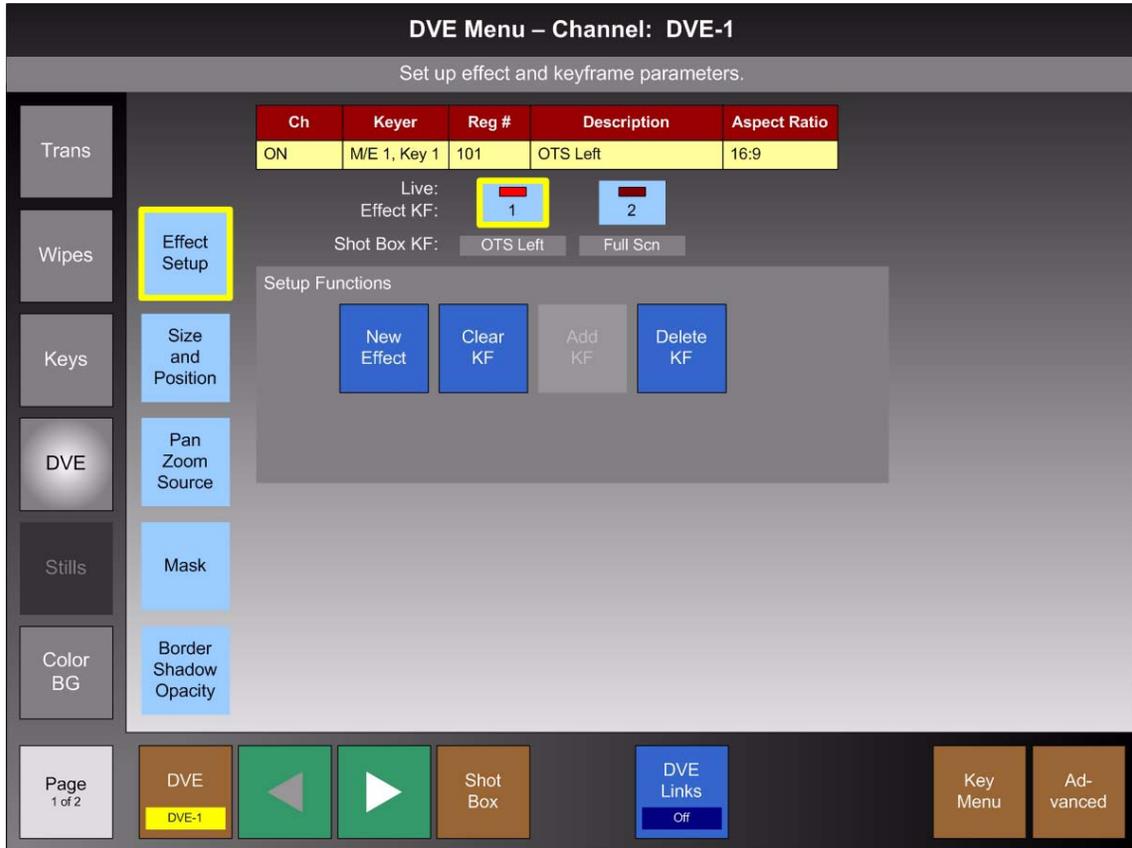
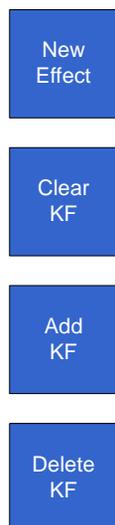


Figure 8-10. DVE Effect Setup Panel (sample)

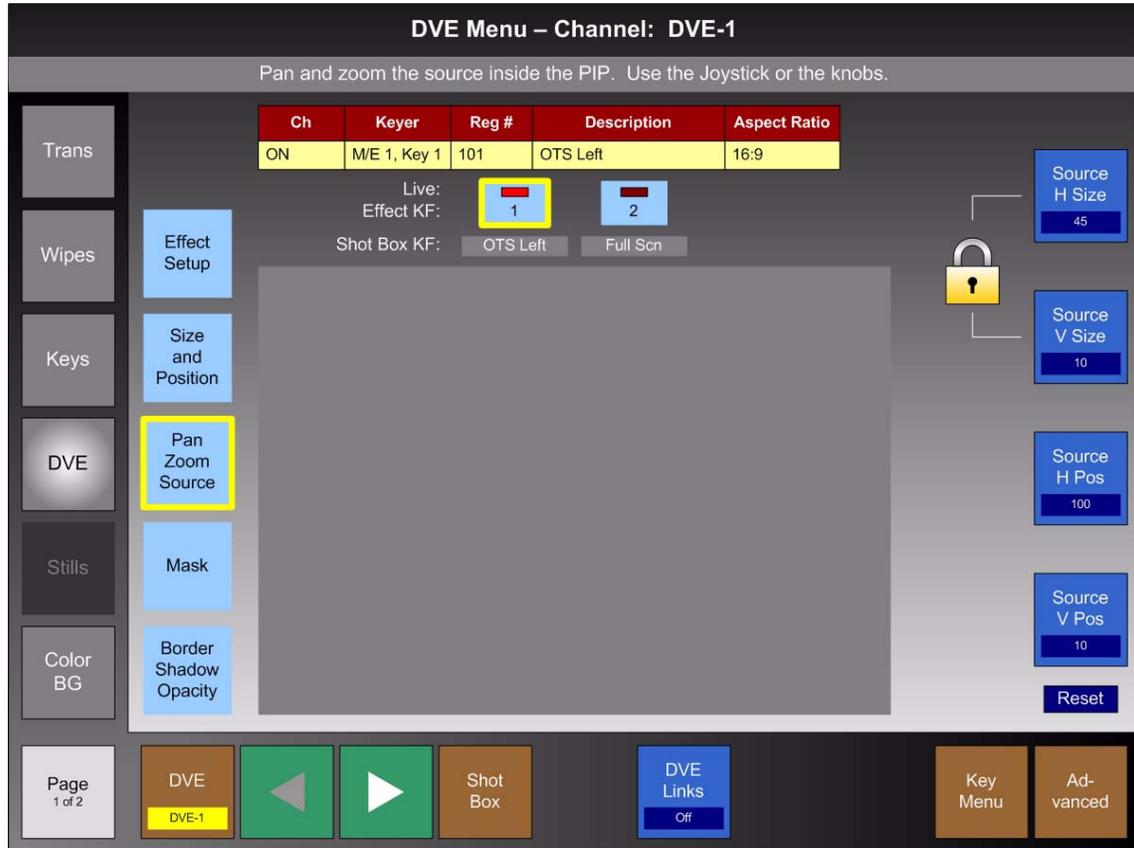
The **Effect Setup Panel** enables you to create new DVE effects, add and delete keyframes, and clear keyframes. The following functions are provided:



- Press **{New Effect}** to create a new single keyframe effect. All previous effect keyframes are deleted, and the new keyframe **1** is set to full screen center, with no border and no shadow. In the table, all previous register and description information clears.
- Press **{Clear KF}** to clear the current “selected” keyframe back to its default values — full screen center, with no border and no shadow. You can clear either keyframe **1** or **2** in this manner, without affecting the other un-selected keyframe.
- Press **{Add KF}** to add a second keyframe to a single keyframe effect. Once pressed, the system makes an exact duplicate of the current keyframe, keyframe **2** is automatically selected, and the button grays out.
- Press **{Delete KF}** to delete the selected keyframe. If keyframe **1** is selected, keyframe **2** becomes keyframe **1**. The button is grayed out if there is only one keyframe in the effect.

## Pan Zoom Source Panel

The figure below illustrates the DVE's **Pan Zoom Source Panel**:



**Figure 8-11.** DVE Pan Zoom Source Panel (sample)

The **Pan Zoom Source Panel** enables you to size and position the source image *within* the boundaries of the PIP. In this mode, the PIP's outside boundaries remain constant (including border and shadow), but using the functions on this panel, you can pan and zoom the inside source as desired.

### Note

The **Pan Zoom Source** function does not allow you to reveal video that is outside of the input's active area.

The following functions are provided:



- Press **{Source H Size}** or use the knob to change the source image's horizontal size. Remember that **{Source H Size}** and **{Source V Size}** track together if the **{Lock}** is enabled.
- Press **{Source V Size}** or use the knob to change the source image's vertical size. Remember that **{Source H Size}** and **{Source V Size}** track together if the **{Lock}** is enabled.

## 8. DVE Operations

### DVE Menu Orientation



- Press the **{Lock}** button to lock or unlock **H** and **V** source size tracking. When locked, both parameters track together. When unlocked, **H** and **V** can be adjusted independently. Note that lock/unlock status is maintained for each DVE channel.
- Press **{Source H Pos}** or use the knob to change the source image's horizontal position along the X axis.
- Press **{Source V Pos}** or use the knob to change the source image's vertical position along the Y axis.
- Press **{Reset}** to reset all source pan and zoom values to default. Please note:
  - ~ If all **Mask** values are **0.00**, the source image will return to display its full input active area.
  - ~ If any **Mask** values are other than **0.00**, the full input active area will not be displayed.

## Mask Panel

The figure below illustrates the DVE's **Mask Panel**:

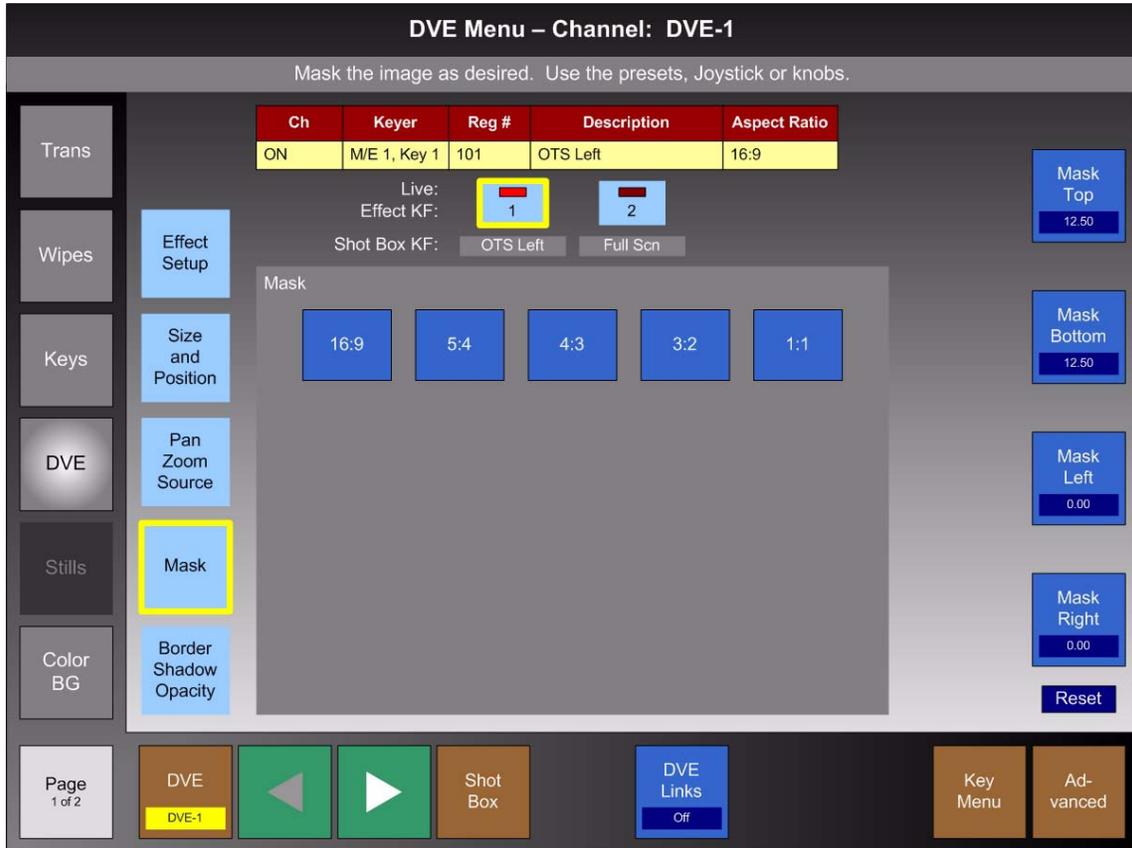


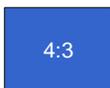
Figure 8-12. DVE Mask Panel (sample)

The **Mask Panel** enables you to mask (crop) the top, bottom, left, and right edges of the PIP or key. Five convenient presets are available, or you can mask individual edges manually. Please note:

- All mask presets are additive. For example, if you mask to **16:9** and then press **4:3**, the system creates the **4:3** mask using the previous **16:9** image as a base.
- All mask values are in percent. The range is **0.00** to **100.0**.

The following preset functions are provided:

- Press **{16:9}** to mask the PIP (or key) to a 16:9 aspect ratio.
- Press **{5:4}** to mask the PIP (or key) to a 5:4 aspect ratio.
- Press **{4:3}** to mask the PIP (or key) to a 4:3 aspect ratio.



## 8. DVE Operations

### DVE Menu Orientation

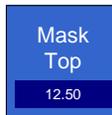


- Press **{3:2}** to mask the PIP (or key) to a 3:2 aspect ratio.

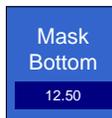


- Press **{1:1}** to mask the PIP (or key) to a 1:1 aspect ratio.

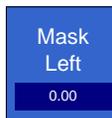
The following manual mask controls are provided:



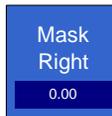
- Press **{Mask Top}** or use the adjacent knob to manually mask the top edge of the PIP or key.



- Press **{Mask Bottom}** or use the knob to manually mask the bottom edge of the PIP or key.



- Press **{Mask Left}** or use the knob to manually mask the left edge of the PIP or key.



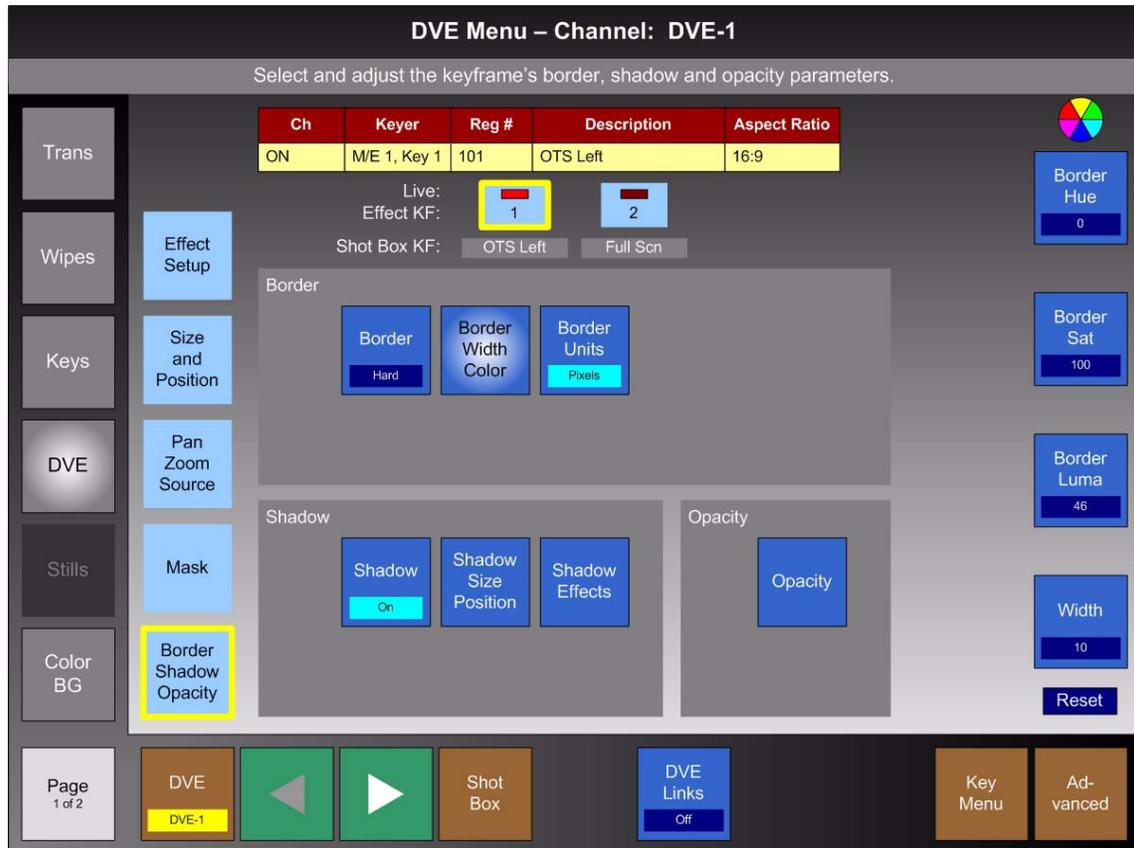
- Press **{Mask Right}** or use the knob to manually mask the right edge of the PIP or key.



- Press **{Reset}** to reset all mask values to default.

### Border Shadow Opacity Panel

The figure below illustrates the DVE's **Border Shadow Opacity Panel**:



**Figure 8-13.** DVE Border Shadow Opacity Panel (sample)

The **Border Shadow Opacity Panel** enables you to add borders and shadows to the PIP, and adjust opacity. All “edge” functions work on a keyframe by keyframe basis, enabling you to “morph” border effects as desired.

**Note**

When the DVE mode is set to **Key** on the **Keyer Menu**, the **{Border Shadow Opacity}** button is grayed out.

The Palette is divided into three sections:

- [Border Section](#)
- [Shadow Section](#)
- [Opacity Section](#)

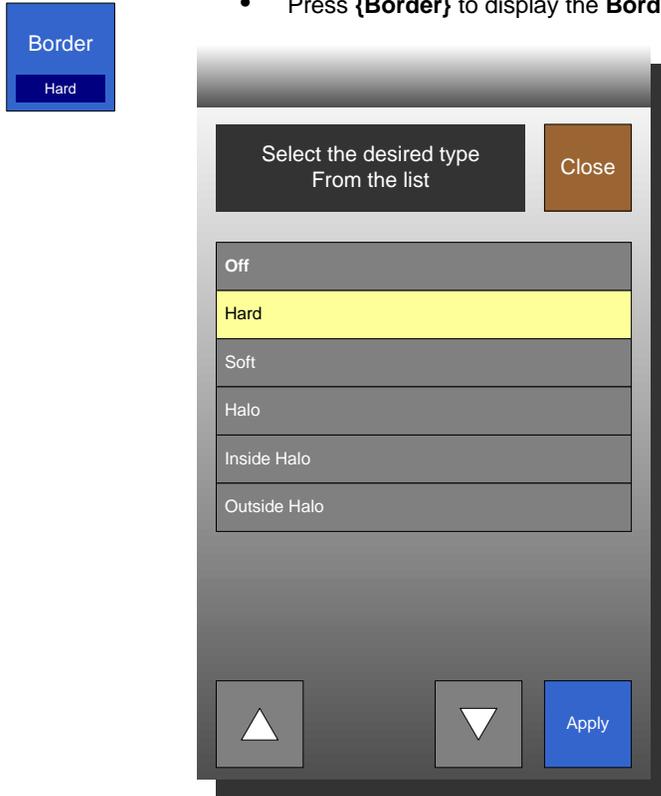
## 8. DVE Operations

### DVE Menu Orientation

#### Border Section

The following functions are provided in the **Border Section**:

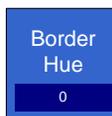
- Press **{Border}** to display the **Border Selection Keypad**.



**Figure 8-14.** Border Selection Keypad

Six PIP border types are available. Select the desired border type and press **{Apply}**. Press **{Close}** when complete.

- For all border types (except for **Off** and **Soft**), press **{Border Width Color}** to display the four border width and color value buttons — plus the **{Color Picker}** button.
- Press the **{Color Picker}** button to display the **Color Picker Pop-up**. Use the color wheel, the color chips, and up to six “user” colors to select the desired color. In Chapter 5, refer to the “[Color Picker Pop-up](#)” section for details.
- Press **{Border Hue}** or use the adjacent knob to select the desired border hue.
- Press **{Border Sat}** or use the adjacent knob to select the desired border color saturation.



## 8. DVE Operations

### DVE Menu Orientation



- Press **{Border Luma}** or use the adjacent knob to select the desired border luminance value.
- Press **{Width}** or use the adjacent knob to select the desired border width.
  - ~ If the **{Border Units}** button is set to **Pixels**, the button's label reads "Width."
  - ~ If the **{Border Units}** button is set to **Percent**, the button's label reads "Width (%)."
- Press **{Border Units}** to toggle the method by which border width is calculated.
  - ~ When set to **Pixels**, the border width remains constant as PIP size changes.
  - ~ When set to **Percent**, the border width adjusts automatically as a percentage of PIP size.
- Press **{Reset}** to reset all border values to default.

### Shadow Section

The following functions are provided in the **Shadow Section**:



- Press **{Shadow}** to toggle the PIP's shadow on and off. Note that all shadow calculations are fixed as a percentage of PIP size.
- Press **{Shadow Size Position}** to display the four shadow value buttons.
- Press **{Shadow H Size}** or use the adjacent knob to adjust the shadow's horizontal size. Remember that **{Shadow H Size}** and **{Shadow V Size}** track together if the **{Lock}** is enabled.
- Press **{Shadow V Size}** or use the adjacent knob to adjust the shadow's vertical size. Remember that **{Shadow H Size}** and **{Shadow V Size}** track together if the **{Lock}** is enabled.
- Press the **{Lock}** button to lock or unlock **H** and **V** shadow size tracking. When locked, both parameters track together. When unlocked, **H** and **V** can be adjusted independently.
- Press **{Shadow H Pos}** or use the adjacent knob to adjust the shadow's horizontal position.

## 8. DVE Operations

### DVE Menu Orientation



- Press **{Shadow V Pos}** or use the adjacent knob to adjust the shadow's vertical position.
- Press **{Reset}** to reset all shadow values to default.
- Press **{Shadow Effects}** to display the two shadow effects value buttons.
- Press **{Shadow Luma}** or use the adjacent knob to adjust the shadow's luminance from black to white.
- Press **{Edge Width}** or use the adjacent knob to adjust the width of the shadow's edge.
- Press **{Reset}** to reset all shadow effects to default.

### Opacity Section

The following functions are provided in the **Opacity Section**:



- Press **{Opacity}** to display the two opacity value buttons.
- Press **{Overall Opacity}** or use the adjacent knob to adjust the overall opacity of the PIP, plus its shadow and border.
- Press **{Shadow Opacity}** or use the adjacent knob to adjust the opacity of the PIP's shadow only.
- Press **{Reset}** to reset all opacity values to default.

## Shot Box Menu

The figure below illustrates the DVE's **Shot Box Menu**:

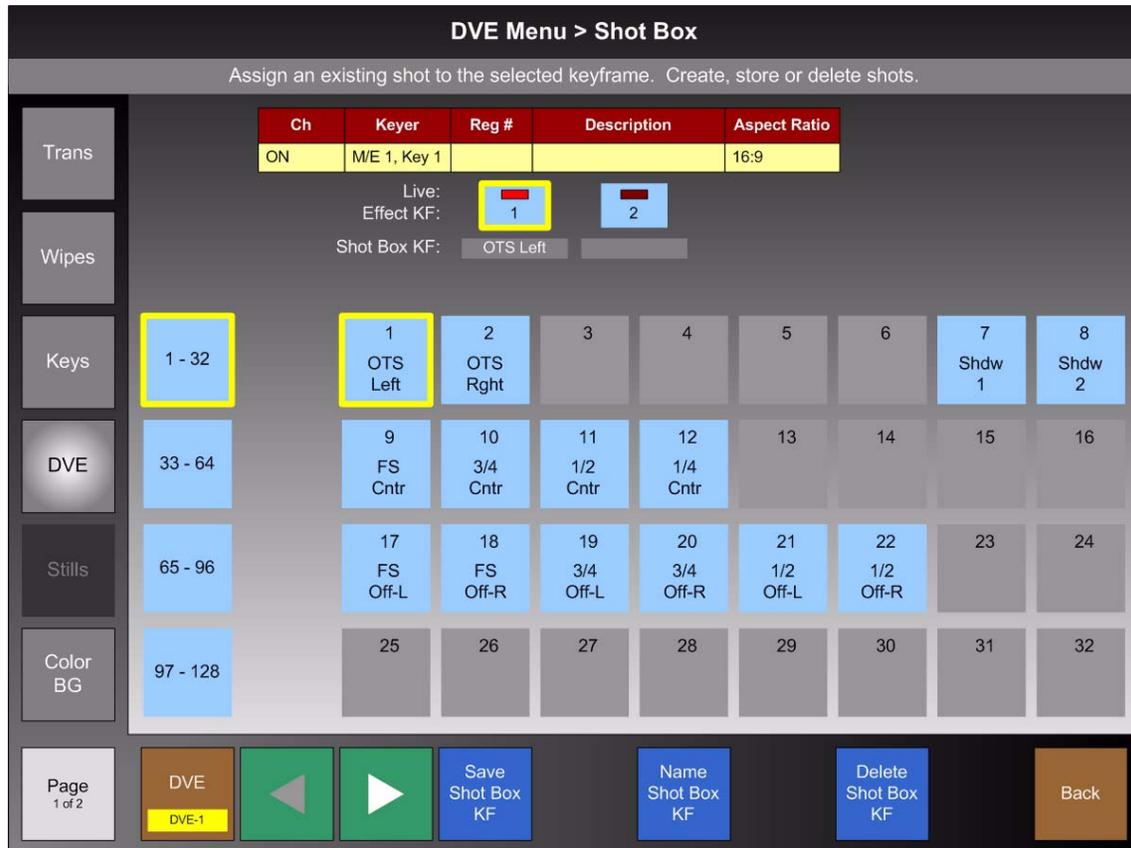


Figure 8-15. DVE Shot Box Menu (sample)

The **Shot Box Menu** enables you to store and name up to 128 individual “shots,” and apply them to a selected effect keyframe. A “shot” is a keyframe and all of its current attributes, including size, position, pan/zoom, aspect, border and shadow. Note that shot box registers are saved as part of a system backup and restore. They are not saved as part of the memory system.

- At the top of the menu, the **Keyframe Editing Section** enables you to select keyframes (for the current effect), and assign any existing “shot.” Once a shot is assigned, its name appears in the **Shot Box KF** field.
- In the **Palette**, storage is provided for 128 shots (or shot box “registers”), in four groups of 32. In the menu’s default **Assign** mode, full registers are shown in blue, while empty registers are grayed out. The yellow highlight indicates the selected shot box register.

To access shot box registers:

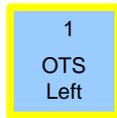
- Press **{1 - 32}** to access shots 1 - 32.
- Press **{33 - 64}** to access shots 33 - 64.
- Press **{65 - 96}** to access shots 65 - 96.
- Press **{97 - 128}** to access shots 97 - 128.



## 8. DVE Operations

### DVE Menu Orientation

The following shot box functions are provided:



- Select the desired keyframe in the **Keyframe Editing Section (1 or 2)**, then select the desired shot box register. Once selected, the keyframe settings saved in the register are immediately copied into the selected keyframe, and the assigned name appears in the **Shot Box KF** field.
- Press **{Save Shot Box KF}** to initiate the process of storing the current effect keyframe into a shot box register. Once pressed, all shot box registers turn blue, enabling you to record into an empty shot, or over-write an existing shot.
  - ~ To perform the save, press the desired shot box button (e.g., **28**). Once pressed, the settings in the selected effect keyframe are copied into the shot box register.
  - ~ If you save to an empty register, the **Keyboard** appears, enabling you to name the new shot box register immediately.
  - ~ If you save to an existing register (over-writing the register), the previous name is retained. You can elect to re-name the register if desired.
- Select a shot box register (to highlight it), then press **{Name Shot Box KF}** to initiate the process of naming (or re-naming) a register. The keyboard appears, with the register's current name in the keyboard's entry field. Enter the new name and press **{Enter}** to accept.

Please note:

- ~ By default, letters append to the current name.
- ~ Names are limited to eight characters or less.
- ~ The **{Name Shot Box KF}** button is grayed out if no shot box buttons are selected (e.g., after a register is deleted).

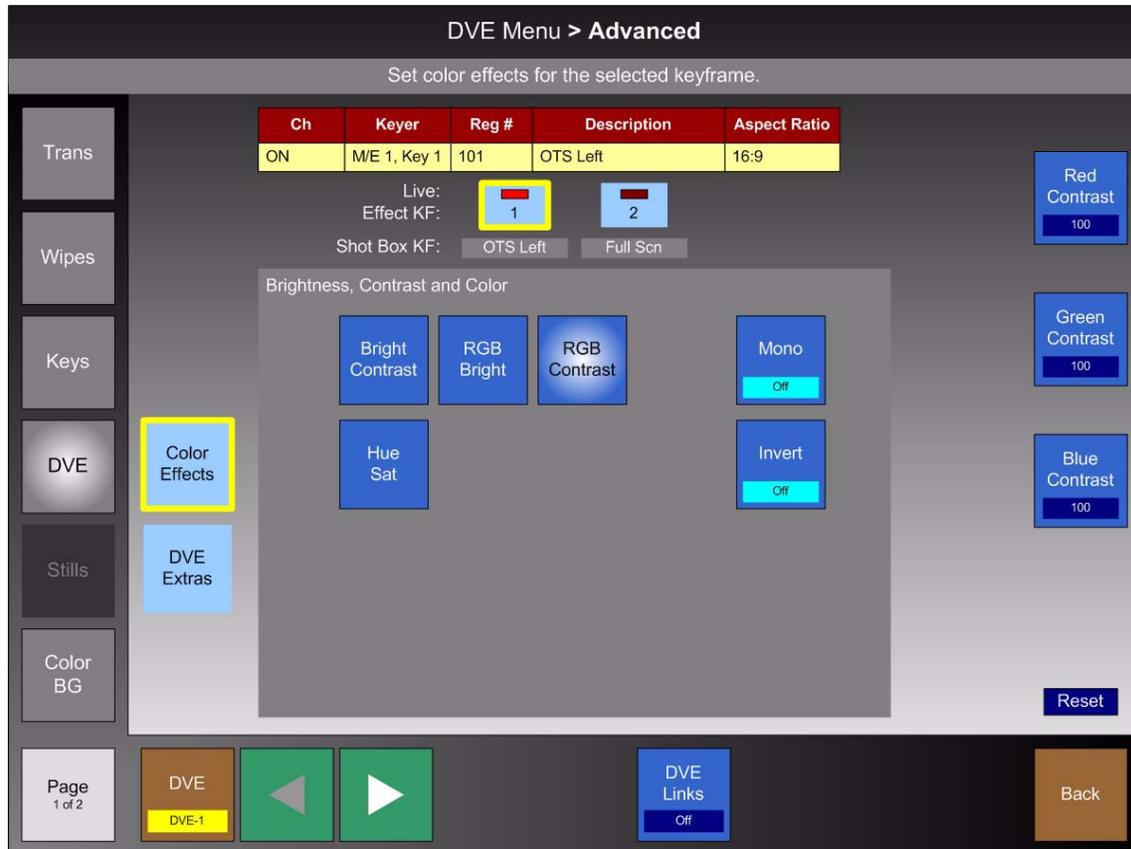
#### Important

Be aware that when you select a shot box register to name (or re-name), you are also assigning it to the currently selected keyframe. The new name will appear in the **Shot Box KF** field.

- Press **{Delete Shot Box KF}** to initiate the process of deleting a show box register. Next, press the button for the register you wish to delete. Once pressed, the register is deleted and the **{Delete Shot Box KF}** is un-selected. Note that there is no “confirm” for the delete procedure, nor is there an “undo.”

## Advanced DVE Menu – Color Effects Panel

The figure below illustrates the **Advanced DVE Menu**, with the **Color Effects Panel** selected:



**Figure 8-16.** Advanced DVE Menu - Color Effects Panel (sample)

The **Color Effects Panel** enables you to adjust the DVE source's overall brightness and contrast, RGB brightness and contrast, hue and saturation, plus mono and invert effects. Note that almost all color correction effects (except "invert") work on a keyframe by keyframe basis. This enables you to morph effects from keyframe to keyframe.

The following "color effect" functions are provided:



- Press **{Bright Contrast}** to adjust the source's overall brightness and contrast. Two value buttons appear:

- ~ Use the **{Bright}** button (or knob) to set overall brightness.
- ~ Use the **{Contrast}** button (or knob) to set overall contrast.
- ~ Press **{Reset}** to reset all brightness and contrast effects to default



- Press **{RGB Bright}** to adjust RGB brightness. Three value buttons appear:

- ~ Use the **{Red Bright}** button (or knob) to set red brightness.
- ~ Use the **{Green Bright}** button (or knob) to set green brightness.
- ~ Use the **{Blue Bright}** button (or knob) to set blue brightness.
- ~ Press **{Reset}** to reset all RGB brightness effects to default.

## 8. DVE Operations

### DVE Menu Orientation



- Press **{RGB Contrast}** to adjust RGB contrast. Three value buttons appear:
  - ~ Use the **{Red Contrast}** button (or knob) to set red contrast.
  - ~ Use the **{Green Contrast}** button (or knob) to set green contrast.
  - ~ Use the **{Blue Contrast}** button (or knob) to set blue contrast.
  - ~ Press **{Reset}** to reset all RGB contrast effects to default.



- Press **{Hue Sat}** to adjust the DVE source's hue and color saturation. Two value buttons appear:
  - ~ Use the **{Hue}** button (or knob) to set the hue.
  - ~ Use the **{Sat}** button (or knob) to set the saturation.
  - ~ Press **{Reset}** to reset all hue and saturation effects to default.



- Toggle the **{Mono}** button to turn the source video's chroma component on and off. When off, the image is completely monochrome.



- Toggle the **{Invert}** button to turn the color "invert" function on and off. When on, all image colors are inverted.

## Advanced DVE Menu – DVE Extras Panel

The figure below shows the **Advanced DVE Menu**, with the **DVE Extras Panel** selected:

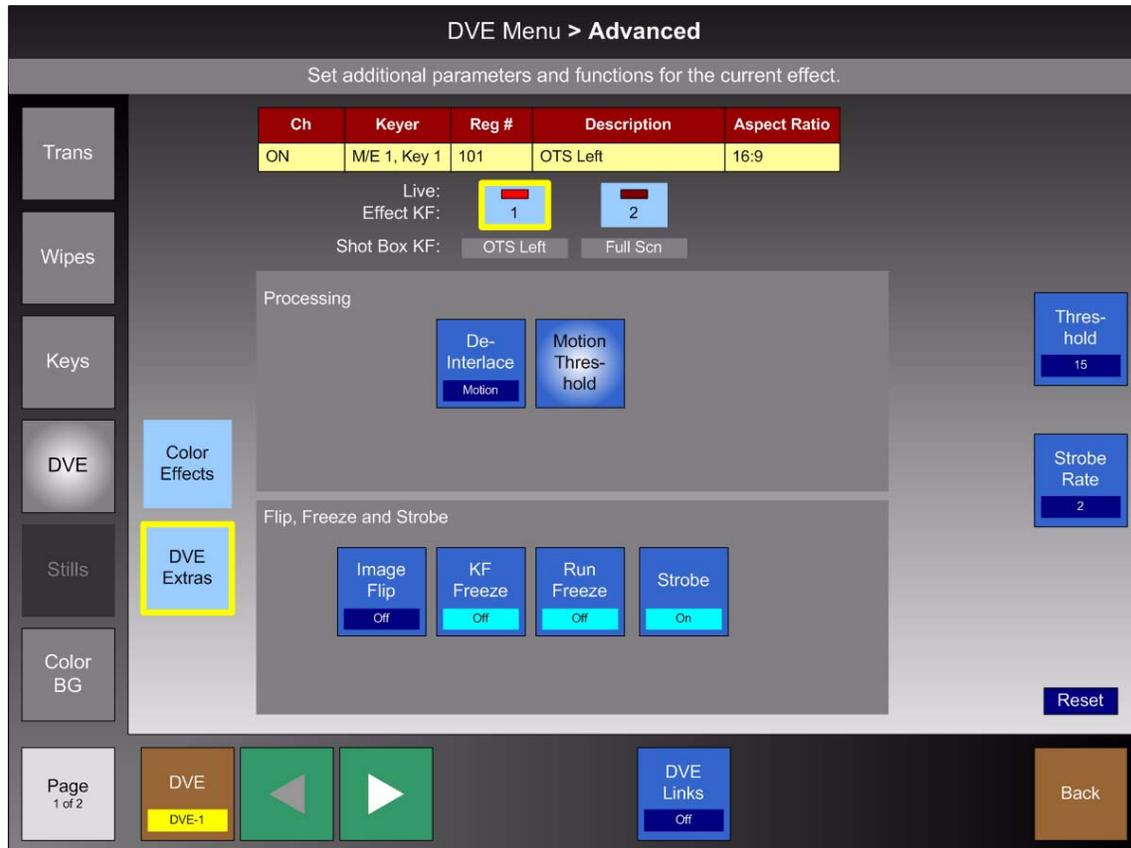


Figure 8-17. Advanced DVE Menu - DVE Extras Panel (sample)

The **DVE Extras Panel** enables you to adjust DVE processing, and control the flip, freeze and strobe modes. The following functions are provided in the **Processing** section:

- Press **{De-Interlace}** to display the **De-Interlace Pop-up**. If the DVE's input is interlaced, this function enables you to set how the system processes the input. The following options are available:
  - ~ Select **Motion Adaptive** to use motion adaptive de-interlacing. In this mode, the **{Motion Threshold}** button appears. See below for details.
  - ~ Select **Field to Frame** to use field-to-frame de-interlacing. This mode avoids motion artifacts by converting individual input fields to progressive output frames.



### Notes

Regarding de-interlace:

- This function is available for interlaced formats only. The button does not appear for progressive inputs.
- This function is not available when keyframe 2 is selected.

## 8. DVE Operations

### DVE Menu Orientation



- If **Motion Adaptive** de-interlacing is selected, press **{Motion Threshold}** to adjust the threshold of the motion adaptive de-interlacer. Because adjustment is rarely required, it is recommended that you leave the function at its default setting. Note that this function is not available when keyframe 2 is selected.
- Press **{Image Flip}** to display the **Image Flip Pop-up**, which enables you to flip the image within the PIP:
  - ~ Select **{Off}** to turn off any image “flip” attributes. The image will be displayed in its original orientation.
  - ~ Select **{H}** to flip the image horizontally, along the Y axis.
  - ~ Select **{V}** to flip the image vertically, along the X axis.
  - ~ Select **{H + V}** to flip the image both horizontally and vertically, along the X and Y axes.
- Press **{Strobe}** to toggle the strobe function on and off. When **On**, adjust the **{Strobe Rate}** interval (in frames) to set the duration that the source is frozen until the next grab.

The **KF Freeze** and **Run Freeze** functions work together to control freeze behavior. Both buttons can be set individually for keyframes 1 and 2, and the settings apply whether or not the effect is running forwards or backwards.

- The **{KF Freeze}** function is a toggle that determines freeze behavior at each keyframe boundary. When **On**, the image is frozen. When **Off**, the image is live. Refer to the [“Keyframe Freeze Behavior”](#) section on page 387 for a detailed table that explains how the two “freeze” buttons work together.
- The **{Run Freeze}** function is a toggle that determines freeze behavior while the effect is running. When **On**, the image is frozen as the effect runs from keyframe to keyframe. When **Off**, the image is live during the run. Refer to the [“Keyframe Freeze Behavior”](#) section on page 387 for a detailed table.

## 8. DVE Operations

### DVE Menu Orientation

#### Keyframe Freeze Behavior

The table below summarizes how the two freeze buttons, {**KF Freeze**} work together.

**Table 8-2.** Image freeze behavior summary

DVE Menu Settings			Effect Run (Transition) Behavior	
KF 1 Freeze	Run Freeze	KF 2 Freeze	Run Forward	Run Reverse
Off	Off	Off	Image is never frozen.	Image is never frozen.
Off	Off	On	Image is frozen when KF 2 is reached.	Image is unfrozen when run is started.
Off	On	Off	<ul style="list-style-type: none"> <li>Image is frozen when the effect runs from KF1 to KF2.</li> <li>Image is unfrozen when KF2 is reached.</li> </ul>	<ul style="list-style-type: none"> <li>Image is frozen when the effect runs from KF1 to KF2.</li> <li>Image is unfrozen when KF2 is reached.</li> </ul>
Off	On	On	Image is frozen when effect runs from KF1 to KF2 and remains frozen at KF2.	Image is unfrozen when KF1 is reached.
On	Off	Off	Image is unfrozen when run is started.	Image is frozen when KF1 is reached.
On	Off	On	<ul style="list-style-type: none"> <li>Image is unfrozen when the effect runs from KF1 to KF2.</li> <li>Image is frozen when KF2 is reached.</li> </ul>	<ul style="list-style-type: none"> <li>Image is unfrozen when the effect runs from KF2 to KF1.</li> <li>Image is frozen when KF1 is reached.</li> </ul>
On	On	Off	Image is unfrozen when KF2 is reached.	Image is frozen when effect runs from KF2 to KF1 and remains frozen at KF1.
On	On	On	Image is always frozen.	Image is always frozen.

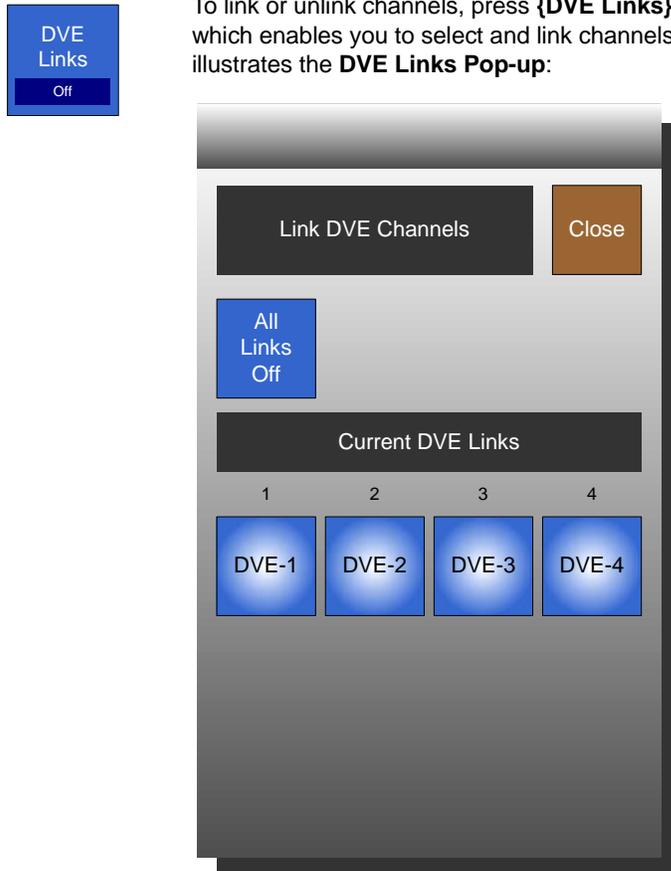
## 8. DVE Operations

### DVE Menu Orientation

## DVE Links

The **DVE Links** function enables you to link two or more DVE channels together. When links are on, all linked channels are programmed as one. When links are off, all assigned DVE channels can be programmed individually.

To link or unlink channels, press **{DVE Links}** to display the **Link DVE Channels Pop-up**, which enables you to select and link channels, and turn links off. The figure below illustrates the **DVE Links Pop-up**:



**Figure 8-18.** DVE Links Pop-up (sample)

The **Link DVE Channels Pop-up** provides buttons for all DVE channels, whether or not they are installed. Each channel's current name appears on the button label.

- To enable DVE links, turn on the desired channel buttons, then press **{Close}** to close the pop-up. The inset on the **{DVE Links}** button changes to "On."
- To cancel all links, press **{All Links Off}**, then close the pop-up. The inset on the **{DVE Links}** button changes to "Off."

Please note the following important points regarding links:

- Links have no effect on the behavior of the **Cut** or **Auto Trans** buttons on the control panel. However, if you have two or more channels linked, each channel must be "armed" to trigger, in the normal manner.
- Links affect the DVE channels, but not the keyers or the keyframes.
- Once DVE channels are linked, the two "run" buttons on the **DVE Menu** run all linked channels (provided the channels contain two keyframes).
- Links are not saved in memory registers or during a backup/restore process.

## 8. DVE Operations

### Assigning DVE Channels to Keyers

- When a shot box keyframe is recalled, the keyframe settings are recalled into all linked DVE channels.
- When saving to a shot box register from a linked DVE channel, the keyframe settings from the currently selected channel (not all linked channels) will be saved into the shot box register.
- If you delete a Keyframe that's included in a link, the active keyframes of all linked channels will be deleted.
- When links are enabled, the **{Border Shadow Opacity}** button is grayed out.

---

## Assigning DVE Channels to Keyers

The **DVE Assign Menu** enables you to assign available DVE channels to specific keyers on the control panel.

- ▲ **Prerequisite** — Ensure that you are familiar with the **DVE Assign Menu**. Refer to the “[DVE Assign Menu](#)” section on page 363 for details.
- Use the following steps to assign DVE channels to keyers:
  1. Navigate to the **DVE Assign Menu** by pressing **{System}** in the **Menu Bar**, then **{DVE Assign}**.
  2. On the **DVE Assign Menu**, name your available DVE channels, if desired:
    - a. Press **{Name Channel}** to enter the naming mode.
    - b. Press the desired channel button in the **Rear I/O View**.
    - c. When the keyboard appears, enter the desired name and press **{ENTER}**.
    - d. When finished, press **{Name Channel}** to exit the mode.
  3. To assign DVE channels to keyers:
    - a. Press the desired keyer button in the **DVE Assignment Table**.
    - b. Press the DVE channel that you want to dedicate to that Keyer.
    - c. Repeat from step “3a” for all remaining assignments.
  4. Store your DVE assignments using the **SYS** category in the memory system. A specific “enable” button **{DVE Assign}** is provided on the **Enables Menu**. In Chapter 5, refer to the “[System Enables](#)” section for details.

#### Note

Remember that based on your DVE assignments, you can fly PIPs, luma keys, linear keys and split keys. On the **DVE Assign Menu**, press **{DVE Assign Info}** to display the **DVE Assignment Information Pop-up** for detailed information.

## 8. DVE Operations

### Selecting the Keyer Mode

On the **Keyer Menu**, when you select a keyer to which a DVE is assigned, you can set the DVE mode to either **PIP** or **Key**, and turn the DVE itself on or off.

- ▲ **Prerequisite** — Ensure that you are familiar with the **Keyer Menu**, and in particular, the menu's DVE functions. In Chapter 5, refer to the "[DVE Keyer Functions](#)" section on page 164 for details.
- Use the following steps to set the keyer mode:
  1. Navigate to the **Keyer Menu** by pressing **{Keys}** in the **Menu Bar**.
  2. In the **Keyer Status Table**, verify your DVE assignments.
  3. Use the **{Keyer}** button to select a keyer to which a DVE is assigned.
  4. In the **Palette**, set the desired keyer mode:
    - ~ Press **{PIP}** to place the keyer in **PIP** mode. In this mode:
      - The assigned DVE channel defaults to **On**, and the **{DVE}** button is grayed out.
      - The **{Clip}**, **{Gain}**, **{Opacity}**, **{Type}** and **{Key Fill}** controls are automatically grayed out.
      - The selected key source appears within the PIP, which can now be manipulated on the **DVE Menu**.
    - ~ Press **{KEY}** to place the keyer in **Key** mode. In this mode:
      - Press **{DVE}** to turn the DVE channel **On** or **Off**.
        - When **On**, the key source is routed through the DVE. The source can be manipulated with the **DVE Menu**, but it can not be bordered or shadowed.
        - When **Off**, the keyer functions normally, with no DVE in line.
      - The **{Clip}**, **{Gain}**, **{Opacity}**, **{Type}** and **{Key Fill}** controls are active.
  5. Press **{DVE Menu}** to switch to the **DVE Menu** for the selected DVE channel (that is assigned to the selected keyer) — enabling you to size, position, and manipulate the key. The button is active in both **PIP** and **Key** modes.

---

## Programming DVE Effects

Programming a single channel or multi-channel DVE effect is a highly creative function that brings all available DVE image manipulation “tools” into play.

- ▲ **Prerequisite** — Ensure that you are familiar with the **DVE Menu**, and all of its associated tabs and functions. Refer to the [“DVE Menu Orientation”](#) section on page 362 for details.

To efficiently program DVE effects, there are three overall sequences to keep in mind — each of which involves additional individual steps:

- Create, store and name “shot box” keyframes for all of your program’s desired positions, locations and looks.
- Create your effects from the shot box keyframes.
- Store the effects in memory, and name them as desired.

The following procedures provide basic programming outlines, which you can use as a starting point, and then customize as required. The following topics are discussed:

- [Programming Single Keyframe Effects](#)
- [Programming Dual Keyframe Effects](#)
- [Creating Dual Keyframe Effects from the Shot Box](#)

### Programming Single Keyframe Effects

- Use the following steps to program single keyframe DVE effects:

1. Set up the effect, and key the DVE channel:
  - a. Navigate to the **DVE Menu** by pressing **{DVE}** in the **Menu Bar**.
  - b. Using the **{DVE}** button, select the channel that you wish to program.
  - c. Press **{Effect Setup}** to display the **Effect Setup Panel**.
  - d. Press **{New Effect}** to create a new single keyframe effect. The new keyframe **1** is set to full screen center, with no border and no shadow.
  - e. On the control panel, key the DVE channel, such that it is visible either on Program or Preset.
2. To design the keyframe, manipulate the image as desired, using any combination of the following tools:
  - a. On the **DVE Menu**, press **{Size and Position}** to display the **Size and Position Panel**. Adjust the channel’s size, position and aspect ratio.
  - b. Press **{Pan Zoom Source}** to display the **Pan Zoom Source Panel**. Adjust the size and position of the source image within the PIP.
  - c. Press **{Mask}** to display the **Mask Panel**. Mask the edges as desired.
  - d. Press **{Border Shadow Opacity}** to display the **Border Shadow Opacity Panel**. Add a border and shadow to the PIP, and adjust opacity.
  - e. Press **{Advanced}** to display the **Advanced DVE Menu**.
  - f. Press **{Color Effects}** to display the **Color Effects Panel**. Adjust the source’s brightness and contrast, and create mono and invert effects.
  - g. Press **{DVE Extras}** to display the **DVE Extras Panel**. Adjust advanced image processing functions, and program freeze, flip and strobe effects.



## 8. DVE Operations

### Programming DVE Effects

6. Store the keyframe in a shot box register:
7. Preview the entire dual keyframe effect using the **Forward** (▶) and **Reverse** (◀) buttons.
8. Edit the effect as required. Refer to the [“Editing Keyframes”](#) section on page 394 for details.
9. Because this is the “active” effect, it can be stored in memory and named.
  - a. Press **STORE** in the control panel’s **Memory Section**, de-select all modules except **DVE**, enter a register number and press **ENTER**.
  - b. In the **Menu Bar**, press **{Memory}** to access the **Memory Menu**, navigate to the register you just stored, and press **{Description}**.
  - c. When the keyboard appears, name the register.
10. Repeat from step 1 to create additional dual keyframe effects

This completes the procedure for programming and storing dual keyframe DVE effects

## Creating Dual Keyframe Effects from the Shot Box

With a wide variety of keyframes stored in the shot box (essentially, your on-line library of keyframes), you can quickly create, edit and store dual keyframe effects.

- Use the following steps to create dual keyframe DVE effects from the shot box:
  1. On the **Effect Setup Panel**, set up a new effect by pressing **{New Effect}**, then key the DVE channel so that it is visible.
  2. Press **{Shot Box}** to display the **Shot Box Menu**.
  3. Select the shot box register that you wish to use, and ensure that its name appears underneath the keyframe 1 button in the **Keyframe Editing Section**.
  4. On the **Effect Setup Panel**, press **{Add KF}** to add a second keyframe.
  5. Press **{Shot Box}** to display the **Shot Box Menu**.
  6. Select the shot box register that you wish to use, and ensure that its name appears underneath the keyframe 2 button.
  7. Preview the effect using the **Forward** (▶) and **Reverse** (◀) buttons.
  8. Edit the effect as required. Refer to the [“Editing Keyframes”](#) section on page 394 for details.
  9. Store and name the effect in memory in the normal manner.
  10. Repeat from step 1 to create additional dual keyframe effects from the shot box.

This completes the procedure for creating dual keyframe DVE effects from the shot box.

## 8. DVE Operations

### Editing Keyframes

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## Editing Keyframes

Keyframe editing is the ability to change one or more parameters of a given keyframe, within a single or dual keyframe effect. With the **DVE Menu**, there are several very important rules with regard to keyframe editing:

- **Single keyframe editing** — When you edit single keyframe effects, you are *always* editing the keyframe that you are physically seeing on your Program or Preview monitor (assuming that the keyer is enabled on **PST** or **PGM**).
- **Dual keyframe editing** — When you edit dual keyframe effects, you can edit the keyframe that you're physically seeing, or you can edit the “next” keyframe — the one currently off air (the one that's not currently visible). This capability provides you with a unique “live edit” mode, and if you understand the tools available, you'll never make an on-air error with the DVE.

For example, let's say that keyframe 1 is on **PGM**, but the Director *immediately* wants the PIP flown completely off screen to the right (and that location is *not* the keyframe currently programmed in the effect). Using the editing controls, you can select keyframe 2, edit it without actually seeing it, and fly the effect off screen. You could also select a shot box keyframe, and perform the same action.

The figure below illustrates the keyframe editing section at the top of the **DVE Menu**, and the **DVE Run** buttons on the menu's **Tool Bar**.



**Figure 8-19.** Keyframe Editing and Run controls (sample)

In the **Keyframe Editing Section**:

- The **Live LED** indicates the keyframe's state:
  - ~ **OFF** = The keyframe is not on PGM or PST
  - ~ **GRN** = The keyframe is on PST
  - ~ **RED** = The keyframe is on PGM
- The **Effect KF** control (either **1** or **2**) is a button that activates a keyframe for editing. Pressing the button moves the yellow border from keyframe to keyframe. When a keyframe is selected, it can be edited. If button **2** is grayed out, the effect is currently a “single keyframe” effect — or, keyframe **2** has not yet been added.

#### Important

The keyframe that is shown on **PST** or **PGM** does *not* change when the **Effect KF** buttons are pressed. To “see” a keyframe in a dual keyframe effect, use the **DVE Run** buttons (see below for details).

## 8. DVE Operations

### Editing Keyframes

- The **Shot Box KF** field indicates the shot box keyframe currently applied to either keyframe 1 or 2. If the associated field is blank, no shot box keyframe has been applied, or the shot box effect (that was *previously* applied) has been modified.

The two **DVE Run** buttons control dual keyframe effects:

- Press the **Forward** (▶) button to run the effect from keyframe 1 to 2.
- Press the **Reverse** (◀) button to run the effect from keyframe 2 to 1.

You can use these two buttons to run effects on **PGM** or **PST**. However, if you want to “see” the keyframe that you are editing, you must “run” to it. For example:

- ▲ Keyframe 1 is on **PST**. To edit keyframe 2 and see the keyframe, press **Effect KF 2**, then press ▶.
- ▲ Keyframe 1 is live on **PGM**. To edit keyframe 2 blind (essentially off air), press **Effect KF 2** and edit the keyframe, or apply a pre-programmed shot box effect. When ready, press ▶ to transition to the edited keyframe.

## 8. DVE Operations

### Automatic DVE Triggering

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## Automatic DVE Triggering

As outlined in the [“Multiple Ways to Trigger”](#) section on page 357 at the beginning of this chapter, there are three ways to trigger dual keyframe DVE effects on the M/E:

- Manually, using the **T-Bar**.
- Via the two “Run” buttons on the **DVE Menu**.
- Automatically, using the **FX TRIG** button.

This section provides instructions for automatically triggering DVE effects on the M/E.

#### Note

Because there is no **FX TRIG** button in the PGM bank’s **Transition Section**, there is only one way to trigger a dual keyframe DVE effect on this bank — via the forward (▶) and backward (◀) buttons on the **DVE menu**.

The following topics are discussed in this section:

- [Automatic Triggering via the Control Panel](#)
- [Trigger Setup and Display](#)
- [Automatic DVE Trigger Rules](#)
- [Using Automatic DVE Triggers](#)
- [Tap In, Tap Out Functions](#)

## Automatic Triggering via the Control Panel

The **FX TRIG** (Effects Trigger) button in the M/E's **Effects Group** enables you to automatically run dual keyframe DVE effects from the control panel. You can trigger effects individually or in combination with transitions.

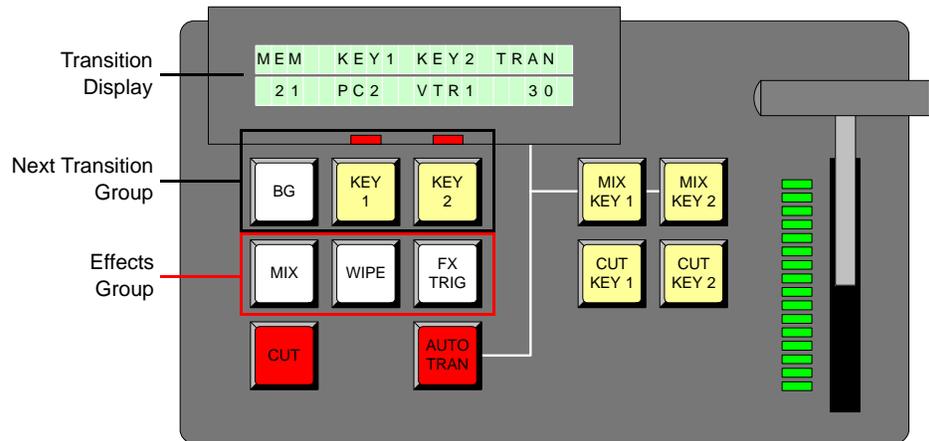


Figure 8-20. M/E Transition Section (sample)

In the **M/E Transition Section**, as shown above, three group of controls determine how your dual keyframe DVE effects behave:

- The buttons in the **Next Transition Group** show which combination of layers are armed for the next transition.
- The buttons in the **Effects Group** indicate which combination of effects (including DVE triggers) are enabled for the next transition.
- The **Transition Display** indicates which specific DVE channel(s) are armed to trigger — the DVE channel assigned to Keyer 1, Keyer 2 or to both keyers.



With one or more DVE channels installed in the FSN-1400, the **FX TRIG** button works by itself, or in combination with the **MIX** and **WIPE** buttons — similar to the way that the buttons in the **Next Transition Group** behave. Whichever combination you enable automatically disables those buttons that were not pressed.

For example:

- Pressing **FX TRIG** by itself allows you to trigger DVE effects *only*, without mixing or wiping backgrounds or keys.
- Pressing **FX TRIG + MIX** enables you to mix keys and backgrounds in the normal way, *and* trigger one or two effects.
- Pressing **FX TRIG + WIPE** enables you to wipe keys and backgrounds in the normal way, *and* trigger one or two effects.

## 8. DVE Operations

### Automatic DVE Triggering

## Trigger Setup and Display

This section provides basic information about trigger setup. There are three types of triggers that can be armed on the panel, and each has its own special label in the **Transition Display**:

- A **“Trigger only”** transition runs the DVE effect only. The selected keyer does not mix or wipe. In the display, the label **“■FX”** indicates this type of trigger. Refer to the [“Trigger Only Transition”](#) section for details.
- A **“Mix-key-trigger”** transition runs the DVE effect *and* mixes the selected keyer. The label **“M■FX”** indicates this type of trigger. Refer to the [“Mix-key-trigger Transition”](#) section for details.
- A **“Wipe-key-trigger”** transition runs the DVE effect *and* wipes the selected keyer. The label **“W■FX”** indicates this type. Refer to the [“Wipe-key-trigger Transition”](#) section for details.

Basic setup for each trigger type is explained and illustrated in the following sections.

### Trigger Only Transition

To arm a “trigger only” transition:

- Ensure that a dual keyframe DVE effect is loaded in the selected keyer(s).
- Enable one or two keyers in the **Next Transition Group**. The **BG** button can either be on or off, as required.
- Enable **FX TRIG** *by itself* in the **Effects Group**.

In the **Transition Display**, the label **“■FX”** indicates “trigger only,” as shown below (for keyer 1).

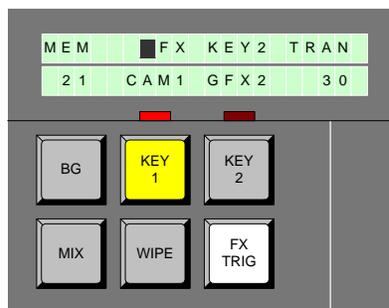


Figure 8-21. “Trigger only” transition armed

### Important

In this mode, the **KEY 1** and/or **KEY 2** buttons light to show which DVE effect(s) are armed to trigger — the buttons do not indicate a mix-key or wipe-key in this mode.



To *always* confirm which keyers are armed to trigger, press and hold **FX TRIG**. In this mode, the “lit” keyer buttons in the **Next Transition Group** are the ones that are armed to trigger. When you release the **FX TRIG** button, the group returns to its previous state.

### Mix-key-trigger Transition

To arm a “mix-key-trigger” transition:

- Ensure that a dual keyframe DVE effect is loaded in the selected keyer(s).
- Enable one or two keyers in the **Next Transition Group**. The **BG** button can either be on or off, as required.
- Enable **MIX** and **FX TRIG** in the **Effects Group**.

In the **Transition Display**, the label “**M■FX**” indicates “mix-key-trigger.”

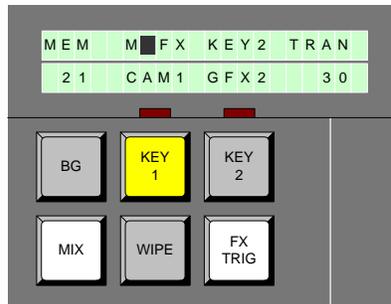


Figure 8-22. “Mix-key-trigger” transition armed



To *always* confirm which keyers are armed to mix, press and hold **MIX**. In this mode, the “lit” keyer buttons in the **Next Transition Group** are the ones that are armed to mix. When you release the **MIX** button, the group returns to its previous state.

### Wipe-key-trigger Transition

To arm a “wipe-key-trigger” transition:

- Ensure that a dual keyframe DVE effect is loaded in the selected keyer(s).
- Enable one or two keyers in the **Next Transition Group**. The **BG** button can either be on or off, as required.
- Enable **WIPE** and **FX TRIG** in the **Effects Group**.

In the **Transition Display**, the label “**W■FX**” indicates “wipe-key-trigger.”

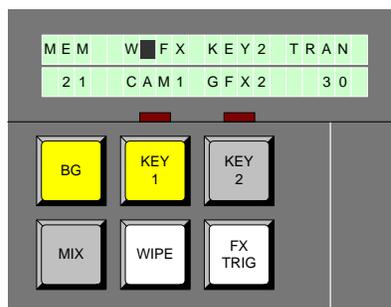


Figure 8-23. “Wipe-key-trigger” transition armed



To *always* confirm which keyers are armed to wipe, press and hold **WIPE**. In this mode, the “lit” keyer buttons in the **Next Transition Group** are the ones that are armed to wipe. When you release the **WIPE** button, the group returns to its previous state.

## 8. DVE Operations

### Automatic DVE Triggering

#### Automatic DVE Trigger Rules

This section outlines the important rules for using automatic DVE triggers in the M/E.

- Only dual keyframe DVE effects can be triggered. However, both single and dual keyframe DVE effects can be mixed and wiped *without* triggers, in the same way that regular keys are mixed and wiped.
- The following conditions must be met for the **FX TRIG** button to light:
  - ~ One or two **DVE** cards must be installed in the FSN-1400.
  - ~ A DVE channel must be assigned to the selected keyer.
  - ~ The DVE mode in the **Key Menu** must be “on.”
  - ~ A dual keyframe effect must be loaded in the selected DVE channel.
- For error-free triggering:
  - ~ Always select your layers first, in the **Next Transition Group**.
  - ~ Always select your effects second, in the **Effects Group**.
- After each effect runs, the **FX TRIG** button remains lit, enabling you to run the effect repeatedly — forwards and backwards. To cancel the trigger:
  - ~ Press **MIX** to return to standard mix mode.
  - ~ Press **WIPE** to return to standard wipe mode.
  - ~ “Tap out” the desired effect. Refer to the [“Tap In, Tap Out Functions”](#) section for details.
- For each trigger combination, press **AUTO TRAN** to run the effect forward (if the effect is on keyframe 1), or backward (if the effect is on keyframe 2).

Please continue with the [“Using Automatic DVE Triggers”](#) section on page 401.

### Using Automatic DVE Triggers

The following combinations of DVE triggers are discussed in this section:

- [Trigger an Effect on Keyer 1 Only](#)
- [Trigger an Effect on Keyer 2 Only](#)
- [Trigger Effects on both Keyers](#)
- [Mix Key and Trigger an Effect on Keyer 1](#)
- [Mix Key and Trigger an Effect on Keyer 2](#)
- [Mix Key and Trigger Effects on both Keyers](#)
- [Mix BG and Keyer 1, and Trigger Effect on Keyer 1](#)
- [Mix BG and Keyer 2, and Trigger Effect on Keyer 2](#)
- [Mix BG and both Keyers, Trigger Effects on both Keyers](#)
- [Wipe Trigger Options](#)
- [Tap In, Tap Out Functions](#)

#### Tip

On the control panel, practice each example below as you read along.

#### Trigger an Effect on Keyer 1 Only

- Use the following steps to trigger a DVE effect on Keyer 1 only:
  1. In the **Next Transition Group**, press **KEY 1**.
  2. In the **Effects Group**, press **FX TRIG**. The label “■FX” appears in the **Transition Display** above **KEY 1**, indicating that the DVE effect is armed.
  3. Press **AUTO TRAN** to run the effect forward or backward.
  4. To cancel the trigger, press **MIX** or **WIPE**.

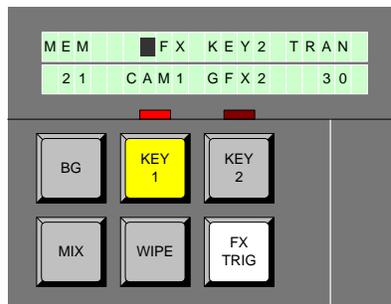


Figure 8-24. Trigger DVE effect on Keyer 1

#### Important

If **KEY 1** is not enabled on Program (with the red “on air” LED lit), you will not see the PIP flight occur, either on Preview or Program.

## 8. DVE Operations

### Automatic DVE Triggering

#### Trigger an Effect on Keyer 2 Only

- Use the following steps to trigger a DVE effect on Keyer 2 only:
  1. In the **Next Transition Group**, press **KEY 2**.
  2. In the **Effects Group**, press **FX TRIG**. The label “**■FX**” appears in the **Transition Display** above **KEY 2**, indicating that the DVE effect is armed.
  3. Press **AUTO TRAN** to run the effect forward or backward.
  4. To cancel the trigger, press **MIX** or **WIPE**.

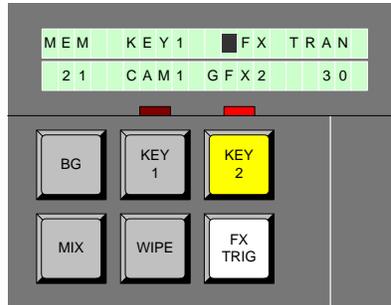


Figure 8-25. Trigger DVE effect on Keyer 2

#### Important

If **KEY 2** is not enabled on Program (with the red LED lit), you will not see the PIP flight occur, either on Preview or Program.

#### Trigger Effects on both Keyers

- Use the following steps to trigger DVE effects on keyers 1 and 2:
  1. In the **Next Transition Group**, simultaneously press **KEY 1** and **KEY 2**.
  2. In the **Effects Group**, press **FX TRIG**. The label “**FX■**” appears in the **Transition Display** above **KEY 1** and **KEY 2**, indicating that both effects are armed.

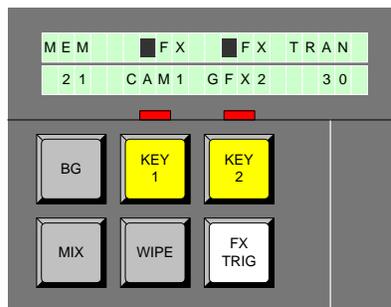


Figure 8-26. Trigger DVE effects on Keyers 1 and 2

3. Press **AUTO TRAN** to run the effects forward or backward.
4. To cancel the triggers, press **MIX** or **WIPE**.

#### Important

If **KEY 1** and **KEY 2** are not enabled on Program (with the red LEDs lit), you will not see the PIP flight occur.

## 8. DVE Operations

### Automatic DVE Triggering

#### Mix Key and Trigger an Effect on Keyer 1

- Use the following steps to mix **KEY 1** and simultaneously trigger its DVE effect:
  1. In the **Next Transition Group**, press **KEY 1**.
  2. In the **Effects Group**, simultaneously press **MIX** and **FX TRIG**. The label “**M■FX**” appears in the **Transition Display** above **KEY 1**, indicating that the keyer is armed to mix, and the effect is armed to trigger.

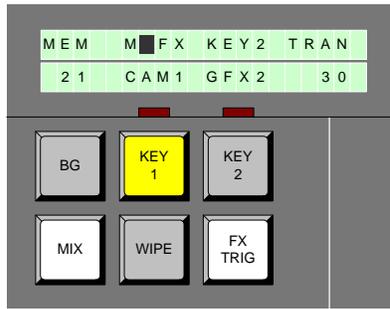


Figure 8-27. Mix and trigger Keyer 1

3. (Option) Use the special “tap out” functions to include or exclude triggers. Refer to the [“Tap In, Tap Out Functions”](#) section on page 407 for details.
4. Press **AUTO TRAN** to mix the key (in or out) and simultaneously run the effect.
5. To cancel the trigger, press **MIX** or **WIPE**.

#### Mix Key and Trigger an Effect on Keyer 2

- Use the following steps to mix **KEY 2** and simultaneously trigger its DVE effect:
  1. In the **Next Transition Group**, press **KEY 2**.
  2. In the **Effects Group**, simultaneously press **MIX** and **FX TRIG**. The label “**M■FX**” appears in the **Transition Display** above **KEY 2**, indicating that the keyer is armed to mix, and the effect is armed to trigger.

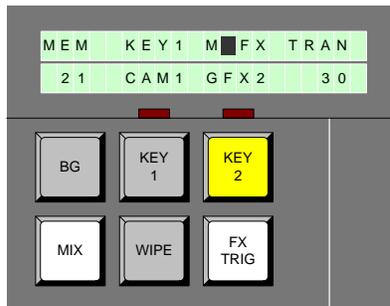


Figure 8-28. Mix and trigger Keyer 2

3. (Option) Use the special “tap out” functions to include or exclude triggers. Refer to the [“Tap In, Tap Out Functions”](#) section on page 407 for details.
4. Press **AUTO TRAN** to mix the key and simultaneously run the effect.
5. To cancel the trigger, press **MIX** or **WIPE**.

## 8. DVE Operations

### Automatic DVE Triggering

#### Mix Key and Trigger Effects on both Keyers

- Use the following steps to mix **KEY 1** and **2**, and simultaneously trigger both effects:
  1. In the **Next Transition Group**, simultaneously press **KEY 1** and **KEY 2**.
  2. In the **Effects Group**, simultaneously press **MIX** and **FX TRIG**. The label “**M■FX**” appears in the **Transition Display** above **KEY 1** and **KEY 2**, indicating that both keyers are armed to mix, and both effects are armed to trigger.

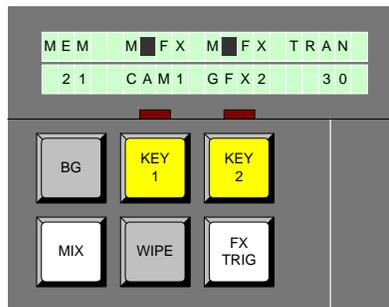


Figure 8-29. Mix and trigger Keyers 1 and 2

3. (Option) Use the special “tap out” functions to include or exclude triggers. Refer to the [“Tap In, Tap Out Functions”](#) section on page 407 for details.
4. Press **AUTO TRAN** to mix the keys and simultaneously run the effects.
5. To cancel the triggers, press **MIX** or **WIPE**.

#### Mix BG and Keyer 1, and Trigger Effect on Keyer 1

- Use the following steps to mix **BG** and **KEY 1**, and trigger the effect on keyer 1:
  1. In the **Next Transition Group**, simultaneously press **BG** and **KEY 1**.
  2. In the **Effects Group**, simultaneously press **MIX** and **FX TRIG**. The label “**M■FX**” appears in the **Transition Display** above **KEY 1**, indicating that the keyer is armed to mix and the effect is armed to trigger.

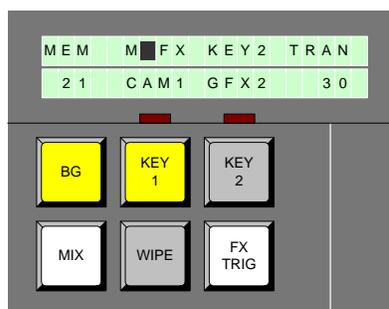


Figure 8-30. Mix BG and KEY 1, and trigger the DVE effect on Keyer 1

3. (Option) Use the special “tap out” functions to include or exclude triggers. Refer to the [“Tap In, Tap Out Functions”](#) section on page 407 for details.
4. Press **AUTO TRAN** to mix the key and the background, and run the effect.
5. To cancel the trigger, press **MIX** or **WIPE**.

## 8. DVE Operations

### Automatic DVE Triggering

#### Mix BG and Keyer 2, and Trigger Effect on Keyer 2

- Use the following steps to mix **BG** and **KEY 2**, and trigger the effect on keyer 2:
  1. In the **Next Transition Group**, simultaneously press **BG** and **KEY 2**.
  2. In the **Effects Group**, simultaneously press **MIX** and **FX TRIG**. The label “**M■FX**” appears in the **Transition Display** above **KEY 2**, indicating that the keyer is armed to mix and the effect is armed to trigger.

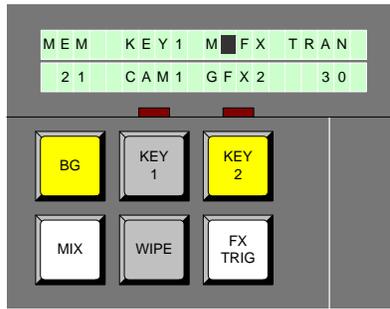


Figure 8-31. Mix BG and KEY 2, and trigger the DVE effect on Keyer 2

3. (Option) Use the special “tap out” functions to include or exclude triggers. Refer to the [“Tap In, Tap Out Functions”](#) section on page 407 for details.
4. Press **AUTO TRAN** to mix the key and the background, and run the effect.
5. To cancel the trigger, press **MIX** or **WIPE**.

#### Mix BG and both Keyers, Trigger Effects on both Keyers

- Use the following steps to mix **BG**, **KEY 1** and **KEY 2**, and simultaneously trigger the DVE effects on keyers 1 and 2:
  1. In the **Next Transition Group**, simultaneously press **BG**, **KEY 1** and **KEY 2**.
  2. In the **Effects Group**, simultaneously press **MIX** and **FX TRIG**. The label “**M■FX**” appears in the **Transition Display** above **KEY 1** and **KEY 2**, indicating that the keyers are armed to mix and the effects are armed to trigger.

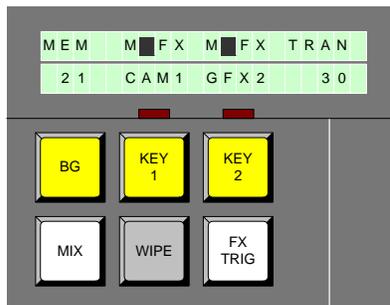


Figure 8-32. Mix BG, KEY 1 and 2, and trigger DVE effects on Keyers 1 and 2

3. (Option) Use the special “tap out” functions to include or exclude triggers. Refer to the [“Tap In, Tap Out Functions”](#) section on page 407 for details.
4. Press **AUTO TRAN** to mix the keys, backgrounds, and run the effects.
5. To cancel the triggers, press **MIX** or **WIPE**.

## 8. DVE Operations

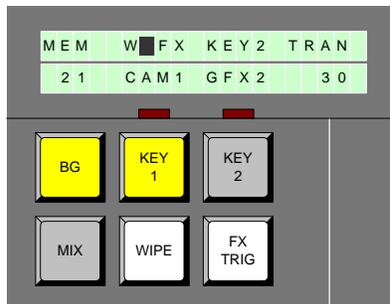
### Automatic DVE Triggering

#### Wipe Trigger Options

The options for triggering wipes are *the same* as triggering mixes — press **WIPE + FX TRIG** instead of **MIX + FX TRIG**, and you can perform the following transitions:

- Trigger Keyer 1 and wipe-key the PIP
- Trigger Keyer 2 and wipe-key the PIP
- Trigger Keyers 1 and 2 and wipe-key the PIPs
- Wipe the Background and Keyer 1, and trigger Keyer 1
- Wipe the Background and Keyer 2, and trigger Keyer 2
- Wipe the Background and Keyers 1 and 2, and trigger Keyers 1 and 2

For each transition listed above, the label “**W■FX**” appears in the **Transition Display** above **KEY 1** and/or **KEY 2**, indicating that the selected keyers are armed to wipe and the selected effects are armed to trigger.



**Figure 8-33.** Wipe BG and KEY 1, and trigger the DVE effect on Keyer 1

To cancel the trigger prior to running the effects, press **MIX** or **WIPE**. In addition, all “tap out” functions apply, using the **WIPE** button instead of the **MIX** button. Refer to the “[Tap In, Tap Out Functions](#)” section on page 407 for details.

### Tap In, Tap Out Functions

Several advanced “tap in, tap out” functions are available that enable you to handle exceptions to the standard DVE trigger modes outlined in the previous sections. Using these advanced functions, you have greater flexibility with regard to mixing, wiping and triggering DVE effects.

- **Tap In** — this function enables you to “include” or replace a mix-key, wipe-key or trigger in an automatic transition that is already set up.
- **Tap Out** — this function enables you to “exclude” or remove a mix-key, wipe-key or trigger from an automatic transition that is already set up.

The following topics are discussed in this section:

- [Tap In, Tap Out Rules](#)
- [Tap in, Tap Out Examples](#)

### Tap In, Tap Out Rules

Each “tap in” and “tap out” function enables you to modify a trigger transition that is already set up. Please note the following important rules:

- All “tap in” and “tap out” functions are “press and hold” functions.
- Before you can “tap in” or “tap out.” the button for the effect that you want to include or exclude *must be lit* in the **Effects Group**.



- ~ To include or exclude an effects trigger, press and hold **FX TRIG**, then select the desired keyer(s). Remember that when you press and hold, the **KEY 1** and/or **KEY 2** buttons light to confirm which keyers are currently armed to trigger.
- ~ To include or exclude a mix-key, press and hold **MIX**, then select the desired keyer(s) and/or the **BG** button. Remember that when you press and hold, the **KEY 1** and/or **KEY 2** buttons light to confirm which keyers are currently armed to mix-key.
- ~ To include or exclude a wipe-key, press and hold **WIPE**, then select the desired keyer(s) and/or the **BG** button. Remember that when you press and hold, the **KEY 1** and/or **KEY 2** buttons light to confirm which keyers are currently armed to wipe-key.

#### Tip

The “subtractive” method works the best. That is, start with the most complex transition, then remove (tap out) the portions that are not required.

## 8. DVE Operations

### Automatic DVE Triggering

#### Tap in, Tap Out Examples

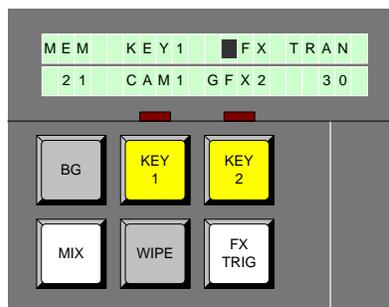
The following examples are provided in this section:

- [Mix KEY 1 and trigger KEY 2](#)
- [Mix BG, trigger KEY 1, mix-key-trigger KEY 2](#)
- [Wipe-key-trigger KEY 1, wipe KEY 2](#)

#### Mix KEY 1 and trigger KEY 2

- Use the following steps to mix **KEY 1** and trigger **KEY 2**:
  1. Program a “mix-key-trigger” transition for both keyers:
    - ~ In the **Next Transition Group**, press **KEY 1** and **KEY 2**.
    - ~ In the **Effects Group**, press **MIX** and **FX TRIG**.
  2. “Tap out” the trigger on **KEY 1**.
    - ~ Press and hold **FX TRIG**, then press **KEY 1**.
  3. “Tap out” the mix on **KEY 2**.
    - ~ Press and hold **MIX**, then press **KEY 2**.

At the conclusion of the procedure, the **M/E Transition Section** appears as shown below, and you’re ready to mix **KEY 1** and trigger **KEY 2**.



**Figure 8-34.** Mix Key 1, Trigger Key 2

#### Note

Remember that once you “tap out” a trigger component, you can tap it back in — provided that the button for the effect that you want to include is already lit in the **Effects Group**.

## 8. DVE Operations

### Automatic DVE Triggering

#### Mix BG, trigger KEY 1, mix-key-trigger KEY 2

- Use the following steps to mix **BG**, trigger **KEY 1** and mix-key-trigger **KEY 2**:
  1. Program a background mix, and a “mix-key-trigger” transition for both keys:
    - ~ In the **Next Transition Group**, press **BG**, **KEY 1** and **KEY 2**.
    - ~ In the **Effects Group**, press **MIX** and **FX TRIG**.
  2. “Tap out” the mix on **KEY 1**.
    - ~ Press and hold **MIX**, then press **KEY 1**.

At the conclusion of the procedure, the **M/E Transition Section** appears as shown below, and you're ready to mix the background, trigger **KEY 1** and mix-key-trigger **KEY 2**.

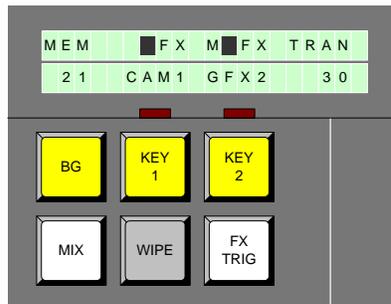


Figure 8-35. Mix BG, trigger Key 1 and mix-key-trigger Key 2

#### Wipe-key-trigger KEY 1, wipe KEY 2

- Use the following steps to wipe-key-trigger **KEY 1** and wipe **KEY 2**:
  1. Program a “wipe-key-trigger” transition for both keys:
    - ~ In the **Next Transition Group**, press **KEY 1** and **KEY 2**.
    - ~ In the **Effects Group**, press **WIPE** and **FX TRIG**.
  2. “Tap out” the trigger on **KEY 2**.
    - ~ Press and hold **FX TRIG**, then press **KEY 2**.

At the conclusion of the procedure, the **M/E Transition Section** appears as shown below, and you're ready to wipe-key-trigger **KEY 1** and wipe **KEY 2**.

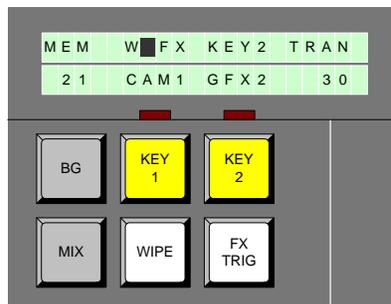


Figure 8-36. Wipe-key-trigger Key 1, Wipe Key 2

## 8. DVE Operations

Automatic DVE Triggering

# 9. Multiviewer Operations

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## In This Chapter

This chapter provides orientation and operating instructions for the FSN Series' optional internal Multiviewer (MVR). The following topics are discussed:

- [Introduction to the Multiviewer](#)
- [Multiviewer Menu Orientation](#)
- [Multiviewer Setup](#)
- [Multiviewer Memory](#)

## 9. Multiviewer Operations

### Introduction to the Multiviewer

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## Introduction to the Multiviewer

The FSN Series' optional internal Multiviewer (**MVR**) enables users to display up to 16 PIPs in either single or dual monitor configurations. With the Multiviewer, you can assign a variety of sources to individual PIPs, including video inputs, program and M/E outputs, preview outputs, clean feed outputs and Auxiliary outputs.

Following is a complete list of Multiviewer features.

- **MVR Card** — All functionality is provided via the plug-in **Multiviewer Card** and its associated rear connector panel. In order to provide connections to both SDI and DVI compatible monitors, two connectors (1 x **BNC**, 1 x **DVI-I**) are provided for each output. Please note:
  - ~ The same output signal appears on both the **DVI-I** and **BNC** connectors. **MVR Output 1** can be used in both single and dual multiviewer monitor configurations, as selected on the **Multiviewer Setup Menu**:
  - ~ The output resolution for both **MVR** outputs is set on the **Multiviewer Output Setup Menu**, using the **Output Format Keypad**.
  - ~ Both the **BNC** and **DVI-I** connectors can be active at the same time, provided that the selected format is compatible. The valid combinations are fully listed in the **Output Format Keypad**.

In Chapter 2, refer to the "**Multiviewer Card**" section on page 62 for additional information on the **Multiviewer Card** and its connector panel.

- **Single or dual monitor configurations** — a graphical library of pre-configured Multiviewer layouts is provided for both types of configurations.
  - ~ In a single monitor layouts, up to 16 PIPs can be displayed on one monitor, and the selected layout appears identically on **MVR Output 1** and **MVR Output 2**.
  - ~ In a dual monitor layouts, the 16 PIPs are divided between two monitor outputs — one half of the layout appears on **Output 1**, and the other half appears on **Output 2**.
- **PIP enable/disable** — any PIP in any Multiviewer layout can be turned on or off from the **Multiviewer Setup Menu**. This provides a degree of layout customization, per your requirements.
- **Color selection** — the following Multiviewer colors can be adjusted from the **Multiviewer Setup Menu**:
  - ~ Multiviewer background color
  - ~ Clock background color
  - ~ PIP border color
  - ~ **UMD** (Under Monitor Display) color can be changed to one of four user-selectable colors.
- **UMD Tally indications** — the following tally indications are pre-programmed:
  - ~ The assigned UMD color will be over-ridden by the color **RED** when the selected source appears on the main Program output.
  - ~ The assigned color will be over-ridden by **GREEN** when the selected source appears on any Preset output (Main, M/E 1 or M/E 2).
  - ~ The assigned UMD color will be over-ridden by **AMBER** when the selected source appears on the M/E 1 or M/E 2 Program output.

## 9. Multiviewer Operations

### Introduction to the Multiviewer

- **UMD text** — the text that appears in the UMD can be changed or modified as desired, up to an eight character limit.
- **Clock** — when a Multiviewer layout includes a clock, the following clock features are available:
  - ~ The clock source can be set to internal or LTC.
  - ~ The display mode can be set to 12 or 24 hour mode.
  - ~ The time can be set on the **User Preferences Menu**.
- **Error indications** — the following error indications are provided:
  - ~ PIP border color will turn **RED** upon loss of signal (LOS). When the error is resolved, the border returns to the current color as set on the **Multiviewer Setup Menu**.
- **Freeze indications** — the following freeze indications are provided:
  - ~ PIP border color will turn **CYAN** when the selected source is frozen. When the source is un-frozen, the border returns to the current color as set on the **Multiviewer Setup Menu**.

## 9. Multiviewer Operations

### Multiviewer Menu Orientation

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## Multiviewer Menu Orientation

This section provides a detailed explanation of all Multiviewer menus and features. The following topics are discussed:

- [Multiviewer Setup Menu](#)
- [Multiviewer Output Setup Menu](#)
- [Select Layout Menu](#)
- [Select Colors Menu](#)
- [Clock Setup Menu](#)
- [Assign Source Keypad](#)

**Tip**

It is recommended that you thoroughly learn all features and functions on all Multiviewer menus, prior to continuing with the setup and operations sections in this chapter.

## 9. Multiviewer Operations

### Multiviewer Menu Orientation

## Multiviewer Setup Menu

From the **System Menu**, press **{Multiviewer Setup}** to show the **Multiviewer Setup Menu**, a sample of which is shown below.

PIP #	Mode	Source	UMD Text	Color
1	On	PREVIEW	PREVIEW	UMD1
2	On	PROGRAM	PROGRAM	UMD1
3	On	M/E1 PVW	M/E1 PVW	UMD1
4	On	M/E1 PGM	M/E1 PGM	UMD1
5	On	AUX 1	STG LFT	UMD1
6	On	AUX 2	STG RGT	UMD1
7	On	AUX 3	AUX 3	UMD1
8	On	AUX 4	AUX 4	UMD1
9	On	AUX 5	AUX 5	UMD1
10	On	CAM 1	C1-JIM	UMD1
11	On	CAM 2	C2-DAVE	UMD1
12	On	CAM 3	C3-ROB	UMD1
13	On	CAM 4	CAM 4	UMD1
14	On	PC-1	PC-1	UMD1
15	On	PC-2	PC-2	UMD1
16	On	DVR	DVR	UMD1

Figure 9-1. Multiviewer Setup Menu (sample)

The **Multiviewer Setup Menu** enables you to configure the Multiviewer's layout, overall appearance, and the sources within each PIP. On the menu:

- The left side of the **Palette** shows a graphic that represents the currently selected single or dual-monitor layout. The current output format is listed above the graphic. The right side shows the **Multiviewer Table**.
- In the layout graphic, each PIP is assigned a number (between **1** and **16**) that corresponds to its associated row in the **Multiviewer Table**. To select a PIP to set up or change, use the top **Knob** to select the desired row in the table, or simply touch the row. This paradigm is identical for both single and dual-monitor layouts.

The **Multiviewer Table** provides the following information:

- **PIP #** — Indicates the corresponding PIP number in the layout graphic. If a row is highlighted, the selected PIP can be changed or modified.
- **Mode** — Indicates if the corresponding PIP is on or off (hidden). Use the **{Mode}** button to change the PIP's mode.
- **Source** — Indicates the video source assigned to the PIP. Use the **{Assign Source}** button to change the PIP's video source.

## 9. Multiviewer Operations

### Multiviewer Menu Orientation

- **UMD Text** — Indicates the current text string shown in the corresponding UMD. Use the **{UMD Text}** button to change the text (maximum eight characters).
- **Color** — Indicates the specific color assigned to the selected PIP's UMD. Four color selections are available, as configured on the **Select Colors Menu**. Use the **{UMD Color}** button to change the assigned color.
- **Clock** — If a clock is available in the layout, a special **"Clock"** row appears at the bottom of the table. Highlighting this row enables you to turn the clock on and off.

The following functions are provided in the **Tool Bar**:



To set up the Multiviewer's output, press **{Output Setup}** to display the **Multiviewer Output Setup Menu**. This menu sets the resolution for both **MVR** outputs. Refer to the ["Multiviewer Output Setup Menu"](#) section on page 417 for details.



To select a single or dual Multiviewer layout from the library of pre-configured layouts, press **{Select Layout}** to display the **Select Layout Menu**. Refer to the ["Select Layout Menu"](#) section on page 418 for details.



To set colors for the Multiviewer's background, PIP borders, clock and four UMD color selections, press **{Select Colors}** to display the **Select Colors Menu**. Refer to the ["Select Colors Menu"](#) section on page 420 for details.



To set up the Multiviewer's clock, press **{Clock Setup}** to display the **Clock Setup Menu**. Refer to the ["Clock Setup Menu"](#) section on page 421 for details. Note that the time is set on the **User Preferences Menu**.



To turn a PIP on or off in the selected layout, highlight the row that corresponds to the desired PIP, then press **{Mode}**. In the pop-up, select **On** or **Off**. When a PIP is off, its source, color, and UMD text assignments remain unchanged.



To assign a source to a PIP, highlight the row that corresponds to the desired PIP, then press **{Assign Source}** to display the **Assign Source Keypad**. Refer to the ["Assign Source Keypad"](#) section on page 422 for details.



To change UMD text, highlight the row that corresponds to the desired PIP, then press **{UMD Text}** to display the **Pop-up Keyboard**. Enter the desired text, up to eight characters in length. In Chapter 5, refer to the ["Using the Pop-up Keyboard"](#) section on page 147 for details on keyboard operations.



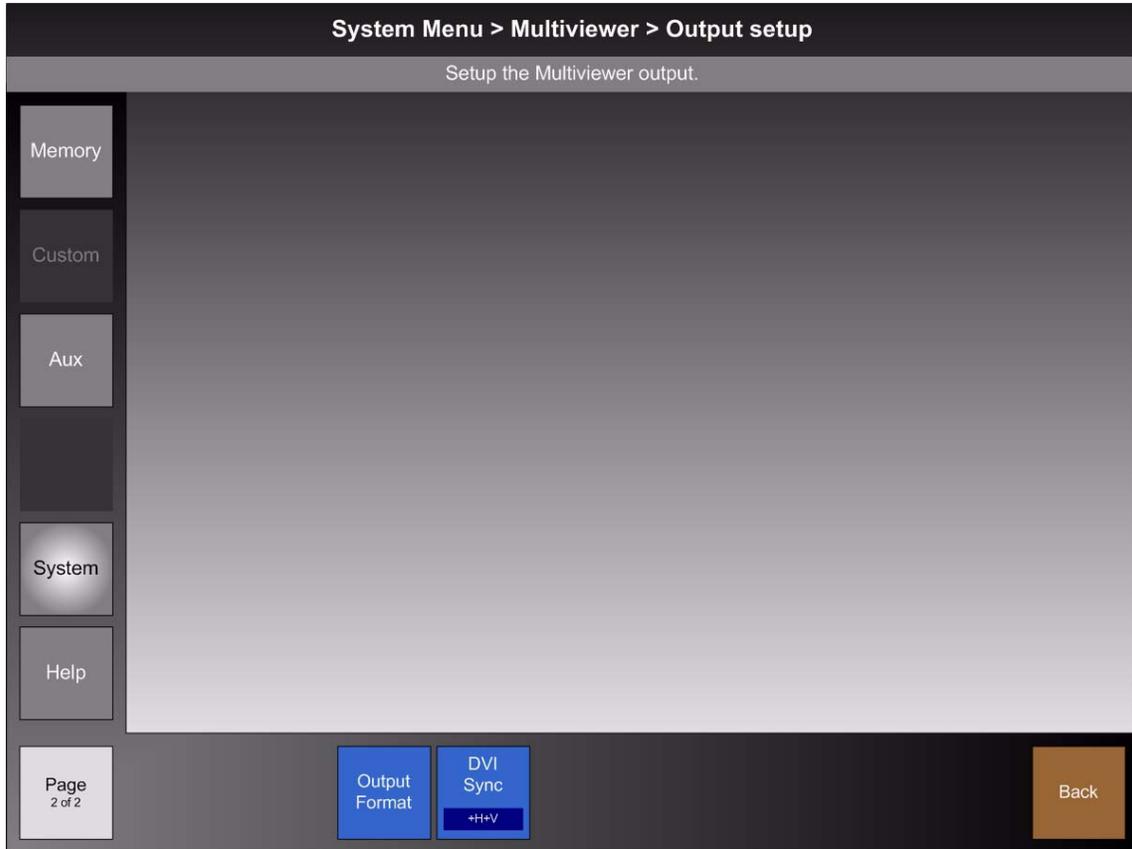
To change UMD color, highlight the row that corresponds to the desired PIP, then press **{UMD Color}**. In the pop-up menu, select one of the four available UMD colors. Note that the color of each button reflects the colors selected on the **Select Colors Menu**. Refer to the ["Select Colors Menu"](#) section on page 420 for details.

#### Note

UMD colors can be used to "group" sources. For example, if you want to visually distinguish your cameras from other Multiviewer sources, create and assign a custom UMD color.

### Multiviewer Output Setup Menu

From the **Multiviewer Setup Menu**, press **{Output Setup}** to show the **Multiviewer Output Setup Menu**. This menu sets the resolution for both **MVR** outputs.



**Figure 9-2.** Multiviewer Output Setup Menu (sample)

The following functions are provided in the menu's **Tool Bar**:

To change the Multiviewer output format, press **{Output Format}** to display the **Output Format Keypad**. The keypad is divided into two columns:

- The left-hand column displays the list of available output formats.
- The right-hand column indicates the output connectors (on the **MVR Card**) that are active for the selected output resolution, e.g., **DVI only** or **SDI, DVI**.

**Important**

The list of available output formats changes, based on the system's native resolution.

- Press **{DVI Sync}** to select the polarity of the digital sync output on the MVR's DVI output connector. The following four options are available in the pop-up: **+H+V**, **+H-V**, **-H+V**, and **-H-V**.

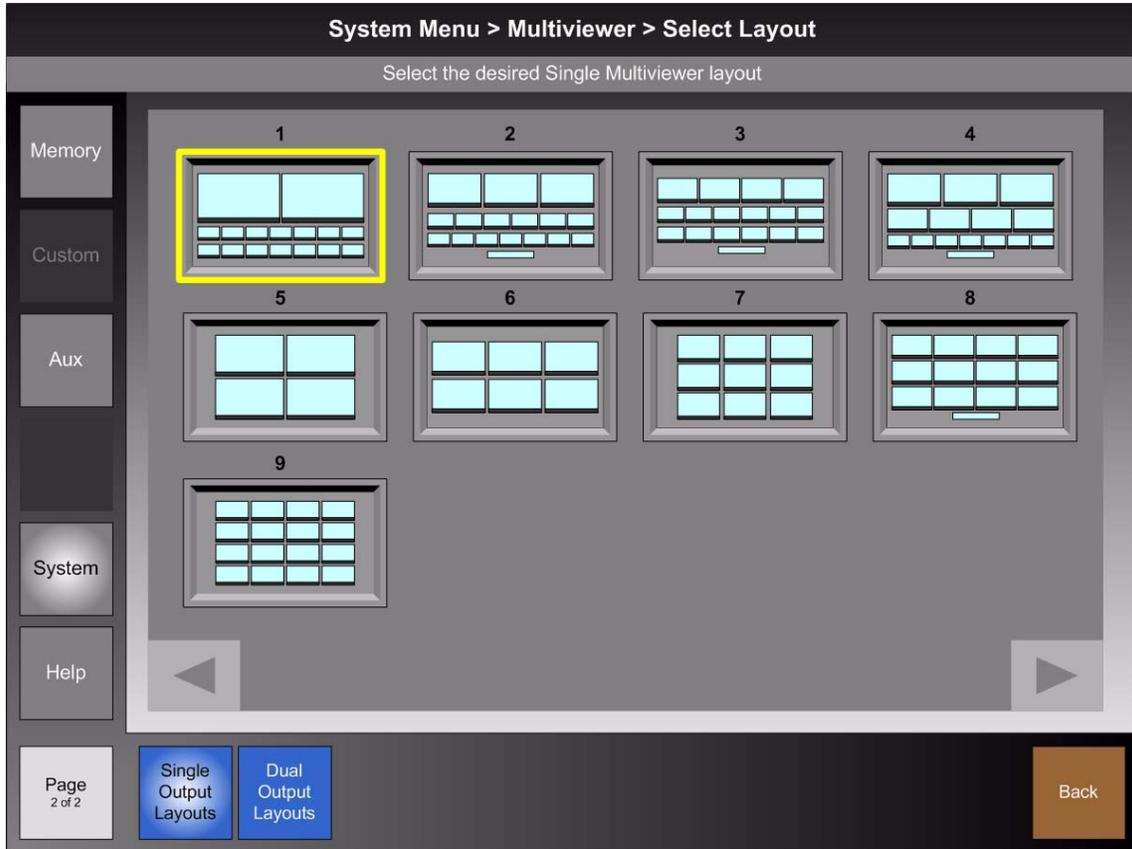


## 9. Multiviewer Operations

### Multiviewer Menu Orientation

## Select Layout Menu

From the **Multiviewer Setup Menu**, press **{Select Layout}** to show the **Select Layout Menu** which enables you to select a pre-configured single or dual monitor layout.



**Figure 9-3.** Multiviewer Select Single Layout Menu (sample)

The **Select Layout Menu** provides graphic representations of each available layout. To select a layout, simply touch its graphic. The yellow border indicates the current selection.

Use the left (◀) and right (▶) arrows to display more layouts, if available. Once a layout is selected, its configuration is immediately applied to the Multiviewer output.

Press **{Single Output Layouts}** to display all available single output layouts.



Press **{Dual Output Layouts}** to display all available dual output layouts.



The two tables on the following page list all available layouts.

## 9. Multiviewer Operations

### Multiviewer Menu Orientation

The table below lists the available **Single Monitor Output** configurations;

**Table 9-1.** Multiviewer Single Monitor Output Configurations

Layout #	Total # PIPs	# PIPs				Clock
		Row 1	Row 2	Row 3	Row 4	
1	16	2	7	7	—	—
2	16	3	6	7	—	Yes
3	16	4	6	6	—	Yes
4	14	3	4	7	—	Yes
5	4	2	2	—	—	—
6	6	3	3	—	—	—
7	9	3	3	3	—	—
8	12	4	4	4	—	Yes
9	16	4	4	4	4	—

The table below lists the available **Dual Monitor Output** configurations;

**Table 9-2.** Multiviewer Dual Monitor Output Configurations

Layout #	Total # PIPs	# PIPs - Monitor 1				# PIPs - Monitor 2			
		Row 1	Row 2	Row 3	Clock	Row 1	Row 2	Row 3	Clock
1	16	2	—	—	Yes	2	6	6	—
2	16	2	—	—	Yes	4	5	5	—
3	16	1	7	—	—	1	7	—	Yes
4	16	2	6	—	Yes	2	6	—	—
5	16	3	3	—	—	5	5	—	Yes
6	14	2	—	—	Yes	4	4	4	—
7	16	2	—	—	Yes	3	5	6	—
8	13	2	7	—	Yes	2	2	—	—
9	15	2	7	—	Yes	3	3	—	—
10	12	3	3	—	Yes	3	3	—	—
11	16	3	3	—	—	4	6	—	Yes
12	15	2	2	—	—	4	7	—	Yes
13	16	4	4	—	Yes	4	4	—	—

## 9. Multiviewer Operations

### Multiviewer Menu Orientation

## Select Colors Menu

From the **Multiviewer Setup Menu**, press **{Select Colors}** to show the **Select Colors Menu**, which enables you to set colors for a full range of Multiviewer parameters.

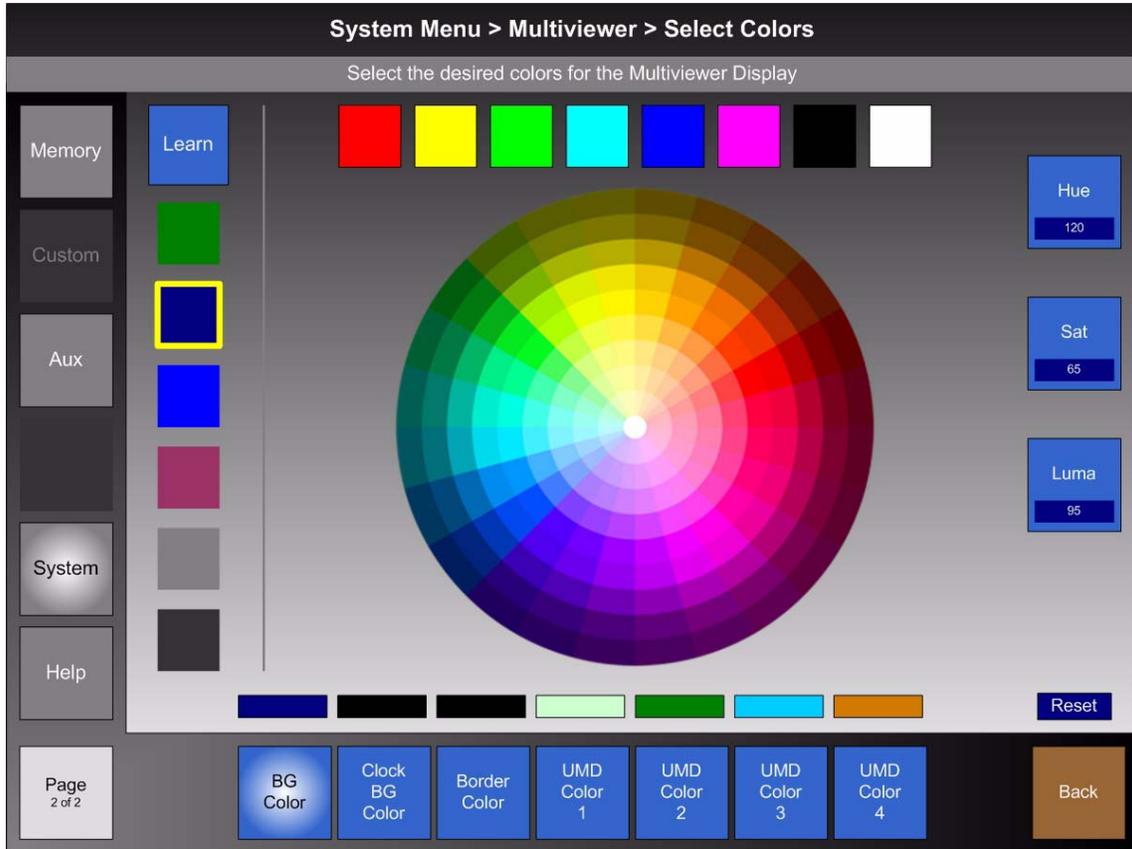


Figure 9-4. Multiviewer Select Colors Menu (sample)

The layout and operation of the **Select Colors Menu** is identical to the **Color Background Menu** — except that there are more parameters that can be colorized. In Chapter 5, refer to the [“Color Background Menu”](#) section on page 169 for details on the **Color Background Menu**.

The following functions are provided:



Press **{BG Color}** to select the Multiviewer’s background color. Use the **Color Wheel**, the **Color Chips**, the **User Colors** or the **Knobs** to select the desired color. The current color box (above the button) updates as different colors are selected or fine-tuned.



Press **{Clock BG Color}** to select the clock’s background color. Use the **Color Wheel**, the **Color Chips**, the **User Colors** or the **Knobs** to select the desired color.



Press **{Border Color}** to select the default border color for all PIPs. Use the **Color Wheel**, the **Color Chips**, the **User Colors** or the **Knobs** to select the desired color.

## 9. Multiviewer Operations

### Multiviewer Menu Orientation



Press **{UMD Color 1}** to select a specific color that can be assigned to any UMD. Use the **Color Wheel**, the **Color Chips**, the **User Colors** or the **Knobs** to select the desired color. Select colors for **{UMD Color 2}**, **{UMD Color 3}** and **{UMD Color 4}** in the same manner.

Once colors are assigned, use the **{UMD Color}** button on the **Multiviewer Setup Menu** to assign colors to specific PIP UMDs.

#### Note

Remember that UMD colors can be used to “group” sources. For example, if you want to visually distinguish your cameras or servers from other Multiviewer sources, create and assign a custom UMD color.

## Clock Setup Menu

From the **Multiviewer Setup Menu**, press **{Clock Setup}** to display the **Clock Setup Menu**. These functions apply whenever a layout is selected that includes a clock.

Two functions are available:



Press **{Clock Source}** to toggle the clock source between **Internal** and **LTC**.

- When set to **Internal**, the system’s internal clock is displayed. Remember that time is set on the **User Preferences Menu**. In Chapter 5, refer to the [“User Preferences Menu”](#) section on page 254 for details.
- When set to **LTC**, the Multiviewer card’s **LTC** (Longitudinal Time Code) **Input** is used. In Chapter 2, refer to the [“Multiviewer Card”](#) section on page 62 for details on the types of time code connections that can be used.



Press **{Clock Display}** to toggle the clock between **12 HR** and **24 HR** modes.

## 9. Multiviewer Operations

### Multiviewer Menu Orientation

## Assign Source Keypad

From the **Multiviewer Setup Menu**, press **{Assign Source}** to display the **Assign Source Keypad**. This keypad enables you to assign a source to the highlighted PIP (as indicated in the **Multiviewer Table**).

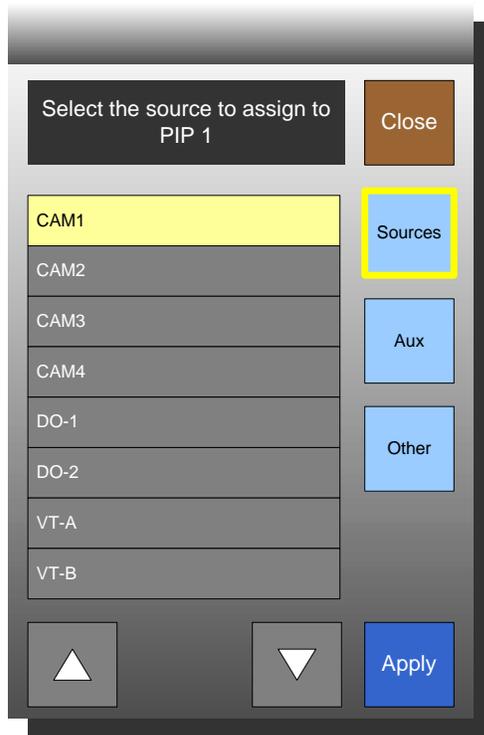


Figure 9-5. Assign Source Keypad (sample)

In the keypad, use the up (▲) and down (▼) arrows to locate the desired source in the list, then press **{Apply}** to accept. When a source is assigned, its current name appears in the PIP's UMD — but this name can be changed using the **{UMD Text}** function.

Three types of PIP sources are available:



Press **{Sources}** to assign input sources to the selected PIP, e.g., those sources that appear on the control panel.



Press **{Aux}** to assign Aux output video to the selected PIP, e.g., **Aux 1**, **Aux 2**, etc. Note that these Aux PIPs will not reflect Aux output scaling.



Press **{Other}** to assign Program and Preview output video to the selected PIP, e.g., **Program**, **Preview**, **M/E 1 PGM**, etc.

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## Multiviewer Setup

Comprehensive Multiviewer setup instructions are provided in Chapter 6. Refer to the [“Multiviewer Setup”](#) section on page 301 for complete details.

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## Multiviewer Memory

Multiviewer setups and layouts (including all PIPs, sources and names) can be stored and recalled using the FSN’s memory system.

- Use the following steps to store a Multiviewer layout in a memory register:
  1. Set up the Multiviewer in the exact configuration that you want stored.
  2. On the **Keypad**, press **STORE**. By default, all available modules light in the keypad’s **Module Section**.
  3. De-select all modules except for **SYS**.
  4. Enter the desired memory register number.
  5. Navigate to the **Memory Menu**. The selected register will be highlighted in the table, and the “**STORE**” banner will be lit red.
  6. Press **{Enables}** to display the **Enables Menu**.
  7. In the “Enables” box, toggle off all Enables except for **Multiviewer**.
  8. Press **{Description}** to display the **Keyboard**.
  9. Enter the desired register description and press **{Enter}**.

**Note**

In <b>Store Mode</b> , the description will not appear in the register table until <b>ENTER</b> is pressed on the <b>Keypad</b> .
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10. Press **ENTER** on the **Keypad**. The Multiviewer layout is now stored, and available for recall as desired.

## 9. Multiviewer Operations

Multiviewer Memory

# 10. Updating Software

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## In This Chapter

This chapter provides detailed instructions for updating FSN Series system software. The following topics are discussed:

- [Software Update Overview](#)
- [Hardware Requirements](#)
- [Downloading Software](#)
- [Updating Control Panel Software](#)
- [Updating FSN-1400 Software](#)
- [Conditional Updates](#)

## 10. Updating Software

### Software Update Overview

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## Software Update Overview

Firmware files for the FSN-1400 and control panel are loaded into the hardware at power-up. These files are stored in the unit's onboard flash memory. Two different update procedures can be performed:

- **Update FSN-1400 and Control Panel** — This procedure updates both the control panel and the FSN-1400. A “new” software update file is required.
  - **Update FSN-1400 only** — This procedure updates the FSN-1400 software to match the control panel software. Use this procedure if the label “**Mismatch**” appears in the **System Status Table** on the **System Menu**.
- For a “new” software update, following is an overview of the steps required:
1. Verify your hardware. Refer to the “[Hardware Requirements](#)” section below.
  2. Download the appropriate “update” file. Refer to the “[Downloading Software](#)” section on page 427.
  3. Transfer the software to a USB thumb drive.
  4. Insert the USB drive into the control panel's top USB port.
  5. In the **Navigation Bar**, press **{System}** to display the **System Menu**.
  6. Press **{Software}** to display the **Software Menu**.
  7. To update the control panel, refer to the “[Updating Control Panel Software](#)” section on page 429.
  8. To update the FSN-1400, refer to the “[Updating FSN-1400 Software](#)” section on page 430.

---

## Hardware Requirements

The following hardware items are required for upgrading FSN Series software:

- IBM compatible computer with an available Ethernet port and USB port.
- USB thumb drive, minimum 1 GB.
- Internet connection.

---

# Downloading Software

Two different methods can be used to download FSN Series software:

- [Via FTP Site](#)
- [Via Web Site](#)

## Via FTP Site

Barco Folsom's FTP site address is: <ftp.folsom.com>

■ To download software from the FTP site:

1. Create a target folder on your PC (e.g., FSN Series), and ensure that your PC is connected to the internet.
2. Log on to the FTP site using one of the following methods:
  - a. If you are using an FTP client such as **Ipswitch WS\_FTP Professional**, log on to our site as follows:
    - **FTP Site:** ftp.folsom.com
    - **User name:** anonymous
    - **Password:** your email address

▲ **Example:** johndoe@somecompany.com
  - b. If you are using a web browser, point the browser to:  
**ftp://ftp.folsom.com**

### Note

If you are using **Internet Explorer 7**, after entering the FTP address, click **Page**, and then click **Open FTP Site in Windows Explorer**.

- c. To use Windows Explorer, right-click the **Start** button, then click **Explore**. When the Explorer window opens, enter the FTP site in the address bar.
3. On the FTP site, navigate to the following directory:  
**ftp://ftp.folsom.com/Image Processing/FSN/**
  4. Transfer the following file to the target folder on your PC:  
**FSN\_[revision #].tar.gz**
  5. Continue with the "[Updating Control Panel Software](#)" section on page 429.

## 10. Updating Software

### Downloading Software

#### Via Web Site

Barco's web site address is: [www.barco.com](http://www.barco.com)

- To download software from the web site:
  1. Create a target folder on your PC (e.g., FSN Series), and ensure that your PC is connected to the internet.
  2. On the web, navigate to:

**<http://www.barco.com>**
  3. Navigate to the “**Presentation Systems**” home page:

**<http://www.barco.com/corporate/en/products/>**
  4. Log in to the **Barco Partnerzone** using your **User Name** and **Password**.
  5. Locate the “**Software Updates**” section, and click “**more software updates.**”
  6. Click the **Folsom Image Processing** tab.
  7. Scroll to the **Presentation Systems/Switchers** section, and click the link for the FSN Series switcher.
  8. Click the link for the latest version of code:

**FSN\_[revision #].tar.gz**
  9. Click the **Download** button.
  10. When the **File Download Dialog** appears, click **Save**.
  11. When the **Save As Dialog** appears, navigate to the target folder on your PC, and then click **Save**.
  12. Continue with the “[Updating Control Panel Software](#)” section on page 429.

---

# Updating Control Panel Software

- Use the following steps to update control panel software.
  1. Ensure that the correct version of software has been properly downloaded from the website or the FTP site. If not, refer to the [“Downloading Software”](#) section on page 427 for instructions.
  2. On your PC or laptop, transfer the software to a USB thumb drive.

### Important

Place the FSN software file at the drive's root. Ensure that only one FSN software file is present at the root.



Update  
Software

3. Insert the USB drive into the control panel's top USB port.
4. In the **Navigation Bar**, press **{System}** to display the **System Menu**.
5. Press **{Software}** to display the **Software Menu**.
6. Note the current software version in the **Status Table**.
7. Press **{Update Software}** to display the **Update Software** menu.
8. Navigate to the folder that contains the correct software file.
9. In the directory, highlight the software file and press **{Install}**. A pop-up alerts you that the update is in progress.
10. When the file has been fully transferred, press **{Restart}**. A pop-up alerts you that the system is re-initializing.
11. Unplug the USB drive.
12. When the pop-up clears, you can continue with the [“Updating FSN-1400 Software”](#) section on page 430.

## 10. Updating Software

### Updating FSN-1400 Software

---

## Updating FSN-1400 Software

This procedure updates the FSN-1400 software to match the control panel software. This step is required:

- After installing a new software file in the control panel.
  - If the label “Mismatch” appears in the **System Status Table** on the **System Menu**.
- Use the following steps to update FSN-1400 software.
1. Ensure that the correct version of software has been installed in the control panel. Refer to the “[Updating Control Panel Software](#)” section on page 429 for details.
  2. If you are not already there, navigate to the **Software Menu**:
    - ~ In the **Navigation Bar**, press **{System}** to display the **System Menu**.
    - ~ Press **{Software}** to display the **Software Menu**.
  3. Press **{Update FSN-1400}**.
  4. In the confirmation pop-up, press **{Yes}**. A pop-up alerts you that the update is in progress.
  5. When prompted in the pop-up, press **{Restart}** to restart the system.

Update  
FSN-1400

### Important

If desired, press **{Close}** to clear the pop-up and display the **Software Menu**. This action will not terminate the “restart” procedure.

If the system fails to restart after several minutes, you can return to the **System Menu** and check the **Communications Setup Menu**. In Chapter 5, refer to the “[Communications Setup Menu](#)” section on page 194 for details.

6. When the pop-up clears, FSN-1400 software matches the control panel software, and your system is fully updated and ready for operation.

---

## Conditional Updates

Two conditional updates may be required if a software mis-match occurs in either the Touch Screen or the control panel’s flash memory. If there is no mis-match, the buttons do not appear.

Update  
Touch  
Screen

Update  
FSN-150  
Flash

- Press **{Update Touch Screen}** to update the software in the **Touch Screen**, if required. Follow the directions on screen to complete the update.
- Press **{Update FSN-150 Flash}** to update the control panel’s flash memory, if required. Follow the directions on screen to complete the update.

# A. Specifications

---

## In This Appendix

This appendix provides detailed technical specifications for the FSN Series. The following topics are discussed:

- [System Specifications Overview](#)
- [Reference Video Input Specifications](#)
- [Reference Video Output Specifications](#)
- [Physical and Electrical Specifications](#)
- [Communications Specifications](#)
- [Agency Specifications](#)
- [Cable Specifications](#)
- [Delay Specifications](#)
- [Pinouts](#)
- [Input and Output Format Tables](#)

## A. Specifications

### System Specifications Overview

---

# System Specifications Overview

The table below provides an overview of all FSN Series specifications.

**Table A-1.** FSN Series Specifications Overview

System Card	Type	Format
NIC	8 x SDI inputs	292M (HDTV), 259M-C (NTSC/PAL)
UIC	2 x SDI inputs	292M (HDTV), 259M-C (NTSC/PAL)
	2 x DVI inputs	DDWG 1.0
	2 x Analog inputs	RGBHV/RGBS/RGsB, YPbPr video, S-video, Composite
M/E	1.5 M/E:13x for Program, Preset, Clean and Aux SDI Outputs	292M (HDTV), 259M-C (NTSC/PAL)
	Cut and Fill SDI Inputs	292M (HDTV), 259M-C (NTSC/PAL)
SYS	SDI ref Input/Loop/Output	SMPTE 292M(HDTV), 259M-C(NTSC/PAL)
	GPIO	4 input (GPI), 8 output (GPO)
	Tally outputs	24 contacts
	2 x Serial Com	RS-232
	Ethernet	10/100 Base-T on RJ-45

## Reference Video Input Specifications

On the **Reference and Output Setup Menu**, when the **{Reference Input}** button is set to **External**, one of three external reference signals can be connected:

- SMPTE bi-level sync
- Tri-level sync
- Black burst

Following is a list of allowed frame rates for the video reference input:

- 25 Hz
- 29.97 Hz
- 50 Hz
- 59.94 Hz

The table below shows the valid video reference frame rates for each FSN-1400 native video format.

**Important**

Interlaced native formats are required to use interlaced video references. 30 Hz frame rate, 60 Hz frame rate and computer syncs are NOT supported video references.

**Table A-2.** Valid video reference frame rates for native video formats

		Native Video Formats					
		720 x 487i @ 29.97 Hz	720 x 576i @ 25 Hz	1920 x 1080i @ 29.97 Hz	1920 x 1080i @ 25 Hz	1280 x 720p @ 59.94 Hz	1280 x 720p @ 50 Hz
Valid Video Reference Frame Rates	29.97 Hz		25 Hz	29.97 Hz	25 Hz	29.97 Hz	25 Hz
						59.94 Hz	50 Hz

## A. Specifications

### Reference Video Output Specifications

---

## Reference Video Output Specifications

On the **Reference and Output Setup Menu**, you can toggle the **{Reference Out}** button between **Tri-Level Sync** and **Black Burst**. Please note:

- The sync out format (as provided on the **Ref Out BNC**) changes, depending on the selected native video format.
- All **SD** sync out formats are black burst.
- All **HD** sync out formats are tri-level.

The table below illustrates which sync out format is provided, based on each available native video format selection.

**Table A-3.** FSN-1400 Sync Out Formats

Native Video Format	Sync Out Format
1080i @ 50	625i @ 50
1080i @ 50	1080i @ 50
1080i @ 59.94	525i @ 59.94
1080i @ 59.94	1080i @ 59.94
1080p @ 23.98	525i @ 59.94 (bi-level only)
1080p @ 23.98	1080p @ 23.98 (tri-level only)
1080p @ 23.98	1080i @ 59.94 (tri-level only)
1080p @ 24	1080p @ 24 (tri-level only)
1080p @ 25	625i @ 50 (bi-level only)
1080p @ 25	1080i @ 50 (tri-level only)
1080p @ 25	1080p @ 25 (tri-level only)
525i @ 59.94	525i @ 59.94
525i @ 59.94	1080i @ 59.94
625i @ 50	625i @ 50
625i @ 50	1080i @ 50
720p @ 50	625i @ 50
720p @ 50	1080i @ 50
720p @ 50	720p @ 50
720p @ 59.94	525i @ 59.94
720p @ 59.94	1080i @ 59.94
720p @ 59.94	720p @ 59.94

## Physical and Electrical Specifications

### FSN-1400

The table below lists FSN-1400 physical and electrical specifications.

**Table A-4.** FSN-1400 Physical and Electrical Specifications

Parameter	Detail	Specification
Power	Connector x 2	Standard IEC, integral on/off switch
		100-240 VAC, 50-60 Hz, 800 watts max. (each supply)
Dimensions	RU	6
	Height	10.5 inches (26.67 cm)
	Width	19.00 inches (48.26 cm)
	Depth	20.75 inches (52.70 cm)
Weight		58.0 lbs (26.5 kg)
Temperature		0-40 degrees C
Humidity		0-95% non-condensing

### FSN-150

The table below lists FSN-150 physical and electrical specifications.

**Table A-5.** FSN-150 Physical and Electrical Specifications

Parameter	Detail	Specification
Power	Connector x 1	Standard IEC, integral on/off switch
		100-240 VAC, 50-60 Hz, 240 watts max.
Dimensions	Height	7.00 inches (17.78 cm)
	Width	22.00 inches (55.88 cm)
	Depth	24.00 inches (60.96 cm)
Weight		26.0 lbs (11.79 kg)
Temperature		0-40 degrees C
Humidity		0-95% non-condensing

## A. Specifications

### Physical and Electrical Specifications

## Touch Screen Display

The table below lists Touch Screen Display physical and electrical specifications.

**Table A-6.** Touch Screen Display Physical and Electrical Specifications

Parameter	Detail	Specification
Power		1.5 amps at 12 V, 18 watts
Dimensions	Height	11.57 inches (29.38 cm)
	Width	9.65 inches (24.51 cm)
	Depth (with knobs)	2.67 inches (6.78 cm)
	Depth (without knobs)	2.00 inches (5.08 cm)
Weight		5.0 lbs (2.26 kg)
Temperature		0-40 degrees C
Humidity		0-95% non-condensing

## Touch Screen Display Stand

The table below lists Touch Screen Display Stand physical specifications.

**Table A-7.** Touch Screen Display Stand Physical and Electrical Specifications

Parameter	Detail	Specification
Stand Dimensions	Height	12.8 inches (32.51 cm)
	Width	14.0 inches (35.56 cm)
	Depth	9.8 inches (24.89 cm)
Weight		8.0 lbs (3.62 kg)

## Communications Specifications

The table below lists FSN Series communications specifications.

**Table A-8.** FSN Series Communications Specifications

Parameter	Detail	Specification
FSN-1400	Ethernet	10/100 Mbps
	RS-232 Diagnostic	8, N, 1 @ 115.2 kbaud
FSN-150	Ethernet Port 1	1 Gbit/s
	Ethernet Port 2	1 Gbit/s
	USB	High Speed USB 2.0

## Agency Specifications

The table below lists FSN Series agency specifications.

**Table A-9.** FSN Series Agency Specifications

Parameter	Detail	Specification
Agency Specifications	EMI/EMC	EN55103-1 E4, EN55103-2, FCC Part 15 Subpart B Class A
	Safety	EN 60950 Class 1

## Cable Specifications

The table below lists the recommended specifications for digital video cable.

**Table A-10.** Digital video cable recommended specifications

Parameter	Detail	Specification
Digital video cable	Belden 1694A	300m at 270Mbps (SD-SDI)
	Belden 1694A	100m at 1.485Gbps and 1.485/1.001Gbps (HD-SDI)

## A. Specifications

### Delay Specifications

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## Delay Specifications

The following specifications are provided in this section:

- [NIC Delay](#)
- [UIC Delay](#)

### NIC Delay

The table below summarizes the amount of delay incurred for a selected native input in each of the three sync modes:

**Table A-11.** Native input delay for selected sync modes

Sync Mode	Native Input Delay	
	Input video is $\leq \pm 1/2$ line of reference	Input video is $\geq \pm 1/2$ line of reference
<b>Auto</b>	Minimum delay	1 frame delay *
<b>Frame Sync</b>	1 frame delay	1 frame delay
<b>Minimum Delay</b>	Minimum delay	Invalid video behavior **

\* In **Auto** mode, if the system switches to **Frame Sync**, the system stays in the mode. To return to **Minimum Delay** mode, press the **{Refresh Sync}** button.

\*\* Invalid video will either tear, or go to black, depending on how the **Black on Invalid Video** function is set on the **User Preferences Menu**.

### UIC Delay

The table below summarizes the amount of delay incurred for a selected universal input:

**Table A-12.** Universal input delay

Universal Input Delay	Input video is $\leq \pm 1/2$ line of reference	Input video is $\geq \pm 1/2$ line of reference
	1 frame delay	2 frames delay

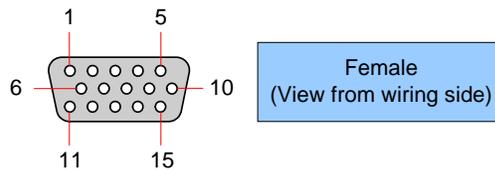
## Pinouts

The following topics are discussed in this section:

- [Analog 15-pin D Connector](#)
- [DVI-I Connector](#)
- [Ethernet Connector](#)
- [Serial Connectors](#)
- [Tally Connector](#)
- [GPIO Connector](#)

### Analog 15-pin D Connector

The figure below illustrates the analog 15-pin D connector:



**Figure A-1.** Analog 15-pin D connector

The table below lists Analog 15-pin D connector pinouts.

**Table A-13.** Analog 15-pin D Connector Pinouts

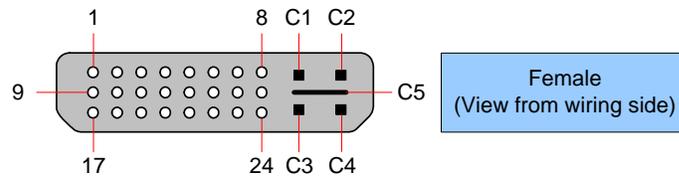
Pin	Signal	Pin	Signal
1	Red	9	+5V Power
2	Green	10	GND
3	Blue	11	
4		12	DDC Data
5		13	H Sync or C Sync
6	Red return	14	V Sync
7	Green return	15	DDC Clock
8	Blue return		

## A. Specifications

### Pinouts

## DVI-I Connector

The figure below illustrates the DVI-I connector:



**Figure A-2.** DVI-I connector

The table below lists DVI-I connector pinouts. Please note:

- T.M.D.S = Transition Minimized Differential Signal
- DDC = Display Data Channel

**Table A-14.** DVI-I Connector Pinouts

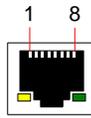
Pin	Signal	Pin	Signal
1	T.M.D.S. Data 2-	13	T.M.D.S. Data 3+
2	T.M.D.S. Data 2+	14	+5V Power
3	T.M.D.S. Data 2/4 Shield	15	ground (for +5V)
4	T.M.D.S. Data 4-	16	Hot Plug Detect
5	T.M.D.S. Data 4+	17	T.M.D.S. Data 0-
6	DDC Clock	18	T.M.D.S. Data 0+
7	DDC Data	19	T.M.D.S. Data 0/5 Shield
8	Analog Vertical Sync	20	T.M.D.S. Data 5-
9	T.M.D.S. Data 1-	21	T.M.D.S. Data 5+
10	T.M.D.S. Data 1+	22	T.M.D.S. Clock Shield
11	T.M.D.S. Data 1/3 Shield	23	T.M.D.S. Clock +
12	T.M.D.S. Data 3-	24	T.M.D.S. Clock -
MicroCross Pins			
C1	Analog Red Video	C4	Analog Horizontal Sync
C2	Analog Green Video	C5	Analog Common Ground Return
C3	Analog Blue Video		

### Note

Pins **C1**, **C2**, **C3**, **C4**, and **C5** are not used on the FSN-1400.

## Ethernet Connector

The figure below illustrates the Ethernet connector:



**Figure A-3.** Ethernet connector

The table below lists Ethernet connector pinouts.

**Table A-15.** Ethernet Connector Pinouts

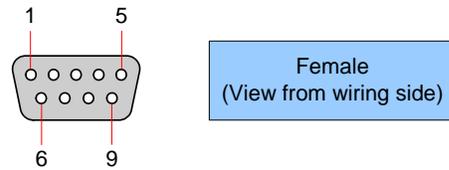
Pin	Signal	Wire Color
1	TX Data +	White / Orange
2	TX Data -	Orange
3	RX Data +	White / Green
4		Blue
5		White / Blue
6	RX Data -	Green
7		White / Brown
8		Brown

## A. Specifications

### Pinouts

## Serial Connectors

The figure below illustrates the 9-pin D RS-232 serial connector:



**Figure A-4.** Serial 9-pin D connector

The table below lists 9-pin D connector pinouts for the **System Card**'s front serial RS-232 diagnostic port:

**Table A-16.** System Card 9-pin D Front Diagnostic Port Pinouts

Pin	Signal	Pin	Signal
1	CD - Carrier Detect	6	DTR - Data Terminal Ready
2	TXD - Transmitted Data	7	CTS - Clear To Send
3	RXD - Received Data	8	RTS - Request To Send
4	DSR - Data Set Ready	9	Unused
5	GND - Signal Ground		

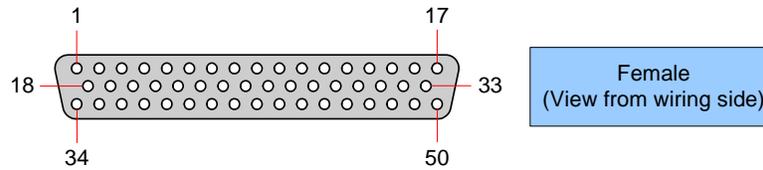
The table below lists 9-pin D connector pinouts for the **System Card**'s two rear serial ports:

**Table A-17.** System Card 9-pin D Rear Serial Port Pinouts

Pin	Signal	Pin	Signal
1	GND - Signal Ground	6	GND - Signal Ground
2	RX-	7	RX+
3	TX+	8	TX-
4	Ground	9	Ground
5	Unused		

## Tally Connector

The figure below illustrates the **Tally** connector.



**Figure A-5.** Tally connector

The table below lists **Tally** connector pinouts.

**Table A-18.** Tally connector pinouts

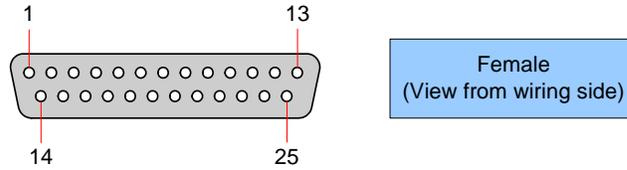
Pin	Signal	Pin	Signal
38	Tally 1 NO	5	Tally 1 C
22	Tally 2 NO	39	Tally 2 C
6	Tally 3 NO	23	Tally 3 C
40	Tally 4 NO	7	Tally 4 C
24	Tally 5 NO	41	Tally 5 C
8	Tally 6 NO	25	Tally 6 C
42	Tally 7 NO	9	Tally 7 C
26	Tally 8 NO	43	Tally 8 C
10	Tally 9 NO	27	Tally 9 C
34	Tally 10 NO	1	Tally 10 C
35	Tally 11 NO	18	Tally 11 C
19	Tally 12 NO	2	Tally 12 C
36	Tally 13 NO	3	Tally 13 C
37	Tally 14 NO	20	Tally 14 C
21	Tally 15 NO	4	Tally 15 C
44	Tally 16 NO	11	Tally 16 C
45	Tally 17 NO	28	Tally 17 C
29	Tally 18 NO	12	Tally 18 C
46	Tally 19 NO	13	Tally 19 C
47	Tally 20 NO	30	Tally 20 C
31	Tally 21 NO	14	Tally 21 C
48	Tally 22 NO	15	Tally 22 C
32	Tally 23 NO	49	Tally 23 C
16	Tally 24 NO	33	Tally 24 C
50	Ground	17	Ground

# A. Specifications

## Pinouts

### GPIO Connector

The figure below illustrates the **GPIO** connector.



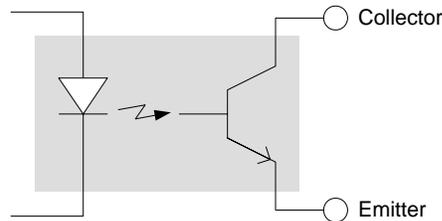
**Figure A-6.** GPIO connector

The table below lists **GPIO** connector pinouts.

**Table A-19.** GPIO Connector Pinouts

Pin	Signal	Pin	Signal
1	Output 1 (Collector)	14	Output 1 (Emitter)
2	Output 2 (Collector)	15	Output 2 (Emitter)
3	Output 3 (Collector)	16	Output 3 (Emitter)
4	Output 4 (Collector)	17	Output 4 (Emitter)
5	Output 5 (Collector)	18	Output 5 (Emitter)
6	Output 6 (Collector)	19	Output 6 (Emitter)
7	Output 7 (Collector)	20	Output 7 (Emitter)
8	Output 8 (Collector)	21	Output 8 (Emitter)
9	Input 1	22	Input 2
10	Input 3	23	Input 4
11	Unused	24	Unused
12	Unused	25	Unused
13	Ground		

The figure below illustrates a generic GPO connection, which could be used for any GPO circuit listed above:



**Figure A-7.** Generic GPO connection

## Input and Output Format Tables

The following tables are provided in this section:

- [UIC Input and UOC Output Formats](#)
- [NIC Input Formats, UIC Input Formats \(BNC\)](#)
- [Output Formats](#)

### UIC Input and UOC Output Formats

The table below lists the following:

- Available input formats supported on the HD-15, DVI-I and BNC connectors for the **UIC** (Universal Input Card).
- Available output formats supported on the HD-15, DVI-I and BNC connectors for the **UOC** (Universal Output Card).

**Note**

An "x" in a cell indicates that the listed format can be processed by the connector.

**Table A-20.** UIC Input and UOC output formats

Format	Color Space	UIC Connectors		
		DVI	HD-15	BNC
NTSC (480i)	SMPTE, RGB		x	x
720x480p	SMPTE, RGB	x	x	
PAL (576i)	SMPTE, RGB		x	x
720x575p	SMPTE, RGB	x	x	
640x480 @59.94	RGB	x	x	
640x480 @60	RGB	x	x	
640x480 @72	RGB	x	x	
640x480 @75	RGB	x	x	
640x480 @85	RGB	x	x	
800x600 @50	RGB	x	x	
800x600 @56	RGB	x	x	
800x600 @59.94	RGB	x	x	
800x600 @60	RGB	x	x	
800x600 @72	RGB	x	x	
800x600 @75	RGB	x	x	
800x600 @85	RGB	x	x	

## A. Specifications

### Input and Output Format Tables

**Table A-20.** UIC Input and UOC output formats (Continued)

Format	Color Space	UIC Connectors		
		DVI	HD-15	BNC
1024x768 @47.95	RGB	x	x	
1024x768 @48	RGB	x	x	
1024x768 @50	RGB	x	x	
1024x768 @59.94	RGB	x	x	
1024x768 @60	RGB	x	x	
1024x768 @70	RGB	x	x	
1024x768 @71.93	RGB	x	x	
1024x768 @72	RGB	x	x	
1024x768 @75	RGB	x	x	
1024x768 @85	RGB	x	x	
1152x864 @75	RGB	x	x	
1280x768 @47.95	RGB	x	x	
1280x768 @48	RGB	x	x	
1280x768 @50	RGB	x	x	
1280x768 @59.94	RGB	x	x	
1280x768 @75	RGB	x	x	
1280x960 @50	RGB	x	x	
1280x960 @59.94	RGB	x	x	
1280x960 @60	RGB	x	x	
1280x960 @85	RGB	x	x	
1280x1024 @47.95	RGB	x	x	
1280x1024 @48	RGB	x	x	
1280x1024 @50	RGB	x	x	
1280x1024 @59.94	RGB	x	x	
1280x1024 @60	RGB	x	x	
1280x1024 @71.93	RGB	x	x	
1280x1024 @72	RGB	x	x	
1280x1024 @75	RGB	x	x	
1280x1024 @85	RGB	x	x	
1364x768 @47.95	RGB	x	x	
1364x768 @48	RGB	x	x	
1364x768 @50	RGB	x	x	

## A. Specifications

### Input and Output Format Tables

**Table A-20.** UIC Input and UOC output formats (Continued)

Format	Color Space	UIC Connectors		
		DVI	HD-15	BNC
1364x768 @59.94	RGB	x	x	
1364x768 @75	RGB	x	x	
1364x1024 @47.95	RGB	x	x	
1364x1024 @48	RGB	x	x	
1364x1024 @50	RGB	x	x	
1364x1024 @59.94	RGB	x	x	
1364x1024 @75	RGB	x	x	
1366x768 @50	RGB	x	x	
1366x768 @59.94	RGB	x	x	
1400x1050 @48	RGB	x	x	
1400x1050 @50	RGB	x	x	
1400x1050 @59.94	RGB	x	x	
1400x1050 @60	RGB	x	x	
1400x1050 @75	RGB	x	x	
1536x768 @50	RGB	x	x	
1536x768 @59.94	RGB	x	x	
1680x1050 @60	RGB	x	x	
1600x1200 @47.95	RGB	x	x	
1600x1200 @48	RGB	x	x	
1600x1200 @50	RGB	x	x	
1600x1200 @59.94	RGB	x	x	
1600x1200 @60	RGB	x	x	
1280x720p @23.98	SMPTE, RGB	x	x	x
1280x720p @24	SMPTE, RGB	x	x	x
1280x720p @25	SMPTE, RGB	x	x	x
1280x720p @29.97	SMPTE, RGB	x	x	x
1280x720p @30	SMPTE, RGB	x	x	x
1280x720p @48	SMPTE, RGB	x	x	
1280x720p @50	SMPTE, RGB	x	x	x
1280x720p @59.94	SMPTE, RGB	x	x	x
1280x720p @60	SMPTE, RGB	x	x	x
1920x1080p @23.98	SMPTE, RGB	x	x	x

## A. Specifications

### Input and Output Format Tables

**Table A-20.** UIC Input and UOC output formats (Continued)

Format	Color Space	UIC Connectors		
		DVI	HD-15	BNC
1920x1080p @24	SMPTE, RGB	x	x	x
1920x1080p @25	SMPTE, RGB	x	x	x
1920x1080p @29.97	SMPTE, RGB	x	x	x
1920x1080p @30	SMPTE, RGB	x	x	x
1920x1080p @48	SMPTE, RGB	x	x	
1920x1080p @50	SMPTE, RGB	x	x	
1920x1080p II @50	SMPTE, RGB	x	x	
1920x1080p @59.94	SMPTE, RGB	x	x	
1920x1080p @60	SMPTE, RGB	x	x	
1920x1080sF@23.98	SMPTE, RGB	x	x	x
1920x1080sF@24	SMPTE, RGB	x	x	x
1920x1080sF@29.97	SMPTE, RGB	x	x	x
1920x1080sF@25	SMPTE, RGB	x	x	x
1920x1080sF@30	SMPTE, RGB	x	x	x
1920x1080i @50	SMPTE, RGB	x	x	x
1920x1080i @59.94	SMPTE, RGB	x	x	x
1920x1080i @60	SMPTE, RGB	x	x	x
2048x1080p @48	RGB	x	x	
2048x1080p @50	RGB	x	x	
2048x1080p II @50	RGB	x	x	

## NIC Input Formats, UIC Input Formats (BNC)

The table below lists the available input formats supported on the NIC, and the available input formats supported on the UIC BNC connector.

**Table A-21.** NIC Input Formats

Standard	Format
SMPTE 259M-C	720 x 487i @ 59.94
	720 x 576i @ 50
SMPTE 292M	1920 x 1080i @ 59.94
	1920 x 1080i @ 50
	1920 x 1080PsF @ 29.97
	1920 x 1080PsF @ 25
	1280 x 720p @ 59.94
	1280 x 720p @ 50

## Output Formats

The table below lists the available output formats supported on the M/E card.

**Table A-22.** M/E Card Output Formats

Standard	Format
SMPTE 259M-C	720 x 487i @ 59.94 (NTSC)
	720 x 576i @ 50 (PAL)
SMPTE 292M	1280 x 720p @ 50
	1280 x 720p @ 59.94
	1920 x 1080i @ 50
	1920 x 1080i @ 59.94
	1920 x 1080p @ 23.98
	1920 x 1080p @ 24
	1920 x 1080p @ 25
	1920 x 1080p @ 29.97

## A. Specifications

Input and Output Format Tables

## B. Contact Information

---

### In This Appendix

The following topics are discussed in this Appendix:

- [Warranty](#)
  - [Return Material Authorization \(RMA\)](#)
  - [Contact Information](#)
- 

### Warranty

All video products are designed and tested to the highest quality standards and are backed by a full 3-year parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. Barco warranties are only valid to the original purchaser/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modifications, lightning strikes, abuse (drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair. Barco will cover shipping charges for return shipments to customers.

---

### Return Material Authorization (RMA)

In the unlikely event that a product is required to return for repair, please call the following number and ask for a Sales Engineer to receive a Return Merchandise Authorization number (RMA).

- (888) 414-7226

RMA Conditions are listed below:

- a. Prior to returning any item, you must receive a Return Merchandise Authorization (RMA) number.
- b. All RMA numbers must appear on their return-shipping label.
- c. RMA numbers are valid for ten (10) days from issue date.
- d. All shipping and insurance charges on all RMAs must be prepaid by the customer

## B. Contact Information

Contact Information

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### Contact Information

**Barco, Inc.**

11101 Trade Center Drive  
Rancho Cordova, California 95670  
USA

- Phone: (916) 859-2500
- Fax: (916) 859-2515
- Website: [www.barco.com](http://www.barco.com)

**Sales Contact Information**

- Direct: (916) 859-2505
- Toll Free: (888) 414-7226
- E-mail: [folsomsales@barco.com](mailto:folsomsales@barco.com)

**Barco N.V.**

Noordlaan 5  
8520 Kurne  
BELGIUM

- Phone: +32 56.36.82.11
- Fax: +32 56.35.16.51
- Website: [www.barco.com](http://www.barco.com)

**Technical Support Information**

- Tech Line: (866) 374-7878 — 24 hours per day, 7 days per week
- E-mail: [folsomsupport@barco.com](mailto:folsomsupport@barco.com)

# Index

## Softkeys and Symbols

+ symbol, map column	205, 206, 242, 298
{1 > 2}	253
{1-1 Sample}	217
{2 > 1}	253
{Active and Pos}	248, 299
{Add KF}	372
{Adjust Custom Aspect}	370
{Adjust H Timing}	217
{Adjust V Timing}	217
{Advanced Output Setup}	244, 247, 298, 299
{Advanced}	168, 177, 185, 366, 369
{All Inputs}	182
{All Links Off}	388
{All Off}	179, 261, 271
{All On}	179, 260, 261
{All Pixels Off}	261
{All Pixels On}	261
{All/Set Trim}	149
{Analog Sync}	246, 299
{Analog Type}	246, 299
{Apply}	194, 237
{Aspect Ratio}	250, 300, 370
{Assign Button}	233
{Assign Source}	416, 422
{Auto Acquire}	215
{Aux 1 - 14}	182
{Aux Name}	242, 298
{Aux Setup}	191, 240, 298
{Aux}	422
{Backup and Restore}	191, 273
{Backup System}	273
{Bank}	151, 153
{BG Bus}	180
{BG Color}	420
{Blue Bright}	210, 383
{Blue Contrast}	210, 384
{Blue}	260
{Border Color}	420
{Border Hue}	378
{Border Luma}	379
{Border Sat}	378
{Border Shadow Opacity}	366, 377, 389
{Border Units}	379
{Border Width Color}	378
{Border}	378
{Bright Contrast Gamma}	210, 252
{Bright Contrast}	383
{Bright}	210, 383
{Button Test Mode}	261
{Calibrate Touch Screen}	259
{Caps Lock}	147
{Clean Feed Outputs}	232
{Clean Feed Setup}	190, 232
{Clear KF}	372
{Clear Log}	267
{Clear Mask}	213
{Clear Tally Closure}	236, 238
{Clear Text}	147
{Clear}	145
{Clip Gain Opacity}	161
{Clip}	161
{Clock BG Color}	420
{Clock Display}	421
{Clock Setup}	416, 421
{Clock Source}	421
{Close All Tallies}	263
{Close}	145
{Color BG}	170, 227
{Color Correct}	223, 252, 300
{Color Effects}	366
{Color Picker}	156, 163, 378
{Color Space}	216
{Com Setup}	190, 194
{Contrast}	210, 383
{Copy All Settings}	246, 299
{Copy Key Settings}	167
{Custom}	370
{De-Interlace}	218, 245, 299, 385
{Delete KF}	372
{Delete Register}	185
{Delete Shot Box KF}	382
{Description}	176, 177, 184
{Diags}	191, 257
{Direction}	153
{Discover FSN-1400}	195
{Display Backlight}	261
{Display Pixel Test}	261

## Index

- {DSK} ..... 181
- {Dual Output Layouts} ..... 418
- {DVE 1 - 4} ..... 183
- {DVE Assign Info} ..... 364
- {DVE Assign} ..... 164, 182, 190, 363, 364
- {DVE Extras} ..... 366
- {DVE Links} ..... 369, 388
- {DVE Menu} ..... 164
- {DVE} ..... 164, 368
- {DVI Sync} ..... 246, 299, 417
- {Edge Width} ..... 156, 380
- {Edge} ..... 155
- {EDID Format} ..... 216
- {Effect Setup} ..... 366
- {Effects} ..... 181
- {Enables} ..... 177, 178
- {Enter} ..... 146
- {Error Reporting} ..... 207, 231, 316
- {Exponent} ..... 150
- {External DSK Setup} ..... 190, 229
- {External Key} ..... 166
- {Factory Reset} ..... 274
- {Fill H/V} ..... 221, 250
- {Fill H} ..... 220, 249
- {Fill V} ..... 220, 250, 300
- {Flicker Filter} ..... 218, 245, 298
- {Freeze Mode} ..... 207, 231
- {Freeze} ..... 206, 230
- {FSN-1400} ..... 267
- {FSN-150} ..... 267
- {Gain} ..... 161
- {Gamma} ..... 210
- {Go to Bottom} ..... 265, 267
- {Go to Top} ..... 265, 267
- {Green Bright} ..... 210, 383
- {Green Contrast} ..... 210, 384
- {Green On} ..... 261
- {Green} ..... 260
- {H Active} ..... 217
- {H Pos} ..... 217
- {H Position} ..... 219, 371
- {H Size} ..... 219, 371
- {H Total} ..... 217, 247
- {Hard} ..... 155
- {Hue Sat} ..... 210, 252, 384
- {Hue} ..... 156, 163, 210, 384
- {Image Flip} ..... 386
- {Info} ..... 204, 230
- {Input Format} ..... 216
- {Input Map} ..... 182
- {Input Name} ..... 206
- {Input Setup} ..... 190
- {Invert} ..... 384
- {Key 1} ..... 180
- {Key 2} ..... 180
- {Key Bus} ..... 162
- {Key Fill} ..... 162
- {Key Menu} ..... 369
- {KEY} ..... 164
- {Keyer} ..... 157, 159
- {KF Freeze} ..... 386
- {LED Test Mode} ..... 260
- {LEDs Buttons Displays} ..... 260
- {Linear} ..... 150, 160
- {Lock Panel} ..... 191, 272
- {Lock Unlock} ..... 185
- {Lock} ..... 219, 222, 371, 374, 379
- {Lum} ..... 156, 163
- {Luma} ..... 160
- {M/E 1 Clean 1} ..... 232, 233
- {M/E 1 Clean 2} ..... 232, 233
- {M/E 1 Out} ..... 232
- {M/E 2 Clean 1} ..... 233, 234
- {M/E 2 Clean 2} ..... 233, 234
- {M/E 2 Out} ..... 233
- {Map Aux to Menu} ..... 242, 298
- {Map Aux to Panel} ..... 242, 298
- {Map Buttons} ..... 190, 224
- {Map Linear Key Fill} ..... 226
- {Map Source/Cut} ..... 226
- {Map to} ..... 206
- {Map} ..... 227
- {Mask Bottom} ..... 213, 222, 376
- {Mask Left} ..... 213, 222, 376
- {Mask Right} ..... 213, 222, 376
- {Mask Top} ..... 213, 222, 376
- {Mask} ..... 213, 222, 251, 253, 300, 366
- {Matte} ..... 163
- {Memory Register} ..... 179, 184
- {Mode} ..... 416
- {Mono} ..... 384
- {Motion Threshold} ..... 219, 245, 299, 385, 386
- {Multiviewer Setup} ..... 191, 239, 415
- {N/R} ..... 154
- {Name Channel} ..... 364
- {Name Shot Box KF} ..... 382
- {New Effect} ..... 372
- {Normal} ..... 154
- {Offset Timing Info} ..... 248
- {Offset Timing} ..... 248, 299
- {Opacity} ..... 161, 380
- {Open All Tallies} ..... 262
- {Other Setup} ..... 191, 253
- {Other} ..... 227, 422
- {Output Format} ..... 200, 244, 417
- {Output Setup} ..... 416, 417
- {Output Test Patterns} ..... 191, 270
- {Output V-Lock Info} ..... 201
- {Output V-Lock} ..... 200
- {Overall Opacity} ..... 380, 382
- {Page Down} ..... 265, 267
- {Page Up} ..... 265, 267
- {Pan Zoom Source} ..... 221, 250, 300, 366
- {Panel Button} ..... 225, 226

{PGM Bus}	181	{Set Top Limit}	258
{PGM Clean}	233, 234	{Set}	255
{PGM Out}	233	{Setup}	208
{PIP}	164	{Shadow Effects}	380
{PST Bus}	180, 181	{Shadow H Pos}	379
{PST}	162	{Shadow H Size}	379
{Pulldown Comp}	218	{Shadow Luma}	380
{Raster Box}	271	{Shadow Opacity}	380
{Rate}	181	{Shadow Size Position}	379
{Re-center}	258	{Shadow V Pos}	380
{Red Bright}	210, 383	{Shadow V Size}	379
{Red Contrast}	210, 384	{Shadow}	379
{Red On}	261	{Sharpness}	218, 245
{Red}	260	{SHIFT}	226
{Ref and Output Setup}	190, 197	{Shot Box}	369
{Ref H Offset}	199	{Shut Down}	192, 276
{Ref Info}	199	{Single Output Layouts}	418
{Ref Input}	197, 198	{Size and Position}	219, 249, 300, 366
{Ref Output}	198, 199	{Sizing and Scaling}	219, 249
{Ref V Offset}	199	{Soft Reset FSN-1400}	275
{Refresh All Sync}	207	{Soft Reset Panel}	275
{Refresh Sync}	211, 230	{Soft Reset System}	274
{Reset to Default}	256	{Soft}	155
{Reset}	161, 192, 219, 274, 371	{Software}	191, 268
{Restart}	273	{Source H Position}	222, 374
{Restore Default Settings}	168, 196, 223, 231, 246, 299	{Source H Size}	221, 373
{Restore Saved Settings}	223, 231	{Source V Position}	222, 374
{Restore System}	273	{Source V Size}	222, 373
{Reverse}	154	{Sources}	227, 422
{RGB Bright}	210, 252, 383	{Split}	162
{RGB Contrast}	210, 252, 384	{Strobe Rate}	386
{Run Forward}	369	{Strobe}	386
{Run Freeze}	386	{Swap Key Settings}	165
{Run Reverse}	369	{Sync Mode}	201, 211, 230
{S Curve}	150	{Sync}	248, 299
{Sample Phase}	217	{Tallies}	262
{Sat}	156, 163, 210, 384	{Tally Setup}	190, 235
{Save All}	191, 272, 348	{Tally}	182
{Save Settings}	223, 231	{T-Bar Joystick Knobs}	258
{Save Shot Box KF}	382	{T-Bar M/E}	259
{Save to USB}	265, 267	{T-Bar}	181
{SDI H Offset}	201	{Tech Support}	265, 267, 277
{SDI Output Timing}	200, 201	{Test Off}	260, 261
{SDI V Offset}	201	{Test Patterns}	227
{Select All Outputs}	271	{Totals}	247, 299
{Select Color}	237	{Trim +}	146
{Select Colors}	416, 420	{Trim -}	145
{Select Input}	237	{Type}	160
{Select Layout}	416, 418	{UMD Color 1}	421
{Self}	162	{UMD Color}	416
{Set Bottom Limit}	258	{UMD Text}	416
{Set Clock}	256, 304	{Unassign Aux}	242, 298
{Set Date}	256, 304	{Un-Assign Channel}	364
{Set IP Address}	194, 196	{Undo}	145
{Set Subnet Mask}	196	{Unlock}	272
{Set Tally Closure}	236, 238	{Un-map Linear Key Fill}	226
		{Un-map Source/Cut}	226

## Index

{Un-Map}	206
{Update FSN-1400}	269, 430
{Update FSN-150 Flash}	269, 430
{Update Software}	269, 429
{Update Touch Screen}	269, 430
{User Prefs}	191, 254
{V Active}	217
{V Pos}	217
{V Position}	219, 371
{V Size}	219, 371
{V Total}	248
{View Error Info}	264, 316
{View Errors}	264
{View Log}	266
{White}	260
{Width}	379

## Numerics

10/100BaseT	100
1-1 Sampling	217

## A

About the FSN Series	23
AC	
power	42, 100
power and voltage selection	115
Access	
color background menu	170
keyer menu	158
memory menu	175
plate	101
system menu	189
transition menu	149
wipe menu	152
Acrobat usage	19
navigating and searching	19
Address, company	3
Adjust	
color correction	210
color correction, output	252
UOC H and V active	248, 299
UOC H and V sync	248, 299
UOC offset timing	248, 299
UOC output	244
UOC output parameters	247
UOC output timing	248, 299
Advanced	
DVE menu	369, 383, 385
key functions menu	168
memory functions	185
UOC setup menu	244, 247, 298, 299
Agency specifications	437

Air vents	41
ALL	
CUT	348
SAVE	272
TRAN	348
Analog	
15-pin D connector pinouts	439
format connection table	65
input flexibility	65, 128
sync polarity	246, 299
sync type	246, 299
Application questions	32
Aspect ratio	
DVE	370
output	250, 300
ASSIGN	232
button	92, 233
DVE channels to keyers	389
mapping notes	234
Assignable source	92
Audio connectors	100
Auto	
acquire	215
acquire, notes	215
sync	211
transition	79, 88
AUTO TRAN	79, 88
memory	97
Automatic	
DVE trigger rules	400
DVE triggering	396, 397
mix	331
mix key	335
transition	325
wipe	332
wipe key	336
Aux	
buses, working with	346
enables	182
format	242
map	242
memory functions	338
menu	186
name	242
output card rear panels	42
output card slot	40
output connections	124
output row	91
outputs, native	51, 61
section	71, 91
setup	298
setup menu	240
setup menu functions	242
slot	241
source row	92
source row, rules	92
table	186

- table, description .....241
- Auxiliary output flexibility .....36
  
- B**
- Background bus .....82
- Backlight .....315
- Backspace .....97, 145
- Backup
  - and restore menu .....273
  - system .....273
  - system to USB .....305
- Bank
  - M/E .....71, 81
  - PGM .....70, 74
  - selection pop-up .....153
  - wipe .....153
- Bar
  - function, keypad .....144
  - menu .....135
  - prompt .....134
  - title .....134
  - tool .....135
- Barco
  - contact information .....452
  - sales contact information .....452
  - technical support information .....3, 452
  - warranty .....451
- Basic system .....25
- BG .....78, 82, 85
- Black on invalid video .....201, 256
- Block diagram, system .....30
- BNC breakout cable .....65, 128
- Border
  - section, DVE .....378
  - selection keypad .....378
- Bottom, control panel .....101
- Boxes, shipping information .....104
- Brightness, input .....210, 383
- Burst .....198, 199
- Bus
  - background .....82
  - display brightness .....255
  - key .....82
  - phantom key .....75
  - preset .....75, 82
  - program .....75
- Button .....225
  - +/- .....97
  - ASSIGN .....92, 233
  - categories and color .....136
  - color, understanding .....311
  - conditional .....138
  - custom control .....93
  - function .....136
  - latching .....137
  - location .....139
  - map table .....225
  - mapping setup .....297
  - momentary .....137
  - navigation .....137
  - pop-up .....139
  - re-entry .....75
  - shift .....75, 82
  - summary of types .....141
  - test mode pop-up .....261
  - toggle .....138
  - value .....138
- Buttons, tables, matrices .....136
  
- C**
- Cable
  - and adapter information .....105
  - specifications .....437
- Calibrate touch screen .....259
- Card
  - descriptions .....43
  - digital video effects .....57
  - DVE .....57
  - ejectors .....45
  - FPGA loaded LED .....64
  - insertion .....118
  - installation .....116
  - LEDs, front edge .....64
  - M/E .....49
  - multiviewer .....62, 412
  - NAC .....60
  - native input .....53
  - native output .....60
  - NIC .....53
  - power LED .....64
  - removal .....120
  - slot allocation .....35
  - system .....44
  - UIC .....55
  - universal input .....55
  - universal output .....58
  - UOC .....58
- Change history .....6
- Chapter structure .....18
- Chassis
  - front view .....39
  - overview .....34
  - rear view .....41
- Clean feed
  - out .....50
  - output selection .....52
  - output table .....52
  - outputs .....232
  - select outputs .....347
  - setup .....290

# Index

setup menu	232
Clear	97, 145
mask	213
tally closure	238
text	147
Clip, gain, opacity	161
Clock	
12 HR or 24 HR	421
internal or LTC	421
multiviewer	413
set	256, 304
setup menu	421
Close keypad	145
Color	
background, map	227
button, understanding	311
chips	170
correction adjustments	210
correction adjustments, output	252
effects panel, DVE	383
fine tuning	171
learn	172
multiviewer	412
picker	156, 163
picker pop-up	156, 163, 172
space	216
space, RGB	217
space, SMPTE	216
user	172
wheel	171
Color background	
functions	170
menu	169
menu access	170
selection	170
Colors, connectors, rear panel view	204
Com port, rear control panel	99
Communications	
setup	285
setup menu	194
specifications	437
Company address	3
Conditional	
buttons	138
software updates	430
Configuration, system	25
Connection	
analog format table	65, 128
aux outputs	124
external DSK inputs	125
multiviewer	129
outputs	122
signals	121
system	112
Connectivity diagram, system	30
Connector	
analog 15-pin D pinouts	439
audio	100
colors	204
DVI-I pinouts	440
Ethernet	46
Ethernet pinouts	441
GPIO	47
light	99
panel, touch screen	102
rear panel, FSN-150	99
reference input	46
serial, pinouts	442
tally	47
VGA	99
Contact information	451, 452
Contrast, input	210, 383
Control	
features, FSN Series	24
panel backlight	255
panel keypad	317
panel sections, FSN-150	70
panel, bottom	101
panel, descriptions	68
panel, installation	106
panel, orientation	67
panel, update software	429
Conventions	19
menu system	134
Coordinate space, DVE	360
Copy	
key settings	167
settings	246, 299
Copyright	2
CPU	
reset switch	45
switch	100
Creating DVE effects from shot box	393
Crosspoint M/E Card	25
Current	
fade to black rate	77
transition rate	77, 84
Curve	
adjustment	150
exponent	150
linear	150
logarithm	150
S	150
setting	330
Custom control	
buttons	93
display	93
section	71, 93
using	348
Customer service portal	3
CUT	79, 88
KEY 1	89
KEY 2	90
working with	329

## D

- Date, set .....256, 304
- DC power
  - out .....100
  - touch screen .....102
- Decimal .....146
  - button .....98
- Decimal entry .....146
- Default
  - factory .....283
  - factory settings .....275
  - naming conventions .....208
- Default IP address .....46
  - FSN-1400 .....48
  - FSN-150 .....48
- De-interlace .....218, 385
  - output .....245, 299
- Delay
  - native input .....212
  - specifications .....438
- Delete
  - keyframe .....372
  - shot box keyframe .....382
- Deleting memory registers .....185, 345
- Description
  - aux table .....241
  - cards .....43
  - enable .....180
  - enables menu .....178
  - input table .....205
  - matrices .....143
  - memory menu .....176
  - memory register .....176
  - menu .....131
  - notes and error messages .....143
  - rear panel view .....203
  - rear panel view, Aux setup .....241
  - system menu .....189
  - tables .....142
- Desk stand installation .....107
- Diagnostics .....263
  - LEDs, buttons, displays .....260
  - menu .....257
  - port .....45
  - tallies .....262
  - T-Bar, joystick, knobs .....258
- Diagram, system connectivity .....30
- Digital video effects card .....57
- Direct key control group .....89, 336
- Direction
  - pop-up .....153
  - wipe .....153
- Discover
  - FSN-1400 .....195
  - FSN-1400 pop-up .....195
- Display
  - backlight pop-up .....261
  - custom control .....93
  - M/E transition .....83
  - memory .....94
  - mount options .....109
  - PGM transition .....76
  - pixel test pop-up .....261
  - programmable .....74, 81
  - section .....70, 73
  - stand specifications .....436
- Documentation conventions and symbols .....19
- Door latch .....37
- Download software .....427
  - via FTP site .....427
  - via web site .....428
- DSK .....78
  - cut in .....51
  - cut setup .....230
  - error reporting .....231
  - fill in .....51
  - fill setup .....231
  - source .....77
- DVE .....26, 57
  - add keyframe .....372
  - advanced menu .....383, 385
  - aspect ratio .....370
  - assign channels to keyers .....389
  - assign menu .....238, 363
  - assignment information pop-up .....364
  - assignment table .....363
  - automatic trigger rules .....400
  - automatic triggering .....396, 397
  - blank panel .....42
  - border section .....378
  - border shadow opacity panel .....377
  - card slot .....40
  - clear keyframe .....372
  - color effects panel .....383
  - common menu components .....366
  - coordinate space .....360
  - create new effect .....372
  - creating effects from shot box .....393
  - cut channel .....158
  - delete keyframe .....372
  - effect durations .....359
  - effect KF .....368
  - effect setup panel .....372
  - enables .....183
  - extras panel .....385
  - fill channel .....158
  - freeze behavior .....387
  - functional tabs .....366
  - functions section .....164
  - introduction .....354
  - joystick control .....361
  - keyer functions .....164

# Index

keyframe editing section	367
links	388
links keypad	369
live LED	368
M/E bank triggers	357
main menu	365
manual size and position	371
mask panel	375
memory functions	338
menu orientation	362
mix BG, both keyers, trigger both keyers	405
mix BG, keyer 1, trigger keyer 1	404
mix BG, keyer 2, trigger keyer 2	405
mode section	164
modes and features	355
morphing	359
multiple ways to trigger	357
opacity section	380
pan zoom source panel	373
PGM bank triggers	358
position presets	370
programming dual keyframe effects	392
programming effects	391
programming single keyframe effects	391
rules	57
selecting keyer mode	390
shadow section	379
shot box KF	368
shot box menu	381
size and position adjustments	369
size and position panel	365
size presets	369
status table	367
status, aspect ratio	367
status, channel	367
status, description	367
status, keyer	367
status, reg #	367
tap in, tap out examples	408
tap in, tap out functions	407
tap in, tap out rules	407
title bar	365
tool bar functions	368
trigger both keyers	402
trigger keyer 1	401
trigger keyer 2	402
trigger mix key and both keyers	404
trigger mix key and keyer 1	403
trigger mix key and keyer 2	403
using triggers	401
wipe trigger options	406
workflow overview	354
<b>DVI</b>	
connector, rear panel	100
connector, touch screen	102
sync polarity	246, 299
sync polarity, multiviewer	417
DVI-I connector pinouts	440
<b>E</b>	
Edge	
color	156
pop-up	155
wipe	155
EDID format	216
Editing keyframes	394
Effect	
duration, DVE	359
keyframe	394
Effects group	79, 86
Ejectors, card	45
Electrical specifications	435
Enable descriptions	180
Enables	
aux	182
DVE	183
M/E 1	180
M/E 2	180
menu	174
menu description	178
menu sections	178
PGM	181
section	179
system	182
Enter	98, 146
Equipment marking terms	5
Error	
messages	143
messages, understanding	316
multiviewer indications	413
reporting	207, 316
reporting, DSK	231
Ethernet	
connections	48
connector	46
connector pinouts	441
port 1	100
port 2	100
status table	194
Exponent curve	150
Extended Display Identification Data	216
External	
DSK connection notes	125
DSK input connections	125
DSK input setup	296
DSK setup menu	229
DSK table	230
key	166
missing	198
not locked	198
reference	198

## F

- Factory
  - default settings ..... 275
  - default, return to ..... 283
  - reset ..... 274
- Fade to black ..... 80
- Fan ..... 100
  - tray ..... 40
- FCC statement ..... 2
- Features
  - DVE ..... 355
  - FSN-150 ..... 69
  - M/E ..... 26
  - version 3.0 ..... 27
- Field to frame ..... 219, 385
- Fill
  - H ..... 220
  - H, output ..... 249
  - H/V ..... 221
  - H/V, output ..... 250
  - key ..... 162
  - V ..... 220
  - V, output ..... 250, 300
- Fine
  - adjust ..... 97, 183
  - tuning color ..... 171
- Firmware version 3.0 ..... 27
- Flicker filter ..... 218
  - output ..... 245, 298
- Flip image ..... 386
- Flip-flop mode ..... 74, 81
  - understanding ..... 314
- Format
  - aux ..... 242
  - connection table, analog ..... 128
  - EDID ..... 216
  - input ..... 205, 216
  - output ..... 197
- FPGA loaded LED ..... 45
- Frame sync ..... 212
  - mode ..... 200
- Free run ..... 197
- Freeze
  - input ..... 206, 230
  - keyframe ..... 386
  - mode ..... 207, 231
  - multiviewer indications ..... 413
  - run ..... 386
  - source ..... 348
- Front door ..... 37
  - hinges ..... 38
  - removal and re-installation ..... 38
  - status LEDs ..... 37
- FSN Series
  - about ..... 23
  - basic system ..... 25, 30
  - block diagram ..... 30
  - card slot allocation ..... 35
  - connectivity diagram ..... 30
  - control features ..... 24
  - control panel descriptions ..... 68
  - control panel orientation ..... 67
  - DVE operations ..... 353
  - Ethernet connections ..... 48
  - hardware description ..... 34
  - hardware installation ..... 103
  - introduction to ..... 17
  - menu tree ..... 132
  - multiple destinations ..... 31
  - multiviewer operations ..... 411
  - operation ..... 307
  - optional cards ..... 26
  - overview ..... 23
  - required cards ..... 25
  - specifications ..... 431
  - system configuration ..... 25
  - updating software ..... 425
- FSN-1400
  - adapters ..... 105
  - cables ..... 105
  - card slot allocation ..... 116
  - default IP address ..... 48
  - discover ..... 195
  - Ethernet connector ..... 46, 48
  - front door ..... 37
  - front view ..... 39
  - hardware orientation ..... 33
  - overview ..... 34
  - physical and electrical specifications ..... 435
  - rack mount procedure ..... 110
  - rear view ..... 41
  - reference input connector ..... 46
  - status table ..... 192
  - system connections ..... 112
  - update flash ..... 269
  - update software ..... 430
- FSN-150 ..... 24
  - cables ..... 105
  - control panel sections ..... 70
  - default IP address ..... 48
  - Ethernet connections ..... 48
  - features ..... 69
  - layers, understanding ..... 312
  - overview ..... 68
  - physical and electrical specifications ..... 435
  - rear panel connectors ..... 99
- FTB ..... 80
- FTP site ..... 427
- Function
  - bar, keypad ..... 144
  - buttons ..... 136
  - input setup menu, tool bar ..... 223

## Index

- quick reference table .....310
- Functional control panel sections .....72
- Functions
  - aux setup menu .....242
  - input menu .....206
  - map buttons menu .....226
  - save all .....272
  - software .....269
  - system menu .....190
  - tally setup menu .....237
  - user preferences .....255
- FX TRIG .....87, 397
  - + MIX .....397
  - + WIPE .....397
- G**
- Gamma, input .....210
- Glossary of switcher terms .....20
- GPI ports .....264
- GPIO .....263
  - connector .....47
  - connector pinouts .....444
  - diagnostics menu .....263
- GPO ports .....264
- Group
  - direct key control .....89
  - effects .....79, 86
  - next transition .....85
- Guarantee and compensation .....2
- H**
- Hardware
  - description .....34
  - installation .....103
  - orientation .....33
  - requirements, updating software .....426
- Help menu .....277
- Hinges .....38
- History, change .....6
- How to
  - assign DVE channels to keyers .....389
  - assign multiviewer sources .....302
  - assign multiviewer UMD color .....302
  - assign sources to aux bus outputs .....346
  - back up system to USB drive .....305
  - back up the system .....350
  - calibrate touch screen .....284
  - clear tallies .....303
  - configure multiviewer color .....301
  - connect Aux output signals .....124
  - connect external DSK signals .....125
  - connect inputs to a NIC .....126
  - connect inputs to a UIC .....127, 129
  - connect outputs signals .....122, 123
  - create DVE effects from shot box .....393
  - delete memory registers .....345
  - disable error reporting, DSK inputs .....296
  - display output test patterns .....289
  - download software from FTP site .....427
  - download software from website .....428
  - enable/disable M/E 2 control .....348
  - freeze a source .....348
  - insert a card .....118
  - insert a rear panel .....117
  - install FSN-1400 system connections .....112
  - install the control panel .....106
  - install touch screen and desk stand .....107
  - lock and unlock memory registers .....344
  - map and name aux outputs .....298
  - map buttons .....297
  - mix BG, both keyers, trigger both keyers 405
  - mix BG, keyer 1, trigger keyer 1 .....404
  - mix BG, keyer 2, trigger keyer 2 .....405
  - mix key and trigger both keyers .....404
  - mix key and trigger keyer 1 .....403
  - mix key and trigger keyer 2 .....403
  - modify multiviewer UMD text .....302
  - perform a cut .....329
  - perform a cut, lookahead .....329
  - perform auto trans on all banks .....348
  - perform automatic mix key .....335
  - perform cut on all banks .....348
  - perform direct cut key .....336
  - perform direct mix key .....336
  - perform manual mix key .....335
  - perform new software update .....426
  - power up system, check status .....282
  - program dual keyframe DVE effects .....392
  - program single keyframe DVE effects .....391
  - rack mount FSN-1400 .....110
  - recall memory, adjust enables .....342
  - recall memory, bypass enables .....342
  - re-install FSN-1400 front door .....38
  - remove a card .....120
  - remove FSN-1400 front door .....38
  - restore from USB drive .....286
  - restore the system .....351
  - return to factory default .....283
  - save all system parameters .....305
  - save all system settings .....348
  - save DSK input settings .....296
  - save input settings .....292, 295
  - select clean feed outputs .....347
  - select multiviewer layout .....301
  - select source for ASSIGN button .....290
  - set native input color correction .....292
  - set output V-lock .....288
  - set SDI output timing .....288
  - set the DVE keyer mode .....390

- set transition rates and curves ..... 330
  - set up advanced UOC parameters ..... 299
  - set up clean feed outputs ..... 290
  - set up communications ..... 285
  - set up keys ..... 334
  - set up multiviewer clock ..... 301
  - set up multiviewer output ..... 301
  - set up native input mask ..... 292
  - set up native input sync ..... 292, 296
  - set up native inputs ..... 291
  - set up output format ..... 287
  - set up reference video output ..... 288
  - set up tallies ..... 303
  - set up universal aux output format ..... 298
  - set up universal input ..... 293
  - set up universal input capture, timing ..... 294
  - set up universal input color correction ..... 295
  - set up universal input processing ..... 294
  - set up universal input sizing, scaling ..... 294
  - set up universal output color correction ..... 300
  - set up universal output sizing, scaling ..... 300
  - set up user preferences ..... 304
  - set up video reference input ..... 287
  - store memory, bypass enables ..... 339, 340
  - store memory, set enables ..... 340
  - store multiviewer in memory ..... 423
  - trigger effect on both keyers ..... 402
  - trigger effect on keyer 1 ..... 401
  - trigger effect on keyer 2 ..... 402
  - un-freeze a source ..... 348
  - update control panel software ..... 429
  - update FSN-1400 software ..... 430
  - use custom control functions ..... 348
  - use M/E 2 control ..... 349
  - use menu system ..... 134
  - use this guide ..... 19
  - view memory registers ..... 344
  - Hyperlinks ..... 19
- I**
- Image
    - flip ..... 386
    - strobe ..... 386
  - Input
    - brightness ..... 210, 383
    - capture and process panel ..... 215
    - capture and timing section ..... 215
    - card rear panel ..... 41
    - card slot ..... 40
    - color correction panel ..... 223
    - color correction section ..... 210
    - color legend pop-up ..... 204
    - connections, NIC ..... 126
    - connections, UIC ..... 127
    - connectors ..... 54
    - contrast ..... 210, 383
    - delay, native ..... 212
    - error reporting ..... 207
    - flexibility ..... 35
    - flexibility, analog ..... 65, 128
    - format ..... 205, 216
    - format table ..... 445
    - format table, NIC inputs ..... 449
    - format table, UIC inputs ..... 445
    - freeze ..... 206, 230
    - gamma ..... 210
    - map ..... 205
    - mask section ..... 213
    - menu ..... 202
    - menu functions ..... 206
    - name ..... 205, 206
    - power ..... 115
    - processing section ..... 218
    - scaling ..... 219
    - setup menu ..... 208
    - setup menu tool bar functions ..... 223
    - setup menu, native inputs ..... 209
    - setup menu, universal inputs ..... 214
    - setup notes ..... 223
    - sizing and scaling panel ..... 219
    - slot ..... 205
    - specifications, reference ..... 433
    - sync ..... 211
    - sync section ..... 211
    - table ..... 205
    - un-map ..... 206
  - Insertion
    - card ..... 118
    - rear panel ..... 117
  - Inspection ..... 104
  - Installation
    - card ..... 116
    - control panel ..... 106
    - desk stand ..... 107
    - hardware ..... 103
    - rack mount ..... 110
    - rear panel ..... 116
    - safety precautions ..... 104
    - shipping information ..... 104
    - site preparation ..... 105
    - touch screen ..... 107
    - unpacking and inspection ..... 104
  - Introduction
    - to multiviewer ..... 412
    - to the DVE ..... 354
    - to the FSN Series ..... 17
  - Invalid
    - signal ..... 143
    - video ..... 316
  - Invert numeric entry, +/- ..... 145
  - IP address ..... 194
    - change ..... 196

## Index

- default .....46
  - reset switch .....46
- ### J
- Joystick .....71, 98
    - DVE control .....361
    - table .....258
    - X-axis control .....98
    - Y-axis control .....98
    - Z-axis control .....98
- ### K
- #### KEY
- 1 .....85
  - 2 .....86
- #### Key
- 1 source, DVE status .....84
  - 2 source, DVE status .....84
  - bus .....82
  - control section .....82
  - copy settings .....167
  - direct controls .....336
  - external .....166
  - fill .....162
  - fill pop-up .....162
  - linear .....160, 228
  - luma .....228
  - luminance .....160
  - setup .....334
  - swap settings .....165
  - type pop-up .....160
  - working with .....333
- #### Keyboard
- port .....99
  - using pop-up .....147
- #### Keyer
- functions and modifiers .....159
  - menu .....157
  - menu access .....158
  - selecting DVE mode .....390
  - selection .....159
  - selection pop-up .....159
  - status table .....158
  - type .....160
- #### Keyframe
- add .....372
  - clear .....372
  - delete .....372
  - editing .....367, 394
  - editing section .....394
  - freeze .....386
  - freeze behavior .....387
- #### Keypad
- assign multiviewer source .....422
  - border selection .....378
  - control panel .....317
  - DVE links .....369
  - function bar .....144
  - map buttons .....227
  - memory .....96
  - notes .....146
  - numeric buttons .....97
  - output format .....417
  - register .....144
  - set clock .....256, 304
  - set date .....256, 304
  - touch screen .....317
  - UOC output format .....244
  - using .....144, 317
- #### Knobs
- .....73
- ### L
- #### Last Memory Register
- .....76, 83
- #### Latching
- buttons .....137
  - momentary and conditional buttons .....137
- #### Layers
- rules .....312
  - understanding .....312
- #### Learn color
- .....172
- #### LED
- card front edge .....64
  - card power .....64
  - FPGA loaded .....45, 64
  - power .....37
  - system power .....45
  - test mode pop-up .....260
  - transition .....77, 84
  - video reference .....38, 45
- #### LEDs, buttons, displays menu
- .....260
- #### Light
- connectors .....99
  - control .....71
- #### Line voltage selection
- .....115
- #### Linear
- curve .....150
  - key .....160, 228
  - key fill .....225
- #### Links, DVE
- .....388
- #### Location buttons
- .....139
- #### Lock
- memory registers .....344
- #### Lock/Unlock panel
- .....272
- #### Locking and unlocking registers
- .....185
- #### Logarithm curve
- .....150
- #### Lookahead preview
- .....319
- overview .....319

tutorial	320	input	213
Loop, reference	47	output	251, 253
LOS	316	preset functions	222, 375
loss of signal	143	preset functions, output	251
Loss of signal	316	presets section	222
Luma key	228	presets section, output	251, 300
Luminance key	160	Matrices, description	143
<b>M</b>		Memory	
M/E		advanced functions	185
1 clean feed out	50	AUX functions	338
1 enables	180	AUX module	96
1 preview out	50	CUST module	96
1 program out	50	delete registers	345
2 clean feed out	50	deleting registers	185
2 enables	180	display	94
2 preview out	50	display rules	94
2 program out	50	DVE functions	338
bank	71, 81	DVE module	96
card	49	function section	95
card components	50	functions table	339
card connectors	49	keypad	96
card output connections	122	lock and unlock registers	344
card rear panel	42	locking and unlocking registers	185
features	26	M/E 1 module	95
memory functions	338	M/E 2 module	96
set priority	253	M/E functions	338
transition display	83	menu	174
transition section	71, 83	menu access	175
M/E 2 control	348	menu description	176
using	349	module section	95
MAC	195	multiviewer	423
Manual		naming registers	184
mix	331	PGM functions	337
mix key	335	PGM module	96
transition	325	recall mode	174
wipe	332	recall notes	343
wipe key	335	recall registers	342
Map		recall, add modules	343
aux	242	recall, adjust enables	342
buttons keypad	227	recall, bypass enables	342
buttons menu	224	recall, remove modules	343
buttons menu functions	226	register overview	337
color background	227	registers and T-bar	327
input	205	registers, working with	337
linear key fill	226	section	71, 94
luma keys and linear keys	228	selecting registers	183
other sources	227	STILL module	96
plus (+) symbol	205, 206, 242, 298	store mode	174
source/cut	226	store notes	341
sources	227	store, add modules	341
test patterns	227	store, bypass enables, custom name	340
Mapping setup	297	store, bypass enables, default name	339
Mask		store, remove modules	341
clear	213	store, set enables, custom name	340
		storing registers	339
		summary of functions, table	174
		SYS functions	338

# Index

SYS module	96
table	176
view mode	174
view registers	344
Menu	
advanced DVE	369
advanced key functions	168
advanced UOC setup	244, 247, 298, 299
aux	186
aux setup	240
backup and restore	273
bar	135
clean feed setup	232
clock setup	421
color background	169
communications setup	194
description	131
diagnostics	257
DVE assign	238, 363
DVE orientation	362
DVE, advanced	383, 385
DVE, shot box	381
enables	174
external DSK setup	229
GPIO diagnostics	263
help	277
input	202
input setup, native inputs	209
input setup, universal inputs	214
keyer	157
LEDs, buttons, displays	260
map buttons	224
memory	174
multiviewer orientation	414
multiviewer output setup	417
multiviewer setup	239, 415
orientation	131
other setup	253
output test patterns	270
reference and output setup	197
reset	274
rules and conventions	134
select multiviewer colors	420
select multiviewer layout	418
shortcuts	278
shot box	369, 381
software	268
system	188
tally diagnostics	262
tally setup	235
T-bar, joystick, knobs	258
transition	148
tree	132
UOC setup	243
usage, rules	134
user preferences	254
view errors	264
view log	266
wipe	151
Midplane architecture	34
Minimum delay	212
MIX	79, 87
+ FX TRIG	397
KEY 1	89
KEY 2	89
Mix	
automatic	331
key, automatic	335
key, manual	335
manual	331
notes	331
working with	331
Mode	
recall	174
store	174
view	174
Modes, DVE	355
Module	
AUX	96
CUST	96
DVE	96
M/E 1	95
M/E 2	96
PGM	96
section	179
STILL	96
SYS	96
Momentary buttons	137
Monitor arm	109
Morphing DVE effects	359
Motion	
adaptive	218, 385, 386
threshold	219, 385, 386
threshold, output	245, 299
Mouse port	99
Multiviewer	26
assign source keypad	422
card	62, 412
card connectors	62
clock	413
clock setup menu	421
color selection	412
connections	129
error indications	413
freeze indications	413
introduction to	412
memory	423
menu orientation	414
monitor configurations	412
operations	411
output format keypad	417
output setup menu	417
PIP enable/disable	412
select colors menu	420

select layout menu	.418
set clock	.256
setup	.301, 423
setup menu	.239, 415
table	.415
UMD tally	.412
UMD text	.413
MVR	.26, 62
card connectors	.62
output card slot	.40

## N

NAC	.26, 60
card components	.61
card connectors	.60
output connections	.124
Name	
aux	.242
conventions	.208
input	.205, 206
shot box keyframe	.382
Naming memory registers	.184
Native	
aux outputs	.51, 61
input card	.53
input setup	.291
inputs 1-8	.54
output card	.60
resolution	.103
Navigation buttons	.137
New feature review	.27
Next transition group	.77, 85
rules	.78, 86
NIC	.26, 53
card components	.53
card connectors	.53
connection notes	.126
delay specifications	.438
input connections	.126
input formats	.449
Notes	
and error messages	.143
auto acquire	.215
input setup	.223
keypad	.146
memory recall	.343
memory register storage	.341
mix	.331
pop-up	.143
transition LEDs	.327
wipe	.332
Notice	.2

## O

Opacity section, DVE	.380
Operation	
DVE	.353
FSN Series	.307
multiviewer	.411
quick setup	.308
system backup and restore	.350
Operators safety summary	.4
Optional cards	.26
Options, display mount	.109
Orientation	
control panel	.67
DVE menus	.362
hardware	.33
menu	.131
multiviewer menus	.414
Other	
setup menu	.253
sources	.227
Output	
and process panel	.244
aspect ratio	.250, 300
clean feed selection	.52
color correction panel	.252
connections	.122
connector combinations, universal	.59
de-interlace	.245, 299
flicker filter	.245, 298
format	.192, 197
format keypad	.244, 417
format table	.449
format table, UOC outputs	.445
mask	.251, 253
motion threshold	.245, 299
pan zoom source	.250, 300
processing section	.245
quick adjust	.249, 300
section	.244
setup	.287
setup, multiviewer	.417
sharpness	.245
size and position	.249, 300
sizing and scaling panel	.249
sizing and scaling section	.249
specifications, reference	.434
status section	.245
status table	.197
test patterns menu	.270
test patterns setup	.289
tool bar functions	.246
universal	.59, 63
V-lock	.200
V-lock info pop-up	.201
Overview	

## Index

- DVE workflow .....354
  - FSN series .....23
  - FSN-1400 .....34
  - FSN-150 .....68
  - lookahead preview .....319
  - memory registers .....337
  - software update .....426
  - system specifications .....432
- P**
- Palette .....135
  - Panel
    - color effects, DVE .....383
    - DVE extras, DVE .....385
    - DVE, border shadow opacity .....377
    - DVE, effect setup .....372
    - DVE, mask .....375
    - DVE, pan zoom source .....373
    - DVE, size and position .....365
    - input capture and process .....215
    - input color correction .....223
    - input sizing and scaling .....219
    - lock/unlock .....272
    - lockout pop-up .....272
    - output and process .....244
    - output color correction .....252
    - output sizing and scaling .....249
    - soft reset .....275
  - Patterns, wipe .....152
  - PDF file usage .....19
    - navigating and searching .....19
  - PGM
    - bank .....70, 74
    - enables .....181
    - memory functions .....337
    - transition display .....76
    - transition section .....71, 76
  - Phantom key bus .....75
  - Physical
    - and virtual T-bar position .....326
    - position, T-bar .....326
    - specifications .....435
  - Pinouts .....439
    - analog 15-pin D connector .....439
    - DVI-I connector .....440
    - Ethernet connector .....441
    - GPIO connector .....444
    - serial connector .....442
    - tally connector .....443
  - Plus symbol, map column .....205, 206, 242, 298
  - Plus/Minus (+/-) .....97, 145
  - Pop-up
    - bank selection .....153
    - button test mode .....261
    - buttons .....139
    - color picker .....156, 163, 172
    - direction .....153
    - discover FSN-1400 .....195
    - display backlight .....261
    - display pixel test .....261
    - DVE assignment information .....364
    - edge .....155
    - input color legend .....204
    - key fill .....162
    - key type .....160
    - keyboard .....147
    - keyer selection .....159
    - LED test mode .....260
    - note .....143
    - output V-lock info .....201
    - panel lockout .....272
    - reference input .....198
    - reference video and timing info .....199
    - refresh sync .....207
    - select tally color .....237
    - sync mode .....211, 230
    - tech support .....265
    - working with .....317
  - Port
    - com, rear control panel .....99
    - Ethernet 1 .....100
    - Ethernet 2 .....100
    - GPI .....264
    - GPO .....264
    - keyboard .....99
    - mouse .....99
    - serial .....46
    - USB .....93
  - Power
    - AC .....100
    - AC connectors .....42
    - consumption .....115
    - cord, line voltage selection .....115
    - DC out .....100
    - input .....115
    - LED .....37
    - precautions .....115
    - supplies .....39
    - up .....282
  - Preset
    - bus .....75, 82
    - DVE position .....370
    - DVE size .....369
    - mask functions .....222, 375
    - mask functions, output .....251
  - Press and hold, understanding .....318
  - Preview
    - lookahead .....319
    - lookahead, tutorial .....320
    - out .....50
  - Program
    - bus .....75

out ..... 50  
 Programmable display ..... 74, 81  
 Programming  
   dual keyframe DVE effects ..... 392  
   DVE effects ..... 391  
   single keyframe DVE effects ..... 391  
 Prompt bar ..... 134  
 PST ..... 82  
 Pulldown comp ..... 218

## Q

Quick  
   function reference table ..... 310  
   setup and operations ..... 308  
 Quick Adjust section ..... 220  
   output ..... 249, 300

## R

Rack mount installation ..... 110  
 Raster box ..... 271  
 Rate, transition ..... 149  
 Rear  
   panel connectors, FSN-150 ..... 99  
   view, chassis ..... 41  
 Rear I/O view ..... 229  
 Rear panel insertion ..... 117  
 Rear panel installation ..... 116  
 Rear panel removal ..... 117  
 Rear panel view ..... 202, 270, 363  
   connector colors ..... 204  
   description ..... 203, 241  
 RECALL ..... 95, 175  
 Recall  
   memory notes ..... 343  
   memory registers ..... 342  
   mode ..... 174  
 Re-entry  
   buttons ..... 75  
   using ..... 328  
 Ref Output Timing} ..... 199  
 Reference  
   and output setup menu ..... 197  
   external ..... 198  
   free run ..... 197  
   H and V offset ..... 199  
   input ..... 193  
   input connector ..... 46  
   input pop-up ..... 198  
   input, video ..... 197  
   loop ..... 47  
   out ..... 47  
   output, video ..... 198

setup ..... 287  
 valid frame rates, table ..... 433  
 video and timing info pop-up ..... 199  
 video input specifications ..... 433  
 video output specifications ..... 434  
 Refresh  
   sync ..... 211, 230  
   sync pop-up ..... 207  
 Reg ..... 176  
 Register, keypad ..... 144  
 Registers  
   naming ..... 184  
   selecting ..... 183  
 Removal  
   card ..... 120  
   rear panel ..... 117  
 Required cards ..... 25  
 Reset  
   factory ..... 274  
   menu ..... 274  
   soft FSN-1400 ..... 275  
   soft panel ..... 275  
   soft system ..... 274  
 Reset switch  
   CPU ..... 45  
   IP address ..... 46  
 Resolution, native ..... 103  
 Restore  
   default settings ..... 223, 246, 299  
   saved settings ..... 223  
   system ..... 273  
 Return material authorization ..... 451  
 RGB color space ..... 217  
 RMA ..... 451  
 Row  
   aux output ..... 91  
   aux source ..... 92  
 Rules  
   DVE triggering ..... 400  
   layers ..... 312  
   memory display ..... 94  
   next transition group ..... 86

## S

S curve ..... 150  
 Safety  
   precautions ..... 104  
   summary ..... 4  
 Sales contact information ..... 452  
 Sample phase ..... 217  
 Sampling, 1-1 ..... 217  
 Save  
   all ..... 272  
   all, functions list ..... 272  
   settings ..... 223

# Index

shot box keyframe	382, 383
SAVE ALL	348
Scale inputs	219
SDI	
H and V offset	201
output timing	200
Section	
aux	71, 91
custom control	71, 93
display	70, 73
enables	179
enables menu	178
function, memory	95
input capture and timing	215
input color correction	210
input mask	213
input processing	218
input sync	211
key control	82
M/E transition	71, 83
mask presets	222
mask presets, output	251, 300
memory	71, 94
module	179
module, memory	95
output	244
output processing	245
output sizing and scaling	249
output status	245
PGM transition	71, 76
quick adjust	220
quick adjust, output	249, 300
sizing and scaling	219
Sections, FSN-150 control panel	70
SEL	82
Select	
clean feed outputs	347
colors menu, multiviewer	420
tally color pop-up	237
Selecting memory registers	183
Sequence, system setup	281
Serial	
connector pinouts	442
ports	46
Set	
clock	256, 304
clock keypad	256, 304
date	256, 304
date keypad	256, 304
M/E priority	253
multiviewer clock	256
tally closure	238
Setting transition rates and curves	330
Settings, factory default	275
Setup	
aux	298
back up system to USB	305
button mapping	297
clean feed	290
communications	285
DSK cut	230
DSK fill	231
external DSK inputs	296
key	334
multiviewer	301, 423
native inputs	291
output test patterns	289
power up and status check	282
prerequisites	280
reference and video output	287
restore the system	286
return to factory default	283
save system parameters	305
sequence	281
system	279
tallies	303
touch screen calibration	284
universal inputs	293
user preferences	304
wipe	332
Shadow section, DVE	379
Sharpness	218
output	245
SHIFT	
button	82
buttons	75
Shipping information, boxes	104
Shortcuts	277
table	278
Shot box	
assign to keyframe	382
delete keyframe	382
keyframe	395
menu	369, 381
name keyframe	382
save keyframe	382, 383
Shutdown, system	276
Signal	
connections	121
invalid	143
Site preparation	105
Sizing and Scaling section	219
Slot	
aux	241
input	205
SMPT color space	216
Soft	
FSN-1400 reset	275
panel reset	275
system reset	274
Software	
conditional updates	430
downloading	427
functions	269

menu	.268
table	.269
update control panel	.429
update overview	.426
update, hardware requirements	.426
updating	.425
version	.18
Source	
assignable	.92
freeze	.348
map	.227
un-freeze	.348
Source/Cut	.225
Specifications	.431
agency	.437
cable	.437
communications	.437
delay	.438
electrical	.435
FSN-1400	.435
FSN-150	.435
input format table	.445
NIC delay	.438
overview	.432
physical	.435
pinouts	.439
reference video input	.433
reference video output	.434
touch screen	.436
UIC delay	.438
Status	
check	.282
keyers	.158
LEDs	.37
output	.197
table, system menu	.192
Store	.95, 175
mode	.174
Storing, memory registers	.339
Strobe image	.386
Subnet mask	.195, 196
Summary	
button types	.141
memory functions	.339
memory functions table	.174
Support, technical information	.3, 452
Swap key settings	.165
Switch, CPU	.100
Switcher layers, understanding	.312
Symbols	.19
Sync	
auto	.211
mode pop-up	.211, 230
mode, understanding	.211
refresh	.211, 230
SYS	
memory functions	.338
memory module	.96
System	
backup	.273
backup and restore	.350
basic	.30
card	.25
card components	.46
card connectors	.44
card description	.44
card rear panel	.42
card slot	.40
configuration	.25
connections	.112
enables	.182
flexibility	.35
menu	.188
menu access	.189
menu description	.189
menu functions	.190
menu, status tables	.192
multiple destinations	.31
power LED	.45
restore	.273, 286
save parameters	.305
setup	.279
setup prerequisites	.280
setup sequence	.281
shutdown	.276
soft reset	.274
specifications overview	.432
status LEDs	.37
<b>T</b>	
Table	
analog format connections	.128
aux	.186
aux, description	.241
button map	.225
card slot allocation, FSN-1400	.116
descriptions	.142
dual monitor output, multiviewer	.419
Ethernet status	.194
external DSK	.230
format connections	.65
FSN-1400 status	.192
input	.205
input formats	.445
keyer status	.158
memory functions summary	.339
memory registers	.176
menu shortcuts	.278
multiviewer	.415
NIC input formats	.449
output formats	.449
output status	.197

## Index

- quick function reference .....310
  - single monitor output, multiviewer .....419
  - software .....269
  - status, DVE .....367
  - status, system menu .....192
  - summary of memory functions .....174
  - tally .....236
  - UIC input formats .....445
  - UOC output formats .....445
  - user preferences .....255
  - valid reference frame rates .....433
  - Tally
    - clear closure .....238
    - connector .....47
    - connector pinouts .....443
    - diagnostics .....262
    - diagnostics menu .....262
    - M/E bank, no re-entry .....315
    - M/E bank, re-entry .....315
    - multiviewer UMD .....412
    - PGM bank .....315
    - set closure .....238
    - setup .....303
    - setup menu .....235
    - setup menu functions .....237
    - table .....236
    - understanding .....315
  - Tap in, Tap out
    - examples .....408
    - functions .....407
    - rules .....407
  - T-Bar .....77, 84
    - joystick, knobs menu .....258
    - normal movement .....326
    - table .....258
    - understanding .....325
    - with memory registers .....327
  - Tech support .....265
  - Technical support information .....3, 452
  - Terms, equipment marking .....5
  - Test patterns
    - list .....271
    - map .....227
    - menu .....270
    - setup .....289
  - Text, clear .....147
  - Timing
    - adjust H .....217
    - adjust V .....217
  - Title bar .....134
    - DVE .....365
  - Toggle buttons .....138
  - Tool bar .....135
  - Touch screen .....73
    - brightness .....255
    - calibrate .....259
    - calibration .....284
  - connector panel .....102
  - display stand specifications .....436
  - installation .....107
  - keypad .....317
  - physical and electrical specifications .....436
  - update .....269
  - Trademarks .....3
  - Transition
    - auto .....88
    - automatic .....325
    - curve .....150
    - display brightness .....255
    - display contrast .....255
    - LED notes .....327
    - LEDs .....77, 84
    - LEDs, understanding .....325
    - manual .....325
    - menu .....148
    - menu access .....149
    - rate adjustment .....149
    - rates, setting .....330
  - Tree, menu .....132
  - Trigger
    - DVE .....357
    - DVE, M/E .....357
    - DVE, PGM .....358
    - effect on both keyers .....402
    - effect on keyer 1 .....401
    - effect on keyer 2 .....402
    - mix BG, both keyers, trigger both keyers .....405
    - mix BG, keyer 1, trigger keyer 1 .....404
    - mix BG, keyer 2, trigger keyer 2 .....405
    - mix key and both keyers .....404
    - mix key and keyer 1 .....403
    - mix key and keyer 2 .....403
    - wipe trigger options .....406
  - Triggering
    - DVE .....396
    - using .....401
  - Tri-level .....198, 199, 288
  - Trim - .....97, 145
  - Trim + .....97, 146
  - Tutorial, lookahead preview .....320
  - Type, keyer .....160
- ## U
- UIC .....26, 55
    - analog format connection table .....128
    - card components .....55
    - card connectors .....55
    - connection notes .....127
    - delay specifications .....438
    - input connections .....127
    - input formats .....445
  - UMD tally .....412

- Understanding
    - button color ..... 311
    - error messages ..... 316
    - flip-flop mode ..... 314
    - lookahead preview ..... 319
    - press and hold ..... 318
    - switcher layers ..... 312
    - sync mode ..... 211
    - tally ..... 315
    - T-bar and transition LEDs ..... 325
  - Undo ..... 145
  - Un-freeze source ..... 348
  - Universal
    - input card ..... 55
    - input setup ..... 293
    - output ..... 59, 63
    - output card ..... 58
    - output connector combinations ..... 59
  - Unlock memory registers ..... 344
  - Un-map
    - input ..... 206
    - linear key fill ..... 226
    - source/cut ..... 226
  - Unpacking ..... 104
  - UOC ..... 26, 58
    - card components ..... 58, 62
    - card connectors ..... 58
    - output adjustments ..... 244
    - output connections ..... 124
    - output formats ..... 445
    - setup menu ..... 243
  - Update
    - FSN-1400 ..... 269
    - FSN-1400 and control panel ..... 426
    - FSN-1400 flash ..... 269
    - FSN-1400 only ..... 426
    - FSN-1400 software ..... 430
    - software ..... 269, 425
    - touch screen ..... 269
  - USB
    - port ..... 93, 273
    - port, touch screen ..... 102
    - ports, rear panel ..... 100
  - User
    - colors ..... 172
    - colors section ..... 172, 173
  - User preferences
    - functions ..... 255
    - menu ..... 254
    - setup ..... 304
    - table ..... 255
  - Using
    - automatic DVE triggers ..... 401
    - custom control functions ..... 348
    - keyboard, pop-up ..... 147
    - keypad ..... 144, 317
    - M/E 2 control functions ..... 349
    - re-entry ..... 328
- ## V
- Value buttons ..... 138
  - Version
    - 3.0 features ..... 27
    - 3.0 firmware ..... 27
  - VESA mount ..... 109
  - VGA connector ..... 99
  - Video
    - invalid ..... 316
    - reference input ..... 193, 197
    - reference LED ..... 38, 45
    - reference output ..... 198
  - View
    - errors menu ..... 264
    - log menu ..... 266
    - memory registers ..... 344
    - mode ..... 174
  - Virtual position, T-bar ..... 326
  - V-lock, output ..... 200
- ## W
- Warranty ..... 451
  - Web site, download software ..... 428
  - WIPE ..... 79, 87
    - + FX TRIG ..... 397
  - Wipe
    - automatic ..... 332
    - bank ..... 153
    - direction ..... 153
    - edge ..... 155
    - edge color ..... 156
    - functions and modifiers ..... 152
    - key, automatic ..... 336
    - key, manual ..... 335
    - manual ..... 332
    - menu ..... 151
    - menu access ..... 152
    - notes ..... 332
    - patterns ..... 152
    - setup ..... 332
    - working with ..... 332
  - Working with
    - Aux buses ..... 346
    - cuts ..... 329
    - keys ..... 333
    - memory registers ..... 337
    - mixes ..... 331
    - pop-ups ..... 317
    - wipes ..... 332

# Index

## X

X-Axis Control, Joystick .....	98
XLR Connector, script lights .....	99

## Y

Y-Axis Control, Joystick .....	98
--------------------------------	----

## Z

Z-Axis Control, Joystick .....	98
--------------------------------	----