INDIGO AV Mixer

User Manual

Software Version 1.2.2

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August 2007 / Revision 2

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CERTIFICATE

Certificate Number: 510040.001

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Including its implementation, meets the requirements of the standard:

ISO 9001:2000

Scope:
The design, manufacture and support of video hardware and software products and related systems.

This Certificate is valid until: June 14, 2009
This Certificate is valid as of: August 30, 2006
Certified for the first time: June 14, 2000

H. Pierre Sallé

H. Pierre Sallé
President
KEMA-Registered Quality

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Contacting Grass Valley

On the www.thomsongrassvalley.com web site you get further information on Grass Valley and our products.

For Sales and Service, please contact your local dealer.

To find the account representative, dealer, or distributor nearest you, go to www.thomsongrassvalley.com/sales.

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END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive and in the United States from the Environmental Protection Agency, individual state or local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight, however you are responsible for the removal of the equipment from your facility and packing the equipment ready for pickup.
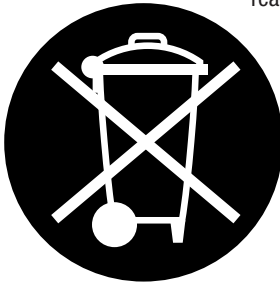
For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the US and Canada please call 800-547-8949 or 530-478-4148. Ask to be connected to the EH&S Department. In addition, information concerning the program can be found at: www.thomsongrassvalley.com/environment

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CE Conformity

This product is in conformity with the following standards, corresponding to the provisions of 89/336/EEC and 73/23/EEC:

Standard	Version	Standard	Version
EN 55103-1; -2 / Class A	1997-06	EN 61000-4-4	2002-07
EN 55022 / Class A	2000-05	EN 61000-4-5	2001-12
EN 61000-4-2	2001-12	EN 61000-4-6	2001-12
EN 61000-4-3	2001-12	EN 61000-4-11	2001-4-11

Find the detailed Declaration of Conformity on the CD shipped with your **INDIGO AV Mixer**.

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Table of Contents

Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.

WARNING **Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.**

1.1   Safety Terms and Symbols

1.1.1   Terms in this Manual

Safety-related statements may appear in this manual in the following form:

WARNING **Warning statements identify conditions or practices that may result in personal injury or loss of life.**

CAUTION Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.

1.1.2   Terms on the Product

The following terms may appear on the product:

DANGER — A personal injury hazard is immediately accessible as you read the marking.

WARNING — A personal injury hazard exists but is not immediately accessible as you read the marking.

CAUTION — A hazard to property, product, and other equipment is present.

1.1.3 Symbols on the Product

The following symbols may appear on the product:

Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.

This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.

Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.

Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.

Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

1.2   Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life.

Dangerous voltage or current may be present — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

Do not service alone — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

Remove jewelry — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

Avoid exposed circuitry — Do not touch exposed connections, components or circuitry when power is present.

Use proper power cord — Use only the power cord supplied or specified for this product.

Ground product — Connect the grounding conductor of the power cord to earth ground.

Operate only with covers and enclosure panels in place — Do not operate this product when covers or enclosure panels are removed.

Use correct fuse — Use only the fuse type and rating specified for this product.

Use only in dry environment — Do not operate in wet or damp conditions.

Use only in non-explosive environment — Do not operate this product in an explosive atmosphere.

High leakage current may be present — Earth connection of product is essential before connecting power.

Double pole neutral fusing — Disconnect mains power prior to servicing.

Avoid mechanical hazards — Allow the fan to come to a stop before servicing.

1.3   Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property.

Do not open the device — Unauthorized opening will void warranty.

Use correct power source — Do not operate this product from a power source that applies more than the voltage specified for the product.

Provide proper ventilation — To prevent product overheating, provide equipment ventilation in accordance with installation instructions. Do not deposit any papers beneath the device — they could affect ventilation. Place device only on a flat surface.

Use anti-static procedures — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment, and surfaces during servicing.

Do not use CF card with a PC — The CF card is specially formatted. The software stored on the CF card could be deleted.

Do not operate with suspected equipment failure — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

Route cable properly — Route power cords and other cables so that they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

Use correct power supply cords — Power cords for this equipment, if provided, meet all regional electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

Use correct replacement battery — This product contains a battery. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

The unit does not contain any user serviceable parts. If problems arise, please contact your local dealer.

Welcome

Welcome to the **INDIGO AV Mixer**. The **INDIGO AV Mixer** uniquely combines the advanced features of a video production switcher, a seamless switcher, and an audio mixer.

*Figure 1. The **INDIGO AV Mixer***

Key features of your **INDIGO AV Mixer**:

- Live seamless switching of video, computer, and audio sources

- Mix digital and analog sources

- Upconvert/downconvert multiple video channels between High Resolution (HR) and SD

- SD/HR simulcast output

- Pre-programmable video layouts with keyers for picture-in-picture and other effects

- Digital effects with 2D and 3D transformations, including page turns, ripples, and swirls

- Linear/luminance and chroma keyers

- Integrated control of the Grass Valley Turbo™ intelligent digital disk recorder (iDDR) and other devices

- Stereo analog and AES/EBU audio

- SDI audio de-embedding and re-embedding

- Four-band parametric equalizer and motordriven audio faders

- Simple audio-follow-video mode

- Intelligent audio-delay management for live production lip sync

2.1   About this Manual

This User Manual is intended to help you understand how your **INDIGO AV Mixer** works and how to work with it.

In addition to explaining basic functionality (*Basic Operation* on page 37), hardware (*Connections* on page 17) and software, it also provides practical hints. The *Tutorials* on page 67 may give you a good starting point for creating your own setups.

The section *Menus* on page 73 explains the basic navigation and organization of the menus and provides a quick reference to all their functions and buttons.

This User Manual also provides further details on how to operate the **INDIGO AV Mixer** in a network (*Network Operation* on page 147) and how to operate external devices (*External Devices* on page 149).

The section *Maintenance* on page 151 explains how to clean the **INDIGO AV Mixer**, how to calibrate its operating elements, and how to update the software.

Finally, the section *Troubleshooting* on page 159 provides tips and tricks for dealing with most common problems on your **INDIGO AV Mixer**.

2.2   Related Documents

You will find the complete **User Manual** and all **Release Notes** (as published so far) on the CD-ROM included in the **INDIGO AV Mixer** package. It provides you with comprehensive information about your **INDIGO AV Mixer**.

Users who have a general understanding of how a video/audio mixer works and who want to start immediately, should review the **Quick Start Guide**.

Additionally, you will find the following information at www.thomsongrassvalley.com:

- **Online versions of Documentation** — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format are available for download.

- **FAQ Database** — Search our Frequently Asked Questions (FAQ) database to find quick answers to common questions and troubleshoot problems.

- **Software Downloads** — Software updates, drivers, and patches are available for download.

2.3   Before You Begin

Check whether your **INDIGO AV Mixer** package is complete. The following items are included:

- **INDIGO AV Mixer** device
- Two power supply cables (US and Continental Europe)
- **Tally/GPI/GPO** breakout box + cable (if ordered)
- **Digital Audio** breakout cable (if ordered)
- **HiRes Board** (if ordered)
- CD-ROM with the **User Manual** in different languages
- Multilingual **Quick Start Guide**

Connections

3.1   Rear Panel Overview

The following figure shows the rear panel of the **INDIGO AV Mixer** with its various connectors:
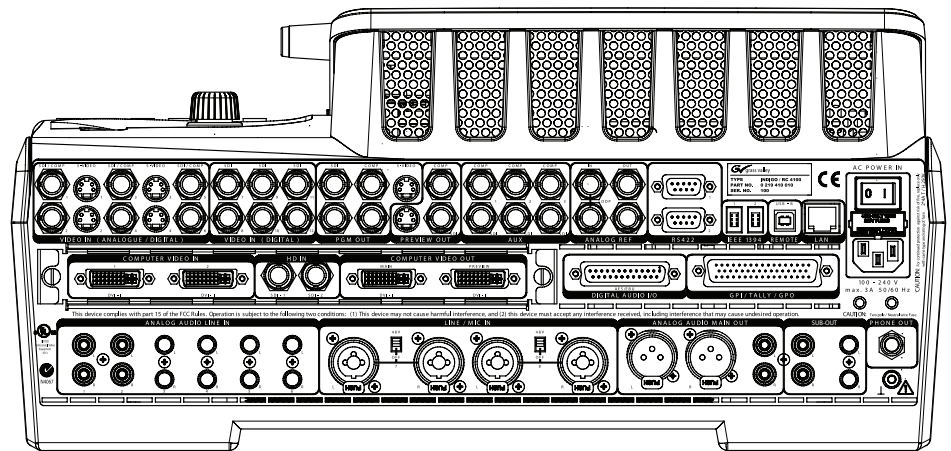
*Figure 2. Rear panel of the **INDIGO AV Mixer***

Note   All Sub-D connectors of the **INDIGO AV Mixer** use SAE inch threads, **not** ISO/DIN metric threads.

3.2   Electric Power Supply

3.2.1   AC Power Cable

Use the power cable to connect the power inlet of the **INDIGO AV Mixer** to the wall outlet.

Note   If required, ask your dealer for an appropriate power cable.

3.2.2   Ground Screw

Use the ground screw to connect the unit to the ground terminal.
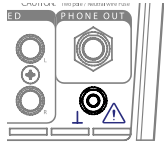
Figure 3. The ground screw

3.3   Rackmount Connections

You can install your **INDIGO AV Mixer** in a rack using telescopic rails. For this purpose, the device is equipped with four M5 cage nuts underneath.
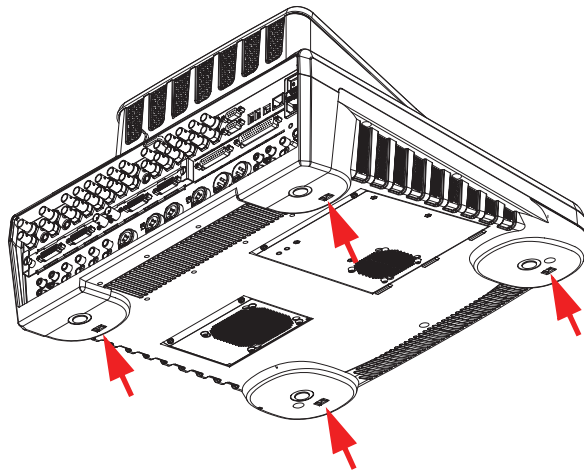
Figure 4. Cage nuts for rackmounting

CAUTION   To avoid damages of the unit, only use screws with a maximum length of 10 mm (0.39 inch).

3.4   Video Connections

The **INDIGO AV Mixer** provides various analog and digital video inputs and outputs. Via the optional HiRes board you can also make use of HD inputs and outputs as well as internal upscaled and downscaled signals.

3.4.1   Video Inputs Overview

The following figure shows the video inputs of the **INDIGO AV Mixer**:
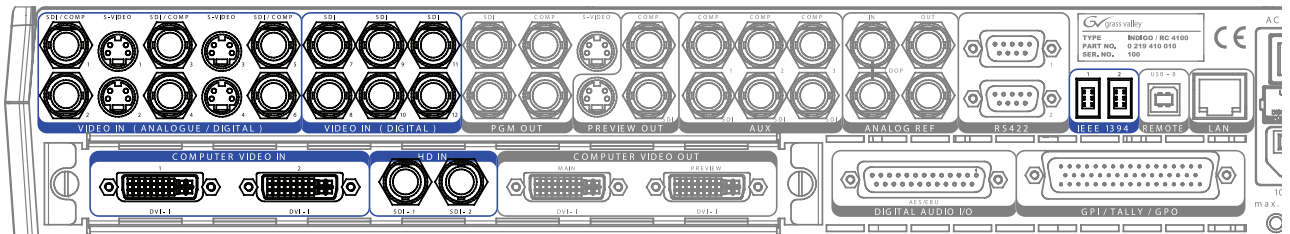
Figure 5. Video input connections

3.4.2   Video Inputs

The **INDIGO AV Mixer** provides various inputs for video, both analog and digital.

Note   The system can perform auto frame synchronizing for all video inputs, so there is no requirement for genlocking.

The following inputs are available:

- 12 **SDI** inputs, the first 6 supporting also analog formats

  Supported **analog** formats:

  - PAL B, G, H, I, M, N; Pal 60

  - NTSC, NTSC M, NTSC 4.43

  Supported **digital** formats:

  - ITU-R-656 (SMPTE 259M-1997) with embedded audio (SMPTE 272M-1994)

- 6 **CVBS** (**Composite**) inputs

Note   The CVBS inputs share connectors with the first 6 SDI inputs.

- 4 **S-Video** inputs, aliased with the first 4 SDI inputs

- 2 **IEEE 1394** (**Firewire**) inputs

Note   The firewire inputs will replace the SDI inputs 11 and 12.

Note   The Firewire connectors can also be configured as outputs.

HiRes Board

The optional HiRes board additionally provides the following video inputs:

*   2 **DVI-I** inputs with a resolution of up to 1920x1080 pixels

*   2 **HD-SDI** inputs with a resolution of 1080i or 720p

Note   Using an appropriate adapter, analog **VGA** signals can also be input via the DVI-I connectors (see *DVI-I to VGA* on page 29).

3.4.3   Video Outputs Overview

The following figure shows the video outputs of the **INDIGO AV Mixer**:
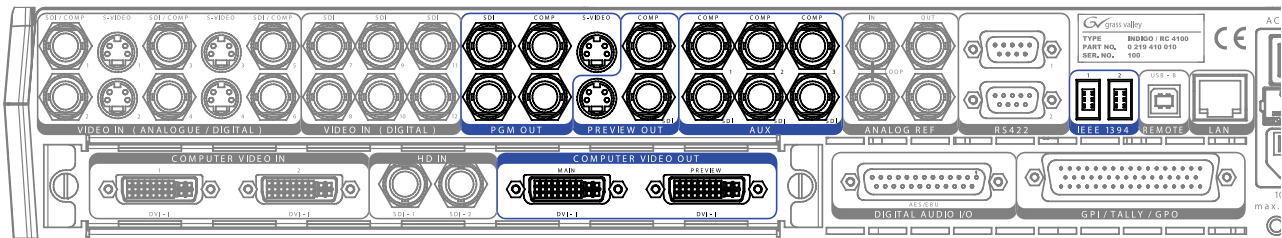
Figure 6. Video output connections

3.4.4   Video Outputs

The outputs listed below are sorted by sections (as labeled on the rear panel), in order to allow a quick and easy overview.

Section PGM OUT

The **PGM OUT** section provides the following outputs, which can be used concurrently:

*   2 x **SDI**

*   2 x **CVBS** (Composite)

*   1 x **S-Video**

Section PREVIEW OUT

The **PREVIEW OUT** section provides the following outputs, which can be used concurrently:

*   1 x **SDI**

*   1 x **CVBS** (Composite)

*   1 x **S-Video**

Section AUX

The **AUX** section provides the following outputs, which can be used concurrently:

- 3 x **SDI**

- 3 x **CVBS** (Composite)

Note   AUX outputs cannot be used in bypass mode and are always re-clocked/timed.

Section IEEE 1394 (Firewire)

The **Firewire** section provides 2 outputs.

Note   The Firewire connectors can also be configured as inputs.

Section COMPUTER VIDEO OUT (HiRes Board)

The optional **HiRes board** additionally provides the following video outputs:

- 2 **DVI-I** outputs with a resolution of up to 1920x1080 pixels

Note   DVI only provides progressive signals.

- 2 downscaled outputs

  The downscaled outputs provide HR versions of **PGM OUT** and **PREVIEW OUT** and are internal resources. Select one or two inputs out of the 12 available inputs.

Note   Each downscaled output will replace one SDI input (11 = PGM, 12 = PVW).

Note   Using an appropriate adapter, also analog **VGA** signals can be output via the DVI-I connectors (see *DVI-I to VGA* on page 29).

3.5   Analog Ref Connections

The **Analog Ref** section provides two Black Burst outputs to sync external equipment, i.e. the **INDIGO AV Mixer** can be used as sync generator for the rest of the production system.

It also provides a Black Burst input with a loop through connector to sync the **INDIGO AV Mixer** to an external reference signal.

Use a terminating resistor of 75 Ohm if you connect a signal but do not loop it through.

Note   The Analog Ref connectors cannot be used as inputs or outputs for video signals.
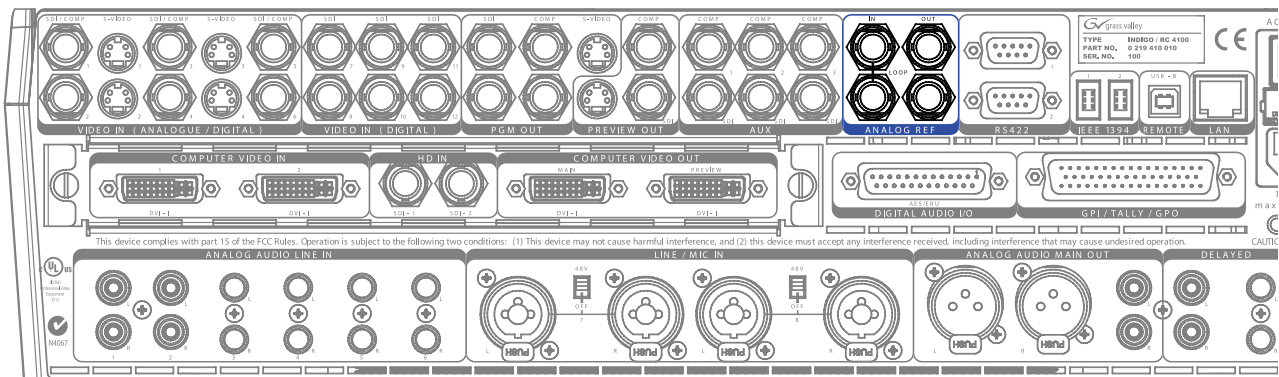
Figure 7. Analog Ref connections

3.6 Audio Connections

The **INDIGO AV Mixer** provides various analog and digital audio inputs and outputs.

3.6.1 Audio Inputs Overview

The following figure shows the audio inputs of the **INDIGO AV Mixer**:

Figure 8. Audio input connections

| Note | All XLR connectors of the **INDIGO AV Mixer** correspond to IEC 61076-2-103. Only use corresponding plugs, for example, NEUTRIK. Plugs that do not match this standard may become stuck in the jack. |

3.6.2 Audio Input Types

You can connect various analog and digital audio input signals to the **INDIGO AV Mixer**.

| Note | The maximum amount of concurrently usable audio channels is 8. |

Analog Audio Input

The **INDIGO AV Mixer** provides the following connections for analog audio input:

- 2 x **RCA** (unbalanced)
- 4 x **TRS 1/4"** (balanced)

Microphone / Line In

The **LINE/MIC IN** section provides combined XLR/TRS 1/4″ connectors as inputs:

- 4 x **XLR**

- 4 x **TRS 1/4″** (the TRS 1/4″ phone connectors are located in the middle of the combined connectors and can be used instead of XLR)
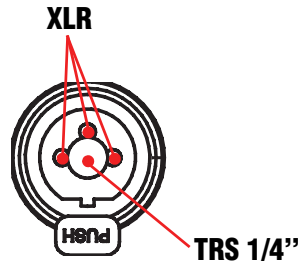
Figure 9. Combined XLR/TRS 1/4″ connector

Note   Phantom power (+48 V DC) can be activated for Line/Mic inputs 1/2 and 3/4.

Note   The LINE/MIC IN inputs can be amplified (see *Mixer Submenu* on page 97).

Digital Audio Input

The **INDIGO AV Mixer** provides the following connections for digital audio input:

- 6 x **AES/EBU** (25-pin Sub-D connector, section **DIGITAL AUDIO I/O**)

De-embedded/Embedded Audio (SDI)

Audio can also be derived (de-embedded) from up to six SDI video inputs (see *Audio Submenu* on page 129).

For all SDI outputs, audio is embedded in **Main** and **Sub** channels in pairs 1+2 and 3+4.

Note   De-embedded audio signals may be automatically delayed according to their related video signals to avoid offset when being processed and re-embedded on output.

3.6.3   Audio Outputs Overview

The following figure shows the audio outputs of the **INDIGO AV Mixer**:
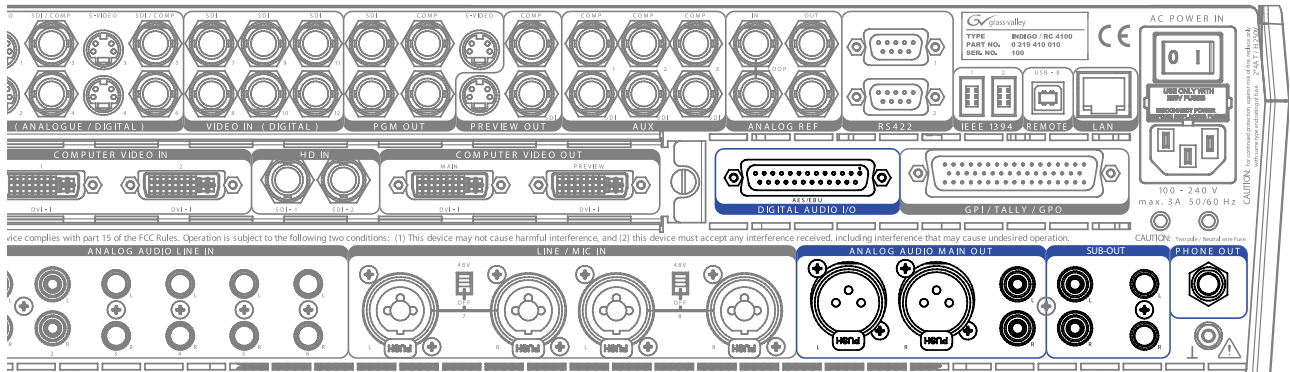
Figure 10. Audio output connections

3.6.4   Audio Output Types

The **INDIGO AV Mixer** provides various analog and digital audio outputs.

Analog Audio Output

The outputs listed below are sorted by sections (as labeled on the rear panel), in order to allow a quick and easy overview:

Section ANALOG AUDIO MAIN OUT

These outputs can be used concurrently:

• 1 x **XLR** (balanced)

• 1 x **RCA** (unbalanced)

Section SUB-OUT

Sub-Out is a fully featured mixing unit. These outputs are similar to **Main Out**, but additionally provide delayed output functionality (for example, for a second pair of speakers in the middle of a bigger area or hall). They can be used concurrently:

• 1 x **RCA** (unbalanced)

• 1 x **TRS 1/4"** (unbalanced)

Headphones

There are 2 headphones connectors, one on the top panel and one on the rear panel. The headphone connectors may also be used for monitoring, when connecting speakers instead of headphones.

Digital Audio Output

The **INDIGO AV Mixer** provides the following connections for digital audio output:

- 2 x **AES/EBU** (25-pin connector, section **DIGITAL AUDIO I/O**)

Note   The first digital output provides the same audio signal as section **ANALOG AUDIO MAIN OUT**.
The second digital output provides the same audio signal as section **SUB-OUT**.

Additionally, the SDI outputs of **PGM OUT** (*Section PGM OUT* on page 20) provide embedded audio (Channel 1+2 = Main, 3+4 = Sub).

Note   There is no audio processing for HR sources.

3.6.5   AES/EBU Pin Out

Digital audio I/O are available over SD-SDI or AES/EBU. The pin out for the AES/EBU connector is shown below.
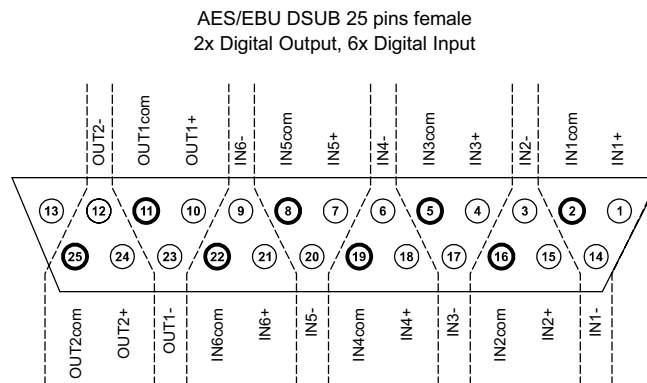
Figure 11. AES/EBU pin out

The following table shows the pin assignment grouped by inputs and outputs:

Digital Audio Input	Description	Pin
	IN1+	1
1	IN1-	14
	IN1com	2
	IN2+	15
2	IN2-	3
	IN2com	16
	IN3+	4
3	IN3-	17
	IN3com	5
	IN4+	18
4	IN4-	6
	IN4com	19
	IN5+	7
5	IN5-	20
	IN5com	8
	IN6+	21
6	IN6-	9
	IN6com	22
Digital Audio Output	**Description**	**Pin**
	OUT1+	10
1	OUT1-	23
	OUT1com	11
	OUT2+	24
2	OUT2-	12
	OUT2com	25

Note   The optional adapter **INDIGO1-AUDIO_CABLE** connects two XLR outputs and six XLR inputs with the 25pin AES/EBU connector of your **INDIGO AV Mixer**. The cable length is three meters.

3.7 Monitors

The **INDIGO AV Mixer** provides program, preview, and auxiliary monitor outputs.

3.7.1 Program Monitors

Program monitors are connected to the outputs in the **PGM OUT** section. You can connect up to five program monitors in parallel.
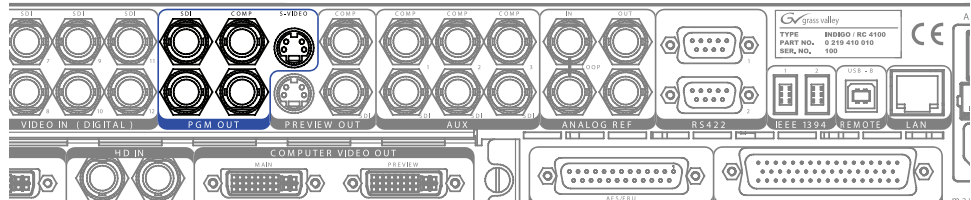
Figure 12. Program monitor connections

3.7.2 Preview Monitors

Preview monitors are connected to the outputs in the **PREVIEW OUT** section. You can connect up to three preview monitors in parallel.
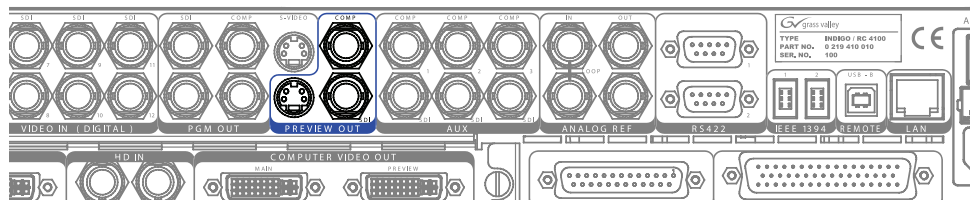
Figure 13. Preview monitor connections

3.7.3 Auxiliary Monitors

Use the connectors of the **AUX** section to output special signals, for example, a single keyer signal, to check on a separate monitor. You can connect up to three auxiliary monitors in parallel.
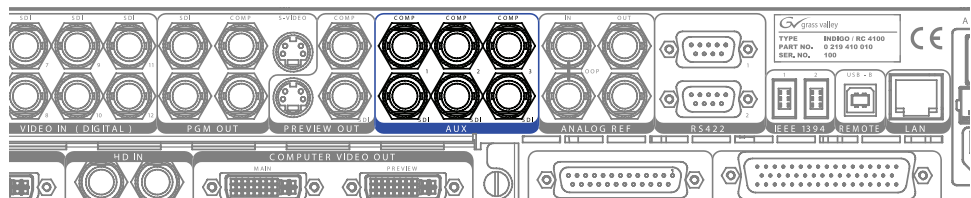
Figure 14. Preview monitor connections

3.8   USB Ports

The **INDIGO AV Mixer** provides 3 USB ports: one on the rear panel and two on the top panel.

Note   The USB port on the rear panel is for future use and currently without function.

The USB ports on the top panel allow you to connect USB devices like USB sticks or USB drives to store and load data (for example, user settings or images).
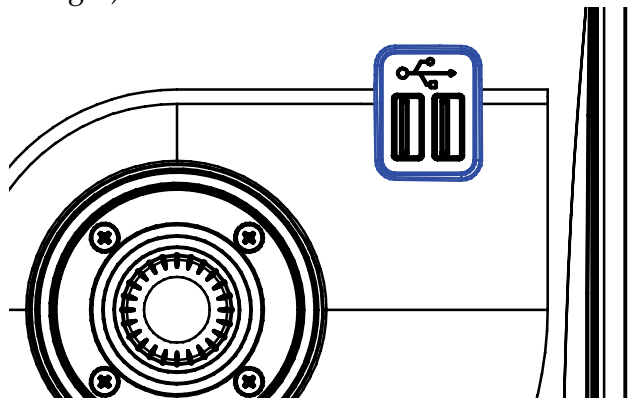
Figure 15.   USB ports on the top panel

Note   To ensure proper function, use only USB sticks that are tested and confirmed by GrassValley.

3.9   Adapters

3.9.1   DVI-I to VGA

The DVI-I outputs of the **INDIGO AV Mixer** provide both DVI and VGA signals. If you want to connect standard VGA monitors you need an appropriate adapter or breakout cable.

3.9.2   DVI-I to DVI-D

You do not need an adapter to connect DVI-D devices to the DVI-I inputs and outputs of the **INDIGO AV Mixer**.

3.9.3   DVI-I to HDMI

You can use conventional adapters to connect HDMI devices to the DVI-I inputs and outputs of the **INDIGO AV Mixer**.

3.10 Tally/GPI/GPO

Use the **GPI / TALLY / GPO** 50-pin Sub-D connector to control external devices via relays, or to send and receive control signals and events.
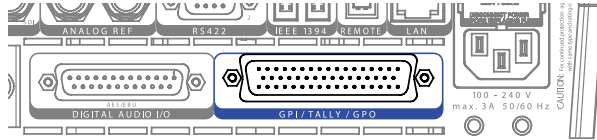
Figure 16. GPI / TALLY / GPO connector

The **GPI / TALLY / GPO** connector provides:

• 16 outputs, usable as tally out or GPO

This lets you open and close connections between two corresponding pins of the connector, to control external devices or relays.

• 8 inputs, usable as tally in or GPI

By opening/closing the connection between two corresponding pins of the connector, you activate functions like transitions or audio channel on/off (see *GPIO Submenu* on page 138).

Tally Breakout Adapter

The optional **Tally Breakout Adapter** provides an easy way to use the **GPI / TALLY / GPO** connector.
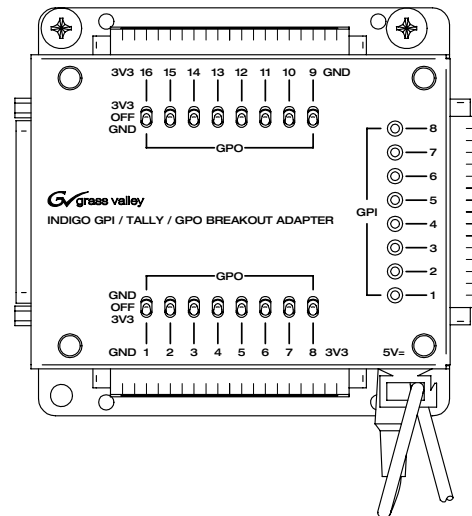
Figure 17. Tally Breakout Adapter

It comes with a wall mount adapter (EU and USA) for power supply with 5 V DC and 10 W maximum power. If required, ask your dealer for a different adapter.

You may also develop your own breakout box or simply connect the pins that you need for your application.

GPI/GPO Interface

In the following you can see the pin assignment of the GPI/GPO connector and how to connect the inputs and outputs of the interface.

GPI/GPO Connector

A pair of two pins of the GPI/GPO connector represents one input or one output. The following table shows the corresponding pin assignments:

GPI	Pins	GPO	Pins
1	1, 2	1	22, 23
2	18, 19	2	8, 9
3	34, 35	3	24, 25
4	3, 4	4	41, 42
5	20, 21	5	10, 11
6	36, 37	6	26, 27
7	5, 6	7	43, 44
8	38,39	8	12, 13
		9	28, 29
		10	45, 46
		11	14, 15
		12	30, 31
		13	47, 48
		14	16, 17
		15	32, 33
		16	49, 50
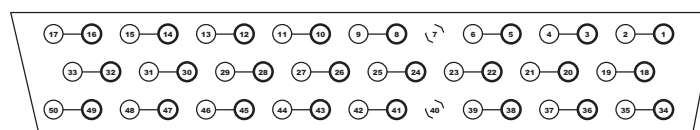
Pins 1 ... 17
Pins 18 ... 33
Pins 34 ... 50

Figure 18. 50-pin Sub-D plug for GPI/GPO features

Interface Connections

The following figure shows how to connect GPI 1 of the GPI interface, as an example. The other inputs are connected the same way:
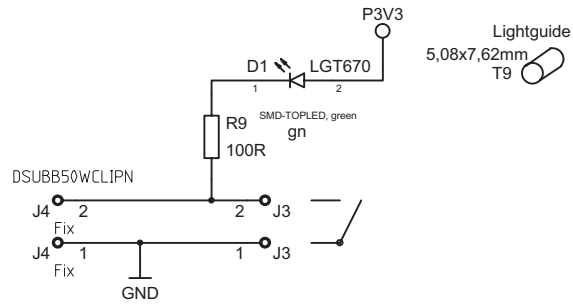
Figure 19. GPI interface

The following figure shows how to connect GPO 1 of the GPO interface, as an example. The other inputs are connected the same way:
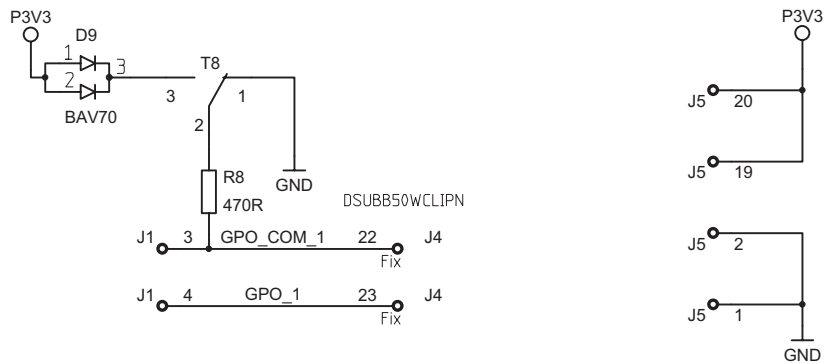
Figure 20. GPO interface

Section   4

Initial Settings

If you switch on your **INDIGO AV Mixer** for the first time or use a new setup (i.e. you connected different or additional devices) you have to adjust the video and audio settings after first power-on.

4.1   Power-On

Use the power switch on the rear side to switch on your **INDIGO AV Mixer**.
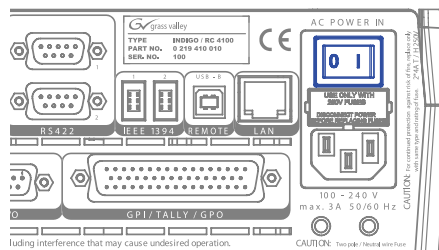
Figure 21. The power switch

4.2   Video Settings

Configure the video settings as needed, according to the connected devices:

1. Select the **SETUP** main menu (see *Setup Main Menu* on page 116) to make your settings.

2. In the **VIDEO** submenu (see *Video Submenu* on page 120), press the **Input** button to list all video inputs and set the signal **Type** for each (used) video input.

3. Press the **Output** button and select the desired **Graphic Standard** (resolution) and **Type** (PAL or NTSC).

4. If desired, in the **CONTROL PANEL** submenu (see *Control Panel Submenu* on page 135), press **Button Assign** and set the video signal routing, i.e. which video **Sources** are routed to which **Buttons** on the Background crossbar.

   By default, the buttons are assigned corresponding to the number of the video signal input channel, for example, the signal from video input 2 is routed to button **2**, SD stills are assigned to buttons **Shift+3** to **Shift+10**.

4.3   Audio Settings

To adjust the audio settings:

1. Select the **SETUP** main menu (see *Setup Main Menu* on page 116).

2. In the **AUDIO** submenu (see *Audio Submenu* on page 129), press the **Operation Mode** button to select one of the following modes:

   - **8 Stereo**: You can use the audio signals of eight stereo sources, deriving from RCA, TRS 1/4″, XLR, AES/EBU signals or even de-embedded audio from video streams.

   - **7 Stereo, 2 Mic**: You can use seven stereo audio signals (deriving from RCA, TRS 1/4″, XLR, AES/EBU signals or even de-embedded audio from video streams) and two microphones that are connected to **LINE/MIC IN** inputs.

   - **6 Stereo, 4 Mic**: You can use six stereo audio signals (deriving from RCA, TRS 1/4″, XLR, AES/EBU signals or even de-embedded audio from video streams) and up to four microphones that are connected to **LINE/MIC IN** inputs.

   Note   When assigning an XLR connector to a Mic Input, the corresponding Gain parameter in Audio Mixer changes from Channel Gain to Mic Gain, indicating the individually used pre-amplifier circuits.

3. If desired, in the **CONTROL PANEL** submenu (see *Control Panel Submenu* on page 135), press **Fader Assign** and set the audio signal routing (i.e. which audio source is routed to which fader in the Audio Control Subpanel (see *Tutorials* on page 67).

   By default, the faders are assigned according to the number of the audio signal input channel, for example, the signal from audio input 3 is routed to fader **3**.

4.4   Example Setup

The following figure shows a possible setup:

Figure 22. Connections for a big event setup

See more examples and how to adjust the corresponding setups in the section *Tutorials* on page 67.

Section 5

Basic Operation

5.1   Overview of Control Features

5.1.1   Control Panel

The **INDIGO AV Mixer** is operated by using the buttons, Digipots, lever controls, and the graphical menu on the Touch Screen.

The buttons on the Control Panel are used during live operation for fast and real time control. The menus, accessed via the Touch Screen, allow full control and edit facilities and are mainly used to set up effects and for system configuration.

The control features of the **INDIGO AV Mixer** are grouped by functionality into the following main sections:

- (1) *Touch Screen with Digipots* (see page 38)
- (2) *Delegation Subpanel* (see page 39)
- (3) *Crossbars for Bus and Source Selection* (see page 40)
- (4) *Main Transitions Subpanel with Transition Lever Arm* (see page 41)
- (5) *Numeric Input Subpanel* (see page 43)
- (6) *Audio Control Subpanel* (see page 44)
- (7) *Joystick* (see page 45)

The following figure shows the Control Panel of the **INDIGO AV Mixer** with its various control features:
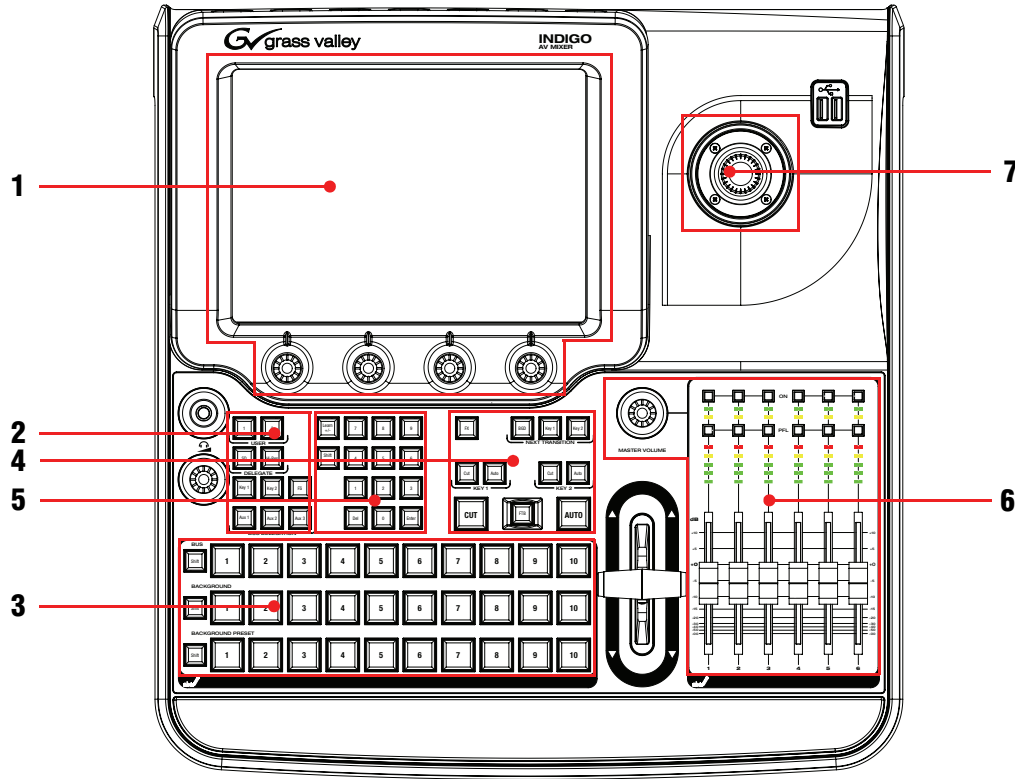
Figure 23. Control Panel

5.1.2 Touch Screen with Digipots

Touch Screen

The Touch Screen allows direct interaction with menu controls displayed on the screen. The screen is designed to work with a finger or other soft objects. The Touch Screen is sensitive to a single pressure location only, so only one touch surface control can be adjusted at a time.

CAUTION Do not apply any sharp or rigid object (no pens or pencils) to the Touch Screen display surface.

If **Auto Menu Delegation** in the lower left corner is unlocked (see *Auto Menu Delegation* on page 77), the menus will follow the related Control Panel buttons. For example, pressing the **FX** button displays the **EFFECTS** submenu of the **TRANSITION** main menu on the screen.

See *General Handling of the Menus* on page 73 for detailed information on how to use the menus.

Digipots

The Digipots below the graphical display can be used to dial in parameter values for functions displayed on the Touch Screen. Pressing a Digipot sets the parameter value to default.

5.1.3   Delegation Subpanel
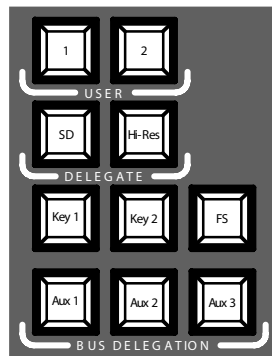
Figure 24. Delegation Subpanel

User

Use buttons **1** or **2** to quickly and directly access a specific point in the menu hierarchy, for example, to call up **Calibration** in the **SETUP** main menu.

To assign a specific menu screen to button **1** (or button **2)**, open the desired menu screen and press and hold button **1** (or button **2)** for two seconds.

Delegate

Use the **DELEGATE** section to determine which M/E is active: SD or HiRes.

Bus Delegation

The **INDIGO AV Mixer** M/Es include multiple sources as well as keyers and aux buses.

To simplify use, the **INDIGO AV Mixer** panels provide alternate buses accessed by **BUS DELEGATION** buttons. Press a **BUS DELEGATION** button to change which bus is affected by pressing a source select button on the Bus Crossbar. You can select between

- Key sources (**Key 1** or **Key 2**)

- Auxiliary output sources (**Aux 1** to **Aux 3**)

See *Selecting Sources* on page 46 for further information.

Note   Auxiliary output delegation is only available for SD.

5.1.4   Crossbars for Bus and Source Selection

The **INDIGO AV Mixer** includes several inputs which can be used universally for video or key signals.
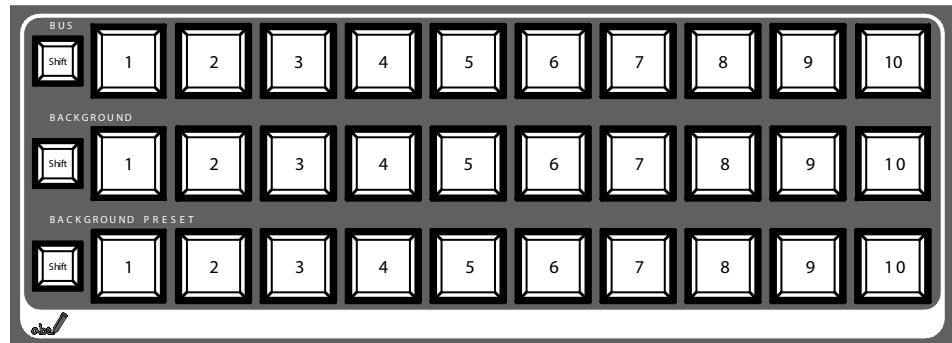
Figure 25. Crossbars for Bus and Source Selection

Note   Use the **Shift** buttons to access numbers 11 to 20 on the Bus, Background, and Background Preset Crossbars.

By default, the buttons **1** to **10** and **Shift+1** and **Shift+2** correspond to the sources **IN01 SD** to **IN12 SD**, the buttons **Shift+3** to **Shift+10** correspond to Stills 1 to 8 (for button assignment see also *Control Panel Submenu* on page 135).

Bus

The Bus Crossbar is used to select key and fill signals as well as sources for AUX 1 to 3.

See *Delegation Subpanel* on page 39 for information on the types of buses that can be assigned to the crossbar and how to select them.

Background

The Background Crossbar indicates which signal is selected as the current background picture. Pressing another key in this row performs a hard cut to another background picture. The selected background picture can be viewed on the corresponding program monitor.

Background Preset

The Background Preset Crossbar is used to pre-select and indicate the background involved in a signal transition. The preset background picture and the selected modifications (for example, keys) can be viewed on the corresponding preview monitor.

The background and preset buses operate in "Flip-Flop" mode. After the background transition is complete, the preset source is automatically selected on the background bus and the original background source is automatically "flipped" to the preset bus.

5.1.5   Main Transitions Subpanel with Transition Lever Arm

The transition controls are used to select the signal elements that will be involved in the transition (background and/or keys), define the type of transition and perform the transition.

The control is performed in two sections:

- **Main Transition Section** with all main controls for transitions

- **Transition Lever Arm** for manual transition control

Main Transition Elements

Use the **Key 1**, **Key 2**, and **BGD** buttons in the **NEXT TRANSITION** section to select the elements that will change during the next transition.

Use the **CUT** and **AUTO** buttons and the **Transition Lever Arm** to perform main transitions. After a transition is complete, the background source selections flip-flop, readying the Background Preset bus for the next source selection.
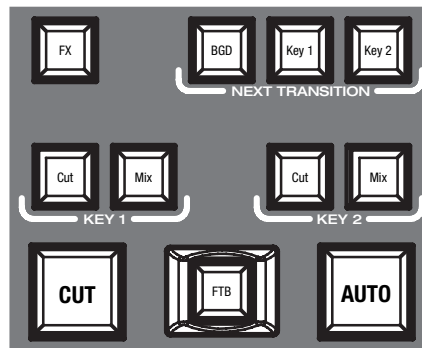
Figure 26. Main Transition Section

Next Transition

Pressing these buttons does not change the current output of the switcher, but prepares for a change (the next transition). The **NEXT TRANSITION** section includes the following buttons:

- **BGD** - Background Transition

  Use the **BGD** button to select a change in the Background buses. The result will be a transition from the current source on the Background bus to the source selected on the Background Preset bus. After the transition, the buses will flip flop, so the Background bus always remains the on-air bus. The Background bus selection remains the background source if this button is not selected as part of the next transition.

- **Key 1** and **Key 2**

  Use the **Key 1** and **Key 2** buttons to select the keyers that will be involved in the next transition. The Background bus selection remains unchanged if one of these buttons is selected for the next transition.

  Note   A keyer may be on, but not visible (for example, half way through a preset black transition).

Key 1 and Key 2

Cut

An instantaneous switch from one picture to another. Switching circuitry allows cuts only during the vertical interval of the video signal to prevent disruption of the picture.

Mix

A transition between two video signals in which one signal is faded down as the other is faded up.

Also called a dissolve (blending a new video into the existing image). When applying an effect, it gradually blends in the effect.

CUT

Instantaneously replaces the selected elements with their new sources or states, regardless of the transition type selected.

AUTO

Starts an automatic transition of a predetermined rate, either from one video to another or when applying an effect. The duration can be set in the **DURATION** submenu (see page 82).

Pressing **Auto** a second time during a transition pauses the transition at that point. The transition can then be completed by pressing the button a third time or by moving the **Transition Lever Arm** to its opposite limit.

FTB (Fade to Black)

This button fades the video out to or in from a black screen. Audio signals fade out to or in from silence.

FX

Activates the selected effects for each layer and makes them usable for transitions. The effects are selected and adjusted in the **TRANSITION** main menu.

If the **FX** button is deactivated, the selected effects are ignored and *Mix* is used for transitions.

See *Transition Main Menu* on page 77 for information on selecting effects.

Transition Lever Arm
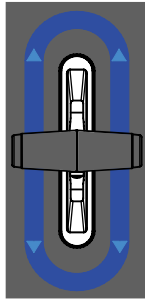
Figure 27. Transition Lever Arm

The **Transition Lever Arm** is used to manually perform a transition. You can move the lever in either direction to run a transition due to the flip-flop architecture of the buses. Moving the lever from one limit to the other performs a complete transition.

It is possible to start a transition with the lever, then stop moving the lever at any point, reverse its direction, and even return it to the original limit without completing the transition.

5.1.6 Numeric Input Subpanel

Use the Numeric Input Subpanel to enter numbers, for example to enter the standardized identification number for effects in the **EFFECTS** submenu. Use the **Del** button to delete the last digit entered and press the **Enter** button to confirm your entries.

You can also adjust parameter values via the Numeric Input Subpanel. In this case, the **Shift** button outputs the decimal point (".") and the **Learn** button outputs the minus sign ("-").
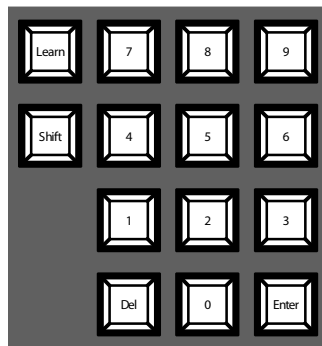
Figure 28. Numeric Input Subpanel

You can use the Numeric Input Subpanel to store and call up E-MEMs. These are mixer state presets (see *E-MEM Main Menu* on page 107 for further information). Use the numeric keys to have quick access to the first 20 presets. Access numbers 11 to 20 with the **Shift** button. In the **E-MEM** main menu, you can access stored presets with a number higher than 20.

Learn

Waits for the next state to be saved to E-MEM via **Enter.**

5.1.7   Audio Control Subpanel
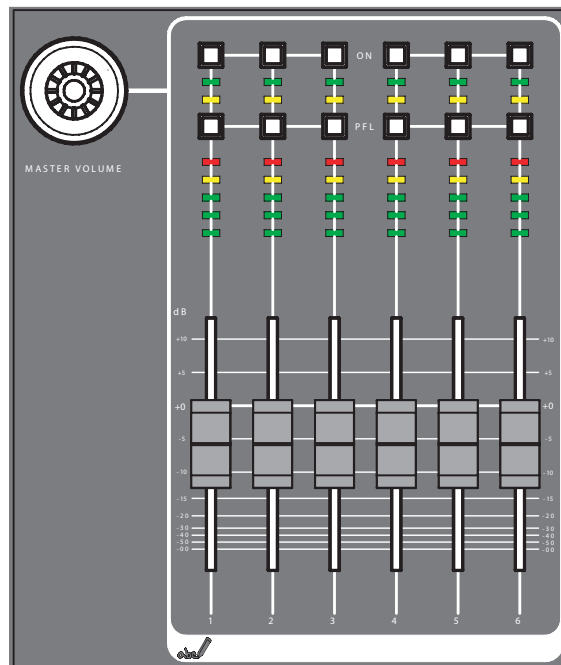
Figure 29. Audio Control Subpanel

Mute/PFL Buttons

PFL (Pre-Fader-Listening)

Changes to PFL mode. This allows you to hear the audio signal on the headphones as it sounds before the fader.

On

Turns the related audio channel on/off.

LED Peak-Meters

The meters read the inputs assigned to the faders and display the channel levels with three different colors:

- *Green*: from -∞ to -6 dB

- *Yellow*: -6 dB to -2 dB

- *Red*: -2 dB to +10 dB

Faders

The faders adjust the input levels of the audio assigned to the **INDIGO AV Mixer** channels within the range of -∞ to +10 dB.

Use them to level the volumes of different audio sources.

Master Volume Button

The Master Volume Button lets you adjust the overall volume.

Headphones

The phones connectors output the Main out, Sub-Out or channel PFL signal.

There are 2 phones connectors: one on the Control Panel and one on the rear panel. They have the same source, but separate amplifiers.

5.1.8 Joystick

The Joystick in the upper right section of the **INDIGO AV Mixer** provides easy positioning and sizing of keys (for example, positioning PIPs). On Chromakey, the Joystick can be used to position the cursor for selecting the color area to perform the key processing.

5.2   Selecting Sources

This section provides information on selecting sources as video and audio signals, keys sources, and Stills.

Configure and route the input and output sources for both video and audio signals in the **SETUP** main menu (see *Setup Main Menu* on page 116).

5.2.1   Video

Select video signals with the crossbar buttons (see *Crossbars for Bus and Source Selection* on page 40). Use the **SETUP** main menu to assign video sources to the buttons.
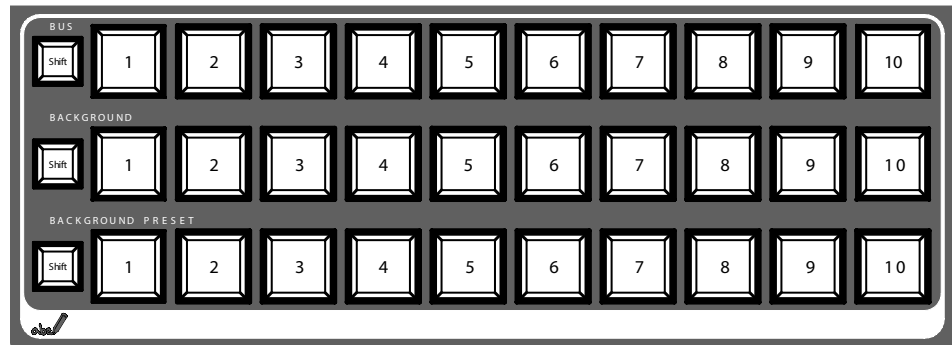
See also *Video Settings* on page 33 for information on configuring video settings.

Video Sources

The video signals for the program monitors are selected in the middle crossbar row, labeled as **BACKGROUND**. Pressing another key in this row performs a hard cut to another signal.

Select the input and output sources in the **VIDEO** submenu under **SETUP** (see *Video Submenu* on page 120), and assign the signals to the crossbar buttons in the **CONTROL PANEL** submenu (see *Control Panel Submenu* on page 135).

Keys Sources, Auxes and Stills

Key and fill signals, and auxiliary outputs are selected in the top crossbar row, labeled as **BUS**. See *Bus Delegation* on page 39 for information on selecting the types of sources.

Select and adjust the key and fill sources in the **KEYERS** main menu (see *Keyer Main Menu* on page 83).

To save a Still (capture a video frame) from a currently displayed video, use the Stills Store menu (see *Stills Store Main Menu* on page 112).

Preview of Signal Transitions

The preset background involved in a signal transition together with the selected modifications (for example, keys) is selected in the bottom crossbar row, labeled **BACKGROUND PRESET**. Pressing a key in this row shows the selected preset background on the corresponding preview monitor (LAH preview).

Onscreen Preview

The **Onscreen Preview** window lets you display program, preview, and aux1/2 signals of SD outputs directly on the Touch Screen (see *Onscreen Preview* on page 75).

5.2.2   Audio

Use the faders and the **AUDIO MIXER** main menu to control the audio signals (see *Audio Mixer Main Menu* on page 97).

Use the **CONTROL PANEL** submenu to assign the audio channels to the faders (see *Control Panel Submenu* on page 135).

You can assign an audio stream to a video source (see *Audio Follow Video* on page 64).

See also *Audio Settings* on page 34 for information on configuring the audio settings.

5.3   Video Processing

This section shows you how to make transitions, effect transitions, titles, and chroma keys.

5.3.1   Transitions, Effects, and Keying

The **INDIGO AV Mixer** provides various ways to manipulate and mix video signals. The most common ways are described in the following.

The first part of this section provides some theory and basic information about transitions and keying.

The second part provides examples for:

- Making a background transition
- Making a title
- Making a chroma key
- Making an effect transition
- Making a PiP (Picture in Picture)

Transitions

A *transition* is a change from one image to another. It can be applied to the entire picture, or to only the background or keyed elements of the picture. It may include multiple elements.

The **INDIGO AV Mixer** supports the following types of transitions:

- Cut
- Mix
- Wipe

Cut

A *cut* is an instantaneous switch from one image to another (between successive video fields or frames). The simplest type is a hot cut, accomplished by selecting a different source on a bus feeding an M/E output. This only changes that bus' contribution to the output, and does not change what elements may be involved in the output (the same buses are involved).

The **INDIGO AV Mixer** also provides cut transitions, where the elements involved in a mixed output can be changed instantaneously. Different buses can be included or excluded, causing changes in the resulting composite image. Background cut transitions on the M/E are first selected on the Background Preset bus to allow the upcoming picture to be previewed before it is cut "On Air".

Mix

A *mix* is a transition from one picture to another where the new picture fades in as the existing picture fades out. During a standard mix transition, a superimposition of both pictures, each at a lower intensity, is visible.

The **INDIGO AV Mixer** allows mixing from one background to another and to mix up to two separate keys on or off over a background. Background and key mixes can be done separately or simultaneously.

Wipe

A *wipe* is a transition from one picture to another in which the edge of a shape moves across the screen, revealing the new picture. Wipe transitions can be applied to backgrounds, keys, or both simultaneously. A wipe transition shape can be selected from a variety of patterns. These patterns can be adjusted in several ways (for example, the edge attributes).

Fade to Black (FTB)

Fade to Black is a special type of transition where the picture transitions to black and then out of black to the new picture. Fade to Black actually involves two transitions: one to black and one from black. Therefore, it requires two operator commands to complete. The entire picture goes to black even if all the transition elements involved in the picture were not selected.

Keying

Keying inserts a part of one picture into another to create a composite picture. Keying involves three signals:

- Background

- Key cut, used to specify where to cut a hole in the background

- Key fill, used to fill the hole in the background

The fill can be an incoming video signal or it can be an internally generated matte fill. A separate key cut input signal is not necessarily required for keying. For example, a self key (also called a video key) uses the same input signal for both key cut and key fill.

Key Control Signal Adjustment

During keying, the selected key cut signal can be converted into a key control signal. It is the key control signal that actually cuts the hole in the background video. Adjusting the key control signal (Clip and Gain) is essential in the keying process. The art of setting up a good key is to use just enough Gain to suppress any imperfections in the incoming key signals. Setting Gain too high can cause ragged key edges.

The **INDIGO AV Mixer** provides two methods for adjusting the key control signal:

- Clip and Gain

- Cleanup and Density

Note that both of these methods control the same basic keying process.

Clip and Gain

The Clip and Gain operation selects a threshold of the selected key cut video that will be used to cut the hole in the background video. Clip controls the threshold, and Gain controls the softness of the key edges and any translucent areas. High portions of the key cut signal specify what video is retained, and low portions determine what video is removed. Intermediate levels specify a soft blend of the background and fill video.

Cleanup and Density

The Cleanup and Density operation influences only one end of the key area and keeps the other one constant. Cleanup only influences the background area. Key levels are increasingly limited to black, i.e. "cleaned". Noise and slight shadows in this area will disappear. Density only influences the foreground area. Key levels are increasingly limited to white to the unity value "1", which corresponds to the "dense" foreground.

Key Invert

Keys can be inverted, causing holes to be cut in the background where a normal key retains the background, and vice versa. Key invert makes the white areas of the key cut signal produce transparency, and the black areas produce opacity, the opposite of a standard key.

Border

The Border feature generates borders around keys. The key signal is delayed and/or enlarged, and the extra bordering space can be filled with matte. Border can be adjusted in size and in horizontal and vertical placement. Variations include Outline, Extrude and Drop.

Opacity

The opacity of a key can be adjusted. When opacity is reduced below 100% some background video is allowed to show through areas where it is normally excluded. Key opacity is an adjustment to the overall intensity of the key and is separate from Clip and Gain controls. Note that a common mistake is to set opacity to zero and forget that adjustment was made, which can cause confusion later when that key is selected but not visible.

The **INDIGO AV Mixer** supports the following types of keys:

- Luminance Key
- Chroma Key
- PiP (Picture in Picture)

Two of the keys, *Luminance Key* and *Chroma Key*, are described in detail in the following.

Luminance Key

A *luminance key* uses the luminance of an incoming source to specify where to cut the hole in the background. Luminance keying is typically done on sources that do not have an accompanying key cut signal, like a video camera. The key cut signal must be generated from the incoming video signal, using clip and gain controls. When only one source is used for both key cut and key fill, the key is called a Self key or Video key. The same key source signal is multiplied by the key cut signal to create the key fill, and then the signals are summed.
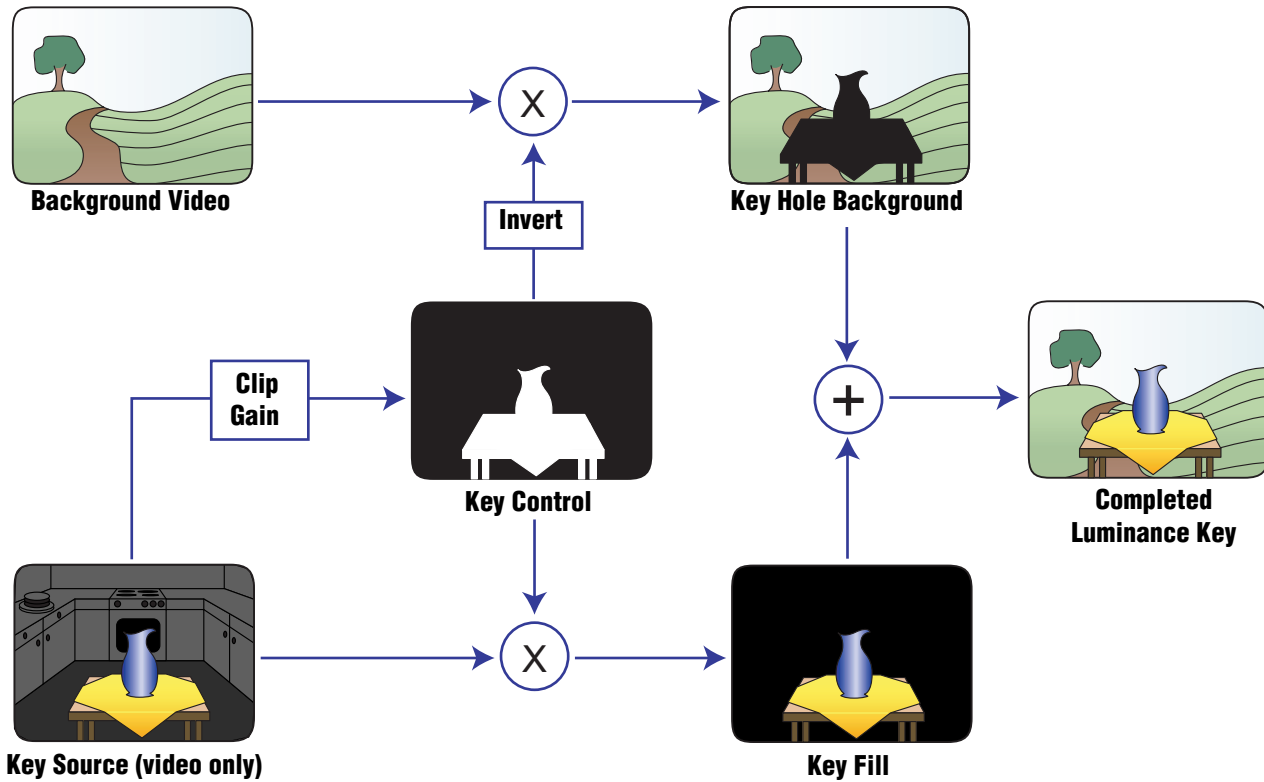
Figure 30. Luminance Key

Clip and Gain controls for luminance keys offer wide adjustment ranges.

Chroma Key

A *chroma key* is a key that detects color (rather than luminance) in a video image and replaces it with a new background. For example, a reporter may be in a studio sitting in front of a backdrop with a blue or green backing color, and the new background can be a mountain scene. The completed chroma key consists the mountain scene replacing the backing color, creating the illusion that the reporter is sitting in front of the mountain.
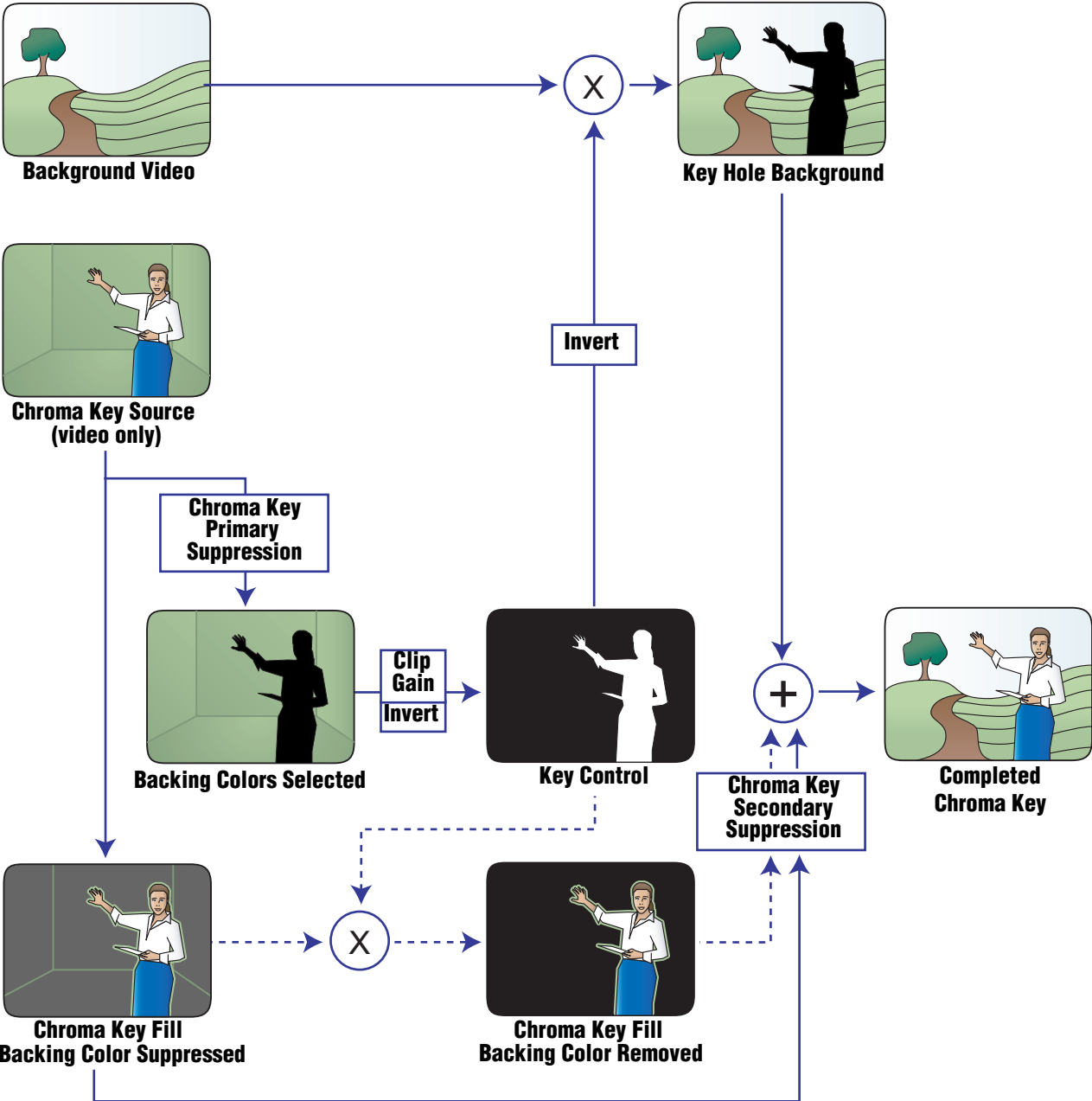
Figure 31. Chroma Key

The terms foreground and background are often a source of confusion when used for chroma keys. Foreground refers to the people or objects in a chroma key scene that are in front of the colored backdrop. Background refers to the scene that will replace the backing color (same as a linear or luminance key) in the final picture. Background does not refer to the backdrop of the foreground scene.

Chroma keys are performed by suppressing the backing color in the foreground scene, cutting a hole in the background, and then combining the two processed signals. When conditions are ideal, complete suppression of the backing color is possible and the hole cut in the background will match the suppressed foreground, permitting these two signals to be added successfully.

5.3.2 Making a Background Transition

To make a background transition:

1. Select **SD** or **HiRes [DELEGATE]**.
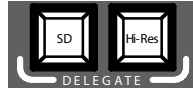
2. Select the desired source on the **Preset** bus.
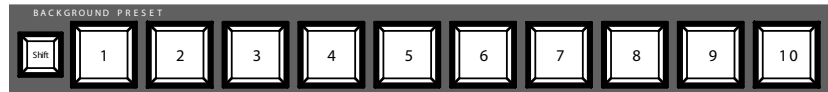
3. Make sure background transition is selected, i.e. the **BGD [Next Transition]** button is **ON**.

4. If necessary, select the **TRANSITION** main menu, select the **SD EFFECTS** or **HR EFFECTS** submenu (depending on delegation), and press **SD BGND** or **HR BGND**.

5. Select the desired category and the pattern, for example, **3D** and **Ripple**. See *SD/HR Effects Submenu* on page 78 for further information.

Note   If the **FX** button is **OFF**, only *Mix* is used for transitions. If **FX** is **ON**, the selected effects are used for transitions.

Note   For HiRes, only *Wipes* and *Mix* are available.

6. Press the **AUTO** button.
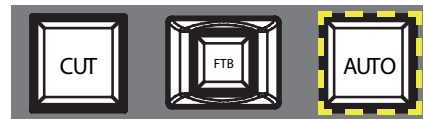
See *Duration Submenu* on page 82 if you want to modify the duration of the Auto transition.

– or –

Move the **Transition Lever Arm** to the opposite position.

5.3.3 Making a Title

This type of transition inserts a text into the background scene. The background remains unaffected.

A title is based on a luminance key (see *Luminance Key* on page 52).

Note   The following example uses **Key 1** in SD mode, but you can also use **Key 2** and/or HiRes mode.

To make a title:

1. Select **Key 1 [NEXT TRANSITION]**.

   If **Auto Menu Delegation** is **unlocked**, the **KEYER** menu is selected automatically.

   Key 1 [BUS DELEGATION] is selected automatically.
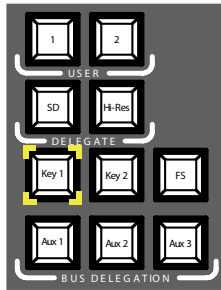
2. Make sure **Key 1 [BUS DELEGATION]** is selected.

3. Make sure **KEYER** main menu is selected.

4. Select the **SD KEY 1** submenu and press **Type**.

5. Select **Luma** as key type.

6. Press the **Source** button to select key sources.

   Fill: Characters from title generator

   Key: "Alpha channel" from title generator

7. Press the **Adjust** button.

8. Press the **Auto** button.

9. Select the mode (**Clip Gain** or **Cleanup Density**)

   If necessary, adjust the settings.

10. Press the **Cut [KEY 1]** or **Mix [KEY 1]** button.

– or –

Press the **CUT** or **AUTO** button.

See *Duration Submenu* on page 82 if you want to modify the duration of the Auto transition.

– or –

Move the **Transition Lever Arm** to the opposite position.

5.3.4 Making a Chroma Key

This type of transition inserts one video signal in place of areas of a particular color of another video signal. The background remains unaffected.

Note   The following example uses **Key 1** in SD mode, but you can also use **Key 2** and/or HiRes mode.

To make a chroma key:

1. Select **Key 1 [NEXT TRANSITION]**.

If **Auto Menu Delegation** is **unlocked**, the **KEYER** menu is selected automatically.

Key 1 [BUS DELEGATION] is selected automatically.

2. Make sure **Key 1 [BUS DELEGATION]** is selected.

3. Make sure **KEYER** main menu is selected.

4. Select the **SD KEY 1** submenu and press **Type**.

5. Select **Chroma** as key type.

6. Press the **Source** button to select key and fill sources.

7. Press the **Adjust** button.

8. Press the **Auto** button.

This adjusts the **Chroma** and **Selectivity** values automatically.

– or –

Press the **Cursor** button.

Adjust the Cursors position and size with the Joystick to set the color values used for the chroma key.

Note   **Auto** and **Cursor** buttons are not available in HiRes mode.

9. If required, adjust the **Chroma** and **Selectivity** values manually.

10. Press the **Cut [KEY 1]** or **Mix [KEY 1]** button.

– or –

Press the **CUT** or **AUTO** button.

– or –

Move the **Transition Lever Arm** to the opposite position.

5.3.5 Making an Effect Transition

With this type of transition, the background remains unaffected.

Note   The following example uses **Key 1** in SD mode, but you can also use **Key 2** and/or HiRes mode.

To make an effect transition:

1. Select **Key 1 [NEXT TRANSITION]**.

   If **Auto Menu Delegation** is **unlocked**, the **KEYER** menu is selected automatically.

   Key 1 [BUS DELEGATION] is selected automatically.

2. Make sure **Key 1 [BUS DELEGATION]** is selected.

3. Make sure **KEYER** main menu is selected.

4. Select the **SD KEY 1** submenu and press **Type**.

5. Select **Type**.

6. Select **Source**.

7. Go to the **TRANSITION** main menu.

8. Select **SD Key 1 In**.

9. Select the desired category and pattern, for example, **Slide** and **Left**.

10. If necessary, go to the **DURATION** submenu to adjust the timing settings.

11. Select **SD Key 1 Out**.

12. Select the desired category and pattern, for example, **Wipe** and **Circle**.

13. If necessary, go to the **DURATION** submenu to adjust the timing settings.

14. Make sure **FX** is selected.

15. Press the **Mix [KEY 1]** button.

    – or –

    Press the **AUTO** button.

    See *Duration Submenu* on page 82 if you want to modify the duration of the Auto transition.

    – or –

    Move the **Transition Lever Arm** to the opposite position.

5.3.6   Making a PiP (Picture in Picture) in SD Mode

This type of transition inserts a picture into the background scene. The background remains unaffected.

Note   The following example uses **Key 1** in SD mode, but you can also use **Key 2**.

To make a PiP:

1. Select **Key 1 [NEXT TRANSITION]**.

    If **Auto Menu Delegation** is **unlocked**, the **KEYER** menu is selected automatically.

    Key 1 [BUS DELEGATION] is selected automatically.

2. Make sure **Key 1 [BUS DELEGATION]** is selected.

3. Make sure **KEYER** main menu is selected.

4. Select the **SD KEY 1** submenu and press **Type**.

5. Select **PiP** as **Type**.

6. Press the **Source** button and select the **Fill** source from the list.

7. Press **Transform**.

8. Make sure the **Enable** button is activated.

9. Adjust **Top Corner**, **Bottom Corner**, and **2D Size** as desired to position and resize the picture.

10. Press the **Cut [KEY 1]** or **Mix [KEY 1]** button.

    – or –

    Press the **CUT** or **AUTO** button.

    – or –

    Move the **Transition Lever Arm** to the opposite position.

5.3.7 Making a PiP (Picture in Picture) in HR Mode

Making a PiP in HR mode is basically the same as in SD mode.

Note   In HR mode, the **Fill** source must not be the same as the background source.

Note   There is a special **PiP within PiP** possibility in HR mode which allows you to use four images in spite of the limitation to only three HR inputs. See *Making a PiP within a PiP in HR Mode* below.

5.3.8 Making a PiP within a PiP in HR Mode

The PiP function in HR mode generates a PiP within an HR image (which is already assembled on the input) before the HR keyer.

This compound image behaves like one single image for keying and transitions. This means that the PiP of the HR image cannot be faded in and out independently from the main HR image, and no separate keying is possible (for example, chroma keying on a special color).

Note   The source of an HR PiP is always an SD signal: SD PGM, SD PVW, Aux 1, or Aux2.
The HR source image cannot derive from a different SD source. Therefore, it should be VGA, DVI, or HD SDI. However, HD SDI also accepts an SD signal.

HR Key Type **PiP** sets up the outer PiP. However, sometimes a different Key Type could be useful.

Note   HR Key Type **PiP** is not the same as the described PiP of HR images. Key Type **PiP** means that neither luminance nor chroma keying will take place, but the assembled HR image will be cut into the background without any change.
Thus, you get an HR image including its PiP, which in turn is used as "keyer PiP" for the background (see figure below).

Note   Other Key Types may be used for special setups: The assembled HR image can be keyed into the background, using luminance or chrominance keying.

Overcome Input Limitations

By setting the main HR image size to **1**, the PiP of an HR image can also be used as a simple PiP. Thus, you can overcome the limitation to three HR inputs: The preview output may have **IN01 HR** with PiP **SD Aux1**, and the program output may have **IN02 HR** with PiP **SD Aux2**. Set the completely covered and invisible background to **IN03 HR**.

This setup is not possible using only regular Keyer PiPs (like in *Making a PiP (Picture in Picture) in HR Mode* on page 61), because four images are visible, but there are only three HR inputs – two full featured and one internal.

An HR PiP is structured as follows:

(1) Background

(2) PiP of HR image

(3) HR image
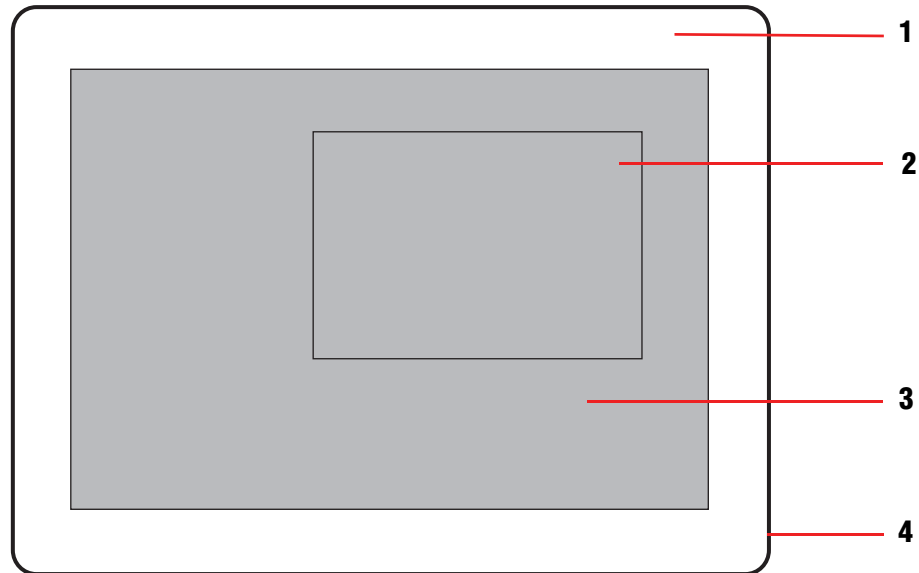
(4) Screen border .

Figure 32. PiP of an HR image within a Keyer PiP

Note   The grey area corresponds to the complete HR image (= Keyer PiP, i.e. HR image including PiP of HR image)

Note   The following example uses **HR Key 1** and **Key 1 [BUS DELEGATE]**, but you can also use **HR Key 2** and/or **Key 2 [BUS DELEGATE]**.

Configuring the Keyer

1. In the **KEYER** main menu, select **HR Key 1** and press **Type**.

2. Select **PiP** as **Type**.

3. Press the **Source** button and select the **Fill** source from the list.

Note   Select **IN01 HR** or **IN02 HR**. Do not select a Still!

4. Press **Transform**.

5. Make sure the **Enable** button is activated.

6. Make sure the **PiP Enable** button is activated.

7. Select **Hi-Res [DELEGATE]**.

8. Select **Key 1 [BUS DELEGATE]**.

9. Select **Hi-Res [DELEGATE]**.

10. Press the **Cut [KEY 1]** or **Mix [KEY 1]** button.

– or –

Press the **CUT** or **AUTO** button.

– or –

Move the **Transition Lever Arm** to the opposite position.

Setting the Default Sizes of the Images

Note   These are just pre-settings. The sources may not be visible at this time.

1. In the **TRANSFORM** submenu, set **2D Size** values **X**, **Y**, and **All** to **1**, in order to completely cover the background.

– or –

Decrease the value **All** (for example, to **0.75**), in order to show a part of the background (see *PiP of an HR image within a Keyer PiP* on page 62).

2. Set **PiP Size 2D** to, for example, **0.5**.

Selecting the Sources

1. Select the desired background.

2. Select the **PiP** of the HR image:

    a. In **SETUP > VIDEO > INPUT** select **IN01 HR** (or **IN02 HR**) as source from the list.

    b. Select **Internal SD** as **Type**.

    c. Select the desired internal source from the **Int. Sources** list.

    d. Adjust the **Alignment**.

    e. If you want to get a fixed aspect ratio, activate the **Preserve Aspect** button.

3. Select the HR main image, using a different **Type** (**VGA**, **DVI**, or **SDI HD**).

4. Set the sizes of the images (see above).

Note   In few cases, the lowest line of the HR image's PiP flickers with some sources and settings. Changing the size or the Internal SD Alignment may help.

Note   The HR sync signal must always be valid.
If an HR input signal is or becomes invalid (i.e., no or no valid sync), the PiP will blink for approx. 15 seconds.

5.4   Audio Processing

This section shows you how to process and mix audio signals with the **INDIGO AV Mixer**.

Audio Follow Video

You can assign one or more audio channels to a video channel (see *Audio Follow Video* on page 133).

Thus, when this video channel is selected, the assigned audio channels are selected automatically. The audio channels' volume levels can be adjusted for **On Air** and **Off Air**.

To assign an audio channel to a video channel:

1.   Select the **SETUP** main menu.

2.   Select the **AUDIO** submenu.

3.   Press **Follow Video**.

4.   If required, press **AVF Enable** to display the **Video Sources**.

5.   Select the desired video channel from the **Video Sources** list.

6.   Press the **Audio Source** button to display the **Audio Sources** list.

7.   Select the desired audio channel from the **Audio Sources** list.

8.   Press the **Level-Set** button.

9.   Use the two faders of the small area next to the **Audio Sources** list to adjust the audio levels for **On Air** and **Off Air**.

You may also use the Digipots to adjust these values for the selected audio source.

10.   If required, repeat steps 7 to 9 to assign further audio sources.

Note   Activated (enabled) video and audio sources are displayed as green entries within the lists.

5.4.1   Mic Inputs

The **INDIGO AV Mixer** includes four LINE/MIC IN mono inputs to feed in microphones or line levels.

If required, switch on phantom power (+48 V DC) for microphones. This can be activated separately for inputs 1/2 and 3/4.

You may, for example, pan the signals, route them to buses and set the desired volumes.

Note   Mic inputs are only available if you set the appropriate **Audio Mode** in the **AUDIO** submenu of the **SETUP** main menu (see *Audio Submenu* on page 129).

5.4.2   Stereo Inputs

You can use up to eight stereo audio inputs simultaneously, for example, audio signals from video channels and separate signals from CD players or other devices.

The stereo inputs can be processed the same way as the microphone inputs.

5.4.3   Adjusting Audio

The audio channel settings can be edited in the **AUDIO MIXER** main menu (see *Audio Mixer Main Menu* on page 97) and via the audio faders and buttons on the front panel.

Some important functions are explained here.

Equalizer

An *equalizer* allows you to manipulate the frequency spectrum of an audio signal. You can use it, for example, to prevent feedback in live situations, to reduce unwanted frequencies like low-level noise, or to raise frequencies that are important for an instrument's sound or a speaker's intelligibility.

The **INDIGO AV Mixer** provides a 4-band equalizer for each channel, i.e. you can adjust four different frequencies simultaneously: **Low**, **Mid 1**, **Mid 2**, and **High**.

Additionally, there is a **Low Cut** for each channel that cuts all frequencies below 100 Hz to reduce low-level noise.

ON Button

This button toggles between on and off.

If, for example, one of two microphones is not used for a while and has to be activated later at the same level, you will not need to adjust the fader to reduce the level. Simply press the **ON** button (in the **AUDIO MIXER** main menu or on the front panel). This turns off the related audio channel. To turn the channel on, press the **ON** button again.

PFL Button

The **PFL** button provides two functions:

- Press the **PFL** button to toggle between Main Out or Sub-Out AFL (LED off) and channel PFL (LED on).

- Press and hold the **PFL** button to access all audio channel settings on the Touch Screen.

Toggling between AFL and PFL

By default, audio signals are output in AFL (*After Fader Listening*) mode, i.e. if you change the fader, the volume also changes.

In some cases, you may not want the audio to follow the fader, for example, if you want to check an audio channel without changing the adjusted volume. You can achieve this by pressing the **PFL** button, which changes to PFL (*Pre Fader Listening*) mode. This allows you to hear the audio signal as it sounds before the fader.

Accessing channel settings

If you press and hold a channel's **PFL** button for approximately two seconds, the Touch Screen will display the **CHANNEL ADJUST** submenu (see *Channel Adjust Submenu* on page 99).

Section 6

Tutorials

This chapter contains practical tutorials to show you how to work with the **INDIGO AV Mixer**, how to choose the appropriate devices, connect them to your **INDIGO AV Mixer**, adjust the settings for all video and audio channels, and compose the output signal.

The tutorials are examples only; configure your system according to your individual needs.

Note   Currently there is only one tutorial.

6.1   Tutorial 1—Small Presentation

Use the **INDIGO AV Mixer** for your company presentations or other small events.

Only a few devices and settings are necessary to create an impressive presentation.

Note   This example makes use of the optional HiRes board's DVI inputs and outputs.

6.1.1   Setup

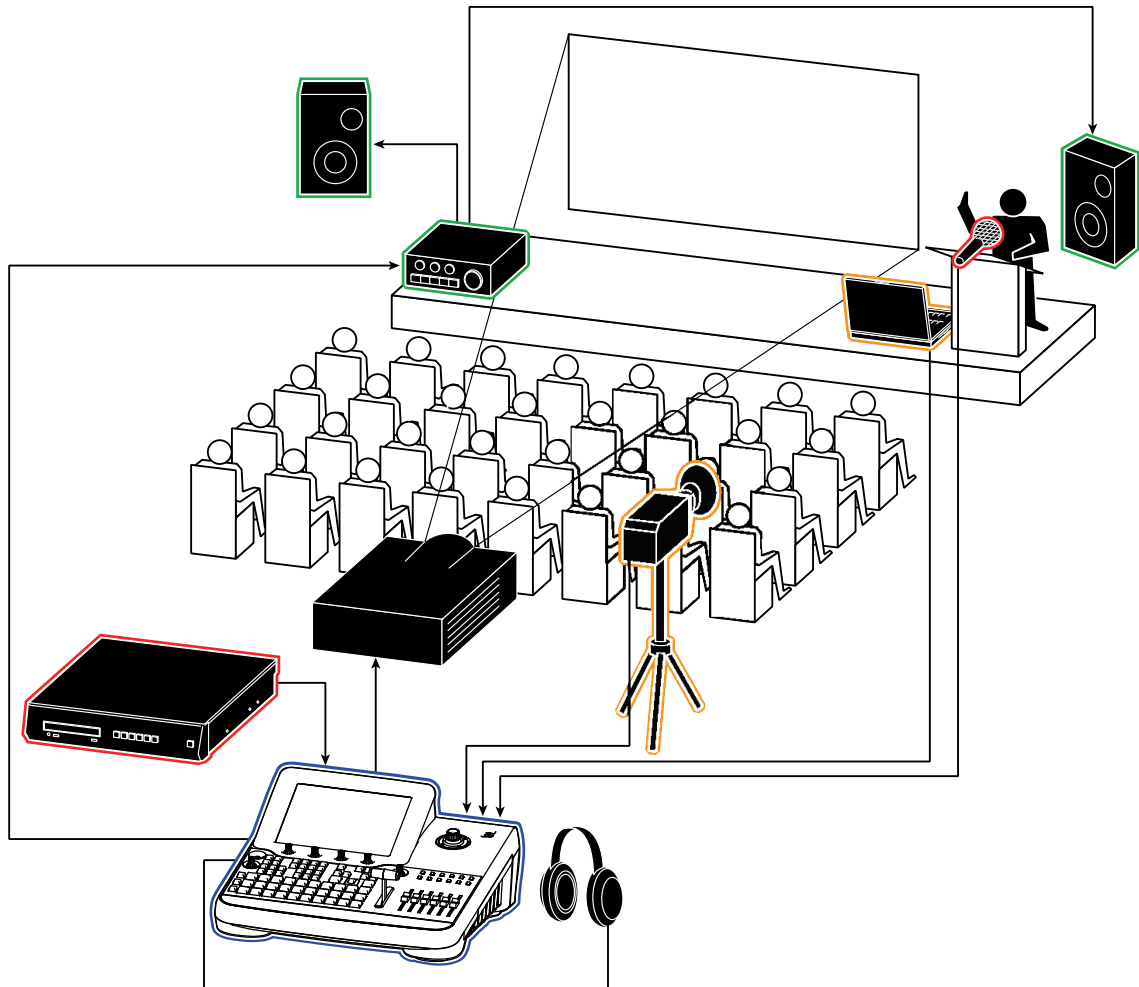The following figure illustrates a possible setup for a small presentation or event:

Figure 33. Example for a small presentation setup

6.1.2   Connections

This example uses the following devices:

- *(1)* **INDIGO AV Mixer**

- *(2)* A *miniDV camera*, filming the speaker; connected via S-Video to input **S-VIDEO 1** of the **VIDEO IN (ANALOG/DIGITAL)** section

- *(3) Microphone* for the speaker; connected to input **7 L** of the **LINE/ MIC IN** section

- *(4) Laptop* for visual input, for example, PPT presentations or videos; connected to input **DVI-I 1** of the **COMPUTER VIDEO IN** section (HiRes board)

- *(5) CD/DVD player* for background music; connected to RCA input **1 L/R** of the **ANALOG AUDIO LINE IN** section

- *(6) Projector*, to let the audience see the presentation; connected to **DVI-I MAIN** of the **COMPUTER VIDEO OUT** section (HiRes board)

- *(7) Amplifier* with *speakers*; connected to **ANALOG MAIN OUT** via RCA

- *(8) Headphones*; connected to the phones jack on the top panel

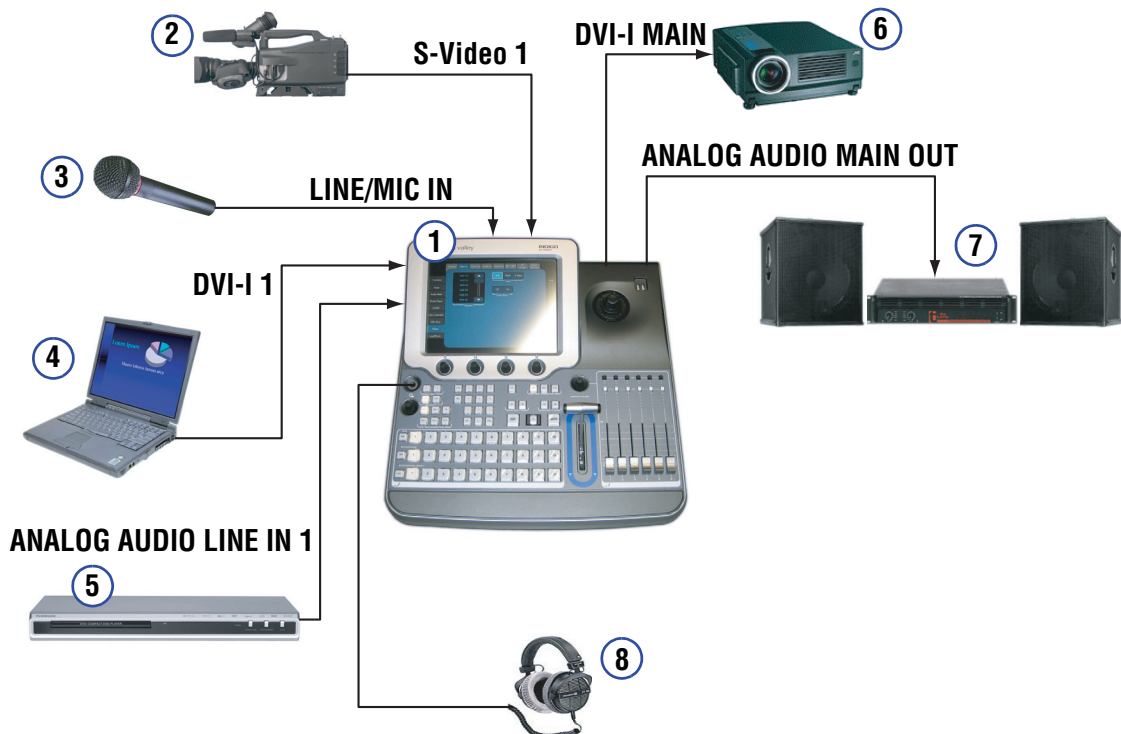The devices are connected to your **INDIGO AV Mixer** as follows:

Figure 34. Connections for the small presentation setup

6.1.3   Result

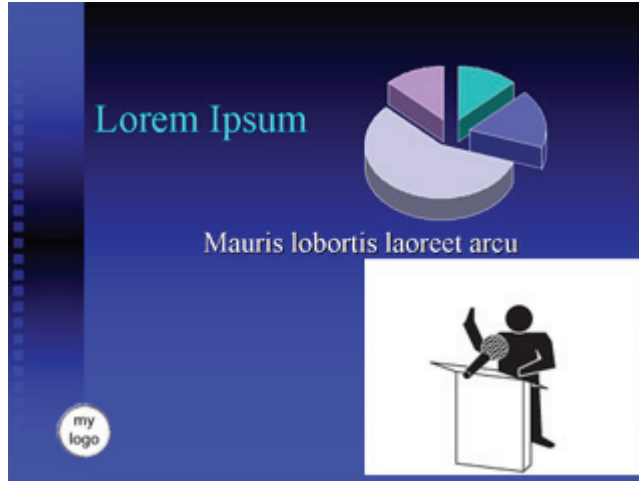This is what your presentation could look like:

Figure 35. Your presentation from the audience's view

The **INDIGO AV Mixer** produces a presentation view mixed by three signals:

- The background is a PPT presentation from the laptop.
- In the right lower corner, the main camera's view (showing the presenter) is inserted via PiP.
- In the left lower corner, a logo from an internal Still is inserted.

6.1.4 How to Set Up a Small Presentation

1. Connect the devices as shown in Figure 34 on page 69.

2. Select the **SETUP** main menu.

Video Settings

3. Select the **VIDEO** submenu.

    a. Press **INPUT**.

    b. Select input **IN01 SD** (the camera) from the list and set the **Type** to **S Video**.

    c. Select input **IN01 HR** (the laptop) from the list and set the **Type** to **DVI**.

    d. Press **OUTPUT**.

    e. Set the **Graphic Standard** according to your projectors' specifications.

    f. Select the **Standard** (**PAL** or **NTSC**), as required.

Audio Settings

4. Select the **AUDIO** submenu.

    a. Press **Operation Mode**.

    b. Select **7 Stereo 2 Mic** as **Audio Mode**.

5. Select the **AUDIO MIXER** main menu.

6. Select the **MIXER** submenu.

    a. Select **Micro 1**.

    b. Make sure the **ON** button is activated.

    c. Adjust volume and pan.

7. Select **CHANNEL ADJUST** submenu.

    a. Make sure the **Equalizer On** button is activated.

    b. Adjust the equalizer settings to your needs.

    c. If required, adjust the **Mic Gain**.

    d. Activate **Low Cut**.

PiP Settings

8. Select the **KEYER** main menu.

9. Select the **SD KEY 1** submenu.

    a. Press **Type**.

    b. Select **PiP** as **Type**.

    c. Press **Source**.

    d. Select **IN01 SD SDI** (the camera) as **Fill**.

    e. Press **Transform**.

    f. Make sure the **Enable** button is activated.

    g. Adjust **Top Corner**, **Bottom Corner**, and **2D Size** as desired.

Logo Settings

10. Insert a USB memory stick containing the logo file in the USB drive.

11. Select the **STILLS STORE** main menu.

12. Select memory cell **1** and press **Load**.

13. Select the desired logo file from the list and press **OK**.

14. If desired, rename the Still.

15. Select the **KEYER** main menu.

16. Select the **SD KEY 2** submenu.

    a. Press **Type**.

    b. Select **Chroma**.

    c. Press **Source**.

    d. Select **IN01 SD Still** or newly named Still (the logo) as **Fill** and **Key**.

    e. Press **Adjust**.

    f. Press **Auto**.

    g. If required, adjust **Chroma** and **Selectivity** manually.

    h. Press **Transform**.

    i. Make sure the **Enable** button is activated.

    j. Adjust **Top Corner**, **Bottom Corner**, and **2D Size** as desired.

Menus

7.1   General Handling of the Menus

This section shows you how to work with the menus of your **INDIGO AV Mixer** in general and provides you with a quick reference for looking up information regarding the single menus.

The **INDIGO AV Mixer** menus provide capabilities that complement the operation of the Control Panel. The menus control most of the system functions and have additional controls not available on the Control Panel (for example, wipe pattern selection, chroma key manual controls, and configuration menus).

During live production, the operator spends most of his time working directly on the Control Panel. The menus are used extensively for setup and effects creation.

There are four Digipots beneath the Touch Screen. In many menus, you can use them to adjust the parameters of the selected characteristic. Pressing a Digipot sets the parameter value to default.

The handling of the menus is quick and easy, because of the Touch Screen, the Digipots, and the sophisticated structure of the menus themselves.

In general, to learn menu capabilities, you can touch the screen where you think more information may be available (data pads and submenu touch buttons). The actual video output of the system will not change unless a specific parameter button is touched, a value is changed with a Digipot, or a new value is entered manually.

7.1.1 Menu Navigation and Organization

The Menu Display consists of the following sections:

(1) Main Menu tabs

(2) Submenu tabs

(3) Parameter Navigation Area

(4) Parameter Edit Area

(5) Display of the parameters that are adjustable via the Digipots

(6) Audio Display

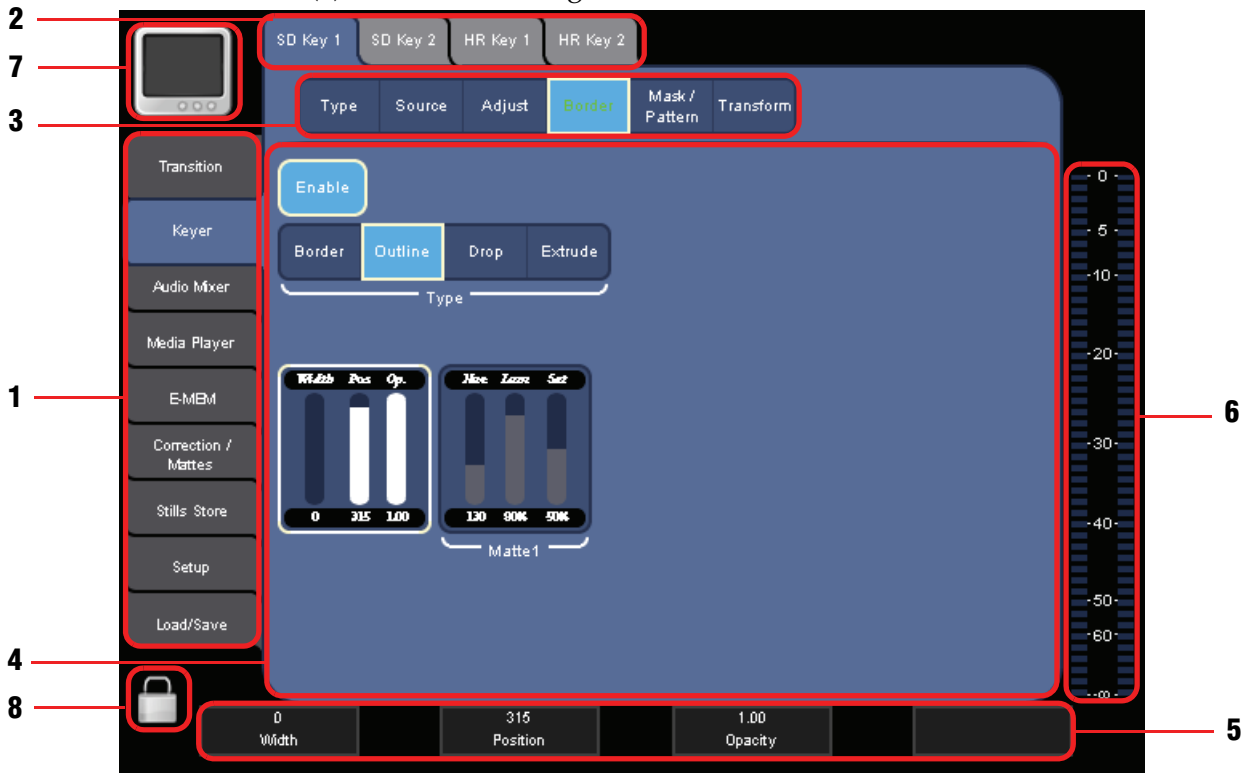(7) Onscreen Preview button

(8) Auto Menu Delegation button

Figure 36. Example of the Graphical User Interface

You can easily navigate through the menus by touching the desired **Main Menu** on the left and the **Submenus** on the top of the screen.

In the menus, use the **Parameter Navigation Area** in the upper part to select the parameter you want to modify.

In the **Parameter Edit Area** in the middle and by using the Digipots, you can then adjust the parameter values.

The **Digipots** below the graphical display can be used to dial in parameter values for settings displayed on the Touch Screen. The Digipots become active for the part of the menu that is currently highlighted. The parameters can be adjusted by turning the Digipots. Pressing a Digipot sets the parameter value to default.

Using the Touch Screen and the Digipots allows easy operation. On some menus, you can scroll a list located on the screen with the Digipots.

7.1.2 Virtual Numeric Keypad and Keyboard

Alternatively, you can use the Virtual Numeric Keypad to type in parameter values.
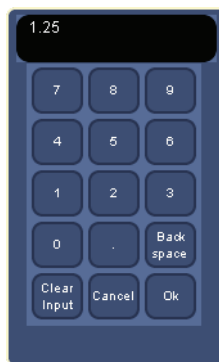
Figure 37. Virtual Numeric Keypad

To open the Virtual Numeric Keypad, select the area containing the parameter to be modified, then press the display area directly above the corresponding Digipot. Type in the new parameter value and press **Ok**.

In a similar fashion, you can use a Virtual Keyboard to edit the name of a stored file or to rename an E-MEM.
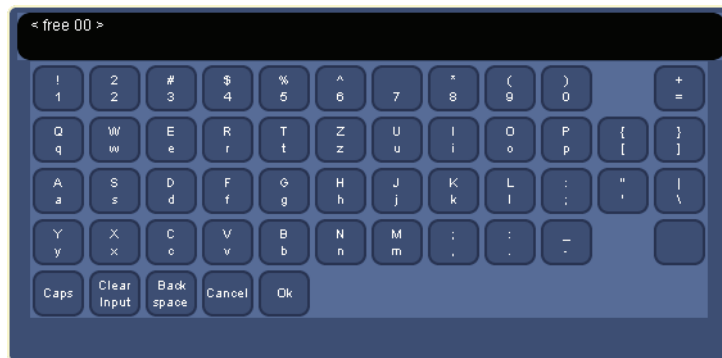
Figure 38. Virtual Keyboard

7.1.3 Onscreen Preview

Use the **Onscreen Preview** button in the upper left corner of the Touch Screen to open/close the **Onscreen Preview** video overlay window.

The **Onscreen Preview** window lets you display program, preview, and aux1/2 signals of SD outputs directly on the Touch Screen. Thus, you can check the signal output or adjust a chroma key without having to use an external monitor.
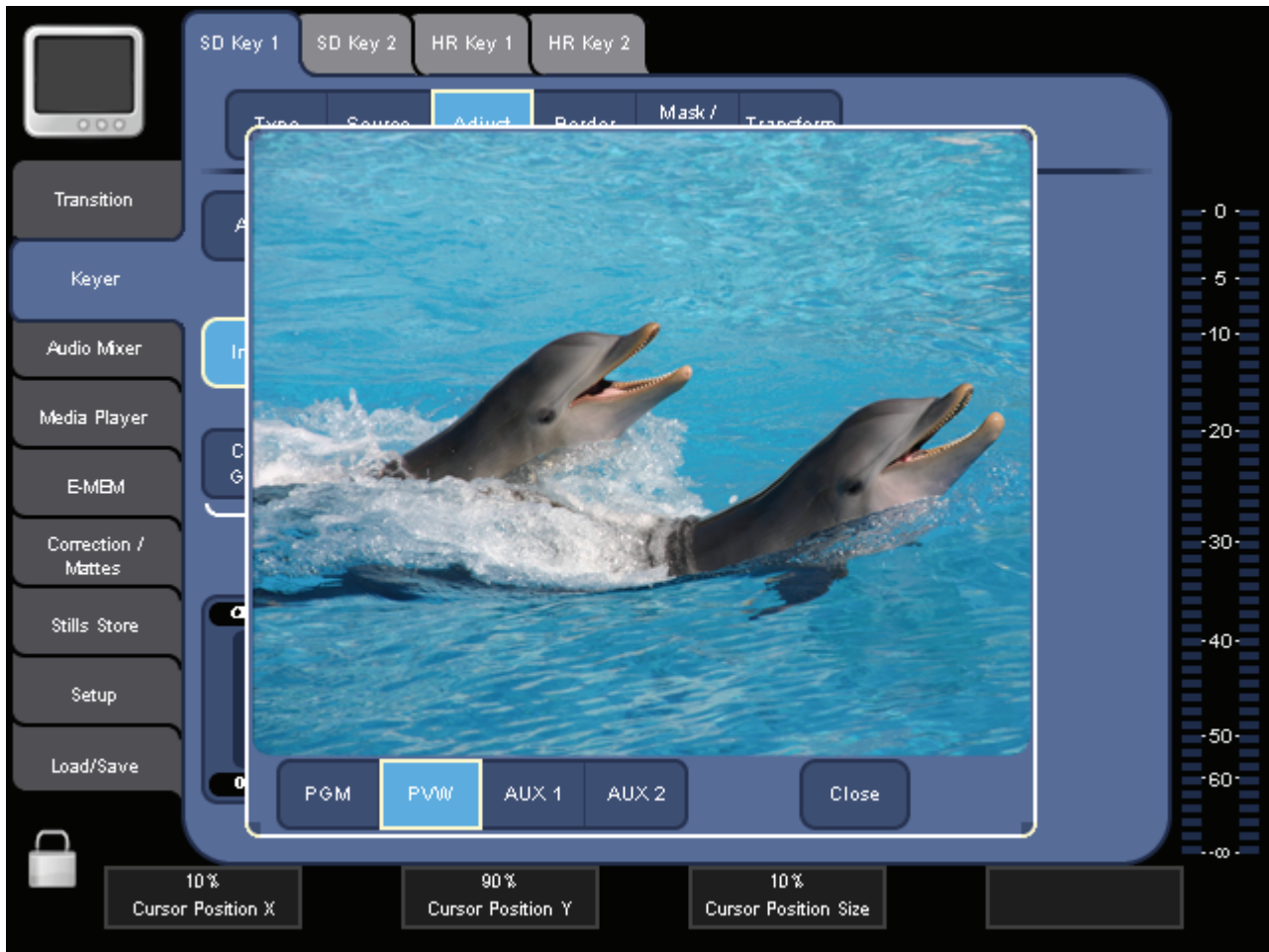

Figure 39. Onscreen Preview window

Note   There is no onscreen preview available for HiRes PGM or PVW.

7.1.4 Auto Menu Delegation

The **Auto Menu Delegation** button in the lower left corner of the Touch Screen determines the behavior in which the menus react to Control Panel buttons:

- **unlocked**

  If **Auto Menu Delegation** is unlocked, pressing a panel button automatically shows the corresponding menu. For example, if you press **Key 1** on the **Delegation** subpanel, the menu for key adjustment is shown.

- **locked**

  If **Auto Menu Delegation** is locked, the menu display is not affected by panel buttons.

7.2 Transition Main Menu

Use the **TRANSITION** main menu to select and modify transitions and effects and assign them to the Background and the transition in/transition out of Key 1 and Key 2:

- Select the effect type for the background and for the transition in/transition out of Key 1 and Key 2 for both SD and HR in the *SD/HR Effects Submenu* (see page 78).

- Define the duration of the selected effect in the *Duration Submenu* (see page 82).

See *Video Processing* on page 48 for more information on transitions and effects.

7.2.1   SD/HR Effects Submenu

Use the **SD/HR EFFECTS** submenus to select which effect type is assigned to a transition for the selected signal source.

The functionality is basically the same for SD and HR (HiRes). Only the number of available categories and patterns varies.
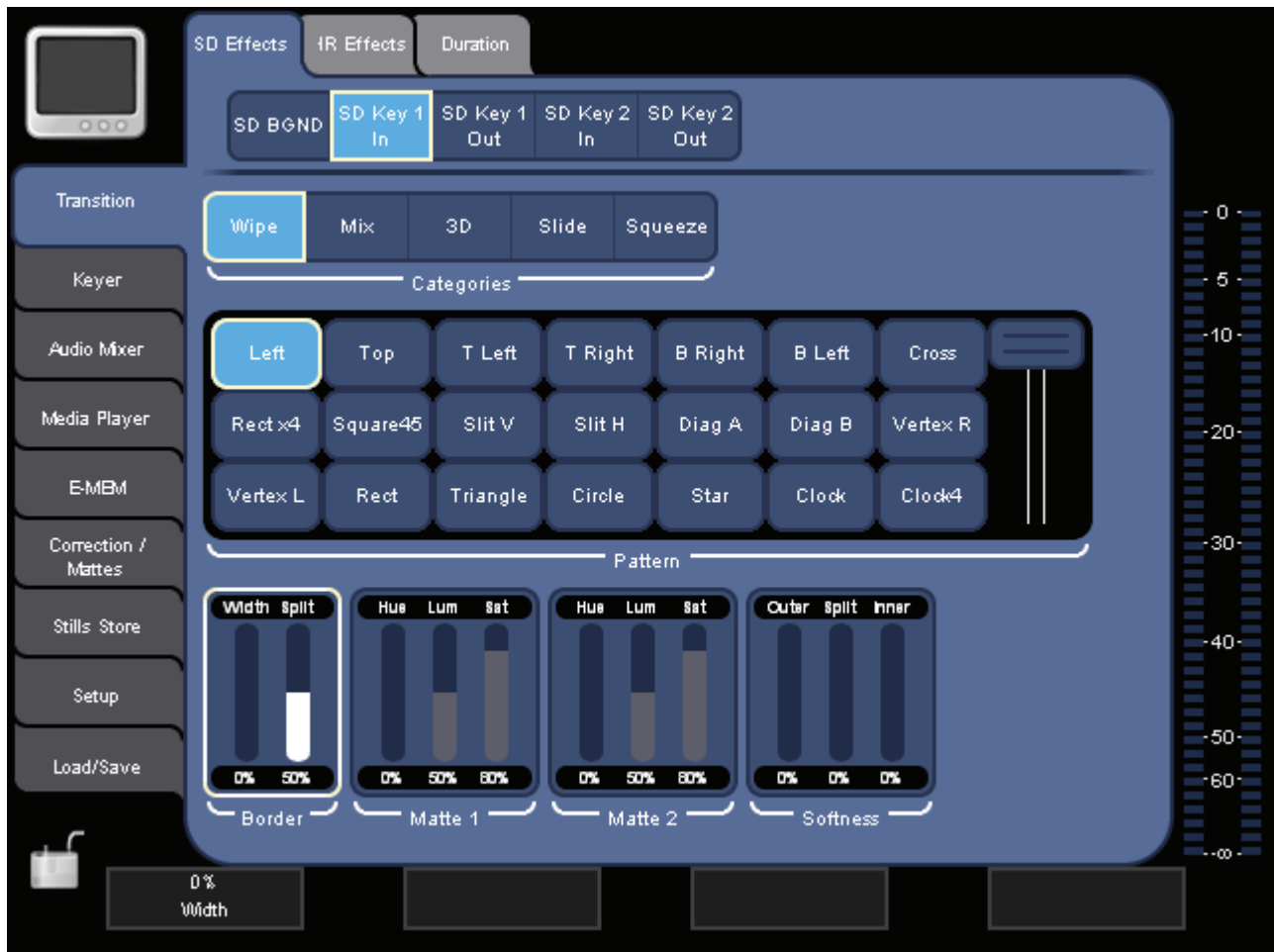

Figure 40. Transition SD Effects submenu

To assign an effect (see also *Making an Effect Transition* on page 59):

1. In the Parameter Navigation Area, select the signal (for example, **SD BGND**) that will be affected.

2. In the Parameter Edit Area, select one of the **Categories** and the effect **Pattern**.

Depending on the selected pattern, additional parameter areas are displayed which allow you to change specific parameters.

The figure above shows the typical parameters for a **Wipe** pattern:

- **Width** allows you to set the border width.

- **Split** allows you to set the proportion of inner and outer part of the border.

  The outer part is displayed in **Matte 1** color, the inner part is displayed in **Matte 2** color. If **Split** is set to 0 % or 100 %, only one color is displayed.

- **Softness** allows you to set the softness of the border's outer and inner edges, and for the color crossing between outer and inner part.

Note   If **Width** is set to 0 %, the border is turned off and only one edge is displayed. The **Softness** of this edge is determined by the **Outer** value. **Inner** and **Split** have no effect.

Note   **Matte 1** and **Matte 2** have the same default colors. Some parameter changes are only visible if different colors are set for **Matte 1** and **Matte 2**.

SD Transitions

You can independently define transitions for the SD background and the two SD keyers.

SD BGD

For the SD background, the following effect categories are available:

- Wipe

- Mix

- 3D

- Page Roll

- Page Turn

- Slide

- Squeeze

- Door

SD Key 1/2 In/Out

For the fade-in and fade-out of the SD keyers, the following effect categories are available:

- Wipe

- Mix

- 3D

- Slide

- Squeeze

Overview of SD Effect Patterns

The following table shows all available SD transitions. Some of them are only available for **SD BGND**.

Effect Pattern Categories							
Wipe	**Mix**	**3D**	**Page Roll**	**Page Turn**	**Slide**	**Squeeze**	**Door**
Left	Mix	Ripple	Left	Left	Left	Left	Left
Top	White Mix	Sphere	Right	Right	Right	Right	Right
T Left	Black Mix	Swirl	Top	Top	Top	Top	Top
T Right	Matte Mix	Rock	Bottom	Bottom	Bottom	Bottom	Bottom
B Right		Blind 4	T Left	T Left	T Left	T Left	Hor
B Left		Discont	T Right	T Right	T Right	T Right	Vert
Cross			B Right	B Right	B Right	B Right	
Rect x4			B Left	B Left	B Left	B Left	
Square45			2 Hor	2 Hor		Hor	
Slit V			2 Vert	2 Vert		Vert	
Slit H			4 Multi	4 Multi		Center	
Diag A			8 Multi	8 Multi			
Diag B			16 Multi	16 Multi			
Vertex R			32 Multi	32 Multi			
Vertex L			64 Multi	64 Multi			
Rect			128 Multi	128 Multi			
Circle			Inf Multi				
Star			2 Out				
Clock			Inf Out				
Clock4							
Angle							
Matrix 1							
Matrix 2							
Rings							
Slit4 H							
Slit4 V							

HR Transitions

You can independently define transitions for the HR background and the two HR keyers.

For HR, only **Wipe** and – for **HR BGND** – **Mix** are available as categories.

Overview of HR Effect Patterns

The following patterns are available for **Wipe**:

- Left

- Top

- Cross

- Rect

The following patterns are available for **Mix**:

- White Mix

- Black Mix

- Matte Mix

7.2.2 Duration Submenu

Use the **DURATION** submenu to define default durations for the following transitions, independent for SD and HR:

- Background Transition (**BGD**)

- Transition for Key 1/2 (**Key 1/2**)

- Fade to Black (**FTB**).
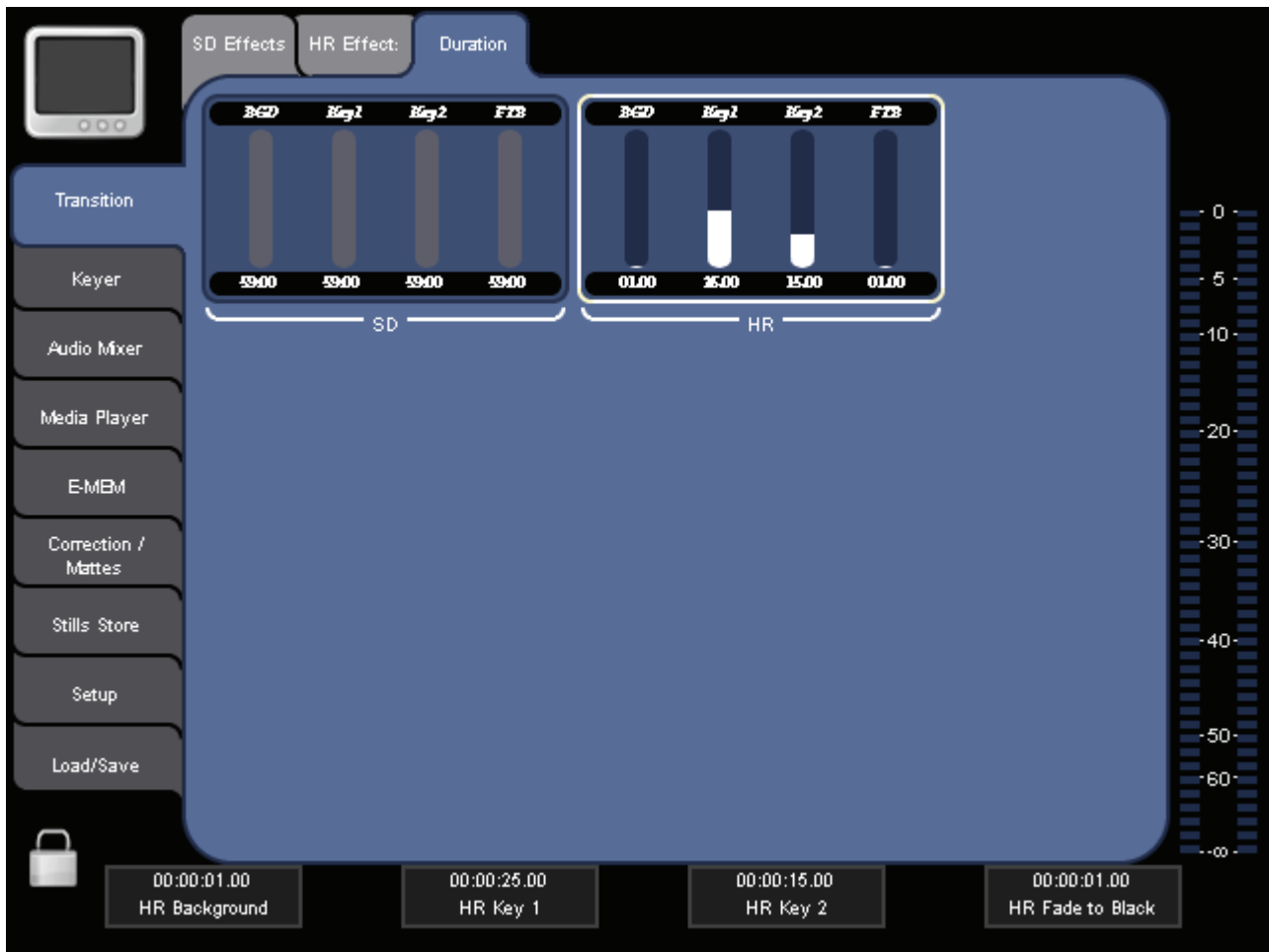
Figure 41. Transition Duration submenu

Use the Digipots to adjust the duration, or enter the value with the Virtual Numeric Keypad. The duration is displayed in seconds and frames, and ranges from 0 to 59 seconds.

7.3   Keyer Main Menu

Use the **KEYER** main menu to select and modify the keys you want to use for a transition, both SD and HR.

See *Transitions, Effects, and Keying* on page 48 for basic information on keying.

For detailed instructions on how to use keys for a transition, see also *Making a Background Transition* on page 55, *Making a Title* on page 56, *Making a Chroma Key* on page 58, *Making an Effect Transition* on page 59, *Making a PiP (Picture in Picture) in SD Mode* on page 60, and *Making a PiP within a PiP in HR Mode* on page 61.

Using the submenu tabs on the top, you can select which key should be used to perform the following actions:

- Selecting the key type (see page 83).
- Selecting the source of the fill and the key signal (see page 84).
- Adjusting the key parameters (see page 85).
- Modifying the key border (see page 88).
- Modifying the key size and position (see page 93).

Type

Select the key type:

- **Chroma**
- **Luma**
- **PiP** (Picture in Picture)

Depending on the key type, different parameters will be displayed in the **Adjust** and the **Border** section.

Source

Select the input sources for the **Fill** and the **Key** signals from the lists. If you selected **PiP** as key type, only the **Fill** list is displayed here.
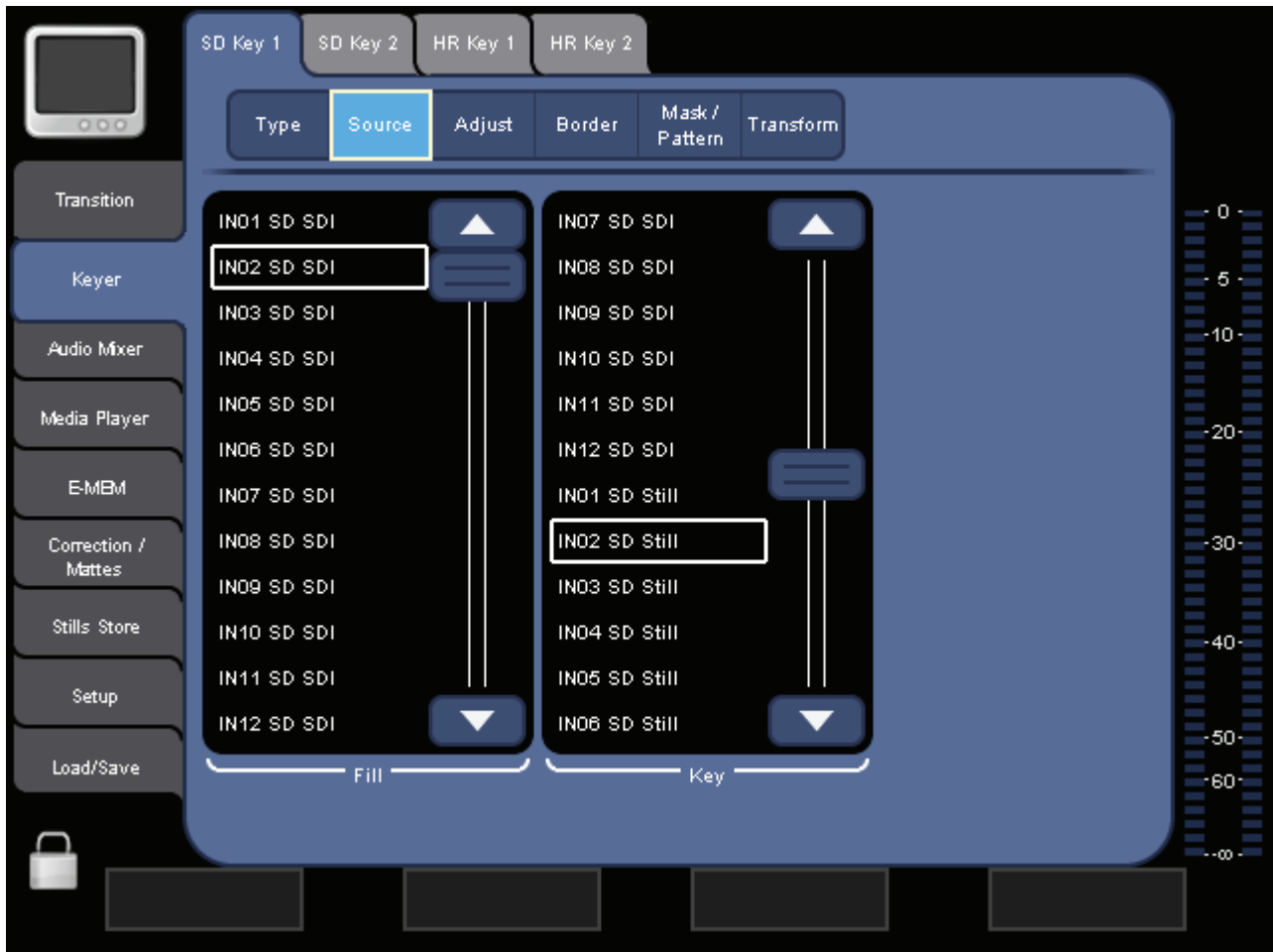

Figure 42. Selecting the source of the fill and the key signal

The input sources can either be one of the video input channels or a saved Still (see *Stills Store Main Menu* on page 112).

Note   For HR keyers, the functionality is basically the same, but you can only select a **Fill** signal from one of the HR inputs.

You can also select the sources via the crossbars:

• **Fill**

   Press the corresponding button on the Bus Crossbar.

• **Key**

   Press and hold the desired **BUS DELEGATION** button (for example, **Key 1**) and select the corresponding source from the Bus Crossbar.

Adjust

Different parameters are displayed, depending on the key type you selected. If you selected **PiP** as key type, only **Opacity** is displayed here.

See also *Key Control Signal Adjustment* on page 50 for detailed information.
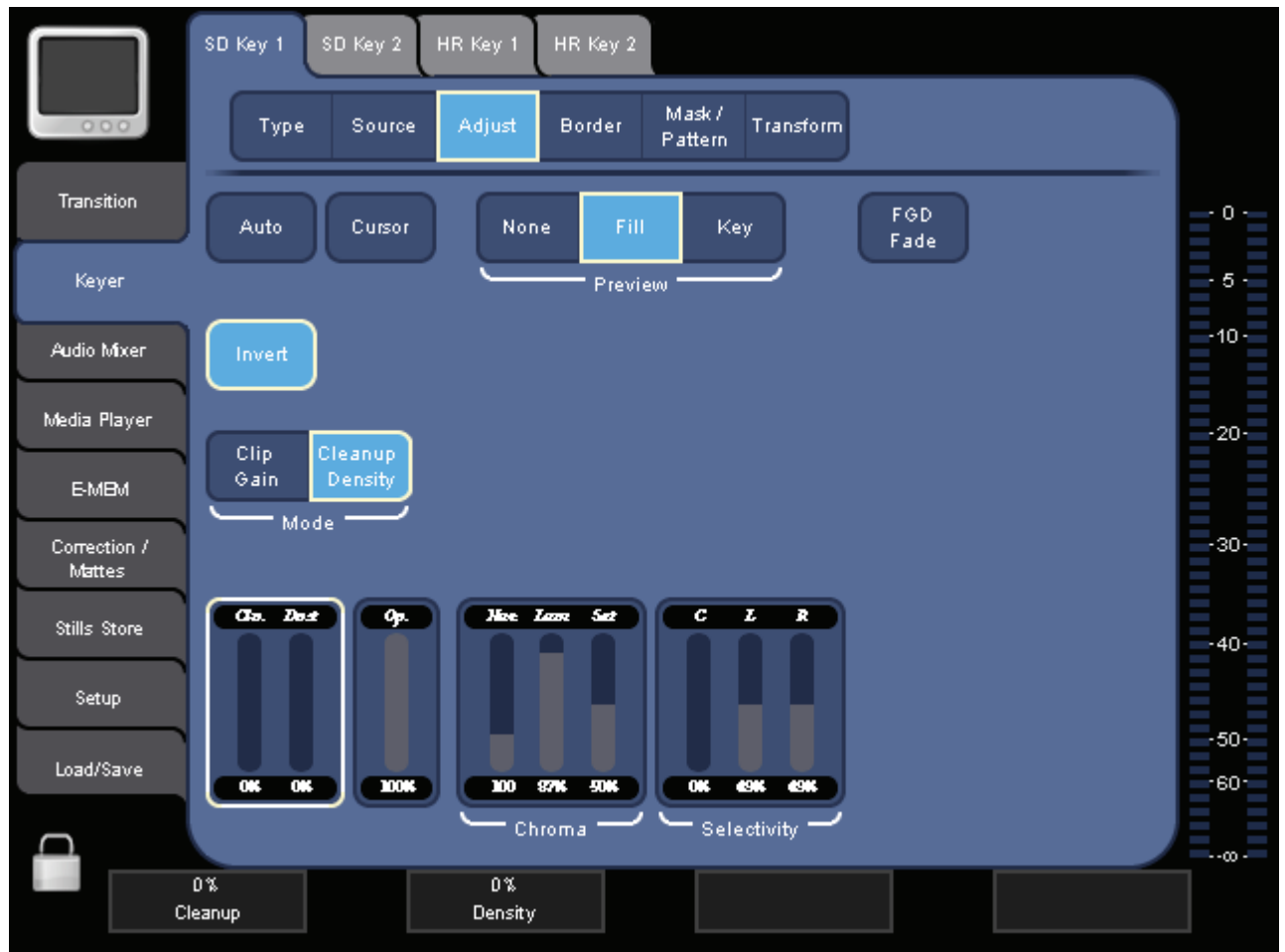

Figure 43. Adjusting the Keyer parameters

Auto

The **INDIGO AV Mixer** automatically sets the key signal parameters to suitable values (automatic chromakey computation).

Cursor

This button is only available if you selected **Chroma** as the key type.

The **Cursor** button enables/disables the Cursor to select the area (color) to be cut.

Position the Cursor with the Joystick. Twist the Joystick to adjust the Cursor size: The larger the Cursor, the more color values are included in the chroma key.

The values for Cursor position (X, Y) and size are displayed in the **Chroma** parameter display field in the lower right corner of the Parameter Edit Area. If this area is selected, you can also adjust these values with the corresponding Digipots.

When the Cursor is activated and positioned, press the **Auto** button to start the automatic chromakey computation.

If **Auto** is pressed while the Cursor is not active, the dominant color of the source is used to compute the automatic chromakey.

Preview

Select what is to be displayed on the **Preview Out**:

*   **None** shows the standard transition preview

*   **Fill** shows the pre-processed fill signal of this keyer

*   **Key** shows the related key (alpha) signal

This function is useful when setting up a keyer to check if the desired part of the video is opaque.

FGD Fade

This button is only available if you selected **Chroma** as the key type.

The **FGD Fade** (Foreground Fade) key switches over the chroma key processing. If activated, the cleaned key fill signal and the background signal are faded in one fading operation by the key control signal.

Fade Mode

This section is displayed only if you selected **Luma** as the key type.

Select the fade mode for the **Luma** key:
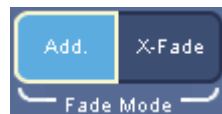
*   **Add.** for additive fading

*   **X-Fade** for crossfading

Invert

Inverts the key signal.

Mode

Select the mode for adjusting the key signal:

- **Clip Gain**
- **Cleanup Density**

The parameter display field in the lower left corner of the Parameter Edit Area changes accordingly.

In the second parameter display field, you can modify the Opacity (**Op**) of the key signal.

If you selected **Chroma** as the key type, you get two additional display fields:

- **Chroma** to modify Hue, Luminance and Saturation
- **Selectivity** to modify Color Offset (**C**), Left (**L**) and Right (**R**) Selectivity

Crop/Border

Different parameters are displayed, depending on the key type you selected.

See also *Key Control Signal Adjustment* on page 50 for detailed information.

Press **Enable** to display the border parameters.

If you selected **Chroma** or **Luma** as the key type, you can modify the following parameters:
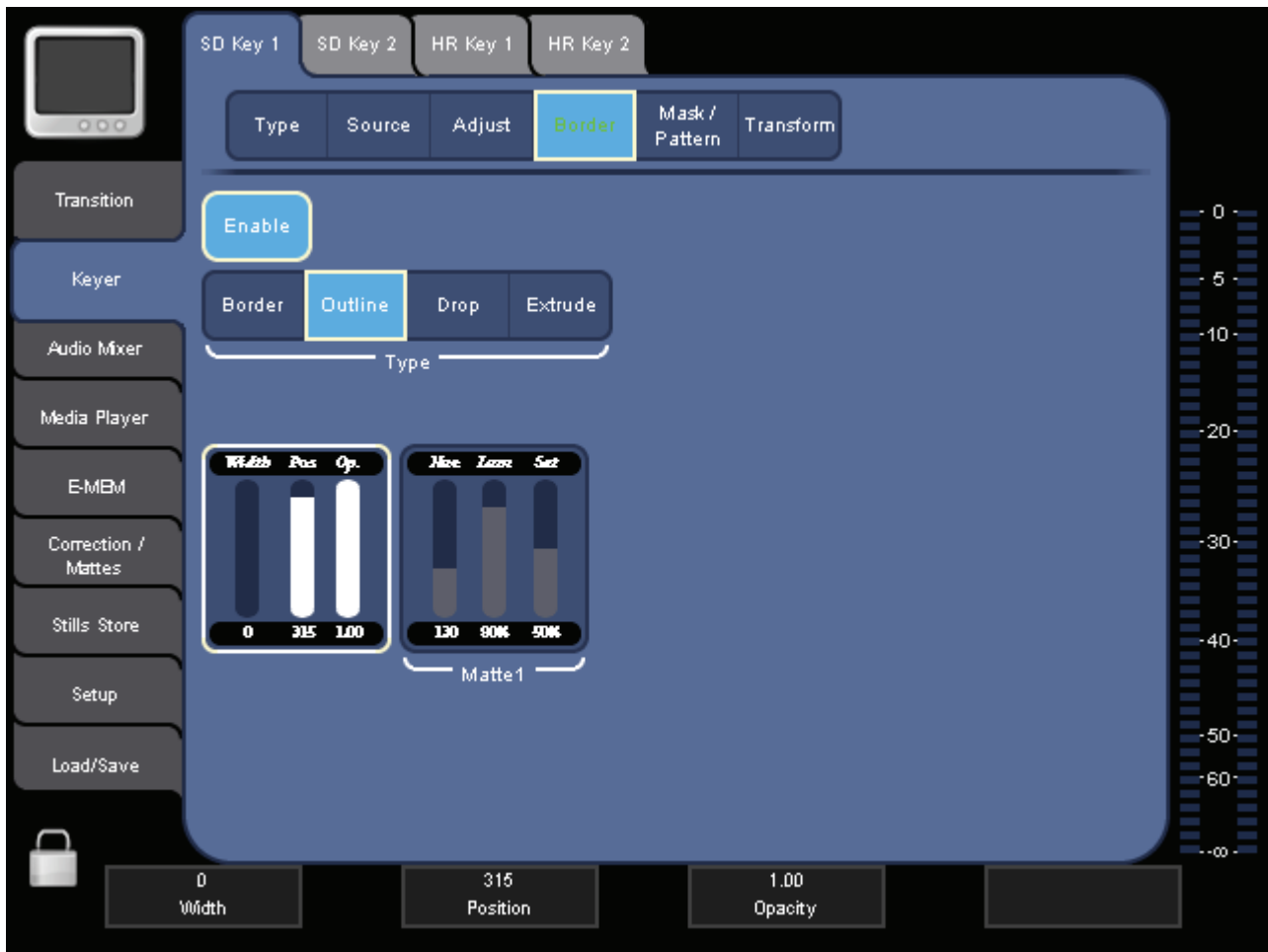
Figure 44. Modifying the key border Chroma or Luma as the key type

Type

Note   This section is not available for HR keys. HR keys only have the type **Border**.

Select one of the following border types:

- **Border**
- **Outline**
- **Extrude**
- **Drop**

You can then modify Width and Position in the left parameter display field.

Use the **Matte 1** display field to modify Hue, Luminance and Saturation of the Matte (which determines the color of the border).

If you selected **PiP** as the key type, you can modify the **Crop** and **Border** parameters.

Use the **Crop** functions to "trim" the edges of a key. The picture edge will be replaced with the background video.
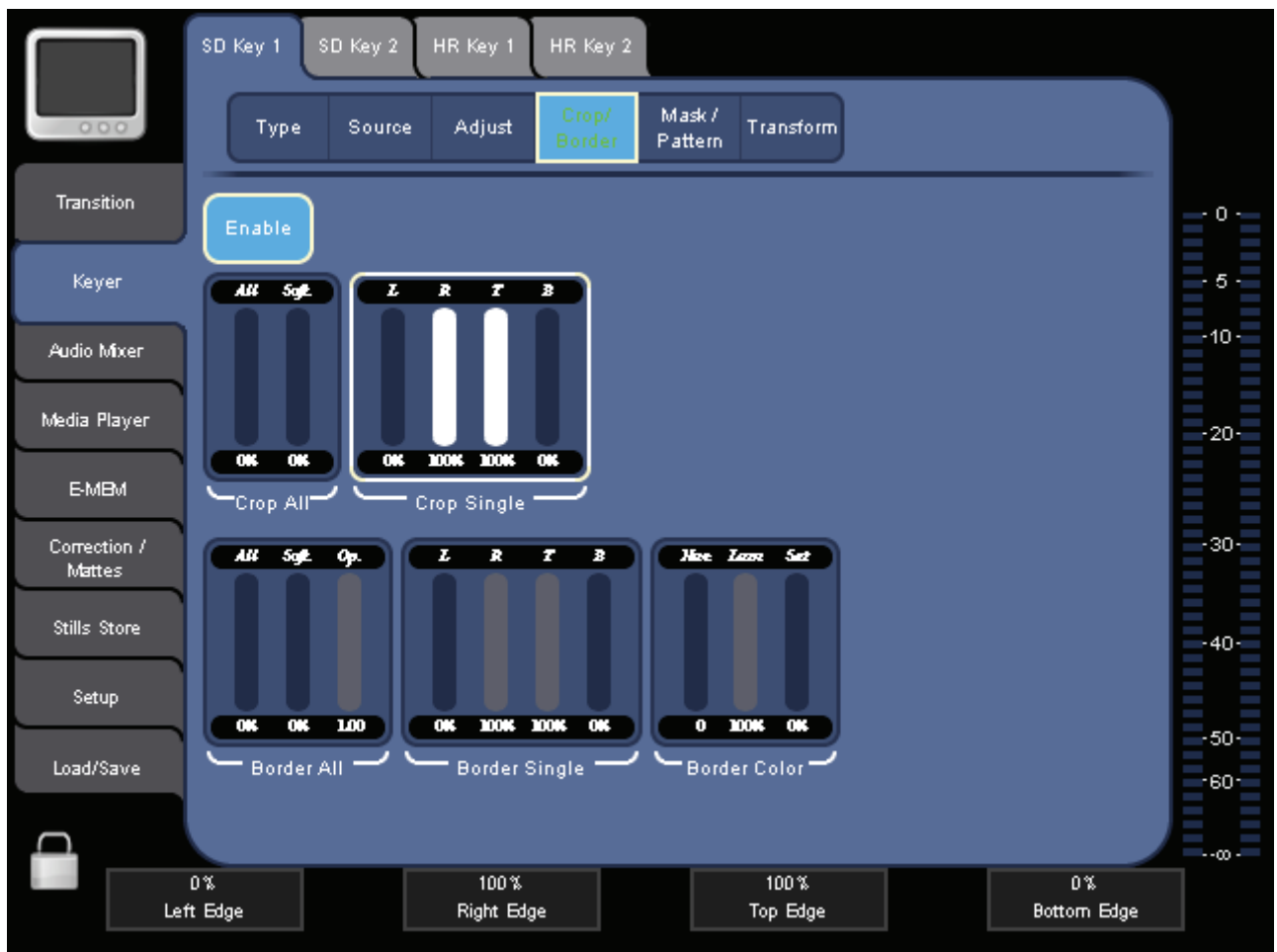
Figure 45. Modifying the key border for PiP as the key type

In the Parameter Edit Area, you can modify the corresponding parameters in the following display fields:

- **Crop All**

  Allows you to modify the values for:

  - Cropping all edges

  - Softness

  - Opacity

- **Crop Single**

  Allows you to modify the values for cropping the left (**L**), right (**R**), top (**T**) or bottom (**B**) edge.

- **Border All**

  Allows you to modify the values for:

  - All edges

  - Softness

  - Opacity

- **Border Single**

  Allows you to modify the values for the left (**L**), right (**R**), top (**T**) or bottom (**B**) edge.

- **Border Color**

  Allows you to modify Hue, Luminance and Saturation in the parameter display field.

Mask/Pattern

Note   This functionality is not available for HR keys.

Press **Enable** to display the mask parameters and patterns.
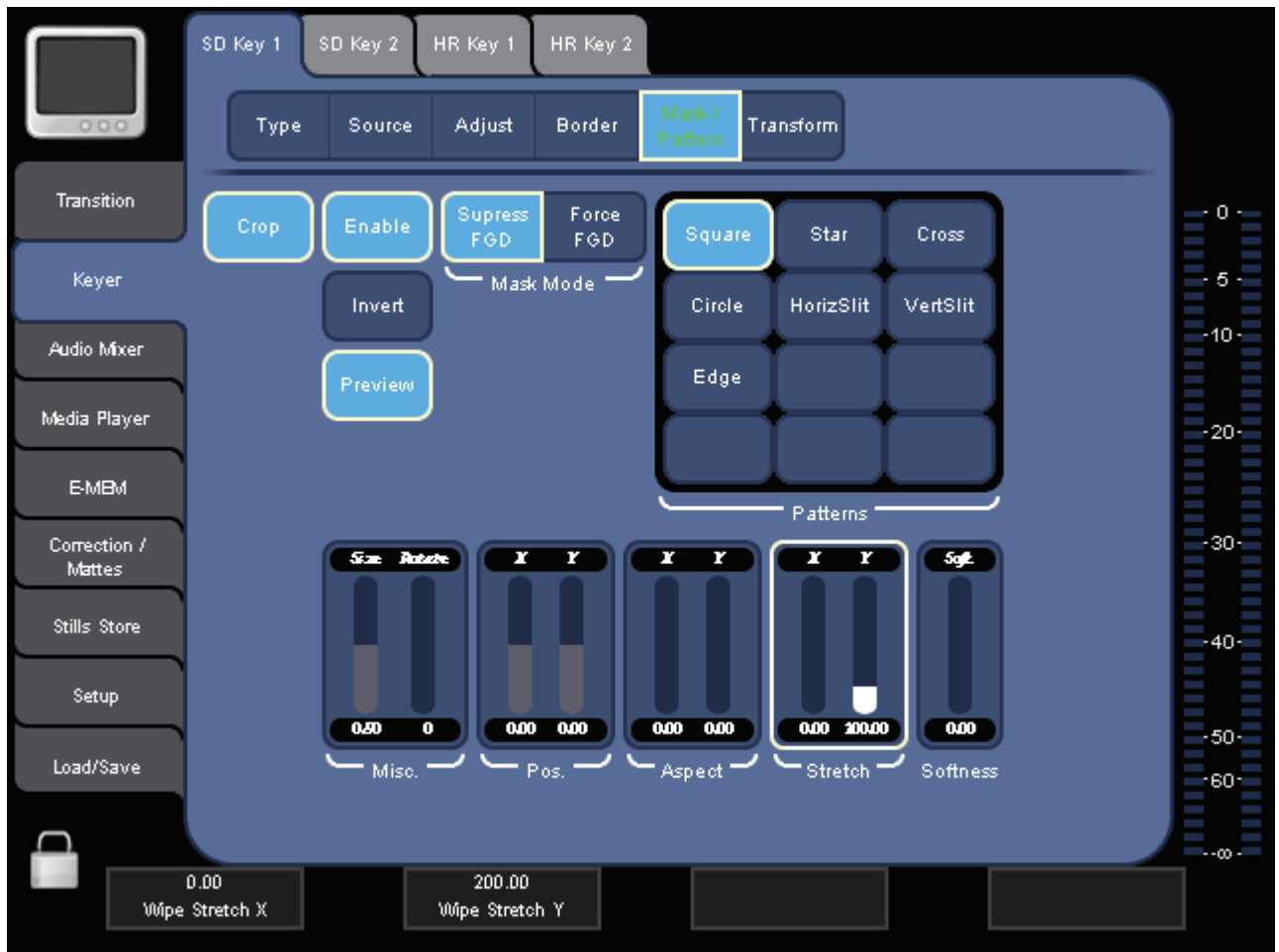
Figure 46. Modifying the mask and pattern parameters

Crop

Automatically truncates the width of an analog signal, so blanking does not extend into the image.

Mask Mode

Select one of the following modes:

- **Force FGD**

  Forces the area within the selected and adjusted mask to show the foreground signal.

  Use this mode if you experience problems with parts of the picture that have a similar color like the key (for example, a blue tie of the newsreader while using a bluescreen).

- **Suppress FGD**

  Suppresses the area within the selected and adjusted mask.

  Use this mode if objects accidentally extend into the bluescreen area (for example, a microphone hanging down) and should be masked out.

Patterns

Select the desired mask pattern from the **Patterns** list. This allows you to adjust the mask approximately to the area to be masked in or out (depending on **Mask Mode**).

Invert

Inverts the mask.

The parameter display fields in the lower part of the Parameter Edit Area allow you to adjust the size and appearance of the mask.

Preview

Shows the modified signal on the Preview output.

Transform

Press **Enable** to display the parameters.

Note   This menu appears slightly different for SD and HR keys.

SD Keys

For every SD keyer type, you can modify the following properties:

- **Top Corner**
- **Bottom Corner**
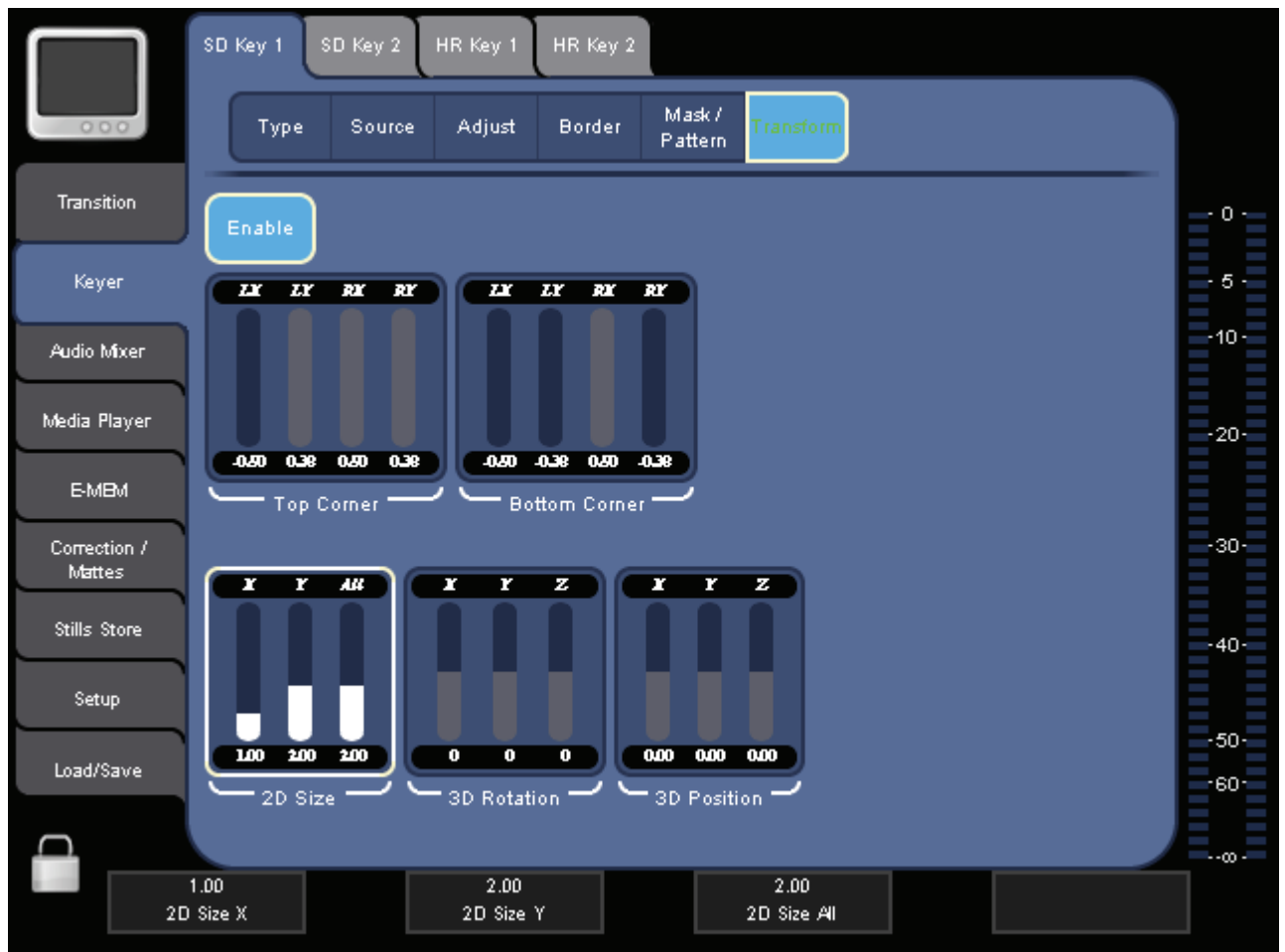- **2D Size**
- **3D Rotation**
- **3D Position**

Figure 47. Modifying the key size and position for SD keys

Select the property you want to modify by touching the corresponding pad and use the Digipots to adjust the parameters.

- Use the parameters in the **Top Corner** and **Bottom Corner** display fields to modify the position of all four corners of the key. For example, the **LY** parameter in the **Top Corner** display field moves the upper left corner of the key up or down. The key is modified accordingly.

- Use the parameters in the **2D Size** display field to alter the dimension of the key

  - horizontally (**X**),

  - vertically (**Y**), or

  - horizontally and vertically at the same time (**All**).

- Use the parameters in the **3D Rotation** display field to rotate the center of the key around the x-, y- or z-axis.

- Use the parameters in the **3D Position** display field to move the center of the key along the x-, y- or z-axis.

HR Keys

For every HR keyer type, you can modify the following properties:
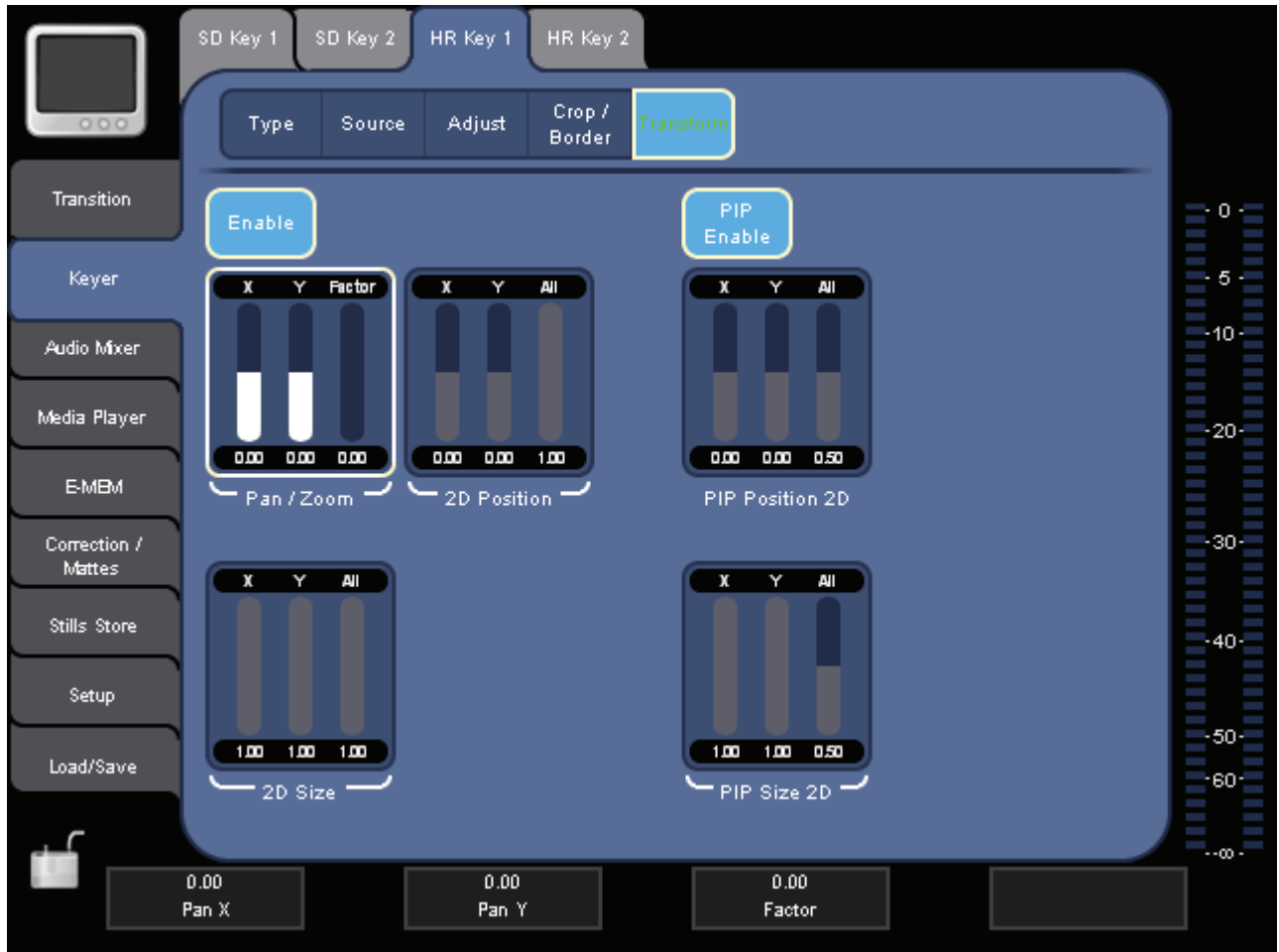
- **Pan/Zoom**
- **2D Position**
- **2D Size**

Figure 48. Modifying the key size, position, and PiP parameters for HR keys

Select the property you want to modify by touching the corresponding pad and use the Digipots to adjust the parameters.

- Use the parameters in the **Pan/Zoom** display field to modify the position and the size of the key.

Note   Alternatively, you can use the Joystick to adjust position and size.

- Use the parameters in the **2D Position** display field to move the center of the key along the x- and y-axis.

- Use the parameters in the **2D Size** display field to alter the dimension of the key

    - horizontally (**X**),

    - vertically (**Y**), or

    - horizontally and vertically at the same time (**All**).

See also *Preserve Aspect* on page 122 for information on manipulating the HR video input signal size.

PiP Enable

When enabling PiP, you can change the following parameters to adjust the PiP function:

- **PiP Size 2D**

- **PiP Position 2D**

Find detailed information on how to use this function for "PiP in PiP" in *Making a PiP within a PiP in HR Mode* on page 61.

7.4   Audio Mixer Main Menu

Use the **AUDIO MIXER** main menu to control all audio channels. Assign the input source and select the operation mode in the **SETUP** main menu (see *Audio Submenu* on page 129).

You can perform the following actions in the submenus:

*   Set audio channel volume and pan (see page 97).

*   Adjust an audio channel's EQ and gain settings (see page 99).

*   Set the Main Out, Sub-Out, and Phones Out level (see page 101).

7.4.1   Mixer Submenu

Use the **MIXER** submenu to control audio channel volume and pan (balance). The number and type (Stereo or Micro) of the channels displayed in this submenu depend on the **Operation Mode** selection in the **SETUP** main menu (see *Audio Submenu* on page 129).
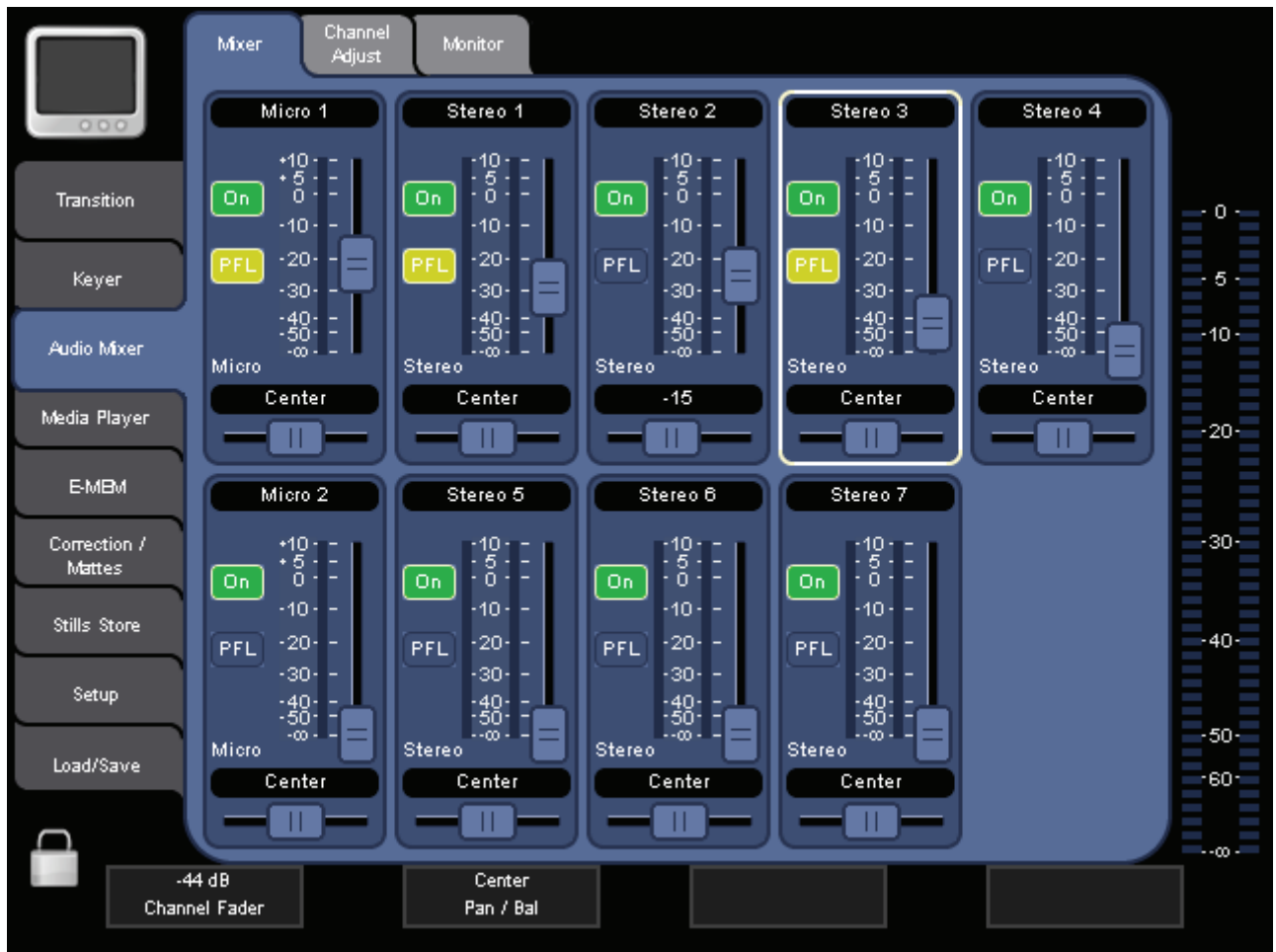
Figure 49. Mixer submenu

If you have already assigned the faders to the audio sources (see *Control Panel Submenu* on page 135), this menu functions similar to the Audio Control Subpanel for the corresponding channels, with the exception that the Audio Control Subpanel only allows you to control six audio channels and does not permit panning.

On

Turns the related channel on/off.

PFL

Activates Pre Fader Listening for this channel.

The PFL mode allows you to hear the audio signal on the head-phones as it sounds before the fader. So you can adjust the sound of this channel (e.g.with the equalizer), before you mix this channel to Main/Sub.

EQ

Indicates the Equalizer is turned on for this channel. You can turn the Equalizer on/off for the selected channel in the **CHANNEL ADJUST** submenu (page 99).

See *Adjusting Audio* on page 65 for further information.

7.4.2   Channel Adjust Submenu

Use the **CHANNEL ADJUST** submenu to adjust the settings for the channel selected in the **MIXER** submenu, for example, the 4-band equalizer and the gain.
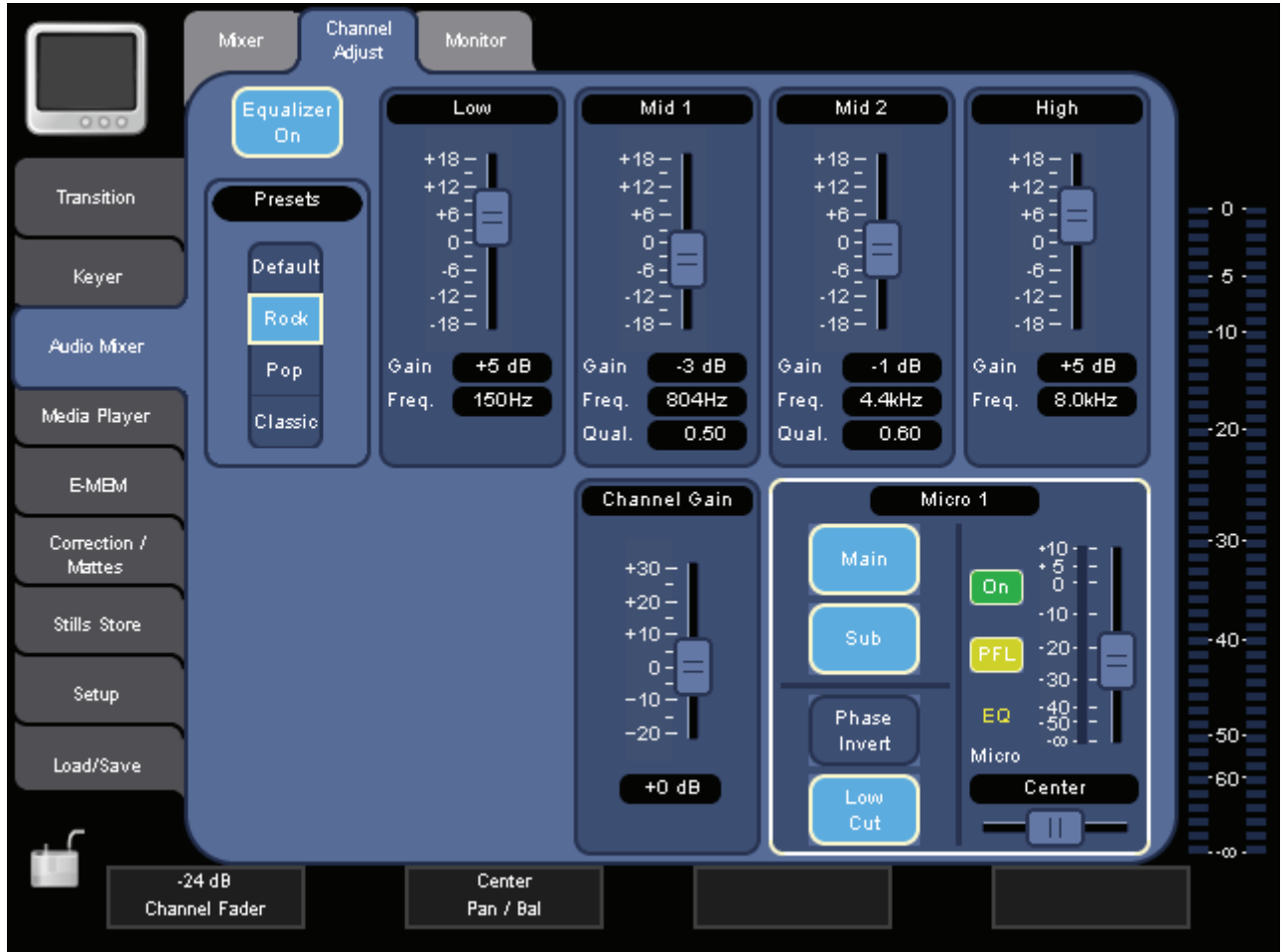

Figure 50. Channel Adjust submenu

Equalizer On

Turns the Equalizer on/off for the selected channel, i.e. the channel selected in the **MIXER** submenu (page 97).

The **Low**, **Mid 1**, **Mid 2**, and **High** sections allow you to adjust the gain of four separate frequencies. The frequency of each of the four bands can be set individually. You may also set the Q factor (quality) – i.e., the width of the filter – for the Mid 1 and Mid 2 bands.

Presets

You can choose from the presets list:

- **Default** (flat)

- **Rock**

- **Pop**

- **Classic**

In the lower part of the screen, you can adjust the channel's gain and use the following functions:

Main

Turns the audio signal on the main output on/off (see *Audio Output Types* on page 25).

Sub

Turns the audio signal on the sub output on/off (see *Audio Output Types* on page 25).

Phase Invert

This button is only available if you assigned a microphone input to the channel.

It shifts the phase of a monaural audio signal or one channel of a stereo audio pair by 180 degrees.

Low Cut

Cuts all frequencies below 100 Hz, to reduce low-level noise. This is especially recommended if a speech signal is assigned to the channel.

Channel Gain (Stereo Input) or Pre Gain (Mic Input)

This slider lets you adjust the input level to get a good level for mixing.

7.4.3 Monitor Submenu

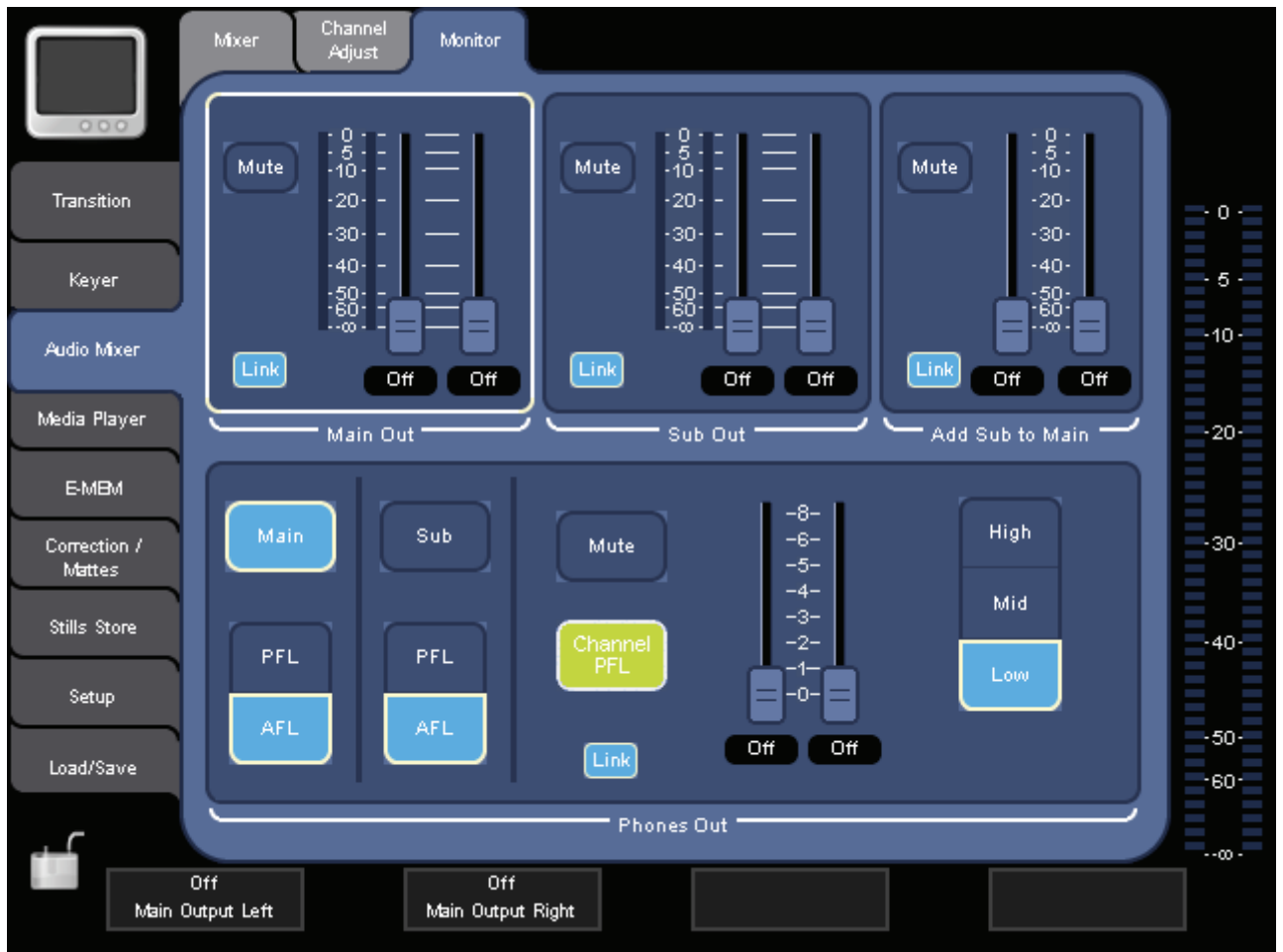Use the **MONITOR** submenu, to adjust the volume of Main Out, Sub-Out and the headphones.

Figure 51. Monitor submenu

Mute

Mutes the corresponding output.

This applies to the **Main Out**, **Sub Out**, **Add Sub to Main**, and **Phones Out** sections.

Link

Links/unlinks an output's left and right channel faders. If **Link** is on, moving one fader automatically moves the other one.

This is also useful for balancing different left and right audio levels:

1. Deactivate **Link**.

2. Set left and right channel to the required levels.

3. Activate **Link**.

Now you can turn the volume of the output up and down without the need to compensate for the different levels.

This applies to the **Main Out**, **Sub Out**, **Add Sub to Main**, and **Phones Out** sections.

Add Sub to Main

Use these faders to mix the Sub-Mix to Main-Mix.

Phones Out

The **Phones Out** section offers some additional buttons:

- **Main**
  Allows you to hear the signals of the Main output on the headphones. This button is only available if no channel PFL is active.

- **Sub**
  Allows you to hear the signals of the Sub output on the headphones. This button is only available if no channel PFL is active.

- **PFL/AFL**
  Choose if you want to hear the signals of the Main and Sub outputs in AFL or PFL mode on the headphones. These buttons are only available if no channel PFL is active.

- **Channel PFL**
  This button is only available if at least one channel PFL is activated. Press it to deactivate all channel PFL.

- **High/Mid/Low**
  Allows you to set the power of the phone amp to adjust it to your studio headphone: **High** is 100%, **Mid** is 50% and **Low** is 25%.

Use the faders of the **Phones Out** section to gain up the signal, if necessary.

7.5   Media Player Main Menu

Use the **MEDIA PLAYER** main menu to load and play clips from external devices, for example a *Turbo iDDR.* You can also create a favorites list for quick access to preferred clips.

The configuration of the connected external device is handled in the **SETUP** main menu (see *External Devices Submenu* on page 143).

7.5.1   Remote Control Submenu

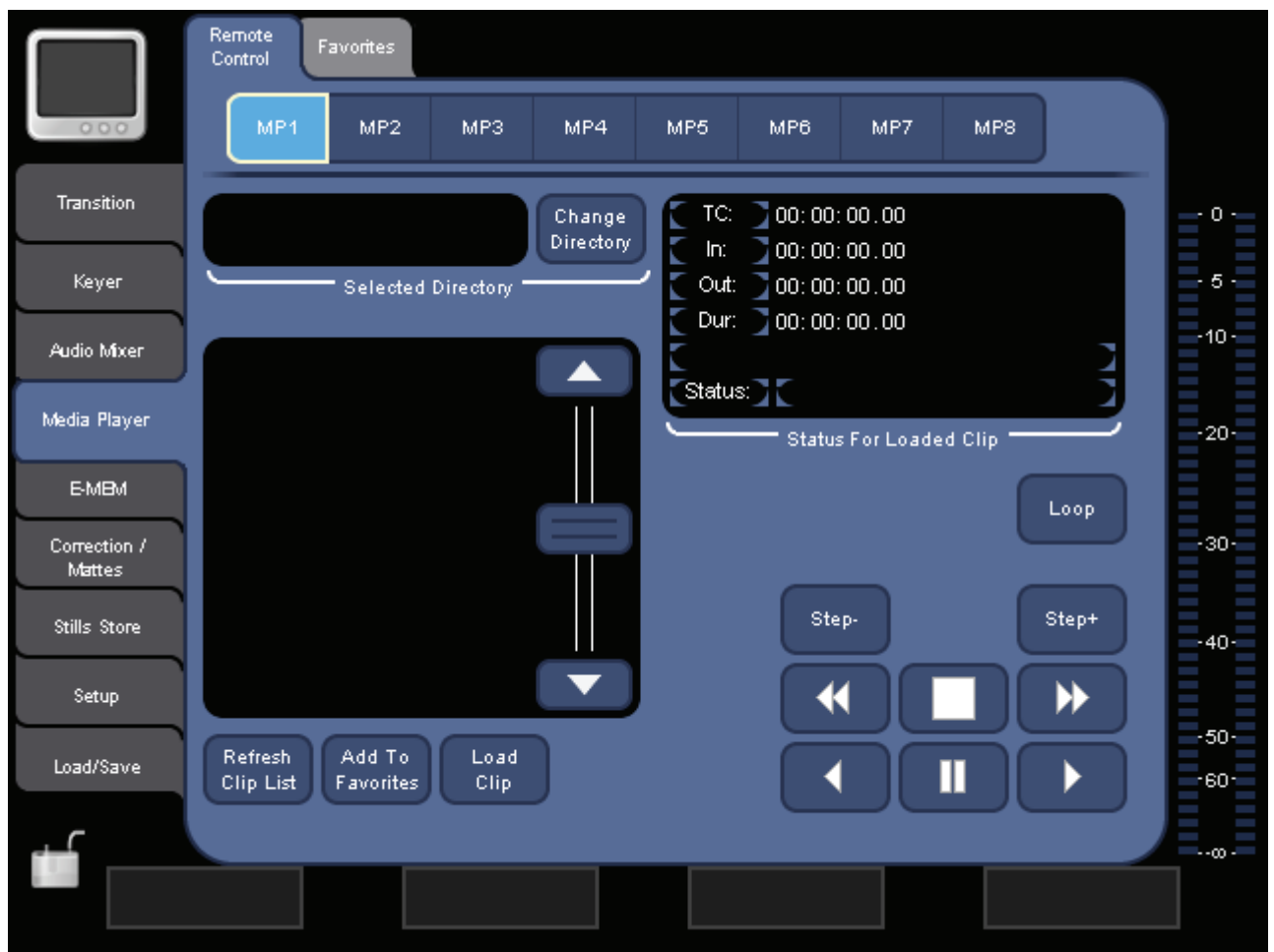Use the **REMOTE CONTROL** submenu to select the Media Player and the clips that you want to load and play.

Figure 52. Remote Control submenu

Loop

Sets the loop status of the clip. If active, the defined section (IN/OUT) of the clip is repeated endlessly (for example, on a *Turbo iDDR*).

Step-

Go one frame backward in the clip.

Step+

Go one frame forward in the clip.

Loading a Clip

To load a clip from an external device:

1. In the Parameter Navigation Area, select the external Media Player (for example a *Turbo iDDR*).

   See *External Devices Submenu* on page 143 for information on how to assign an external device.

2. Press **Change Directory** to select the desired clip directory on the external device.

3. Press **Refresh Clip List** to update the list.

4. Select the desired clip from the list.

5. Press **Load Clip**.

6. Press **Add to Favorites** if you want to add this clip to your list of preferred clips (see *Favorites Submenu*).

In the **Status for Loaded Clip** display you get information about the clip's start and end time, its duration, and its status. While a clip is playing, you can also see the current position in the upper row (**TC**, time code).

Use the player control buttons in the lower right corner to play, pause, rewind and fast forward the clip.

7.5.2 Favorites Submenu

Use the **FAVORITES** submenu to quickly recall clips without selecting the external device and the source directory first. To use a clip in this submenu you first must have loaded the clip and added it to this list with the **Add to Favorites** button in the **REMOTE CONTROL** submenu (see *Remote Control Submenu* on page 103).

Figure 53. Favorites submenu

Move To

Moves the selected clip to another destination on this screen. By using this button, you can change the order of your favorite clips.

To move a clip to another position:

- Select the clip.
- Press **Move To**.
- Select the desired position.

Remove from List

Removes the selected clip from the list.

Load Clip

Loads the selected clip.

Use the player control buttons on the bottom to play, pause and rewind the clip.

7.6 E-MEM Main Menu

Use the **E-MEM** main menu to store and recall E-MEMs. An E-MEM can be a stored preset state of the **INDIGO AV Mixer**, or even a sequence of successive (interpolated) states. The state defines parameter settings for video, audio, effects and transitions.

After an E-MEM is learned, it is stored into one of 160 available memory cells that can be accessed via this menu and recalled at a later time.

The first 20 E-MEMs can also be accessed via Numeric Input Subpanel.
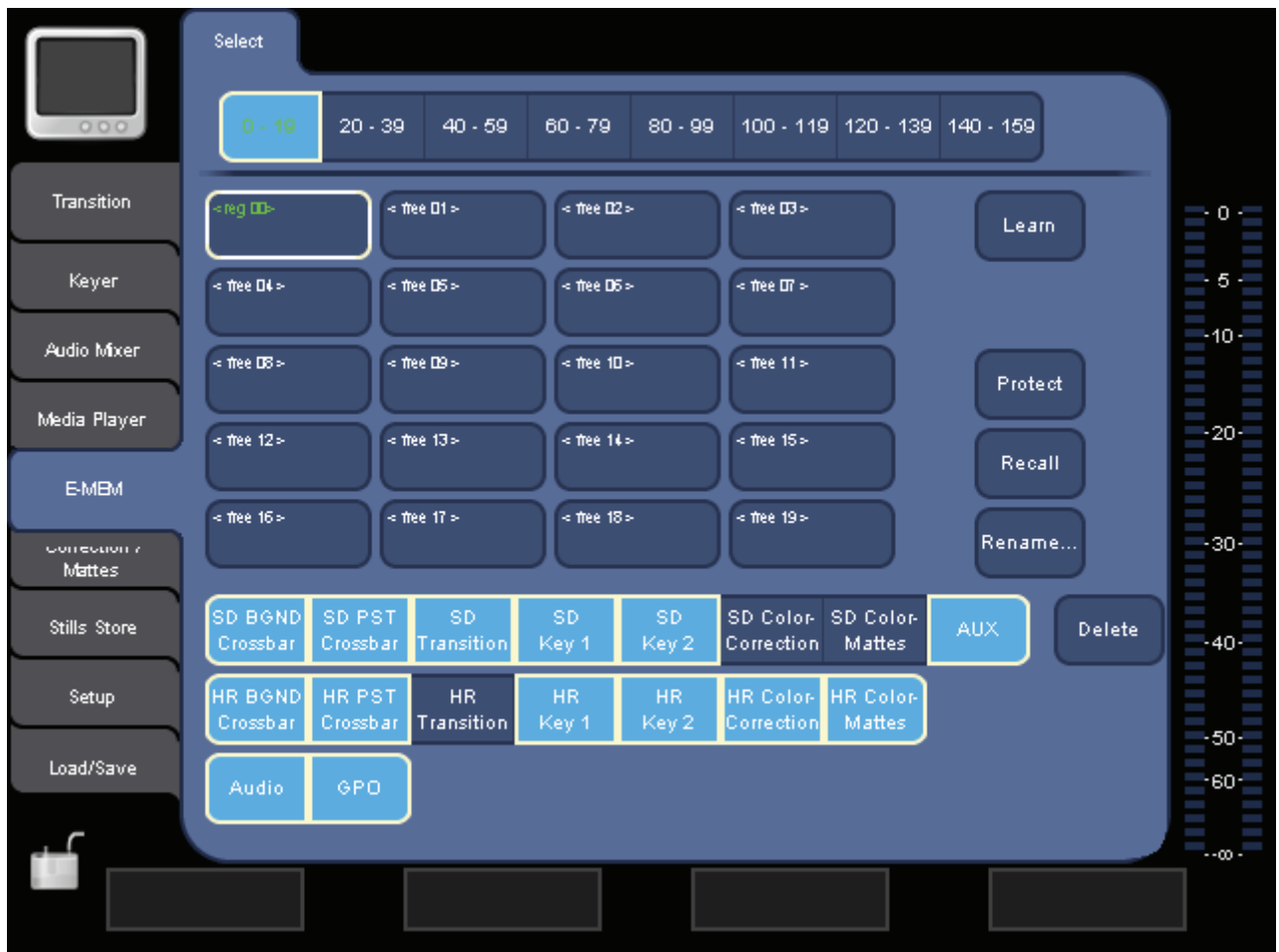
Figure 54. E-MEM main menu

Learn

Starts the learning sequence.

Delete

Deletes the selected E-MEM. Only unprotected E-MEMs can be deleted.

Rename…

Calls up the Virtual Keyboard. Type in the new name and press **Ok**.

Protect

Protects the selected E-MEM from being deleted.

Recall

Recalls the selected E-MEM.

Enter

Adds a state to the E-MEM that is being learned.

Creating E-MEMs

To store an E-MEM:

1. Select the range in the Parameter Navigation Area (for example, **0 - 19**).

2. Select the desired memory cell in the Parameter Edit Area.

3. Select which settings are to be included in the E-MEM by de-/ activating the corresponding buttons below the E-MEM list.

4. Press **Learn** (activate the button).

5. Make the desired settings, for example, change inputs on the Crossbar or adjust audio fader settings.

6. Press **Enter**.

7. If required, repeat steps 5 and 6 until your sequence is finished.

8. Press **Learn** again.

    The E-MEM is now stored to the selected memory cell.

9. If required, press **Rename…** to rename the E-MEM.

To recall an E-MEM, select it and press **Recall**.

In addition, you can use the Numeric Input Subpanel to store and recall E-MEMs (see *Numeric Input Subpanel* on page 43).

7.7   Correction/Mattes Main Menu

Use the **CORRECTION/MATTES** main menu to modify the color information of every video input signal and to define four color mattes (independently for SD and HR).

7.7.1   Color Correction Submenu

Use the **COLOR CORRECTION** submenu to change an input signal's brightness, contrast and gamma correction for the luma, red, green and blue components, as well as hue and saturation for the chroma component.
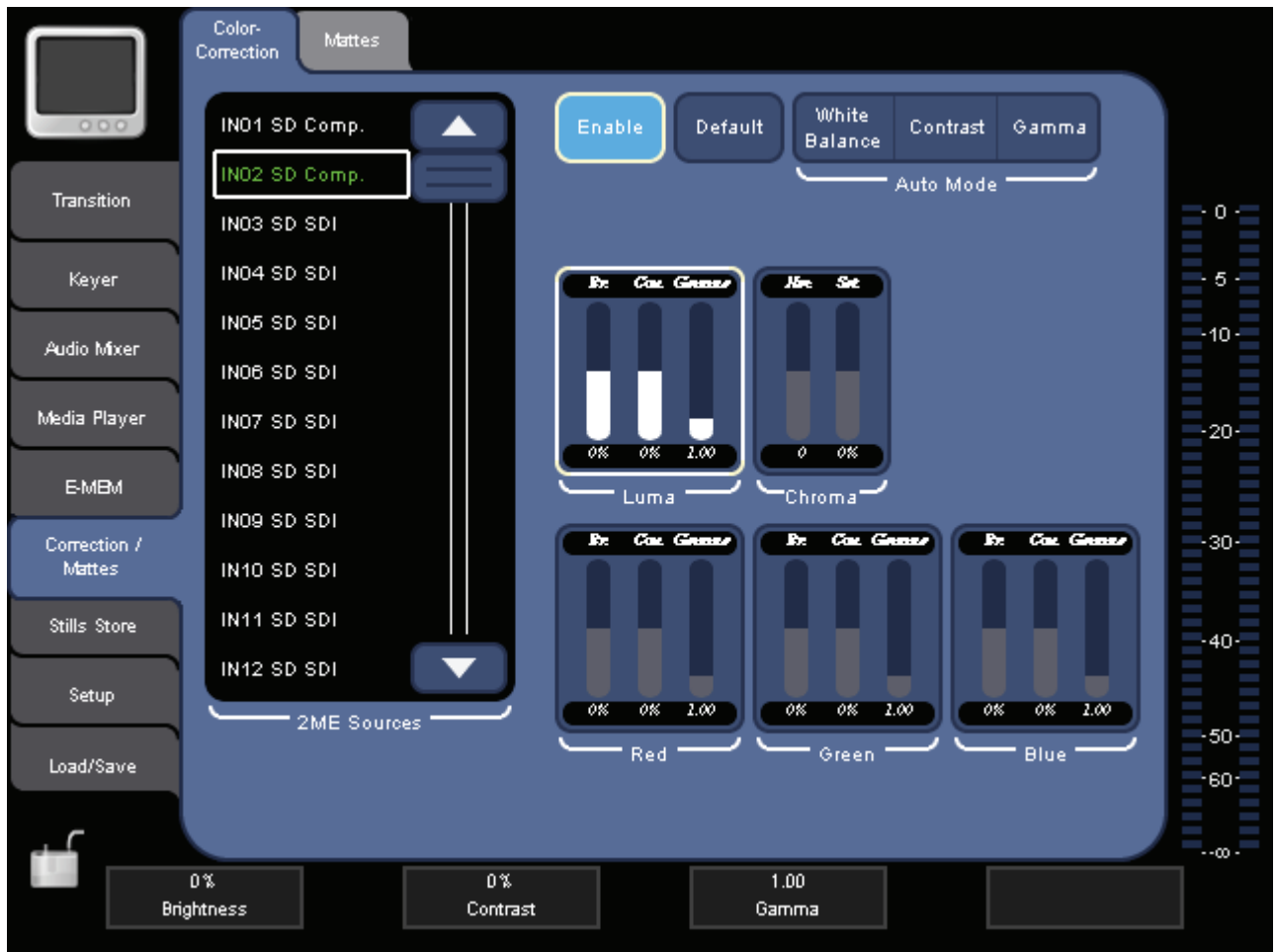

Figure 55. Color Correction submenu

Enable

Switches the color correction and the display of the parameters for the selected source on or off.

A green entry in the **Sources** list indicates that the color correction is active for the corresponding source.

Default

Sets all parameter values to default.

Auto Mode

The following functions are available:

- **White Balance**

  This automatically compensates for lighting conditions with different color temperatures. The function finds a reference point which represents white and then adjusts the three color channels accordingly.

- **Contrast**

  Automatically "stretches" the image to the complete range of luminance.

- **Gamma**

  Automatically adjusts the gamma settings of the image.

Applying Color Correction to a Video Signal

To modify the color information of a video signal by hand:

1. Select the input source of the video signal from the **Sources** list.

2. Press **Enable** to activate the color correction and to display the parameters.

3. Select the desired color component (**Red, Green**, or **Blue**) by touching the corresponding area on the screen.

4. Use the Digipots to modify the parameters.

5. If required, repeat step 4 for other color components.

6. If required, also adjust **Luma** and **Chroma**.

7.7.2 Mattes Submenu

Use the **MATTES** submenu to change/adjust hue, luma and saturation for the predefined four SD and four HR color mattes.
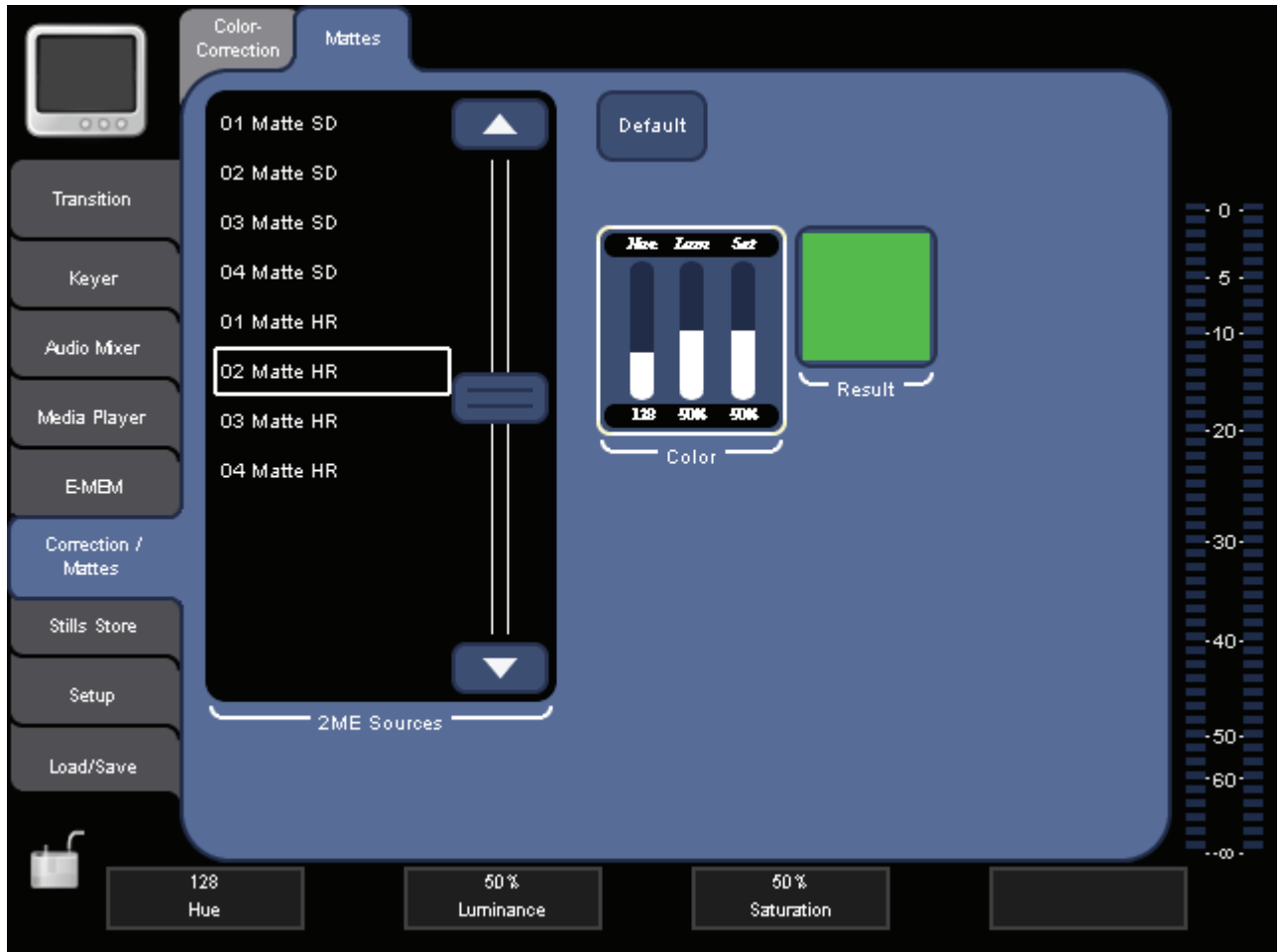
Figure 56. Mattes submenu

Default

Sets all parameters to the predefined default values.

Note Mattes can be assigned to Control Panel buttons. See *Button Assignment* on page 136 for more details.

7.8   Stills Store Main Menu

Use the **STILLS STORE** main menu to save up to twelve Stills. A Still can be a loaded graphic file or a captured frame of a video signal.

You can use the saved Stills as signals for keying (see *Keyer Main Menu* on page 83) and assign them to a button on the Control Panel (see *Control Panel Submenu* on page 135).

Figure 57. Stills Store main menu

Note   Depending on the Operation Mode (see *Video Operation Mode* on page 125), there are both **STILL SD** and **STILL HR** submenu, only **STILL SD** submenu, or only **STILL HR** submenu.
The functionality of SD and HR submenu is nearly identical.

Sources

Select the video input source to take the Still from.

Readout

Note This is only available for **STILL HR** if an interlaced video standard has been selected (for example, 1080i).

Select what part of the Still is displayed when you select this Still as a source signal:

- **Field 1/2** for field 1 or field 2 only

  Use the field mode if a movement is in the stored picture.

- **Frame** for the full frame

Freeze

Captures the currently displayed video frame of the video input signal defined by **Sources**.

Rename…

Opens the Virtual Keyboard. Type in the new name and press **Ok**.

Load

Opens a dialog to let you select and load a Still from an external USB device.

This dialog also allows you to create new directories and delete or rename Stills.

Note Stills must be JPGs or PNGs and must match the selected video standard resolution.

Save

Opens a dialog to let you save a Still to an external USB device. Choose between **JPEG** and **PNG** image file formats.

This dialog also allows you to create new directories and delete or rename Stills.

Note For SD, when saving color bars in PNG format, the color Magenta will be changed, because it exceeds the RGB color space.

Making a Still

To make a Still:

1. Select the video signal input source from the **Sources** list.

2. Select the destination memory cell by touching one of the twelve pads on the right side of the screen.

3. Press **Freeze**.

The Still automatically receives the name of the corresponding input source and a thumbnail is shown.

Alternatively, you can make a Still using the **FS** button on the Delegation Subpanel (see *Delegation Subpanel* on page 39):

1. Select a video source in SD or HR mode

2. Press **FS** to capture a frame of the video input and store it into the next unused Still Store.

To confirm the storage of the Still, the **FS** button flashes shortly and the **STILL STORE** menu appears (if **Auto Menu Delegation** is active).

Note   You can only capture Stills from a video source. Color Mattes and already existing Stills cannot be stored into a Still Store.

Saving a Still

To save a Still to an external USB device:

1. Select the still to be saved by touching one of the twelve pads on the right side of the screen.

2. Press **Save** to open the save dialog.

3. Navigate to the desired directory.

The currently selected directory is shown in the **Current Directory** display.

4. If desired, press **Current Filename** to change the name.

5. Select **JPEG** or **PNG** as file format.

6. Press **Save** to save the still.

Loading a Still

To load a Still from an external USB device:

1. Select the destination memory cell by touching one of the twelve pads on the right side of the screen.

2. Press **Load** to open the load dialog.

3. Navigate to the desired directory.

    The currently selected directory is shown in the **Current Directory** display.

4. Select the desired Still from the list of image files.

    The currently selected filename is shown in the **Current Filename** display.

5. Press **Load** to open the file.

    The Still is loaded into the selected memory cell and a thumbnail is shown.

7.9   Setup Main Menu

Use the **SETUP** main menu to adjust network settings, obtain diagnostic information, set input and output settings for video and audio, assign faders and buttons, calibrate the system, manage GPI/GPO settings and configure the ports and interfaces for every external device connected to the **INDIGO AV Mixer**.

Use the tabs on the top to access the following submenus:

• *System Submenu* (network settings and diagnostic information)

• *Video Submenu* (video signal input and output settings)

• *Audio Submenu* (audio signal input and output settings)

• *Control Panel Submenu* (assignment of buttons/faders and calibrations)

• *GPIO Submenu* (GPI/GPO settings)

• *External Devices Submenu* (configuration of the Media Players)

7.9.1   System Submenu

Use this submenu to set up the parameters for a connected network, obtain information on the system status and set the complete system to default settings.

Use the buttons in the Parameter Navigation Area on the top to access the following sections:

Network

In this section, you can configure the ID parameters if the **INDIGO AV Mixer** is connected to a network, for example, to remotely control a *Turbo iDDR*.

Note   In order to be able to remotely control a Turbo iDDR via network, the **INDIGO AV Mixer** and the Turbo iDDR must use the same address range.

You can set up the following ID parameters:

• **IP address**

• **Sub Net Mask**

Note   Do not use IP addresses starting with 192.168.99.xxx. This may cause malfunctions.

See also *Network Operation* on page 147 for further information.

Note   Do not remove or connect the network cable while you are on air. Removing or connecting the network cable or changing the network parameters can cause distortions to the video signals.
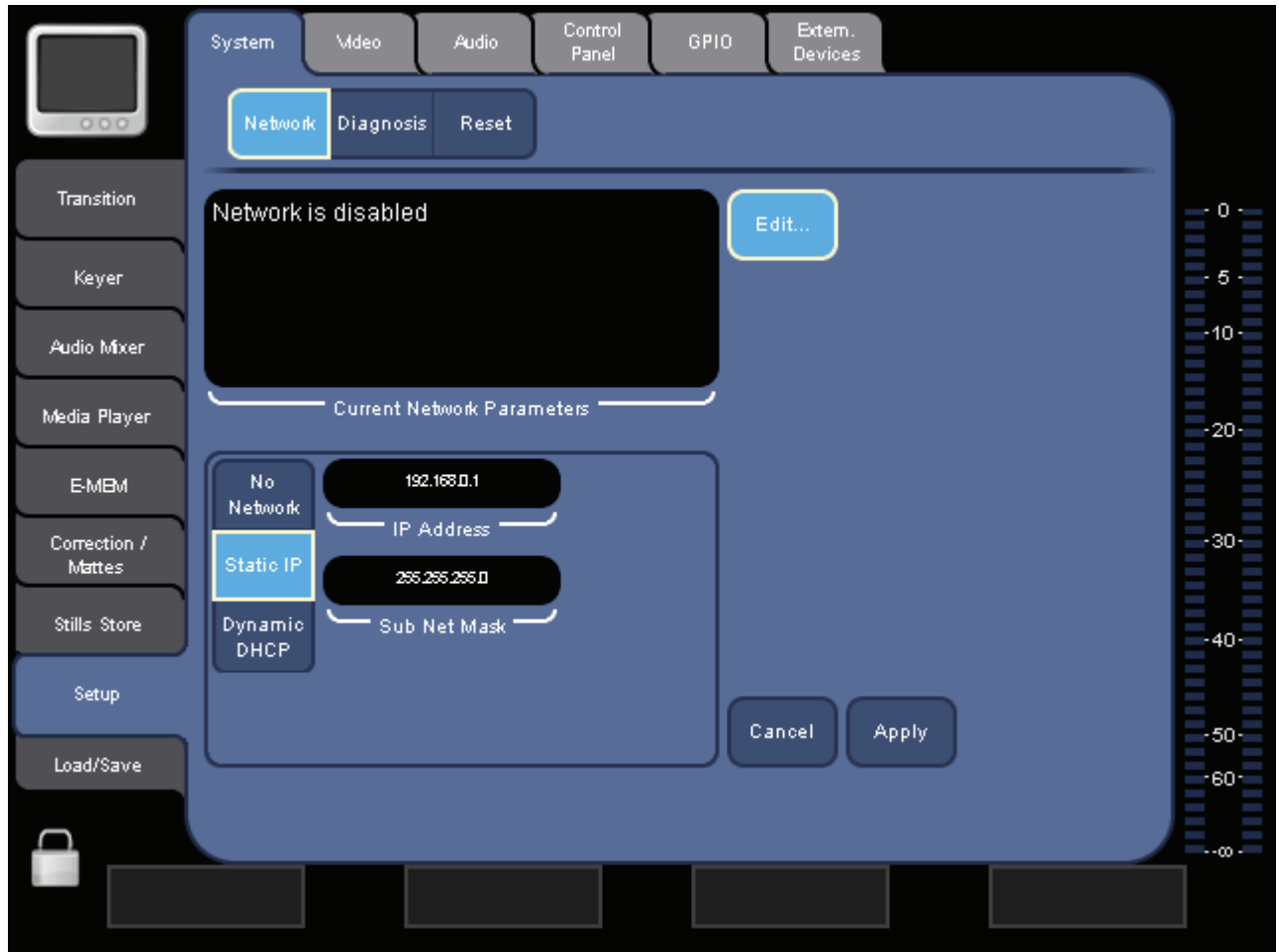
Figure 58. Setting up the network parameters of the system

The **Current Network Parameters** display shows a summary of the current settings.

Note   If the network status is displayed in red, there is a major problem with the network. Fix the problem or switch the system to **No Network** mode.

Press **Edit...** to display the buttons for configuring the IP parameters.

No Network

Select this button if the **INDIGO AV Mixer** is not connected to a network.

Static IP

Select this button if you want to assign static IP parameters. Touch the display areas for the **IP Address** and **Sub Net Mask** to open the Virtual Numeric Keypad and type in the values.

Dynamic DHCP

Enables DHCP (Dynamic Host Configuration Protocol) to automate the assignment of the **IP address** and **Sub Net Mask**.

Apply

Applies the new IP parameters to the network.

Note   Updating the values may take up to 30 seconds.

Cancel

Closes the display field to the left and resets the values for **IP address** and **Sub Net Mask**.

Diagnosis

This display provides you with information on:

- The fan status and the system's temperature

- The version of the mainframe and its panel

Figure 59. Overview of the system status

See *Troubleshooting* on page 159 for information on how to handle the error messages.

Reset

Press **Reset All** to reset the complete system to default settings.

7.9.2   Video Submenu

Use this submenu to set up the video inputs and outputs.

Use the buttons in the Parameter Navigation Area on the top to access the following sections:

Video Input Settings

In this section, you define the signal type of every video channel input. Depending on the input (see *Video Inputs* on page 19), you can select:

- **SDI** (for all sources, except 13 to 15 [HR])

- **Composite** (for sources 1 to 6)

- **S-Video** (for sources 1 to 4)

- **Downscaled** (for sources 9 and 10)

- **DV IEEE 1394** (for sources 11 and 12)

- **VGA, DVI, SDI HD** (for sources 13 and 14 [HR])

- **Internal SD** (for sources 13 to 15 [HR])

Figure 60. Video input settings

Downscaled

Inputs 9 and 10 can be set to show downscaled internal HR signals. The routing is predefined: Input 9 shows the HR program signal (PGM), input 10 shows the HR preview signal (PVW).

DV IEEE 1394

Inputs 11 and 12 can be set to show DV codecs or SDI signals:

- **DV**
  The signal of the DV input (Firewire) is shown.

- **SDI**
  The PGM signal is shown.

Note   The Firewire outputs always show the SD PGM signal.

VGA

Inputs 13 and 14 can be set to show VGA signals. If necessary, you can modify the VGA signal:

- Use **Extended Positioning** to adjust (center) a VGA input that does not match the supported VGA modes. If this button is active, you can change **Position X** and **Position Y** even if **Overscan X** is 0 (see **Alignment** section below).

- **Auto Adjust** automatically adjusts position and colors of the VGA signal.

- Activate **Manual Gain** to manually adjust the signal's **VGA Gain** and **VGA Blacklevel**.

SDI HD

Inputs 13 and 14 can be set to show SDI HD signals. If necessary, adjust the aspect of the signal:

- **Like SD-ME** adopts the settings from the SD-M/E.

- **4:3** (independent from settings in SD-M/E)

- **16:9** (independent from settings in SD-M/E)

Internal SD

Inputs 13 to 15 can be set to show internal (upscaled) SD signals. The following internal sources can be selected:

- **SD PGM**

- **SD PVW**

- **SD AUX1**

- **SD AUX2**

Bypass Framesync.

Allows you to activate/de-activate the automatic frame synchronization for synchronous input signals.

This button is only available if **Ext. Lock Enable** in the **Video Output Settings** section is active (see *Video SD Output Settings* on page 126).

Note   If framesync is active, there is always a delay of at least one frame for this source.

Alignment

Allows you to adjust the video size of HR sources:

- Use **Overscan X** to cut the video signal on the left and on the right.

- Use **Overscan Y** to cut the video signal on the top and on the bottom.

- Use **Position X** and **Position Y** to change the position of the video signal.

Preserve Aspect

Allows you to preserve the aspect ratio of the source signal when changing the size:

- If **active**, after sizing the video signal via Overscan, the image gets re-sized regarding the aspect ratio. This may result in (black) borders on the left and right or on the top and bottom of the image if it does not match the output window exactly.

- If **not active**, after sizing the video signal via Overscan, the image gets re-sized to the full output window, regardless of its original aspect ratio.

For background signals (program and preset), the "output window" is the screen of the PGM or PVW monitor. For HR keyers in PiP mode, it is the size that you defined in the **Transform** section (see *HR Keys* on page 95).

Sync Status indication

The display beneath the type selection shows the sync status of the selected source.

Depending on the sync status, the display shows the following:

- **Nothing**

  The display is empty. This means, that **Ext. Lock Enable** in the **Video Output Settings** section is not active (see *Video SD Output Settings* on page 126).

- **White message ("Input is asynchronous")**

  If this message is shown, the input is not in range for framesync bypass, and you should not activate the **Bypass Framesync** button.

- **Yellow message**

  This means that no proper bypass can be guaranteed. In this case, try to improve the sync signal:

  a. Activate the **Ext. Lock Enable** button in the **Video Output Settings** section (see *Video SD Output Settings* on page 126).

  b. Increase the **Phases** values in the **Video Output Settings** section.

Note   If you consider the incoming video signal to be in sync with the reference, try to set the **V** phase to a value between 5 and 7.

  c. Check, if the **Sync Status** color changes to green and the message "Input is in range for framesync bypass" is shown.

  d. If necessary, repeat steps b and c.

- **Green message ("Input is in range for framesync bypass")**

  If this message is shown, bypass will work properly and you can activate the **Bypass Framesync** button.

Input CMD

In this section, you select a command to be executed when a video input goes "on air".
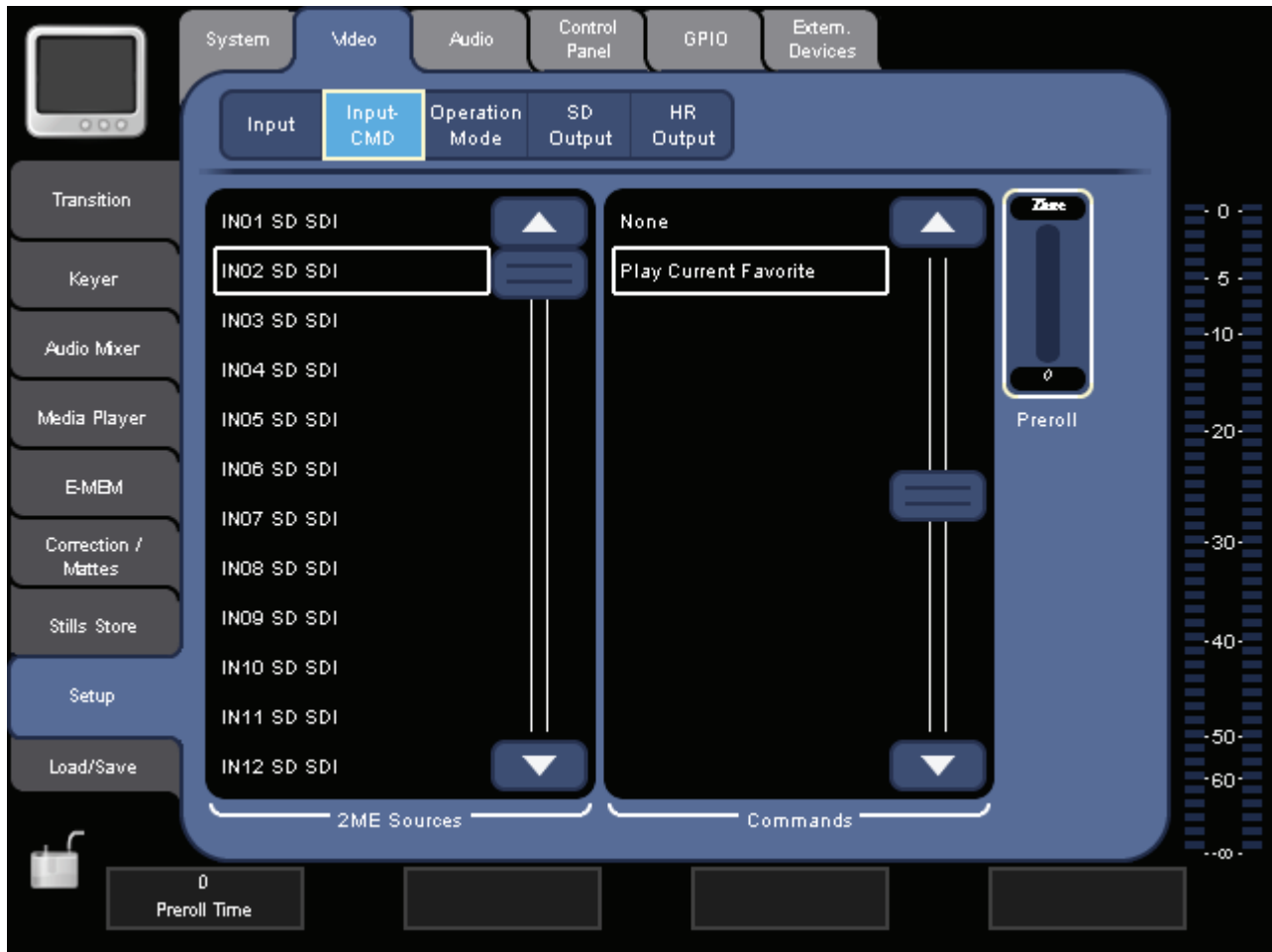
Figure 61. Video input CMD settings

If you select **Play Current Favorite** from the **Commands** list, the currently selected favorite clip (see *Favorites Submenu* on page 105) will be started as soon as the source input is selected for program output.

Note   For this command to work, the clip must have been saved to Favorites from the same source that you are now taking to air.

To adjust an offset of the external media player, set an appropriate **Preroll** time.

Video Operation Mode

In this section, you can select the operation mode of your
INDIGO AV Mixer.

Figure 62. Video operation mode

Operation Mode

Select one of the following modes:

- **2 MEs**

  The 2 ME mode is the standard mode and useful when working with
  both SD and HR signals. In this mode, separate SD and HR button
  assignment is possible in the Control Panel (see *Control Panel Submenu*
  on page 135).

- **SD-Flat**

  In the SD mode, only SD ME is available. SD inputs 9 and 10 are
  replaced by HR inputs 1 and 2. No HR inputs can be configured for
  internal SD sources.

- **HR-Flat**

  In the HR mode, only HR ME is available. You can use HR sources 1 and 2 as well as SD sources (except 9 and 10).

  When making background transitions in HR mode, transitions between HR and SD sources are done using the HR effect, transitions between two SD sources are done using the SD effect.

Note   Due to the limited number of scalers (three), there are some limitations for source combinations visible on the program out at the same time.

Note   The HR program and preview signals – available in SD output format on SD AUX 1 and AUX 2 – can be used for recording.

Video SD Output Settings

In this section, you can select the format of the SD video output.
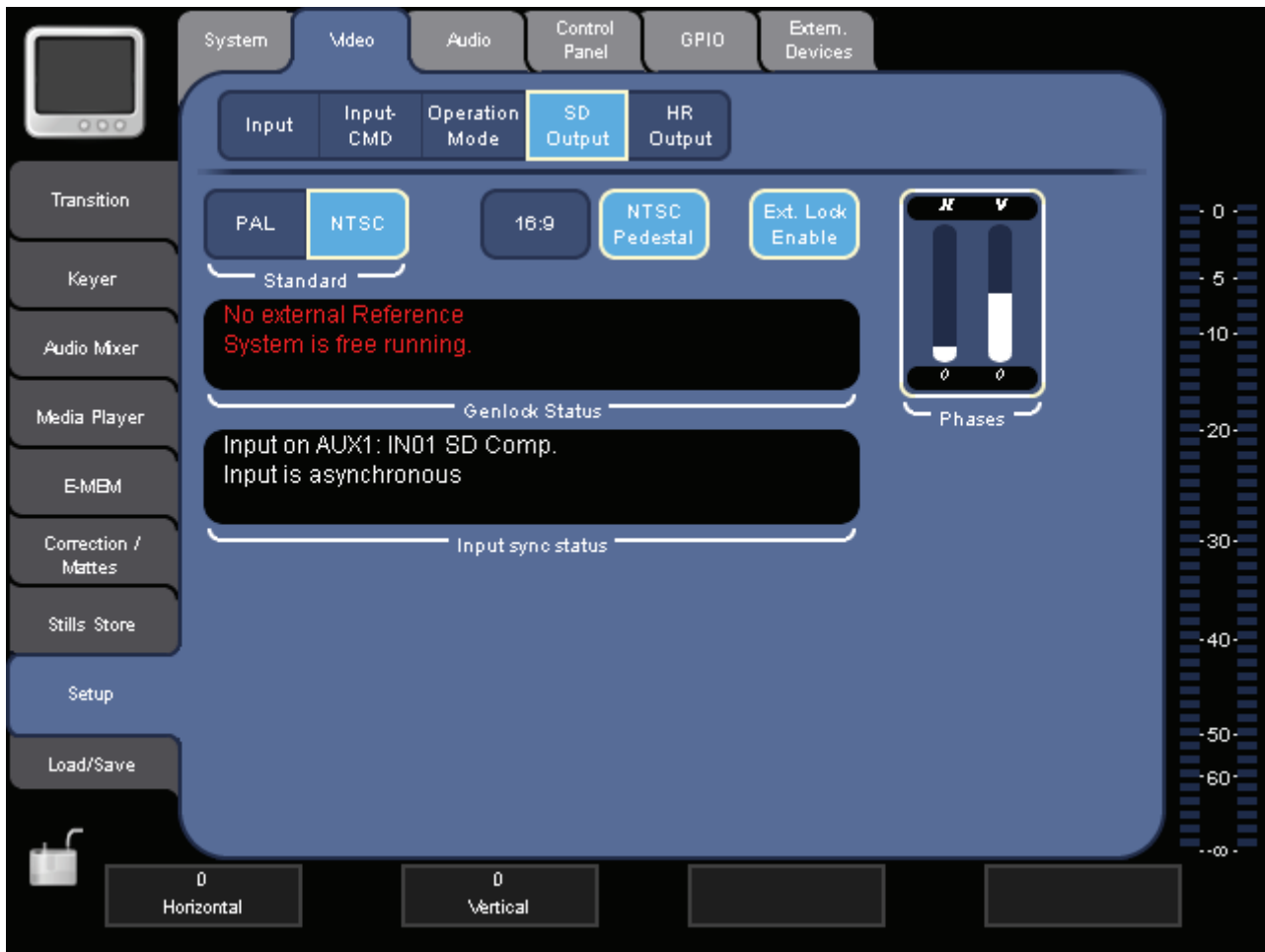
Figure 63. Video SD output settings

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Standard

Select the video standard format: **PAL** or **NTSC**.

16:9

Activate this button if you need a 16:9 video output format.

NTSC Pedestal

This button is only available if you selected **NTSC** as video standard.

Allows you to activate/de-activate an internal offset of the NTSC signal, to avoid differences in brightness.

Note   The NTSC Pedestal setting always affects both inputs and outputs. Independent settings are not possible.

Ext. Lock Enable

Allows you to lock the **INDIGO AV Mixer** to an external reference signal.

The external reference signal must match the selected video standard (**PAL** or **NTSC**).

When **Ext. Lock Enable** is active and a valid reference signal is applied to the **Analog Ref** input (see also *Analog Ref Connections* on page 22), the **INDIGO AV Mixer** will enter the Ext. Lock mode.

In Ext. Lock mode, you can use the **Phases** parameter display field to adjust the relative position between the output video of the **INDIGO AV Mixer** and the reference signal (for example, "start of field").

Note   Changing the Ext. Lock mode or the phases may cause a momentary signal distortion on the output.

The current status is shown in the **Genlock Status** and **Input sync status** display.

Video HR Output Settings

In this section, you can select the format of the HR video output.
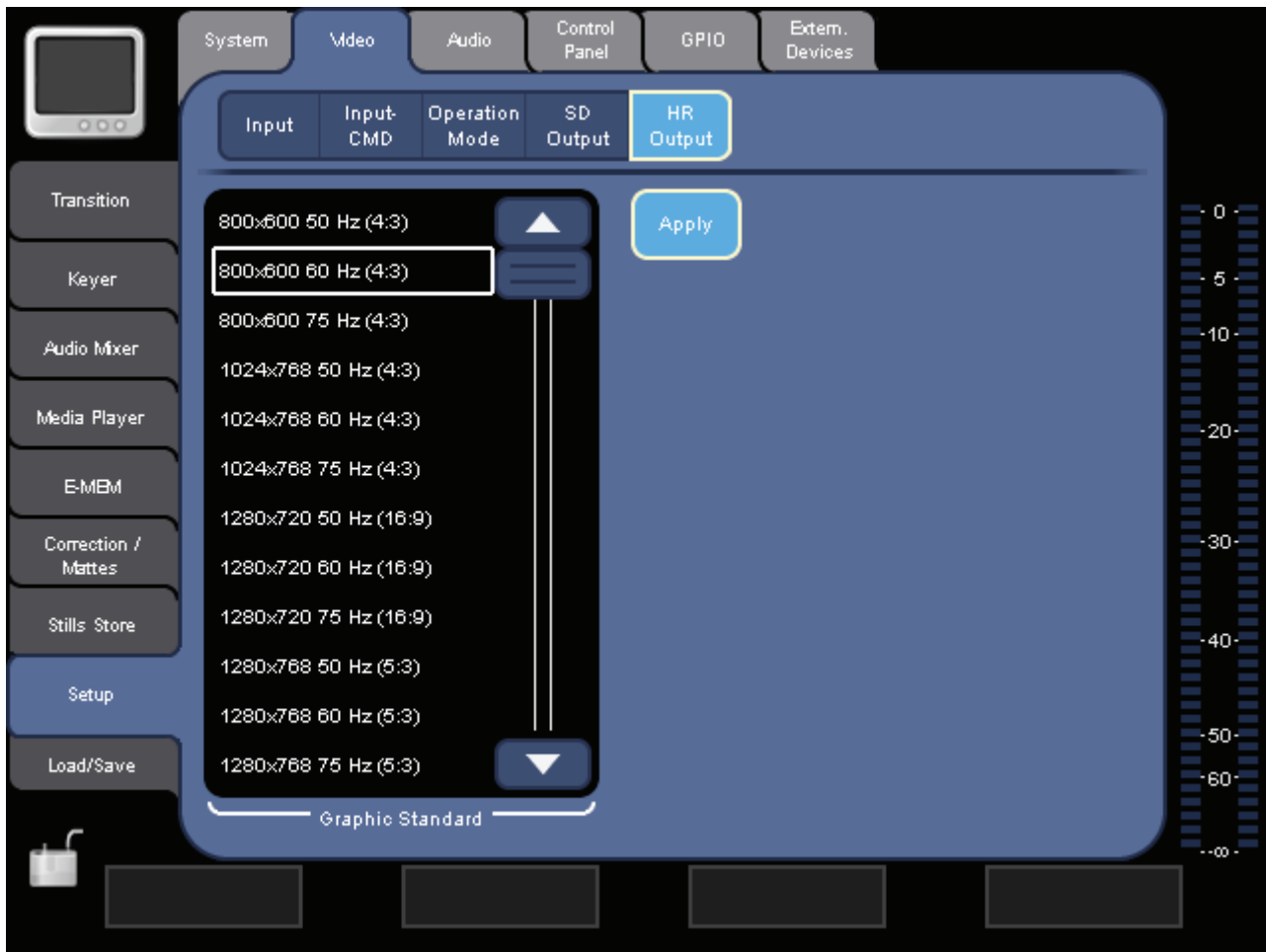
Figure 64. Video HR output settings

Graphic Standard

Select the graphic standard of the video output.

Note   Changing the graphic standard may take up to 30 seconds.

To change the graphic standard:

1. Select the desired setting from the **Graphic Standard** list.

2. Click **Apply.**

7.9.3 Audio Submenu

Use this submenu to set up the audio operation mode and check the audio input and output settings.

Use the buttons in the Parameter Navigation Area on the top to access the following sections:

Audio Input

In this section, you can select which of the physical **Audio Inputs** is assigned to which of the eight internal audio channels, called **Mixer Inputs**. The following audio inputs are available:

- **RCA**
- **TRS** (TRS 1/4'' Phone)
- **XLR**
- **AES**
- **SDI**
- **SineGen** (sine wave generator)
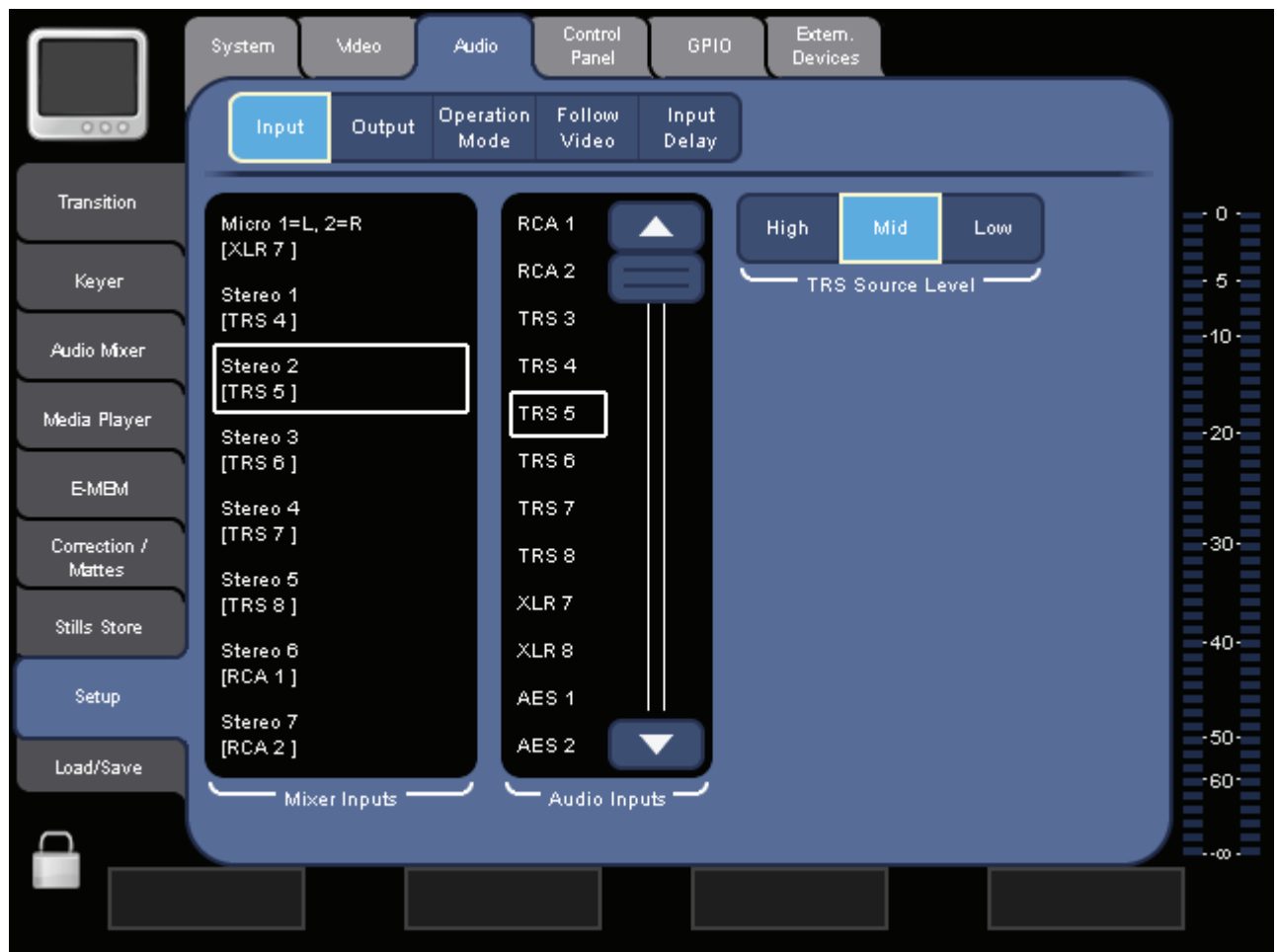
Figure 65. Audio input assignment

To assign an audio input to an audio channel:

1. Select the desired audio channel from the **Mixer Inputs** list.

Note   The display of this list depends on the **Operation Mode** you selected.

2. Select the audio signal's connection type from the **Audio Inputs** list.

TRS

If you select a TRS 1/4" Phone connection, you can also select the **TRS Source Level** (**High**, **Mid** or **Low**).

SDI

The SDI connections provide de-embedded audio. If you select an SDI input you can also select the group (**Group A/B/C/D**) and the channel pair (**Pair 1/2**) where the audio is to be taken from.

SineGen

The sine wave generator can be used for testing and analyzing purposes. It generates a frequency of 440 Hz.

Audio Output

In this section, you can change the settings for Main Out and Sub-Out.
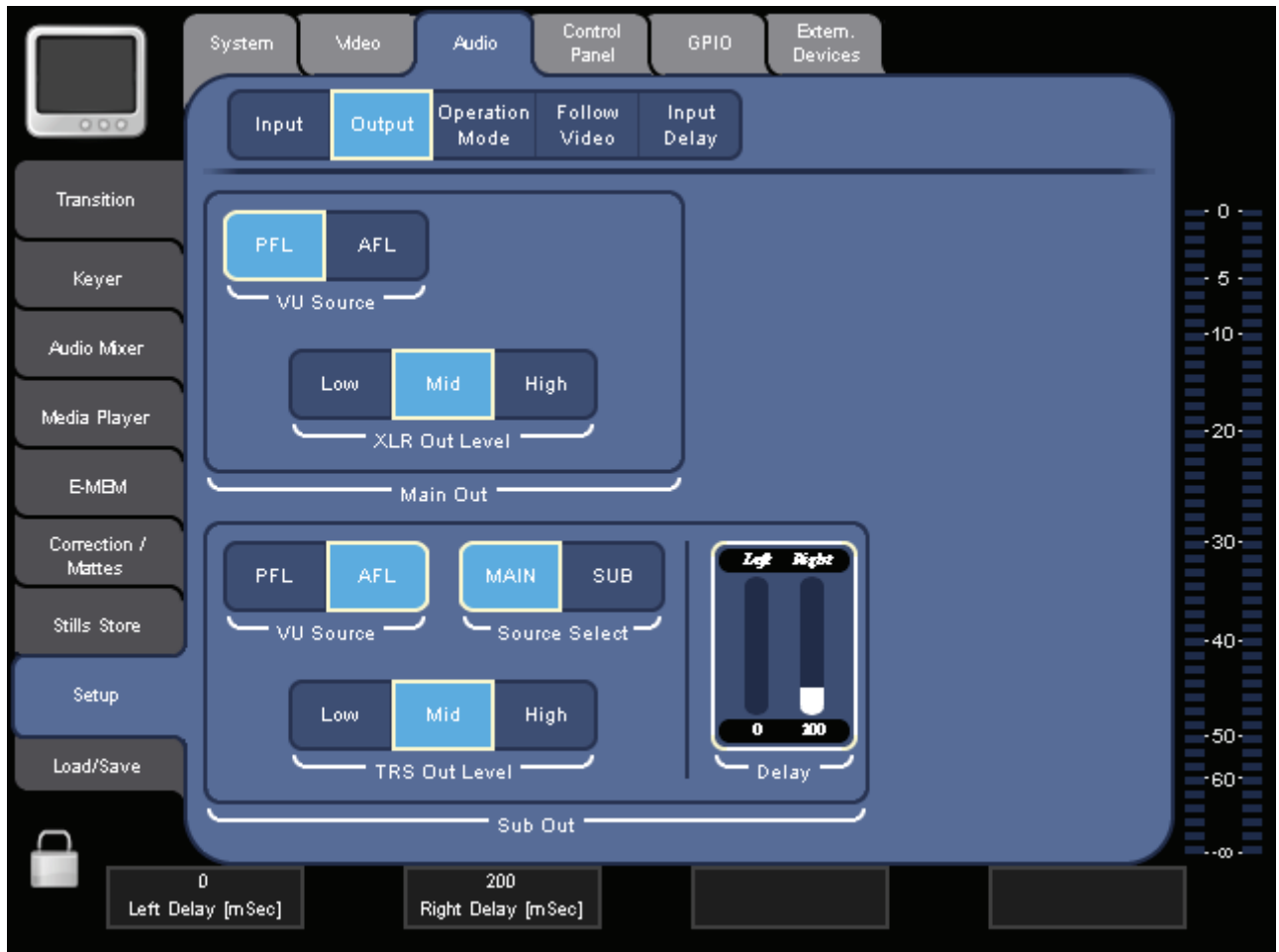
Figure 66. Audio output assignment

Main Out

Select the **VU Source**, i.e. if you want the PFL ("pre masterfader") or the AFL ("after masterfader") signal to be displayed by the main VU meter on the right side of the screen.

You can also set the **XLR Out Level (**i.e., the output gain) to **Low, Mid** or **High**.

Sub Out

Provides the same options as **Main Out**.

In addition, you can set a **Delay** in milliseconds (independently for left and right channel), for example, to balance wide distances between the speakers.

Source Select allows you to select if the signal comes from **MAIN** or **SUB** source.

If you just want to have a delayed signal from the Main output, use **Main**. Otherwise, you have to take care that in all used channels Main Out and Sub-Out is selected.

Operation Mode

Select one of the following modes:

- **8 Stereo**: You can use the audio signals of eight stereo sources, deriving from RCA, TRS 1/4″, XLR, AES/EBU signals or even de-embedded audio from video streams.

- **7 Stereo, 2 Mic**: You can use seven stereo audio signals (deriving from RCA, TRS 1/4″, XLR, AES/EBU signals or even de-embedded audio from video streams) and two microphones that are connected to **LINE/ MIC IN** inputs.

- **6 Stereo, 4 Mic**: You can use six stereo audio signals (deriving from RCA, TRS 1/4″, XLR, AES/EBU signals or even de-embedded audio from video streams) and up to four microphones that are connected to **LINE/MIC IN** inputs.

Note   When assigning an XLR connector to a Mic Input, the corresponding Gain parameter in Audio Mixer changes from Channel Gain to Mic Gain, indicating the individually used pre-amplifier circuits.

Audio Follow Video

In this section, you can enable the Audio Follow Video mode for a video signal. For detailed information see *Audio Follow Video* on page 64.

Note   You can also assign Audio Follow Video to Stills.
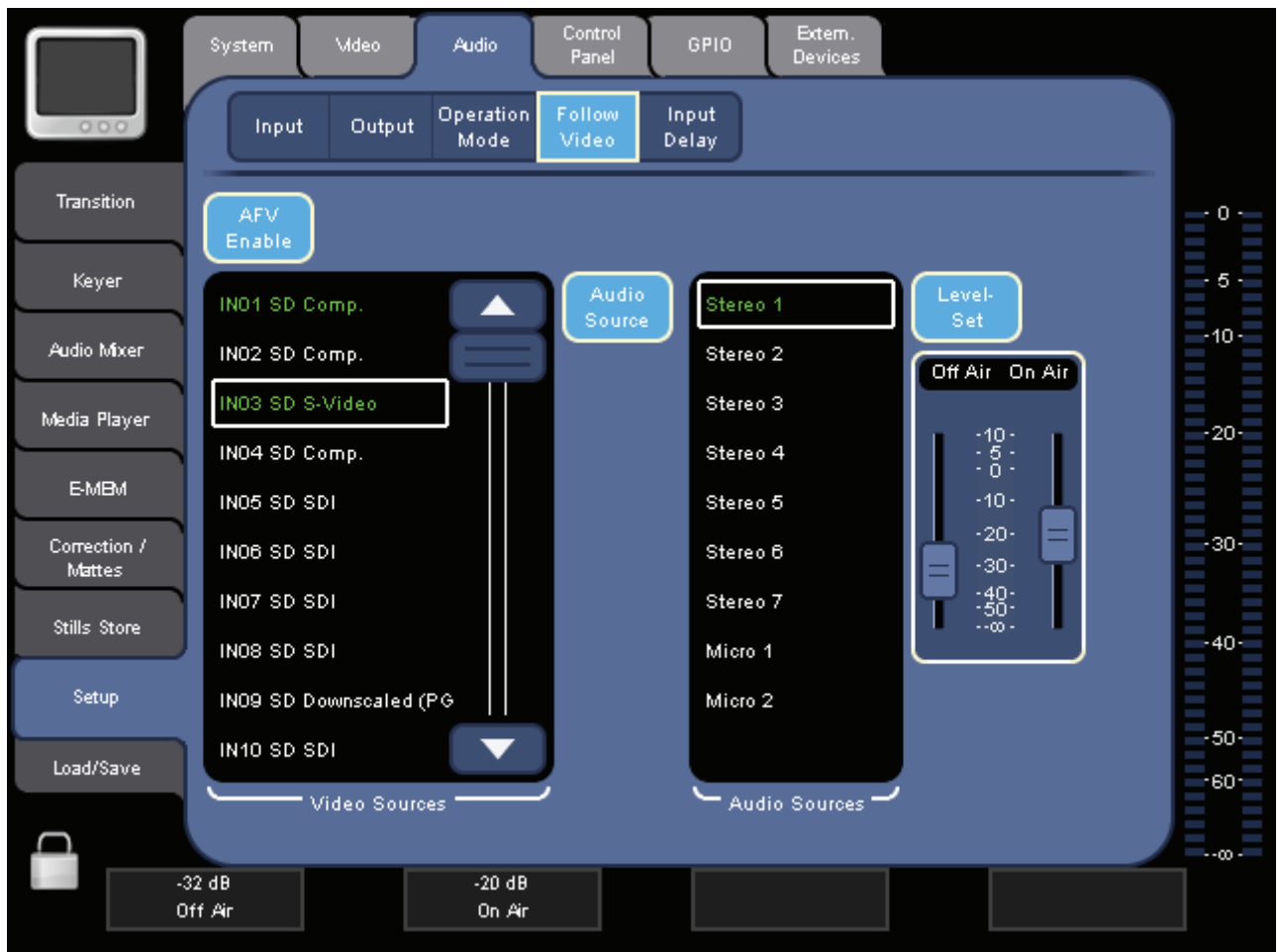
Figure 67. Audio Follow Video assignment

To enable Audio Follow Video:

1. Press **AVF Enable**.

    The **Video Sources** list is displayed.

2. Select the video signal from the **Video Sources** list.

    You can also select Stills from this list.

3. Press **Audio Sources**.

    The **Audio Sources** list is displayed.

4. Select the audio input from the **Audio Sources** list.

The content of this list depends on the **Operation Mode** you selected.

5. Press **Level-Set**.

The volume output level faders for the volume output level are displayed.

6. If desired, you can change the volume level (in dB) for "on air" (right fader) and "off air" (left fader).

Input Delay

In this section, you can change the delay settings for the audio inputs.
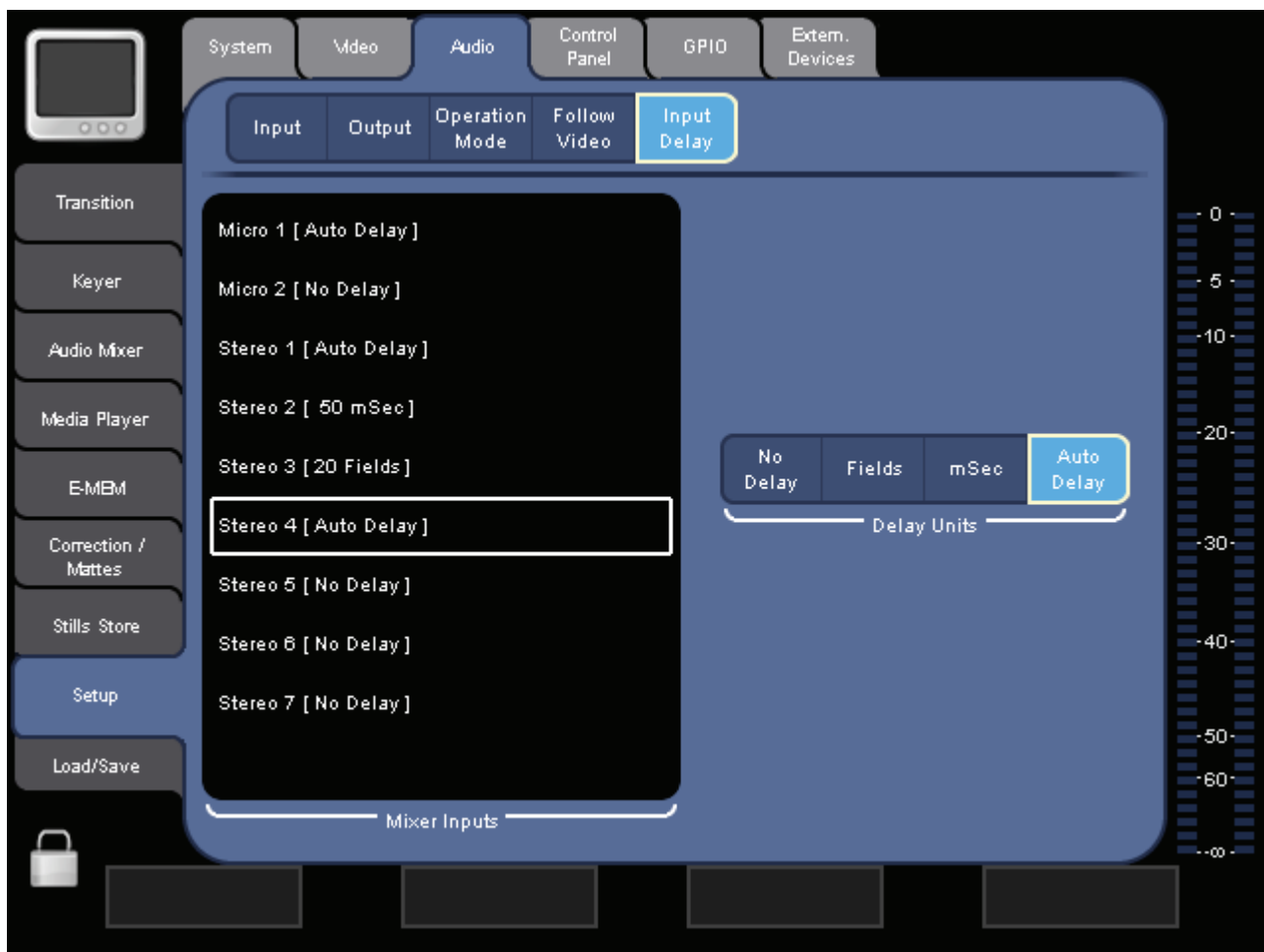
Figure 68. Input Delay

To change the delay settings for an input:

1. Select the audio input signal in the **Mixer Inputs** list.

    The **Video Sources** list is displayed.

2. Select the **Delay Units**.

    For **Fields** and **mSec**, a **Delay** parameter field is displayed which allows you to set the delay in fields or milliseconds.

    No Delay sets the delay to zero.

    Auto Delay sets the delay automatically in sync with the video signal.

3. Set the delay in the **Delay** parameter field.

7.9.4   Control Panel Submenu

Use the buttons in the Parameter Navigation Area on the top to access the following sections:

Calibration

In this section, you can perform the calibration of the following control elements:

*   Audio Faders
*   Joystick
*   Touch Screen
*   Transition Lever Arm (T-Bar)

Additionally, you can also enter the calibration mode of the Touch Screen by pressing all four Digipots simultaneously.

For detailed descriptions on the calibrations, see *Calibrations* on page 155.

Button Assignment

In this section, you can assign a video signal, a Still or a Matte to any button in the Background Crossbar on the Control Panel.

Figure 69. Assigning video signals to buttons on the Control Panel

Note   Depending on the Operation Mode (see *Video Operation Mode* on page 125) you can assign SD and HR buttons, only SD buttons, or only HR buttons.

To assign a button to a signal:

1. Select the desired button from the **Buttons** list.

([S] stands for the **Shift** button on the left side of the crossbar.)

2. Select the video signal's source from the **Sources** list.

3. Press **Assign**.

Default

Resets the assignment of the selected button.

Default All

Resets the assignments of all buttons.

Fader Assignment

In this section, you can assign the audio channels to the six faders on the Audio Control Subpanel.

Figure 70. Assigning audio signals to faders on the Control Panel

To assign a fader to an audio signal:

1. Select the desired fader from the **Fader** list.

2. Select the audio signal's source from the **Sources** list.

    The entries in this list depend on your selection of the operation mode in the **AUDIO** submenu.

3. Press **Assign**.

Default

Resets the assignment of the selected fader.

Default All

Resets the assignments of all six faders.

7.9.5   GPIO Submenu

Use the buttons in the Parameter Navigation Area on the top to access the following sections:

GPI

Here you define actions to be triggered for up to eight GPIs. See also *Tally/ GPI/GPO* on page 30.

Figure 71. Configuring the GPI

GPIs

Select the desired input from the **GPIs** list.

Action

Select the action to be triggered from the **Action** list:

- **None** – do nothing
- **Recall Timeline** – executes one of the recorded E-MEMs
- **Audio channel On** – toggles the on/off status of the selected audio channel
- **Audio channel PFL** – toggles the selected audio channel between PFL and AFL mode
- **Transition Auto** – executes an auto transition
- **Transition Cut** – executes a cut

Trigger

Select the trigger type from the **Trigger** list. Depending on the selected action, this can be **Closed/Opened** or **Rising/Falling/Both**.

EMEM/Channel/Transition

This shows the "destination" of the action. Depending on the selected action, you can select an E-MEM, a channel or a transition from the list.

GPO

Here you define settings for up to 16 GPOs. See also *Tally/GPI/GPO* on page 30.
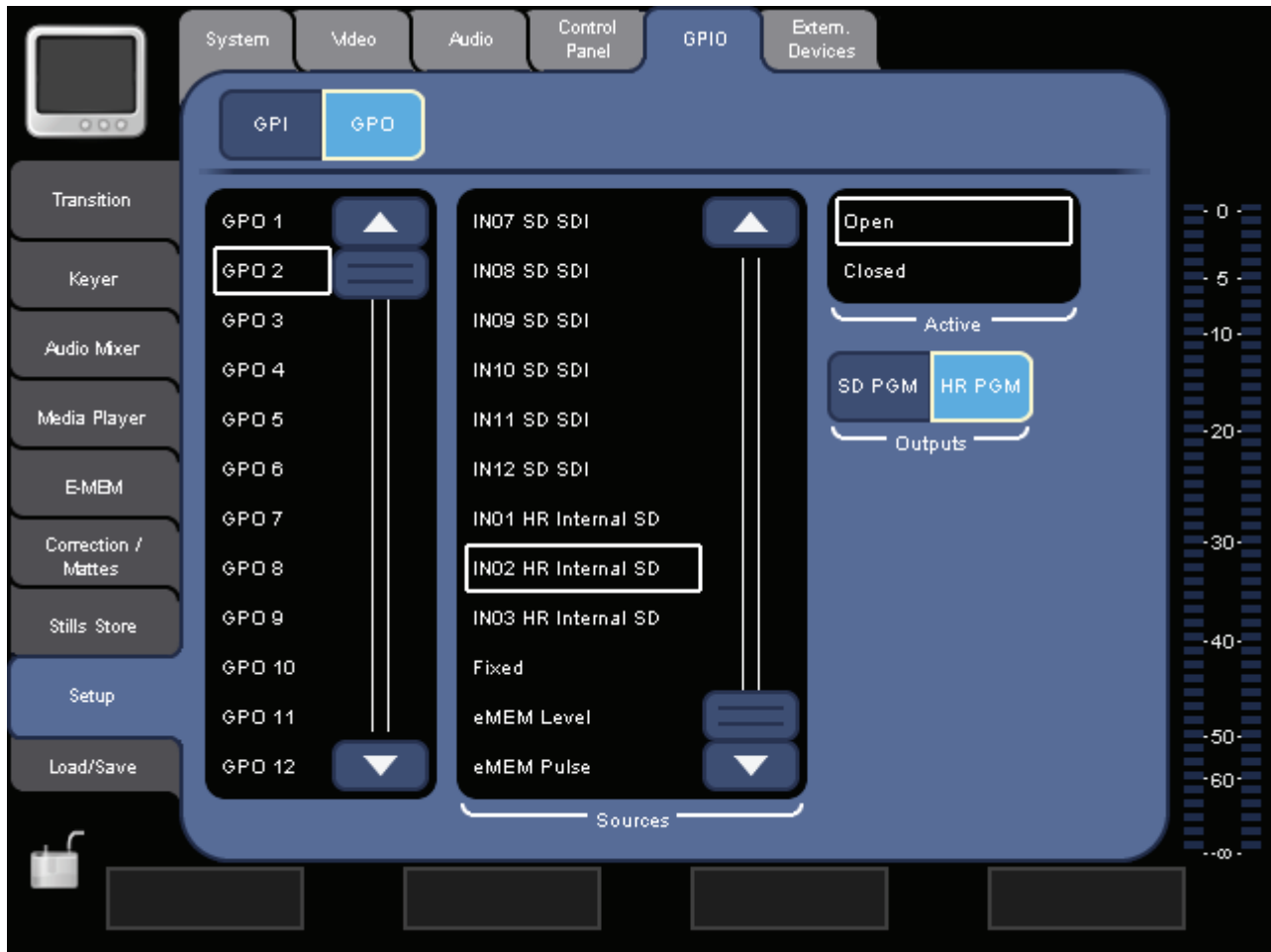
Figure 72. Configuring the GPO

To define the settings for a GPO:

1. Select the GPO from the list.

2. Select the video input from the **Sources** list.

3. Select the **Outputs**.

   Depending on this selection, the GPO reacts if the selected source is included in an **SD PGM** signal or an **HR PGM** signal, or either of them (if both are selected).

4. Set the desired GPO status from the **Active** list.

Note   If you select **Fixed** from the **Sources** list, you can set a GPO to permanent **Open** or **Closed** status.

There are two additional, special **Sources**:

•   **eMEM Level**

•   **eMEM Pulse**

eMEM Level

You can use **eMEM Level** to, for example, switch lights on and off.
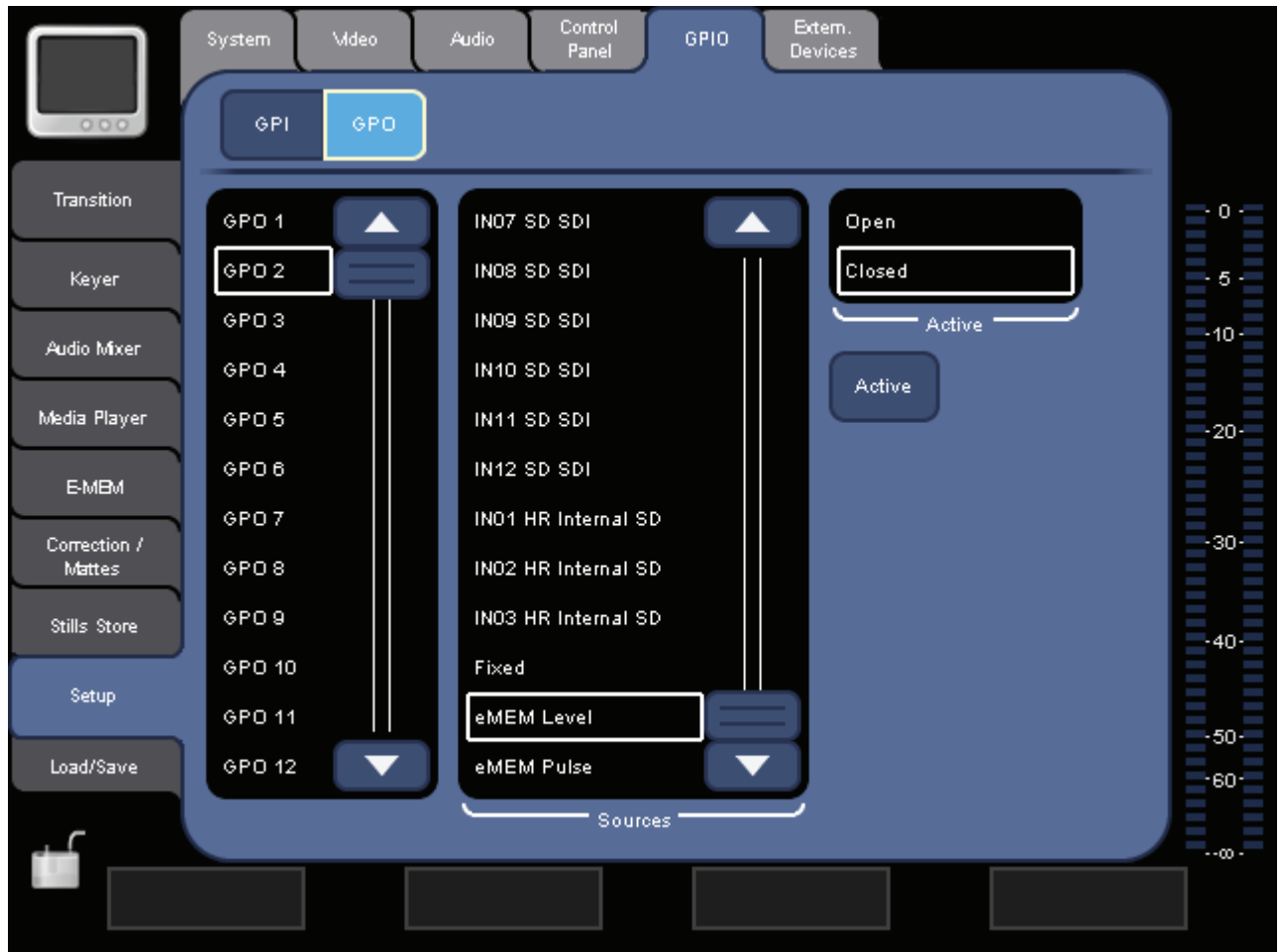
Figure 73. eMEM Level settings

The state of the **Active** button will be recorded in the E-MEM (if **GPO** is active in the **E-MEM** menu, see *E-MEM Main Menu* on page 107).

If **Active** is highlighted, the contact of the corresponding GPO is set to the **Active** state (here: **Closed**).

eMEM Pulse

You can use **eMEM Pulse** to, for example, send play commands to devices that cannot be controlled via RS422 or Ethernet.
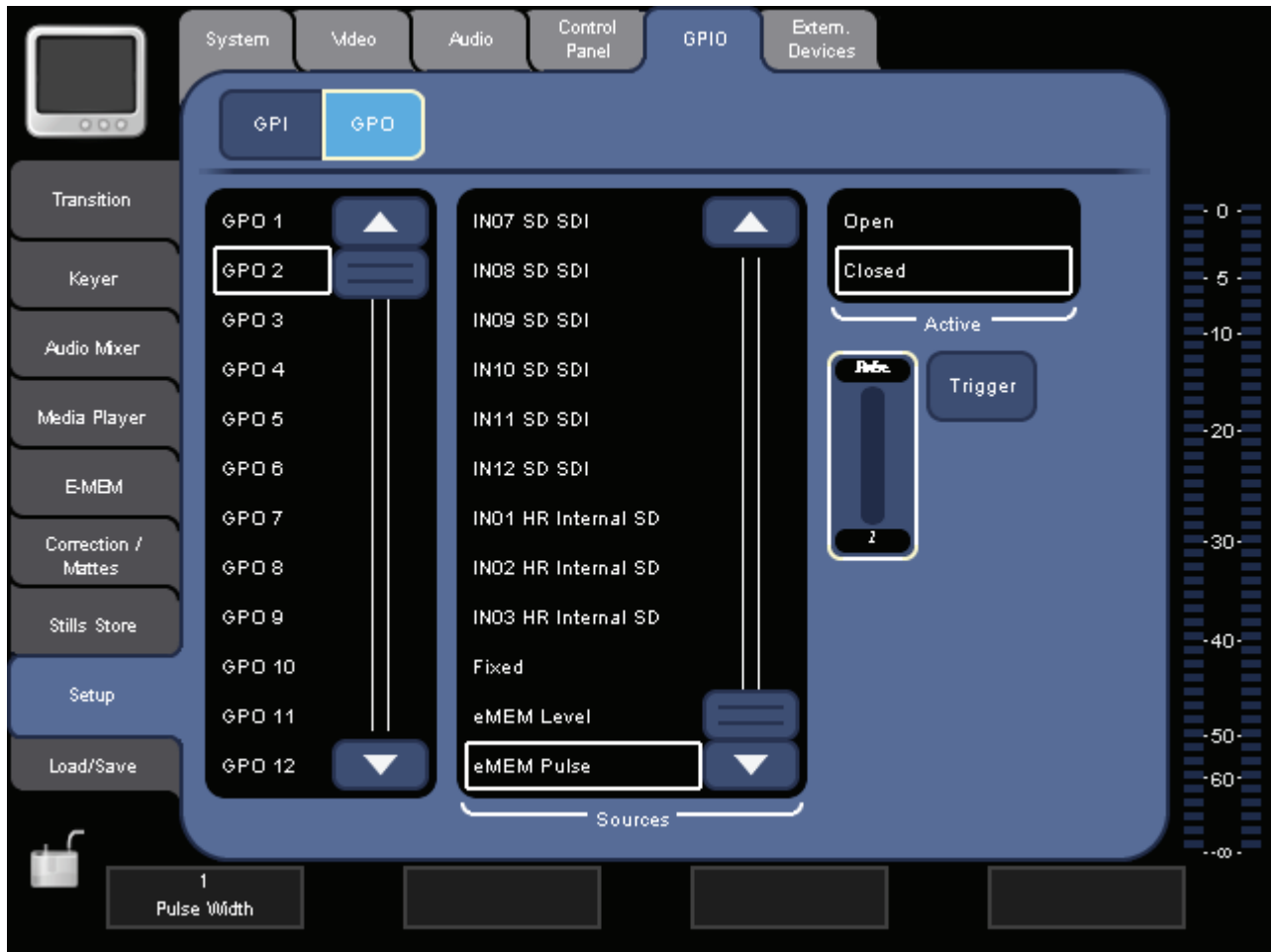
Figure 74. eMEM Pulse settings

Pressing the **Trigger** button will be recorded as event in the E-MEM (if **GPO** is active in the **E-MEM** menu, see *E-MEM Main Menu* on page 107).

The **Trigger** button generates a pulse of the set length (here: **1** field). The polarity is valid for the active range of the pulse (in this example, **Closed** is selected, i.e. the contact will be closed for the duration of one field).

The pulse length will also be recorded in the E-MEM, but not the polarity.

If **Active** is highlighted, the contact of the corresponding GPO is set to the **Active** state (here: **Closed**).

7.9.6 External Devices Submenu

Use this submenu to define external media players and to set up the **INDIGO AV Mixer** for remote control via external devices.

Media Players

In this section you define up to eight external devices (for example, *Turbo iDDR*) that you can then access via the **MEDIA PLAYER** main menu (see *Media Player Main Menu* on page 103).
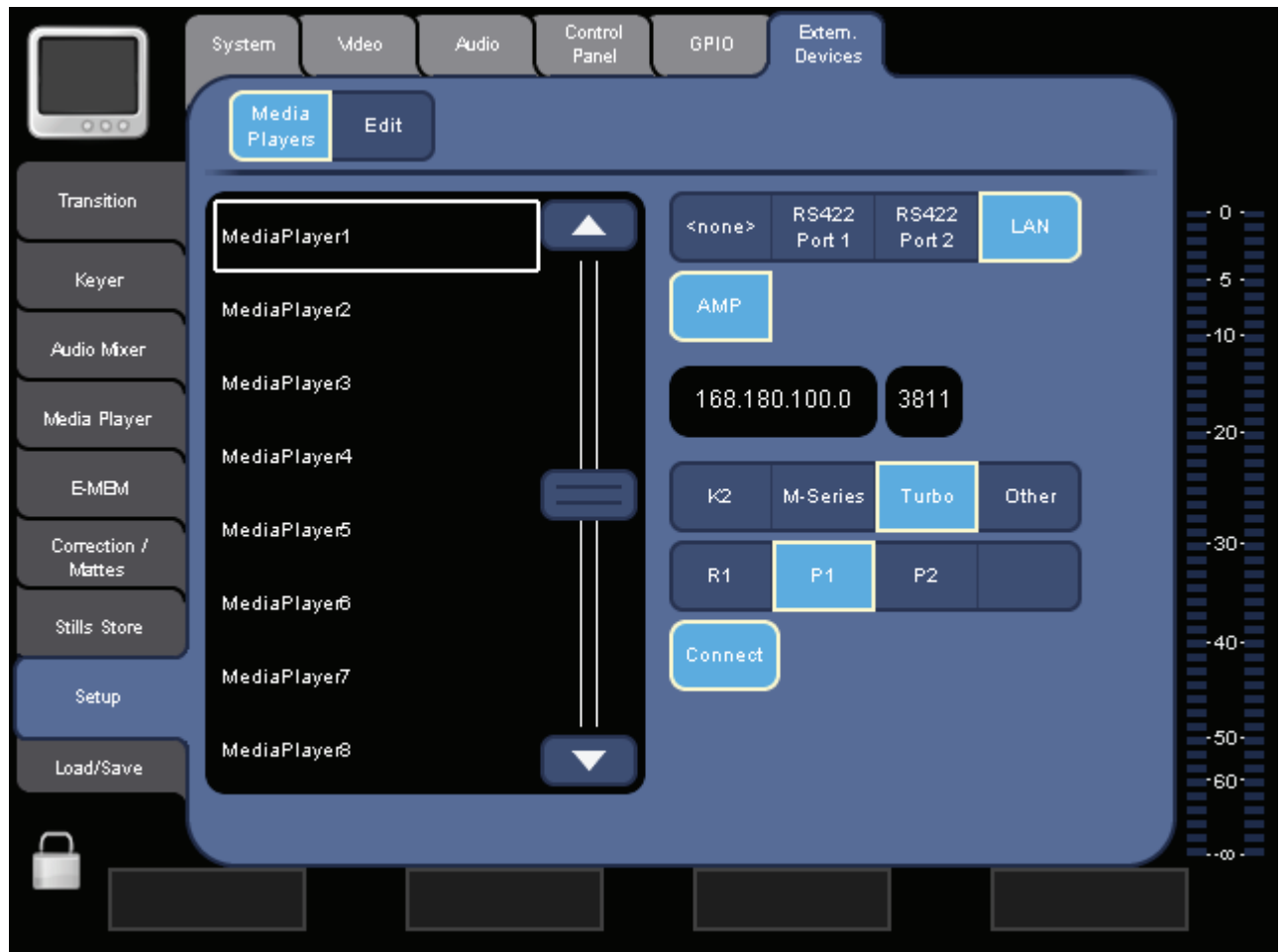
Figure 75. Configuring the media players

To set up, for example, a *Turbo iDDR* as external player, do the following:

1. Select the desired entry from the list (for example, **MediaPlayer1**).

2. Select the type of connection, for example, **LAN**.

3. Select **Turbo**.

4. Select **P1** to have access to player 1 of the selected *Turbo iDDR*.

5. Press **Connect** to establish the connection to the *Turbo iDDR*.

You can now access this *Turbo iDDR's* clips by selecting **MP1** from the **MEDIA PLAYER** main menu.

Edit

In this section you define how your **INDIGO AV Mixer** can be remotely controlled by an external editing system.
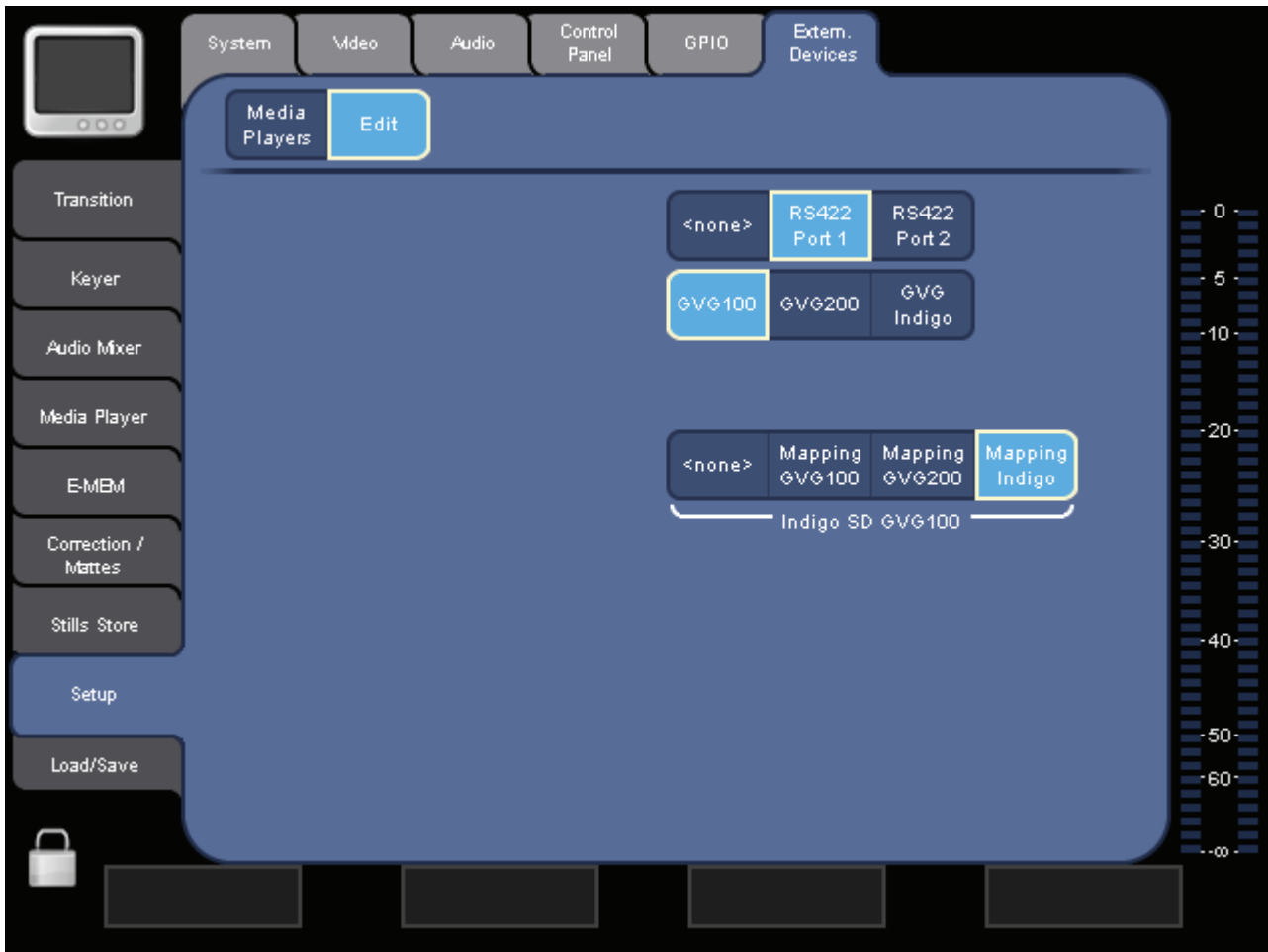
Figure 76. Configuring the Indigo for remote control

To set up the **INDIGO AV Mixer** for remote control:

1. Select the port (**RS422 Port 1** or **RS422 Port 2**) to which the external editing system is connected.

2. Select the protocol:

    •   **GVG 100** allows to control 1 M/E (SD).

    •   **GVG 200** allows to control 2 M/Es (M/E 1 = SD, M/E 2 = HiRes).

    •   **GVG Indigo** is an extension for GVG 200 and reserved for future use.

3. Select the effect mapping:

    •   **Mapping GVG 100** provides only 10 background wipes.

    •   **Mapping GVG 200** provides 36 background wipes.

    •   **Mapping Indigo** provides all effects of the **TRANSITION** menu.

Note   If you select **<none>** the currently selected effect from the **TRANSITION**
              menu will be used.

7.10 Load/Save Main Menu

Use the **LOAD/SAVE** main menu to store and administer complete setups (including keyer settings, input/output routings, E-MEMs etc.) of your **INDIGO AV Mixer** using an external USB device, for example, a USB stick. Thus, different users can quickly and easily use their individual settings by loading a setup within seconds.

The stored setup files have the extension ".indigo".

Figure 77. Load/Save main menu

Current Loaded Application

This display shows the name of the latest setup that has been loaded via the **Load** button.

Load

Opens the load dialog which lets you load, rename and delete setups.

Save

Opens the save dialog which lets you save, rename and delete setups.

Network Operation

8.1 Purpose

The main purpose of network operation is to connect the **INDIGO AV Mixer** to a network, for tasks such as remotely controlling a *Turbo iDDR* that also belongs to this network.

Connect the **INDIGO AV Mixer** to the network via Ethernet.

Note DHCP is only working if a DHCP server is available in the network (it is NOT a self organizing network).

8.2 Setting Up a Network Connection

To set up a network connection, do the following:

1. Connect the **LAN** connector of your **INDIGO AV Mixer** to the *Turbo iDDR* or the router via Ethernet cable.

2. Select the **SETUP** main menu.

3. Select the **SYSTEM** submenu.

4. Select **Network** in the Parameter Navigation Area.

5. Press **Edit...** to show the possible settings.

   In an existing company network or if you use a router, press the **Dynamic DHCP** button to enable dynamic address allocation.

   – or –

   Press **Static IP** and type in the appropriate **IP Address** and **Sub Net Mask**.

6. Click **Apply**.

Note   In oder to be able to remotely control a *Turbo iDDR* via network, the **INDIGO AV Mixer** and the *Turbo iDDR* must use the same address range, for example:

	IP Address	Sub Net Mask
INDIGO AV Mixer	192.168.0.100	255.255.255.0
Turbo iDDR	192.168.0.101	255.255.255.0

Note   Do not use IP addresses starting with 192.168.99.xxx. This may cause mal-functions.

Note   Updating the values may take up to 30 seconds.

External Devices

The **INDIGO AV Mixer** offers the possibility to remotely control various external devices, and to be controlled by linear editors via corresponding protocols.

9.1   Players and Recorders

To remotely control players and recorders via the **INDIGO AV Mixer**, the following protocols are supported:

*   **GVG-100/200**: Supports transport functions only.
    GVG-100 supports 1-M/E mixers, GVG-200 also supports 2-M/E mixers.

*   **BVW75**: Supports transport functions only.

*   **AMP**: Extended Odetics protocol providing clip lists and thumbnails (for example, to remotely control a *Turbo iDDR*).

9.2   Linear Editors

Using linear editors, the **INDIGO AV Mixer** can be remotely controlled. For this purpose, it supports the GVG-100 and GVG-200 protocols.

GVG-100

This protocol offers remote control to select:

*   Sources

*   Transitions

*   Effects

GVG-200

This is the same as GVG-100, but allows control of 2-M/E mixers, i.e. the two M/Es of the **INDIGO AV Mixer** can be controlled separately.

Maintenance

This chapter shows you how to maintain your **INDIGO AV Mixer** properly.

10.1 CF Card / Software Update

The software of your **INDIGO AV Mixer** is stored on a CF (compact flash) card. The CF card is installed in the slot beneath the lid found on the right side of the **INDIGO AV Mixer**.

Needed Parts

The following parts are needed to update the software on the CF card:

- PC with CF card reader

- CF card with at least 128 MB capacity, formatted with FAT file system

Note   The CF card of your **INDIGO AV Mixer** will do, but you may want to keep the old software on it.

Procedure

To update the software:

1. Download the latest software version (incl. the installation tool) at

   http://www.thomsongrassvalley.com/rnt/Switcher/switcher_Indigo.htm

   or

   http://gvg.custhelp.com/cgi-bin/gvg.cfg/php/enduser/std_adp.php?p_faqid=1268.

2. Optionally, save the settings of your **INDIGO AV Mixer**:

   a. Insert a USB flash memory in one of the USB connectors.

   b. Select the **LOAD/SAVE** menu.

   c. Select **Save** and give the saved data a meaningful name.

> **d.** Wait until the save process is completed.
>
> **e.** Remove the USB flash memory.

3. Turn off your **INDIGO AV Mixer**.

4. Open the lid on the right side and remove the CF card.

5. Insert the CF card (or a new, FAT formatted one) into the CF card reader of the PC.

6. On the PC, open the downloaded self-extracting **.EXE** file. It will automatically run the software installation tool **Indigo CD**.
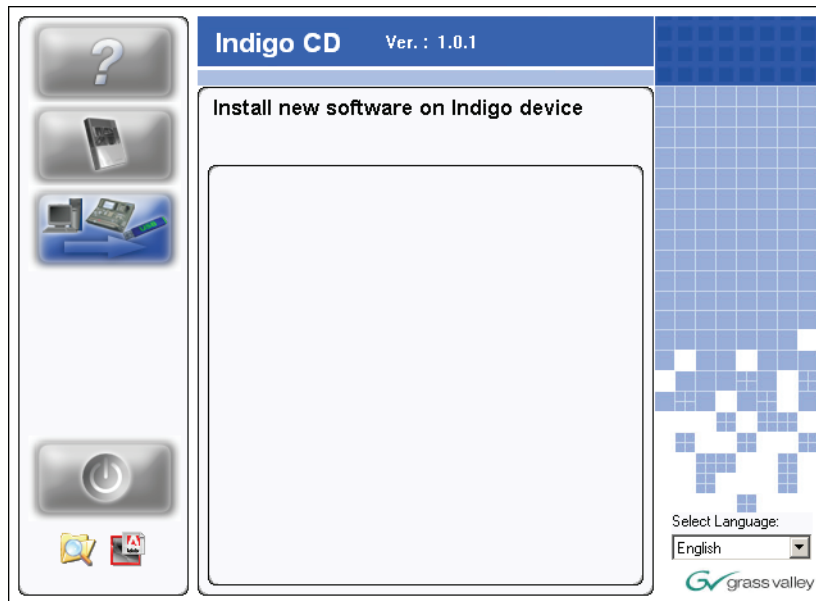
7. Select **Install new software on Indigo device** to copy the new software onto the CF card.

8. Wait until the copy process is completed.

9. Remove the CF card.

10. With your **INDIGO AV Mixer** still turned off, insert the CF card containing the new software into the slot.

CAUTION Do not insert the CF card below the mainboard.

11. Close the slot.

12. Turn on the **INDIGO AV Mixer**.

13. Perform an audio fader calibration (see *Faders* on page 157).

14. Optionally, restore the settings of your **INDIGO AV Mixer**:

    a. Insert the USB flash memory with the saved data in one of the USB connectors.

    b. Select the **LOAD/SAVE** menu.

    c. Select the saved data from the list and press **Load**.

    d. Wait until the load process is completed.

    e. Remove the USB flash memory.

15. Start working with the new software.

Contacting Grass Valley Customer Service

Contact Grass Valley Customer Service if you have questions or encounter any problems:

• North America: 1-800-547-8949 or 1-530-478-4148

• ERoW Call Center: +800 80 80 20 20

    Accessible from the following countries: Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom

• +33 1 48 25 20 20 for all other countries outside North America

• E-mail: **gv.indigo.support@thomson.net**

10.2 Cleaning

If the surface, Touch Screen or keys are dirty (for example, from adhesive residue, dust, stains, or the like), remove the dirt with a clean cloth and some rubbing alcohol or another mild cleaning agent such as window cleaner.

Note   When cleaning, do not use cleaning agents containing solvents or cleaners containing scouring powder or polishing particles as they may damage the surface and the Touch Screen of your **INDIGO AV Mixer**.

10.3 Battery

The battery should be changed every three years, to ensure that the system time is correct.

To change the battery:

1. Switch off the **INDIGO AV Mixer**.

2. Open the main fan cover at the bottom side by removing the two screws.
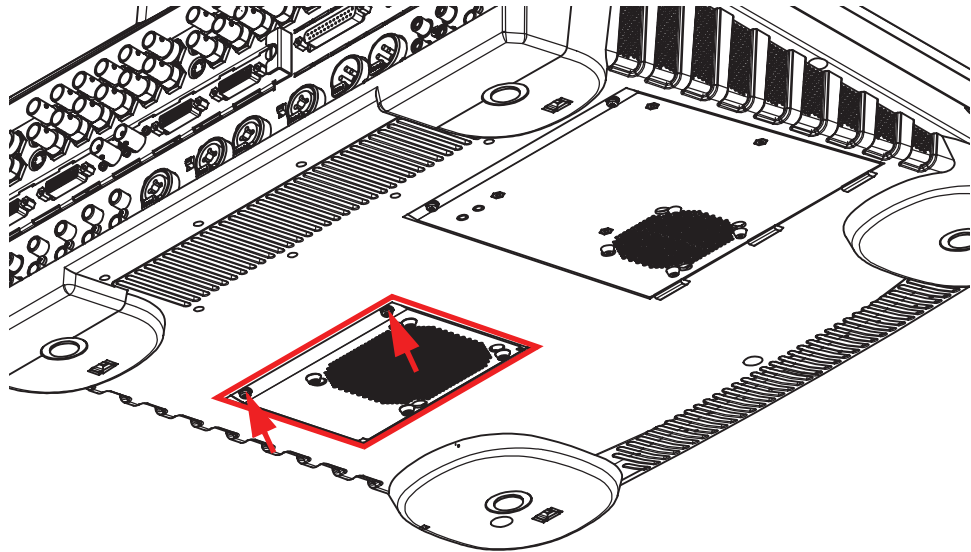
3. Remove the old battery.

4. Insert the new battery.

The battery type must be **CR 2032**.

5. Close the cover and screw in the screws.

6. Switch on the **INDIGO AV Mixer** and set the correct system time.

Note   The menu to set the system time will be added in the next software release.

10.4 Calibrations

When you switch on your **INDIGO AV Mixer** for the first time or if you encounter problems with the operation devices, calibrate the system as follows.

10.4.1 Touch Screen

To calibrate the Touch Screen:

1. Press all four Digipots at once to enter calibration mode.
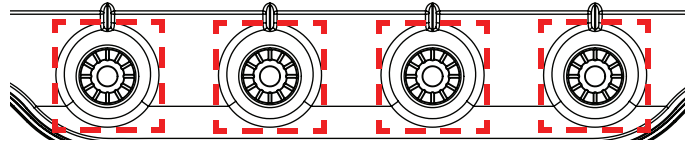
– or –

Select **SETUP** main menu, select **CONTROL PANEL** submenu, press **Calib.**, press **Touchscreen**.

2. Touch the four corners of the Touch Screen one after each other (as indicated by the calibration procedure).
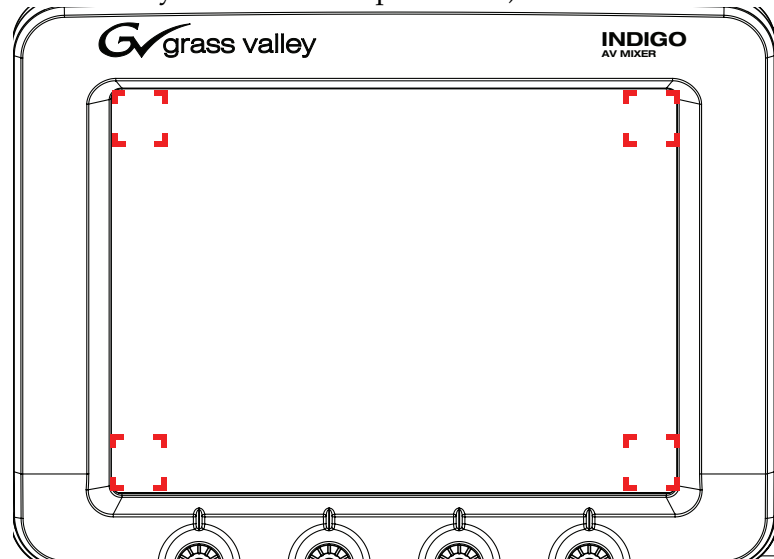
Note Missing a corner when calibrating makes the Touch Screen inoperable. To recover, press all four Digipots at once.

10.4.2 Transition Lever Arm (T-Bar)

To calibrate the Transition Lever Arm:

1. Select **SETUP** main menu.

2. Select **CONTROL PANEL** submenu.

3. Press **Calib.** button.

4. Press **T-Bar** button to enter calibration mode.

5. Move the Transition Lever Arm **up** as indicated by the calibration procedure.
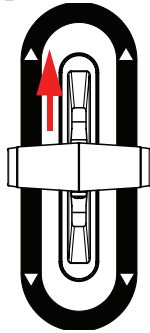
6. Press the **OK** button.

7. Move the Transition Lever Arm **down** as indicated by the calibration procedure.
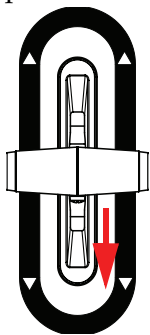
8. Press the **OK** button.

9. Press **OK** again to store the calibration.

10.4.3 Faders

To calibrate the faders:

1. Select **SETUP** main menu.

2. Select **CONTROL PANEL** submenu.

3. Press **Calib**. button.

4. Press the **Audio Fader** button to enter calibration mode.

The faders all move automatically to upper and lower position.

5. Press **OK** to store the calibration.

10.4.4 Joystick

To calibrate the Joystick:

1. Select **SETUP** main menu.

2. Select **CONTROL PANEL** submenu.

3. Press **Calib**. button.

4. Press **Joystick** button to enter calibration mode.

5. Move the Joystick to the **upper left** position as indicated by the calibration procedure.
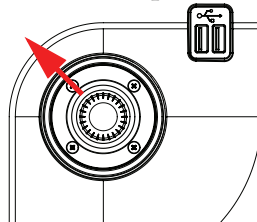
6. Press the **OK** button.

7. Move the Joystick to the **lower right** position as indicated by the calibration procedure.
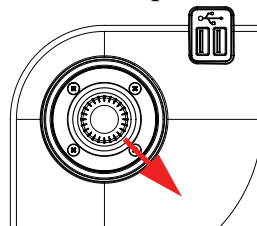
8. Press the **OK** button.

9. Twist the Joystick to the **left** as indicated by the calibration procedure.

10. Press the **OK** button.

11. Twist the Joystick to the **right** as indicated by the calibration procedure.

12. Press the **OK** button.

13. Press **OK** again to store the calibration.

Troubleshooting

This chapter provides you with hints for dealing with most common problems on your **INDIGO AV Mixer**.

Further information can be found in the **FAQ Database** at www.thomsongrassvalley.com.

If you cannot find a solution to your specific problem, consult your dealer or Thomson/Grass Valley.

Problem	Possible causes	Possible solution
SETUP		
The INDIGO does not start and the display is black	The power cable is not plugged in	Plug in the power cable and switch on the device
	The INDIGO is off	Switch on the device
	There is no CF card with the INDIGO software in the drive	Insert a CF card with the required INDIGO software
The Transition Lever Arm does not work correctly	The Transition Lever Arm is not calibrated	Go to Setup > Control Panel > Calib. and calibrate the Transition Lever Arm
The audio faders do not work correctly	The audio faders are not calibrated	Go to Setup > Control Panel > Calib. and calibrate the audio faders
The Touch Screen does not work correctly	The Touch Screen is not calibrated	Go to Setup > Control Panel > Calib. and calibrate the Touch Screen
The Joystick does not work correctly	The Joystick is not calibrated	Go to Setup > Control Panel > Calib. and calibrate the Joystick
The fan is not working	The fan is blocked	Turn off the unit; check if objects have got into the cooling slots (do not open the case)
System is overheated, but the fans are ok	Cooling slots are obstructed	Check the cooling slots of the unit; do not place the INDIGO on carpet, papers or clothes
	Too hot environment	When working in extremely hot environments, air condition should be used.

Problem	Possible causes	Possible solution
VIDEO		
No video from source	The source device is switched off	Switch on the source device
	The cables are not connected properly	Check the cables and their connections
	The input signal is not routed correctly	Check the input signal routing
No video on PGM/PVW monitor	The monitor is switched off	Switch on the monitor
	The cables are not connected properly	Check the cables and their connections
	The FTB button is activated	Deactivate the FTB button
	The button assignment is not correct	Go to Setup > Control Panel > Button Assign and assign the buttons according to your needs
	The video input setup is not correct	Go to Setup > Video > Input and adjust the input according to your needs
	The video output setup is not correct	Go to Setup > Video > Output and adjust the output according to your needs
	No video source is selected on the Background Crossbar	Check the selected sources on the Background Crossbar
AUDIO		
No sound on audio output	The cables are not right connected	Check the input/output connections
	The audio input setup is not correct	Go to Setup > Audio > Input and set up the audio mixer inputs
	The audio output setup is not correct	Go to Setup > Audio > Output and check the settings in [Source Select] and [TRS Out Level]
	The used audio channel is off	Go to the Audio Mixer menu and check whether the On button is enabled for the corresponding audio channel; If the problem still exists, go to Audio Mixer > Channel Adjust and check whether the Main and Sub buttons are enabled for the corresponding audio channel
	The source device is switched off	Switch on the source device
	The cables are not connected properly	Check the cables and their connections
	The related fader's ON button is switched off	Switch on the fader's ON button
	The related fader is turned down	Turn up the fader
No sound can be heard via headphones	PFL (of a soundless channel) is active	Turn off PFL for all channels
No sound can be heard via speakers or headphones, but the audio meter moves	The main volume is turned down	Turn on the main volume
	The speakers/amplifier are/is not connected properly	Check the connection of the speakers and the amplifier
Sound balance is inverted	The cables are mixed up	Check the audio output connections

Technical Specifications

12.1 Power Supply

Line voltage	100 V … 240 V AC +/-10 % autorange, power factor corrected
Line frequency	50/60 Hz +/- 5 %
Power consumption	max. 220 W
Leakage current	< 2.5 mA
USB Power	max 0.5 A (all devices)

12.2 Environmental Data

Storage temperature	-20 °C to +70 °C (-4 °F to 158 °F)
Operating temperature	+5 °C to +40 °C (41 °F to 104 °F)
Relative humidity	≤ 90 % non-condensing
Electromagnetic environment	E2 (according to EN55103-1, -2)

12.3 Mechanical Data

Width	444 mm (17.5 inch)
Depth	469 mm (18.5 inch)
Height	57 … 211 mm (2.3 – 8.3 inch)
Weight	INDIGO1-SD 9 kg (19.8 lbs) INDIGO1-HR 9.5 kg (20.9 lbs)

Glossary

A

AMP (Advanced Media Protocol)

Protocol to send commands via RS-422 serial link or via an Ethernet connection.

Auto Transition

A transition having a predefined duration generally initiated by pressing a control panel button.

Aspect

The ratio of a picture's horizontal and vertical dimensions when correctly displayed (4:3, 16:9).

Auxiliary

Supplemental equipment or features that provide capabilities to the basic system.

Audio Follow Video

A video recording, mixing or switching technique in which the audio signal associated with any given video signal is recorded, switched, or mixed with that video signal.

B

Background Transition

A transition between the background video signals selected.

Background Video

Video that forms a background scene into which a key may be inserted.

Backing Color

The color in a chroma key scene that will be replaced with another video signal.

Bit Rate

The number of bits per second passed from one point to another.

Black Burst

Video reference signal for synchronization purposes. Contains the combined sync timing elements of a video signal along with the color burst signal.

Box Wipe

A rectangular wipe pattern. For masking, the system provides a special box wipe pattern generator allowing independent control of the placement of each side of the box.

Bus

A bunch of parallel conductors or signal channels connecting various inputs and outputs.

C

Channel Gain

See *Gain*.

Chroma

The depth or saturation of color. Chroma, hue, and luminance make up the three characteristics of television color.

Chroma Key

A video key effect in which one video signal is inserted in place of areas of a particular color in another video signal. Blue and green are the chroma key colors most frequently used.

Clip

A threshold level adjustment to which the keying attribute (luminance, chrominance) is compared for generating the internal key control signal. Clip, in conjunction with gain, sets the switching point between the background and the key fill. Also see *Gain*.

Composite Video

An encoded video signal that combines color information with luminance information. NTSC, PAL, and D-2 are examples of composite video.

Compositing

Combining two or more video signals together into one output signal.

Control Signal

A signal used to perform an alteration or transition of video signals. For example, control signals are used for keying, masking, and wipe transitions.

Control Surface

The set of controls available to a single operator. These controls may reside on separate but related control panels.

Cross Fade

See *Mix*.

Crossbar

Mechanical device with push-buttons to connect various inputs and outputs.

Crosspoint

An electronic switch, usually controlled by a button on the panel, that allows video or audio to pass when the switch is closed.

Cut

An instantaneous switch from one picture to another. Switching circuitry allows cuts only during the vertical interval of the video signal to prevent disruption of the picture.

D

Delegate

To assign panel controls to a particular operating function. Some panel controls (buttons, knobs, Joystick) can affect more than one function. The operator can choose an alternative function by delegating the panel controls to that function (typically by pressing or holding down a panel button).

Deserializer

A device that converts serial digital information to parallel.

Dissolve

See *Mix*.

DHCP (Dynamic Host Configuration Protocol)

A protocol for automatically assigning addresses to clients when they connect to a network, and recovering the addresses when they disconnect.

Digipot

Abbreviation for DIGItal POTentiometer. A Digipot facilitates to control an analog output by a digital input.

DPM (Digital Picture Manipulator)

A digital video effects systems which can manipulate a video picture to change its size, shape, angle, etc.

DVE (Digital Video Effect)

Visual effect that provides interesting transitions from one scene to another (for example, fades, wipes, page turns, etc.) rather than just switching signals.

DVI-D

DVI-D is an interface for transferring digital video information. It is commonly used for high definition (HD) signals, for example, from PC to TFT monitor.

DVI-I

DVI-I transfers digital and analog video information via one single interface. Thus, using a simple adapter, a VGA signal can be derived from the DVI-I output.

E

Effect

A setup of panel controls specifying the sources involved and any processing applied to those sources. Effects can be learned (saved) and recalled by the E-MEM effects memory system.

Effect Transition

Recalling an E-MEM effect so that a transition is automatically performed at the start of the recall.

Effects Processor

The portion of a switcher that performs mixes, wipes and cuts between background and/or effects key video signals.

E-MEM Effects Memory

A feature that permits control panel setups to be stored for later recall.

Ethernet

A form of high speed data transport between devices on a network.

F

Fade to Black

A mix transition to black.

Fader

Straight-line slider for the audio level control.

Field

One scan of an interlaced video image. In interlace systems, two fields are required to make a complete picture (video frame) because alternate lines are scanned.

Fill Video

A video signal which fills a hole cut in background video by a key control signal.

Flip-Flop

A transition where the sources selected on the background buses (for example, preset and program) of an M/E are exchanged at the end of a transition. The original preset bus source becomes selected on the program bus, and the original program bus source becomes selected on the preset bus.

Frame

One complete scan of a video image. For interlace video, alternate lines are scanned, and so a frame containing all the picture information consists of two fields.

Frame Rate

The number of frames presented per second. For interlace systems the frame rate is half the field presentation rate.

G

Gain

An amplification factor applied to a key control signal by a keyer that determines how much, if any, of the background and key fill video will be mixed together at the key edge areas. Low gain (1, or unity) generally results in a linear key.

Also the amplification (boost) of an audio signal, esp. useful with mic inputs.

GP (General Purpose Interface)

An interface that allows limited remote control of some of a device's functions.

GPI (General Purpose Interface Input)

see GP

GPO (General Purpose Interface Output)

see GP

GVG-100/200

Protocol to send commands via serial link.

H

HD

Abbreviation for High Definition.

Digital HD video provides a higher resolution (up to 1920 x 1080 pixels) and thus shows much more details than standard definition video.

Hi-Res, HiRes

Abbreviation for High Resolution.

Usually describes screen or video resolutions of 800 x 600 pixels or higher.

House Sync

Sync generated within a facility that is used as a reference for generating and/or timing other signals.

HR

See *Hi-Res*.

Hue

The location of a color on the color spectrum (i.e. red, yellow, green, blue). Chroma, hue, and luminance make up the three characteristics of television color.

I

Interlace

A system of video scanning where the odd and even numbered lines of a picture are presented consecutively as two separate interleaved fields. The two fields required to make a complete picture are called a frame.

K

Key

An effect where a portion of a background scene is replaced by a new video. Key cut and key fill signals are involved, though in some cases the same signal may be used for both (self key).

Key Cut

In key effects, the key cut signal is used to specify where to cut a hole in the background that will be filled with the key fill video. The key cut signal determines the shape of the key effect.

Key Fill

In key effects, the video signal which fills the hole cut in the background video.

Key Frame

A complete definition of an effect at a single point in time. Default keyframe values can be set. See *Snapshot*.

Key Invert

Reversing the polarity of a key, such that material formerly keyed out will be keyed in, and vice versa.

Key Mask

A key mode which allows use of a wipe pattern generator to prevent some undesirable portions of the key cut signal from cutting holes in the background video.

Key Memory

A feature where the last keying and video processing settings for a source are retained and re-imposed when that source is re-selected. Default source memory values can be set for each source on each bus.

Key Priority

The stacking order of multiple keys. The keyed signal with the highest priority appears in front of all the others. Keyed signals appear below higher priority keys and in front of lower priority keys, in a stack. A key priority transition changes the order of the keys without changing the background output.

L

Limiter

A function which prevents audio levels from exceeding a specified threshold. Used to suppress peaks in audio with large differences in amplitude.

Linear Key

A Luminance key with a special parameter Setting: gain 100%, Clip 50%.

Look Ahead Preview

Video that shows the result of the currently setup next transition.

Looping, Loop-Through

An input that includes two connectors. One connector accepts the input signal, and the other connector is used as an output for connecting the input signal to another piece of equipment.

Low Cut

A high pass filter that removes low frequencies from an audio signal. Useful for speakers to remove low-level noise and to make speech clearer.

Luminance

The brightness of the picture or area of the screen being considered. Chroma, hue, and luminance make up the three characteristics of television color.

Luminance Key

A key effect in which the portions of the key cut signal that are greater in luminance than the clip level cuts the hole in the background scene. Generally used when the key cut and key fill signals originate from the same source. Luminance key clip and gain is adjustable.

M

Mask

See *Key Mask.*

Matte

Internally-generated color video which can be adjusted for luminance, hue, and chroma. Matte can be used to fill areas of keys and borders.

Matte Fill

Using matte video to fill the hole of a key effect.

Matte Generator

A video generator that produces matte signals.

M/E

Abbreviation of mix/effects, pertaining to the circuitry and controls involved in compositing video signals.

Mix

A transition between two video signals in which one signal is faded down as the other is faded up.

Multiplier

A control circuit in which a control signal is multiplied with one or more input video signals. The resulting video output level varies from full on to full off according to the state of the control signal.

O

Object

An individual functional area of a system, typically one of several having similar capabilities.

P

Pattern Border

A variable width border that occurs at the edges of a wipe pattern.

PFL (Pre Fade Listen)

Monitoring audio before level adjustments with the audio channel faders. Used to check the input audio.

PGM (Program signal output)

The final video and audio signals from this system, after the application of the effects. The video seen by viewers.

Phase Invert

A switch in the audio channel. It inverts the polarity of the signal to correct for balanced lines and mics that are wired backwards. May in some cases improve sound if signals are out of phase.

Pixel

A picture element. A pixel is a digital sample of the luminance and color values of a picture at a single point.

Point of Use

A location in the system where a resource is used. A resource is generally used at different locations at different times. However, with some resources it is possible to use the same resource at different locations at the same time.

Post-Fader

A term used to describe an aux send (or other output) that is connected so that it is affected by the setting of the associated channel fader.

Pre-Fader

A term to describe an aux send (or other output) that is connected so that it is not affected by the setting of the associated channel fader.

Preset Bus

A row of source buttons used to select the source that will be output by the M/E during the next background transition.

Preset Pattern

A key effect in which a wipe pattern that has been preset to a desired size and location is used to cut the key hole. The characteristics of the pattern are set using pattern controls.

Preview

A video signal that is viewed before it is output by the switcher. See also *Look Ahead Preview* and *Switched Preview*.

Program Bus

A row of source buttons used to select the source for the current output of the M/E.

Programmable Clean Feed

A type of clean feed where different keys can be selected for inclusion or exclusion from the clean feed.

R

Recall

To restore a previous panel setup that has been learned using E-MEM.

Reclocking

The process of clocking the data with a re-generated clock to remove jitter.

Resource

A capability of the system, typically consisting of a set of circuitry.

Register

A place to store an effect.

S

S-Video

Transfers video data via Hosiden/Mini-DIN-plug. Uses different carrier signals for luminance and chrominance.

Saturation

The degree of purity of a color. Adding white to a color reduces its degree of saturation.

SDI (Serial Digital Interface)

Transfers video, audio and timecode data.

Self Key

A key effect in which a single video signal serves as both the key cut and key fill.

Serial Digital Video

Passing video data bits in serial form (one bit after another), along a single wire.

Standard

Definition serial digital video (SMPTE 259M) operates at 270 MBits/sec (2 x 13.5 MHz x 10 bits).

Serial Interface

An interface which allows the switcher to be controlled remotely by a computer editor or other serial controller. Data is passed serially between the editor and the switcher at selectable baud (transmission) rates.

Serializer

A device that converts parallel digital information to serial.

Snapshot

An E-MEM with only one keyframe.

Soft Border

A wipe pattern border which is mixed on the edges to give a soft effect.

Soft Edge

A pattern edge between two video signals in which the signals are mixed for a soft effect.

Source

1) An external device providing video. A source may provide only one video signal, or it may provide two signals (key fill and key cut).

2) The video signal(s) from a source, along with the source definition information associated with that source.

Stack

See *Key Priority.*

Still Store

A device that captures, saves, and outputs a still video image.

Store (Learn)

To save a panel setup using E-MEM.

Sync

1) General term for a synchronizing signal or signal component. Digital systems generally employ an analog external timing reference signal (such as color black or tri-level sync) to synchronize different pieces of equipment. Within the digital signal itself, however, synchronizing information is carried by special digital codes inserted at the beginning and end of each active line.

2) In analog television systems, sync is the portion of the video signal which occurs during blanking and is used to synchronize the operation of cameras, monitors, and other equipment. Horizontal sync occurs within the blanking period in each horizontal scanning line, and vertical sync occurs within the vertical blanking period. A color black signal is often used for synchronizing different pieces of analog equipment.

T

T-Bar

See *Transition Lever Arm*.

Tally

A light which lights up to indicate that the associated button has been selected or to indicate that the associated input to the switcher is on-air.

Terminate, Termination

To complete a circuit by connecting a resistive load to it.

Touch Screen

A screen with a touch-sensitive film on top, allowing a user to touch areas of the screen to press buttons and move sliders.

Transition

A change from one picture to another. Cut, mix, and wipe are transitions.

Transition Lever Arm

A hand gear to manually execute transitions.

V

Vertical Interval

The portion of the video signal that occurs between the end of one field or frame and the beginning of the next.

VDR (Video Disk Recorder)

A video recorder and playback device using hard disk storage in place of video tape.

Video Fill

A video signal used to fill the hole made by a key cut signal.

Video Path

The path that video takes through the switcher.

W

Wash Matte

A type of matte that contains two elements rather than a single flat color. For example, a wash matte can have one color that mixes gradually across the screen to another color.

Wipe

A transition between two video signals that occurs in the shape of a selected pattern.

Wipe Pattern Generator

Circuitry that creates patterns that can be used to create wipe transitions, preset patterns, key masks, and matte washes.

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