Building on the proven capabilities of its industry-acclaimed predecessor, the X75™ synchronizer/converter, the X85™ maintains the functionality, flexibility and format-friendly design of the original, and adds all-new features to keep it — and your operation — in pace with the changing market.

The X85 multiple application video and audio platform features up to eight AES inputs and outputs, and up to 32 channels of internal audio processing — packing the industry’s most advanced technology into its space-saving 1RU frame.

Dual-channel processing ensures maximum efficiency. An affordable, linear frame rate conversion option converts 59.94 Hz and 50 Hz-based signals. For live productions, a proximity-avoidance option delays the program, giving the operator time to bail out to an alternate signal in master control. And software-enabled 3 Gb/s upgrade capability ensures an easy, economical move anytime you’re ready to make the transition to 1080p.

**FEATURES**

- Dual-channel up/down/cross converter for true dual-path processing with 3DTV capability
- Two auto-detected inputs for 27/1.5/3 Gb/s
- Audio, data and metadata embedding/de-embedding for 27/1.5/3 Gb/s
- Active format description (AFD) for 27/1.5/3 Gb/s
- Many modes of operation for single-point video and audio applications, from mobile to production to ingest to outbound signal processing
- Dual fiber input and output; may be a field retrofit
- V2A video to audio timing measurement for 27/1.5/3 Gb/s
- Color correctors for 27/1.5/3 Gb/s
- Media monitoring over Ethernet – basic (video only); optional streaming video and audio
- DVI-D (720p, 1080i, 1080p) output
- 8, 16 or 32 channels core audio processing
- Optional internal audio decoder (Dolby® E/A/3)
- Optional internal audio encoder (Dolby® E/A/3) or optional DTS Neural Surround™ Up/DownMix, MultiMerge and DTS Neural Loudness Control
- SNMP-enabled (optional)
- CEA-608 to CEA-708 transcoding
- SMPTE RDD-8 teletext captions for up and down conversion
- HD/SD logo with SD memory card (tumble slide, side bar keying)
- I-Wings side bar keying with video input

**PRODUCT DETAILS**

**I/O Flexibility**

The X85 offers unparalleled I/O flexibility. Up to 17 input and 20 output formats are provided — dependent on the selected options. I/O features include:

- Two SDI (3G/HD/SD) optical fiber serial component digital video inputs and outputs
- Two SDI (3G/HD/SD) serial component digital video inputs and outputs
- Two SDI (SD) serial component digital video inputs and outputs
- Streaming video and audio output over IP
- Thumbnails video output over IP
- Component analog video (Betacam®) input* and output
- S-video (S-VHS/HQ) input* and output
- NTSC/PAL-M/PAL-B/SECAM composite video input* and output
- RGB-S output
- DVI-D output for HD signals
- Auto-detecting inputs with user-selectable alarms
- Multiple operating modes, allowing for a critical program path processing for ingest, bridges between routers/tape transports/servers, mobile broadcast and edit suites

*Optional

**Video Processing**

- Level/color/hue/clip controls
- Color correction with RGB clipping, RGB gain, offset, white slope, black stretch and gamma*
- 3D (3AD adaptive three dimensional) color decoding and 12-bit color encoding*
- 3D SD adaptive noise reduction*
- Frame synchronization and time base correction for non-synchronous signals
- Analog-to-digital and digital-to-analog video conversion
- 10-bit motion adaptive up/down/cross/standards conversion with aspect ratio conversion for hybrid standard and high-definition facilities, including 3 Gb/s 1080p facilities*
- Level A and Level B YCbCr 4:2:2 10-bit

*Optional

**Audio Processing**

- Level/invert/delay/swap/summing controls
- Audio limiting*
- Dolby® E and Dolby® Digital decoding and encoding*
- DTS Neural Surround™ UpMix, DownMix and MultiMerge*
- DTS Neural Loudness Control
- Two optional audio modules: 16-channel internal processing (4-channel analog, 5 AES I/O); 32-channel internal processing (8 AES I/O)
- Analog-to-digital and digital-to-analog conversion
- Embedding and de-embedding for all SDI serial digital signals, including Level A and Level B for 16 channels of embedded audio — for interfacing any audio signal in a professional environment
- Sample rate conversion, synchronization and timing to video — for lip-sync error correction
- Multichannel program signal processing for surround sound applications

*Optional

**Other Ancillary Data Metadata**

Embedded ancillary data within the program stream, including closed captioning for CEA608/CEA-708 and teletext (SMPTE RDD-8, OP47), are passed transparently from input to output with the proper data translation. Audio metadata may be generated, processed from the embedded or serial port inputs and embedded on the output or on the serial port. Active format description (AFD) for automatic aspect ratio control is also provided.
X85™
Multiple Application Video and Audio Platform

Test Signals
A complement of test signals is available for analog, digital SD 270 Mb/s, HD 1.5 Gb/s and 1080p 3 Gb/s. There are four selectable test tones for the embedded, AES and analog outputs.

An option available to facilitate timing of video and analog for lip sync purposes. Three applications are possible:
- An X85 or X75 in a local location provides a test signal that can be recorded and played back. Any X85/X75 can measure any video-to-audio relative differences in time from the playback source.
- A single X85 or X75 can send the test signal into a transmission system in a loopback application and measure any video-to-audio relative timing differences.
- Any X85 or X75 can send the test signal to any X85 or X75, and measure any video-to-audio relative timing differences.

This test sync provides a video-to-audio timing measurement so that the operator can adjust lip sync in an automatic fashion or manually without guessing.

Control and Monitoring
Control and monitoring of signals passing through the X85 is enabled using IP over Ethernet. Instant operator control from the local or remote control panels allows for easy manipulation of video and audio signals. The use of two Ethernet ports per unit (one for control, monitoring and video thumbnails, and one for video and audio streaming) makes PC control and monitoring over large networks entirely manageable. A built-in web server and optional simple network management protocol (SNMP) are industry-standard means of controlling and monitoring the X85 over Ethernet. The Harris® CCS Navigator™ software further enhances the remote control aspects of the X85. The NUCLEUS™ network control panel provides complete user customization to tailor the control interface to the specific X85 application. A secure device (SD) provides expandable memory for the HD and SD logo generators inserters and stores presets.

User-Selectable Modes
Operational modes for numerous applications can be user-selected:
- All Output Select: The user has the choice of processing any input to all outputs
- M-PATH: Multiple path processing; up to five paths of processing
- SIMULCAST: Any two inputs can be switched to all outputs
- Side panel fill using video input, (i.e., I-Wings application)
- Frame rate conversion
- Program delay
- Output follows input mode (using auto detect)

Control and Monitoring Flexibility
- Via separate remote control panel — such as the X75-RCP/X85-RCP or NUCLEUS
- Using the CCS Navigator software application
- Via web browser such as Internet Explorer® or Mozilla Firefox
- Via simple network management protocol (SNMP)
- Via third-party control software using CCS EP (extended protocol)
- Via a NUCLEUS user-customizable remote panel
- Major and minor alarm LEDs
- Status LEDs for power and memory access

For X85 units with an installed local control panel, configuration and control can be performed locally. Numerous LEDs that indicate alarm, status and configuration information are available from the front control panel.

Control Architecture
The X85 can be equipped with a local control panel, or it can be controlled in the following ways:
- Ethernet — X85 includes two 10/100Base-T Ethernet ports.
  One Ethernet port is dedicated to control, monitoring and low bit-rate streaming, providing a low frame rate video-only thumbnail. The second Ethernet port is dedicated to streaming common image format (CIF) full-motion video and audio for monitoring purposes.
- Web Server — The X85 processor’s built-in web server allows control via Ethernet and permits alarms to be monitored on a unit-by-unit basis. A video thumbnail is streamed from the X85 to the web browser.
- Remote Panel — A remote panel with Ethernet capability (and the same control features) is available for controlling up to 200 X85s, X75s and DPS-575s. The X85 remote panel can monitor and control one X85 or X75 at a time. Note also that local and remote control panels associated with installed DPS-575s can control X85s, X75s through the text menu system. NUCLEUS can be customized by the user to control X85s, X75s and other devices on the control and monitoring network.
- SNMP — For those who have adopted (or may adopt) the industry-standard SNMP, an SNMP agent can be added as an option.
- CCS — The X85 is CCS-compliant for use with CCS Navigator and NUCLEUS. A specific graphical user interface (GUI) is available for control, monitoring and diagnostics purposes.
- Serial Control — RS-232 serial control for automation purposes is available.

SPECIFICATIONS
Specifications are subject to change without notice.

Video
Standard .......................... SMPTE 292M
Connector .......................... BNC (IEC 169-8)
Impedance .......................... 75 ohms
Return Loss .......................... >15 dB, typical, from 5 to 1485 MHz
Equalization .......................... Adaptive cable equalization for up to:
- 388 ft (100 m), typical, of Belden 8281 coaxial cable or
- 492 ft (150 m), typical, of Belden 1694A coaxial cable

3 Gb/s HD-SDI Video Input
Standard .......................... SMPTE 424M, SMPTE 425 Level A, Level B-DL (YCbCr, 4:2:2, 10-bit with 16 channels of embedded audio)
Connector .......................... BNC (IEC 169-8)
Impedance .......................... 75 ohms
Return Loss .......................... >15 dB, typical, from 5 to 1485 MHz
Equalization .......................... 164 ft (50 m) typical, of Belden 1694A coaxial cable

1.5 Gb/s HD Fiber Video Input
Standard .......................... SMPTE 292M, mode B operation
Number of Inputs .................. 2
Connector .......................... LC
Input Wavelength .................. 1200 to 1600 nm
Maximum Input Power .............. 0 dBm, typical
Sensitivity .......................... Better than -20 dBm
## 3 Gb/s HD Fiber Video Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>SMPTE 424M</td>
</tr>
<tr>
<td>Number of Inputs</td>
<td>2</td>
</tr>
<tr>
<td>Connector</td>
<td>LC</td>
</tr>
<tr>
<td>Input Wavelength</td>
<td>1260 to 1610 nm</td>
</tr>
<tr>
<td>Maximum Input Power</td>
<td>0 dBm</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>-18 dB, typical</td>
</tr>
</tbody>
</table>

### SD-SDI Video Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>SMPTE 259M-C, 270 Mb/s, 525/625 component</td>
</tr>
<tr>
<td>Connector</td>
<td>BNC (IEC 169-8)</td>
</tr>
<tr>
<td>Impedance</td>
<td>75 ohms</td>
</tr>
<tr>
<td>Return Loss</td>
<td>&gt;18 dB from 5 to 270 MHz</td>
</tr>
<tr>
<td>Equalization</td>
<td>&gt;23 dB Belden 8281 cable</td>
</tr>
</tbody>
</table>

### X75OPT-A3D Analog Composite

### Video Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>NTSC, PAL-M, PAL-B</td>
</tr>
<tr>
<td>Connector</td>
<td>4-pin DIN</td>
</tr>
</tbody>
</table>

### Genlock Input

<table>
<thead>
<tr>
<th>Connector</th>
<th>BNC (IEC 169-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance</td>
<td>75 ohms</td>
</tr>
<tr>
<td>Return Loss</td>
<td>&gt;40 dB, 0.1 to 6 MHz</td>
</tr>
<tr>
<td>Input Level</td>
<td>1 V pk-pk</td>
</tr>
<tr>
<td>Common Mode Range</td>
<td>5 V</td>
</tr>
<tr>
<td>CMRR</td>
<td>60 dB @ 50/60 Hz, 5 V pk-pk</td>
</tr>
<tr>
<td>Setup Level Range</td>
<td>±7.5 IRE</td>
</tr>
<tr>
<td>Frequency Response</td>
<td>±0.1 dB, 0.1 to 6 MHz</td>
</tr>
<tr>
<td>SNR</td>
<td>62 dB, typical (X75OPT-A3D); 58 dB, typical (X75OPT-POM)</td>
</tr>
<tr>
<td>Y/C Gain Error</td>
<td>&lt;0.1 dB</td>
</tr>
<tr>
<td>Y/C Delay Error</td>
<td>&lt;10 ns</td>
</tr>
</tbody>
</table>

### Component Video Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>Betacam</td>
</tr>
<tr>
<td>Connector</td>
<td>BNC (IEC 169-8)</td>
</tr>
<tr>
<td>Input Level</td>
<td>1 V pk-pk</td>
</tr>
<tr>
<td>Quantization</td>
<td>Normal mode, non-TBC mode CAV, Y: 12 bits, Cr: 10 bits, Cr: 10 bits, Normal mode, non-TBC mode S-Video Luma: 12 bits, Chroma: 10 bits TBC mode CAV: Not supported S-Video: 8 bits all</td>
</tr>
</tbody>
</table>

### Connector

| Connector                   | BNC (IEC 169-8)                                                               |

## 1.5 Gb/s HD-SDI Video Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>SMPTE 424M, SMPTE 425 Level A, Level B-DL (YCrCb, 4:2:2, 10-bit with 16 channels of embedded audio)</td>
</tr>
<tr>
<td>Connector</td>
<td>BNC (IEC 169-8)</td>
</tr>
<tr>
<td>Impedance</td>
<td>75 ohms</td>
</tr>
<tr>
<td>Return Loss</td>
<td>&gt;15 dB, typical, from 5 to 1485 MHz</td>
</tr>
<tr>
<td>DC Offset</td>
<td>0 V ±0.5 V</td>
</tr>
<tr>
<td>Rise and Fall Time</td>
<td>&lt;270 ps</td>
</tr>
<tr>
<td>Overshoot</td>
<td>&lt;10% of amplitude</td>
</tr>
<tr>
<td>Jitter</td>
<td>Timing: &lt;1 UI; alignment: &lt;0.2 UI</td>
</tr>
</tbody>
</table>

## 3 Gb/s HD Fiber Video Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>SMPTE 429M, Mode B operation</td>
</tr>
<tr>
<td>Number of Outputs</td>
<td>2</td>
</tr>
<tr>
<td>Connector</td>
<td>LC</td>
</tr>
<tr>
<td>Output Wavelength</td>
<td>1310 ±20 nm</td>
</tr>
<tr>
<td>Output Power</td>
<td>-7 dBm</td>
</tr>
<tr>
<td>Rise and Fall Time</td>
<td>&lt;270 ps</td>
</tr>
<tr>
<td>Jitter</td>
<td>&lt;135 ps pk-pk</td>
</tr>
<tr>
<td>Laser Safety Level</td>
<td>Class 1</td>
</tr>
</tbody>
</table>

## 3 Gb/s HD Fiber Video Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>SMPTE 424M</td>
</tr>
<tr>
<td>Number of Outputs</td>
<td>2</td>
</tr>
<tr>
<td>Connector</td>
<td>LC</td>
</tr>
<tr>
<td>Output Wavelength</td>
<td>1310 ±20 nm</td>
</tr>
<tr>
<td>Output Power</td>
<td>-7 dBm</td>
</tr>
<tr>
<td>Rise and Fall Time</td>
<td>&lt;135 ps, typical</td>
</tr>
<tr>
<td>Jitter</td>
<td>&lt;70 ps pk-pk</td>
</tr>
<tr>
<td>Laser Safety Level</td>
<td>Class 1</td>
</tr>
</tbody>
</table>
# X85™
## Multiple Application Video and Audio Platform

### SD-SDI Video Output
- **Standard**: SMPTE 259M-C, 270 Mb/s, 525/625 component
- **Quantization**: 10 bits
- **Connector**: BNC (IEC 169-8)
- **Impedance**: 75 ohms
- **Return Loss**: >18 dB, typical, from 5 to 270 MHz
- **Signal Level**: 800 mV ±10%
- **DC Offset**: 0 ±0.5 V
- **Rise and Fall Time**: 400 to 1500 ps (20% to 80%)
- **Overshoot**: <10% amplitude
- **Jitter**: Timing: <0.2 UI (pk-pk)

### Composite Video Output
- **Standard**: NTSC, PAL-B, PAL-M, PAL-I
- **Connector**: BNC (IEC169-8)
- **Quantization**: 12-bits
- **Impedance**: 75 ohms
- **Return Loss**: >40 dB (0.1 to 6 MHz)
- **Frequency Response**: ±0.1 dB (0.1 to 6 MHz)
- **DC Offset**: <0.0 ±0.005 V
- **Differential Gain**: <0.5% Differential Phase**: <0.5°
- **Y/C Delay**: <10 ns
- **Transient Response**: <0.5% K Factor
- **SNR**: >63 dB (0.1 MHz to 6 MHz)

### Component Video Output
- **Format**: Betacam
- **Connector**: BNC (IEC169-8)
- **Quantization**: Y: 12-bits
- **Impedance**: 75 ohms
- **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
- **DC Offset**: <±5 mV
- **Relative Delay**: <±10 ns
- **SNR**: >63 dB

### Streaming Video Output
- **Video Compression Type**: MPEG-4
- **Profile**: Simple profile
- **Modes**: Fixed bit rate mode, variable bit rate (VBR) mode
- **Bit Rate Range Control**: User-selectable 200 kb/s — 1 Mb/s
- **Frame Rate (VBR)**: 30 f/s, 25 f/s
- **Frame Rate (fixed)**: As bit rate is lowered, frame rate is lowered
- **Audio Compression Type**: Advanced audio coding (AAC) format
- **Profile**: Low complexity (LC)
- **Sample Rate**: 48 k
- **Stereo Bit Rate (two channels)**: 64 kb/s

### DVI Video Output
- **Standard**: 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
- **Connector**: DVI-D
- **Rise and Fall Time**: 75 ps to 0.4UI (20% to 80%)
- **Level**: 1 V ±0.2 V (differential, pk-pk)
- **Jitter**: 0.25 UI

### Audio
- **AES/DARS Input**
  - **Balanced**: Balanced, transformer coupled
    - **Connector**: 2 DB-26/44, female, with breakout cable
    - **Sensitivity**: <200 mV
    - **Impedance**: 110 ohms ±20% (0.1 to 6 MHz)
    - **Common Mode Rejection**: 0 to 7 V (0 to 20 kHz)
    - **Input Audio Rate**: 32 to 108 kHz
  - **Unbalanced**: Unbalanced, AC coupled
    - **Connector**: BNC (IEC 169-8)
    - **Sensitivity**: <100 mV
    - **Impedance**: 75 ohms
    - **Return Loss**: >25 dB, 0.1 to 6 MHz
    - **Input Audio Rate**: 32 to 108 kHz

### Analog Input
- **Connector**: Removable barrier strip
- **Input Impedance**: Jumper selectable with J5~J8
  - Pin 2-3: 100 k ohms
  - Pin 1-2: 600 ohms
- **Input Analog Level**: 28 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

### Balanced
- **Standard**: AES-3, SMPTE 276M
- **Type**: Balanced, transformer coupled
- **Connector**: 2 DB-26/44, female, with breakout cable
- **Signal Level**: 4 V (pk-pk)
- **Impedance**: 110 ohms ±20% (0.1 to 6 MHz)
- **Jitter**: <±4 ns, peak value
- **DC Offset**: 0 V ±50 mV
- **Rise and Fall Time**: 5 to 30 ns (10% to 90%)
X85™
Multiple Application Video and Audio Platform

Unbalanced
Standard .................................. AES-3, SMPTE 276M
Type ........................................ Unbalanced, AC coupled
Connector ................................. BNC (IEC 169-8)
Signal Level ............................... 1 V ±10% (pk-pk)
Impedance ................................. 75 ohms
Return Loss ............................... >25 dB, 0.1 to 6 MHz
Jitter ........................................ <±4 ns, peak value
DC Offset .................................. 0 V ±50 mV
Rise and Fall Time Time .......................... ±1.2 sec between video and audio
Connector ................................. DB-26
Output Impedance Output analog level (adjustable by 2 dB increments)
Linearity .................................. <±0.5 dB (20 Hz to 20 kHz)
Frequency Response ......................... <±0.1 dB (20 Hz to 20 kHz)
THD ......................................... <±0.5 dB (after filtering)
SNR ......................................... >100 dB
I/O
Multi-I/O
Composite Output . NTSC, PAL-B, SECAM, SYNC
Component Output ................................ GBR
Quantization ................................ 8 bits, all
GPI Inputs .................................. 2
  Internally pulled high
  Jumper selectable with J1~J4, J9~J12
GPI Outputs .................................. 2
  TTL-compatible
  75 ohms impedance
  Sink 64 mA, source 32 mA
Connector .................................. DB-26

Thumbnail Streaming
Connector .................................. RJ-45
Protocols .................................. CCS, SNMP, HTTP

Hardware
V2A
Measurement Window ..................... ±1.2 sec between video and audio
Time to Provide Measurement ............. 5 sec
Measurement Resolution .................. ±2 video lines

Note: The measurement result has 1.64 to 1.66 MS delay for HD de-embedded audio
and 1.28 to 1.3 M for SD de-embedded audio.

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

Weight and Dimension Measurements
Weight ................................... Fully loaded unit, no power cords: 11 lbs (4.9 kg)
  1.75 in. (4.5 cm)
  19 in. (48.3 cm)
  19 in. (48.3 cm)
  21.5 in. (54.6 cm)
  includes extruding knobs and BNCs

Power Consumption by Individual Component

Component Description  Power Consumption @ 115V AC

X85/X75 Frame with Mainboard  17.2 W
Local Control Panel  7.0 W
Blank Front Panel  5.3 W
X75OPT-HDUPG HD Module  28.4 W
8-, 16-, or 32-Channel Audio Submodule  19.7 W (8- and 16-channel)
  6.1 W (32-channel)
Analog Video in Submodule (A3D or PQM)  7.9 W
Streaming Submodule  4.0 W
Second Power Supply  Adds extra 5% to single power supply system configuration
X85OPT-HDUPG HD Module  33.6 W
Operating Temperature Range  41º to 95º F (5º to 35º C)

ORDERING INFORMATION

X85HD with Dual-Chiel Up/Down/Cross-Conversion,
Redundant PSU
X85HD-AV-2PS .......... 1RU up/down/cross converter and synchronizer,
  video and 16-channel audio, (4-channel analog
  audio input and output, 5 AES input and output),
  local control panel, redundant power supply
  (dual-channel .27/1.5 Gb/s conversion), for 3 Gb/s
  order the X85OPT-3G software key option
X85HD-LCAV-2PS ...... 1RU up/down/cross converter and synchronizer,
  video and 16-channel audio, (4-channel analog
  audio input and output, 5 AES input and output),
  no control panel, redundant power supply (dual-
  channel .27/1.5 Gb/s conversion), for 3 Gb/s
  order the X85OPT-3G software key option

X85-3G with Dual-Chiel Up/Down/Cross-Conversion,
Redundant PSU
X85-3G-AV-2PS .......... 1RU up/down/cross converter and synchronizer,
  video and 32-channel audio, (8 AES input and
  output), local control panel, redundant power supply
  (dual-channel .27/1.5 Gb/s conversion), X85OPT-3G option is included
X85-3G-LCAV-2PS .... 1RU up/down/cross converter and synchronizer,
  video and 32-channel audio, (8 AES input and
  output), no control panel, redundant power supply (dual-
  channel .27/1.5 Gb/s conversion), X85OPT-3G option is included

X85 Hardware Options (may not be used in X75)
X85OPTPD-2 .......... Program delay software key license (maximum 26 sec for
  27 Gb/s, 10 sec for 1.5 Gb/s, 5 sec for 3
  Gb/s), requires X85OPT-M2 memory module
X85OPTPD-2-M2 .... Program delay software key license (27 sec for
  27 Gb/s, 10 sec for 1.5 Gb/s, 5 sec for 3 Gb/s),
  includes X85OPT-M2 memory module

www.broadcast.harris.com

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www.broadcast.harris.com
X85™
Multiple Application Video and Audio Platform

X85OPTSC-SD .......................................................... SD<>SD standards conversion software key license, X85OPT-M2 must be installed
X85OPTSC-HD .......................................................... HD/SD<>HD/SD standards conversion software key license, X85OPT-M2 must be installed
X85OPTSC-SD-M2 .......................................................... SD<>SD standards conversion software key license, includes X85OPT-M2 memory module
X85OPTSC-HD-M2 .......................................................... HD/SD<>HD/SD standards conversion software key license, includes X85OPT-M2 memory module

**X85 Optical Fiber Options (may not be used in X75)**
- OP+SF+RR .......................................................... Small form factor-pluggable fiber receiver, dual inputs, standard sensitivity
- OP+SF+TT+13+13 .......................................................... Small form factor pluggable fiber transmitter, dual outputs, 1310 nm FP lasers, -7 dBm

**X85 Software Key (may not be used in X75)**
- X85OPT-3G .......................................................... 3 Gb/s input and output option, requires X85OPT-HDLPG
- X85OPT-CC .......................................................... Color correction software key option for X85 includes 1 SD and 2 3G/HD/SD color correctors, (for 3 Gb/s, the X85-3G model or X85HD model with the X85OPT-3G software key is required and includes RGB clipping

**X75 Hardware Options (may be used in X85)**
- X85OPT-HDLPG .......................................................... HD submodule with dual auto-detected 270/1, 5/3 inputs and dual 1.5/3 output and dual up, down or cross-conversion, coaxial and optional input and output, for 3 Gb/s operation, the X85OPT-3G software key license is required
- X75OPT-A3D .......................................................... Analog video input with high-performance 3D fully-adaptive comb filtering, S-video and analog component Betacam inputs
- X75OPT-A3D-1 .......................................................... Analog video input with industry-leading 3D fully-adaptive comb filtering, S-video and analog component Betacam inputs (with alternate color decoder algorithm)
- X75OPT-AS-32 .......................................................... 32-channel audio synchronizer with 8 AES/SD and HD 4 group embedded inputs and outputs, includes cable set
- X75OPT-AS-32-L .......................................................... 32-channel audio synchronizer with 8 AES/SD and HD 4 group embedded inputs and outputs with audio limiting, includes cable set
- X75OPT-AS-16 .......................................................... 16-channel audio synchronizer with 4-channel analog/5 AES/SD and HD 4 group embedded inputs and outputs, includes cable set
- X75OPT-AS-16-L .......................................................... 16-channel audio synchronizer with 4-channel analog/5 AES/SD and HD 4 group embedded inputs and outputs with audio limiting, includes cable set
- X75OPT-DOLBY-1 .......................................................... Dolby® E and Dolby® Digital (AC-3) integrated decomposition
- X75OPT-DOLBY-2 .......................................................... Dolby® E integrated compression
- X75OPT-DOLBY-3 .......................................................... Dolby® Digital (AC-3) integrated compression

**DTS Neural Options**
- X75OPT-UM .......................................................... DTS Neural Surround™ UpMix DTV 5.1 production solution, plug-in for X75 and X85 (requires 32 channel audio module X75OPT-AS-32)
- X75OPT-DM .......................................................... DTS Neural Surround™ DownMix DTV 5.1 transport solution, plug-in for X75 and X85 (requires 32 channel audio module X75OPT-AS-32)
- X75OPT-MM .......................................................... DTS Neural Surround™ 5.1 and rendered stereo content transitioning for DTV 5.1 production, plug-in for X75 and X85 (requires 32 channel audio module X75OPT-AS-32)

**X85 Software Options (may not be used in X75)**
- X85-RCP .......................................................... Remote control panel for X85, X75, DPS-475/575 and X50
- X75OPT-PS .......................................................... Power supply field retrofit kit
- X75OPT-STR .......................................................... MPEG-4 monitor streaming option (field retrofit for units with serial numbers higher than LHT0240085001)
- X85OPT-LCP .......................................................... Field retrofit kit (change a blank panel to a local control panel) for X85 and X75 (connects to DPS-475/575 and X50)

**X75 Software Options (may be used in X85)**
- X75OPT-NR .......................................................... Motion-adaptive noise reduction and bandwidth filtering for SD input signals
- X75OPT-ASL .......................................................... Audio limiting software keyable option
- X75OPT-SNMP .......................................................... SNMP agent software keyable option
- X75OPT-V2A .......................................................... Video/audio timing tool software keyable option for receiving units
- X75OPT-STR .......................................................... DVB subtitling software key option, system B — world system teletext (WST)

**Optional Cables for X75 and X85**
- X75OPTCAB-16-C .......................................................... Cable set for 16-channel audio synchronizer, unbalanced coaxial AES (1 set included)
- X75OPTCAB-16-CX .......................................................... Cable set for 16-channel audio synchronizer, unbalanced coaxial AES and balanced XLR AES
- X75OPTCAB-16-X .......................................................... Cable set for 16-channel audio synchronizer, balanced XLR AES
- X75OPTCAB-32-C .......................................................... Cable set for 32-channel audio synchronizer, unbalanced coaxial AES and balanced XLR AES
- X75OPTCAB-32-CX .......................................................... Cable set for 32-channel audio synchronizer, unbalanced coaxial AES (1 set included)
- X75OPTCAB-32-X .......................................................... Cable set for 32-channel audio synchronizer, unbalanced coaxial AES and balanced XLR AES
- X75OPTCAB-DVI .......................................................... Cable for DVI-D single link output
- X75OPTCAB-MULTI ......................................................... Cable set for multi IO connector