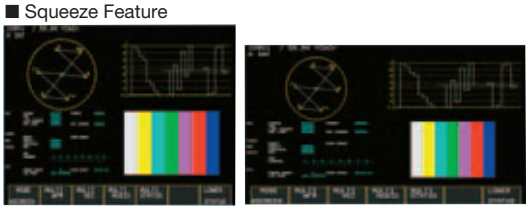
MULTI SDI RASTERIZER

LV 7330

LEADER

■ Squeeze Feature



Supports aspect ratios of 4:3, 16:9, and 16:10.

External Display

HD-SDI

SD-SDI

5 Bar

CE
Upon request

CINELITE II INSIDE

Multi SDI Rasterizer

The LV 7330 is a highly functional, compact, light-weight SDI rasterizer that boasts exceptional cost performance.
When the LV 7330 is connected to an external XGA or WXGA monitor, it can display the picture of an HD-SDI or SD-SDI signal in addition to video signal waveforms, vectors, audio data, and data analyses of the signal. The LV 7330 also comes standard-equipped with CINELITE II, a convenient tool for analyzing luminance data.

FEATURES

- **SDI Inputs and Outputs**
  The LV 7330 has two SDI input connectors that can be used for both HD-SDI and SD-SDI input. It also has an SDI output connector that you can use to send a reclocked SDI signal.
- **DVI Output**
  The various LV 7330 displays are transferred through a DVI-I connector to an XGA (1024 x 768) display. The LV 7330 also uses a squeeze method to support aspect ratios of 16:9 (1366 x 768) and 16:10 (1920 x 1200).
- **CINELITE II**
  The LV 7330 comes standard-equipped with CINELITE II (CINELITE and CINEZONE), which is a video signal luminance information analysis tool.
  With CINELITE, you can use the cursor to select any 3 points and display their f-Stop numbers, percentage values, and level values. You can choose to analyze a single pixel or a small area by setting the size of the measured area to 1 pixel or to the average value for 9 or 81 pixels.
  With CINEZONE, you can display the luminance levels in the picture using different colors. This allows you to quickly determine the overall luminance distribution in the picture, and it makes it easy to spot overexposure, underexposure, and different luminance levels in dark areas.
- **Picture Display**
  The LV 7330 has a wide assortment of SDI signal picture display features including zoom, various safety markers, and brightness, contrast, and chroma adjustment. The LV 7330 also supports CEA/EIA-608 closed captioning and superimposition.
- **Video Signal Waveform Display**
  The LV 7330 uses fully digital waveform display processing to achieve high precision and quality. From video signal waveform display gain expansion, sweep expansion, and cursor measurement to pseudo-composite and RGB displays, the LV 7330 has all of the features that people look for in a waveform monitor. The LV 7330 is equipped with an external sync signal input and it can display video signal waveforms based on a tri-level sync signal or an NTSC or PAL black burst signal.
- **Vector Display**
  The LV 7330 can display component chrominance signal vectors.
  The amplitude can be manually zoomed, or set to a fixed magnification value such as five. The IQ axes, which are useful for vector observation, can be turned on and off.
- **5 Bar Display**
  The LV 7330 can display the peak levels of the Y, R, G, B and pseudo-composite signals.
  This feature is useful for monitoring gamut errors.
- **Audio Display**
  The LV 7330 can extract the audio signal embedded in an SDI signal and display level meters, Lissajous curves, and surround-sound images for up to eight channels. The LV 7330 also supports external digital audio input, for which it can display a two-channel level meter and Lissajous curves.

  *The resolution of SD-SDI audio quantization is up to 20 bits.
- **Stereo Headphone Output**
  The LV 7330 can extract the audio signal embedded in an SDI signal. You can select two channels from the extracted audio and transmit them in stereo through the headphone output connector.
- **Status Display**
  The status display has a number of advanced features, including SDI signal error detection and analysis features.
- **Time Code Display**
  The LV 7330 can decode SMPTE 12M-2 time codes (LTC or VITC) and SMPTE 266M time codes (D-VITC) and display them. These codes can be used as timestamps in the event log.
- **Screen Capture**
  The display can be captured. Captured displays can be viewed or superimposed over an input signal. Captured displays can be saved in internal memory (RAM) or USB memory or sent to a PC through an Ethernet connection as bitmap data.
- **Presets Settings**
  The LV 7330 can store up to 30 frequently used setting configurations. The configurations can be recalled easily from the front panel or using commands sent through the Ethernet or remote connector.
- **Remote Connector**
  You can recall presets by sending commands through the remote connector. Also, a tally light can be displayed on the screen.
- **Ethernet Connector**
  From a PC connected to the LV 7330 through the Ethernet connector, you can recall presets, execute panel operations, transfer files, and monitor errors.
- **Last Memory**
  The LV 7330 backs up the current settings so that you can use the same settings that you were using before immediately after powering it up.
- **Power Supply**
  The LV 7330 has an XLR DC input connector and runs on a 12-VDC power supply.

LV 7330SER01 HISTOGRAM & USER GAMMA DISPLAY (Option)

This software option enables you to show video signals on the LV 7330 histogram display. It also enables you to convert the user-defined gamma to ITU-R BT709 gamma and show the converted signal on the picture display.

LV 7330SER02 GAMUT & LEVEL ERROR(Option)

This GAMUT & LEVEL ERROR option adds the following features to the LV 7330

- Area and time specification in gamut error detection
- Detection of luminance and chrominance signal level errors

Video Signal Formats and Corresponding Standards

Single Link System Video

Color System	Quantization	Format		Corresponding Standard
		Scanning	Frame (Field) Rates	
Y,C_B,C_R 4:2:2	10 bit	1080i	60/59.94/50	SMPTE 274M
		1080p	30/29.97/25/24/23.98	SMPTE 292M
		1080PsF	30/29.97/25/24/23.98	SMPTE RP 211 SMPTE 292M
		720p	60/59.94/50/ 30/29.97/25/24/23.98	SMPTE 296M SMPTE 292M
		525i	59.94	SMPTE 259M
		625i	50	

(only link A is supported for dual link)

Color System	Quantization	Format		Corresponding Standard
		Scanning	Frame (Field) Rates	
GBR 4:4:4	10 bit	1080p	30/29.97/25/24/23.98	SMPTE 372M (1920×1080)
		1080PsF	30/29.97/25/24/23.98	
		1080i	60/59.94/50	
	12 bit	1080p	30/29.97/25/24/23.98	
		1080PsF	30/29.97/25/24/23.98	
		1080i	60/59.94/50	
Y,C_B,C_R 4:2:2	10 bit	1080p	60/59.94/50	
	12 bit	1080p	30/29.97/25/24/23.98	
		1080PsF	30/29.97/25/24/23.98	
		1080i	60/59.94/50	

Format Setting
Can be set automatically based on the corresponding format or set manually (Set manually for dual link)

Supported Sampling Frequencies
HD:74.25 MHz or 74.25/1.001 MHz
SD:13.5 MHz

External Sync
Automatically set from the corresponding format

Audio Playback

Compliant Standard
HD:SMPTE-299M, SD:SMPTE-272M

Sampling Frequency
48 kHz (must be synchronized to the video signal)

Quantization
HD:24 bits, SD:20 bits

Channel Separation
2 groups of 8 channels are selectable.

Input/Output Connectors

SDI Input

Input Connector
2 BNC connectors (A/B switching)

Maximum Input Voltage
±2 V (DC + peak AC)

External Reference Input*

Input Signal
Tri-level sync or NTSC/PAL black burst signal

Input Connector
1 pair of BNC connectors loop-through

* If the video signal waveform or phase difference is displayed using an external sync signal as reference, the waveform phase one clock before or after an SDI signal is inserted or the power is turned on is indefinite.

AES/EBU Input

Input Connector
1 BNC connector

Sampling Frequency
48 kHz

SDI Output

Output Connector
1 BNC connector
Reclocks and transmits the selected SDI input signal

DVI-I Output

Output Connector
1 DVI-I connector

Signal Format
Single Link T.M.D.S analog RGB

Display Format
XGA (1024 x 768)
Supports wide displays (using squeeze methods)

DDC:
Not Supported

HOT PLUG Detection
Not Supported

Headphone Output

Output Signal
The LV 7330 extracts and transmits the audio signal embedded in an SDI signal.(Must be synchronized to the video signal.)

Output Connector
One 6.3-mm (1/4 in.) stereo jack

Control Connectors

USB Port

Function
Used to save screen captures, event logs, preset data, and data dumps

Specifications
USB 2.0

Media
Only USB memory devices are supported.

Remote Connector

Function
Used to recall presets, display a tally light, and switch input channels (A/B)

Control Connector
15-pin D-sub (female)

Ethernet Port

Function
Used to control the LV 7330 from a PC and monitor errors and other events

Input/Output Connectors
1 RJ-45 connector

Type
10Base-T/100Base-TX (automatic switching)

Screen Capture

Function
Captures the screen

Display
Displays the captured image or superimposes the captured image over the input signal

Media
Internal memory (RAM) and USB memory Only one screen capture can be stored in the internal memory.

Data Output
Screen captures can be saved as bitmap files or in a file format that the LV 7330 can load. They can be saved to USB memory or transmitted through an Ethernet and saved on a PC.

Data Input
Data saved to USB memory can be loaded and displayed on the LV 7330.

Presets Settings

Number of Presets
30

Display Format

1 Screen Display
Picture display, CINELITE display, CINEZONE display, video signal waveform display, vector display, status display, or audio display

2 Screen Display
Picture display and video signal waveform display
Video signal waveform display and vector display
Video signal waveform display and picture display
Video signal waveform display and audio level display
Audio waveform display and level meter display

4 Screen Display
Select audio level display or status display in addition to video signal waveform display, vectorscope display, and picture display

Time code
LTC, VITC, or D-VITC

Format Display

Color System Display

Date Display

Time or Time Code Display

Waveform Display

Waveform Operations

Display Modes

Overlay
Overlays component signals.

Parade
Displays component signals side by side.

Timing
Computes and displays Y-C_B and Y-C_R.Uses a bowtie signal.

Blanking Period
Show or hide

RGB Conversion
Converts a Y,C_B,C_R signal into an RGB signal and displays the result.

Pseudo-Composite Display
Artificially converts component signals into composite signals and displays the result.

Vertical Axis

Gain
x1 or x5

Variable Gain
x0.2 to x2.0

Amplitude Accuracy
±0.5 %

Horizontal Axis

Line Display
x1, x10, x20, ACTIVE, or BLANK

Field Display
x1, x20, or x40

Cursor Measurement

Amplitude Measurement
mV, %, R%, 3FF, 1023

Time Measurement
usec/msec

Frequency Display
Computes and displays the frequency with the length of one period set to the time between two cursors.

Scale

Type
%, V, 3FF, 1023

75 % Marker
Displays where the location of the peak of a 75 % color bar chrominance signal would be.

Vector Display

Gain
x1, x5, or IQ-MAG

Variable Gain
x0.2 to x2.0

Amplitude Accuracy
±0.5 %

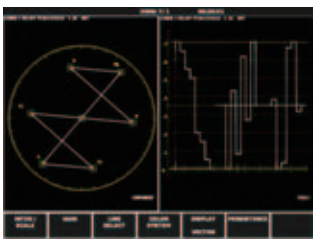
Blanking Period
Masked

Scale	
Type	75 % or 100 % (color bar)
IQ Axis	Show or hide
Pseudo-Composite	Artificially converts component signals into composite signals and displays the result.
5 Bar Display	
Function	Displays five peak levels: those of the Y, R, G, B and composite signals.
Error Level	Based on gamut error level and composite gamut error level settings.
Filter	Removes transient errors (The filter characteristics are the same as for gamut errors.)
Phase Difference Display	
Display	Displays the phase difference between an SDI signal and the external sync signal both numerically and graphically.
Display Range	
Vertical	±1 field (for interlace) ±1/2 frame (for progressive)
Horizontal*	±1 line * If the video signal waveform is displayed using an external sync signal as a reference, the waveform phase one clock before or after an SDI signal is inserted or the power is turned on is indefinite.
Picture Display	
Image Quality Adjustment	Brightness, contrast, chroma level, and aperture
Display Sizes	FIT, x1, or x2
Color Selection	Color or monochrome
Marker Displays	
Center Marker	
Aspect Markers	
HD	4:3, 14:9, 13:9, 2.35:1, 1.85:1, and 1.66:1
SD	16:9, 14:9, 13:9, 2.35:1, 1.85:1, and 1.66:1
Safe Action Markers	95 %, 93 %, and 90 %
Safe Title Markers	88 % and 80 %
CINELITE Display	
Function	f-Stop display, percentage display, and level display
f-Stop Display	Displays the f value relative to the reference point The reference point is set to the value of an object with a reflection level of 18 %.
f-Stop Gamma Correction	
Reference Gamma	0.45 (ITU-R BT709)
User-Defined Correction Tables	3
External Correction Tables	5 (read from USB memory)
Percentage Display	Displays luminance or RGB components as percentages.
Level Display	Displays luminance or RGB components with 256 levels (8 bits).
Measured points	3
Measurement sizes	1 pixel, 3 x 3 pixels, or 9 x 9 pixels
CINEZONE Display	
Function	Displays the luminance levels in the picture using different colors
Display Colors	Linear (1024 colors) or step (12 colors)
Upper Limit Setting	-6.3 to 109.4 % (values above the upper limit are displayed using white)
Lower Limit Setting	-7.3 to 108.4 % (values below the lower limit are displayed using black)
Level Search Display	Displays a specified luminance level ±0.5 % using green on an otherwise monochrome picture display.
Luminance Level Setting	-7.3 to 109.4 %
Embedded Audio Display	
Lissajous Display	
Displayed Channels	2 channels or 8 channels (only for embedded audio)
Sound Image Display	
Channel Mapping	L, R, C, LFE, Ls(s), Rs, LL, RR
Surround Formats	3-1, 3-2, 3-2-2
Level Meter Display	
Displayed Channels	8ch / 2ch
Meter	60 dB peak level, 90 dB peak level, average, or loudness
Channels	
Group Selection	You can select any 2 groups from groups 1, 2, 3, and 4. * The LV 7330 cannot display Lissajous curves, 8-channel level meters, or sound images for AES/EBU signals that it receives.

Status Display	
SDI Signal Error Detection	TRS Error, Line Number Error, CRC Error, EDH Error, Gamut Error, Composite Gamut Error, Parity Error, Checksum Error, BCH Error, Audio CRC Error
Audio Information Detection	Detects the presence of each audio channel
Error Count	Up to 100,000 errors (Only the specified errors are counted.)
Count Period	Only one error is counted for each second or frame.
Event Log Display	
Recording Capacity	Up to 1,000 events
Recorded Events	Errors, changes in input type, time stamps, etc.
Data Output	Event logs can be saved to USB memory or sent to a PC through an Ethernet connection as text data.
Data Dump Display	
Display Modes	Display data separated by serial data sequence or by channel
Line Select	Displays the selected line
Sample Select	Displays from the selected sample
Jump Feature	Jumps to an EAV or SAV
Data Output	Event logs can be saved to USB memory or sent to a PC through an Ethernet connection as text data.
Audio Status Display	Control Packets, Channel Status
Ancillary Data Analysis	EDH Display, Closed Caption Display, Inter-Stationary Control, Data Display (NET-Q), Data Broadcast Trigger Signal Display, V-ANC User Data Display, Time Code Display
Front Panel	
Key LEDs	You can dimly light all of the keys by pressing the shortcut key.
Last Memory	Backs up the panel settings.
Environmental Conditions	
Operating Temperature	0 to 40 ˚C
Operating Humidity	85 %RH or less (no condensation)
Power Supply	
Voltage	10 to 18 VDC
Power Consumption	18 W max.
Dimensions	215(W) x 44(H) x 250(D) mm (excluding protruding parts) 8 1/2(W) x 1 3/4(H) x 9 7/8(D) inch
Weight	1.3 kg 2.9 lbs.
Accessories	Instruction manual.....1 AC adapter (SPU40-105) .....1 15-pin D-sub connector.....1 15-pin D-sub connector cover .....1 Ferrite core 1

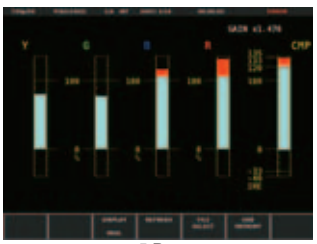
■ Display Examples

Multi-Screen



Multi-Screen

Phase Difference



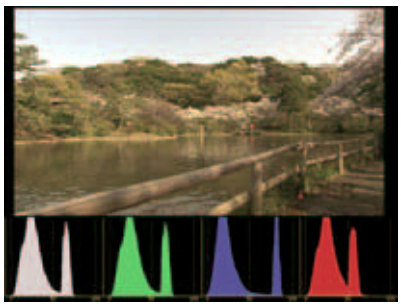
5 Bar

LV 7330 Option

LEADER

LV 7330SER01 HISTOGRAM & USER GAMMA DISPLAY (Option)

This software option enables you to show video signals on the LV 7330 histogram display. It also enables you to convert the user-defined gamma to ITU-R BT709 gamma and show the converted signal on the picture display.



LV 7330SER01 SPECIFICATIONS

Histogram Display	
Display Modes	YGBR, YRGB, Y1023
YGBR, YRGB	8-bit data processing
Y1023	10-bit data processing
Error Display	Values that are less than 0 % or greater than or equal to100.1 % are displayed as errors.
Error Display Colors	
Y	Red
GBR	Yellow
Histogram Brightness	-128 to 127
Scale Brightness	-8 to 7
Scale Unit	%, 3FF, 1023
Scale Color	White, yellow, cyan, green, magenta, red, blue
Picture Display with User-Defined Gamma	
User-Defined Gamma	Acquired with CAL in the CINELITE display. Selected with GAMMA (USER-A, USER-B, USER-C, USER-D, USER-E).
General Specifications	
Environmental Conditions	Same as the LV 7330
Contents	License key.....1 Instruction manual.....1

LV 7330SER02 GAMUT & LEVEL ERROR(Option)

This GAMUT & LEVEL ERROR option adds the following features to the LV 7330

- Area and time specification in gamut error detection
- Detection of luminance and chrominance signal level errors

LV 7330SER02 SPECIFICATIONS

Gamut Error	
Error Detection	Detect by specifying area and time
Area Specification	0.0 to 5.0 % (specifying 0.0 % is equivalent to not specifying an area)
Time Specification	1 to 50 consecutive frames
Level Error	
Error Detection	Level errors in the luminance and chrominance signals are detected (not available in dual link mode)
Detection Level	
Luminance Signal	-7.2 to 109.4 %, -50.4 to 765.8 mV (for both upper and lower limits)
Chrominance Signal	-57.0 to 57.0 %, -399.0 to 399.0 mV (for both upper and lower limits)
General Specifications	
Environmental Conditions	Same as the LV 7330
Contents	License key.....1 Instruction manual.....1

■ LV 7330 Front Panel

■ LV 7330 Rear Panel

■ Rack Mounting

LR 2481 Rack Mount Adapter (sold separately)