LEITCH

X75HD

**High-Definition
Digital Processing Synchronizer**

Installation and Operation Manual

ALL INFORMATION IN THIS MANUAL IS PRELIMINARY
AND SUBJECT TO CHANGE WITHOUT NOTICE

Enabling Your
Integrated Content Environment

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.

content production

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.

content processing

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™).

content transmission

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.

content management

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.

X75HD

High-Definition Digital Processing Synchronizer

Installation and Operation Manual

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Preliminary Edition A
December 2004

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Preface

Manual Information

Purpose

This manual details the features, installation procedures, operational procedures, and specifications of the X75HD High-Definition Digital Processing Synchronizer.

Audience

This manual is written for technicians and operators responsible for the installation, setup, and/or operation of the X75HD High-Definition Digital Processing Synchronizer.

Revision History

Table P-1. Manual Revision History

Edition	Date	Details
Preliminary A	December 2004	Preliminary release

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 troublefree 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 two inches 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.

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Safety Terms and Symbols

Terms and Symbols Used in this Manual

WARNING statements and icons 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 and icons 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 statements and icons identify 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

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.

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.

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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.

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Laser Radiation When Open
CAUTION: To avoid damage from laser radiation, do not remove or displace any connections or protective panels.

CLASS 1 LASER PRODUCT

[Finland] LUOKAN 1 LASERLAITE.
[Sweden] KLASS 1 LASER APPARAT.

CLASS 1
LASER PRODUCT

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.

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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.

For Products with Multiple Power Cords:

WARNING: To reduce the risk of electric shock, plug each power cord into separate branch circuits employing separate service grounds.

CAUTION: This unit can have more than one power supply cord. To de-energize the internal circuitry, disconnect all power cords before servicing.

Norway:

ADVARSEL: Utstyret kan ha mere ennn en tilførselsledning. For å gjore interne deler spennigsløse må alle tilførselsledningene trekkes ut.

Sweden:

VARNING: Denna apparat har mer än en nätanslutning. Samtliga nätkablar måste bortkopplas för att göra de interna kretsarna spänningsfria.

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

Table P-3. EMC Standards and Descriptions

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.
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}.

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Table P-3. EMC Standards and Descriptions *(Continued)*

EMC Standard	Description
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 Environment E4

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

Table P-4. Safety Standards and Descriptions

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

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Section I—Getting Started

This section contains the following topics:

- Introduction
- System Installation and Connections
- X75HD Applications
- Module and Back Panel Descriptions
- Specifications
- Initial Configuration

After reading these chapters, you will have a general understanding of the X75HD along with its features and options, and how to install the system and get it up and running.

Chapter 1

Introduction

Overview

The Leitch Technology X75HD™ High-Definition Digital Processing Synchronizer is a standard and high-definition utility synchronizer and converter that combines video and audio processing capabilities with the ability to up-convert, down-convert, and cross-convert from most common input and output video formats.

The X75HD is equally suited for analog, digital, or hybrid facilities, and represents the ideal choice for broadcasters making the transition to digital television (DTV and HDTV). Available in video-only and audio/video configurations, these synchronizers provide an ideal bridge between analog and digital and high definition systems with analog, digital and embedded audio.

This chapter describes main features and applications of the X75HD, including the following topics:

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Chapter 1: Introduction

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General Description

> **Note**
>
> See "Product Packages" on page 15 for more specific information on what each X75HD system package provides.

The X75HD offers unparalleled I/O flexibility. Up to nine video inputs and ten video output formats are provided, dependant on the selected options:

- One HDTV optical fiber serial component digital video input and output
- Two HDTV serial component digital video (HD-SDI) inputs and one output
- Two SD-SDI serial component digital video inputs and outputs
- Streaming video output over IP (audio optional)
- Component analog video (Betacam®) input and output (input optional)
- S-video (S-VHS/Hi8) input and output (input optional)
- NTSC/PAL-M/PAL-B/SECAM composite video input and output (input optional)
- RGB-S output
- DV (IEEE-1394) input or output with transport control (optional)
- DVI-D output

See "Chapter 2: X75HD Applications" for a description of the various X7HD applications that are available.

Inputs

Inputs are auto-detected with user selectable SMART alarms.Two input modes for automatic detection or selection allow for critical program path processing for ingest, bridges between routers/tape transports/servers, mobile broadcast, and edit suites.

Video Processing

Processing for video includes level/color control, 3D-adaptive color decoding, frame synchronization and time base correction for non-synchronous signals, analog-to-digital and digital-to-analog video conversion for hybrid facilities, up- and down-conversion with aspect ratio conversion for hybrid standard definition and high-definition facilities, and high-definition cross-conversion for broadcast and production facilities with multiple high-definition format requirements.

Audio Processing

Processing for audio includes level control, analog-to-digital and digital-to-analog conversion, and SD-SDI and HD-SDI serial digital signal embedding and de-embedding for interfacing any audio signal in a professional environment. Audio is sample rate converted, synchronized, and timed to video to correct for lip sync errors. Embedded compressed audio signals, such as AC-3™, can be de-embedded or embedded. Multiple channel program signals can be processed for surround-sound applications before or after compression.

The available AFV (audio-follow-video) mode, a popular audio input-to-output processing feature, launches when video inputs are selected, but can easily be over-ridden if required.

All audio can be converted, adjusted, timed, de-multiplexed, and multiplexed, as required.

Signal Control and Monitoring

Embedded metadata in the program stream (for example, closed captioning) is passed transparently from input to output. Control and monitoring of signals passing through the X75HD is enabled using IP over Ethernet. Instant operator control from the local or remote control panels allow for easy manipulation over video and audio signals. PC control and monitoring over large networks is entirely manageable by using two Ethernet ports per unit.

Operating Modes

There are two main operational modes: M-Path (multiple path) processing, and Simulcast processing.

- M-Path operation involves processing any analog, digital, and HDTV inputs to any analog, digital and HDTV outputs, providing multi-channel processing, and allowing the wrapping around of an SDTV transport device (for example, a VTR). Also provided are up to 16-channels (8 AES) of audio processing.

- Simulcast operation allows the selection of any two inputs for clean and simultaneous switching between selected outputs (for example, SDTV and HDTV).

See for more information on modes of operation.

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Main Features

All X75HD features and functions can be accessed from an installed front local control panel, an RCP-X75™ remote control panel, or a supported Web browser. Along with the applications described on "Chapter 2: X75HD Applications", the X75HD includes the following features:

General Functionality

- Frame syncs for analog, SDTV and HDTV
- Up-converter, down-converter, cross-converter, and aspect ratio converter
- Analog-to-digital converter
- Digital-to-analog converter
- Optional SDTV and HDTV logo generator
- Proc amps for analog, SDTV and HDTV
- 16 channels of internal audio processing (gain, invert, swap, sync/delay, sum)
- Embedding and de-embedding for SD-SDI and HD-SDI
- Audio (and embedded) test generator
- Built-in Web server with thumbnail monitoring

Input/Outputs

- Auto-detected inputs
- Two SD-SDI and two HD-SDI inputs
- Color black, tri-level sync and DARS reference inputs
- Optional NTSC/PAL-M/PAL-B/SECAM input with CAV and S-video inputs
- Ability to provide all outputs (composite, component, SD-SDI, HD-SDI, HDTV fiber, DVI-D, S-video)
- SC and optional FC and ST fiber interface for HDTV
- Five AES inputs and outputs, 75/110Ω
- Four analog audio inputs and outputs
- GPI input and output

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- Optional DV input/output

Operation, Control, and Monitoring

- Two operating modes: M-Path (multiple-path) and Simulcast
- Local and remote control panels
- Control for up to 200+ units from a single control panel
- X75 Web server software application
- SNMP and third-party interfaces
- SMART alarms (a 'global' set of parameters for all inputs allow custom-definitions for how/when alarms are activated, including a priority setting for each main/backup input)

Hardware Features

- SD (Secure Device) removable media (customer-supplied)
- Front-to-back air flow
- Single and dual redundant power supplies

Summary of Benefits

Among the many benefits provided by the X75HD, a major advantage is a reduction in the amount of equipment needed to perform everything that the X75HD can do in just one 1RU. In a single system, the X75HD combines HDTV frame synchronization along with up/down and cross/down conversion. It provides analog inputs and outputs with SD-SDI, HD-SDI, and HDTV optical, and delivers analog, digital, and embedded audio. Voice-over is part of the 16-channel audio option.

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Front and Rear Panels

Front Panel Description

Figure 1-1 and Figure 1-2 illustrate the available X75HD front panels, including blank panels and control panels.

For X75HD units with a blank front panel, all configuration and control must be done remotely using one of the following methods:

- Separate remote control panel such as the RCP-X75
- Web server application using a common Web browser such as Internet Explorer™ (IE) or Netscape™

As well, blank front panels only provide a certain number of LEDs for alarm and status monitoring, including major and minor alarm LEDs, and status LEDs for power and memory access.

For X75HD units with an installed local control panel, configuration and control can be done locally. Numerous LEDs that indicate alarm, status, and configuration information are available from the front control panel. For more detailed information on front panel controls and indicators, see the *Control Panels for X75 Systems Installation and Operation Manual.*

Figure 1-1. X75HD Front Panel (Blank)

Figure 1-2. X75HD Front Panel (with Local Control Panel)

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Rear Panel Description

Figure 1-3 illustrates a typical rear panel with all module options installed. Figure 1-4 provides a graphical overview of the rear panel connector placement.

Figure 1-3. X75HD Rear Panel
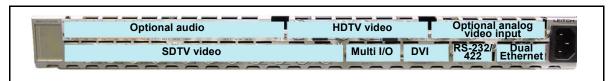
Figure 1-4. Overview of Connector Placement

For more information on back panel connections, see "Chapter 4: System Installation and Connections".

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Chapter 1: Introduction

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Overview of Operating Modes

There are two main operational modes: M-Path (multiple-path) processing, and Simulcast processing.

If you are selecting a single or multiple source for signal processing, you do not need configure the system in any special way. Depending on your input source selections, the single-source or multi-source operating mode is automatically set, and the required processing carried out. See "M-Path Operation" below for more information on M-Path operation.

If you want the X75HD system to operate in Simulcast mode (where any two inputs are selected to cleanly switch simultaneously between determined outputs, such as SDTV and HDTV), you will need to set-up the unit to process signal information differently. To do this, see "Simulcast Operation" on page 14.

M-Path Operation

Video Processing

> **Note**
>
> For some conversion processes, the optional analog video input module is required.

M-Path operation involves the processing of any analog, digital, and HDTV inputs to any analog, digital and HDTV outputs; provides multiple channel processing; and allows for the wrapping around of an SDTV transport device (for example, a VTR).

Accepted video input signals include analog component/Betacam, analog composite, and S-video/CAV, DV, SD-SDI, and HD-SDI. Analog (composite/S-video/CAV) and DV inputs are optional.

Available video outputs include analog composite, analog component/RGB/Betacam, S-video/CAV, DV, DVI, SD-SDI, HD-SDI, and streaming. DV and streaming outputs are optional.

During processing, the X75HD up-converts, down-converts, or cross-converts, as required. Various examples of video processing are illustrated in Figure 1-5 and Figure 1-6 on page 11.

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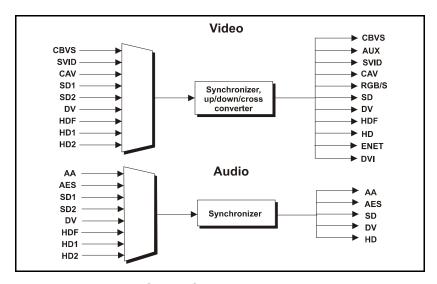
Figure 1-5. M-Path Single-Source Video and Audio Processing
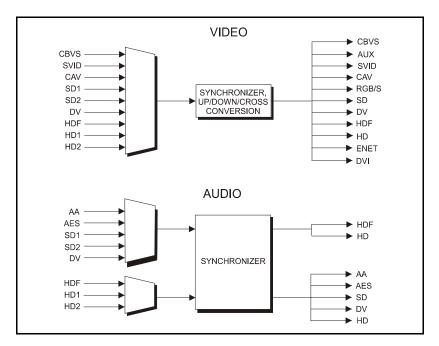
Figure 1-6. M-Path (Single-Video and Multi-Audio Source) Processing

Audio Processing

An X75HD unit can process up to 16-channels (8 stereo channels) of audio at the same time as the video. Any combination of audio is assigned from the inputs (four channel analog audio, five AES balanced or unbalanced, up to four groups demuxed from the SD-SDI and HD-SDI input) into the 16-channel processor.

The processed audio signals can be mapped to all outputs. When one set of audio input is selected, these mono channels are mapped intelligently to provide outputs to all available channels. Audio outputs include the following: four channel analog audio, five AES balanced and unbalanced, up to four groups muxed into the SD-SDI and HD-SDI outputs.

Other M-Path audio processing variations include the following:

• Compressed audio can be de-embedded into an external audio decoder, then the decompressed multiple channel surround-sound audio is processed through the X75HD.

• Multiple channel surround-sound audio can be processed, sent to an external encoder, and then embedded into the video program signal.

All audio can be converted, adjusted, timed, multiplexed, and de-multiplexed, as required.

illustrates the audio processing flow.

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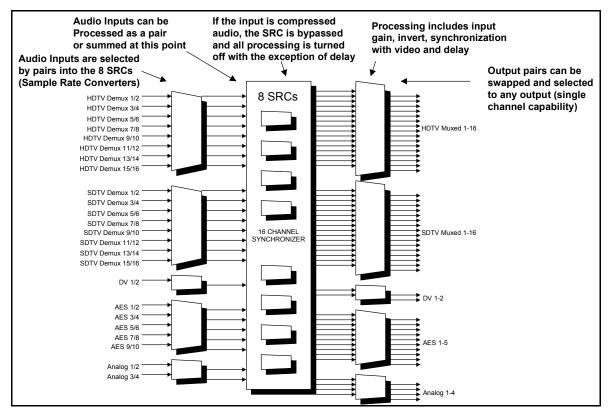
Figure 1-7. Audio Functional Block Diagram

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Simulcast Operation

General Description

Simulcast operation allows you to identify two inputs and outputs (out of many possible inputs) that you intend to cleanly switch between frequently. As an example, when you enable this mode, the X75HD can cleanly switch SDTV and HDTV inputs to simultaneous, deterministic SDTV and HDTV outputs. This mode is useful for when you need to alternate between both HDTV and SDTV signals and broadcast them together (for example, if you have an HDTV satellite feed carrying the programming and an SDTV local feed carrying the advertisements). A simplified illustration is provided below.
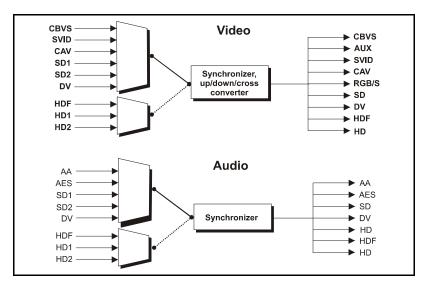
Figure 1-8. Simulcast Processing

Enabling Simulcast Mode

To enable Simulcast as the operating mode for the X75HD, navigate to the **Routing Setup** menu, and select **Simulcast Mode Select**. Set the **Simulcast Enable** parameter to **Enable**.

For more information on selecting inputs for Simulcast processing, see "Understanding X75HD Processing Modes" on page 77.

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Product Packages

There are a variety of different modules, product packages, and options available when ordering a X75HD system. See the following tables for more information:

Available Processing Modules

Table 1-1 describes the various X75HD product packages that can be ordered.

Table 1-1. X75HD Module and System Packages

Product Code	Description	Major Features
X75HD	SDTV and HDTV "all-in-one" system, including local control panel	• 1RU FR-X75 frame with local control panel, single power supply and power cable • Auto-sensing standard (SDTV/HDTV) serial digital component synchronizer • Component, composite, S-video, and SD-SDI outputs • Framestore memory • 12-bit processing • Multiple operational modes • SMART alarms and streaming capability • Optional DV I/O module • Optional AS-X75HD internal 16-channel digital audio synchronizer module
X75HD-LC	SDTV and HDTV "all-in-one" system, with blank front panel	• Same features as the X75HD, *excluding* the local control panel • Blank front panel
X75HD-AV	SDTV and HDTV "all-in-one" system, with 16-channel audio synchronizer	• Same features as the X75HD (including local control panel) • Internal 16-channel digital audio synchronizer module, providing separate/embedded audio • Includes CAB-X75-COAX and CAB-X75HD-COAX cables

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Table 1-1. X75HD Module and System Packages *(Continued)*

Product Code	Description	Major Features
X75HD-LCAV	SDTV and HDTV "all-in-one" system, with 16-channel audio synchronizer and blank front panel	• Same features as the X75HD, *excluding* the local control panel • Internal 16-channel digital audio synchronizer module, providing separate/embedded audio • Blank front panel • Includes CAB-X75-COAX and CAB-X75HD-COAX cables
X75HD-2PS	SDTV and HDTV "all-in-one" system, with two power supplies	• Same features as the X75HD (including local control panel) • Additional power supply and power cable for full redundancy
X75HD-LC-2PS	SDTV and HDTV "all-in-one" system, with two supplies and blank front panel	• Same features as the X75HD, *excluding* the local control panel • Additional power supply and power cable for full redundancy • Blank front panel
X75HD-AV-2PS	SDTV and HDTV "all-in-one" system, with two power supplies and 16-channel audio synchronizer	• Same features as the X75HD (including local control panel) • Additional power supply for full redundancy • Internal 16-channel digital audio synchronizer module, providing separate/embedded audio • Includes CAB-X75-COAX and CAB-X75HD-COAX cables
X75HD-LCAV-2PS	SDTV and HDTV "all-in-one" with two power supplies, 16-channel audio synchronizer, and blank front panel	• Same features as the X75HD, *excluding* the local control panel • Additional power supply for full redundancy • Internal 16-channel digital audio synchronizer module, providing separate/embedded audio • Blank front panel • Includes CAB-X75-COAX and CAB-X75HD-COAX cables

Options

Table 1-2 describes the various options available for X75HD systems. Some can be installed in the factory at the time of purchase, while other options and upgrades can be ordered and installed at a later time by you.

For further cable and cable pinout information, see "Appendix A: Cables and Pinouts".

Table 1-2. X75HD System Options and Cables

Product Code	Description	Major Features
System Options		
AS-X75HD	Optional sixteen channel digital audio synchronizer submodule for separate/embedded audio	Mounts inside any X75HD system, and includes the following: • Analog, AES/EBU, and embedded SD-SDI audio I/O • Sixteen-channel processing • Audio analog-to-digital conversion • Audio digital-to-analog conversion • Audio embedding • Audio de-embedding • Audio synchronizing • Audio delay insertion • Audio processing amplification Comes with CAB-X75HD-COAX and CAB-X75-COAX breakout cables
FCFIBER-X75HD	Optional FC type fiber connectors	FC type fiber connectors (factory installed)
STFIBER-X75HD	Optional ST type fiber connectors	ST type fiber connectors (factory installed)
A3D-X75	Optional high performance 3D-adaptive decoder, component Betacam, S-video input	• Input submodule • Field upgradable or factory installed
RCP-X75	Optional remote control panel	Remote panel, field-upgradable
X75PS	Optional power supply kit	Field upgradeable

Table 1-2. X75HD System Options and Cables *(Continued)*

Product Code	Description	Major Features
Cable Options		
CAB-X75MULTI	Optional accessory cable set for multi I/O connector Provides the following connections: • Sync comp out • SDTV audio delay • Blue out • HDTV audio delay • Green out • Red out • GPI1 out • Y/C out • GPI2 out • Time code in • GPI1 in • GPI2 in	1 ft (30 cm) multi I/O breakout cable with the following connector types: • DB26(M)—6 x BNC(F) • 1 x XLR(F) • 1 x MiniDin4(F) • 4 x RCA(F)
CAB-X75-DVI	Optional cable for DVI output connector	DVI-D to DVI-D (digital-single link) cable
CAB-X75-COMBO	Optional cable for systems that require both XLR and BNC connectors Provides the following connections: **BNC**	**XLR** • DARS in • DARS in • AES1 in • AES1 in • AES2 in • AES2 in • AES1 out • AES1 out • AES2 out • AES2 out	1 ft (30 cm) breakout cable with the following connector types: • DB26(M)—5 x BNC(F) • 3 x XLR(F) • 2 x XLR(M)

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Table 1-2. X75HD System Options and Cables *(Continued)*

Product Code	Description	Major Features
CAB-X75HD-COMBO	Optional cable for systems that require both XLR and BNC connectors Provides the following connections: **BNC** • AES3 in • AES4 in • AES5 in • AES3 out • AES4 out • AES5 out **XLR** • AES3 in • AES4 in • AES5 in • AES3 out • AES4 out • AES5 out	1 ft (30 cm) breakout cable with the following connector types: • DB26(M)—6 x BNC(F) • 3 x XLR(F) • 3 x XLR(M)
CAB-X75-XLR	Optional cable for systems that require XLR connectors Provides the following connections: • DARS in • AES1 in • AES2 in • AES1 out • AES2 out	1 ft (30 cm) breakout cable with the following connector types: • DB26(M)—3 x XLR(F) • 2 x XLR(M)
CAB-X75HD-XLR	Optional cable for systems that require XLR connectors Provides the following connections: • AES3 in • AES4 in • AES5 in • AES3 out • AES4 out • AES5 out	1 ft (30 cm) breakout cable with the following connector types: • DB26(M)—3 x XLR(F) • 2 x XLR(M)

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Chapter 1: Introduction

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Typical Control Configurations

The X75HD can be configured, controlled, and monitored using the following methods:

- Local control panel on X75HD (see the *Control Panels for X75 Systems Installation and Operation Manual* for details)

- Separate remote control panel such as the RCP-X75 (see the *Control Panels for X75 Systems Installation and Operation Manual* for details)

- Web browser program such as Internet Explorer™ (IE) or Netscape™ (see "Configuring for HTTP Control (via Web Browser)" on page 76 or "Chapter 9: Controlling the X75HD via Web Server Software" for details)

All remote methods of operation are done via an RJ-45 Ethernet connection to an X75HD. See Figure 1-9 on page 21 for an illustration of these various control configurations.

📝 **Note**

The maximum recommended length for a standard 10/100Base-T cable is 382 ft (100 m).

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x75HD high-definition digital processing synchronizer

3rd party hub or switch

Pilot/ Navigator

HP Openview™

Netscape Navigator/ MS IE

CCS EP

CCS application
(reserved for future use)

SNMP
(reserved for future use)

Web browser

Third-party control
software
(reserved for future use)

Remote PC-based software control and monitoring options

RCP-x75

Remote control hardware panel

DPS-575

Existing Leitch products

Figure 1-9. Typical Configuration, Control, and Monitoring Methods

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Chapter 2

X75HD Applications

Overview

The X75HD is more than just a synchronizer. It functions in many different ways and fills a variety of broadcasting roles, including the following:

- Input video processing (proc amp, frame sync/TBC, up/down/cross-conversion) for mobile, outside broadcast vehicles (see Table 2-1 on page 25)

- Critical input video processing (proc amp, frame sync/TBC, up/down/cross-conversion) for satellite/microwave reception (see Table 2-2 on page 26)

- Input video processing (proc amp, frame sync/TBC, up/down/cross-conversion) for news production (see Table 2-3 on page 27

- Ingest input video processing (proc amp, frame sync/TBC, up/down/cross-conversion) with audio decompressing and processing (see Table 2-4 on page 28)

- Output video processing (proc amp, frame sync/TBC, up/down/cross-conversion) with audio compression and processing (see Table 2-5 on page 29)

- Input video, embedded audio, and compressed audio processing (proc amp, frame sync/TBC, up/down/cross-conversion) with external audio compression and decompression (see Table 2-6 on page 30)

- Wrap-around for tape transports (see Table 2-7 on page 31)

- Bridging between routing switchers with different formats (see Table 2-8 on page 32)

- Simulcast switching of standard and high definition signals (see Table 2-9 on page 33)

The X75HD's multi-conversion and frame synchronization abilities make it ideal for hybrid SDTV and HDTV broadcasts in cable, satellite, mobile, and production facilities.

The following sections and tables describe the most common functions and applications surrounding input video processing, output video processing, input video and audio processing, video and audio converting, bridging router switchers, and simulcast switching.

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Chapter 2: X75HD Applications

Input Video Processing

A variety of common input video processing applications are described in this section, including the following:

Table 2-1. Input Video Processing for Mobile, Outside Broadcast Vehicles

Description	Products
A composite, SD-SDI or HD-SDI input is auto detected and then sent through the video processing engine to provide multiple types of outputs. Any composite, SD-SDI or HD-SDI signal is automatically converted to the required output format. A single BNC connector on the bulkhead of a mobile or outside broadcast vehicle feeds a wideband distribution amplifier. The wideband distribution amplifier feeds into the composite, SD-SDI and HD-SDI inputs of the X75HD. The X75HD is setup to auto-detect any of the three types of inputs and provide processed video to all of the outputs. The HDTV output can be preset to provide the required format (for example, 1080i or 720p) for the production.	X75HD with A3D-X75 analog video input option and INT-EX6X1

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Chapter 2: X75HD Applications

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Table 2-2. Critical Input Video Processing for Satellite/Microwave Reception

Description	Products
HD-SDI main and backup receivers (with a SDTV backup receiver) are auto detected and switched through the video processing engine to provide multiple types of outputs. Main (primary) and backup (secondary) HDTV receivers provide inputs which are automatically switched and processed to the required output format. A tertiary SDTV receiver provides a backup if both HDTV receivers do not have outputs.	X75HD-AV with A3D-X75 analog video input option

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Chapter 2: X75HD Applications

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Table 2-3. Input Video Processing for News Production

Description	Products
A composite, SD-SDI or HD-SDI tape can be selected, played, and sent through the video processing engine to provide multiple types of outputs. Any tape format can be selected and converted to the required output format.	X75HDAV and A3D-X75 analog video input option

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Chapter 2: X75HD Applications

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Table 2-4. Ingest Input Video Processing with Audio Decompressing and Processing
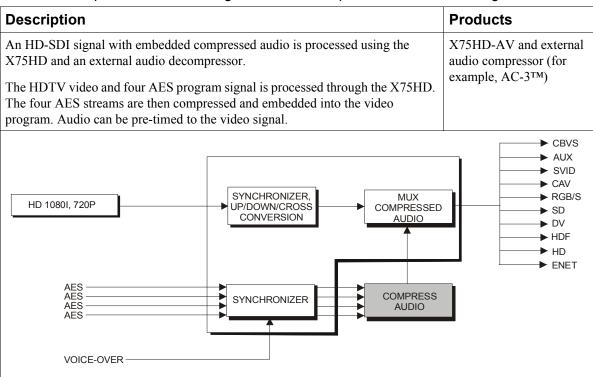
Description	Products
An HD-SDI signal with embedded compressed audio is processed using the X75HD and an external audio decompressor. The embedded compressed audio stream is de-embedded and provided as an AES stream into the audio decompressor. The decompressed audio streams (four AES, eight channels) are processed and timed with the video signal.	X75HD and audio decompressor (for example, AC-3™)

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Chapter 2: X75HD Applications

Output Video Processing

Table 2-5 describes a sample output video processing application commonly used with audio compression and processing.

Table 2-5. Output Video Processing with Audio Compression and Processing

Description	Products
An HD-SDI signal with embedded compressed audio is processed using the X75HD and an external audio decompressor. The HDTV video and four AES program signal is processed through the X75HD. The four AES streams are then compressed and embedded into the video program. Audio can be pre-timed to the video signal.	X75HD-AV and external audio compressor (for example, AC-3™)

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Input Video and Audio Processing

Table 2-6 describes common input video and audio processing applications.

Table 2-6. Input Video, Embedded Audio, and Compressed Audio Processing with External Audio Compression and Decompression

Description	Products
HD-SDI video with embedded audio and embedded compressed audio is processed using the X75HD and external audio decompressor and compressor. The HDTV video and AES program signals are processed through the X75HD. Embedded compressed audio is sent to an audio decompressor, providing three AES (5.1) signals to the X75HD. The X75HD processes the audio signals and then sends them to an audio compressor. The compressed audio signal is sent to the X75HD where it is embedded into the output processed program video signal.	X75HD-AV and external audio compressor and decompressor (for example, AC-3™)

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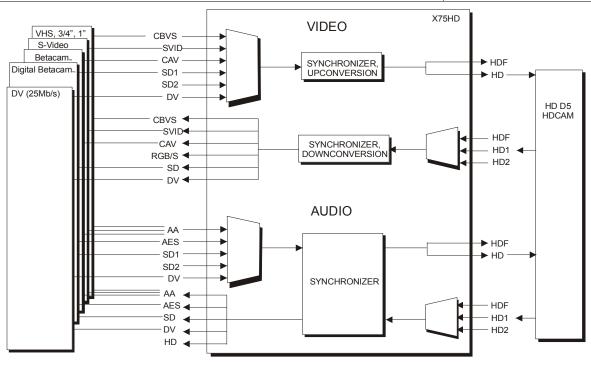
Video and Audio Converting

Table 2-7 describes a common video and audio converting application.

Table 2-7. Wrap-Around for Tape Transports

Description	Products
The X75HD provides conversion and processing for video and audio for HDTV and all SDTV formats. Video and audio connections through the X75HD provide conversion and synchronization (along with time base correction, if required) for standard definition and high definition tape transports.	X75HD-AV

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Chapter 2: X75HD Applications

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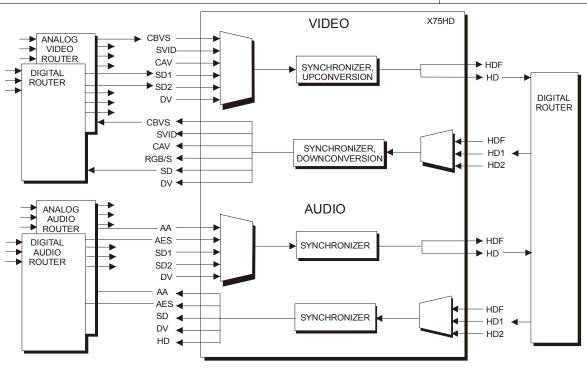
Bridging Router Switchers

Table 2-8 describes a common application for bridging router switchers.

Table 2-8. Bridging Between Routing Switchers with Different Formats

Description	Products
The X75HD provides conversion and processing for video and audio for HDTV and all SDTV formats. Video and audio can be converted through the X75HD providing bridges between sources and destinations in hybrid facilities.	X75HD, Panacea and Integrator Routing Systems
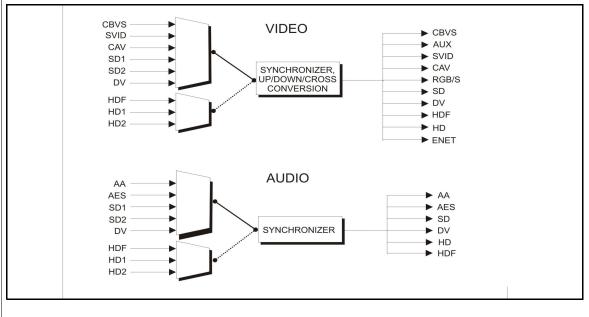
Simulcast Switching

Table 2-9 describes a common application for simulcast switching of SDTV and HDTV signals.

Table 2-9. Simulcast Switching of Standard and High Definition Signals

Description	Products
The X75HD provides SDTV to HDTV switching with SDTV and HDTV simultaneous outputs. A high definition signal is switched to and from a standard definition signal. Simultaneous outputs of high and standard definition are provided.	X75HD-AV

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Chapter 2: X75HD Applications

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<div align="right">Chapter 3</div>

Module and Back Panel Descriptions

Overview

This chapter briefly describes the X75HD modules and their corresponding back panels, including card-edge LEDs and controls, jumper settings, and connector information.

- "AS-X75HD Module and Back Panel" on page 38
- "A3D-X75 Module and Back Panel" on page 42
- "HD-X75 Module and Back Panel" on page 44

See the following chapters for more information on performance specifications, back panel cables and connectors, and servicing:

- "Specifications" on page 85
- "Cables and Pinouts" on page 155
- "Servicing Instructions" on page 179

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Chapter 3: Module and Back Panel Descriptions

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AS-X75HD Module and Back Panel

General Description

The AS-X75HD audio module and associated back panel provides five AES inputs and outputs, one DARS input, a four-channel analog audio input, and a four-channel analog audio output. Sixteen channels of processing from/to SDTV and from/to HDTV, including embedding and de-embedding, is possible with this module.

Looking from the rear, this back panel is located in the top, left corner of the frame, above the SDTV video connectors.
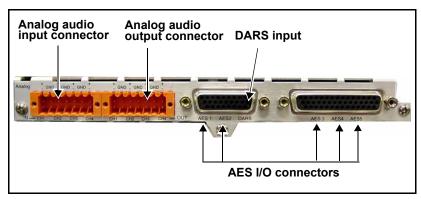
Figure 3-1. AS-X75HD Back Panel

This module provides all audio processing for the X75HD. You require this module to access, configure, and enable audio parameters in the **Audio Setup** menu such as gain, delay, tone, mute, fade, voice-over, AFV (audio follow video), and more.

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Required Jumper Settings and Local Configuration

Setting Jumpers

The AS-X75HD module requires you to configure several jumpers prior to operation to properly configure both the analog audio input and output impedance.

> **📝 Note**
>
> Beside each jumper described in this section, there is a white triangle screened on the board. This triangle points to pin 1.

- Set jumpers J5 through J8 to configure the analog audio input impedance. To do this, place a jumper on pins 1 and 2 to set the input impedance to 600Ω, or on pins 2 and 3 to set the input impedance to 100 kΩ. Make the same impedance setting to all required jumpers (J5, J6, J7, J8).

- Set jumpers J1 through J4, and J9 through J12 to configure the analog audio output impedance. To do this, place a jumper on pins 1 and 2 to set the output impedance to 600Ω, or on pins 2 and 3 to set the output impedance to 66Ω. Make the same impedance setting to all required jumpers (J1, J2, J3, J4, J9, J10, J11, J12).

Jumpers 1 through 12 can all be found at the rear of the board, located directly behind the back panel. Figure 3-2 shows their general location.
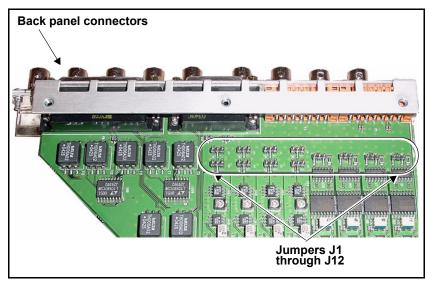
Figure 3-2. AS-X75HD Jumper Locations

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Chapter 3: Module and Back Panel Descriptions

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Installing Audio Receptacles

To make analog audio input and output connections, you need to appropriately connect stripped wires for each audio channel to the provided audio receptacle. Once done, install the wired receptacle to the back panel audio input and output connectors. The following procedure describes this process:

1. Insert a small, flathead screw driver into a rectangular hole of the audio receptacle. The corresponding round wire hole will open (either directly above or directly below the screwdriver).

2. Heeding the positive (+), negative (-), and ground (GND) markings on the back panel, place an appropriate stripped audio wire into the open hole.

   The top row of wire connection holes alternate between positive and ground. The bottom row of wire connection holes alternate between negative and ground. See Figure 3-3.
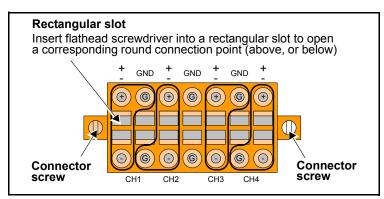
Figure 3-3. Installing Analog Audio Receptacles

3. Remove the screwdriver to lock the wire into place.

4. Repeat for other wire connections.

5. Once all wiring in completed, plug the receptacle into the analog audio input ports (each labelled CH1 CH2 CH3 CH4), and then secure into place with the attached connector screws.

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Chapter 3: Module and Back Panel Descriptions

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Special Control Considerations

For the AES input signals on DB-26 and DB-44 connectors, you can select either an **Unbalanced** or **Balanced** input from the **Audio Setup** menu. When a coaxial connection is used, select the default setting **Unbalanced**. With an XLR connection, the **Balanced** setting is required.

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Chapter 3: Module and Back Panel Descriptions

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A3D-X75 Module and Back Panel

General Description

The optional A3D-X75 module and associated back panel provides selectable analog composite, component Betacam (CAV), and s-video inputs (see Figure 3-4).

The composite input is processed through a high performance 3D-adaptive comb filter. The TBC is always used for s-video input. The Component analog video input is digitized straight, without decoding, and then sent down for further processing.

Looking from the rear, this back panel is located in the top, right corner of the frame, above the dual Ethernet ports.
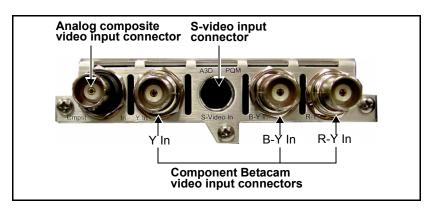
Figure 3-4. A3D-X75 Module Back Panel

This module provides analog video processing for the X75HD. You require this module to input the analog video types shown in Figure 3-4, above (including analog composite, s-video, and component Betacam). This module allows you to access, configure, and enable the analog video parameters under the **Video Setup** menu.

Special Control Considerations

Unlike SD-SDI inputs, only a single analog video source can be auto-detected. Therefore, you must pre-select the desired analog input video source (composite, s-video, or CAV) first in order for the auto-detection to work across the HD/SD/analog inputs. You can select the desired input from the **Analog Video Source** parameter (found within the **Video Setup** menu/**Analog Input** submenu).

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Chapter 3: Module and Back Panel Descriptions

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HD-X75 Module and Back Panel

General Information

The HD-X75 module and associated back panel provides two HDTV coaxial inputs, two HDTV coaxial outputs, one HDTV fiber input, and one HDTV fiber output. On-board up/down/cross-conversions are provided and processed through this module.

This back panel is located in the top, middle of the frame (rear-view), above the Multi I/O and DVI-D ports. The HD-X75 is a standard, factory-installed module that is shipped with all X75HD systems.
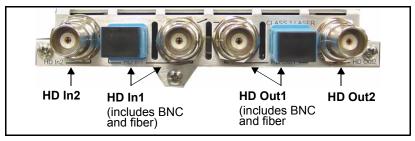
Figure 3-5. HD-X75 Back Panel

This module provides high-definition processing for the X75HD, and allows both coaxial and fiber inputs and outputs. You require this module to input and output HDTV and fiber signals. This module allows you to access, configure, and enable the HDTV input and output parameters found within HDTV submenus under **Video Setup**.

Precautions

The HD-X75 fiber optic module is a CLASS 1 laser product.

Avoid looking directly at a laser. Laser radiation is invisible and can cause serious eye damage.

For more information on handling and connecting fiber optics, see "Understanding and Working With Fiber Optics" on page 181.

> ⚠ **Caution**
>
> USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED IN THIS MANUAL MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Special Control Considerations

The selection between HD1 and HD-Fiber is not automatic. You must pre-select the desired input video source first in order for auto-detection to work across the HD/SD/analog inputs. You can select the desired input from the **HD1/HDF Input Select** parameter (found within the **Video Setup** menu/**HD Input** submenu).

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Chapter 3: Module and Back Panel Descriptions

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<div align="right">Chapter 4</div>

System Installation and Connections

Overview

This chapter contains the following information:

- "Checking the Packing List" on page 48
- "Preparing for Installation" on page 50
- "Installing Options" on page 53
- "Installing Rack Support Brackets and Cable Relief Bar" on page 54
- "Making Cable and System Connections" on page 57

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Chapter 4: System Installation and Connections

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Checking the Packing List

Before unpacking your product, read the "Unpacking/Shipping Information" on page v.

Standard Items

The following items are included with every X75HD system:

- One X75HD High-Definition Digital Processing Synchronizer
- One AC power cable (773-254 or 773-505)
- Two rear support brackets (741-983A) and corresponding hardware
- Two cable relief support brackets (164-000306-00) and one corresponding cable relief bar (164-000305-00)

These items are only included with X75HD-AV/X75HD-LCAV systems:

- Two 2x7 analog audio terminal blocks (134-000228-00); this item may be pre-installed on your unit
- HDTV audio module (AS-X75HD), with CAB-X75HD-COAX and CAB-X75-COAX breakout cables

Optional Items

You may have additional items included in your shipment if you have ordered any of the available options or upgrades. Some options may include the following:

- CAB-X75MULTI breakout cable
- CAB-X75DVI DVI-D digital video cable
- CAB-X75-COMBO audio breakout cable
- CAB-X75HD-COMBO audio breakout cable
- CAB-X75-XLR audio breakout cable
- CAB-X75HD-XLR audio breakout cable
- A3D-X75 high performance 3D-adaptive decoder, component Betacam, S-video input
- RCP-X75 remote control panel
- X75PS power supply kit for optional, redundant power supply (typically factory installed, although can be field-upgraded)

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Chapter 4: System Installation and Connections

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Replaceable Parts

There may be items that you wish to order separately or that require replacing over the life span of your product. Replaceable items include the following:

- Power supply (X75PS)
- Fans (SPAREFAN-X75)
- Rubber keymat (KEYPAD-X75)
- Board stacker 2x15 pin (STACKER-X75)

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Chapter 4: System Installation and Connections

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Preparing for Installation

Prior to installing your system, you need to ensure certain environmental and electrical conditions are met, and that frame support brackets are installed on the chassis. This section covers the following topics:

Meeting Electrical Requirements

The X75HD power supply has a universal input of 100-240 VAC at 47 to 63 Hz (nominal). There is no voltage selector switch. Ensure that a proper power supply source is available prior to operating your system.

Meeting Environmental Requirements

⚠ **Caution**

To ensure proper ventilation and to prevent the frame from overheating, keep the front panel of a X75HD frame closed.

X75HD frames are cooled by forced air drawn in from the front of the frame and exhausted through vents at the rear. There must be free passage for air flow at the front and back of the unit to allow for adequate ventilation. Take care to select a dry, well-ventilated location with a minimum of dust.

Frames are designed for mounting in a standard 19-in. (48-cm) rack using standard front-mounting ears and rear support brackets, and occupy a 1RU vertical space of 1.75 in. (4.4 cm). When installing a frame in a rack, ensure that there is adequate space behind the mounting ears and clearance for the connecting cables at the rear of the frame. Maintain about 10 in. (25 cm) of slack in the rear connecting cables to allow for frame access and maintenance while installed in the rack.

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After unpacking the unit and before installing into a console or rack, allow at least 30 minutes for temperatures to equalize and to eliminate any condensation that may have developed. X75HD frames require an ambient temperature of between 41° to 113°F (5° to 45°C), with a relative humidity of 10-90% (non condensing). The frame can only maintain proper operating temperatures when the front panel is properly installed.

Understanding Power Supply Load Limitations

Each X75HD frame has space for two power supplies; however, a single power supply can meet the requirements of a fully-loaded frame. An optional second power supply can be purchased to provide full backup redundancy. See "Installing a Redundant Power Supply" on page 52 for more information.

These ratings refer to the total module power consumption (excluding that of the power supply) allowable within a X75HD frame. The limits are based on the ability of the unit to dissipate heat over a temperature range of 32° to 122°F (0° to 45°C).

The maximum frame loading figures are described in Table 4-1 on page 51.

Table 4-1. Ratings for Power Consumption

System Type	Maximum Dissipation (per system type)	
X75HD and X75HD-2PS	40 W	Systems with two power supplies will draw a negligible amount of extra power.
X75HD-LC and X75HD-LC-2PS	34.7 W	
X75HD-AV and X75HD-AV-2PS	55 W	
X75HD-LCAV and X75HD-LCAV-2PS	49.7 W	

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Installing a Redundant Power Supply

If you purchased an optional redundant power supply prior to receiving your product shipment, both power supplies will be pre-installed in the X75HD frame. However, if you purchased a redundant power supply after receiving your product shipment, you will need to install it yourself.

See "Appendix C: Servicing Instructions" for more information on installing X75HD power supplies.

Removing and Replacing Fans

For information on removing and replacing fan boards and individual fans, see "Appendix C: Servicing Instructions".

Upgrading to a Local Control Panel

For information on upgrading an X75HD frame with a blank front panel to one with a local control panel, see "Appendix C: Servicing Instructions".

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Installing Options

If you purchased optional hardware separately from the factory (such as an audio synchronizer module), you will need to install it yourself.

See the following topics in "Appendix C: Servicing Instructions" for more information on installing and removing hardware options:

- "Installing and Removing an Audio Synchronizer Module (AS-X75HD/AS-X75HD-L)" on page 186
- "Installing Optional HDTV Module with Fiber (HD-X75)" on page 191
- "Installing a 3D Adaptive Decoder Module (A3D-X75)" on page 196

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Installing Rack Support Brackets and Cable Relief Bar

Although the front-mounting ears provide the main support for the frame within a rack, you must install additional brackets and a cable relief bar at the rear of the unit to support the weight of cabling and frame stacking. The following procedure describes how to install an X75HD frame in a standard 19-inch rack using the provided front-mounting ears, rack support brackets, and cable relief bar.

1. Locate two sets of rack support brackets in the packing box, along with the cable relief bar and the provided screws.

    Each support bracket comes in two pieces and requires assembly. The cable relief bar is a single piece. (See Figure 4-1.)
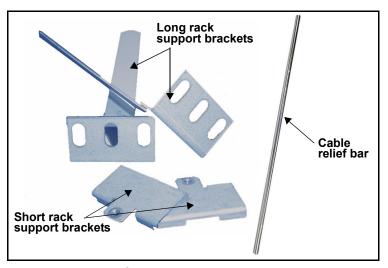
Figure 4-1. Rack Support Brackets

2. Attach the short rack support brackets to the sides of the X75HD frame using the screws that are provided in the frame holes. (See Figure 4-2 on page 55.)

![Caution icon] **Caution**

Do not use screws longer than those provided for the rear support brackets. Five 4-40 x 1/4-inch flat-head screws are provided for this purpose. Longer screws could cause internal damage.

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Installing short rack support bracket
Remove this screw from the frame, place short bracket over hole, and then secure bracket to frame with screw

Figure 4-2. Location of Short Bracket Support Screw

3. Attach the cable relief bar between the long rack support brackets using the provided screws.

    You can secure the cable relief bar through any of the screw holes on the rack support bracket. (See Figure 4-3.)
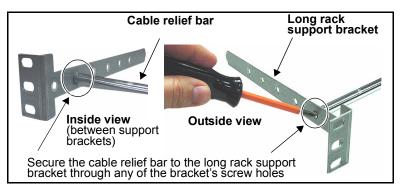
Figure 4-3. Installed Cable Relief Bar

4. Using the screws that are provided, attach the ends of the rack support brackets to the rear of the rack.

    Ensure that the holes on the rack support brackets face outward, away from the frame. (See Figure 4-4.)

Long rack support bracket
Secure this end to rack.
Holes point away from the frame (for example, this bracket will support the right side of the frame, rear view)
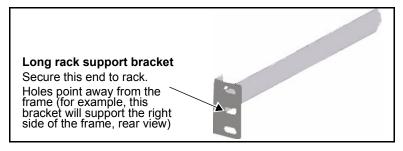
Figure 4-4. Long Rack Support Bracket

5. Push the X75HD into the front of the rack, ensuring that the rack support brackets slide into the slotted rack supports. (See Figure 4-5.)

Slide the frame onto the installed rack support brackets, ensuring that the long brackets slide into the short, slotted brackets attached to the frame.
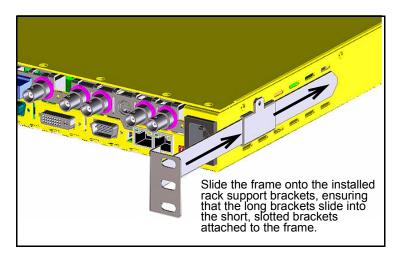
Figure 4-5. Installed Long and Short Rack Support Brackets

6. Attach the frame's front-mounting ears to the rack using the appropriate rack screws.

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Making Cable and System Connections

Some connections to the X75HD are provided via supplied breakout cable(s), others are made directly to the frame via single-link cabling. Figure 4-6 identifies the various connectors on the X75HD back panel:
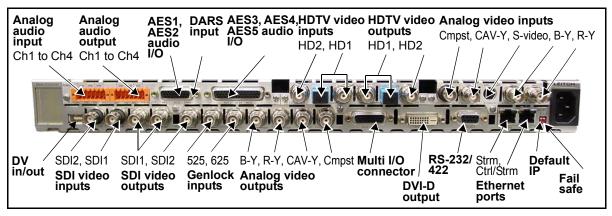
Figure 4-6. X75HD Back Panel

When making cable connections, maintain approximately 10 in. (25 cm) of slack in the rear connecting cables (wrap or tie extra cable around the cable relief bar). This allows you to pull the frame out from the rack for servicing without needing to remove any cable connections.

Multi-Purpose Breakout Cable and Connections

The optional CAB-X75MULTI breakout cable connects to the high-density DB-26M connector on the back of the unit labelled MULTI I/O.

This cable provides the following output connections: S-video (Y/C), RGB (Blue, Green, Red), Aux Composite or Sync, GPI1 and GPI2, SDTV audio delay, and HDTV audio delay. Input connections include Time code (reserved for future use), GPI1 and GPI2. Each breakout cable connector is labelled as to its function.

The pinout description for this cable connector is described in "Appendix A: Cables and Pinouts".

S-Video (Y/C) Output

This four-pin mini-DIN connector on the Multi I/O breakout cable provides processed, synchronized/time base-corrected S-video (Y/C) output.

RGB (Blue, Green, Red) Video Output

These four BNC connectors on the Multi I/O breakout cable, comprising auxiliary Red, Green, Blue, and Sync, provide processed, synchronized/time base-corrected RGB(S) (RGB with auxiliary sync) video output. All three RGB channels' sync signals can be independently turned On or Off. If RGB without auxiliary sync is sufficient, the Sync/Composite connection can be reassigned as an auxiliary composite output.

Synchronized Composite Output

The Sync Comp connection on the Multi I/O breakout cable, normally used for sync in RGB(s) (RGB with auxiliary sync) video output, can be reassigned to provide an auxiliary composite video output with the **Aux Sync/Comp** option in the **Video Setup** menu.

GPI1 and GPI 2 Input/Output

Two RCA-jack GPI inputs are provided on the Multi I/O breakout cable. These allow a GPI-based external controller to trigger functions of the unit. The function triggered by each GPI input is configured in the **System Config** menu, under the **Setup** submenu.

Two RCA-jack GPI outputs are provided on the Multi I/O breakout cable. These outputs can be configured as a GPI output to trigger external devices. The functionality of this output is configured with the **GPO Output** parameter, found within the **System Config** menu, under the **Setup** submenu.

Time Code Input

This connector is reserved for future use.

SD Aud Delay Output

> This BNC connector on the Multi I/O breakout cable provides the varying width TTL pulse that is a direct output from the selected path's SDTV frame synchronizer output. The pulse width is directly proportional to the frame synchronizer's input-to-output propagation delay. Some external audio synchronizer devices can use this pulse signal to auto-synchronize the audio signal to the video.

HD Aud Delay Output

> This BNC connector on the Multi I/O breakout cable provides the varying width TTL pulse that is a direct output from the HDTV frame synchronizer output. The pulse width is directly proportional to the frame synchronizer's input-to-output propagation delay. Some external audio synchronizer devices can use this pulse signal to auto-synchronize the audio signal to the video.

Video Connections

> The following are direct single-link video connections (not via breakout cables) on the rear of the X75HD.

Digital Video Input

> This six-pin IEEE-1394 connector, labeled DV, is used to connect DV (often referred to as "Firewire") devices. In addition to carrying DV video and audio input and output, this port also provides DV device control, allowing control of the DV device directly from the X75HD. This connection is active only if the optional DVI I/O module is installed.

Serial Digital Input

> These BNC connectors, labeled SDI1 IN and SDI2 IN, accept serial digital ITU-R BT.601 video and embedded audio data at a rate of 270 Mb per second. SDI1 has a relay bypass capability to SD1 OUT.

Serial Digital Outputs

> These BNC connectors, labeled SDI1 OUT and SDI2 OUT, provide the processed and synchronized serial digital ITU-R-BT.601 video and embedded audio at an output rate of 270 Mb per second.

HDTV Serial Digital Inputs

There are three HDTV video input connectors on the X75HD frame that allow for three possible input choices. Choose from HD-FIBER, HD1 IN, or HD2 IN.

HDTV Serial Digital Outputs

There are three available outputs on the X75HD frame: HD-FIBER, HD1 OUT, and HD2 OUT. All three outputs will contain the same content.

Genlock Input

This BNC connector, labeled GENLOCK, is used to input a genlock signal to establish the timing for the video output signal. The signal for this input must always be stable, such as the output from a black-burst or color-bar generator. Do not attempt to use a signal that has not been time base-corrected.

The you can choose one of the following reference locking sources:

• External reference input, either color black or tri-level sync

• Internal clock generated by the X75HD

• Any video input, including HD fiber, HD1, HD2, SDI1, SDI2, DV, composite, analog component, s-video

When a valid signal is connected to the genlock input, all video outputs from the X75HD will be genlocked to this signal, and the Genlock LED will be on. When no external reference is supplied to the genlock input, the unit will operate using its own internal clock.

Component Analog Video Outputs

These three BNC connectors, labeled CAV-Y OUT, R-Y OUT, and B-Y OUT, are used to output the signals to analog component devices, such as Betacam VTRs.

Composite Video Output

This BNC connector, labeled Composite Out, provides processed, synchronized versions of any of the input signals.

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DVI-D Output

This connector, labelled DVI-D, is a digital-only transmitter that provides up to 330 MHz bandwidth signal and supports 1080i/29.97, 1080i/25, 1080i/59.94, 1080i/50, 720p/59.97, 480i/29.97, and 576i/25 outputs. Connect an optional CAB-X75-DVI DVI-D to DVI-D (digital, single-link) cable between the appropriate port and a customer-supplied monitor.

Composite Video Input

This BNC connector, labeled CMPST, is used to feed composite 1 V pk-to-pk 75Ω video to the X75HD. The input video signal must be direct color or monochrome (such as from a satellite feed or live camera).

S-Video Input

This four-pin mini-DIN connector, labeled S-VIDEO, is used for S-video (Y/C) signals, such as from an S-VHS or Hi-8 device. It is normally connected to the S-video output of a playback VTR.

Component Analog Video Inputs

These three BNC connectors, labeled CAV-Y IN, R-Y IN, and B-Y IN, are used to input the signals from analog component devices, such as Betacam VTRs.

Audio Connections

On X75HD systems equipped with an HDTV audio option, up to eight stereo channels can be processed from any of the following inputs:

- 4 x analog mono channels
- 5 x AES
- 1 x DV stereo channel
- SDTV embedded (four groups, sixteen mono channels)
- HDTV embedded (four groups, sixteen mono channels)

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DARS Inputs

The DARS input is available on the standard CAB-X75-COAX and optional CAB-X75-XLR or CAB-X75-COMBO breakout cables. The "DARS Bal/UnBal Sel" parameter selects between the unbalanced (Coax) and balanced (XLR) type of connection. The primary usage of the DARS (Digital Audio Reference Signal) is for the audio synchronization.

AES/EBU Inputs

The AES1 and AES2 inputs are available on the standard CAB-X75-COAX and optional CAB-X75-XLR or CAB-X75-COMBO breakout cables. The AES3, AES4 and AES5 inputs are available only on the standard CAB-X75HD-COAX and optional CAB-X75HD-XLR or CAB-X75HD-COMBO breakout cables. The "AES# Bal/UnBal Sel" parameters select between the unbalanced (Coax) and balanced (XLR) type of connection. Only one input connection type is supported.

AES/EBU Outputs

The AES1 and AES2 outputs are available on the standard CAB-X75-COAX and optional CAB-X75-XLR or CAB-X75-COMBO breakout cables. The AES3, AES4 and AES5 outputs are available only on the standard CAB-X75HD-COAX and optional CAB-X75HD-XLR or CAB-X75HD-COMBO breakout cables. Both the unbalanced (Coax) and balanced (XLR) AES audio signals are present at all time on both D-Sub connectors.

Analog Audio Inputs and Outputs

Four channels (two stereo pairs) of analog audio inputs and outputs are supported. The analog audio input and analog audio output connectors are each labelled CH1 CH2 CH3 CH4. Each balanced analog audio input channel can be configured as 600Ω or high impedance.

Two analog audio receptacles (included with purchase of an AS-X75HD module) must be plugged into these connectors before configuration. See "AS-X75HD Module and Back Panel" on page 38 for more information.

Remote Control Ports

Remote control methods that are supported include the following:

- 10Base-T or 100/Base-T Ethernet networking used for control through a TCP/IP-based network using a controller such as the RCP-X75 remote control panel

- Web browser program such as Internet Explorer™ (IE) or Netscape™

- SNMP (Simple Network Management Protocol) and third-party control software through CCS EP (Extended Protocol)

- GPI (General Purpose Interface) input/output used for remote triggering of functions such as Freeze or triggering of external devices.

Automation control via RS-232/RS-422 is reserved for future use.

Ethernet Ports

The 10/100Base-T Ethernet connector, labeled CTRL/STRM, is used to connect the X75HD to a TCP/IP-based network for remote control and status monitoring. Control of the unit is then handled through web-browsing software or an RCP-X75 remote control panel. See for details of controlling the unit from your web browser.

Ethernet can also be used to control additional X75HD units from the front panel of this unit. When using Ethernet, the IP Address, Netmask, and Gateway settings of the unit must be configured for your network; your network administrator can provide you with these settings. These settings are located in the **System Config** menu.

A second port, labeled STRM, is reserved for future use.

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Chapter 4: System Installation and Connections

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Chapter 5

Initial Configuration

</div>

Overview

This chapter describes the various configurations and settings that are required before you begin operating the X75HD. Although you can modify all parameters and settings at any point during operation, there are certain control options and configurations that you need to set first, including those listed below:

This chapter briefly outlines the configurations you are required to make. Unless otherwise specified, directions are given for making these changes via the control panel only.

For more details on using local and remote control panels, navigating the menus, and changing parameter options, see the *Control Panels for X75 Systems Installation and Operation Manual*.

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Initial Power-Up and Control Steps

1. If you have an AS-X75HD audio option card, ensure all jumper settings have been made (see "AS-X75HD Module and Back Panel" on page 38 for details).

   The AS-X75HD audio module is shipped with the following jumper settings: 100 kΩ for input impedance, and 66Ω for output impedance. If 600Ω impedance is required, all input and output jumpers should be placed on pins 1 and 2.

2. Install the X75HD in a rack and make the required system connections (see "System Installation and Connections" on page 47 for details).

3. Plug the unit into a grounded electrical source to turn it on.

   The unit is factory configured with default settings, including the following network settings:

   • IP address of X75HD system: 192.168.100.250

   • Subnet mask: 255.255.255.0

   • Gateway: 192.168.100.250

   • Machine name: Leitch X75

   (Upon request, Leitch can preconfigure X75HD systems with specific IP addresses and network settings. A request for factory configuration of network settings must be placed at the time of order. Please contact your Leitch customer service representative for more details.)

4. If desired, you can change the direction of the control panel knob by pressing the **Option** button, opening the **Setup** menu, and selecting the **Shaft Direction** parameter. Set the direction of the knob to either **Clockwise = Up** or **Clockwise = Down**.

5. Using a frame-mounted local control panel (LCP), configure the network settings for each system: assign a unique IP address to each unit, configure the subnet mask to be the same for all units on a shared network, and change the gateway if required (see "Configuring Network Settings" on page 68 for details).

📝 **Note**

The current system IP address and network settings can be viewed on a local or remote panel VFD screen. If you do not have access to a control panel, and you cannot remember the set IP address of your system, see "Recalling the Unique IP Address for a System" on page 176 for more information.

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6. If you are controlling the unit remotely via RCP, make the required Ethernet connections (see "Remotely Controlling X75HD Systems" on page 73 for details).

7. If you are controlling the unit via a third-party Web browser, launch the Web browser (see "Configuring for HTTP Control (via Web Browser)" on page 76 for details).

8. Configure your video (and audio) input settings prior to operation (see "Configuring Video" on page 81 and "Configuring Audio" on page 83 for details).

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Configuring Network Settings

When shipped, the X75HD is configured with a default IP address along with other network settings. If you intend to control the unit remotely or connect it to a network hub/switch along with other X75HD units, you will need to reconfigure the IP with unique network settings. Local control (with a direct connection to a PC) does not require any IP configuration.

Supported Network Protocols

The X75HD supports various network protocols for remote/network control:

- EP (for example, using an RCP-X75 remote control panel).

  See "Remotely Controlling X75HD Systems" on page 73 for details.

- HTTP (for example, using a MS Internet Explorer 6.0).

  See "Configuring for HTTP Control (via Web Browser)" for details.

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Making Required Hardware Connections

> ✎ **Note**
>
> The RJ-45 connector labelled STRM on the back of the X75HD is used for video streaming purposes. It is currently reserved for future use.

If you are connecting an X75HD directly to a PC (no network connection), connect one end of a cross-over Ethernet cable to the CTRL/STRM RJ-45 port on the back of the X75HD, and the other end to the PC Ethernet port. See Figure 5-1.
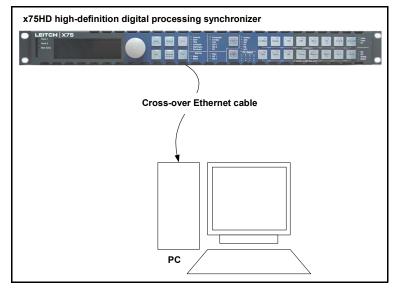
Figure 5-1. Direct-to-PC Connection

If you are establishing a network connection, connect a 10/100Base-T Ethernet cable between the X75HD CTRL/STRM port and the network hub/switch.

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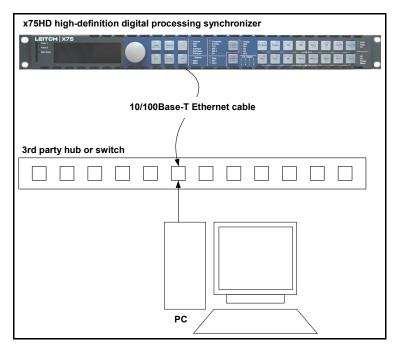
Figure 5-2. Network Connection

Setting IP and Subnet Mask Addresses

To allow devices to communicate on a network, you need to set all devices to the same subnet (network location). When shipped, all X75HD units are configured with the same default IP (device identifier) and subnet addresses. These addresses need to be changed so that each unit is uniquely identified and the network location of all units is accurately reflected.

An IP address is made up of a four-item set of numbers (octet). The default (factory-configured) IP address for every X75HD unit is 192.168.100.250. You need to change the first three items in the octet to identify the location (address) of the unit on your network; you need to change the last item in the octet to uniquely identify the device from other X75HD units.

The default subnet mask address for every X75HD is 255.255.255.0. The subnet mask address always ends in a 0 (zero).

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Setting the IP Address of a Single Unit

Follow these steps to configure X75HD IP and subnet mask addresses:

1. Apply power (plug in) an X75HD unit with a frame-mounted local control panel (LCP).

   When ready for configuration, the X75HD main menu shows on the display screen.

2. Press the **Option** button on the LCP.

3. Use the panel knob to scroll to the **Setup** menu, and then press **Enter**.

4. Locate and scroll to the **Panel IP** parameter, and then press **Enter**.

   If this is a new unit being configured, the default IP displays. Otherwise, the current IP address of the unit displays.

5. Change the IP address, following these steps:

   a. Press **Enter** to navigate to one of the four numerical items in the octet.

   b. Modify the address value by using the scroll knob to set a new number.

   c. Press **Enter** to move to the next item in the octet, and then repeat step b above.

   d. Press **Exit** when you are finished configuring the address.

6. Press **Exit** to return to the **Setup** menu.

7. Locate and scroll to the **Subnet Mask** parameter, and then press **Enter**.

   If this is a new unit being configured, the default subnet mask displays. Otherwise, the current subnet displays.

8. Follow the same procedure as described in step 5.

9. Locate and scroll to the **Gateway** parameter, and then press **Enter**.

   If this is a new unit being configured, the default gateway displays. Otherwise, the current gateway address displays.

10. Follow the same procedure as described in step 5.

11. Restart the X75HD unit.

    To do this, navigate to the **Setup** menu, select **Reboot**, and then press **Enter**. To restart an X75HD unit with a blank front panel, unplug it and then reapply power.

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Setting the IP Addresses of Multiple Units

If you have multiple X75HD systems that require network configuration, you will need to set unique IP addresses and assign a subnet mask and gateway address for each of them one at a time. The following procedure summarizes the required steps:

1. Apply power (plug in) the first X75HD unit with a frame-mounted local control panel (LCP).

   When ready for configuration, the main X75HD menu shows on the display screen.

2. Configure the network settings for this unit, as described in the procedure on page 71.

   This includes setting an IP address to uniquely identify the unit, and setting the subnet mask and gateway addresses.

3. Restart the X75HD unit.

4. Apply power to the next X75HD system, configure its network information, and then restart the unit.

   Follow this procedure for all remaining X75HD units that require configuration.

5. If you will be using a remote panel (RCP), configure the RCP's network settings (such as the IP address, subnet mask, and gateway address) in the same way as you would for an X75HD system.

   See "Remotely Controlling X75HD Systems" on page 73 for more information on RCP configuration.

6. Connect all X75HD systems and remote panels to a network hub or switch using a 10/100Base-T Ethernet cable.

7. Ensure that all configured X75HD units are detected on the network.

   To do this, press **Remote** on the front panel of either an RCP or a frame-mounted local control panel (LCP). All units configured with the same subnet mask address will display (you will see a list of all detected IP addresses).

   If a unit or RCP is not detected, ensure that the subnet mask address is accurate. Alternatively, confirm that all units were restarted after configuring any network settings.

📝 Note

If configured to be on the same network, the following items will be detected: X75HD systems, RCP-X75 panels, and any DPS-575 systems.

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Chapter 5: Initial Configuration

Remotely Controlling X75HD Systems

This section provides the following general configuration procedures:

-
-

See your *Control Panels for X75 Systems Installation and Operation Manual* for more information on using an RCP-X75 remote control panel.

Preparing for Remote Control via RCP

📝 **Note**

A frame-mounted local control panel (LCP) can also remotely control other networked X75HD units. Procedures described in this section also apply to LCP control. See for more information.

You can remotely control X75HD units over a network from a remote control panel. RCP-X75 panels remotely control X75HD units via broadcast. Switchers and routers in the network need to be configured accordingly. Preparation for remote control includes the following:

1. Using an LCP, reconfigure each X75HD and RCP-X75 unit with unique IP addresses and other appropriate network settings, including shared subnet mask addresses. See for details.

2. Restart each X75HD and RCP-X75 unit.

   After restarting an X75HD unit or RCP-X75 panel, you will need to wait approximately 20 seconds before they are detected on the network.

3. Connect all X75HD systems and remote panels to a TCP/IP-based network hub or switch using 10/100Base-T Ethernet cable.

   For RCP-X75 units, the 10/100Base-T Ethernet connector on the rear of the unit, labelled CONTROL, is used to connect the panel to a TCP/IP-based network for remote control and status monitoring of a selected device. For remote control using an LCP, connect to the CTRL/STRM port at the back of the X75HD unit. See for more information.

4. Discover all units found on the network, and then select the one you wish to control. See for details.

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Selecting a Remote Unit to Control

All X75HD systems that share the same subnet can be remotely controlled by an RCP-X75 panel or a frame-mounted local control panel (LCP). Both examples of remote control are described in the sections that follow.

Using an RCP-X75 for Remote Operation

Follow these steps to select and control a detected X75HD over the network:

1. Ensure all connections and network settings have been made.

2. On the RCP-X75, press the **Remote** button to bring up a list of available units for control. See Figure 5-3.

> **Note**
> If the network settings are not configured properly (either on the RCP or individual X75HD units), X75HD units may not be detected. Confirm all network settings, if required.

Figure 5-3. List of Systems Available for Remote Control

The **<local device>** option represents the unit you are using (the local unit that is in front of you), and is always available on this list. An asterisks (*) beside an IP address indicates that this is the remote system currently being controlled by the panel.

3. Use the control knob to scroll through the list of available X75HD devices, highlight the unit you wish to control, and then press **Enter**.

The RCP-X75 screen reads "Connecting...".

4. Wait a few moments, and the menu of the selected X75HD unit appears along with all of that unit's settings.

5. Operate the selected unit as required.

> **Note**
> The light on the **Remote** button flashes while the unit is remotely controlling a device.

Once a unit is selected for remote control, all front panel features operate as if you were actually at the front panel of the selected remote unit. This means that the VFD panel, status indicators, and buttons (with the exception of the **Remote** and **Option** button) all control and/or reflect the status of the remote unit, NOT the one you are physically operating.

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6. To switch to another unit, or to control the local device you are physically operating, click **Remote**, and then select a new device to control. Select **<local device>** to resume normal single-unit operation.

Using a Frame-Mounted Local Control Panel for Remote Operation

After ensuring that all connections and network settings have been made, you can also remotely control X75HD units that are on the network using a frame-mounted local control panel (LCP). To do this, click **Remote** on the LCP to enter Remote mode, and to view the list of X75HD units available for control on the same subnet. The procedure remains the same for selecting and operating devices remotely via LCP as for the RCP-X75.

See "Using an RCP-X75 for Remote Operation" on page 74 for details.

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Configuring for HTTP Control (via Web Browser)

Once the networking parameters of the X75HD have been configured appropriately, and it is connected to the Ethernet network, the built-in Web server allows a standard Web browser to control the X75HD unit. Before controlling your unit in this way, note the following system and browser requirements:

- The X75HD supports Web browsers that are compatible with HTML 4.0 (and later).

- Although most standard Web browsers can be used with the X75HD for HTTP control, the following browsers have been tested and approved by Leitch: Microsoft® Internet Explorer 6.0, Netscape® Navigator™ 7.2, and Mozilla® Firefox™ 1.0.

Procedure

To select a unit for control, follow these steps:

1. Ensure all required connections and network settings have been made locally on your X75HD unit(s).

2. Open a supported Web browser, and then type the IP address of the unit you wish to control into the **Address**, **Location**, or **URL** field of your Web browser (the name of the field depends on the Web browser you are using). For example, type the following to control an X75HD unit with this IP address:

   `http://192.168.100.250`

   The Web browser then displays the Home page of the X75HD Control interface (Web server).

See "Chapter 9: Controlling the X75HD via Web Server Software" for more information.

Note

Web browser control is only available for X75HD units, and not for RCP-X75 panels.

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Understanding X75HD Processing Modes

General Information

You cannot identify an input source for every output (there are simply too many permutations); however, you can identify an input source for every output *group*. Output groups include the following:

> **Note**
>
> If you are missing certain option modules, the corresponding outputs will not be available.

- Analog (includes five analog output types: composite, CAV (Y, B-Y, R-Y), S-video, RGB, AUX-composite)

- SD (includes both SD1 and DVI/SD)

- SDI2

- SV (high-end and low-end streaming video; reserved for future use)

- HD (with various options like HD-F, HD1, HD2).

These are the X75HD output groupings used for configuration purposes. Each of these output groups can be individually set to accept a specific input source. Figure 5-4 describes the general configuration required for mapping input sources to output groups.

The configuration flow follows these general steps:

1. Select an input source.
2. Map the input source to each set of output groups.
3. Alternatively, use **AllOutSelect** to map one input source to all output groups.

Output groups (5)	Physical outputs that form part of this output group:	Input sources to assign to each output group:
• Analog	• Cmpst, CAV, S-vid, AUX, RGB	• User
• SD	• SDI1, DVI (SD)	• Composte
• SDI2	• SDI2	• S-Vid
• SV	• SV (low-end streaming)	• CAV
• HD	• HD (HD1, HD2, HD-F)	• SD1
		• SD2
		• DV
		• HD-F
		• HD1
		• HD2

Figure 5-4. Mapping Available Input Sources to Output Groups

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There is a shortcut control that will map one specified input source to *all* of the output groups simultaneously, without individual manual configuration. This shortcut control is called **AllOutSelect** and is a single-source option. Single-source processing means that all five output groupings are set to accept the same input source. Use this shortcut if you want to set all the same input sources for all the outputs instead of going into each of the five output groups and individually setting the input. In contrast to single-source, multiple-source (or M-Path) processing connotes that different input sources set to different output groupings.

Input Video Modes

Note

If you make manual changes to the input/output paths, **Auto Detect** mode will automatically revert to **User Select** mode.

Note

Precedence levels that can be assigned include **Highest**, **High**, **Normal**, **Low**, and **Lowest**. (For example, if the X75HD unit detects two input signals, it will accept an HD signal tagged **Higher** over an SD signal that is tagged **Normal**.) If all input types are assigned the same precedence level, then a default ordering will kick in. This default order is reflected top-down in the menu order.

For you to assign input sources to each output group (as described in the previous section) is considered manual configuration; the **Input Video Mode** for manual configuration is **User Select**. However, if you set the **Input Video Mode** to **Auto-Detect**, the X75HD system will automatically detect the incoming input signal(s) and then send it to all output groups.

In the default **Auto Detect** mode, the X75HD senses the presence of valid input signals, and then processes them to all outputs. This mode is a useful redundancy feature: If one input signal disappears, the X75HD will automatically switch to **AllOutSelect** control, and will process whatever input is detected and send it to all outputs. If the X75HD detects more than one valid input, it will refer to the precedence order set by you in the **Video In Precedence** submenu, or it will apply the default priority order.

A third input video mode is **Simulcast Enable**. This mode allows you assign two different input sources to selected output groups for the purpose of switching between the sources. In this mode, you would most likely use a GPI control to switch between the selected input sources at the required time. When a switch in input source is made, the **AllOutSelect** control also changes the output mappings accordingly.

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Configuration Exceptions and Further Information

There are a few exceptions to the input source/output group mapping process described in the previous sections, including the following:

- "Mutually Exclusive Inputs"
- "AllOutSelect Limitations"
- "Advanced Routing Configurations"

Mutually Exclusive Inputs

Several input settings are mutually exclusive. For example, the back of the X75HD allows for up to three HD input sources; however, only one of these inputs sources can be accepted at a time. In this example, all output groups must be set to the same HD input type, *not* to three different input types. If you attempt to map different HD inputs to various output groups, only the last setting you make will apply. Previous HD input mappings will change to reflect the last setting.

This scenario of mutually exclusive HD inputs also applies to the following input types:

- SDI2 and DV
- Analog (Composite, CAV, and S-video)

These groupings are not independent inputs. Only one input type in each of these groups can be selected for each output group.

AllOutSelect Limitations

The **AllOutSelect** control lists all available input sources. But in cases where you have manually assigned different input sources to various output groups, then **AllOutSelect** will not able to reflect a single input type. Instead, **M-Path** control is selected.

When you manually configure any of the **M-Path** menu output groups, then **AllOutSelect** control will change over the **M-Path** control.

Note that if you change **AllOutSelect** to a single input type, and you return to **AllOutSelect** control, then all manual changes done previously during **M-Path** configuration will be overridden.

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Advanced Routing Configurations

There are more advanced settings and configuration types outside of the **M-Path** menu. Advanced configurations are found within **System Setup** > **Factory** > **Advanced Routing**. However, Leitch advises that you do not attempt make advanced configurations prior to contacting your customer service representative. Any changes made in the **Advance Routing** menu will override manual settings made previously.

Configuring Video

Selecting a Video Source

> **📝 Note**
>
> If you press the **Video In** button and then manually select a video source, the X75HD unit reverts to **User-Select** mode. Video modes are found under **Routing Setup** > **Input Video Mode**.

X75HD units are shipped with **Auto-Detect** video mode as the factory default setting. This mode sets the X75HD to automatically detect between composite, S-video, CAV, SD1, SD2, DV, HD-F, HD1, and HD2 inputs. When video is connected to any of these inputs, the X75HD automatically selects the applied input video and then sends out the converted video to all outputs. The Video Input LEDs on the front panel show the selected video source. For information on certain exceptions and limitations applied to video source selection, see "Mutually Exclusive Inputs" on page 79.

For analog video sources, only a single video source can be automatically detected. Therefore, you must pre-select the desired analog input video source first in order for auto-detection to work across the HD/SD/analog inputs.

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 scroll through the list of input types, and then press to **Enter** to select one.

When multiple video sources are connected, the **Video In Precedence** setting determines the selection of the input video. For example, if the X75HD unit detects two input signals, it will accept the signal tagged as **Higher** over another lower-precedence signal. Found in the top-level **Routing Setup** menu, precedence levels include **Highest**, **High**, **Normal**, **Low**, and **Lowest**. If all input types are assigned the same precedence level, then the X75HD unit defaults to the SD1 as the master source and/or a default ordering applies (reflected top-down in the menu order).

Figure 5-5 on page 82 graphically illustrates a single-source signal process, where one selected video input is fed to all outputs.

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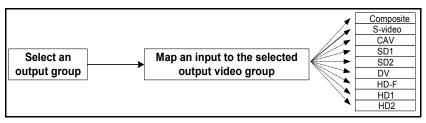
Figure 5-5. Single-Source Processing

Adjusting Video Levels

Various control panel buttons provide quick access to the video processing parameters of a selected video source. Simply press a button and use the control knob to change the selection.

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Configuring Audio

This section describes how to select a single audio source and how to quickly adjust audio levels. For more detailed and/or advanced information about audio configuration, see your *X75HD High-Definition Digital Processing Synchronizer Installation and Operation Manual*.

Selecting an Audio Source

Directly 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.

Adjusting Audio Levels

When a single audio source is selected and sent to all outputs, press the **Ctrl** and **A. Proc** buttons to quickly access the audio level controls of the selected audio input.

The selected audio input channels' Gain controls are mapped to the numbered buttons on the control panel accordingly. The mapped buttons will illuminate during audio proc control. The audio Proc LEDs on the lower, right corner of the front panel indicate which processing block is currently selected.

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Chapter 6

Specifications

Overview

This chapter describes all X75HD video, audio, and other miscellaneous performance and hardware specifications.

The following specifications are included:

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Chapter 6: Specifications

Video Specifications

Input

Table 6-1. HD-SDI Video Input Specifications

Item	Specification
Standard	SMPTE292M
Connector	BNC (IEC169-8)
Impedance	75Ω
Return loss	>18 dB, typical, from 5 MHz to 1485 MHz
Equalization	Adaptive cable equalization for up to— • 388 ft (100 m), typical, of Belden 8281 co-axial cable or • 492 ft (150 m), typical, of Belden 1694A co-axial cable

Table 6-2. HDTV Fiber Video Input

Item	Specification
Standard	SMPTE 292M, Mode B Operation
Number of inputs	1
Connector	Single mode fiber, SC connector standard (FC or ST type optional)
Input wavelength	1200 to 1600 nm
Max. input power	0 dBm, typical
Sensitivity	Better than -20 dBm

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Table 6-3. SD-SDI Video Input Specifications

Item	Specification
Standard	SMPTE259M-C, 270 Mbps, 525/625 component
Connector	BNC (IEC169-8)
Impedance	75Ω
Return loss	>18 dB from 5 MHz to 270 MHz
Equalization	> 23 dB Belden 8281 cable

Table 6-4. S-Video Input Specifications

Item	Specification
Standard	• NTSC • PAL-M • PAL-B
Connector	4-pin DIN

Table 6-5. Composite Video Input Specifications

Item	Specification
Standard	• NTSC (SMPTE170M) • PAL-B (ITU624-2) • SECAM • PAL-M
Connector	BNC (IEC 169-8)
Quantization	12 bits (SECAM and PAL-M is 8 bits)
Input level	1.0 V pk-to-pk
Impedance	75Ω
Return loss	>40 dB, 0.1 MHz to 6 MHz
Common mode range	5.0 V

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Table 6-5. Composite Video Input Specifications *(Continued)*

Item	Specification
CMRR	60 dB @ 50/60 Hz, 5 V pk-to-pk
Setup level range	±7.5 IRE
Frequency response	±0.1 dB, 0.1 MHz to 6 MHz
SNR	62 dB, typical
Y/C gain error	< 0.1 dB
Y/C delay error	<10 ns

Table 6-6. Component Input Specifications

Item	Specification
Format	Betacam
Connector	BNC (IEC169-8)
Input level	1.0 V pk-to-pk
Quantization	• Y: 12 bits • Cb: 10 bits • Cr: 10 bits
Impedance	75Ω
Return loss	>40 dB, 1 kHz to 6 MHz
Common mode range	5.0 V
CMRR	60 dB @ 50/60 Hz, 5 V pk-to-pk
Frequency response	• Y: ±0.15 dB to 5.5 MHz • Pb/Pr: ±0.10 dB to 3.0 MHz
SNR	>60 dB

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Table 6-7. Genlock Input Specifications

Item	Specification
Connector	BNC (IEC169-8)
Impedance	75Ω
Return loss	>40 dB, 0.1 MHz to 6 MHz
Input level	• 1 V pk-to-pk, -5.0 dB to +6.0 dB for NTSC/PAL-B • 1 Vpk-to-pk, -3.5 dB to +6.0 dB for Tri-level sync (1080i/720p)
Signal type	NTSC/PAL-B analog composite ±300 mV Tri-level sync (1080i/720p)

Output

Table 6-8. HD-SDI Video Output Specifications

Item	Specification
Standard	SMPTE292M
Connector	BNC (IEC169-8)
Impedance	75 Ω
Return loss	> 18 dB, typical, from 5 MHz to 1485 MHz
Signal level	800 mV ± 10%
DC offset	0.0 V ± 0.5 V
Rise/fall time	<270 ps
Overshoot	<10% of amplitude
Jitter	<135 ps pk-to-pk

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Table 6-9. HDTV Fiber Video Output Specifications

Item	Specification
Standard	SMPTE 292M, Mode B Operation
Number of outputs	1
Connector	Single mode fiber, SC/FC/ST type (as per customer order)
Output Wavelength	1310 ± 40 nm
Output Power	-7 dBm
Rise/Fall time	<270 ps
Jitter	<135 ps pk-to-pk
Laser Safety Level	Class 1

Table 6-10. SD-SDI Video Output Specifications

Item	Specification
Standard	SMPTE259M-C, 270 Mbps, 525/625 component
Quantization	10 bits
Connector	BNC (IEC169-8)
Impedance	75Ω
Return loss	>18 dB from 5 MHz to 270 MHz
Signal level	800 mV ± 10%
DC offset	0.0 ± 0.5 V
Rise/fall time	400 ps to 1500 ps (20% to 80%)
Overshoot	<10%
Jitter	<0.2 UI (pk-to-pk)

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Table 6-11. Composite Video Output Specifications

Item	Specification
Standard	• NTSC • PAL-B • PAL-M
Connector	BNC (IEC169-8)
Quantization	12 bits
Impedance	75Ω
Return loss	>40 dB (0.1 MHz to 6 MHz)
Frequency response	±0.1 dB (0.1 MHz to 6 MHz)
DC offset	<0.0 ± 0.005 V
Differential gain	<0.5%
Differential phase	<0.5°
Y/C delay	<1 ns
Transient response	< 0.5% K Factor
SNR	>63 dB (0.1 MHz to 6 MHz)

Table 6-12. Component Output Specifications

Item	Specification
Format	Betacam
Connector	BNC (IEC169-8)
Quantization	• Y: 12 bits • Cb: 10 bits • Cr: 10 bits • GBR: 12 bits
Impedance	75Ω
Return loss	>40 dB (1 kHz to 6 MHz)
Frequency response	• Y: ±0.1 dB to 5.5 MHz • Pb/Pr: ±0.10 dB to 3.0 MHz

Table 6-12. Component Output Specifications *(Continued)*

Item	Specification
DC offset	<0.0 ± 5 mV
Relative delay	<±1 ns
SNR	>63 dB

Table 6-13. Streaming Output Specifications

Item	Specification
Connector	RJ-45
Standard	MPEG4

Table 6-14. DVI Output Specifications

Item	Specification
Standard	• 1080i/29.97 • 1080i/25 • 720p/59.97 • 480i/29.97 • 576i/25
Connector	DVI-D
Rise/fall times	75 ps to 0.4 UI (20% to 80%)
Level	1.0 V ± 0.2 V (differential, pk-to-pk)
Jitter	0.25 UI

Audio Specifications

Input

Table 6-15. AES/DARS Input Specifications

Item	Specification
Balanced	
Standard	AES3
Type	Balanced, transformer coupled
Connector	2 female DB-26/DB-44 connector with breakout cable
Sensitivity	<200 mV
Impedance	110Ω ± 20% (0.1 MHz to 6 MHz)
Common mode rejection	0 V to 7 V (0 kHz to 20 kHz)
Input audio rate	32 kHz to 108 kHz
Unbalanced	
Standard	AES3, SMPTE276M
Type	Unbalanced, AC coupled
Connector	BNC (IEC169-8)
Sensitivity	<100 mV
Impedance	75Ω
Return loss	>25 dB, 0.1MHz to 6 MHz
Input audio rate	32 kHz to 108 kHz

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Table 6-16. Analog Audio Input Specifications

Item	Specification
Connector	Removable barrier strip
Input impedance	Jumper selectable with J5~J8 • Pin 2-3: 100 kΩ • Pin 1-2: 600 Ω
Input analog level	28 dBu to 16 dBu (adjustable by 2 dB increments)
CMRR	>80 dB @ 60 Hz, typical
Linearity	<±0.5 dB (to -100 dBFS)
Frequency response	<±0.05 dB (20 Hz to 20 kHz), typical
THD	>100 dB (@ -1 dBFS, 20 Hz to 20 KHz)
SNR	>100 dB

Output

Table 6-17. AES Output Specifications

Item	Specification
Balanced	
Standard	AES3
Type	Balanced, transformer coupled
Connector	2 female DB-26/DB-44 connector with breakout cable
Signal level	4.0 V (pk-to-pk)
Impedance	110Ω ± 20% (0.1 MHz to 6 MHz)
Jitter	<± 4 ns, peak value
DC offset	0.0 ± 50 mV
Rise/fall time	5 ns to 30 ns (10% to 90%)

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Table 6-17. AES Output Specifications *(Continued)*

Item	Specification
Unbalanced	
Standard	AES3, SMPTE276M
Type	Unbalanced, AC coupled
Connector	BNC (IEC169-8)
Signal level	1.0 V ± 10% (pk-to-pk)
Impedance	75Ω
Return loss	>25 dB, 0.1 MHz to 6 MHz
Jitter	<± 5 ns, peak value
DC offset	0.0 ± 50 mV
Rise/fall time	30 ns to 44 ns (10% to 90%)

Table 6-18. Analog Audio Output Specifications

Item	Specification
Connector	Removable barrier strip
Output impedance	Jumper selectable with J1~J4, J9~J12 • Pin 2-3: 66Ω • Pin 1-2: 600Ω
Output analog level	28 dBu to 16 dBu (adjustable by 2 dB increments)
Linearity	<±0.5 dB (to -100 dBFS)
Frequency response	<±0.1dB (20 Hz to 20 kHz)
THD	>90dB (@ -1 dBFS, 20 Hz to 20 KHz), typical
SNR	>100 dB

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I/O Specifications

Table 6-19. Multi-I/O Specifications

Item	Specification
Composite output	• NTSC • PAL-B • SECAM • Sync
Component output	GBR
Time code	Input
GPI inputs	• Number: 2 • Internally pulled HIGH • External contact closure to ground to trigger
GPI outputs	• Number: 2 • TTL-compatible • 75Ω impedance • Sink 64 mA, source 32 mA
Connector	DB-26

Table 6-20. DV I/O Specifications

Item	Specification
Standard	IEEE-1394
Connector	IEEE-1394, 6 pin molex connector

Table 6-21. Control/Streaming I/O Specifications

Item	Specification
Connector	RJ-45
Protocols	• HTTP

Communication Specifications

Table 6-22. RS-232/RS-422 Specifications

Item	Specification
Standard	Electrical specification EIA-232C
Connector	• DB-9 • 232/422 switchable • 422 termination can be selected from the menu

Hardware Specifications

Table 6-23. Weight and Dimension Measurements

Item	Specification
Weight	• Fully loaded unit, no power cords: 11 lbs (4.9 kg) • Breakout cables (each): 2.5 lbs (1.1 kg)
Height	1RU, 1.75 in. (4.5 cm)
Width	19 in. (48.3 cm)
Depth (includes extruding knobs and BNCs)	21.5 in. (54.6 cm)

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Section II—Operating the X75HD

This section contains the following topics:

- Operation via Front Panel Controls
- Controlling the X75HD via Web Server Software
- Configuring Video
- Configuring Audio
- Using Special Function Buttons

After reading these chapters, you will know how to operate the X75HD using the system's front panel controls or a Web browser, and will become familiar with some of the major settings and options available from the various X75HD menus.

Chapter 8

Operation via Front Panel Controls

Overview

This chapter describes the main areas of the front panel, and provides the following general descriptions:

- "Front Panel Description" on page 102
- "Using the Control Knob and Menu Control Buttons" on page 103
- "Getting Visual Feedback: Status and Alarm LEDs" on page 107
- "Video Input LEDs" on page 111
- "Audio Input LEDs" on page 112
- "Control Mode Status LEDs" on page 113

This chapter does *not* give specific descriptions about available menus, submenus, parameters, or options. For this information, see the *X75HD Control Options* PDF document available from the Leitch Web site at www.leitch.com or on the accompanying CD.)

Detailed information on using front panel controls can be found in the *Control Panels for X75 Systems Installation and Operation Manual*. Some limited control information (such as information on video and audio proc amp status LEDs, and audio proc amp channel mappings) can be found in the following chapters:

- "Chapter 10: Configuring Video"
- "Chapter 11: Configuring Audio"
- "Chapter 12: Using Special Function Buttons"

Front Panel Description

The front panel (Figure 8-1) is divided into several areas for control and monitoring, including the following:

- VFD screen for viewing menu options, selections, feedback, and device information; changes to the display intensity and screen saver functionality can be done within the **Setup** submenu (press the **Option** button) in order to prolong the life of the VFD

- Control knob and buttons for scrolling, selecting, and setting menu options; the push and turn shaft encoder (knob) is used for menu navigation and selection, and for coarse and fine parameter adjustment; the knob direction can be changed to your preference from within the **Setup** submenu (press the **Option** button)

- 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.
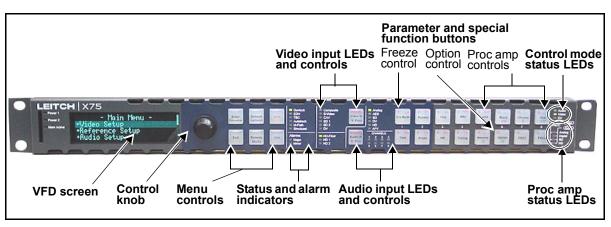

Figure 8-1. X75HD Front Panel

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Chapter 8: Operation via Front Panel Controls

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Using the Control Knob and Menu Control Buttons

All menus and device settings for the X75HD can be selected and configured by using the control knob and menu control buttons. Figure 8-2 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.
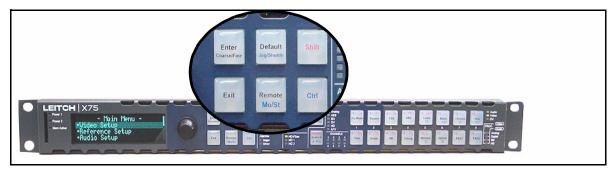

Figure 8-2. Control Knob and Menu Control Area

Setting the Direction of the Control Knob

If desired, you can change the direction of the control knob by pressing the **Option** button, opening the **Setup** menu, and selecting the **Shaft Direction** parameter.

Set the direction of the knob to either **Clockwise = Up** or **Clockwise = Down**.

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Chapter 8: Operation via Front Panel Controls

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Using Multi-Function Buttons

Many of the buttons on the X75HD control panel have multiple functions assigned to them. Multi-function buttons can have up to three functions assigned to them. To select a certain function from a multi-function button, perform one of the following steps:

Note

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

- 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 on front panel buttons, see the *Control Panels for X75 Systems Installation and Operation Manual*.

Navigating Through the Menus

To navigate through the menus, follow these steps:

1. With the idle screen displayed on the VFD panel, press **Enter** on the front panel. (If the idle screen is not currently displayed, press **Exit** repeatedly until it is.)

   The display panel shows the **Main** menu options.

2. Scroll through the menus using the control knob to highlight a desired submenu.

3. Press **Enter** to open the submenu.

4. Scroll through the options and parameters using the control knob, and then press **Enter** to make a selection.

   See "Changing Parameters" on page 105 for more information.

5. Press **Exit** to go back a step in the menu structure. If you are in the **Main** menu, press **Enter** to return to the idle screen.

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Changing Parameters

Once you have selected an option from a particular menu or submenu, use the control knob on the front panel to set the new value for the parameter following the methods described below.

Alternatively, you can use the RCP-X75 to remotely control the X75HD. See "Configuring Network Settings" on page 68 and "Remotely Controlling X75HD Systems" on page 73 for more information on configuring the X75HD for remote control.

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.

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Chapter 8: Operation via Front Panel Controls

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Setting a Numerical Value

For parameters that have a numerical range of values, the VFD panel shows both a numeric and a visual representation of the range. Figure 8-3 shows this representation.
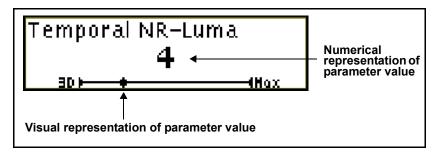

Figure 8-3. VFD Showing Numerical Range of Values

To set a parameter with a numerical 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.

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Chapter 8: Operation via Front Panel Controls

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Getting Visual Feedback: Status and Alarm LEDs

The status and alarm LEDs provide visual feedback on the current mode and operating conditions of the unit. These LEDs are located together in the center of the panels, as shown in Figure 8-4.
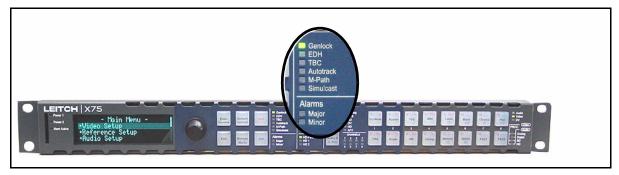
Figure 8-4. Status LED Area

Genlock Status LED

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

Table 8-1. 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 both SDI1 and SDI2 inputs for status reporting.

Table 8-2. EDH LED Status Definitions

LED Status	Operating Condition
On	The EDH feature is in operation.
Off	The EDH feature is turned off or EDH is not present on the input signal.
Flashing	EDH detection is enabled and EDH errors have been detected and not yet cleared by the operator. See the EDH Error Count menu option for a count of errors.

TBC Status LED

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

Table 8-3. 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).
Flashing	The time base corrector is not operating correctly.

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Chapter 8: Operation via Front Panel Controls

Autotrack Status LED

The Autotrack LED indicates whether or not the audio Auto Track mode is enabled.

Table 8-4. Autotrack LED Definitions

LED Status	Operating Condition
On	The audio delay feature is selected to match the delay of video data through the synchronizer (up to four fields).
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 8-5. 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 8-6. Simulcast LED Definitions

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

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Chapter 8: Operation via Front Panel Controls

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Major and Minor Alarm LEDs

The Major and Minor Alarm LEDs are activated from the enabled list of alarms found in the unit's parameter list. Major alarms are red; minor alarms are amber. The local and remote control panels detect alarms that are anywhere on the network of X75 units.

Table 8-7. 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.

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Video Input LEDs

Directly 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 with the video input sources. When more than one video sources are 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.

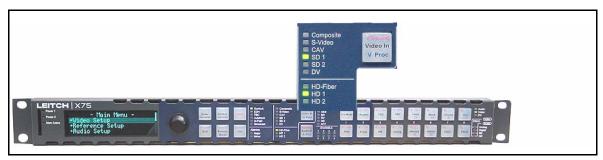See "Chapter 10: Configuring Video" for more information.

Figure 8-5. Video Input LED Area

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Chapter 8: Operation via Front Panel Controls

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Audio Input LEDs

Directly 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.

See "Chapter 11: Configuring Audio" for more information.

Figure 8-6. Audio Input LED Area

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Control Mode Status LEDs

The Audio, Video, DV LEDs indicate the current focus of control. Whenever an audio parameter adjustment is made, the Audio LED lights. Whenever a video parameter adjustment is made, the Video LED lights. When the DV control is enabled, the DV LED lights.

Figure 8-7. Control Mode Status LED Area

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Chapter 8: Operation via Front Panel Controls

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Chapter 9

Controlling the X75HD via Web Server Software

Overview

📝 **Note**

Web browsers do not automatically update when server information changes. As a result, your Web page may contain stale information. Using the **Back** and **Forward** buttons on your browser may also present you with stale data. Before monitoring a device, be sure to click **Refresh** on your browser to get the latest information from theX75HD server.

Once the networking parameters of the X75HD have been configured appropriately, and it is connected to the Ethernet network, you can control the unit through standard Web browsing software (for example, Microsoft® Internet Explorer 6.0, Netscape® Navigator™ 7.2, or Mozilla® Firefox™ 1.0). See "Configuring for HTTP Control (via Web Browser)" on page 76 for more information.

Controlling the X75HD remotely from your PC through a standard Web browser gives you the same options for control and alarm monitoring as other local and remote control methods, without the additional costs of purchasing control panels or specialized software applications. Using a Web browser to control the X75HD does not require any special hardware or software.

The following topics are discussed in this chapter:

- "Accessing the X75HD/Launching the Web Server Software" on page 116
- "Controlling Devices" on page 117
- "Navigating Menus and Options via the Menu Navigation Tree" on page 123
- "Monitoring Alarms" on page 124
- "Getting Help" on page 126

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Chapter 9: Controlling the X75HD via Web Server Software

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Accessing the X75HD/ Launching the Web Server Software

To access the X75HD, open a supported Web browser on your computer (supported browsers include MS IE 6.0, Netscape Navigator 7.2, and Mozilla Firefox 1.0, among others).

In the **Address**, **Location**, or **URL** field of your Web browser (the name depends on the browser), type `http://` followed by the **IP Address** of the X75HD you want to control. For example, if the X75HD is configured with the IP Address 10.0.0.1, you would enter the following location into your Web browser:

```
http://10.0.0.1
```

The Web browser then displays the Home page of the X75HD Control interface (hereafter referred to as the "Web server"), as shown in Figure 9-1.
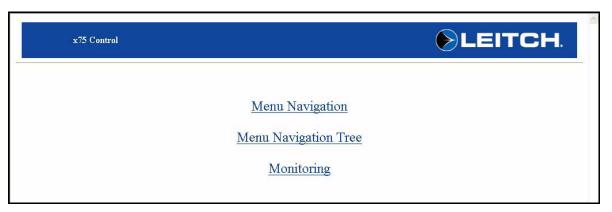

Figure 9-1. X75HD Control Home Page for Web Server

The Home page provides three options:

- **Menu Navigation** (see page 123)
- **Menu Navigation Tree** (see page 117)
- **Monitoring** (see page 124)

Click an option to open the desired control page.

Controlling Devices

Click **Menu Navigation** from the Home page to open the **Main** menu page. The **Main** menu page provides access to all available X75HD menus and options. These menus mirror those accessible through the local and remote control panels of the unit.

Navigating from the Main Menu Page

The **Main** menu page lists several major submenus through which you can navigate to a required parameter/setting. Click a menu to open the corresponding configuration page. Continue to navigate through the resulting submenus until you reach the desired parameter you wish to set.

The **Main** menu also has a number of individual parameters that can be set directly from this page. Click a parameter name from the **Main** menu table to change the value; a separate parameter configuration page will open.

Figure 9-2 on page 118 describes the **Main** menu page interface. Figure 9-3 on page 119 illustrates the sequence of pages that results during navigation.
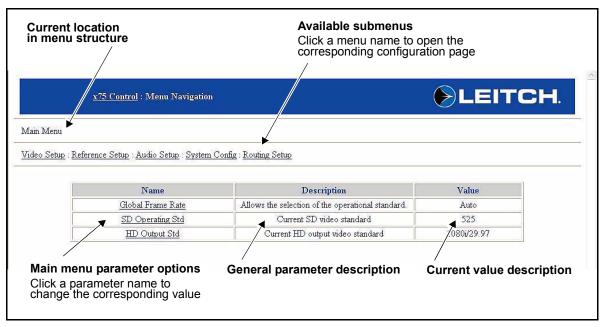
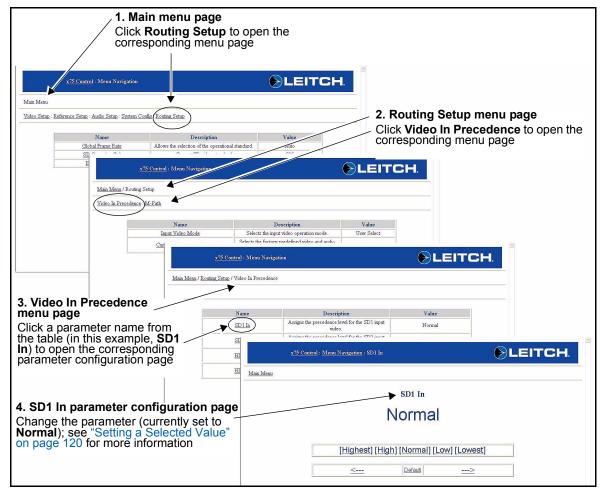Preliminary—Contents are proprietary and confidential. Do not photocopy or distribute.

Chapter 9: Controlling the X75HD via Web Server Software

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Figure 9-2. Main Menu Page

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Figure 9-3. Sequence of Pages that Result During Navigation (Example)

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Chapter 9: Controlling the X75HD via Web Server Software

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Setting a Selected Value

To set a parameter value, navigate through the required menu and submenu structure until you reach the desired option. Click the parameter name from the table to open the corresponding parameter page and to modify its value.

Individual parameter pages show a minimum, maximum, and default value for a selected option. Click a minimum or maximum value, or enter a specific value in the provided text field, to change the parameter setting. Alternatively, you can click the >> or << arrows to increase or decrease the values incrementally, or click **Default** to return the parameter to its factory setting. (See Figure 9-4.)
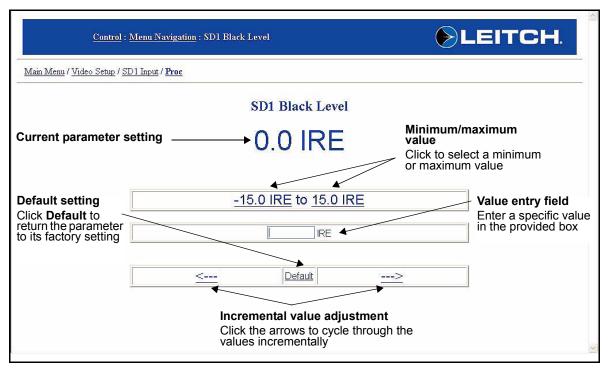

Figure 9-4. Setting a Parameter Value (Range)

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For parameter options with discrete values, all of the available values are displayed. Click one of the values to set the option for that value. Alternatively, you can click the >> or << arrows to cycle through the values, or click **Default** to return the parameter to its factory setting. (See Figure 9-5).
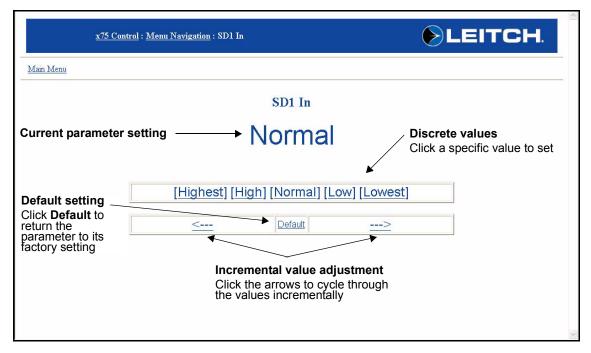

Figure 9-5. Setting a Parameter Value (Discrete)

> 📝 **Note**
>
> To ensure that the values shown on your screen are current, be sure to refresh the screen on your browser regularly.

Some parameters are read-only, or status reporting, options that cannot be changed. Others may be disabled and unavailable for configuration. (See Figure 9-6 on page 122.) If you require more information about the read-only function, click **Read-Only** to open a Help page. The Help page provides general information about read-only and disabled parameters. See "Getting Help" on page 126 for more information.

Figure 9-6. Viewing a Read-Only Parameter

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Navigating Menus and Options via the Menu Navigation Tree

Click **Menu Navigation Tree** from the Home page to present the X75HD menu structure for selecting and setting options. These menus mirror those accessible through the local and remote control panels of the unit.

The menu listings display available menus and submenus. Click any of these to open the corresponding configuration page. Figure 9-7 shows a sample of the **Menu Navigation Tree** page and a resulting configuration page that opens when you click a submenu.
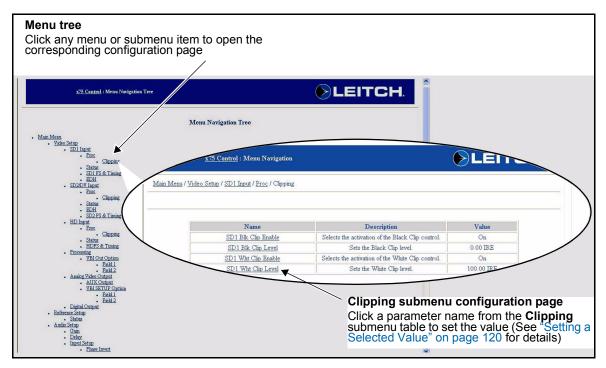
Figure 9-7. Menu Navigation Tree Control Page

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Chapter 9: Controlling the X75HD via Web Server Software

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Monitoring Alarms

Click **Monitoring** from the Home page to open the **X75 Alarms** page and view or change the status of various of alarms and events. (See Figure 9-8 on page 125.)

The **Alarms** table groups alarms and events into the following categories: Active Alarms, Inactive Alarms, and Disabled Alarms.

- Apply the Disabled designation to those alarms you do not want reported.

  Disabled alarms are listed in Disabled Alarm list at the bottom of the table.

- The Inactive designation is applied automatically to those items that do not have an alarm associated with them.

- An Active designation means that an alarm is detected.

Alarms listed under the Inactive Alarms or Active Alarms categories are always enabled. To change the status of an alarm, follow one of these procedures:

- To disable an alarm, click **Disable** from the Action column for the appropriate alarm.The alarm will then move to the Disabled Alarms list at the end of the table.

- To enable an alarm from the Disabled Alarms list, click **Enable** from the Action column for the appropriate alarm. The alarm will then return to either the Active Alarms or Inactive Alarms list.

For all alarm categories, the name of the alarm is reported in the Alarm Name column along side the associated Alarm_Priority level.
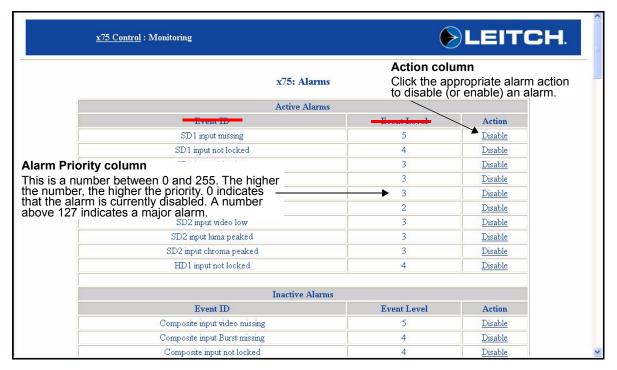
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Chapter 9: Controlling the X75HD via Web Server Software

Figure 9-8. Alarm Monitoring Page

Getting Help

For certain parameters, help text is provided to answer why a parameter may be disabled or is available only as a "read-only" item. On parameter setting pages where you cannot change the value, click **Read-Only** to open the provided **Help** page. The **Help** page provides general information about read-only and disabled parameters. See Figure 9-9.
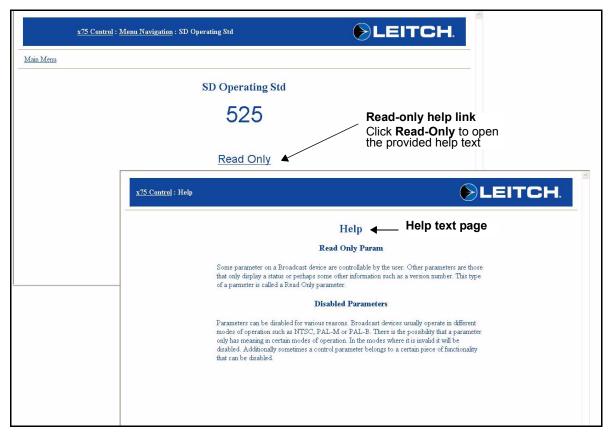

Figure 9-9. Read-Only Parameter Sample

Chapter 10

Configuring Video

Overview

This chapter briefly describes the major video configuration options that can be changed in the course of normal operation.

The following topics are found in this chapter:

See the following for more detailed information:

- For information on control panel shortcuts to audio settings, see the *Control Panels for X75 Systems Installation and Operation Manual*.

- For a list of all available menus and parameter options, see the separate *Parameter Options* document available for download from either the Leitch Web site (www.leitch.com) or the included X75HD documentation CD.

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Chapter 10: Configuring Video

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Selecting a Video Source

General Information

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. The M-Path (multiple inputs) selection allows any output group to be assigned with the video input sources. When two or more video sources are selected and mapped to multiple output groups, the M-Path and corresponding video input source LEDs will be lit. When the selected input signal is absent, the LED flashes. Available inputs include the following:

• Analog Out Sel

• HD Sel

• SDI1 Out Sel

• SDI2 Out Sel

If the **Auto Detect** feature is enabled when a selected input option is not installed or detected, the panel accepts the next available input. If **Auto Detect** is not enabled, the selected **Video In** LED flashes.

Procedure

📝 Note

If you press the **Video In** button and then manually select a video source, the X75HD unit reverts to **User-Select** mode. Video modes are found under **Routing Setup** > **Input Video Mode**.

X75HD units are shipped with **Auto-Detect** video mode as the factory default setting. This mode sets the X75HD to automatically detect between analog, SD1, SD2, DV, HD-F, HD1, HD2, Composite, and S-video inputs. When video is connected to any of these inputs, the X75HD automatically selects the applied input video and then sends out the converted video to all outputs. The Video Input LEDs on the front panel show the selected video source.

For analog video sources, only a single video source can be automatically detected. Therefore, you must pre-select the desired analog input video source first in order for auto-detection to work across the HD/SD/analog inputs.

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Chapter 10: Configuring Video

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 scroll through the list of input types, and then press to **Enter** to select one.

When multiple video sources are connected, the **Video In Precedence** setting determines the selection of the input video. For example, if the X75HD unit detects two input signals, it will accept the signal tagged as **Higher** over another signal that has been given a lower-precedence. Found in the top-level **Routing Setup** menu, precedence levels include **Highest**, **High**, **Normal**, **Low**, or **Lowest**. You can set them to have different precedent levels, or to be all the same. If all input types are assigned the same precedence level, then the X75HD unit defaults to the SD1 as the master source and/or a default ordering applies (reflected top-down in the menu order).

Figure 10-1 graphically illustrates a single-source signal process, where one selected video input is fed to all outputs.
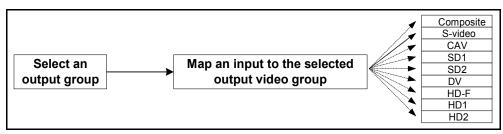

Figure 10-1. Single-Source Processing

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Adjusting Video Levels

Various control panel buttons provide quick access to the video processing parameters of a selected video source. Simply press a button and use the control knob to change the selection.

Chapter 11

Configuring Audio

Overview

This chapter describes the audio configuration options that can be changed in the course of normal operation.

The following topics are found in this chapter:

-
-
-
-

See the following for more detailed information:

- For information on control panel shortcuts to audio settings, see the *Control Panels for X75 Systems Installation and Operation Manual*.
- For a list of all available menus and parameter options, see the separate *Parameter Options* document available for download from either the Leitch Web site (www.leitch.com) or the included X75HD documentation CD.

General Information

With control panel shortcuts, you can select an input (or multiple inputs) and immediately send it to all audio outputs. Directly 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
- 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

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.

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Selecting an Audio Source

Directly 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.

Adjusting Audio Levels

When a single audio source is selected and sent to all outputs, press the **Ctrl** and **A. Proc** buttons to quickly access the audio level controls of the selected audio input.

The selected audio input channels' Gain controls are mapped to the numbered buttons on the control panel accordingly. The mapped buttons will illuminate during audio proc control. The audio Proc LEDs on the lower, right corner of the front panel indicate which processing block is currently selected.

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Chapter 11: Configuring Audio

Audio LED Mappings

When you press the **Audio In** or **Ctrl + A Proc** button on a local or remote control panel, or if you make audio input selections via your Web browser software or other control application, certain parameters and audio proc amp buttons get mapped, and various Channel LEDs and Audio I/P LEDs will light according to the selected input configuration. The following tables describe the LEDs, buttons, and that are assigned to selected input sources.

Selecting an Audio Input

Directly press **Audio In** to select any one input to be sent out to all audio outputs. Alternatively, open the **Audio Setup** menu and navigate to **Routing** submenu. From here you can select and configure your audio inputs.

After configuring you audio inputs, the following LEDs will light (see Figure 11-1 on page 135 for their locations):

- The Audio Mode LED on the far right side of the front panel (top) indicate the current mode of operation.

- The Audio Proc LED(s) on the far right side of the front panel indicates the current processing mode.

- The Audio Input LEDs to the top, right of the button indicate which input is currently selected.

- The Audio Channel LEDs immediately to the right of the button indicate which audio channels are mapped and internally routed to the SRC channels. (The Channel LED blinks if the corresponding audio signal is missing in both mono and stereo cases).

  See "Proc Amp Controls" on page 141 for information on LED and channel mappings on a frame-mounted local control panel or RCP-X75 remote control panel.
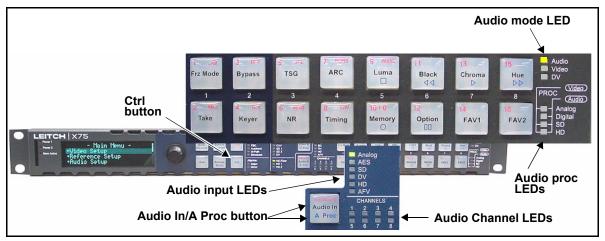
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Chapter 11: Configuring Audio

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Figure 11-1. Location of Audio LEDs

Accessing Audio Level Controls

Press the **Ctrl** and **A Proc** buttons together to quickly access the audio level controls of a selected audio input. Along with LEDs, the selected audio input channel's gain controls will be mapped to specific numbered buttons on the right side of the front panel. These buttons will light during audio processing and configuration.

See for information on LED and channel mappings on a frame-mounted local control panel or RCP-X75 remote control panel.

AFV (Audio Follows Video) Mode

> **📝 Note**
>
> The AFV mode currently functions on the SDI1 input.

In AFV mode, each of the selectable video inputs has an audio input selection linked to it. With this feature enabled, the audio input selection for the channel automatically changes when the video input is changed.

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-SD1** parameter specifies the audio input for **SRC Channel 1** will be automatically switched when the **SD Out Sel** parameter changes to **SD1**.

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Chapter 11: Configuring Audio

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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 11-2 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 SD1 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 SD1 input video is selected, all four groups of de-multiplexed audio channels are routed through eight SRC channels.
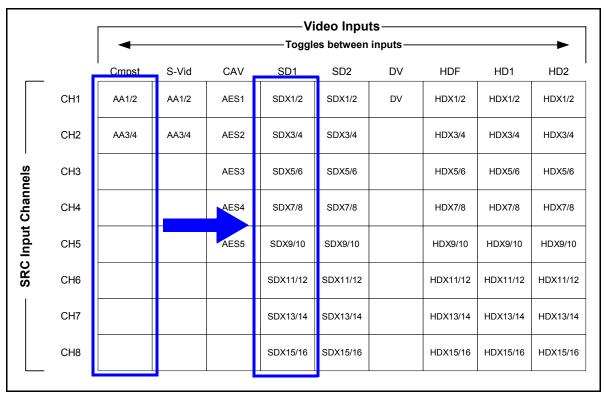
	Video Inputs								
	Toggles between inputs								
	Cmpst	S-Vid	CAV	SD1	SD2	DV	HDF	HD1	HD2
CH1	AA1/2	AA1/2	AES1	SDX1/2	SDX1/2	DV	HDX1/2	HDX1/2	HDX1/2
CH2	AA3/4	AA3/4	AES2	SDX3/4	SDX3/4		HDX3/4	HDX3/4	HDX3/4
CH3			AES3	SDX5/6	SDX5/6		HDX5/6	HDX5/6	HDX5/6
CH4			AES4	SDX7/8	SDX7/8		HDX7/8	HDX7/8	HDX7/8
CH5			AES5	SDX9/10	SDX9/10		HDX9/10	HDX9/10	HDX9/10
CH6				SDX11/12	SDX11/12		HDX11/12	HDX11/12	HDX11/12
CH7				SDX13/14	SDX13/14		HDX13/14	HDX13/14	HDX13/14
CH8				SDX15/16	SDX15/16		HDX15/16	HDX15/16	HDX15/16

SRC Input Channels

Figure 11-2. Default AFV Channel Assignment

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Chapter 11: Configuring Audio

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. 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**).
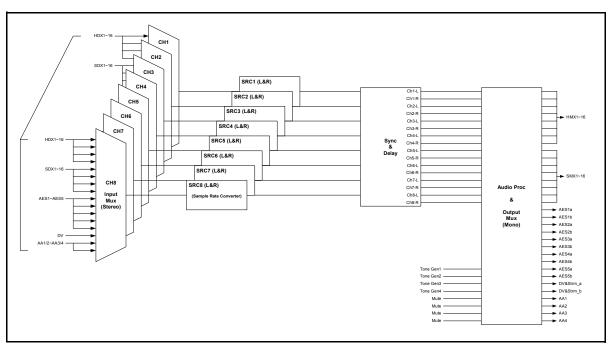

Figure 11-3. Advanced Audio Signal Routing

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Chapter 11: Configuring Audio

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<div align="right">Chapter 12</div>

Using Special Function Buttons

Overview

This chapter describes various special function buttons found on the frame-mounted local control panel or RCP-X75 remote control panel, including the following:

- "Using the Freeze Control" on page 140
- "Using Proc Amp Controls" on page 141
- "Using the Memory Function" on page 147
- "Using the FAV1 and FAV2 Function" on page 150
- "Using the Bypass Function" on page 151
- "Using the Keyer, Test Signal Generator (TSG), and Noise Reducer (NR) Functions" on page 151
- "Using the ARC Function" on page 151
- "Using the Timing Control" on page 151
- "Using Option Controls" on page 152

See the following for more detailed information:

- For information on control panel shortcuts to audio settings, see the *Control Panels for X75 Systems Installation and Operation Manual*.

- For a list of all available menus and parameter options, see the separate *Parameter Options* document available for download from either the Leitch Web site (www.leitch.com) or the included X75HD documentation CD.

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Chapter 12: Using Special Function Buttons

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Using the Freeze Control

The freeze controls provide instant access to freezing individual frame syncs. It is important to note that this action only freezes the currently active video proc amp block.

Press **Frz Mode** to open a menu where you can select a Freeze mode to apply to the incoming video. This is the same as the **Freeze** mode menu option. The control knob can be used for selection.

The available modes are:

- Field1: Freezes the field 1 of the incoming video
- Field2: Freezes the field 2 of the incoming video
- Frame: Freezes an entire frame of the incoming video
- Strobe: Strobes the incoming video
- Film: Applies a 3:2 pull-down to the incoming video, effectively giving a simulated 24 fps look to the video output

Press **Take** to activate the selected Freeze mode and apply it to the incoming video. The LED on the **Take** button flashes while Freeze mode is active. Press **Take** again to return to the live video feed.

If Strobe Freeze mode is selected, the display panel indicates the current strobe rate (number of frames per update) applied to the incoming video (1 to 255). This will initially be the same as the value of the **Strobe Rate** parameter. The control knob changes the rate (and the **Strobe Rate** parameter updates accordingly).

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Using Proc Amp Controls

Video Proc Amp

There are four internal input video proc amps: HD, SD1, SD2 and Analog.

• HD1, HD2 and HD-Fiber inputs share the HD video proc amp.

• SD1 input has its own dedicated SD1 video proc amp.

• SD2 and DV inputs share the SD2 video proc amp.

• Composite, S-video and CAV inputs share the analog video proc amp.

The four most commonly used video processing controls are available from the control panel as the hot buttons, and include the following:

• **Luma**: Can be mapped to Analog Luma Gain, SD1 Luma Gain, SD2 Luma Gain, HD Luma Gain

• **Black**: Can be mapped to Analog Black Level, SD1 Black Level, SD2 Black Level, HD Black Level

• **Chroma**: Can be mapped to Analog Chroma Gain, SD1 Chroma Gain, SD2 Chroma Gain, HD Chroma Gain

• **Hue**: Can be mapped to Analog Hue Phase, SD1 Hue Phase, SD2 Hue Phase

The VFD briefly displays the selected video proc amp block when the **Ctrl** and **V Proc** buttons are pressed simultaneously.

Video Proc Amp Status LEDs

The three Video Proc LEDs (Analog, SD, HD) on the far right side of the front panel become active whenever the control panel is set to adjust the video parameters. They indicate which input video processing block is currently selected for the adjustments.

• Analog: It lights when the analog video proc amp is selected

• SD: It lights when the SD1 or SD2 video proc amp is selected. When a shortcut (front panel) button is pressed, the parameter prefix on the VFD display indicates which video processing block is currently active.

• HD: It lights when the HD video proc amp is selected.

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Chapter 12: Using Special Function Buttons

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Audio Proc Amp Controls

For X75HD unit equipped with the AS-X75HD module, it allows up to 16 mono channels to be synchronized, delayed and processed through the system. Depending on the selected audio source group type, the numbered buttons 1 through 16 are mapped accordingly to allow quick access to its audio gain controls.

The audio source group types include the following:

- 4 mono channels of analog audio
- 5 AES channels
- DV audio
- 16 channels from the SD demultiplexer
- 16 channels from the HD demultiplexer

Tables 12-1 through 12-6 in the pages below describe the button mappings for single audio source configurations.

Single Source Configuration

Tables 12-1, 12-2, 12-3, and 12-4 show the mapped buttons on the control panels and the parameters affected when you use a single source of analog, AES, SD demuxed, and HD demuxed audio.

For more information about the items in these tables (for example, what each of the column headings refer to), see "Appendix to Tables" on page 145.

Table 12-1. 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	

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LEITCH   Chapter 12: Using Special Function Buttons

Table 12-2. 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 12-3. SD Demuxed Audio Selected (SDX)

Selected Inputs	Lit Channel LEDs	Lit Audio Input LEDs	Mapped Parameters	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
SD1/2	1	SD	Gain1, Gain2	1, 2	SD
SD3/4	2		Gain3, Gain4	3, 4	
SD5/6	3		Gain5, Gain6	5, 6	
SD7/8	4		Gain7, Gain8	7, 8	
SD9/10	5		Gain9, Gain10	9, 10	
SD11/12	6		Gain11, Gain12	11, 12	
SD13/14	7		Gain13, Gain14	13, 14	
SD15/16	8		Gain15, Gain16	15, 16	

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Chapter 12: Using Special Function Buttons

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Table 12-4. HD Demuxed Audio Selected (HDX)

Selected Inputs	Lit Channel LEDs	Lit Audio Input LEDs	Mapped Parameters	Mapped Buttons on Control Panel	Lit Audio Proc LEDs
HD1/2	1	HD	Gain1, Gain2	1, 2	HD
HD1/2	2		Gain3, Gain4	3, 4	
HD1/2	3		Gain5, Gain6	5, 6	
HD1/2	4		Gain7, Gain8	7, 8	
HD1/2	5		Gain9, Gain10	9, 10	
HD1/2	6		Gain11, Gain12	11, 12	
HD1/2	7		Gain13, Gain14	13, 14	
HD1/2	8		Gain15, Gain16	15, 16	

Multiple Audio Input Source Configurations

Tables 12-5 and 12-6 show the mapped buttons on the control panels and the parameters affected when you use multiple sources of analog, AES, SD and SD audio. Use the **Ctrl** + **A Proc** buttons to switch between the audio input types.

Table 12-5. Multiple Audio Inputs Selected

Selected Inputs	Lit LED Channels	Lit Audio Input LEDs	Mapped Parameters
AA1/2	1	Analog	Gain1, Gain2
AA3/4	2		Gain3, Gain4
AA5/6	3	AES	Gain5, Gain6
AA7/8	4		Gain7, Gain8
AA9/10	5	SD	Gain9, Gain10
AA11/12	6		Gain11, Gain12
AA13/14	7	HD	Gain13, Gain14
AA15/16	8		Gain15, Gain16

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Chapter 12: Using Special Function Buttons

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Table 12-6. 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	

Appendix to Tables

Tables 12-1 through 12-6 describes the various channels, LEDS, gain controls, and control panel buttons that are affected/activated by the selection of certain inputs. Table 12-7, below, provides some general information and definitions about each of these items.

Table 12-7. Table Definitions

Item	Description
Items Applied/Enabled when you Press the "Audio In" Button	
Selected Inputs	This identifies the selected input source. Select an input using the X75 Web server software (via a Web browser), or by pressing **Audio In Src** on a control panel.
Lit Channel LEDs	This identifies the audio channels (and their LEDs) that correspond with your selected audio input source. Find these eight LEDs directly to the right of the **Audio In/A Proc** button on a control panel. Options include Analog, AES, SD, DV, HD, and AFV (Audio Follow Video).

Table 12-7. Table Definitions *(Continued)*

Item	Description
Lit Audio Input LEDs	This identifies the audio input LED that lights when an input source is selected. Find these LEDs above, and to the right, of the **Audio In/A Proc** button on a control panel.
Mapped Parameters	This identifies the selected audio input channel's gain controls/parameters that are now enabled and available once a certain audio input source is selected.
Items Applied/Enabled when you Press the "Ctrl" + "A Proc" Buttons	
Lit Channel LEDs	This identifies the audio channels (and their LEDs) that correspond with your selected audio input source. Find these eight LEDs directly to the right of the **Audio In/A Proc** button on a control panel.
Mapped Buttons on Control Panel	This identifies the audio proc amp buttons on the right side of the control panel (labelled 1 through 16) that become mapped to/correspond with the selected audio input channel's gain controls. Mapped buttons are backlit; unmapped buttons remain dimmed. Once mapped, simply press a numbered button to enable the gain controls assigned to it
Lit Audio Proc LEDs	This identifies the audio proc LED that lights when an audio input source type is selected. Find these four LEDs on the far right side of the control panel. Options include Analog, Digital, SD, and HD.

Audio Proc Amp Status 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.

- Analog: It lights during analog audio channels gain adjustments.

- Digital: It lights for AES and DV channel audio gain adjustments.

- SD: It lights during SDX (SD demuxed) channel audio gain adjustments.

- HD: It lights during HDX (HD demuxed) channel audio gain adjustments.

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Using the Memory Function

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

Procedure

To save a preset, follow these steps:

1. Press **Memory**.

   A menu pops up with the following options:
   - Save Preset
   - List 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**).

Procedure

To recall a preset, follow these steps:

1. Press **Memory**.

   A menu opens with the following options:
   - Save Preset
   - List Presets

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:
   - Recall Preset
   - Rename Preset
   - Move Up
   - Move Down
   - Delete Preset

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

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Chapter 12: Using Special Function Buttons

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

   Your preset is recalled.

Procedure

To rename a preset, follow these steps:

1. Press **Memory**.

   A menu opens with the following options:

   - Save Preset
   - List 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:

   - Recall Preset
   - Rename Preset
   - Move Up
   - Move Down
   - Delete 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.

Procedure

To delete preset, follow these steps:

1. Press **Memory**.

   A menu opens with the following options:

   - Save Preset
   - List Presets

2. Select **List Presets**.

3. Scroll to the preset you would like to delete.

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Chapter 12: Using Special Function Buttons

4. Press **Memory** again, or press **Enter**.

    A menu opens with the following options:

    - Recall Preset

    - Rename Preset

    - Move Up

    - Move Down

    - Delete Preset

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

    A confirmation box appears stating that the preset was deleted.

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Chapter 12: Using Special Function Buttons

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Using the FAV1 and FAV2 Function

The **Fav1** and **Fav2** buttons store lists of favorite menu locations or controllable parameters.

Procedure

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**.

Procedure

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, and then press **Enter**.

4. Press **Fav1** or **Fav2** again.

   A menu opens with the following options:
   - Delete Favorite
   - Move up
   - Move down

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.

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Chapter 12: Using Special Function Buttons

Using the Bypass Function

Only the SD1 input-to-output video path has the physical relay bypass capability. When the X75HD 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. When the Bypass mode is active, the **Bypass** button flashes.

Using the Keyer, Test Signal Generator (TSG), and Noise Reducer (NR) Functions

These functions and controls are reserved for future implementation.

Using the ARC Function

The **ARC** button allows quick access to **ARC (HD Out)** and **ARC (SD Out)** controls. When the HD video proc amp block is selected, press the **ARC** button go directly to the **ARC (HD Out)** controls. When the SD1, SD2 or analog video proc amp block is selected, press the **ARC** button go directly to the **ARC SD Out** controls.

Depending on the video configuration, you will have to manually select the appropriate ARC controls to apply the settings to outputs.

Using the Timing Control

The **Timing** button allows quick access to the selected video proc amp's timing controls. For example, if you press this button when the analog video Proc LED is lit, you will go directly to the **AVFS & Timing** menu node's first available control.

Using Option Controls

The **Option** control panel shortcut allows quick access to parameters that 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:

- **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.

- **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.

- **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.

- Alarms: Using this parameter, you can set the parameters for alarms on your network of RCP-X75-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.

- **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**.

- **Setup**: The **Setup** menu contains a number of parameters that affect how your display screen operates.

More information on each of these control options can be found in the *Control Panels for X75 Systems Installation and Operation Manual*.

Section III—Appendixes

This section contains the following topics:

- Cables and Pinouts
- Troubleshooting
- Servicing Instructions

These appendixes contain extra information useful for configuring, operating, and servicing your X75HD system.

<div align="right">

Appendix A

Cables and Pinouts

</div>

Overview

This appendix describes various cable options and I/O, video, and audio cable pinouts (both standard and optional) available for use with the X75HD, including the following:

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Appendix A: Cables and Pinouts

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Multi I/O Cable (CAB-X75MULTI)

Figure A-1 identifies the cable connectors available on the optional multiple input/output CAB-X75MULTI cable.
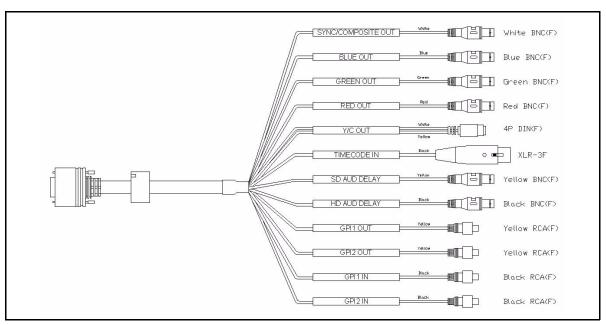
Figure A-1. CAB-X75MULTI Cable Connectors

Figure A-2 shows the pinouts for the CAB-X75MULTI DB-26M connector.
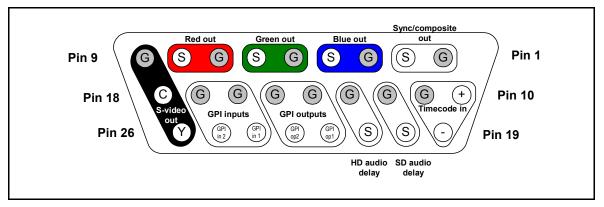
Figure A-2. CAB-X75MULTI I/O Connector Pinout

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Appendix A: Cables and Pinouts

Table A-1 describes each pin on the CAB-X75MULTI DB-26M connector and its connection type.

Table A-1. CAB-X75-MULTI I/O Pinout Descriptions

Pin Number	Connection Type	Description
1	BNC-Gnd	Sync/composite out ground
2	BNC	Sync/composite out signal
3	BNC-Gnd	Blue out ground
4	BNC	Blue out signal
5	BNC-Gnd	Green out ground
6	BNC	Green out signal
7	BNC-Gnd	Red out ground
8	BNC	Red out signal
9	4-Pin DIN-1-Gnd 4-Pin DIN-2-Gnd	S-video (Y) ground S-video (C) ground
10	XLR-2	Timecode in (+)
11	XLR-1-Gnd	Timecode shield
12	BNC-Gnd	SDTV audio delay ground
13	BNC-Gnd	HDTV audio delay ground
14	RCA-Gnd	GPI out 1 ground
15	RCA Gnd	GPI out 2 ground
16	RCA Gnd	GPI in 1 ground
17	RCA Gnd	GPI in 2 ground
18	4-Pin DIN-4	S-video (C) out
19	XLR-3	Timecode in (−)
20	BNC	SDTV audio delay out
21	BNC	HDTV audio delay out
22	RCA	GPI out 1
23	RCA	GPI out 2

Table A-1. CAB-X75-MULTI I/O Pinout Descriptions *(Continued)*

Pin Number	Connection Type	Description
24	RCA	GPI in 1
25	RCA	GPI in 2
26	4-Pin DIN-3	S-video (Y) out

DVI-D Output Cable (CAB-X75-DVI)

The optional DVI-D to DVI-D digital single-link cable connects a monitor to the DVI port on the back of the X75HD unit. This is a straight connection cable with no breakouts, and a single DVI-D connector for digital video output.

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Appendix A: Cables and Pinouts

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Standard Audio Coax Cable (CAB-X75-COAX)

Figure A-3 identifies the cable connectors available on the standard AES/EBU audio CAB-X75-COAX cable, which supports only the unbalanced audio signal.
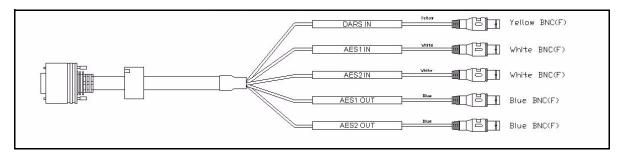

Figure A-3. CAB-X75-COAX Cable Connectors

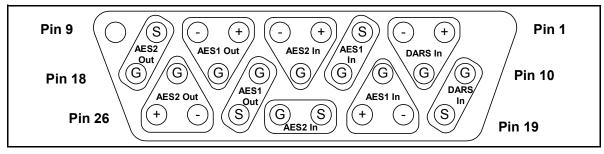Figure A-4 shows the pinouts for the CAB-X75-COAX DB-26M connector.
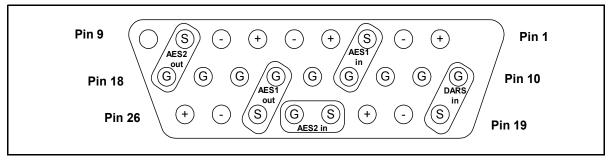
Figure A-4. CAB-X75HD-COAX Connector Pinout

Table A-2 describes each pin on the CAB-X75HD-COAX DB-26M connector and its connection type.

Table A-2. CAB-X75HD-COAX Pinout Description

Pin Number	Connection Type	Description
1	NC	N/A
2	NC	N/A
3	BNC	Unbalanced AES1 in

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◆LEITCH. Appendix A: Cables and Pinouts

Table A-2. CAB-X75HD-COAX Pinout Description *(Continued)*

Pin Number	Connection Type	Description
4	NC	N/A
5	NC	N/A
6	NC	N/A
7	NC	N/A
8	BNC	Unbalanced AES2 out
9	NC	N/A
10	BNC-GND	Unbalanced DARS in ground
11	NC	N/A
12	NC	N/A
13	BNC-GND	Unbalanced AES1 in ground
14	NC	N/A
15	BNC-GND	Unbalanced AES1 out ground
16	NC	N/A
17	NC	N/A
18	BNC-GND	Unbalanced AES2 out ground
19	BNC	Unbalanced DARS in
20	NC	N/A
21	NC	N/A
22	BNC	Unbalanced AES2 in
23	BNC-GND	Unbalanced AES2 in ground
24	BNC	Unbalanced AES1 out
25	NC	N/A
26	NC	N/A

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Appendix A: Cables and Pinouts

Standard Audio Coax Cable (CAB-X75HD-COAX)

Figure A-5 identifies the cable connectors available on the standard AES/EBU CAB-X75HD-COAX audio cable, which supports only the unbalanced audio signal.
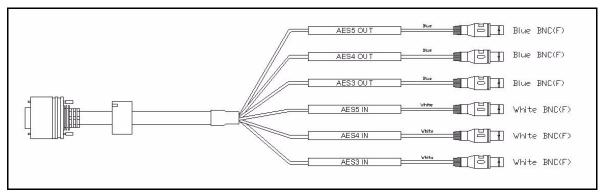
Figure A-5. CAB-X75HD-COAX Cable Connectors

Figure A-6 shows the pinouts for the CAB-X75HD-COAX DB-44M connector.
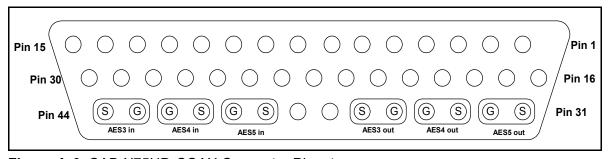
Figure A-6. CAB-X75HD-COAX Connector Pinout

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Appendix A: Cables and Pinouts

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Table A-3 describes each pin on the CAB-X75HD-COAX DB-44M connector and its connection type.

Table A-3. CAB-X75HD-COAX Pinout Description

Pin Number	Connection Type	Description
1 through 30	NC	N/A
31	BNC	Unbalanced AES5 out
32	BNC-Gnd	Unbalanced AES5 out Ground
33	BNC	Unbalanced AES4 out
34	BNC-Gnd	Unbalanced AES4 out ground
35	BNC-Gnd	Unbalanced AES3 out ground
36	BNC	Unbalanced AES3 out
37	NC	N/A
38	NC	N/A
39	BNC	Unbalanced AES5 in
40	BNC-Gnd	Unbalanced AES5 in ground
41	BNC	Unbalanced AES4 in
42	BNC-Gnd	Unbalanced AES4 in ground
43	BNC-Gnd	Unbalanced AES3 in ground
44	BNC	Unbalanced AES3 in

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Appendix A: Cables and Pinouts

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Optional Audio BNC/XLR Cable (CAB-X75-COMBO)

Figure A-7 identifies the cable connectors available on the optional AES/EBU CAB-X75-COMBO audio cable, which supports both the unbalanced and balanced audio signals.
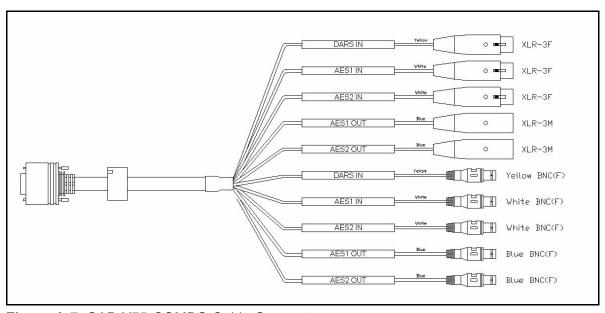

Figure A-7. CAB-X75-COMBO Cable Connectors

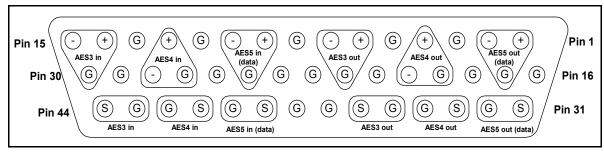Figure A-8 shows the pinouts for the CAB-X75-COMBO DB-26M connector.

Figure A-8. CAB-X75-COMBO Connector Pinout

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Appendix A: Cables and Pinouts

Table A-4 describes each pin on the CAB-X75-COMBO DB-26M connector and its connection type.

Table A-4. CAB-X75-COMBO Pinout Description

Pin Number	Connection Type	Description
1	XLR-2	Balanced DARS in (+)
2	XLR-3	Balanced DARS in (-)
3	BNC	Unbalanced AES1 in
4	XLR-2	Balanced AES2 in (+)
5	XLR-3	Balanced AES2 in (-)
6	XLR-2	Balanced AES1 out (+)
7	XLR-3	Balanced AES1 out (-)
8	BNC	Unbalanced AES2 out
9	NC	N/A
10	BNC-GND	Unbalanced DARS in ground
11	XLR-1-GND	Balanced DARS in ground
12	XLR-1-GND	Balanced AES1 in ground
13	BNC-GND	Unbalanced AES1 in ground
14	XLR-1-GND	Balanced AES2 in ground
15	BNC-GND	Unbalanced AES1 out ground
16	XLR-1-GND	Balanced AES1 out ground
17	XLR-1-GND	Balanced AES2 out ground
18	BNC-GND	Unbalanced AES2 out ground
19	BNC	Unbalanced DARS in
20	XLR-3	Balanced AES1 in (-)
21	XLR-2	Balanced AES1 in (+)
22	BNC	Unbalanced AES 2 in
23	BNC-GND	Unbalanced AES2 in ground

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Appendix A: Cables and Pinouts

LEITCH

Table A-4. CAB-X75-COMBO Pinout Description *(Continued)*

Pin Number	Connection Type	Description
24	BNC	Unbalanced AES1 out
25	XLR-3	Balanced AES2 out (-)
26	XLR-2	Balanced AES2 out (+)

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Appendix A: Cables and Pinouts

◉LEITCH.

Optional Audio BNC/XLR Cable (CAB-X75HD-COMBO)

Figure A-9 identifies the cable connectors available on the optional AES/EBU CAB-X75HD-COMBO audio cable, which supports both the unbalanced and balanced audio signals.
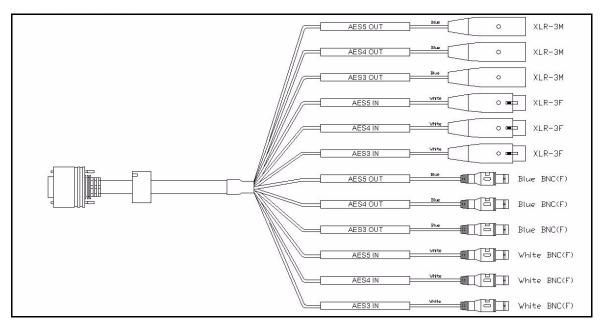
Figure A-9. CAB-X75HD-COMBO Cable Connectors

Figure A-10 shows the pinouts for the CAB-X75HD-COMBO DB-44M connector.

Figure A-10. CAB-X75HD-COMBO Connector Pinout

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Appendix A: Cables and Pinouts

LEITCH

Table A-5 describes each pin on the CAB-X75HD-COMBO DB-44M connector and its connection type.

Table A-5. CAB-X75HD-COMBO Pinout Description

Pin Number	Connection Type	Description
1	XLR-2	Balanced AES5 out (+)
2	XLR-3	Balanced AES5 out (-)
3	NC	N/A
4	XLR-2	Balanced AES4 out (+)
5	NC	N/A
6	XLR-2	Balanced AES3 out (+)
7	XLR-3	Balanced AES3 out (-)
8	NC	N/A
9	XLR-2	Balanced AES5 in (+)
10	XLR-3	Balanced AES5 in (-)
11	NC	N/A
12	XLR-2	Balanced AES4 in (+)
13	NC	N/A
14	XLR-2	Balanced AES3 in (+)
15	XLR-3	Balanced AES3 in (-)
16	NC	N/A
17	XLR-1-Gnd	Balanced AES5 out ground
18	NC	N/A
19	XLR-1-Gnd	Balanced AES4 out ground
20	XLR-3	Balanced AES4 out (-)
21	NC	N/A
22	XLR-1-Gnd	Balanced AES3 out ground
23	NC	N/A
24	NC	N/A
25	XLR-1-Gnd	Balanced AES5 in ground
26	NC	N/A

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Appendix A: Cables and Pinouts

LEITCH.

Table A-5. CAB-X75HD-COMBO Pinout Description *(Continued)*

Pin Number	Connection Type	Description
27	XLR-1-Gnd	Balanced AES4 in ground
28	XLR-3	Balanced AES4 in (-)
29	NC	N/A
30	XLR-1-Gnd	Balanced AES3 in ground
31	BNC	Unbalanced AES5 out
32	BNC-Gnd	Unbalanced AES5 out ground
33	BNC	Unbalanced AES4 out
34	BNC-Gnd	Unbalanced AES4 out ground
35	BNC-Gnd	Unbalanced AES3 out ground
36	BNC	Unbalanced AES3 out
37	NC	N/A
38	NC	N/A
39	BNC	Unbalanced AES5 in
40	BNC-Gnd	Unbalanced AES5 in ground
41	BNC	Unbalanced AES4 in
42	BNC-Gnd	Unbalanced AES4 in ground
43	BNC-Gnd	Unbalanced AES3 in ground
44	BNC	Unbalanced AES3 in

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Appendix A: Cables and Pinouts

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Optional Audio XLR Cable (CAB-X75-XLR)

Figure A-11 identifies the cable connectors available on the optional AES/EBU CAB-X75-XLR audio cable, which supports only balanced audio signals.
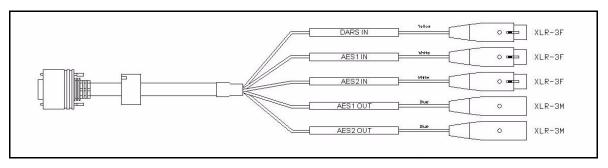
Figure A-11. CAB-X75-XLR Cable Connectors

Figure A-12 shows the pinouts for the CAB-X75-XLR DB-26M connector.
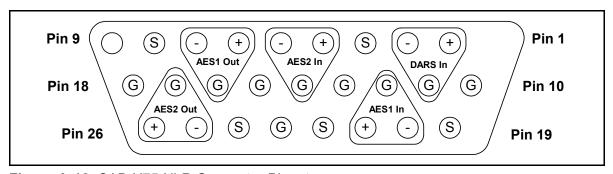
Figure A-12. CAB-X75-XLR Connector Pinout

Table A-6 describes each pin on the CAB-X75-XLR DB-26M connector and its connection type.

Table A-6. CAB-X75-XLR Pinout Description

Pin Number	Connection Type	Description
1	XLR-2	Balanced DARS in (+)
2	XLR-3	Balanced DARS in (-)
3	NC	N/A

Table A-6. CAB-X75-XLR Pinout Description *(Continued)*

Pin Number	Connection Type	Description
4	XLR-2	Balanced AES2 in (+)
5	XLR-3	Balanced AES2 in (-)
6	XLR-2	Balanced AES1 out (+)
7	XLR-3	Balanced AES1 out (-)
8	NC	N/A
9	NC	N/A
10	NC	N/A
11	XLR-1-GND	Balanced DARS in ground
12	XLR-1-GND	Balanced AES1 in ground
13	NC	N/A
14	XLR-1-GND	Balanced AES2 in ground
15	NC	N/A
16	XLR-1-GND	Balanced AES1 out ground
17	XLR-1-GND	Balanced AES2 out ground
18	NC	N/A
19	NC	N/A
20	XLR-3	Balanced AES1 in (-)
21	XLR-2	Balanced AES1 in (+)
22	NC	N/A
23	NC	N/A
24	NC	N/A
25	XLR-3	Balanced AES2 out (-)
26	XLR-2	Balanced AES2 out (+)

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Appendix A: Cables and Pinouts

LEITCH

Optional Audio XLR Cable (CAB-X75HD-XLR)

Figure A-13 identifies the cable connectors available on the optional AES/EBU CAB-X75HD-XLR audio cable, which supports only balanced audio signals.
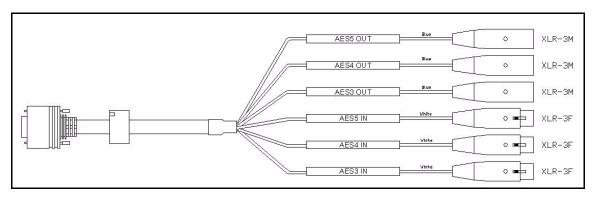
Figure A-13. CAB-X75HD-XLR Cable Connectors

Figure A-14 shows the pinouts for the CAB-X75HD-XLR DB-44M connector.
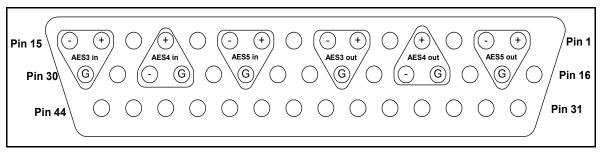
Figure A-14. CAB-X75HD-XLR Connector Pinout

Table A-7 describes each pin on the CAB-X75HD-XLR DB-44M connector and its connection type.

Table A-7. CAB-X75HD-XLR Pinout Description

Pin Number	Connection Type	Description
1	XLR-2	Balanced AES5 out (+)
2	XLR-3	Balanced AES5 out (-)
3	NC	N/A
4	XLR-2	Balanced AES4 out (+)
5	NC	N/A
6	XLR-2	Balanced AES3 out (+)
7	XLR-3	Balanced AES3 out (-)
8	NC	N/A
9	XLR-2	Balanced AES5 in (+)
10	XLR-3	Balanced AES5 in (-)
11	NC	N/A
12	XLR-2	Balanced AES4 in (+)
13	NC	N/A
14	XLR-2	Balanced AES3 in (+)
15	XLR-3	Balanced AES3 in (-)
16	NC	N/A
17	XLR-1-Gnd	Balanced AES5 out ground
18	NC	N/A
19	XLR-1-Gnd	Balanced AES4 out ground
20	XLR-3	Balanced AES4 out (-)
21	NC	N/A
22	XLR-1-Gnd	Balanced AES3 out ground
23	NC	N/A
24	NC	N/A
25	XLR-1-Gnd	Balanced AES5 in ground
26	NC	N/A

Table A-7. CAB-X75HD-XLR Pinout Description *(Continued)*

Pin Number	Connection Type	Description
27	XLR-1-Gnd	Balanced AES4 in ground
28	XLR-3	Balanced AES4 in (-)
29	NC	N/A
30	XLR-1-Gnd	Balanced AES3 in ground
31 through 44	NC	N/A

Appendix B

Troubleshooting

Overview

The following troubleshooting tips can be found in this chapter:

Recalling the Unique IP Address for a System

If you cannot remember the set IP address for you system, you have several options:

- Navigate to the **Setup** menu on your local control panel to discover the IP address of your X75HD system.

- Connect your RCP-X75 remote panel to the X75HD system, and navigate to the **Setup** menu to discover the IP address.

- If you do not have a local or remote panel with a VFD screen for viewing your IP address, you can reset the X75HD to its default IP address and then reconfigure the address using your Web browser software. To do this, follow these steps:

  a. Push the DEF IP DIP switch on the back on the unit to the down position.

     This resets the IP address of the system to its default address. (System IP: 192.168.100.250; Subnet mask: 255.255.255.0; Gateway: 192.168.100.250.) The Machine Name will not change.

  b. Launch your X75 Web server software, and navigate to the **Setup** menu.

  c. Set a unique IP address for your system.

  d. Return the DEF IP DIP switch to the up position, and then reboot the system.

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Appendix B: Troubleshooting

Files are Corrupted (Entering Fail-Safe Mode)

If your files become corrupted (for example, during an upload), you can put the system into Fail-Safe mode by pushing down the F.S. DIP switch on the back the X75HD unit. All system programs and current activity will cease.

In Fail-Safe mode, all system functions are disabled except for the ability to upload new software via FTP. To do this, follow these steps to transfer new files to your system using CoPilot.

1. Ensure your X75HD system is either connected to the network using a 10/100Base-T Ethernet cable or directly connected to a PC using a cross-over cable.

2. Push down the F.S. DIP switch on the back of the unit to put the X75HD system into Fail-Safe mode.

3. Launch CoPilot on the connected (either remotely or directly) PC.

4. Follow the procedure in your CoPilot User Manual or online help system for "Updating the Software on a CCS Device."

5. Return the F.S. DIP switch to the up position, and then reboot your system.

Note

CCS CoPilot is a Windows-based software application provided with your X75HD system that discovers devices on your network, and allows you to configure all system IP address settings (such as IP Address, Default Gateway, Subnet Mask, etc.). The current release of your X75HD system only provides limited support for CoPilot. Contact your Leitch customer support representative for more information.

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Appendix B: Troubleshooting

LEITCH

Not Receiving AES Audio Input Signal

If you do not appropriately select the X75HD for BNC or XLR input, you will not get an audio signal. Ensure that you have made the appropriate setting from the following menu path: **Audio Setup** > **Input Setup** > **AES/DARS Audio**. See "Configuring Audio" on page 83 for more information.

Appendix C

Servicing Instructions

Overview

This appendix includes the following information and procedures:

Safety Precautions

Only qualified personnel should perform service procedures. Contact your Leitch Customer Service representative for servicing information. Refer to the "Important Safety Instructions" on page vii before servicing the X75HD or its components.

Laser Caution

This product may contain lasers! Heed the following caution:

Laser Radiation When Open

CAUTION: To avoid damage from laser radiation, do not remove or displace any connections or protective panels.

CLASS 1 LASER PRODUCT
[Finland] LUOKAN 1 LASERLAITE.
[Sweden] KLASS 1 LASER APPARAT.

CLASS 1
LASER PRODUCT

ESD Caution

When servicing the X75HD and its components, take the proper precautions to avoid electrostatic discharge (ESD).

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
- Use a safe work area
- Handle components carefully
- Transport and store sensitive components carefully

See "Injury Precautions" on page ix for more details on preventing ESD.

Understanding and Working With Fiber Optics

Input and output modules using optical fibre transmitters and receivers were developed in response to a growing demand for a flexible method of transporting very high speed digital video and audio over long distances.

Fiber optic technology offers many benefits over copper wire systems:

- Longer distance capability
- Higher bandwidth
- Better signal quality
- Immunity from EM radiation and lightning
- Advantage of being light weight
- Ability to be easily upgraded

Basic Principles

Fiber optic technology can be explained using these two concepts:

1. Light is transmitted over optical fiber by reflecting it within a long "cylindrical mirror."

2. The mirrored surface occurs at the core cladding interface. By sending on/off bursts of light within the optical fiber, light can be guided along varying paths.

   See Figure C-1 and Table C-1 on page 182 for further explanation.

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Appendix C: Servicing Instructions

LEITCH.
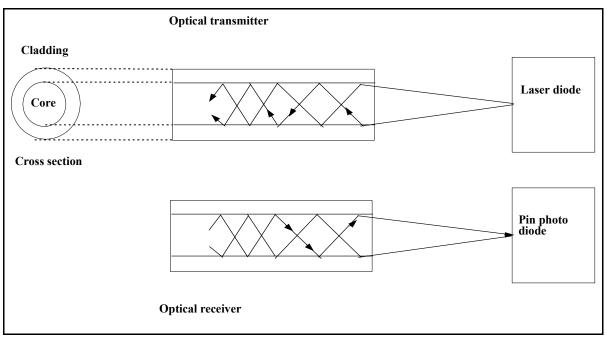
Figure C-1. Fiber Optics Transmitting and Receiving

Table C-1. Function and Description of Fiber Optic Components

Item	Function	Composition
Optical transmitter	Converts a data signal into an equivalent optical power waveform and couples it into an optical fiber.	• Laser diode • Laser diode driver The role of the driver is to bias the laser. Some laser drivers contain circuitry to control power and temperature.
Optical receiver	Converts the incoming optical power signal into an output data signal.	• PIN photo diode • Transimpedance amplifier • Decision circuitry The role of the receiver circuitry is to provide standard ECL outputs based on the input voltage.

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⬤LEITCH.   Appendix C: Servicing Instructions

Handling and Connecting Fibers

Class 1 Laser Products
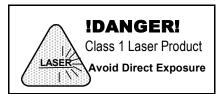
⚠ **Caution**

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED IN THIS MANUAL MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

The HD-X75 fiber optic module is a CLASS 1 laser product.

Avoid looking directly at a laser. Laser radiation is invisible and can cause serious eye damage.

!DANGER!
Class 1 Laser Product
LASER **Avoid Direct Exposure**

General Precautions

📝 **Note**

The HD-X75 comes with an SC interconnection housings built into the module. With this style of connector, the fiber assembly and the housing assembly can only be connected in one way and with very good repeatability. The optical fiber with SC connectors must be customer supplied.

Please take the following precautions when working with fiber optics:

• Never touch the end face of an optical fiber.

• Do not place optical fibers under heavy objects.

• Transmission characteristics of the fiber are dependent on the shape of the optical core; therefore, care must be taken to prevent fiber compression.

• Avoid abrupt fiber bending.

  A suggested minimum bending radius is 1.2 in. (3 cm). Bending radii smaller than this can lead to fiber bending loss which will decrease the maximum attainable link length by decreasing the available power budget.

• Make fiber interconnections very secure.

• Clean fiber *every time* that it is mated or unmated. (See "Cleaning Optical Fibers" on page 184.)

  As dust particles on the ends of the optical fiber can add up to 1 dB of loss, it is important to clean them regularly. Larger dust particles can totally obscure light altogether.

• Cover a fiber *immediately* when unmated.

  Most fiber manufacturers provide a plastic boot that fits over the ferrule body for this purpose.

• Remove dust particles from the housing assembly with a blast of dry air when using interconnection housing to mate two optical fibres.

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Appendix C: Servicing Instructions

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Cleaning Optical Fibers

Required Cleaning Equipment

Optical fibers must always be cleaned before mating and after unmating. You will need the following items:

- "Kimwipes" or any lens-grade, lint-free tissue
- Denatured alcohol
- Canned dry air

Cleaning Technique

Use the following method to clean the fibers:

1. Fold the tissue twice so that it is four layers thick.
2. Saturate the tissue with alcohol.
3. Clean the sides of the connector ferrule.
   - i. Place the connector ferrule in the tissue and apply pressure to the sides of the ferrule.
   - ii. Rotate the ferrule several times to remove all contamination from the ferrule sides.
4. Clean the end of the connector ferrule.
   - i. Move to the clean part of the tissue.
   - ii. Be sure it is still saturated with alcohol and that it is still four layers thick.
   - iii. Put the tissue against the end of the connector ferrule.
   - iv. Place your finger against the tissue so that it is directly over the ferrule.
   - v. Rotate the end of the connector.
5. Mate the connector immediately. Do not let the connector lie around before mating.

> **Note**
>
> Dry air can be used to remove dust from the connector housing or the transmitter or receiver ports.

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◆LEITCH.   Appendix C: Servicing Instructions

Preparing the X75HD for Servicing

Before installing any hardware options, do the following:

1. Read and heed the safety precautions outlined in the "Preface" on page iii and in the section "Safety Precautions" on page 180.

2. Confirm that the X75HD is turned off and that the power cord is disconnected from the rear panel.

   Note that with the power cord disconnected, the unit is no longer grounded, so be cautious about static electricity.

3. Use a Phillips screwdriver to remove the 26 retaining screws on the chassis cover. Figure C-2 shows the location of the screws along the back edge, front edge, top, and each side of the frame.

   Keep the screws, as they will be needed to replace the top cover.
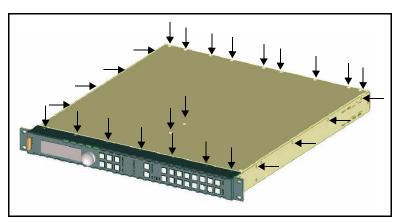
Figure C-2. Location of Chassis Cover Screws

4. Lift off the chassis cover from the X75HD.

To complete the installation of all hardware options:

1. Replace the top cover, and use the original 25 screws to secure the top cover.

2. Plug the power cord back in.

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Appendix C: Servicing Instructions

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Installing and Removing an Audio Synchronizer Module (AS-X75HD/AS-X75HD-L)

Installing a New Module

If you have ordered an AS-X75HD or AS-X75HD-L module separately and wish to upgrade your X75HD system, you will need to install the module yourself. Follow these steps to install an audio synchronizer module in an X75HD frame:

1. Remove the chassis cover (see "Preparing the X75HD for Servicing" on page 185).

2. Remove the screws from the blank cover plate on the rear panel where the new audio synchronizer module is to be installed, and then remove the cover plate.

    Retain the screws for later use.

3. Remove the packaging from the audio synchronizer module.

    The AS-X75HD/AS-X75HD-L package includes one board, four stackers, and the required number of standoff screws.

4. Turn the board upside down and insert the four stackers into the corresponding connectors on the underside of the board. See Figure C-3.
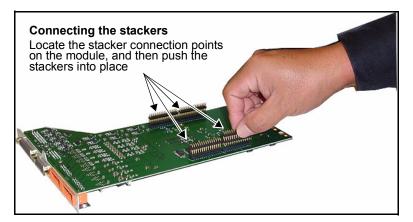
Figure C-3. Connecting Four Stackers to Module

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Appendix C: Servicing Instructions

5. Return the module to its upright position, and then align it with the installed standoffs on the main board.

There are two standoffs on the back of the main board, and one in the middle. The standoff in the back left corner is higher than the others in order to assist with alignment. See Figure C-4 and Figure C-5 on page 187.

Locating the standoffs on the main board
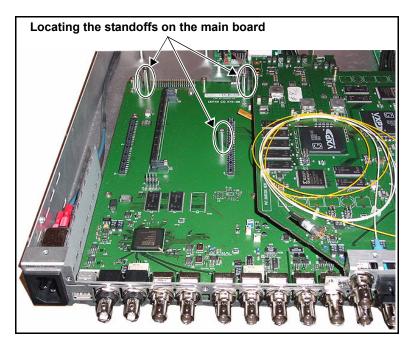
Figure C-4. Locating Main Board Standoffs

Positioning the module over the main board
Align stackers with corresponding connectors on the main board
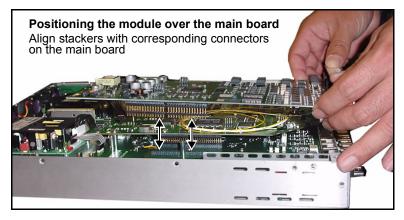
Figure C-5. Positioning Module over Standoffs

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Appendix C: Servicing Instructions

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6. Inspect the connectors on both the module and the main board to ensure that all pins are straight, and the push the board gently over the main board stacker connection points until they lock into place.

    Figure C-6 illustrates the area of the module you should push so that the stackers lock firmly into place.
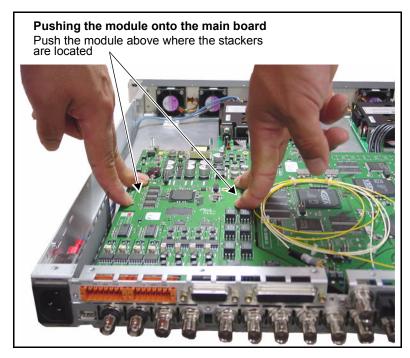
Figure C-6. Pushing the Module on to the Main Board

7. Secure the new module to the main board using the provided screws.

    Figure C-7 on page 189 illustrates the location of the three module standoffs where you need to apply the screws.

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Securing the module to the main board
Screw the module to the main board via the three standoffs
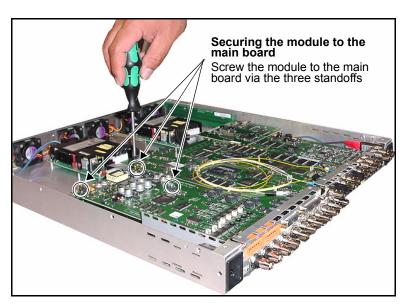
Figure C-7. Securing the Module to the Main Board

8. Screw the back panel into place using the screws removed in step 2.

Securing the back connector to the frame
Screw the back connector to the frame in three locations
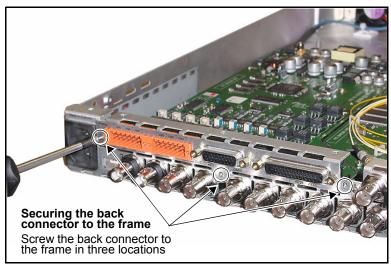
Figure C-8. Securing the Back Connector to the Frame

9. Replace the chassis cover using the original screws. See "Preparing the X75HD for Servicing" on page 185 for more information on replacing the cover.

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Appendix C: Servicing Instructions

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Removing an Existing Module

If you must remove an existing audio synchronizer module from a unit, follow these steps:

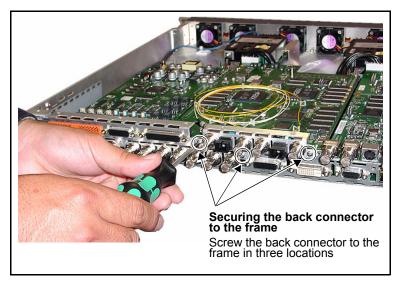1. Remove the chassis cover. To do this, remove the screws along the back edge and each side of the frame, and then slide the cover off.

    Retain the screws for later use.

2. Remove the three rear connector screws that secure the module to the frame.

    See Figure C-8 on page 189 to locate these screws.

3. Remove the three screws that secure the module to the main board.

    See Figure C-7 on page 189 to locate these screws.

4. Gently lift the module off of the main board.

    Be sure to lift the module off evenly to prevent the stacker connector pins from bending or breaking. Inspect the connectors on the module and main board to ensure that all pins are straight.

5. Store the board in a protective bag to protect it from damage or ESD.

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Appendix C: Servicing Instructions

Installing Optional HDTV Module with Fiber (HD-X75)

Installing a New Module

If you have ordered an optional HD-X75 with fiber module separately and wish to upgrade your X75HD system, you will need to install the module yourself. Follow these steps to install a fiber connector module in an X75HD frame:

1. Remove the chassis cover (see "Preparing the X75HD for Servicing" on page 185).

2. Remove the screws from the blank cover plate on the rear panel where the new fiber connector module is to be installed, and then remove the cover plate.

    Retain the screws for later use.

3. Remove the packaging from the fiber connector module.

    The HD-X75 with fiber module package includes one board, seven stackers, and the required number of standoff screws.

4. Turn the board upside down and insert the seven stackers into the corresponding connectors on the underside of the board. See Figure C-9.

Connecting the stackers
Locate the stacker connection points on the module, and then push the stackers into place
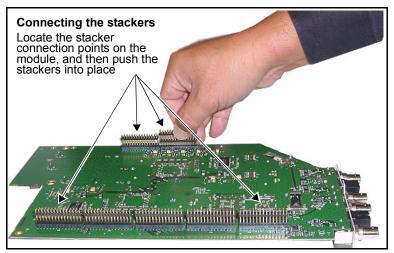
Figure C-9. Connecting Seven Stackers to Module

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Appendix C: Servicing Instructions

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5. Return the module to its upright position, and then align it with the installed standoffs on the main board.

    There are three standoffs on the back edge of the main board, and one in the middle. The middle standoff along the back edge of the module is higher than the others in order to assist with alignment. See Figure C-10 and Figure C-11.
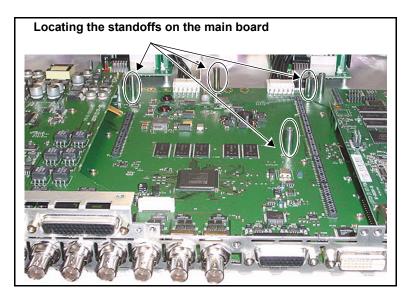
Figure C-10. Locating Main Board Standoffs
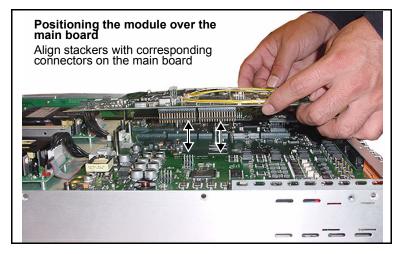
Figure C-11. Positioning Module over Standoffs

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6. Inspect the connectors on both the module and the main board to ensure that all pins are straight, and the push the board gently over the main board stacker connection points until they lock into place.

    Figure C-12 illustrates the area of the module you should push so that the stackers lock firmly into place.
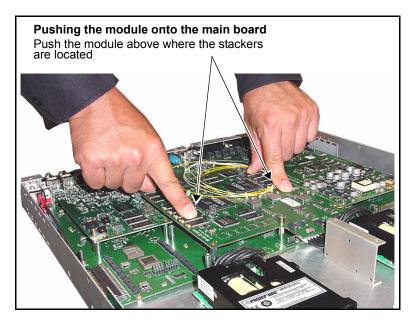
Figure C-12. Pushing the Module on to the Main Board

7. Secure the new module to the main board using the provided screws.

    Figure C-13 on page 194 illustrates the location of the three module standoffs where you need to apply the screws.

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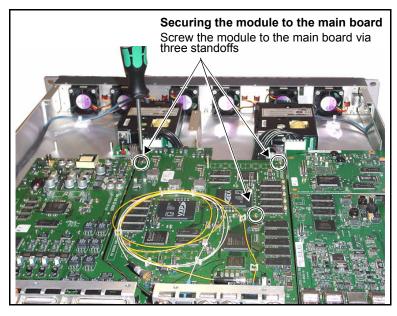
Figure C-13. Securing the Module to the Main Board

8. Screw the back panel into place using the screws removed in step 2.

Figure C-14. Securing the Back Connector to the Frame

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9. Replace the chassis cover using the original screws. See "Preparing the X75HD for Servicing" on page 185 for more information on replacing the cover.

Removing an Existing Module

If you must remove an existing HD-X75 with fiber module from a unit, follow these steps:

1. Remove the chassis cover screws along the back edge, front edge, top, and each side of the frame (see Figure C-2 on page 185), and then slide off the cover.

    Retain the screws for later use.

2. Remove the three rear connector screws that secure the module to the frame.

    See Figure C-14 on page 194 to locate these screws.

3. Remove the three screws that secure the module to the main board.

    See Figure C-13 on page 194 to locate these screws.

4. Gently lift the module off of the main board.

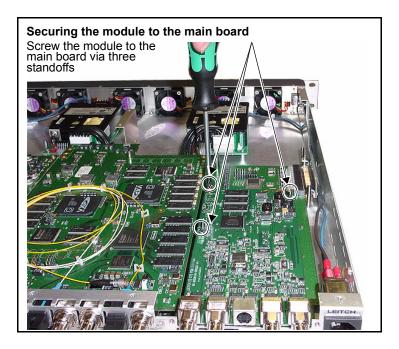   Be sure to lift the module off evenly to prevent the stacker connector pins from bending or breaking. Inspect the connectors on the module and main board to ensure that all pins are straight.

5. Store the board in a protective bag to protect it from damage or ESD.

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Installing a 3D Adaptive Decoder Module (A3D-X75)

Installing a New Module

If you have ordered an optional A3D-X75 module separately and wish to upgrade your X75HD system, you will need to install the module yourself. Follow these steps to install a 3D adaptive decoder module module in an X75HD frame:

1. Remove the chassis cover (see "Preparing the X75HD for Servicing" on page 185).

2. Remove the screws from the blank cover plate on the rear panel where the new 3D adaptive decoder module is to be installed, and then remove the cover plate.

    Retain the screws for later use.

3. Remove the packaging from the fiber connector module.

    The A3D-X75 package includes one board, three stackers, and the required number of standoff screws.

4. Turn the board upside down and insert the three stackers into the corresponding connectors on the underside of the board. See Figure C-15.
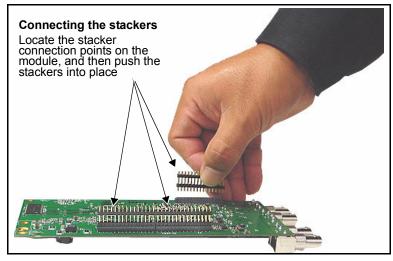
Figure C-15. Connecting Three Stackers to Module

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> **✎ Note**
>
> The A3D-X75 module only covers the back portion of the main board. It is not a full-length module.

5. Return the module to its upright position, and then align it with the installed standoffs on the main board.

There are three standoffs on the back edge of the main board, and one in the middle. The middle standoff along the back edge of the module is higher than the others in order to assist with alignment. See Figure C-16 and Figure C-17.
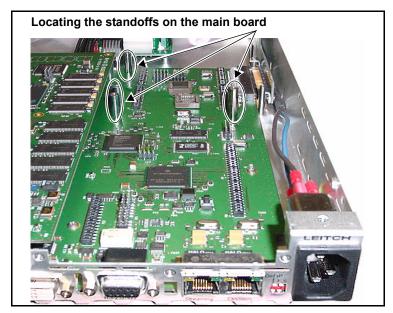
Figure C-16. Locating Main Board Standoffs
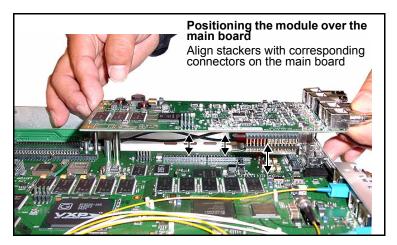
Figure C-17. Positioning Module over Standoffs

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6. Inspect the connectors on both the module and the main board to ensure that all pins are straight, and the push the board gently over the main board stacker connection points until they lock into place.

Figure C-18 illustrates the area of the module you should push so that the stackers lock firmly into place.

Pushing the module onto the main board
Push the module above where the stackers are located
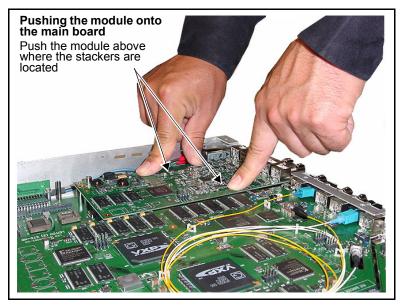
Figure C-18. Pushing the Module on to the Main Board

7. Secure the new module to the main board using the provided screws.

Figure C-19 on page 199 illustrates the location of the three module standoffs where you need to apply the screws.

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Figure C-19. Securing the Module to the Main Board

8.   Screw the back panel into place using the screws removed in step 2.

9.   Replace the chassis cover using the original screws. See "Preparing the X75HD for Servicing" on page 185 for more information on replacing the cover.

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Removing an Existing Module

If you must remove an existing 3D adaptive decoder module from a unit, follow these steps:

1. Remove the chassis cover screws along the back edge, front edge, top, and each side of the frame (see Figure C-2 on page 185), and then slide off the cover.

   Retain the screws for later use.

2. Remove the three rear connector screws that secure the module to the frame.

   See Figure 16-20 on page 195 to locate these screws.

3. Remove the three screws that secure the module to the main board.

   See Figure C-19 on page 199 to locate these screws.

4. Gently lift the module off of the main board.

   Be sure to lift the module off evenly to prevent the stacker connector pins from bending or breaking. Inspect the connectors on the module and main board to ensure that all pins are straight.

5. Store the board in a protective bag to protect it from damage or ESD.

Installing or Replacing an X75PS Power Supply

If you need to replace a failed X75PS power supply or install a new redundant power supply, follow the procedure outlined below ("Removing an Existing Power Supply" on page 201 and "Installing a New Power Supply" on page 205).

Removing an Existing Power Supply

1. Remove all power from the frame, and then remove the chassis cover. See "Preparing the X75HD for Servicing" on page 185 for more information.

2. Locate the failed power supply inside the system, located at the front of the unit behind the fan board.

   Power supplies are secured to the chassis floor, and connected to the main board. See Figure C-20.

Note

The default power supply shipped with every X75HD system is located on the left side of the frame (as seen from the front). An installed redundant power supply is located on the right side of the frame.
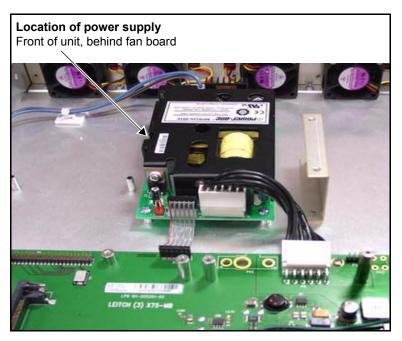
Figure C-20. Location of Connected Power Supply

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3. Remove the main DC power cable and secondary DC ribbon cable that connect the power supply to the main board (on the primary power supply, these are labelled P2 and P40 respectively; on the secondary/redundant power supply, these are labelled P6 and P41). (See Figure C-21.)

    •   To remove the main DC power cable, lift the latches on the top of the connector with one hand, and then pull the connector up and out of the board.

    •   To remove the secondary DC ribbon cable, pull the connector up and off of the board.
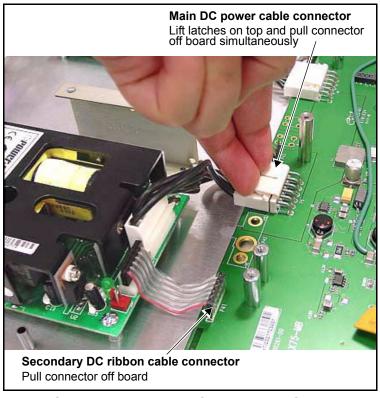
Figure C-21. Removing the DC and Ribbon Cables

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4. Disconnect the polarized AC cables from the power supply. (See Figure C-22.)
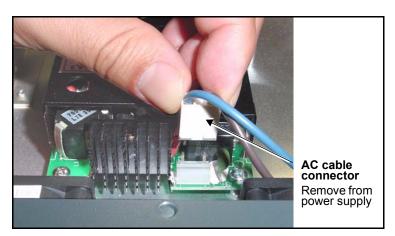
Figure C-22. Removing the AC Cable from Power Supply

> **Note**
>
> Steps 5 through 7 are optional. If you will be replacing this power supply with a new one, then you can reuse the AC cable and inlet with the new X75PS. These steps are required only if you suspect a problem with the the AC inlet and wish to replace the entire power supply and associated cabling/inlet. See "Installing a New Power Supply" on page 205 for more information.

5. Unplug the AC cables and the grounding cable from the AC inlet at the rear of the unit, and then unscrew the grounding cable from the chassis floor. (See Figure C-23).
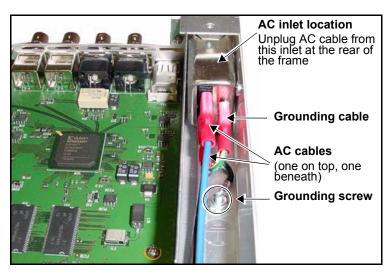
Figure C-23. Removing the AC Cable from AC Inlet

6. Push the AC inlet out of its position, through the back of the chassis.

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7. Remove the two cable tie wraps holding the AC cabling assembly to the chassis floor. (See Figure C-24).
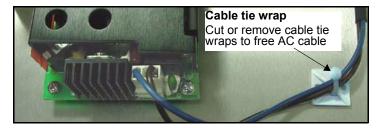
Figure C-24. Freeing the AC Cable from the Cable Tie

8. Unscrew the power supply from the chassis floor.

   Figure C-25 shows the location of the four screws you need to remove. Keep these screws for later reuse.
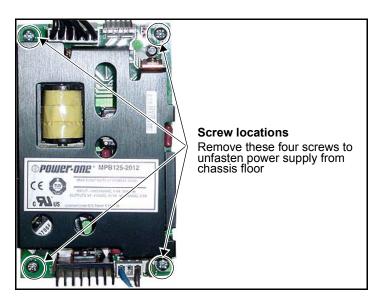
Figure C-25. Removing the Power Supply

9. Remove the power supply from the frame, and replace with a new one. See "Installing a New Power Supply" on page 205 for more information.

   If removing a redundant power supply, you must either replace the power supply prior to operation or install a cover plate over the AC inlet hole to maintain proper ventilation and avoid overheating.

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Installing a New Power Supply

Follow this procedure to install a new, redundant power supply or to replace an existing, failed power supply.

1. Remove all power from the frame, and then remove the chassis cover. See "Preparing the X75HD for Servicing" on page 185 for more information.

2. If you are replacing an existing power supply, identify and remove it from the frame. See "Removing an Existing Power Supply" on page 201.

   If you are installing a new, redundant power supply, locate the position where it will be installed. A redundant power supply is installed on the right side of the frame (labelled 2, below), as seen from the front. (See Figure C-26.)
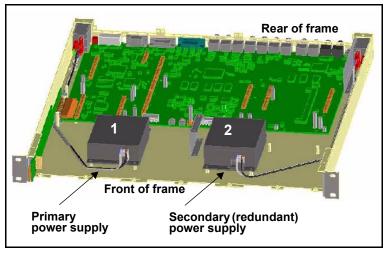
Figure C-26. Where to Install a Redundant Power Supply

3. Install the power supply onto the four standoffs on the chassis floor, and then screw into place. (See Figure 16-28.)

   The two-pin AC cable connector faces the front of the chassis, while the six-pin DC cable connectors face the rear.

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4. Connect one end of the main DC power cable and the secondary DC ribbon cable to the main board, and the other end of each cable to the power supply. (See Figure C-27.)
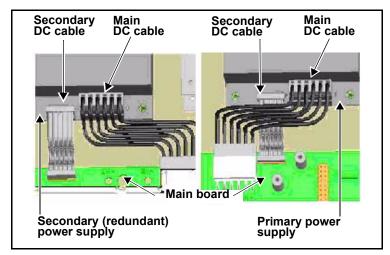
Figure C-27. Connecting DC and Ribbon Cables

5. Plug the end of the AC cable assembly with a two-pin connector into the power supply.

    The two-pin connector has polarized live and neutral wires feeding into it, color-coded as follows:

    • Black/Brown: Live wire

    • White/Blue: Neutral wire

    For primary and secondary power supplies, ensure that the neutral wire is on the left side and the live wire is on the right, as seen from the front. (See Figure C-28).

AC cable assembly
Neutral wire (left)
Live wire (right)
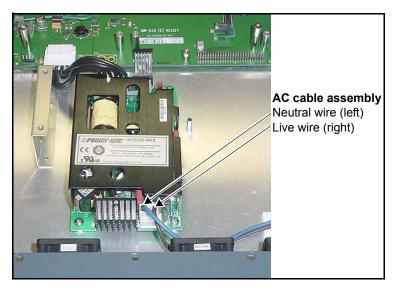
Figure C-28. Connecting AC Cables to Power Supply

6. Secure the AC cabling to the chassis. (See Figure C-29 on page 208.)

    To do this, follow these steps:

    a. Attach the self-stick tie holders to chassis floor (two places for each power supply's AC cabling).

    b. Feed the tie wraps through the holders.

    c. Wrap the tie wraps around the AC cabling.

    d. Clip any extra tie length.

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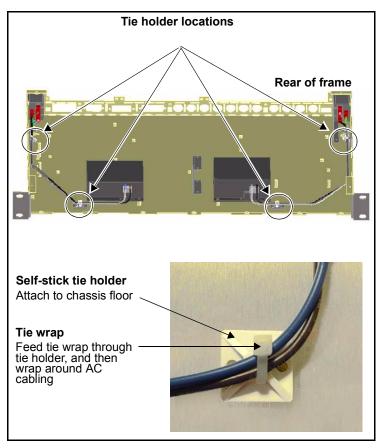
Figure C-29. Attaching Tie Wraps to AC Cabling

7. Take off the AC inlet cover plate by removing the inlet cover screw on the chassis side, and then install the new AC inlet into the slot. (See Figure C-30.)

    Ensure the following during installation:

    •   The Ground plug on the inlet faces must face the outside chassis wall

    •   The AC inlet must snap securely into place

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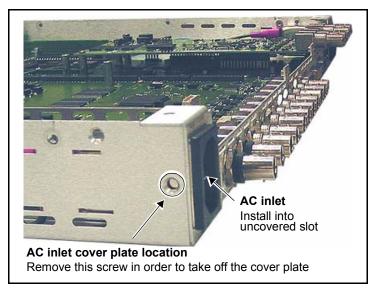
Figure C-30. Removing Cover Plate and Installing AC Inlet

8. Plug the AC wires into the appropriate AC power supply terminals on the back of the inlet (from inside the frame).

    There are three wires: Live (black/brown), Neutral (white/blue), and Ground (green/yellow). The Live wire plugs on top of the Neutral wire, while the Ground wire always plugs into the single row slot that is closest to the chassis wall. (See Figure C-31.)
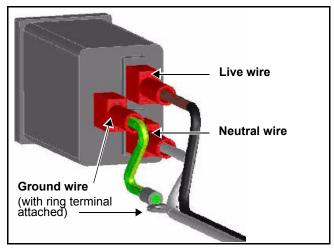
Figure C-31. Connecting AC Cables to Inlet

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9. Place the attached ring terminal on the end of the ground wire over the stud on the chassis floor, and then secure it into place with the supplied nut to ground the unit.

Grounding screw location
Using the provided ring terminal and nut, attach the end of the grounding wire to the chassis floor to ground the unit
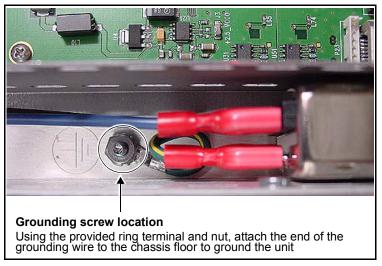
Figure C-32. Grounding AC Inlet

10. Replace the cover on the frame, and then return power to the unit. See "Preparing the X75HD for Servicing" on page 185 for more information on replacing the cover.

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Installing Fans

To replace a fan or fans within the assembly, follow these steps:

1. Remove the four front mounting-ear screws, and then pull the frame out few inches from the rack.

   Retain the screws.

2. Remove the screws along the top and bottom of the front panel that hold it to the frame. (See .Figure C-33)

   Retain the screws.
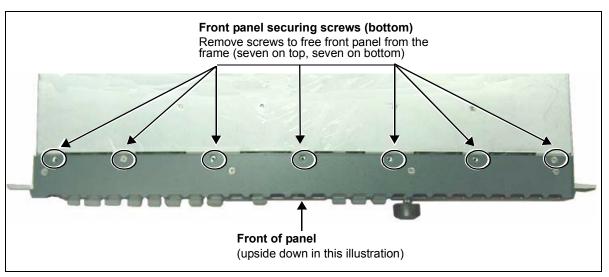
Figure C-33. Freeing the Front Panel from the Frame

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3. Pull the front panel away from the frame. (See Figure C-34.)

    Although a frame-mounted local control panel is shown below, this procedure also applies to blank front panels.

Pull out the front panel
Once the top and bottom front panel screws are removed, pull it out from the frame

Figure C-34. Removing the Front Panel

4. Identify the fan you are replacing on the back side of the front panel, and then remove the corresponding header wires from the fan assembly connector. (See Figure C-35.)

Header wires   Fan connector   Fan removal screws
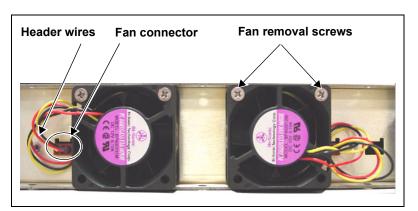
Figure C-35. Removing Header Wires from Fan Assembly Connector

5. Unscrew the fan, and then pull it away from the assembly to remove it.

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6. Fasten a new fan into place on the assembly with the supplied screws. (See Figure C-36.)

Screw fan into place

Insert header wire
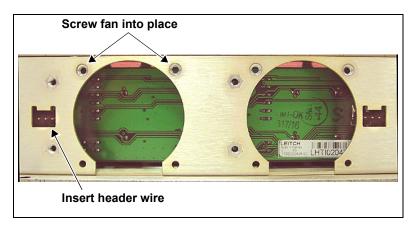
Figure C-36. Replacing a Fan within the Assembly

7. Connect the new fan's header wires to the corresponding fan assembly connector.

8. Replace the fan assembly inside the front cover, and then secure the assembly into place using the original screws from step 3.

9. Secure the front panel to the X75HD frame using the original screws from step 2.

10. Close the front panel, re-establish any connections, and then reapply power to the frame.

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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

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