Control Panels for X75 Systems

Installation and Operation Manual)

Enabling Your
Integrated Content Environment

Edition B
175-000248-00

Integrated Content Environment

Experience an Integrated Content Environment

Leitch Technology is uniquely capable of meeting the needs of customers with a full range of products that provide the experience of an Integrated Content Environment — a streamlined workflow for the production, processing, transmission and management of content.

The area of content production has seen increases in source and output formats, effects, layers and volume of material to be edited. As a result, editors need tools that enable increased productivity to offset these additional time demands, while increasing performance and enhancing creativity.

VelocityQ™ running on Quattrus™ hardware, including a new interface style featuring the unique EyeCon View, has received glowing reviews for its "real-time full-quality" playback speed of four video streams, up to six graphic layers and four 3D DVEs.

Leitch's new NEXIO™ server system, a modular, scalable and highly cost-effective storage infrastructure for news and transmission environments, includes gigabit Ethernet for easy integration with IP networks for movement of content. NEXIO features industry-leading productivity — with the introduction of Ingest Control Manager,™ NewsFlash™ server-based NLE, and BrowseCutter™ II low-resolution editing system — to provide the fastest and most effective workflow today.

The advent of fully Integrated Content Environments has led to significant efficiency improvements in workflow, with processing and monitoring now integrated and transparent.

NEO,™ Leitch's advanced processing platform, not only hosts single-function modules, but also consolidates multiple functions on a single "Simplicity" card. New award-winning modules have been added with the NEO VR™ digital video recorder, LogoMotion™ II branding tool and the NEO SuiteView multi-source display processor. More functionality can be achieved by customers' infrastructure environments with the high-density 6800+.™

Leitch's industry-leading routing offerings allow customers to connect high-quality signals of all formats from analog to HD. Panacea™ provides affordable, compact, modular routing in sizes up to 32x32. The new wideband Integrator® Gold provides scalable routing of almost any digital signal up to 128x128 in a single frame. All processing and routing platforms are fully integrated with Leitch's advanced Command Control System (CCS™).

Advancements in digital technologies have enabled more channels, in different content formats, over multiple distribution systems. Customers now seek to achieve their vision of a fully Integrated Content Environment to supply multiple distribution channels with high-quality content and branding.

Leitch's NEXIO transmission server, which supports multiple compression formats in both standard and high-definition resolution, will also support ASI interface and has the ability to record, process and playback MPEG transport streams.

Leitch's Opus™ master control switcher offers an array of effects and has the ability to control up to 16 on-air channels. Opus meets multi-channel digital integration challenges for both high-definition and standard-definition formats.

Integrated Content Environments offer the greatest opportunity for productivity and performance gains when employing content management and control applications that place content, operations or remote locations under common software controls.

A major workflow enhancement is Leitch's Ingest Control Manager,™ which places control of up to 16 server channels with associated proc amps (DPS-575), eight VTRs and eight separate routers under one control station.

Leitch's CCS Navigator,™ winner of NAB 2003's highest awards for control and monitoring of content quality, and the CCS™ soft real-time system provide open access through standard protocols to components of a networked system.

Control Panels for X75 Systems

Installation and Operation Manual

Edition B
April 2005

LEITCH

Contents

Preface

Chapter 1: Introduction and Installation

Chapter 2: Operation via Front Panel Controls

Chapter 3: Status and Alarm LEDs

Chapter 4: Specifications (X75-RCP)

Appendix A: Servicing Instructions

Appendix B: Display Screen and Device Setup Parameters

Appendix C: Copyright Notice

Index

Preface

Manual Information

Purpose

This manual details the features, installation procedures, operational procedures, and specifications of the local and remote control panels for X75 systems.

Audience

This manual is written for engineers, technicians, and operators responsible for the installation, setup, and/or operation of the local and remote control panels for X75 systems.

Revision History

Table P-1. Revision History

Edition	Date
Preliminary	December 2004
A	January 2005
B	April 2005

Writing Conventions

To enhance your understanding, the authors of this manual have adhered to the following text conventions.

Table P-2. Writing Conventions

Term or Convention	Description
Bold	Indicates dialog boxes, property sheets, fields, buttons, check boxes, list boxes, combo boxes, menus, submenus, windows, lists, and selection names.
Italics	Indicates email addresses, the names of books or publications, and the first instances of new terms and specialized words that need emphasis.
CAPS	Indicates a specific key on the keyboard, such as ENTER, TAB, CTRL, ALT, or DELETE.
`Code`	Indicates variables or command-line entries, such as a DOS entry or something you type into a field.
>	Indicates the direction of navigation through a hierarchy of menus and windows.
hyperlink	Indicates a jump to another location within the electronic document or elsewhere
Internet address	Indicates a jump to a Web site or URL
Note	Indicates important information that helps to avoid and troubleshoot problems

Obtaining Leitch Documents

Leitch documents can be viewed or downloaded from the Leitch Web site at www.leitch.com (go to **Support>Documentation**). Alternatively, contact your Leitch customer service representative to request a document.

Unpacking/Shipping Information

Leitch has carefully inspected, tested, and calibrated this product before shipment to ensure years of stable and trouble free service.

1. Check equipment for any visible damage that may have occurred during transit.
2. Confirm that you have received all items listed on the packing list.
3. Contact your Leitch dealer if any item on the packing list is missing.
4. Contact the carrier if any item is damaged.
5. Remove all packaging material from the product and its associated components before you install the unit.

Keep at least one set of original Leitch packaging, in the event that you need to return a product for servicing. If the original packaging is not available, you can purchase replacement packaging from Leitch at a modest cost or supply your own packaging as long as it meets the following criteria:

- Withstands the weight of the product
- Holds the product rigid within the packaging
- Leaves at least 2 in. (50.8 mm) of space between the product and the container
- Protects the corners of the product

Ship products back to Leitch for servicing prepaid and, if possible, in the original packaging material. If the product is still within the warranty period, Leitch will return the product prepaid after servicing.

Important Safety Instructions

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Read these instructions. Keep these instructions. Heed all warnings. Follow all instructions.

Servicing

Only qualified personnel should perform service procedures. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Safety Terms and Symbols

Terms and Symbols Used in this Manual

WARNING statements identify conditions or practices that can result in personal injury or loss of life. High voltage is present. Uninsulated dangerous voltage within the product's enclosure may be sufficient to constitute a risk of electric shock to persons.

CAUTION statements identify conditions or practices that can result in damage to the equipment or other property. Important operating and maintenance (servicing) instructions are included in the literature accompanying the product.

CAUTION: This icon identifies conditions or practices that can result in damage to the equipment or other property if proper care during use and transport is not taken.

Terms and Symbols Found on the Product

DANGER: Indicates a hazard for high voltage, fire, or personal injury immediately accessible as one reads the marking

WARNING: Indicates a personal injury hazard not immediately accessible as one reads the marking

CAUTION: Indicates a hazard to property, including the product, or the need to take attention and refer to the manual

Protective ground (earth) terminal

Fuse: Replace with same type and rating of fuse

Observe precautions for handling electrostatic-sensitive devices

Important Safety Instructions

Read these instructions. Keep these instructions. Heed all warnings. Follow all instructions.

Do Not Use This Apparatus Near Water

Clean Only With a Dry Cloth

Do Not Block Any Ventilation Openings
Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.

Keep Product Away from Heat Sources
Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Ground the Product
Do not defeat the safety purpose of the polarized and grounding-type plugs. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the Power Cord
Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

Use With Proper Equipment
Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Do Not Operate With Suspected Failures
Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, or the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Use Proper Power Source
Do not operate this product from a power source that supplies more than the specified voltage.

Install Near Socket Outlet
The equipment shall be installed near the socket outlet, and a disconnect device shall be easily accessible.

ATTENTION:
Observe precautions for handling electrostatic-sensitive devices.

Fuse Replacement
CAUTION: For continued protection against risk of fire, replace only with the same type of fuse.

ATTENTION: Remplacer uniquement par un fusible de même type et calibre.

Injury Precautions

WARNING!
To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

AVIS! Risque de choc électrique. Ne pas ouvrir.

WARNING!
Potentially lethal voltages are present within this product's frame during normal operation. The AC power cord must be disconnected from the frame before the top panel is removed. (In frames with multiple power supplies, remove ALL power cords.) Power should not be applied to the frame while the top is open, unless properly trained personnel are servicing the unit.

[Poland] Przod zdjeciem pokrywy wyciagnac wtyczke z gniazda sieciowego.

Use Proper Power Cord
To avoid fire hazard, use only the power cord specified for this product.

Connect to an Earthed Mains Socket-Outlet
The apparatus must be connected to an earthed socket-outlet.

United Kingdom:
WARNING: This appliance must be earthed.

Norway:
Apparaten må tilkoples jordat stikkontakt.

Finland:
Laite on liitettää suojamaadoitus-koskettimilla varustettuun pistorasiaan.

Sweden:
Apparaten skall anslutas till jordat uttag.

Do Not Operate Without Covers
To avoid electrical shock or fire hazard, do not operate this product with covers or panels removed.

Do Not Operate in Wet/Damp Conditions
To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture

Do Not Operate in an Explosive Atmosphere
To avoid injury or fire hazard, do not opeate this product in an explosive atmosphere.

Avoid Exposed Circuitry
To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Isolate IT Power System Connection
CAUTION: IT power system shall be isolated from earth, except that one point may be connected to earth through an impedance or a voltage limiter. The parts of the equipment required to be earthed shall be connected to earth electrodes at the user's premises. Protective earthing shall be provided either directly to the equipment or into the mains supply building installation.

Preventing Electrostatic Discharge
CAUTION: Electrostatic discharge (ESD) can damage components in the product. To prevent ESD, observe these precautions when directed:

Use a ground strap. Wear a grounded wrist strap to discharge the static voltage from your body while installing or removing sensitive components.

Use a safe work area. Do not use any devices capable of generating or holding a static charge in the work area where you install or remove sensitive components. Avoid handling sensitive components in areas that have a floor or benchtop surface capable of generating a static charge.

Handle components carefully. Do not slide sensitive components over any surface. Do not touch exposed connector pins. Handle sensitive components as little as possible.

Transport and store carefully. Transport and store sensitive components in a static-protected bag or container.

CAUTION: To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

CAUTION: Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

Certifications and Compliances

This product has been tested and found to comply with the following EN, IEC, FCC, UL, ICES, and CSA standards, per the provision of the Electromagnetic Compatibility Directive 89/336/EEC of 3 May 1989 as amended by 92/31EEC of 28 April 1992 and 93/68/EEC, *Article 5* of 22 July 1993, and the Low Voltage Directive 73/23/EEC of 19 February 1973 as amended by 93/68/EEC.

EMC Standards

EMC Standard	Description
EN55014	Limits and methods of measurement of radio disturbance characteristics of electric motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.
EN55022	Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Class A.
EN55103-1	Electromagnetic compatibility—Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use, Part 1: Emission, Environment E4.
EN55103-2	Electromagnetic compatibility—Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use, Part 2: Immunity, Environment E4.
EN61000-3-2	Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase).
EN61000-3-3	Limitations of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current less than 16 A.

EMC Standard	Description
EN61000-4-2	Electrostatic discharge requirements “ESD” 2 kV CD, 4 kV AD.
EN61000-4-3	Radiated radio-frequency electromagnetic field immunity test 1V/m {1 kHz 80% AM, 80-1000 MHz}.
EN61000-4-4	Electrical Fast transient requirements “Burst”, 0.5 kV Sig. & Ctrl. Lines 0.5 kV a.c. & d.c. Power line, 0.5 kV functional earth.
EN61000-4-5	Surge Immunity test 0.5 kV a.c. Power line.
EN61000-4-6	Immunity to conducted disturbances induced by radio frequency fields 1 V rms 0.15-80 MHz Sig. & Ctrl. Lines, 3 V rms 0.15-80 MHz d.c. Power line, 1V rms 0.15-80 MHz a.c. Power line, 1V rms 0.15-80 MHz functional earth.
EN61000-4-11	Voltage dips, short interruptions and voltage variations-immunity tests.

Per the provision of the Electromagnetic Compatibility Directive 89/336/EEC of 3 May 1989, as amended by 92/31EEC of 28 April 1992 and 93/68/EEC, *Article 5* of 22 July 1993, these devices are for professional use only and comply with Part 15 of FCC rules. Operation is subject to the following two conditions:

1. These devices may cause interference to Radio and TV receivers in residential areas.
2. These devices will accept any interference received, including interference that may cause undesired operations.

Changes or modifications not expressly approved by Leitch Technology, the party responsible for compliance to the FCC Part 15 Rule, could void the user’s authority to operate this equipment legally in the United States.

These devices do not exceed the class A limits for radio noise emissions from digital apparatus as set out in the interference standard entitled “Digital apparatus”, ICES-003 of the Canadian Department of Communications.

Working Environments E4 and Class A

This product is intended for professional use in a controlled EMC environment such as a purposely-built broadcast studio.

Additional EMC Information

This device is for professional use in a controlled EMC environment, such as purpose-built broadcast studios.

EMC regulations require that the radiation emitted from this unit does not exceed certain limits. These limits are only met when the front panel is closed and the two thumb screws are secured.

Compliance to the EMC regulations is also dependent on the use of suitably shielded (screened) cables. Coax cables should be of the double-shielded (screened) variety. Unused BNCs should be fitted with 75Ω terminations.

All audio cables should be screened with the shield (screen) making good contact with the metallic parts of the cable connectors.

D-type connectors used with this unit should always have metallic shells with the shield (screen) of the cable mechanically bonded to the metal shell. It is further recommended that the D-type cable connectors be of the “dimple” variety. These connectors make a better contact and consequently improve EMC performance.

Safety Standards

Harmonized Standard	Reference IEC Standard	Description
EN 60950-1:2002	IEC 60950-1:2001 Ed. 1.0	Information Technology Equipment-Safety Part 1: General Requirements
UL 60950-1:2003	IEC 60950-1:2001 Ed. 1.0	Information Technology Equipment-Safety Part 1: General Requirements
CAN/CSA C22.2 No. 60950-1-03	IEC 60950-1:2001Ed. 1.0	Information Technology Equipment-Safety Part 1: General Requirements

Chapter 1

Introduction and Installation

Overview

The local and remote control panels for X75 systems are designed to work with X75HD/X75SD Multiple Path Converters and Frame Synchronizers. As well, the X75 control panels can communicate with DPS-575 Digital Processing Synchronizer frames using DCN protocol over Ethernet. DPS-575 Remote Control Panels can similarly control X75HD/X75SD frames. This chapter covers the following topics:

Product Description

The local and remote X75HD/X75SD control panels use a four-line 128 x 32 pixel vacuum fluorescent display (VFD) to display parameter names and values. Viewing the VFD, you can navigate through the parameter lists of X75HD/X75SD frames and DPS-575 frames. Up to 200 devices can be controlled from a single control panel.

Frame Mounted Control Panel

The X75HD/X75SD local control panel is mounted on the front of a 1RU frame. The panel communicates with the frame through an interconnect connector located behind the front panel. Power is provided to the front control panel by the frame's X75PS Power Supply, and a fan module draws air through the vents located in the control panel.

X75-RCP

The X75-RCP Remote Control Panel is a stand-alone rack-mounted remote control panel. Functionally, the X75-RCP is similar to the frame-mounted local control panel. No cooling fans operate in the X75-RCP.

Front Views

Frame Mounted Local Control Panel

Figure 1-1 illustrates the front view of the frame-mounted X75HD/X75SD local control panel.

Figure 1-1. Front View of the X75HD/X75SD Frame-Mounted Control Panel

X75-RCP Remote Control Panel

Figure 1-2 illustrates the front view of the X75-RCP Remote Control Panel. The front panel of the X75-RCP does not include an interface for SD removable media.

Figure 1-2. Front View of the X75-RCP

Rear View (X75-RCP)

Figure 1-3 shows the rear view of the X75-RCP, which has a shorter depth than an X75HD/X75SD frame, and one Ethernet connector.

Figure 1-3. Rear View of the X75-RCP

Packing List

X75HD/X75SD frame-mounted control panels are shipped as part of the frame. See the *X75HD/X75SD Multiple Path Converters and Frame Synchronizers Installation and Operation Manual* for details on that frame packing list.

The X75-RCP Remote Control Panel package is shipped as a separate unit and includes these items:

- One X75-RCP Remote Control Panel
- One AC power cord
- One *Control Panels for X75 Systems Installation and Operation Manual* per order
- One *Documentation for X75 Systems and Control Panels* CD-ROM

See page ix for details on unpacking the X75-RCP Remote Control Panel.

Installing the Control Panels

Frame-Mounted Local Control Panel

The X75HD/X75SD frame-mounted local control panels are shipped as part of the frame. See the *X75HD/X75SD Multiple Path Converters and Frame Synchronizers Installation and Operation Manual* for details on the frame's packing list and installation.

X75-RCP

The X75-RCP Remote Control Panel requires an ambient temperature of 41° to 113°F (5° to 45°C), with a relative humidity of 10-90% (non-condensing). The panel is designed for a standard 19-inch rack. It occupies a vertical space of 1 RU (1.75 in./4.4 cm) and is secured to the rack with standard front mounting ears located on the frame chassis.

To install an X75-RCP control panel, follow these steps:

1. Secure the control panel to the rack by inserting four mounting screws (not included).
2. Connect the Ethernet network at the rear of the control panel.
3. Plug in the AC power cord.

Electrical Requirements

The power supply has a universal input of 100-240 VAC~ 50/60 Hz, and maximum power consumption of 6 watts. There is no voltage selector switch.

Chapter 2

Operation via Front Panel Controls

Overview

This chapter describes the main areas of the front panel, along with the various front panel controls and features. For specific descriptions about available menus, submenus, parameters, or options, see the *X75HD/X75SD Control Options* PDF document available from the Leitch Web site at www.leitch.com (or see the files on the accompanying documentation CD).

To find general information that describes how to use the front panel to navigate, select, and configure various options, see the following topics:

Front Panel Description

The front panel (Figure 2-1) is divided into several areas for control and monitoring, including the following:

- VFD screen for viewing menu options and device information
- Control knob and buttons for scrolling, selecting, and setting menu options
- Programmable and device-dedicated control buttons
- Status and alarm LEDs for monitoring the current mode and operating conditions of the unit

Information about each of these areas is available in this chapter.

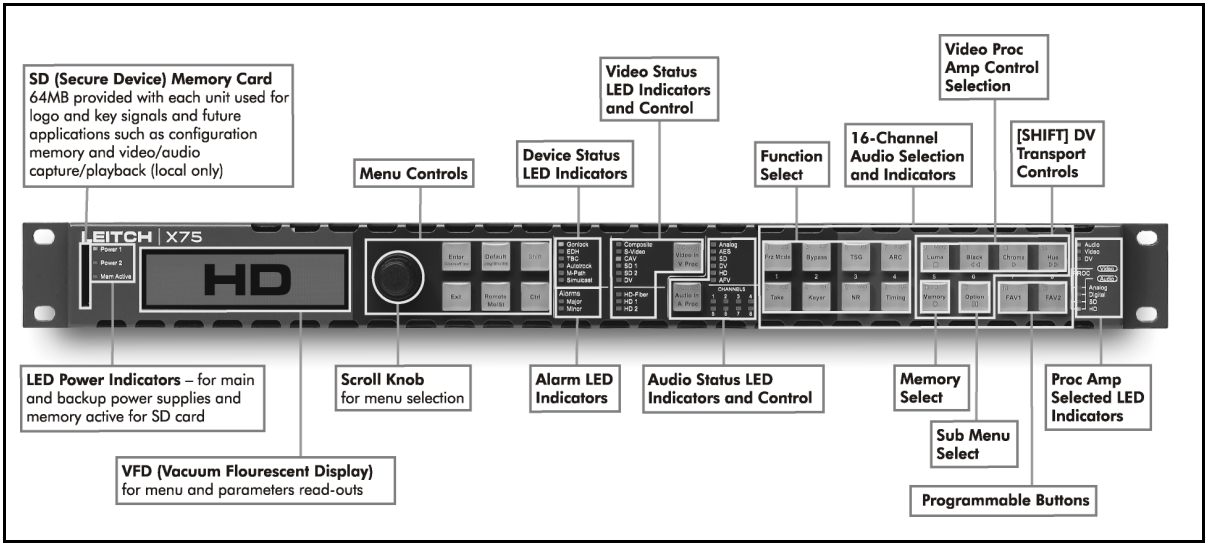


Figure 2-1. Control Panels for X75 Systems Front Panel

About the VFD Screen

Menus, options, settings, device information, and feedback display on the VFD (Vacuum Fluorescent Display) screen. When the frame-mounted local control panels is first turned on, the VFD screen starts at the Main menu. When the RCP-X75 starts, the Remote Units menu appears (see "Navigating Through the Menus" on page 11 for details.)

A variable display intensity and a screen saver are available to extend the life of the display device. See page 58 for details about these features.

Using the Control Knob and Menu Control Buttons

All menus and device settings for the control panels for X75 systems can be selected and configured using the control knob and menu control buttons. Figure 2-2 shows the location of the control knob and various menu control buttons on the device. Use these items to open and navigate menus, to scroll through and select options, and to adjust various parameters and settings. In most menus, when you press the control knob, it replicates the action of pressing the **Enter** button. If you press the control knob while working in numerical parameters, you will toggle between fine and coarse adjustment modes.

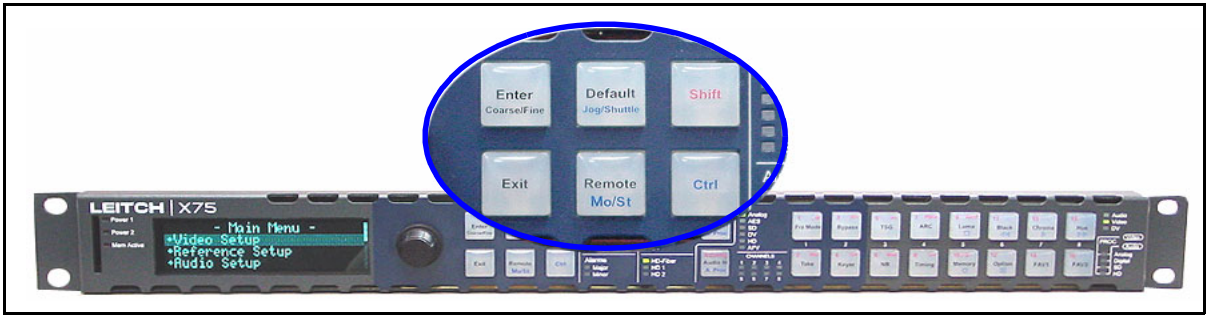


Figure 2-2. Control Knob and Menu Control Area

Using Multi-Function Buttons

Many of the buttons on the control panels have multiple functions assigned to them. To select different tasks from a multi-function button, perform one of the following steps:

- Press the desired multi-function button. The assigned default function is written in *black* text on the button face, either near the top or in the middle of the button.
- Press **Shift** and the desired multi-function button simultaneously. The assigned function is written in *red* text on the button face near the top of the button.
- Press **Ctrl** and the desired multi-function button simultaneously. The assigned function is written in *blue* text on the button face near the bottom of the button.

For more information about front panel buttons, see “Using Front Panel Control Shortcuts” on page 15.

Note

Function names are color-coded and written in red, black, and blue text on the button face to aid in proper selection.

Navigating Through the Menus

Start-up Screen

Upon start-up, the control panels display the Main Menu, containing these items:

- Video Setup
- Audio Setup
- Reference Setup
- System Config
- Global Frame Rate
- SD Operating Standard
- HD Output Standard

See descriptions of these items on page 12.

Controlling Other Frames

To navigate through the menus of different X75 frames, follow these steps:

1. Press the **Remote** button.
2. Select the frame you need from the list of IP addresses, and then press **Enter**.

   The asterisk beside an IP address indicates which frame is currently represented by the control panel.
3. With the **Main Menu** of the selected frame displaying, rotate the control knob to scroll through the menu items.
4. Press the **Enter** button to open the submenu you have selected.
5. Press the **Exit** button to go back a step in the menu structure.
6. When you reach a level in the parameter tree where you can select a value, use the **Exit** button to store the setting.

Exploring the Main Menu

There are eight main menu items available. Each of them open up into several layers of submenus and parameter options that you can scroll through and edit as required. Table 2-1 briefly describes each of the eight main menu items.

Table 2-1. Main Menu Items

Menu Name	Menu Description
Video Setup	Configures and controls the video settings
Audio Setup	Configures and controls the unit's audio settings
Reference Setup	Configures and controls the genlock and other reference settings
System Config	Configures settings of the initial setup parameters
Global Frame Rate	Sets the unit's frame rate per second
SD Operating Standard	Provides a read-only view of the selected or detected SD-SDI operating standard
HD Output Standard	Provides a read-only view of the selected HD-SDI operating standard

Setting Non-Numeric Options

The control knob cycles through non-numeric parameter and value options (such as "Auto, On, Off").

To set a non-numeric parameter option, follow these general steps:

1. Navigate to the required menu or submenu, and then select a parameter.
2. Highlight the parameter with the control knob, and then press **Enter**.
3. Press **Exit** to accept your new value and return to the previous menu or submenu.

Setting Discrete Options

The control knob cycles through discrete parameter and value options (such as “Auto, On, Off”). Depending on the parameter type, it will either wrap or clip when the control knob reaches the end of the option list.

- A wrapping parameter returns to the beginning of its range/list of options after you have scrolled through all of them.
- A clipping parameter requires you to scroll back through the range/list of options to return to the beginning of the list.

Procedure

To set a discrete parameter option, follow these general steps:

1. Navigate to the required menu or submenu, and select a parameter.
2. Highlight a parameter with the control knob, and then press **Enter**.
3. Press **Exit** to accept your new value and return to the previous menu or submenu.

   Selected settings effect the output immediately.

Setting a Numeric Option

For parameters that have a numeric range of values, the VFD panel shows both a numeric and a visual representation of the range. Figure 2-3 shows this representation.

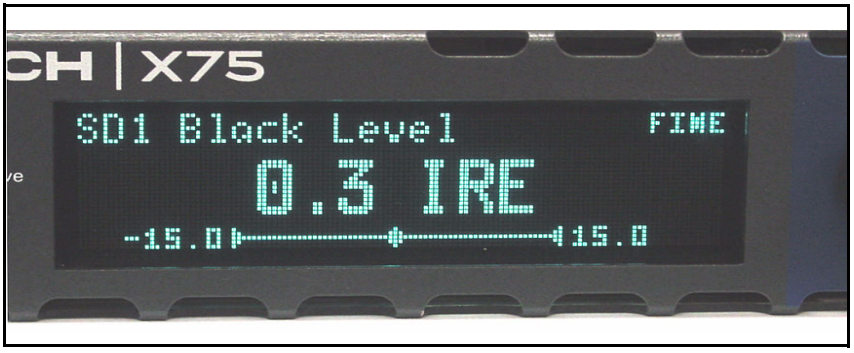


Figure 2-3. VFD Panel Showing Numeric Range of Values

To set a parameter with a numeric value, follow these general steps:

1. Navigate to the required menu or submenu, and select a parameter.
2. Change to Coarse adjustment mode if required. (Fine mode is the default mode when you first enter a parameter adjustment screen.)

   As an example, you can use the control knob to either adjust a value in increments of 0.02 (Fine mode) or 0.50 (Coarse mode).

   a. Press **Enter** to switch to Coarse mode where you can make large adjustments more quickly.

      When in Coarse mode, the **Enter** button lights up.

   b. Press **Enter** again to return to Fine mode.
3. Use the control knob to select a new value, and then press **Enter** to set it.

   Selected settings effect the output immediately.
4. To reset the parameter to its default value, press **Default** on the front panel.

   The Default LED lights up whenever the current value of the parameter is equivalent to the default value (whether you reached this value by pressing the **Default** button, or by scrolling to it with the control knob).
5. Press **Exit** to accept your new value and return to the previous menu or submenu.

Using Front Panel Control Shortcuts

Instead of scrolling through individual menus to access parameter settings, you can use built-in front panel shortcuts. The **Audio** and **Video** LEDs indicate the current focus of control. Whenever audio parametric adjustments are made, the **Audio** LED is lit. Whenever video parametric adjustments are made, the **Video** LED is lit.

The following settings can be made using shortcuts instead of navigating via the control knob and VFD panel:

- "Video Input" on page 16
- "Audio Input" on page 19
- "Audio Proc Amp Settings" on page 20
- "ARC (Aspect Ratio Converter)" on page 29
- "Black" on page 30
- "Bypass" on page 30
- "Chroma" on page 30
- "FAV1 and FAV2 (Favorites1 and Favorites2)" on page 31
- "Frz Mod (Freeze Mode)" on page 33
- "Hue" on page 33
- "Luma" on page 34
- "Keyer" on page 34
- "Memory" on page 34
- "NR (Noise Reduction)" on page 36
- "Option" on page 38
- "Take" on page 39
- "Timing" on page 40
- "TSG (Test Signal Generator)" on page 40

Video Input

With control panel video shortcuts, you can select an input (or multiple inputs) and immediately send it to all video outputs by pressing the **Video In** button. The LEDs on the left side of this button indicate which input is currently selected.

To change the input signal type, follow these steps:

1. Press **Video In** on the control panel, (or navigate to the **Routing Setup** menu and select **AllOutSelect**).

   All available inputs will display on the control panel screen.

2. Use the control panel knob to scroll through the list of input types, and then press to **Enter** to select one.

   The associated video input LED will become lit. In an example where the **SDI 1** LED is lit, the routing is set automatically such that the SDI input signal is upconverted and sent to the HD-SDI output, and to all SDI/Analog outputs.

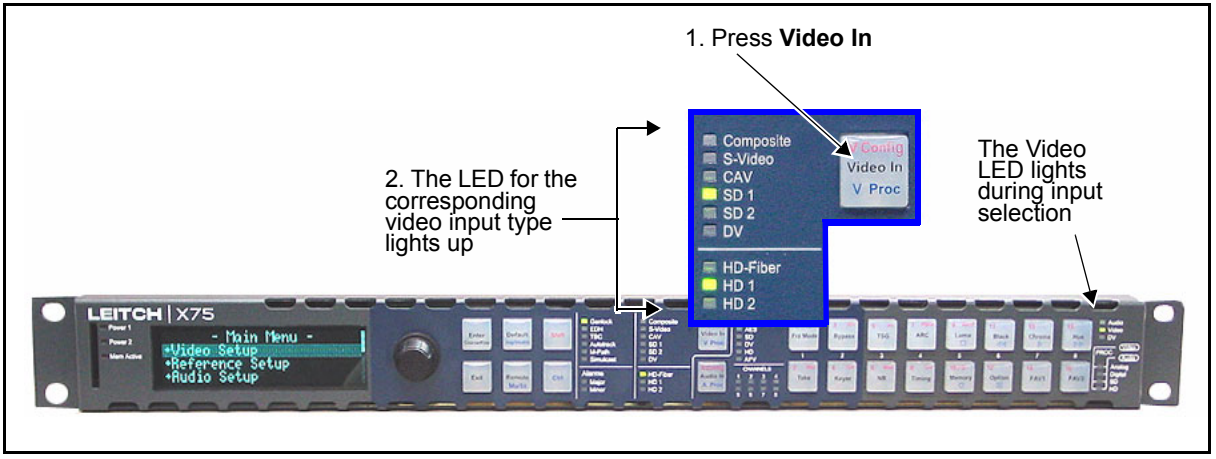


Figure 2-4. Video Input Control Area

Video Proc Amp Settings

The four most commonly used video processing controls are available from the control panel as shortcuts. With a single video input, you can directly access each proc amp parameter by pressing one button. When you are working with multiple video sources, first press **Ctrl** + **V Proc** to switch between the video proc amps of the selected video sources. (The VFD briefly displays the selected video proc amp.) Then press the proc amp parameter buttons.

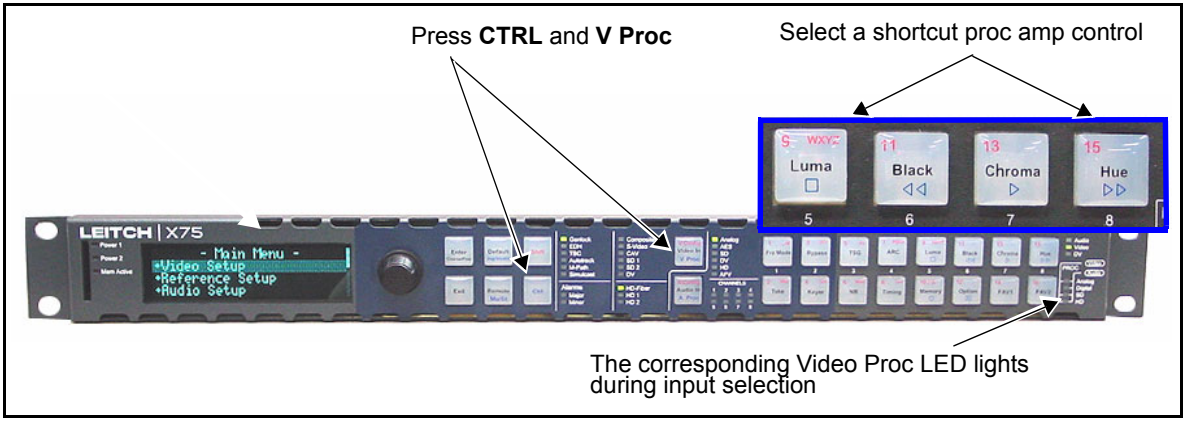


Figure 2-5. Video Proc Amp Control Area

There are four internal input video proc amps: HD-SDI 1, SD-SDI 1, SD-SDI 2, and Analog, routed in the following ways:

- The HD-SDI 1, HD-SDI 2 and HD-Fiber inputs share the HD-SDI video proc amp.
- The SD-SDI 1 input has its own dedicated SD-SDI 1 video proc amp.
- The SD-SDI 2 input uses the SD-SDI 2 video proc amp.
- The Composite, S-Video, and CAV inputs share the Analog proc amp.

Video LEDs

The three **Video Proc** LEDS (**Analog**, **SD, HD**) on the far right side of the front panel become active when you set the control panel to adjust the video parameters. The LEDs indicate which input video processing block is currently selected for the adjustments under the following conditions:

- The **Analog** LED lights when you select the **Analog** video proc amp.
- The **SD** LED lights when you select the SD-SDI 1 or SD-SDI 2 video proc amp. When a shortcut button is pressed, the parameter prefix on the VFD display indicates which video processing block is currently active.
- The **HD** LED lights when you select the HD-SDI video proc amp.

Audio Input

With control panel shortcuts, you can select an input (or multiple inputs) and immediately send it to all audio outputs. Press the **Audio In** button to select any one set of audio inputs to be sent out to all audio multiple output sets. The LEDs to the top, right side of this button indicate which input is currently selected. When the selected input signal is absent, the LED flashes.

Available audio inputs include the following:

- User—Customizable settings
- Analog—4 mono channels of analog audio input
- AES—5 channels
- SD—16 channels from the SD-SDI De-Embedder
- HD—16 channels from the HD-SDI De-Embedder
- Dolby Dec—Dolby audio option

Note

The optional X75OPT-AS-16 module is required for synchronizing, delaying and processing mono audio for SD-SDI and HD-SDI inputs.

Depending upon which input you have selected, the X75 unit automatically and logically maps all output channels. When two or more audio input groups are selected, the **Audio In Src Select** parameter is automatically set to the **User** setting.

The **User** mode includes **Audio Setup** and **Routing** submenus. From these submenus, you can manipulate the input and output audio channels' routing controls for custom configurations to suit most of your applications. To switch between Mono and Stereo audio processing control, press the **Ctrl** and **Mo/St** buttons simultaneously. When Mono control is active, each button controls an individual gain. When Stereo control is active, the top and bottom front panel buttons work together (are “married”) so that either button will adjust the gain in stereo pairs.

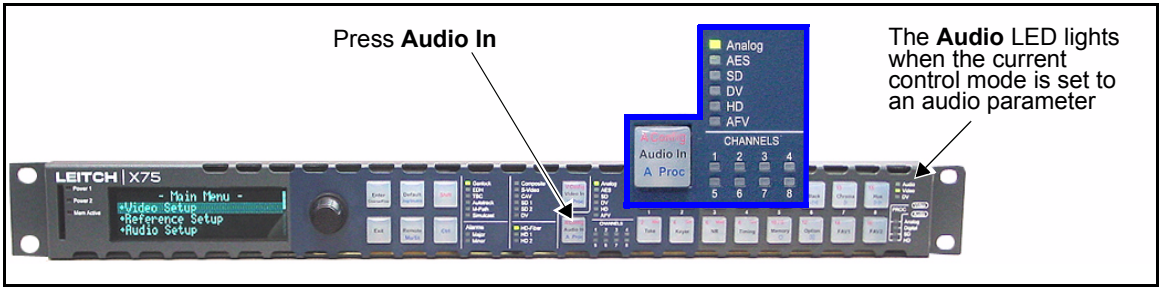


Figure 2-6. Audio Input Control Area

Audio Proc Amp Settings

Using control panel shortcuts, you can quickly access the audio level controls. To do this, press the **Ctrl** and **A Proc** buttons simultaneously; the selected audio input channel's gain controls become mapped to the numbered buttons (1 through 16) accordingly. Once mapped, press a numbered button to enable the gain controls assigned to it.

If you are in M-Path mode and have multiple audio inputs, press **CTRL** and **A Proc** repeatedly to select the audio proc amp for adjustment (either SD-SDI 1, HD-SDI 2, Analog, or Digital); the **Audio Proc** LEDs at the right side of the front panel will indicate which audio channel is currently selected. The selected audio input channel's gain controls become mapped to the numbered buttons (1 through 16) accordingly.

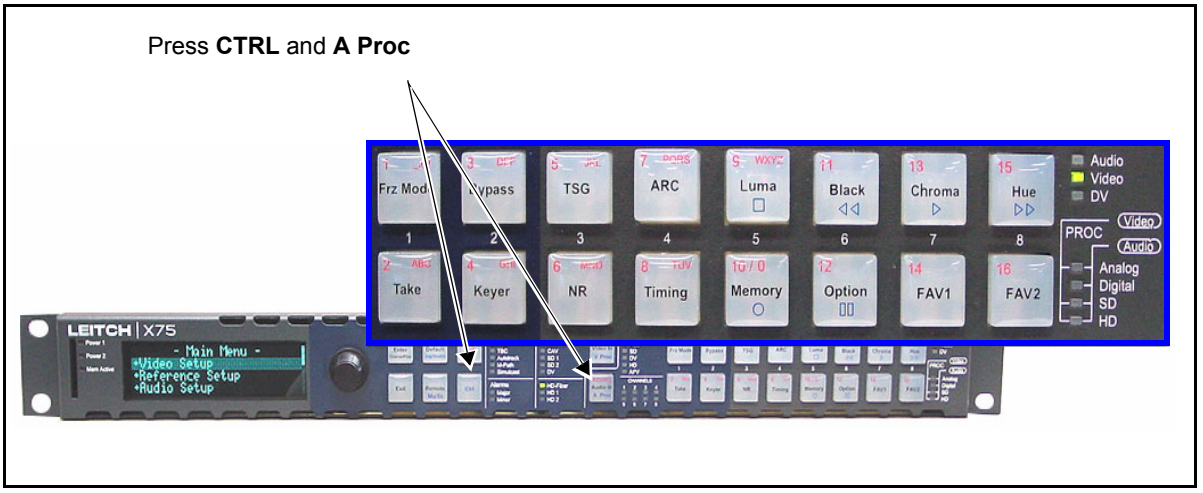


Figure 2-7. Audio Proc Amp Control Area

Tables 2-2 to 2-7 provide more information on the button mappings of the different audio inputs (for both mono and stereo control), including the following:

- Analog audio input
- AES audio input
- SD-SDI audio input
- HD-SDI audio input

Audio LEDs

The four **Audio Proc** LEDs (**Analog**, **Digital**, **SD**, **HD**) on the far right side of the front panel indicate the selected audio input group that is being adjusted for the audio gain. The LEDs indicate which input audio processing block is currently selected for the adjustments under the following conditions:

- The **Analog** LED lights for the Analog audio channels gain adjustments.
- The **Digital LED** lights for the AES channels audio gain adjustments.
- The **SD** LED lights for the SDX (SD demuxed) channels audio gain adjustments.
- The **HD LED** lights for the HDX (HD demuxed) channels audio gain adjustments.

Single Source Configuration

Tables 2-2, 2-3, 2-4, and 2-5 show the mapped buttons on the control panels, and the parameters affected, when you use a single source of analog, AES, SD-SDI demuxed, and HD-SDI demuxed audio.

Table 2-2. Analog Audio Inputs Selected

Selected Inputs	Lit Channel LEDs	Lit Audio Input LEDs	Mapped Parameters	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
AA1/2	1	Analog	Gain1, Gain2	1, 2	Analog
AA3/4	2		Gain3, Gain4	3, 4	

Table 2-3. AES Audio Inputs Selected

Selected Inputs	Lit Channel LEDs	Lit Audio Input LEDs	Mapped Parameters	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
AES1	1	AES	Gain1, Gain2	1, 2	Digital
AES2	2		Gain3, Gain4	3, 4	
AES3	3		Gain5, Gain6	5, 6	
AES4	4		Gain7, Gain8	7, 8	
AES5	5		Gain9, Gain10	9, 10	

Table 2-4. SD-SDI Demuxed Audio Selected (SDX)

Selected Inputs	Lit Channel LEDs	Lit Audio Input LEDs	Mapped Parameters	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
SD 1/2	1	SD	Gain1, Gain2	1, 2	SD
SD 3/4	2		Gain3, Gain4	3, 4	
SD 5/6	3		Gain5, Gain6	5, 6	
SD 7/8	4		Gain7, Gain8	7, 8	
SD 9/10	5		Gain9, Gain10	9, 10	
SD 11/12	6		Gain11, Gain12	11, 12	
SD 13/14	7		Gain13, Gain14	13, 14	
SD 15/16	8		Gain15, Gain16	15, 16	

Table 2-5. HD-SDI Demuxed Audio Selected (HDX)

Selected Inputs	Lit Channel LEDs	Lit Audio Input LEDs	Mapped Parameters	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
HD 1/2	1	HD	Gain1, Gain2	1, 2	HD
HD 3/4	2		Gain3, Gain4	3, 4	
HD 5/6	3		Gain5, Gain6	5, 6	
HD 7/8	4		Gain7, Gain8	7, 8	
HD 9/10	5		Gain9, Gain10	9, 10	
HD 11/12	6		Gain11, Gain12	11, 12	
HD 13/14	7		Gain13, Gain14	13, 14	
HD 15/16	8		Gain15, Gain16	15, 16	

M-Path Configuration

Tables 2-6 and 2-7 show the mapped buttons on the control panels and the parameters affected when you use multiple sources of analog, AES, SD-SDI, and HD-SDI audio. Use the **Ctrl** + **A Proc** buttons to switch between the audio input types.

Table 2-6. Multiple Audio Inputs Selected

Selected Inputs	Lit LED Channels	Lit Audio Input LEDs	Mapped Parameters
AA 1/2	1	Analog	Gain1, Gain2
AA 3/4	2		Gain3, Gain4
AES 1	3	AES	Gain5, Gain6
AES 2	4		Gain7, Gain8
SD 1/2	5	SD	Gain9, Gain10
SD 3/4	6		Gain11, Gain12
HD 1/2	7	HD	Gain13, Gain14
HD 3/4	8		Gain15, Gain16

Table 2-7. Ctrl + A Proc Buttons Pressed

Lit LED Channels	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
1	1, 2	Analog
2	3, 4	
3	5, 6	AES
4	7, 8	
5	9, 10	SD
6	11, 12	
7	13, 14	HD
8	15, 16	

AFV (Audio Follows Video) Mode

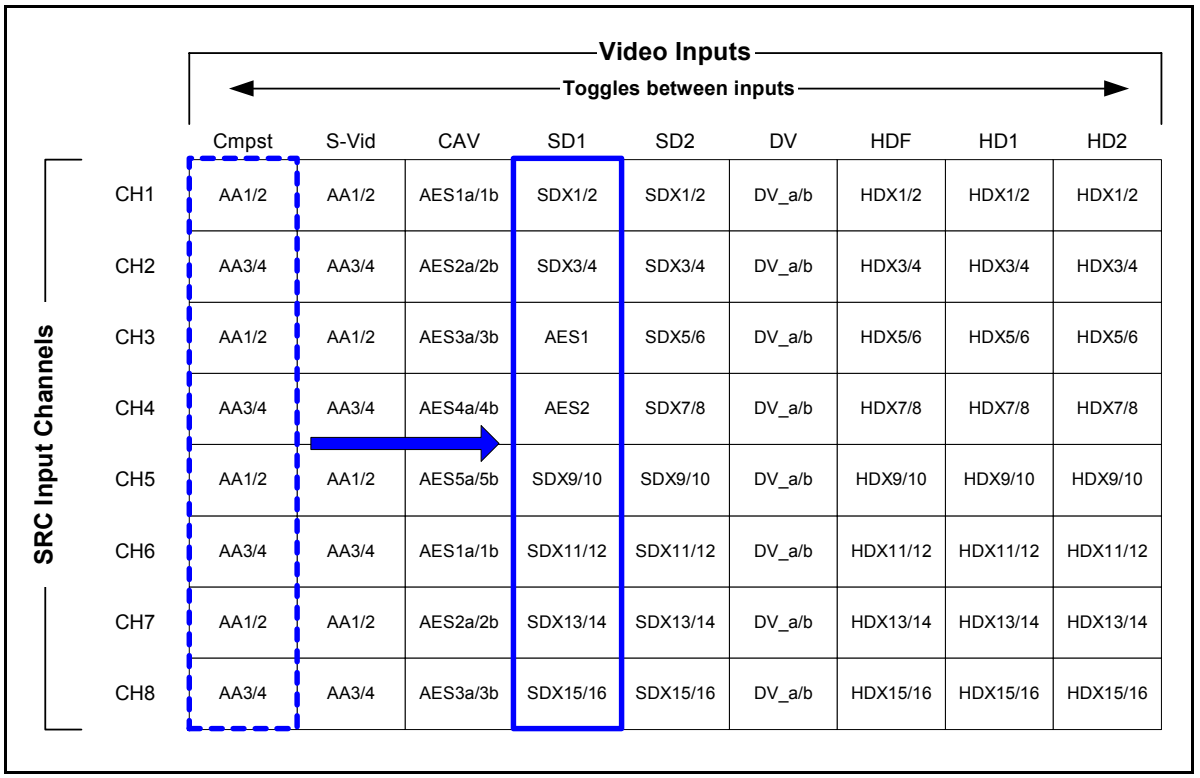
In AFV mode, the audio SRC (Sample Rate Converter) channels can be associated with the video input signal in any combination. When the video is switched from source A to source B, the associated audio channels will be switched simultaneously. By defining this association in advance, you will not need to match the audio source manually.

You can enable or disable AFV mode through the **Audio** menu. The **<channel>-AFV-<input>** parameters specify the audio input channel ("**<channel>**") to be automatically switched when the **SD Out Sel** parameter is switched to a specified input ("**<input>**"). For example, the **Ch1-AFV-SD 1** parameter specifies the audio input for **SRC Channel 1** will be automatically switched when the **SD Out Sel** parameter changes to **SD 1**.

When AFV mode is enabled for any single channel, the AFV LED on the front panel of the unit will be lit.

You can override AFV mode by manually selecting a different audio input. This will not, however, turn AFV mode off—the next time the video input selection is changed, the audio will again follow it. AFV mode can only be disabled through the audio menus.

Figure 2-8 shows the default AFV audio and video assignments. It illustrates the linked audio channels in AFV mode when the video is switched from the composite input to SD-SDI 1 video. When the AFV is enabled for all channels, the composite input video selection also routes the analog input channels 1 and 2 to SRC channel 1, and the analog input channels 3 and 4 to SRC channel 2. When SD-SDI 1 input video is selected, all four groups of de-multiplexed audio channels are routed through eight SRC channels.



	Cmpst	S-Vid	CAV	SD1	SD2	DV	HDF	HD1	HD2
CH1	AA1/2	AA1/2	AES1a/1b	SDX1/2	SDX1/2	DV_a/b	HDX1/2	HDX1/2	HDX1/2
CH2	AA3/4	AA3/4	AES2a/2b	SDX3/4	SDX3/4	DV_a/b	HDX3/4	HDX3/4	HDX3/4
CH3	AA1/2	AA1/2	AES3a/3b	AES1	SDX5/6	DV_a/b	HDX5/6	HDX5/6	HDX5/6
CH4	AA3/4	AA3/4	AES4a/4b	AES2	SDX7/8	DV_a/b	HDX7/8	HDX7/8	HDX7/8
CH5	AA1/2	AA1/2	AES5a/5b	SDX9/10	SDX9/10	DV_a/b	HDX9/10	HDX9/10	HDX9/10
CH6	AA3/4	AA3/4	AES1a/1b	SDX11/12	SDX11/12	DV_a/b	HDX11/12	HDX11/12	HDX11/12
CH7	AA1/2	AA1/2	AES2a/2b	SDX13/14	SDX13/14	DV_a/b	HDX13/14	HDX13/14	HDX13/14
CH8	AA3/4	AA3/4	AES3a/3b	SDX15/16	SDX15/16	DV_a/b	HDX15/16	HDX15/16	HDX15/16

Figure 2-8. Default AFV Channel Assignment

You can assign different audio inputs to each SRC channel, as well as enable and disable the AFV function for each video input to create a complex routing.

Advanced Audio Inputs and Outputs Selection

For custom applications, the X75 unit provides full input and output routing control. You can select multiple audio input sources simultaneously and route them internally to meet your application requirements (see Figure 2-9 on page 27). This advanced routing can only be done through the **Audio** menu (not using a front panel shortcut button). Each SRC can be assigned to any stereo input source. Mono-based audio outputs can select any SRC outputs, including the summation and tones and mutes.

More than one audio input LED will light when multiple audio input sources are selected (for example, **Analog** and **AES**).

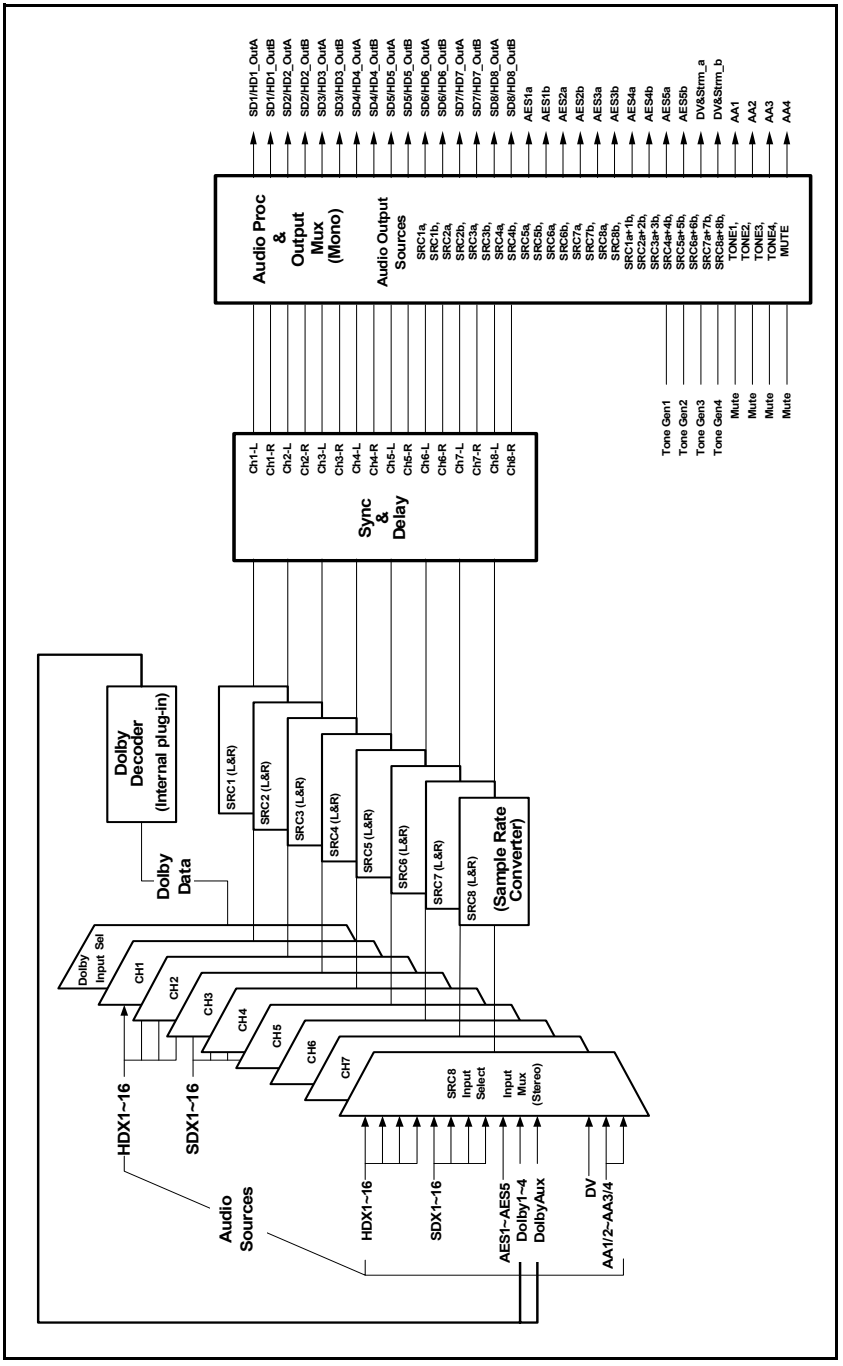


Figure 2-9. Advanced Audio Signal Routing

Other Shortcuts

The following shortcut buttons are located on the right side of the control panel (listed alphabetically):

- ARC (aspect ratio converter)
- Black
- Bypass
- Chroma
- FAV1 (Favorites1)
- FAV2 (Favorites)
- Frz Mod (Freeze mode)
- Hue
- Luma
- Keyer
- Memory
- NR (noise reduction)
- Option
- Take
- Timing
- TSG (timing signal generator)

The function and use of these buttons are described in the following pages.

Figure 2-10. Other Shortcut Buttons

ARC (Aspect Ratio Converter)

Note

The ARC mode requires an HD-SDI module to operate in both HD-SDI and SD-SDI formats.

The **SD-ARC Insert** parameter under the **Video Setup>Processing> ARC (SD-SDI Out)** menu selects a video input source to be processed by the SD aspect ratio converter. All video output groups using the video input source selected by the **SD-ARC Insert** parameter will automatically have the SD-ARC inserted into their video processing path. The HD-ARC is always available for HD outputs.

The **ARC** button provides quick access to the ARC (SD-SDI Out) and ARC (HD-SDI Out) controls. When the HD video processing block is currently selected, pressing the **ARC** button takes you straight to the ARC (SD-SDI Out) variable controls. When the SD 1, SD 2 or Analog video proc amp block is currently selected, pressing the **ARC** button takes you straight to the ARC (HD-SDI Out) variable controls.

Depending on the video configuration, you must manually select the appropriate ARC controls to apply the settings to outputs. The following options are available when the **ARC** button is pressed:

- Aspect Ratio Lock
- H. Size
- H Position
- V Size
- V Position

The manually adjusted User settings can be saved or recalled from the four ARC Presets that are available from each ARC (HD-SDI Out) and ARC (SD-SDI Out) menu. For more information on the use of the aspect ratio converter, see the *X75HD/X75SD Multiple Path Converters and Frame Synchronizers Installation and Operation Manual*.

The control panels for X75 systems also provide viewing modes to allow the quick selection of pre-defined input and output aspect ratios.

ARC (HD-SDI Out)

The following options are available n the ARC (HD-SDI Out) presets:

- Anamorphic
- Pillar Box
- Middle Cut
- 14:9 Pillar Box
- 21:9 Letter Box

ARC (SD-SDI Out)

The following options are available in the ARC (SD-SDI Out) presets:

- Anamorphic
- Letter Box
- Center Cut
- 14:9 Letter Box
- 21:9 Letter Box

Black

To adjust the black level, follow these steps:

1. Press the **Black** button to display the **Black Level** menu on the VFD panel.
2. Set the minimum luma level of the incoming video signal using the control knob and menu controls. Options include the following:
   - Valid range: -15.0 to 15.0 IRE (525-line mode)
   - Default settings: 0.0 IRE (525-line); 0.0 mV (625-line)

Bypass

In Bypass mode, no processing is applied to the **SDI 1 In** video signal; the signal is instead passed directly to the **SDI 1 Out** connector that is closest to the **SDI 1 In** connector. (Only one of the two **SDI 1 Out** connectors provides a bypass output.)

To activate Bypass mode, press the **Bypass** button. From the resulting **Bypass Menu**, select **On** or **Off**, and then press **Enter**. When the unit is powered off, or forced by the user, this relay is not energized to pass the signal straight through the output without any processing. The **Bypass** button flashes when the Bypass mode is active.

Chroma

To adjust the chrominance gain, follow these steps:

1. Press the **Chroma** button to display the **Chroma Gain** menu on the VFD panel.
2. Set the saturation peak of the incoming video signal using the control knob and menu controls. Options include the following:
   - Valid range: -6.00 dB to 6.00 dB
   - Default settings: 0.0 dB

FAV1 and FAV2 (Favorites1 and Favorites2)

The **FAV1** and **FAV2** buttons store lists of favorite menu locations or controllable parameters. Using these buttons, you can "go to" a Favorite, delete a Favorite, or set a Favorite to be activated by GPI.

Figure 2-11. User-Programmable FAV1 and FAV2 Controls

Accessing a Favorite

Note

If the listed favorite is a menu mode (video M-Path), it cannot be set as a GPI parameter.

To go to a favorite, follow these steps:

1. Press **FAV1** or **FAV2**.

   A menu opens with the following options:

   - List Favorites
   - Add Favorite

2. Select **List Favorites**.
3. Scroll to the desired favorite, and then press **Enter**.

Deleting a Favorite

To delete a favorite, follow these steps:

1. Press **FAV1** or **FAV2**.

   A menu pops up with the following options:

   - List Favorites
   - Add Favorite

2. Select **List Favorites**.
3. Scroll to the favorite you want to delete.

4. Press **FAV1** or **FAV2** again.

   A menu opens with the following options:

   - Delete Favorite
   - Move Up
   - Move Down
   - Set as GPI Parameter

5. Scroll to **Delete Favorite**, and then press **Enter**.

   A confirmation box appears stating that the favorite was deleted.

Note

The **Move Up** and **Move Down** options are used to change the order of the presets.

Activating a GPI Input

To set a parameter to be activated by a GPI input signal, follow these steps:

1. Press **FAV1** or **FAV2**.

   A menu pops up with the following options:

   - List Favorites
   - Add Favorite

2. Select **List Favorites**.
3. Scroll to the favorite you wish activated by a GPI input signal.
4. Press **Fav1** or **Fav2** again to store the parameter.

   A menu opens with the following options:

   - Delete Favorite
   - Move Up
   - Move Down
   - Set as GPI Parameter

5. Scroll to **Set as GPI Parameter**, and then press **Enter**.

An arrow (>) is placed just before the parameter name, indicating that the favorite is now set as a GPI-triggered parameter.

Note

The **Move Up** and **Move Down** options are used to change the order of the presets.

Frz Mod (Freeze Mode)

The freeze control provides instant access to freezing individual frames or fields of the incoming video source. The Freeze mode only affects the currently active video proc amp block.

To use the freeze shortcut, follow these steps:

1. Press **Frz Mode** to open a menu in the VFD panel where you can select a mode to apply to the incoming video.
2. Press **Frz Mode** multiple times to cycle through the different modes, or use the control knob.

   Available modes include the following:

   - Field 1
   - Field 2
   - Frame
3. Press **Take** to activate the selected Freeze mode and apply it to the incoming video.

   The **Take** button flashes while the Freeze mode is active.
4. Press the **Take** button repeatedly to toggle between live and freeze modes.

Note

The **Mute In Freeze** option (**Audio** menu) specifies whether or not audio output will be muted while the video is frozen in Frame or Field mode.

Hue

To adjust the phase, follow these steps (hue phase control is not available in HD-SDI):

1. Press the **Hue** button to display the **Hue Phase** menu on the VFD panel.
2. Set the hue in the output signal using the control knob and menu controls. Options include the following:
   - Valid range: -180.00 to 179.94
   - Default settings: 0.00°

Note

This button can be reprogrammed if it is not needed. See "For more information about front panel buttons, see "Using Front Panel Control Shortcuts" on page 15." on page 10 for instructions on assigning a different function to this button

Luma

To adjust the luminance gain, follow these steps:

1. Press the **Luma** button to display the **Luma Gain** menu on the VFD panel.
2. Set the maximum luminance level (in IRE or mV) of the incoming video signal using the control knob and menu controls. Options include the following:
   - Valid range: -6.00 dB to 6.00 dB (Y/C and SD-SDI)
   - Default settings: 0.00 dB

Keyer

This feature is not currently available.

Memory

Press the **Memory** button to quickly access user presets. These controls allow you to store and recall user settings with up to 10 presets. Various procedures for saving, recalling, renaming, and deleting presets are outlined below.

Saving a Preset

To save a preset, follow these steps:

1. Press **Memory**.

   A menu pops up with the following options:
   - List Presets
   - Save Presets
2. Select **Save Preset**.

   A confirmation box appears stating that the preset was saved and is named **Preset *x*** (“*x*” represents a number from **1** to **10**).

Recalling a Preset

To recall a preset, follow these steps:

1. Press **Memory**.

   A menu opens with the following options:
   - List Presets

- Save Preset

2. Select **List Presets**.
3. Scroll to the preset you would like to recall.
4. Press **Memory** again, or press **Enter**.

   A menu opens with the following options:

   - Restore Preset
   - Delete Preset
   - Rename Preset
5. Scroll through the list and select **Recall Preset**, and then press **Enter**.

   Your preset is recalled.

Note

The **Move Up** and **Move Down** options are used to change the order of the presets.

Renaming a Preset

To rename a preset, follow these steps:

1. Press **Memory**.

   A menu opens with the following options:

   - List Presets
   - Save Presets
2. Select **List Presets**.
3. Scroll to the preset you would like to rename.
4. Press **Memory** again, or press **Enter**.

   A menu opens with the following options:

   - Restore Preset
   - Delete Preset
   - Rename Preset
5. Scroll through the list and select **Rename Preset**, and then press **Enter**.

   You will be prompted to enter a new name.
6. Enter a new name.

Deleting a Preset

To delete preset, follow these steps:

1. Press **Memory**.

   A menu opens with the following options:

   - List Preset
   - Save Presets

2. Select **List Presets**.
3. Scroll to the preset you would like to delete.
4. Press **Memory** again, or press **Enter**.

   A menu opens with the following options:

   - Restore Preset
   - Delete Preset
   - Rename Preset

5. Scroll through the list and select **Delete Preset**, and then press **Enter**.

NR (Noise Reduction)

When the X75HD/SD unit is equipped with the X75OPT-NR option, it provides superior noise handling and image enhancement features on SDTV video processing paths. Press the **NR** button for quick access to the noise reduction menu.

The **SDNR Insert** parameter under the **Video Setup>Processing>SD NR/Enhancement** menu selects a video input source to be processed by this block. All video output groups using the video input source selected by the **SDNR Insert** parameter will automatically have the SD noise reducer inserted into their video processing paths.

SD NR/Enhancement

The optional video noise and artifact reducer is based on Leitch's AVARI (Advanced Video Artifact Reducer I) technology. This feature is capable of impulse noise reduction, Gaussian random noise reduction, compression “blockiness” and mosquito artifact reduction and the sharpening and softening of images.

The impulse noise reducer is particularly effective in reducing satellite noise. It automatically detects impulse noise and applies a median filter when necessary. To achieve the ideal setting, adjust the **Impulse Noise Level** control to reduce more impulse noise, but not to the extent that excessive motion artifacts are generated.

AVARI technology uses a recursive 3D directional filter that reduces Gaussian noise and compression artifacts, which includes the ability to block artifacts and mosquito noise. For ideal effectiveness, adjust the **Noise/Artifact Level** control up to see more effect on filtering, but not to a level where excessive blurring is visible.

The directional softening/sharpening filter can be used in various applications. For example, the softening filter can be used as a compression pre-filter to reduce mosquito noise, and the sharpening filter can be used to enhance picture appearance. The **Soften/Sharpen** control provides this function; a negative value achieves a softening effect, and a positive value results in a sharpening effect. While adjusting these controls, the **Split Screen** feature may be used to compare the filtered video against unfiltered video.

The overall filter delay is approximately 1 line when the **Minimum Delay** parameter is set to **Yes**, and approximately 1 field when set to **No**. The overall performance is slightly better when **Minimum Delay** is set to **No**.

HD NR/Enhancement

The HD digital noise reduction and enhancement controls are included as a standard feature with the HD submodule and may be applied to the X75HD's HD outputs.

When equipped with the X75OPT-NR option, for the up-converted HD output signal, you can use either (or both) of the SD or HD noise reduction functions. To use the **SD NR/Enhancement** feature in this case, set the **SDNR Insert** parameter to the appropriate SD video input as described in the previous section.

Option

Note

This button can be reprogrammed if it is not needed. See "For more information about front panel buttons, see "Using Front Panel Control Shortcuts" on page 15." on page 10 for instructions on assigning a different function to this button.

The **Option** control panel shortcut allows quick access to certain parameters, some of which become enabled with the purchase and installation of various optional modules and upgrades.

To access the list of **Option** parameters, press the **Option** button, and then select one of the following items:

- **History**: The last ten parameters that you have viewed or modified appear chronologically in the **History** list. The most recent event appears at the bottom of the list. This list is deleted if the control panel loses its power.
- **Active Alarms**: Using this parameter, you can set the parameters for alarms on your network of X75-RCP-enabled devices. For each alarm, you can make the following settings:
  - Trigger Time
  - Clear Time
  - Priority
  - Alarm Mute
  - Acknowledged
- **Alarms Log**: The last 20 alarms (minor and major) are listed in the Alarms Log. This is a read-only list; it can only be cleared by disconnecting power to the control panel.
- **Configure Alarms**: Use this parameter to set the parameters for alarms on your network of X75-RC-enabled devices. For each alarm, you can access the following options:
  - Trigger Time
  - Clear Time
  - Priority
  - Alarm Mute
  - Acknowledged
- **Favorite 1** and **Favorite 2**: Use these two lists to retain the ten most-needed parameters. With each parameter listing that you wish to save, press **Favorite 1** or **Favorite 2** from the **Options List**, and then select **Add**. The message "Item added" appears. See "FAV1 and FAV2 (Favorites1 and Favorites2)" on page 31 for more information.

- **Preset**
- **MuteKeepAlive:** The X75HD/X75SD unit sends out a “keepalive” message every 15 seconds (approximately). The keepalive checks to determine if the device is still active and resides on the control network. The following options are available:
  - **No**: The keepalive message is broadcast every 15 seconds by the X75 unit to be discovered by the client control systems.
  - **Yes**: Suppresses the keepalive message unless it is requested by any client control system.

  If the X75 is re-powered with the **Mute KeepAlive** option set to **Yes**, a client device such as a remote control panel will not be able to discover the unit until the control panel is re-powered.
- **Home**: This option returns you to the **Main** menu.
- **Path**: Using this feature, you can establish the path of the parameter that you are currently viewing or adjusting. To obtain the path, select **Path** from the options list, and then press **Enter**. Rotate the control knob to view the entire path.
- **Lock Panel**: By selecting and entering this parameter, all card-edge controls are locked out, preventing accidental changes. To remove the Lock Panel function, press **Ctrl** + **Exit**. If you are using a DPS-575 or RC-575 to control the X75, press the **Default** + **Exit** buttons on the DPS-575 or RC-575 to remove the locked panel function.
- **Setup**: The **Setup** menu contains a number of parameters that affect how your display screen operates.
- **Backlight**: To accommodate different lighting environments, the buttons on the front of the frame can be backlit for better visibility..

Take

The **Take** button is used with the **Frz Mode** button. See page 33 for more information about the **Frz Mode** button.

Timing

Using the **Timing** button, you can access the currently selected video processing block's phase controls. When multiple input video sources are selected and processed, pressing the **Ctrl** and **V Proc** buttons allows you to switch between the processing blocks and leads you directly to the selected timing controls.

The PROC LEDs on the right side of the front panel and the display shows the currently selected and active block.

- When the Analog processing block is selected, press the **Timing** button to access the **AVFS & Timing** submenu.
- When an SD processing block is selected, press the **Timing** button to access the **SD1 FS & Timing** or **SD2 FS & Timing** submenus.
- When the HD processing block is selected, press the **Timing** button to access the **HD Out V-Phase** parameter under the **Processing** menu, and press the **Exit** button to access the HD Out H-Phase control.

The timing controls for the down-converted signal can be adjusted with the S**D-ARC/HD Dn V-Ph** and **SD-ARC/HD Dn H-Ph** controls from the **Video Setup>Processing** menu.

TSG (Test Signal Generator)

The X75HD/SD unit provides HDTV(8-bits) and SDTV(10-bits) internal test signals. Table 2-8 on page 41 and Table 2-9 on page 42 respectively show the list of test signals for each standard, and these options are directly accessible through the **TSG** button.The SD Keyer and the test signals function share the same processing block.

Using the **Keyer/TSG Insert** parameter in **Video Setup> Processing>SD TSG & Slide**, you can select a video source to be processed by this block. All video output groups using the video input source selected at the **Keyer/TSG Insert** parameter will automatically have the Keyer/TSG inserted into their video processing paths.

Table 2-8. HDTV Test Signals

HD-SDI 1080	HD-SDI 720
Black	5-Step
Color Bars 100%	10-Step
Color Bars 75%	Aspect 4:3
Horizontal Sweep	Black
Horizontal Sweep Y-only	Color Bars 100%
Color Bars 100% 4:3	Color Bars 100% 4:3
White	Color Bars 75%
5-Step	Horizontal Sweep
10-Step	Horizontal Sweep Y-only
Ramp Y-only	Multiburst
Ramp	Multiburst Y-only
Multiburst Y-only	Pathological 1
Multiburst	Pathological 2
Pluge	Pathological 3
Pathological 1	Pathological 4
Pathological 2	Pluge
Pathological 3	Ramp
Pathological 4	Ramp Y-only
Aspect 4:3	RP219-1
RP219-1	RP219-2
RP219-2	RP219-3
RP219-3	RP219-4
RP219-4	White

Table 2-9. SDTV Test Signals

SD-SDI 525	SD-SDI 625
SMPTE Bars	Bars 100%
EIA Bars	Black
Full Field Bars	Gray
Bars/Reverse	White
Bars/Red	Luma Ramp
Bars 100%	Modulated Ramp
Black	Luma 5-Step
Gray	Modulated 5-Step
White	Shallow Ramp
Luma Ramp	Luma Sweep 5.5MHz
Modulated Ramp	Chroma Sweep
Luma 5-Step	VIRS
Modulated 5-Step	Pluge
Shallow Ramp	SIN(X)/X
Multiburst-60IRE	Timing Bowtie
Luma Sweep 5.5MHz	Matrix 1
Chroma Sweep	SDI EQ Test
Pulse and Bar	SDI PLL Test
NTC7 Composite	Bars/Red 100%
NTC7 Combination	EBU Bars
FCC Composite	EBU Bars/Red
VIRS	Multiburst 5.0MHz
Pluge	Multiburst 5.8MHz
SIN(X)/X	Multiburst 420mV
Red Field	Pulse & Bar 2410t
Timing Bowtie	Pulse & Bar 248t
Matrix 1	Pulse & Bar 2t

Table 2-9. SDTV Test Signals *(Continued)*

SD-SDI 525	SD-SDI 625
Matrix 2	Luma 10-Step
SDI EQ Test	Valid Ramp
SDI PLL Test	Multipulse 5.8MHz
	Shallow Ramps
	VITS 17
	VITS 18
	VITS 19
	VITS 20
	VITS 330
	VITS 331
	Red Field 75%
	Red Field 100%
	Ramp 100
	Ramp 120
	UBM Ramps

Chapter 3

Status and Alarm LEDs

Overview

The status and alarm LEDs on the local and remote control panels provide visual feedback on the current mode and operating conditions of the unit.

This chapter contains the following information:

Location

The Status and Alarm LEDs are located together in the center of the panels, as shown in Figure 3-1.

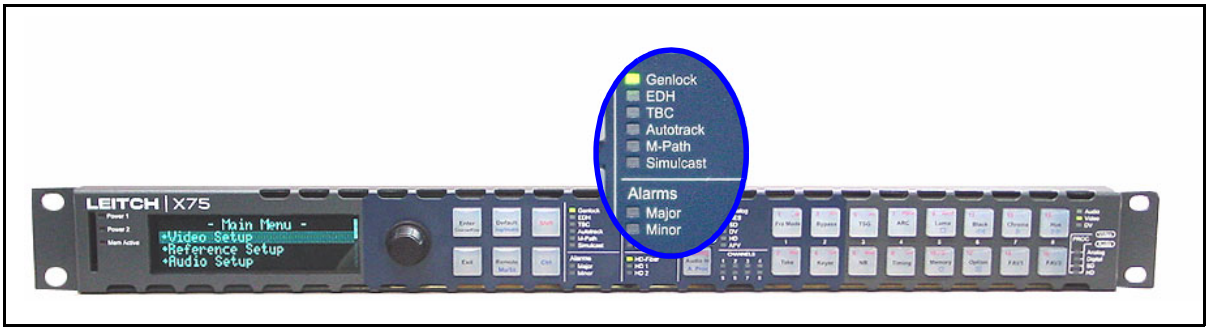


Figure 3-1. Status LED Area

Genlock Status LED

The Genlock LED indicates the current status of the external genlock source.

Table 3-1. Genlock LED Status Definitions

LED Status	Operating Condition
On	The control panel is configured to Auto Genlock and a stable genlock source is detected.
Off	Genlock is not selected.
Flashing	The genlock source is not stable or is missing.

EDH Status LED

The EDH LED indicates the current configuration and status of Error Detection Handling (EDH) in the input standard serial digital video stream. The EDH LED receives SD-SDI 1 and SD-SDI 2 inputs for status reporting.

Table 3-2. EDH LED Status Definitions

LED Status	Operating Condition
On	The EDH feature is monitoring incoming video from both SD-SDI inputs.
Off	The EDH feature is turned off.
Flashing	EDH detection is enabled and EDH errors have been detected, or the incoming SDI feed does not include EDH. For an EDH error count and other related information, follow this thread: **Main Menu>Video Setup>SD1 or SD2 Input>EDH**.

TBC Status LED

The TBC LED indicates whether or not the composite input signal is timebase-corrected by the unit's TBC circuitry.

Table 3-3. TBC LED Definitions

LED Status	Operating Condition
On	The internal time base corrector is operating and correcting the input signal, usually for heterodyned signals from sources such as a VTR.
Off	The internal time base corrector is not active (the unit may be in Sync mode).

Autotrack Status LED

The Autotrack LED indicates whether or not the audio Auto Track mode is enabled. You can independently set each audio synchronizer to track the selected output video channel to auto compensate for the propagation delay introduced in the processed video path. Also, you can add additional delay with the Audio Delay controls. Follow this path: **Audio Setup>Input Setup>Delay**.

Table 3-4. Autotrack LED Definitions

LED Status	Operating Condition
On	Any one of the **I/O Delay SRC#** parameters in **Audio Setup>Global Audio Config>I/O Delay Config** is set to an option other than **None**.
Off	The audio delay feature is turned off.

M-Path Status LED

The M-Path LED indicates whether or not the unit is in M-Path mode. If the M-Path LED is not lit, the Simulcast mode is in effect.

Table 3-5. Digi-Triplex LED Definitions

LED Status	Operating Condition
On	The M-path mode is enabled (more than two input signals are selected and routed to the outputs).
Off	The M-Path mode is not enabled.

Simulcast Status LED

The Simulcast LED indicates when the unit is in Simulcast mode. If the Simulcast LED is not lit, the M-Path mode is in effect.

Table 3-6. Simulcast LED Definitions

LED Status	Operating Condition
On	The Simulcast mode is enabled.
Off	The Simulcast mode is not enabled.

Major and Minor Alarm LEDs

The **Major** and **Minor Alarm** LEDs are activated from the enabled list of alarms found in the selected frame's parameters. Major alarms appear as red LEDs; minor alarms are amber. Local and remote control panels only detect alarms that are activated on X75 and DPS-575 frames that are currently being accessed.

Table 3-7. Major and Minor Alarm LEDs

LED Status	Operating Condition
Flashing	Alarms are detected.
Off	No alarms are detected.

Mem Active LED

This LED is reserved for future use.

Video Input LEDs

Press the **Video In** button to select a video source manually and to send out to all outputs. The LEDs left side of this button indicate which input is currently selected. The M-Path selection allows any output group to be assigned to the video input sources. When more than one video source is selected and mapped to multiple output groups, the M-Path and corresponding video input source LEDs will light. When the selected input signal is absent, the LED flashes.

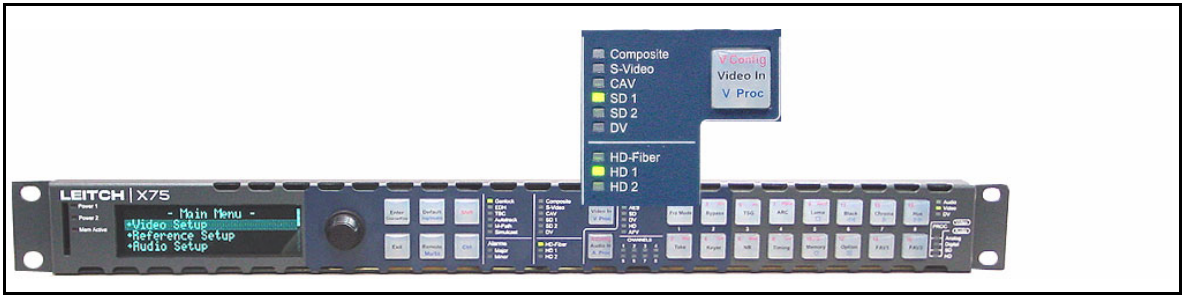


Figure 3-2. Video Input LED Area

Audio Input LEDs

Press the **Audio In** button to select any *one* set of audio inputs to be sent out to all audio multiple output sets. The LEDs to the top, right side of this button indicate which input is currently selected. When the selected input signal is absent, the LED flashes.

Figure 3-3. Audio Input LED Area

Control Mode Status LEDs

The Audio and Video LEDs indicate the current focus of control.

- The Audio LED lights when an audio parameter adjustment is made.
- The Video LED lights when a video parameter adjustment is made.

Figure 3-4. Control Mode Status LED Area

Chapter 4

Specifications (X75-RCP)

Overview

The following specifications are listed for the X75-RCP Remote Control Panel on page 62:

- "Dimensions and Weight"
- "Network Control"
- "Power Consumption"

Specifications for the controls on the frame-mounted local control panel are not described here, as the unit functions within the X75HD/X75SD frame. See the *X75HD/X75SD Multiple Path Converters and Frame Synchronizers Installation and Operation Manual* for more information.

These specifications may change without notice.

Dimensions and Weight

Table P-1. Dimension and Weight Specifications

Item	Dimension
Height	1.75 in. (4.4 cm)
Width	19 in. (48.3 cm)
Mounting depth	Approximately 5 in. (13 cm)
Weight	2.5 lbs (1.1 kg)

Network Control

Table P-2. Network Control Specifications

Item	Specification
Connector	RJ-45
Protocol	EP, DCN over Ethernet
Ethernet	10/100 base-T

Power Consumption

Table P-3. Power Consumption Specifications

Item	Specification
Power consumption	Input power: 6 W max. at 100 to 240 VAC, 50/60 Hz

Appendix A

Servicing Instructions

Overview

This appendix contains information about replacing the fuse in the X75-RCP Remote Control Panel.

X75-RCP Fuse Rating and Replacement

Caution

To avoid the risk of fire, you must always replace the fuse with the same type of fuse and specified rating. Failure to comply may result in equipment damage and/or personal injury.

The X75-RCP input is protected by a 2A slow blow fuse, located in the AC power supply.

In rare cases, it may be necessary to change the power supply fuse. However, a blown fuse indicates the presence of a serious electrical fault.

To access the power supply fuse, follow these steps:

1. Remove the AC power cord and Ethernet connection from the back of the control panel.
2. Remove the control panel's mounting screws.
3. Remove the four screws on the top of the unit, and then remove the flat panel cover.
4. Locate the fuse in the power supply and then remove it.
5. Replace the fuse with another 2 A 250 V 20 mm cartridge fuse.

Fuse Replacement:

CAUTION: For continued protection against risk of fire, replace only with the same type 2 A 250 V 20 mm fuse.

6. Re-install the flat panel cover.
7. Re-connect the AC power supply and Ethernet connection.

Appendix B

Display Screen and Device Setup Parameters

Overview

The display screen **Setup** menu contains a number of parameters that affect how the display screen operates. The device **Setup** parameters control how the control panel functions on its network.

You can find the read-only hardware and software version numbers by following this thread: **Main Menu>System Configuration>Status> Version Info**.

The following main items are included in this appendix:

Display Screen Setup Parameters

The display screen Setup parameters affect the way in which the display screen functions on your panel. These settings do not affect how parameters are seen on other panels.

To access the display screen **Setup** menu, follow these steps:

1. Press the **Option** button.
2. Rotate the control knob and select **Setup**.
3. Press the **Enter** button.

The display screen Setup parameters are described in the following pages.

Scroll Mode

In *Wrap* mode, when you scroll through menus and non-numeric parameters, the module considers the list as a circular set of data. When the last parameter in the list is reached, the first parameter in the list immediately follows it. In *Don't Wrap* mode, the module stops when the last parameter in the list is displayed. To return to the first parameter, you must scroll through the entire list in the opposite direction. The **Scroll Mode** options globally affect all non-numeric parameters as they appear on the control panel where you have made this setting. Numeric values are not affected by Scroll Mode options.

Display Intensity

To accommodate different equipment room lighting conditions, you can set the panel to five levels of display intensity: 100%, 75%, 50%, and 25%.

Screen Saver Timeout

To extend the life of the display device, the screen saver automatically shuts off the display after a preset period of inactivity. Using the screen saver timeout parameter, you can set the duration of inactivity after which the control panel display turns off, or you can disable the screen saver. The available time options are 5, 10, 20, and 30 minutes.

To exit the screen saver mode, press the control knob or any button. No parameters will be changed when you exit the screen saver mode.

Screen Saver Select

The screen saver can be set to either **Blank** or **Default**. The **Default** screen saver consists of a line of scrolling text.

Shaft Direction

Using this parameter, you can determine whether the clockwise rotation of the control knob moves a parameter list up or down. The setting of this parameter only applies to navigation, and does not effect the adjustment of numeric values. To make numeric values increase, the control knob must always be turned the knob clockwise. To make values decrease, you must always turn the knob counter-clockwise.

Device Setup Parameters

Additional **Setup** parameters affect how the control panel functions on the network. Local and remote control panels have slightly different paths for accessing these parameters, and some of the parameters shown on the local control panel **Setup** menu are not related to control functions. Only those parameters related to network control are described in the following pages.

To access the device **Setup** parameters on a frame-mounted local control panel, follow these steps:

1. In the Main Menu, select **System Config**.
2. Select **Setup**.
3. Select the parameter you wish to view or change.

To access the **Device Setup** parameters on an X75-RCP Remote Control Panel, follow these steps:

1. Press the **Remote** button.
2. Select **Device Setup** and then press **Enter**.
3. Select the parameter you wish to view or change.

On an X75-RCP, the **Device Setup** parameters can also be accessed from the **Remote Units** menu when the remote control panel is first powered up.

Machine Name

This option makes it possible to give a custom name to the unit, instead of the normal IP address. The new machine name is visible on other control panels in the network; however, the **Machine Name** parameter is only available on local control panels.

Device IP

Using this parameter, the system administrator can set a new IP address to a control panel. The default IP address of a remote control panel is **192.168.100.251**. The default IP address of a local control panel is **192.168.100.250**.To prevent IP address conflicts, this default IP address must be changed when the control panel is used in a network. You can assign an IP address to the panel using a local control panel. Also, you can use the Web server software control for this purpose. See the *X75 Quick Start Guide* for more details on the Web server control application.

Subnet Mask

A subnet is a part of a network. It may include, for example, the devices in one geographic location, studio, or local area network. Using this parameter, the system administrator can assign a new subnet mask to the remote control panel. The default subnet mask is **255.255.255.0**.

Gateway

This parameter sets the value for the gateway IP address. The default value is **192.168.100.251**.

Save IP

Caution

You will lose control of a device on the network if you change its IP address. To rediscover a "lost" device, press the **Remote** button, and then select the device from the new list of IP addresses.

This parameter is required to save the new IP settings (**Panel IP Address, Subnet Mask,** or **Gateway**). The available options are **Yes** or **No**. If any of these IP addresses is changed without using the **Save IP** feature, the new IP settings are lost.

Appendix C

Copyright Notice

Run-Time Module Software

Leitch Technology is a licensee of VxWorks Run-Time Module software, developed by Wind River Systems, Inc. As an end user, you are entitled to use the VxWorks software in the operation of this Leitch Technology product. However, you are prohibited from taking any or all of the following actions:

- copying the Run-Time Module, except for archive purposes consistent with the end user's archive procedures
- transferring the Run-Time Module to a third party apart from this Leitch Technology product
- modifying, decompiling, disassembling, reverse engineering or otherwise attempting to derive the source code of the Run-Time Module
- exporting the Run-Time Module or underlying technology in contravention of applicable U.S. and foreign export laws and regulations
- using the Run-Time Module other than in connection with operation of this Leitch Technology product

The Run-Time Module is licensed, not sold. Wind River Systems, Inc. and its licensors retain ownership of all copies of the Run-Time Module used in Leitch Technology equipment.

Wind River Systems, Inc. expressly disclaims all implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, title and non-infringement. Wind River Systems, Inc. is not liable for any special, indirect, punitive, incidental and consequential damages resulting from the use of this product.

Further distribution of the Run-Time Module is subject to the same restrictions set forth herein. Wind River Systems, Inc. and its licensors are third party beneficiaries of the End User License Agreement and the provisions related to the Run-Time Module are made expressly for the benefit of, and are enforceable by, Wind River Systems, Inc. and its licensors.

Index

A

B

C

D

E

F

G

H

I

K

L

M

N

O

P

R

S

T

U

V

W

Trademarks and Copyright

Warranty

Leitch Incorporated ("Leitch") warrants to each original end-user purchaser or licensee (each, a "Customer") of hardware or software products manufactured by Leitch (each, a "Product"), or of non-warranty repair or other services provided by Leitch ("Services"), that each such Product and all such Services will be free from defects in materials and workmanship that adversely affect the Product's performance or the Services' intended purpose for a period (the "Warranty Period") of:

- One year for server hardware Products;
- Two years for non-server, and Desktop hardware Products;
- Ninety days for parts, assemblies and supplies to support hardware Products previously sold to Customers;
- Ninety days for media of software licensed separately from Leitch hardware Products, and encoding created by Leitch as physically affixed on or embedded in such media;
- The same period as the hardware Product warranty for media of software licensed as an integral part of any Leitch hardware Product, and encoding created by Leitch as physically affixed on or embedded in such media
- Ninety days for Services.

Please refer to the current "Leitch Limited Warranty Policy" for a complete description of the warranty provided, including important exclusions and limitations as well as procedures for obtaining warranty service.

[WORLDWIDE SUPPORT]

Leitch Technology is a 32-year global leader in the design and distribution of high-performance video systems for the professional television industry. Leitch offers the most extensible products and interoperable systems, enabling operations of any size to achieve a truly Integrated Content Environment. Leitch is the most trusted name for increasing performance and productivity through solutions that streamline workflow of content production, processing, transmission and management. With a sole focus on and commitment to the television industry, Leitch provides unparalleled customer support.

Leitch Americas

Support Headquarters

Phone: +1 (416) 642 3611
Toll Free: +1 (888) LEITCH6 (534 8246)
Fax: +1 (416) 445 9020
Email: service@leitch.com
Post Products: service.post@leitch.com

Server & AgileVision Products

Phone: +1 (818) 843 7004
Toll Free: +1 (888) 843 7004
Fax: +1 (818) 450 2199
Server Products: service.servers@leitch.com
AgileVision Products:service.agilevision@leitch.com

Leitch Europe

Europe & Africa - All Product Support

Phone: +44 1344 446099
Fax: +44 1344 446090
Email: service.europe@leitch.com
Post Products: service.post.eu@leitch.com

Leitch Asia

Asia/Pacific Rim - All Product Support

Phone: +852 2776 0628
Fax: +852 2776 0227
Email: service.asia@leitch.com
Post Products: service.post.asia@leitch.com

Please visit www.leitch.com/support/service for more information.