Leader

LV5300A
MULTI WAVEFORM MONITOR

4K | 12G SDI | 6G SDI | 3G SDI | HD SDI | SD SDI | HDR | WCG | EYE

LV5350
MULTI WAVEFORM MONITOR

4K | 12G SDI | 6G SDI | 3G SDI | HD SDI | SD SDI | HDR | WCG

LV7300
RASTERIZER

4K | 12G SDI | 6G SDI | 3G SDI | HD SDI | SD SDI | HDR | WCG | EYE

ZEN
WAVEFORM MONITOR
LV5300A

ZEN
RASTERIZER
LV7300

General

The LV5300A/LV5350/LV7300 are a space-saving, compact waveform monitor and rasterizer family designed for 4K/UHDTV/HD/SD-SDI video signals. The LV5300A/LV5350 are a waveform monitor with a 7-inch touch screen display in a compact, short-depth 3 RU enclosure optionally operated with battery power supply. The LV7300 is a 1RU half rack sized rasterizer. It is compact but supports eye pattern measurement up to 12G-SDI.

Features

Supports wide range of SDI Video

These monitors and rasterizers support SDI signals from SD formats up to 12G-SDI. Detailed embedded audio analysis is also available.

Unmatched ease of use

The front panel offers familiar, dedicated buttons and knobs for simple operation and training. Additionally, the units can be controlled via a USB mouse. The LV5300A/LV5350 uses a 7-inch full HD panel with a touchscreen, and the LV7300 can be operated and set intuitively by touch operation by connecting an external touch-enabled LCD monitor with a USB cable.

* While most external touch-capable LCD monitors are compatible, not all vendors' products can be guaranteed.

SDI input format

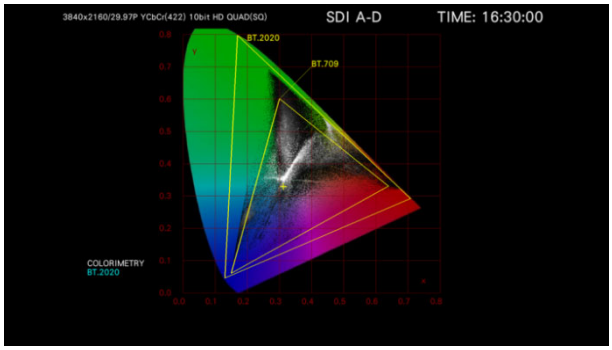
SD-SDI, HD-SDI, 3G-SDI, 6G-SDI, 12G-SDI Single Link is supported.

SDI and IP analysis

For engineering and troubleshooting needs, the LV5300A/LV5350 and LV7300 offer monitoring of SDI transmission errors, external synchronization phase difference, lip sync, SDI signal frequency deviation, and ancillary data analysis.

Video analysis
The LV5300A/LV5350 and LV7300 provide a full set of video displays including waveform, vector, 5 BAR gamut, and CIE chromaticity diagram. In addition to the various displays, quality of experience (QoE) monitoring such as freeze, black, gamut help ensure all potential issues with content are easily diagnosed.

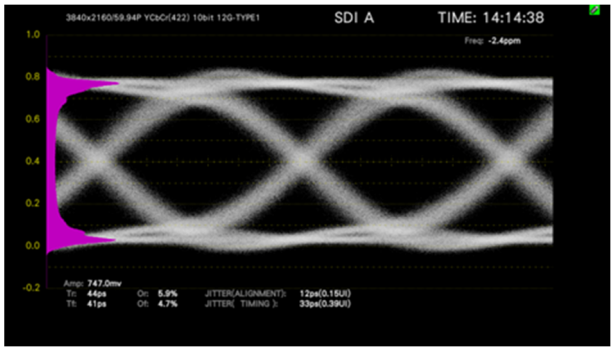
xy chromaticity coordinate display



Audio analysis
Embedded SDI audio can be displayed and monitored using level meters , Lissajous display, mute, and clip error detection. Audio format is compatible with L-PCM.

Eye pattern display
From SD-SDI to 12G-SDI
Full physical layer measurement of the SDI signal including eye pattern display and jitter allows for detailed engineering evaluations of SDI signal paths.

Eye pattern



Subtitles and closed caption decode
CEA-608, CEA-708 closed captioning, Teletext, Japanese subtitles, and OP47 subtitle embedded in the SDI signal can be verified and displayed in the video.

External synchronization signal input
The phase difference and synchronization status of each SDI video signal is shown graphically based on the external synchronization signal (black burst, tri-level sync).

Fully customizable layout
Various items such as waveforms, vector displays, audio bars, gamut views, and pictures of input signals can be laid out in any position with your preferred size.

SDI signal generation
A built-in generator provides SDI test signals, useful for device or network troubleshooting. The generator supports HD-SDI through 12G-SDI with HD multi format color bar and patterns, multiple overlays of moving boxes and embedded audio, flat field at any level, and a 4K multi format color bar.
*For 4K/UHDTV format only 12G-SDI is possible.

External monitor output
The screen can be output to an external SDI monitor or HDMI monitor with full HD resolution.
*Does not guarantee the operation with all HDMI monitors.
*The LV5300A / LV5350 do not support external monitor output.

Capture data for analysis
Capture the display screen as still image data or use the frame capture function to capture up to 16 frames of data.

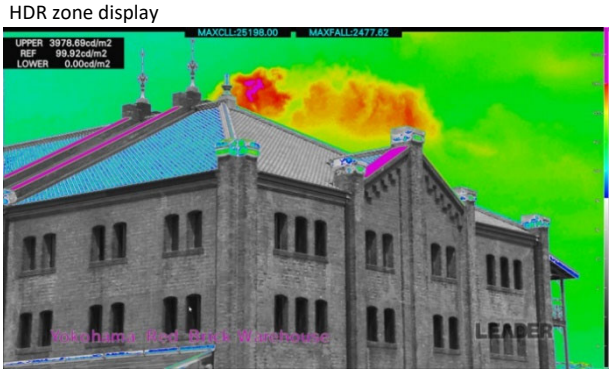
Time code display
The time code may be superimposed on SDI video signals. The time code can also be used as the timestamp of the event log.

External remote terminal
The presets can be recalled by remote terminals, and users can switch input signals, tally displays or output alarms.

Ethernet connectivity
The LV5600 and LV7600 support remote operation by TELNET, file transfer by FTP, remote operation by SNMP and alarm notification, remote operation and monitoring from a web-browser via HTTP.

HDR capable
HDR signal level monitoring and luminance management accounting for OOTF is straightforward. The waveform display in HDR scale is added to the IRE scale. Furthermore, in the CINEZONE™ display, the luminance distribution of HDR and SDR in the picture can be easily confirmed, with SDR content appearing in monochrome gray scale while HDR is colored according to the brightness.

HDR zone display



Focus assist
We developed a new focus detection algorithm based on proprietary nonlinear super-resolution technology. Focus is determined with high sensitivity and repeatability even under difficult, low-contrast images.

Tally display
Serial communication allows display of camera ID, iris and tally. Fast switching of tally display by remote terminal is also possible.

■List of hardware options

Model Name	Type Number			Description
	LV5300A	LV5350	LV7300	
SDI INPUT	—	LV5350 standard	LV7300-SER01	SD,HD,3G SDI input *
SDI INPUT/EYE	LV5300A standard	—	LV7300-SER02	SD,HD,3G SDI input and eye pattern display *
BATTERY ADAPTER V MOUNT	LV5300-SER11	LV5350-SER11	—	Battery adapter: V-Mount
BATTERY ADAPTER QR GOLD	LV5300-SER12	LV5350-SER12	—	Battery adapter: QR-Gold

* For LV7300, either LV7300-SER01 and LV7300-SER02 are selected, but one of them is necessary.

■List of Software options

Model Name	Type Number			Description
	LV5300A	LV5350	LV7300	
AUDIO	LV5300-SER20	LV5350-SER20	LV7300-SER20	Embedded audio analysis
CLOSED CAPTION	LV5300-SER21	LV5350-SER21	LV7300-SER21	Japanese subtitles, EIA-608,708/TELETEXT
CIE	LV5300-SER22	LV5350-SER22	LV7300-SER22	CIE display
HDR	LV5300-SER23	LV5350-SER23	LV7300-SER23	HDR analysis
TSG	LV5300-SER24	LV5350-SER24	LV7300-SER24	SDI signal generation
FOCUS ASSIST	LV5300-SER25	LV5350-SER25	LV7300-SER25	Focus assist
LAYOUT	LV5300-SER26	LV5350-SER26	LV7300-SER26	Customized layout function／Display assignment function
TALLY	LV5300-SER27	LV5350-SER27	LV7300-SER27	Tally displays
4K	LV5300-SER28	LV5350-SER28	LV7300-SER28	4K 6G/12G SDI format support
EXTENDED VEC	LV5300-SER40	LV5350-SER40	LV7300-SER40	Extended vector display function

■Related accessories

Product Name	Model	Related products			Remarks
		LV5300A	LV5350	LV7300	
RACK-MOUNT ADAPTER	LR2530	○	○		Dual rack mount adapter for the LV5300/LV5350. Two LV5300A / LV5350 can be mounted in an EIA 19-inch rack. (Two options of LV5300A + LV5350 need separately option compatibility.)
BLANK PANEL	LC2535	○	○		Blank panel for the LR2530
RACK-MOUNT ADAPTER	LR2561	○	○		LR2561 is a rack mount adapter that allows two LV5600s to be mounted side by sideor an LV5600 and LV5350 or LV5300A to be mounted side by side in an EIA 19-inch rack.*
BLANK PANEL	LC2566	○	○		Blank panel for the LR2561
RACK-MOUNT ADAPTER	LR2731			○	Single rack mount adapter to install in a 19-inch EIA standard rack. One side is a blank panel.
RACK-MOUNT ADAPTER	LR2732			○	Dual rack mount adapter to install in a 19-inch EIA standard rack. It allows two sets of LV7300 to be installed side by side.
AC ADAPTER	GST90A12	○	○	Includ	AC adapter for LV5300A/LV5350/LV7300（Included as a standard accessory for the LV7300）
REMOTE CONTROLLER	LV7290	○	○	○	One remote contoroller can be connected up to 8 units of waveform monitor or rasterrizer via Ethernet. .

* Please be advised that the LV5350 and LV5300A can only be installed on the right side of the LR2561.

LV5350 standard / LV7300-SER01
SDI Input

LV5300A standard / LV7300-SER02
SDI input with eye pattern

Both the LV5350 and LV5300A monitor SDI signals. The LV5300A can also display EYE pattern.

The LV7300 can be configured with or without an EYE pattern display.

Video analysis

The LV5300A / 5350 / 7300 provide a full set of video displays including waveform, vector, 5 BAR gamut, CINELITE™ II, and CIE chromaticity diagram. In addition to the various displays, quality of experience (QoE) monitoring such as freeze, black, gamut, help ensure all potential issues with content are easily diagnosed.

Audio support

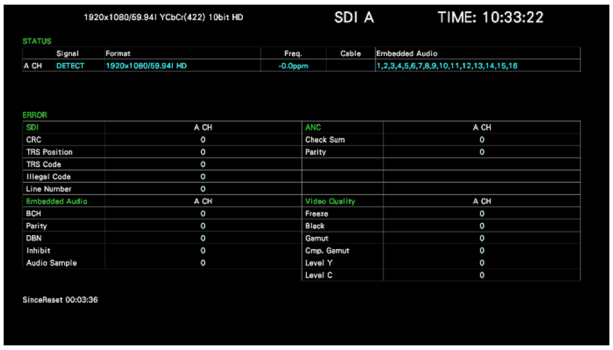
Embedded SDI audio can be displayed on meters for basic level and presence monitoring.

Approved standard	SMPTE ST 299, SMPTE ST 272
	48 kHz/24 bit/L-PCM
Synchronization	All are synchronized with the video clock.
	All input SDI signals are synchronized.
Display channels	8ch
Display dynamic range	
SDI embedded audio	
	-60dBFS/-90dBFS/Reference level ±3dB
Level accuracy	±0.3dB
	(-50 to 0dBFS, 1kHz, signal source impedance 40Ω or less)
Frequency characteristics	
	30Hz to 20kHz ±0.4dB
	(4dBu, 1kHz reference,TRUE PEAK response)
	20Hz to 20kHz +0.4dB, -0.6dB
	(4dBu, 1kHz reference, TRUE PEAK response)
Meter response model	
	TRUE PEAK/PPM type I/PPM type II/VU
Peak hold time	0.0 to 5.0 sec (0.5-sec steps)/HOLD
Level setting	-40.0 to 0.0dBFS
	(reference level, warning over level)

Lissajous, surround and status can be displayed by adding LV5300-SER20/LV5350- SER20/LV7300-SER20

SDI data analysis

The status display summarizes CRC and embedded audio errors in the SDI signal. An event log, data dump, and phase difference measurements can be used to troubleshoot.



Screen capture function

A screen capture function to capture the display screen as still image data and a frame capture function to capture 16 frames of data are available. The captured data can be saved in BMP format in comparison with the input signal, as well as the display on the monitor, and allowing confirmation with an external PC.

Time code display

Embedded time code data can be verified and displayed. The time code can also be used as the timestamp of the event log.

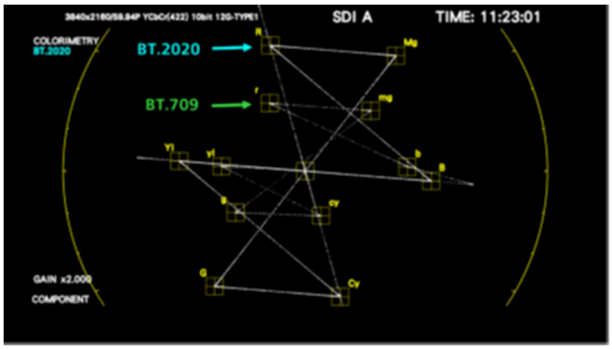
SDI Inputs and outputs

Two (2) SDI inputs BNC connector
Two (2) SDI outputs BNC connector
Output re-clock signal
The SDI signals of the input terminals reclock output to the output terminals, respectively.
Select re-clock signal
The signals of the input terminals can be switched/reclock output.

BT.709 compatible vectorscope scale

UHDTV (ARIB STD-B66) and HLG color bars (ARIB STD-B67) contain BT.2020 and BT.709 colors. This allows quick verification of the vector coordinates of a BT.709 color bar, useful for BT.2020 and BT.709 video content production.

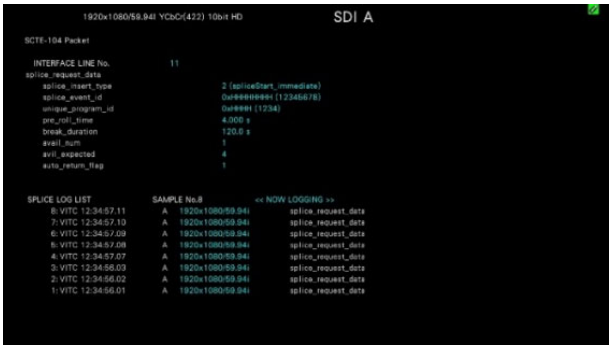
BT.709 color bar vector display



SCTE-104 compatible for ANC data analysis function

In Japan, ARIB-STD B39 (NET-Q) is used for starting and replacing commercials while in other countries SCTE-104 is commonly used.
Recently, SCTE104 has been used in operation systems in Japan too.
We support SCTE-104 for efficient operation worldwide.

SCTE-104 packet display (text display)

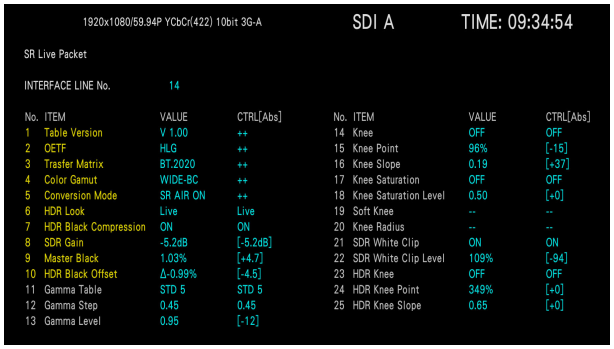


SCTE-104 detection display (Picture Screen)

SR Live Metadata display

The ZEN series waveform monitors and rasterizers LV5600/LV7600/LV5350/LV5300A/LV7300 decode and display the “SR Live Metadata” packet used by Sony Imaging Products & Solutions Inc(“Sony”).

SR Live Metadata display

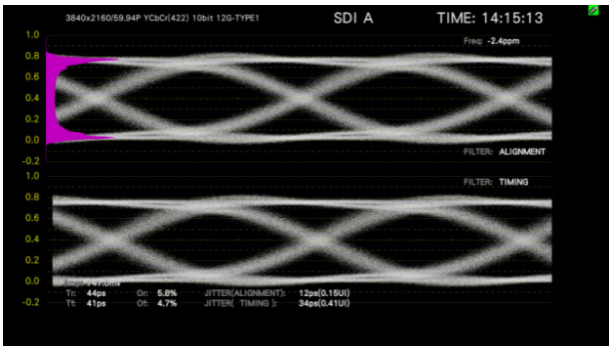


Eye pattern display (LV5300A standard/ LV7300-SER02)

Displays SDI signal eye pattern waveforms and jitter waveforms, and parameter measurements. Only SDI input 1 supports the eye pattern display. A histogram view is also available.
An eye pattern obtained with a 100kHz or higher filter (alignment jitter) and the eye pattern obtained with a 10Hz or higher filter (timing jitter) can be displayed together.

SDI input terminal	SDI INPUT 1
Display	Displays the waveform of the SDI input signal signal before it is equalized.
Screen	
1-screen display	The eye pattern for the selected filter is displayed on one screen.
2-screen display	The eye pattern for the timing filter and eye pattern for the selected filter are displayed on two screens.
Waveform display color	Selectable from seven colors.
Scale display color	Selectable from seven colors.
Method	ETS
Amplitude accuracy	800mV±5% (to 800mV input)
Time-axis display	2UI, 4UI, 16UI
Time-axis accuracy	±3%
Jitter filter	10Hz, 100Hz, 1kHz, 100kHz, TIMING, ALIGNMENT
Cursor measurement	Amplitude measurement/time measurement
Automatically measured items	Amplitude, rising edge, falling edge, timing jitter, and jitter overshoot
Histogram view	Displays the frequency distribution of the eye pattern waveform amplitude.

Concurrent display



*Upper: 100kHz or higher filter, Lower: 10Hz or higher filter, Magenta: Histogram

LV5300-SER11 / LV5350-SER11
Battery adapter: V-Mount

V mount adapter for battery compatible with IDX battery.

LV5300-SER12 / LV5350-SER12
Battery adapter: QR-Gold

QR Golden Mount Adapter for Battery Compatible with Anton Bauer Battery.

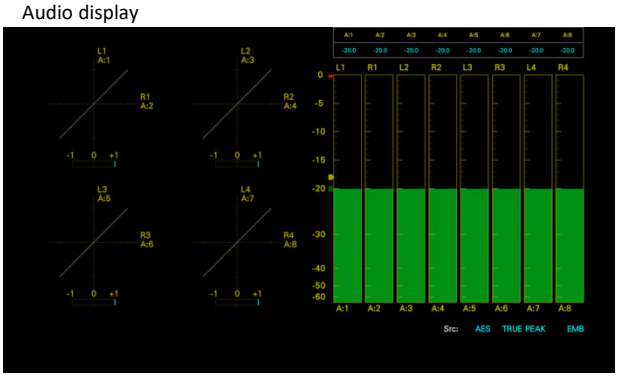
LV5300-SER11 V Mount

LV5300-SER12 Antonbauer

LV5300-SER20 / LV5350-SER20 / LV7300-SER20
Embedded audio analysis

Lissajous display, surround display, mute, clip error detection, etc. are added with this option. Numerous analysis displays are available, and simultaneously display of 8 channels from one SDI signal and 4 channels from 2 SDI signals is possible. Embedded audio playback system complies with SMPTE ST 299, 272.

Audio display



Embedded Audio

Approved standard	SMPTE ST 299, SMPTE ST 272
	48 kHz/24 bit/L-PCM

Synchronization condition: All are synchronized with the video clock. All input SDI signals are synchronized.

Lissajous display

Display channels	2ch x 1/2ch x 4
Display method	X-Y/MATRIX
Correlator	Indicates a value between -1 and 1 for the correlation between two channels.
Channel assignments	
SINGLE LISSAJOU	L/R
MULTI LISSAJOU	L1/R1 to L4/R4

Surround display

Function	Graphically displays the sound field.
Surround system	5.1ch
Channel assignments	L/R/C/LFE/Ls/Rs/Lt/Rt

Status display

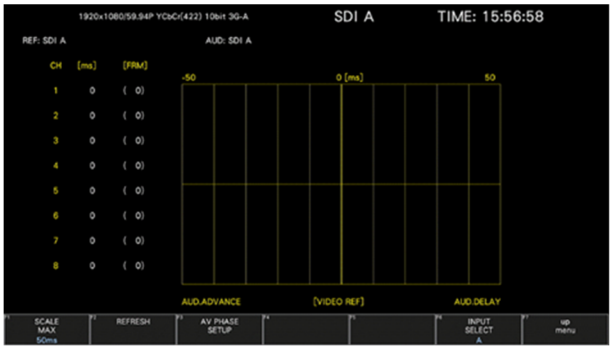
Level value	Indicates the audio level as a (dBFS) value
Error detection	Counts the number of errors that occurred on each channel.
Level over	Counts the number of times the input signal level exceeds the specified value.
Detection setting	-40.0 to 0.0dBFS
Clip	Counts the number of times a maximum value signal exceeding the specified number of samples is input successively.
Detection setting	1 to 100 samples
Mute	Counts the number of times a mute signal exceeding the specified duration of time is input successively.
Detection setting	1 to 5000ms
Parity error	Counts the number of times the parity bit of an input signal differs from the re-calculated parity value.
Validity error	Counts the number of times that the validity bit of an input signal is 1.
CRC error	Counts the number of times the CRC value of the channel status bit differs from the re-calculated CRC value.
Code violation	Counts the number of times the bi-phase modulation of an input signal is abnormal.

Lip sync measurement

Function	Measures the time difference between the SDI signal and digital audio signal and shows measurements as a value and on a graph.
Reference signal	Leader lip sync function.
Luminous level setting value	25 to 100%
Audio signal level setting value	-30 to 0dBFS
Supported audio signal	Embedded audio signal
Measurement range (bar display)	±50ms / ±100ms / ±500ms / ±1.0s / ±2.5s
Measurement range (value display)	±3999ms
Measurement resolution	1ms

* TSG patterns other than ours can be supported by configuring video signal settings and audio signal settings.

Lip sync display



LV5300-SER21 /LV5350-SER21 /LV7300-SER21
Closed captioning

Closed captioning

CEA-608,CEA-708 closed caption, teletext, OP47 subtitle embedded in an SDI signal can be decoded and displayed.

Superimpose Display

Displays English closed captions, European closed captions, and Japanese closed captions over the picture

English Closed Caption

Compliant Standards (Mapping Standards)

EIA-708	SMPTE ST 334
EIA/CEA-608-B（EIA-708-B）	SMPTE ST 334
EIA/CEA-608-B（EIA/CEA-608-B）	SMPTE ST 334
VBI（EIA/CEA-608-B Line21）	CIA/EIA-608-B

Supported Video Formats

SD, HD, 3G-A, 3G-B-DL,
3G(DL)-4K (close caption decoding only for link 1),
6G (close caption decoding only for sub 1),
12G (close caption decoding only for sub 1)

European Closed Caption

Compliant Standards

Teletext	VBI (ITU-R BT. 653-3 System B) (SD only), OP47

Closed caption display

Simple Japanese Closed Caption Display

Displays a simple Japanese closed caption on the picture display. (Select HD, SD, analog, or portable closed caption to display. Select language 1 or 2.)

Compliant Standard	ARIB STD-B37 short form data

Supported Video Formats

SD, HD, 3G-A,
3G(DL)-4K(close caption decoding only for link 1) * ,
12G (close caption decoding only for sub 1) *

Display

Display position control is supported only for HD and SD closed captions.

Characters

Only Kanji, roman numerals, katakana, hiragana, additional characters (ARIB STD-B24), additional kanji (ARIB STD-B24),and 1-byte DRCS are displayed.

Character Sizes

Supports only standard, medium, small, and specified size

Codes

Logging

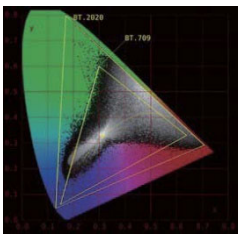
Logged Events	Clear screen command, text closed caption display event,time code, TV commercial material check result
Data Format	Text

* Requires SER28.

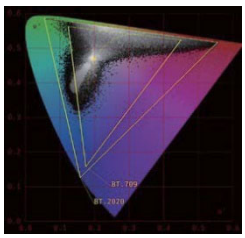
LV5300-SER22 / LV5350-SER22 / LV7300-SER22
CIE chart display function

A chromaticity display of ITU- R BT. 601, ITU- R BT. 709, ITU- RBT. 2020 colorimetry. The display mode supports CIE 1931 (xy display) and CIE 1976 (u'v' display). Since the CIE chart can display two color gamuts, the tool can be used to suppress the color gamut of BT.709 using the equipment compatible with BT.2020, and to confirm the content that exceeds the color gamut of BT.709. In color display, the chromaticity point is displayed using the color (on the picture) in the video signal. The chromaticity can be measured at any pixel with the cursor.

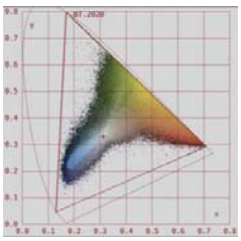
xy chromaticity coordinate display



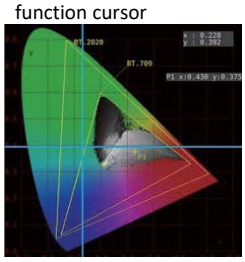
u' v' chromaticity coordinate display



xy coordinate color indication



A light blue is a measurement function cursor



LV5300-SER23 / LV5350-SER23 / LV7300-SER23
HDR analysis

In addition to HLG and PQ per ITU-R BT.2100, this option also supports level monitoring of S-log3 HDR signals. Level management can be made using the assumed luminance (cd/m²) in a display considering OOTF. The video waveform includes the HDR scale added to the IRE scale. In the CINEZONE™ display, the luminance distribution of the HDR area can be easily confirmed with the SDR area shown in monochrome, and the HDR content with a color according to the brightness.

Approved standard

ITU-R BT. 2100 (HLG, PQ), S-Log 3, C-Log, Log-C

Supported format

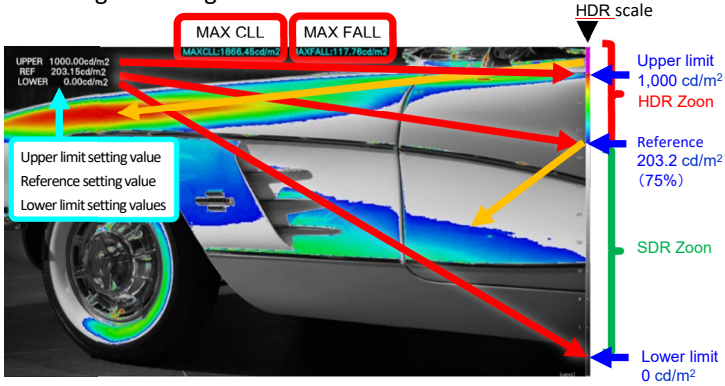
All formats except SD-SDI.

HDR Scale

By associating waveform and histogram with the HDR scale, management of the video with brightness is simplified.

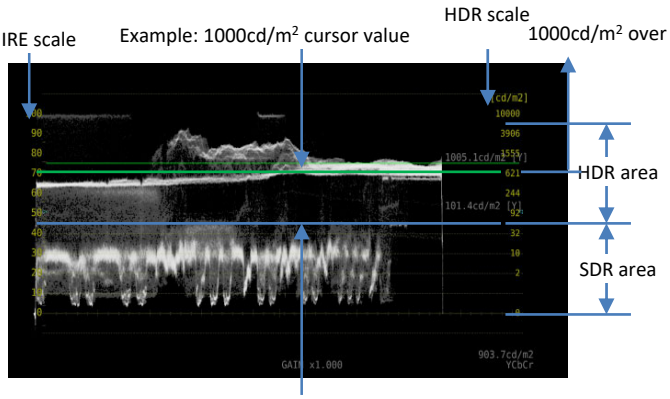
HDR zone display

The luminance distribution of the HDR area can be easily confirmed by coloring the SDR area with monochrome and the HDR with a color according to the brightness.



The SDR part is monochrome, the HDR region is colored according to luminance.
Above the upper limit value is colored with magenta.
The upper limit value, the reference value, the lower limit value can be varied.

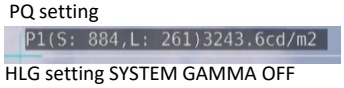
HDR waveform display



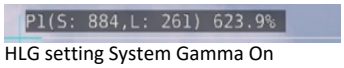
HDR point measurement

The crosshair cursor can be freely moved, with up to 3 points measured simultaneously.

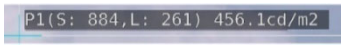
PQ setting



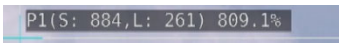
HLG setting SYSTEM GAMMA OFF



HLG setting System Gamma On



S-Log3 setting System Gamma Off



LV5300-SER24 /LV5350-SER24 /LV7300-SER24
SDI signal generation

The optional generator provides SDI test signals, useful for device or network troubleshooting. The generator supports HD-SDI through 12G-SDI with HD multi format color bar and patterns, multiple overlays of moving boxes and embedded audio, flat field at any level, and a 4K multi format color bar.

* The SDI signal generation function of 12G-SDI requires LV5300-SER28/LV5350-SER28 /LV7300-SER28options.
* The LV5300A/LV5350/LV7300 are output from the SDI output terminal 2 according to the output setting.

Output pattern

100% color bar, 75% color bar, HD multiformat color bar *1, 4K multiformat color bar *1, color raster, gamma, cross hatch, 10 step, limit lamp, check field, lip sync pattern(SER20), HDR color bar (SER23) *1

Scrolling *2	ON/OFF
Direction	8 directions (up and down, left and right, and combinations thereof)
Speed range and unit	4 to 124 dots per frame (field), 4 dot units.
Moving Box *2	ON/OFF
Color	WHITE、YELLOW、CYAN、GREEN、MAGENTA、RED、BLUE、BLACK
Speed	1 to 3

Embedded audio

Number of Embedded Channels	16channels max. *3
Embedding	On/Off On/off at the audio group level
Audio Level	-20d BFS, -18 dBFS, 0 dBFS, mute
Audio Frequency	1kHz
CRC Error Addition	An incorrect CRC is inserted into the Y component of the first line.

*1 It cannot be set in horizontal 1280, 4096, and 2048 pixel format.

*2 Either scrolling, or moving box can be selected.

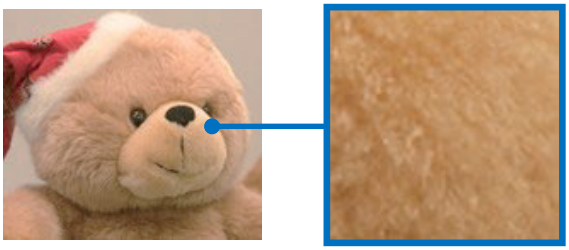
*3 For 4096 × 2160 6G and 2048 × 1080 3G-B-DL, only 8 channels are embedded.

LV5300-SER25 /LV5350-SER25 /LV7300-SER25
Focus assist

This option adds a new, proprietary focus detection algorithm based on nonlinear super-resolution technology to aid in scene focus conditions. Focus is determined with high sensitivity and repeatability even with difficult, low-contrast images. In addition, sensitivity can be selected from 5 levels according to the video scene.

Focus assist display

After focus adjustment
(The green part is the focus adjustment point)

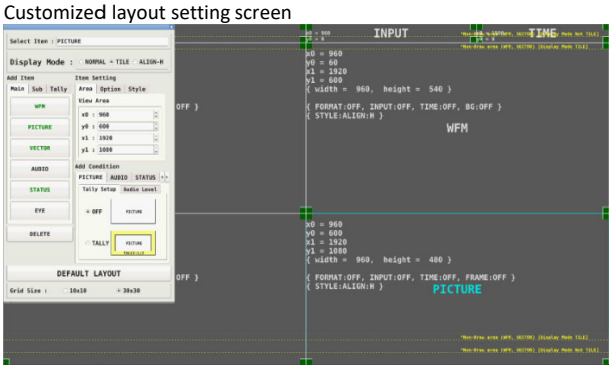


Enlarged view (After focus adjustment)

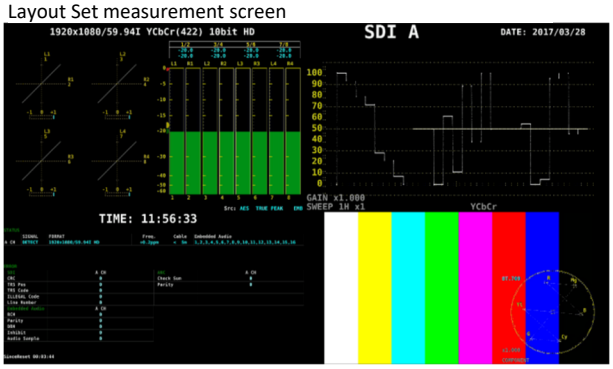
LV5300-SER26 /LV5350-SER26 /LV7300-SER26
Customized layout

Users can size and position all video displays, waveforms, vectorscopes, gamut views, audio tools, etc as desired to optimize the screen for any specific workflow or user. Two input signals can be displayed simultaneously, or one input signal can be displayed on multiple screens.

Customized layout setting screen



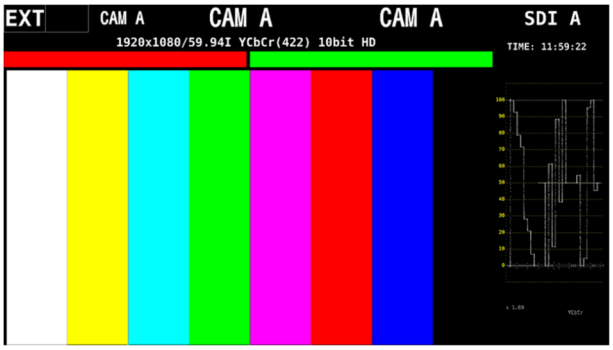
Layout Set measurement screen



LV5300-SER27 / LV5350-SER27 / LV7300-SER27
Tally display

Fast switching of tally display by remote terminal is possible. For the camera ID, a fixed name can be assigned to each channel in the setting of this unit.

Tally display

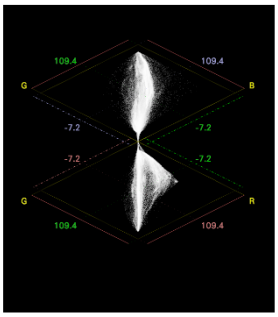


LV5300-SER28 / LV5350-SER28 / LV7300-SER28
4K/UHDTV video

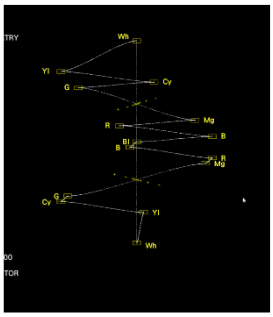
Adds support for 4K/UHDTV signals via 12G/6G- SDI single link.

*12G/6G-SDI signal is input terminal 1 only.

LV5300-SER40 /LV5350-SER40 /LV7300-SER40
Extended vector display function



RGB VECTOR



YCbCr VECTOR

Specifications

SDI video signal formats and standard

SD video signal format and standard

Color System	Quantization	Image	Field Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	720 × 487	59.94 /I	SMPTE ST 259
		720 × 576	50 /I	

HD video signal format and standard

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	1280 × 720	60/59.94/50/ 30/29.97/25/24/23.98 /P	SMPTE ST 292-1 SMPTE ST 296
		1920 × 1080	60/59.94/50 /I	SMPTE ST 274 SMPTE ST 292-1
			30/29.97/25/24/23.98 /P	
			30/29.97/25/24/23.98 /PsF	

3G-A video signal format and standard

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	1920 × 1080	60/59.94/50 /P	SMPTE ST 274 SMPTE ST 425-1
			48/47.95 /P	-
		2048 × 1080	60/59.94/50/48/47.95 /P	SMPTE ST 425-1 SMPTE ST 2048-2
	12bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274 SMPTE ST 425-1
			30/29.97/25/24/23.98 /P	
			30/29.97/25/24/23.98 /PsF	
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
YC_BC_R 4:4:4	10bit	1280 × 720	60/59.94/50/ 30/29.97/25/24/23.98 /P	SMPTE ST 296 SMPTE ST 425-1
		1920 × 1080	60/59.94/50 /I	SMPTE ST 274 SMPTE ST 425-1
			30/29.97/25/24/23.98 /P	
			30/29.97/25/24/23.98 /PsF	
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
	12bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 425-1
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
RGB 4:4:4	10bit	1280 × 720	60/59.94/50/ 30/29.97/25/24/23.98 /P	SMPTE ST 296 SMPTE ST 425-1
		1920 × 1080	60/59.94/50 /I	SMPTE ST 274 SMPTE ST 425-1
			30/29.97/25/24/23.98 /P	
			30/29.97/25/24/23.98 /PsF	
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
	12bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 425-1
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
XYZ 4:4:4	12bit	2048 × 1080	30/25/24 /P	SMPTE ST 425-1
			30/25/24 /PsF	SMPTE ST 428

3G-B-DL video signal formats and standard

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	1920 × 1080	60/59.94/50 /P	SMPTE ST 274 SMPTE ST 372 SMPTE ST 425-1
			48/47.95 /P	-
		2048 × 1080	60/59.94/50/48/47.95 /P	SMPTE ST 372 SMPTE ST 425-1 SMPTE ST 2048-2
	12bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274 SMPTE ST 372
			30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 372 SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
YC_BC_R 4:4:4	10bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 372
			30/29.97/25/24/23.98 /PsF	SMPTE ST 425-1
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 372 SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
	12bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 372
			30/29.97/25/24/23.98 /PsF	SMPTE ST 425-1
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 372 SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
RGB 4:4:4	10bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 372
			30/29.97/25/24/23.98 /PsF	SMPTE ST 425-1
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 372 SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
	12bit	1920 × 1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 372
			30/29.97/25/24/23.98 /PsF	SMPTE ST 425-1
		2048 × 1080	30/29.97/25/24/23.98 /P	SMPTE ST 372 SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
XYZ 4:4:4	12bit	2048 × 1080	30/25/24 /P	SMPTE ST 372 SMPTE ST 425-1
			30/25/24 /PsF	SMPTE ST 428

3G(DL)-4K Video Signal Formats and Standards

Square

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 425-3 SMPTE ST 2036-1
			30/29.97/25/24/23.98 /PsF	-
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 425-3 SMPTE ST 2048-1
			30/29.97/25/24/23.98 /PsF	-

2 sample interleave

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 425-3 SMPTE ST 2036-1
			30/29.97/25/24/23.98 /PsF	-
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 425-3 SMPTE ST 2048-1
			30/29.97/25/24/23.98 /PsF	-

* You also need the SER28.
* When these signals are displayed, phase differences of up to 100 clocks (approx. 0.67µs) between links are automatically corrected.
* 3G-B-DS links are supported.

6G video signal formats and standards (2 sample interleave)

Color System	Quantization	Image	Frame Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2081-10
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10

* Type 1 of 12G-SDI is supported.

12G video signal formats and standards (2 sample interleave)

Color System	Quantization	Image	Frame Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	3840 × 2160	60/59.94/50 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
			48/47.95/P	-
		4096 × 2160	60/59.94/50/48/47.95 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
	12bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
YC_BC_R 4:4:4	10bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
	12bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
RGB 4:4:4	10bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
	12bit	3840 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096 × 2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10

* Type 1 of 12G-SDI is supported.

TSG (SER24) SDI video signal formats and standard

HD video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	1280x720	60/59.94/50 /P	SMPTE ST 292-1
			30/29.97/25/24/23.98 /P	SMPTE ST 296
		1920×1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 292-1
			30/29.97/25/24/23.98 /PsF	

3G-A, 3G-B-DL video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	1920×1080	60/59.94/50/48/47.95 /P	SMPTE ST 274 SMPTE ST 425-1
			48/47.95 /P	-
		2048×1080	60/59.94/50/48/47.95 /P	SMPTE ST 425-1 SMPTE ST 2048-2
YC_BC_R 4:4:4	10bit	1920×1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	
		2048×1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2
RGB 4:4:4	10bit	1920×1080	60/59.94/50 /I	SMPTE ST 274
			30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	
		2048×1080	30/29.97/25/24/23.98 /P	SMPTE ST 425-1
			30/29.97/25/24/23.98 /PsF	SMPTE ST 2048-2

6G video signal formats and standards(2-sample interleave)

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	3840×2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2081-10
		4096×2160	30/29.97/25/24/23.98 /P	SMPTE ST 2048-1 SMPTE ST 2081-10

* You also need the SER28.

12G video signal formats and standards (2-sample interleave)

Color System	Quantization	Image	Frame (Field) Frequency /Scanning	Supported Standard
YC_BC_R 4:2:2	10bit	3840×2160	60/59.94/50 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
			48/47.95 /P	-
		4096×2160	60/59.94/50/48/47.95 /P	SMPTE ST 2048-1 SMPTE ST 2082-10
YC_BC_R 4:4:4	10bit	3840×2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096×2160	30/29.97/25/24/23.98 /P	SMPTE ST 2048-1 SMPTE ST 2082-10
RGB 4:4:4	10bit	3840×2160	30/29.97/25/24/23.98 /P	SMPTE ST 2036-1 SMPTE ST 2082-10
		4096×2160	30/29.97/25/24/23.98 /P	SMPTE ST 2048-1 SMPTE ST 2082-10

* You also need the SER28.

External synchronize input terminal

Input terminal BNC terminal
Number of input terminals 1 line 2 terminals
Input impedance 15 kΩ Passive loop through
Input return loss 30 dB or more (50 kHz to 30 MHz, 75 Ω termination)
Maximum input voltage ± 5 V (DC + peak AC)
Input signal Ternary synchronization signal or NTSC/PAL black burst signal
10 Field ID correspondence
Function SDI reference signal input for video signal waveform display and phase difference display

Headphone output terminal

Output terminal
LV5300A/LV5350 3.5 mm Mini jack 1 terminal (stereo)
LV7300 Standard jack 1 terminal (stereo)
Output signal On the screen of the displayed audio signal, arbitrary 2ch (Downmixed Lt, Rt is also acceptable)

Monitor output terminal

SDI output terminal
Function Output screen for SDI monitor
Output terminal BNC terminal
Number of output terminals 1
Output signal Output liquid crystal display screen is output with HD, 3G-A, 3G-B-DL.
1920 × 1080 60,59.94,50 I/P ,YCBCR 4:2:2(10bit)

* LV7300 outputs SDI monitor output terminal, LV5300A, LV5350 switch output of SDI output 2 terminal

TMDS output terminal（LV7300）
Function The displayed screen is output for HDMI monitor.
Output terminal HDMI terminal
Number of output terminals 1
Signal format Single Link T.M.D.S
DDC function Not supported
HOT PLUG detection function Not supported
Output signal Output liquid crystal display screen is output. 1920x1080 60 P, 59.94 P, 50 P

Control terminal

USB terminal
Terminal shape Standard A
Number of terminals 2
Standard USB 2.0
Compatible device USB memory, USB mouse, touch panel type monitor
For Ethernet terminal control
Approved standard IEEE802.3
Supported protocols TELNET, FTP, SNMP, HTTP, SNTP
Input/output terminals RJ-45
Function Remote operation with an external PC or remote controller, File transfer, get status information
Types 10Base-T, 100Base-TX, 1000Base-T
Remote terminal
Terminal shape D Sub 15 pins (female)
Number of terminals 1
Control signal LV- TTL level (LOW active)
Function Preset recall, input signal switching, alarm output, tally
Alarm output When a format alarm, various errors, fan abnormality, or internal temperature occurs

Display (LV5300A / LV5350)

Liquid crystal display 7 type TFT color liquid crystal
Resolution 1920x1080
Refresh rate 60 Hz, 59.94 Hz, 50 Hz
(Free run or frequency synchronization to external synchronization signal)
Touch panel Electrostatic capacity type touch panel

General specifications

Environmental conditions
Operating temperature range 0 to 40 ℃
Operating humidity range 85% RH or less (no condensation)
Optimal Temperature 10 to 30 ℃
Operating Environment Indoors
Elevation up to 2,000 m
Overvoltage category I
Pollution degree 2
Power supply
Voltage DC 10 to 18 V
Power consumption (DC Power supply)
LV5300A 80W max.
LV5350 60W max.
LV7300 80W max
Dimensions(excluding protrusions)
LV5300A 215 (W)x132 (H)x132(D) mm
LV5350 215 (W)x132 (H)x85(D) mm
LV7300 213 (W)x44 (H)x300 (D) mm
Weight(excluding accessories and battery option)
LV5300A 2.95 kg max.
LV5350 2.5 kg max.
LV7300 2.25 kg max.
Accessories
AC adapter(LV7300 only) x1
D sub 15 pin connector x1
D sub 15 pin connector cover x1
Manual (CR-ROM) x1

LR2530 RACKMOUNT ADAPTER

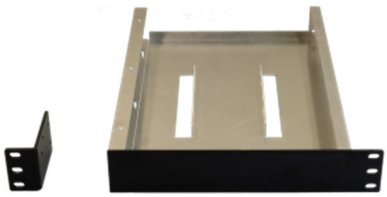
The LR2530 is a dual rack mount adapter used to install LV5300A/LV5350 waveform monitors in a 19-inch EIA standard rack.
It allows two sets of LV5300A/LV5350 to be installed side by side. (Two options of LV5300A + LV5350 need separately option compatibility.)
Compatible models: LV5300A / LV5350

LC2535 BLANK PANEL

The LC2535 is a blank panel for the LR2530 rack mount adapter. Use it when installing a single LV5350 waveform monitor in the LR2530.

LR2731 RACKMOUNT ADAPTER

The LR2731 is a rack mount adapter used to install a LV7300 rasterizer in a 19-inch EIA standard rack. Because one side is a blank panel, use it to install a single LV7300.



LR2732 RACKMOUNT ADAPTER

The LR2732 is a dual rack mount adapter used to install LV7300 rasterizers in a 19-inch EIA standard rack. It allows two sets of LV7300 to be installed side by side.

GST90A12 AC Adapter

An AC adapter exclusive to Leader products. An AC cord is included.
* An AC adapter is attached to the LV7300.

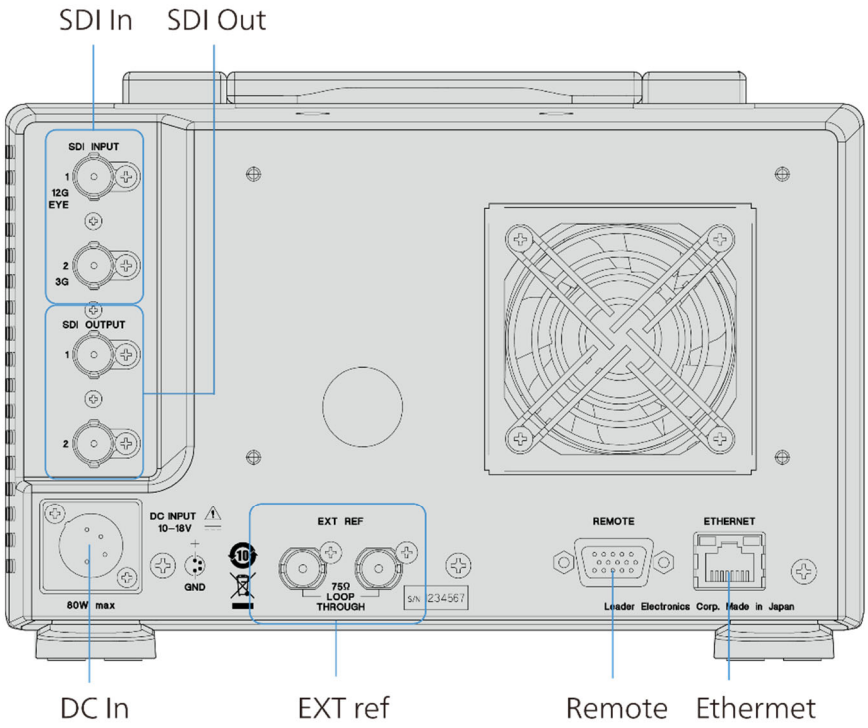
LV7290 Remote Controller

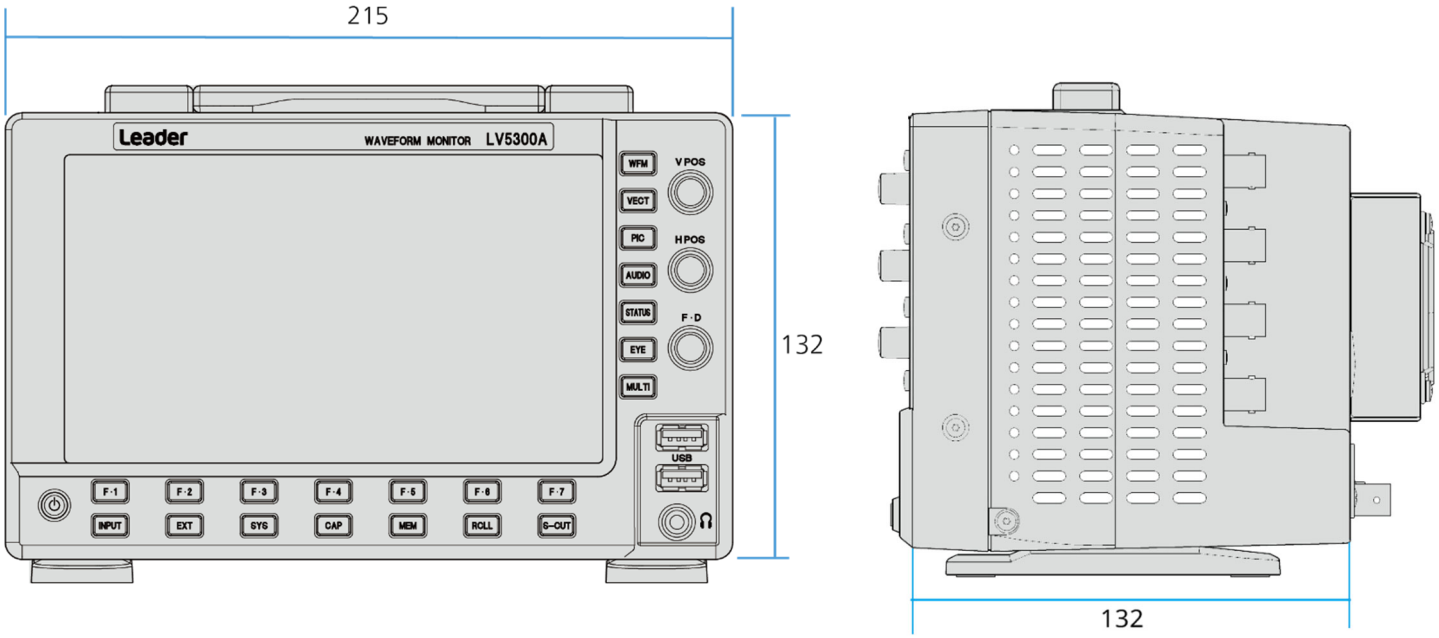
The LV7290 remote controller connects to the Ethernet port on the rear panel of the LV5300A/LV5350/LV7300 and can be used to remotely control the LV5300A/LV5350/LV7300. A single unit can connect and control up to eight LV5300A/LV5350/LV7300s.

Dimensions and weight: 482 (W) X 44 (H) X 110 (D) mm (excluding protrusions), 1.2 kg

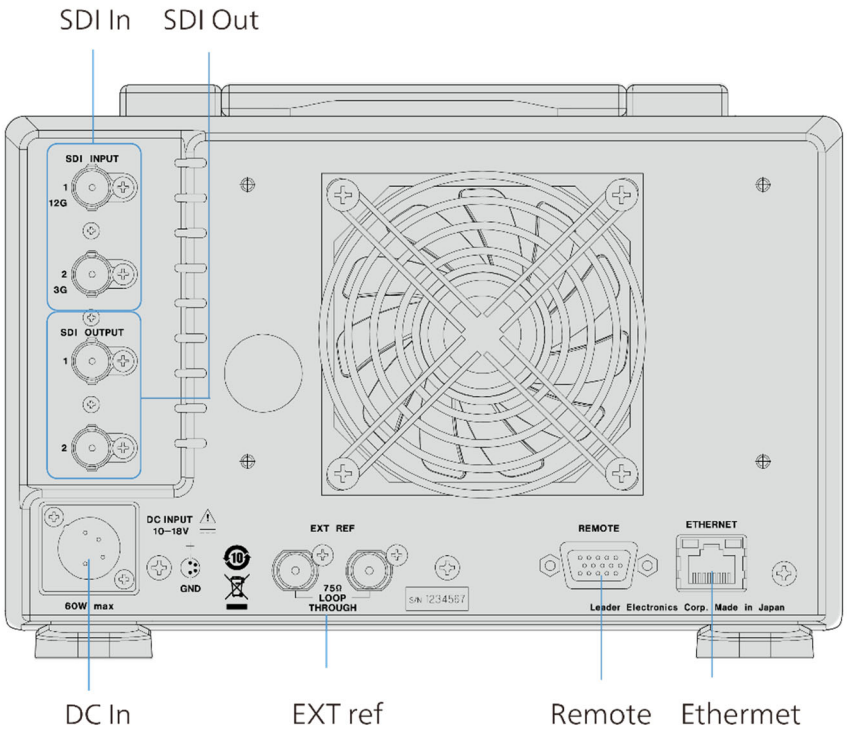
LV7290

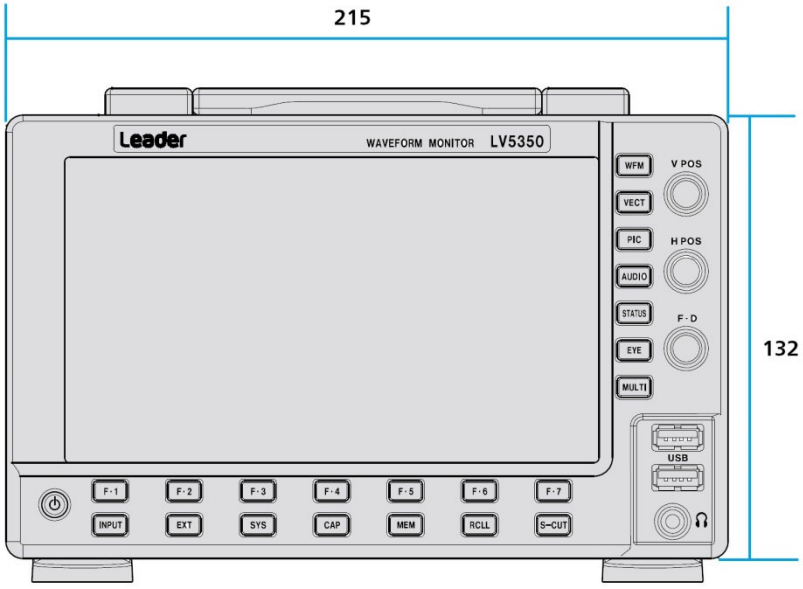
LV5300A

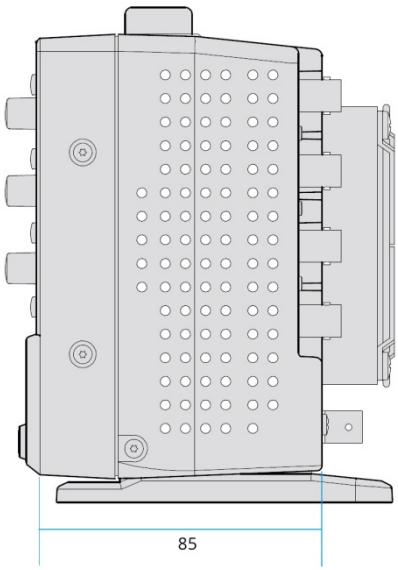

SDI In
SDI Out
SDI INPUT
1
12G
EYE
2
3G
SDI OUTPUT
1
2
DC INPUT
10–18V
GND
80W max
EXT REF
75Ω
LOOP
THROUGH
S/N 234567
REMOTE
ETHERNET
Leader Electronics Corp. Made in Japan
DC In
EXT ref
Remote
Ethermet


215
132
132
Leader
WAVEFORM MONITOR LV5300A
WFM
VECT
PIC
AUDIO
STATUS
EYE
MULTI
VPOS
HPOS
F·D
USB
F·1
F·2
F·3
F·4
F·5
F·6
F·7
INPUT
EXT
SYS
CAP
MEM
ROLL
G-OUT

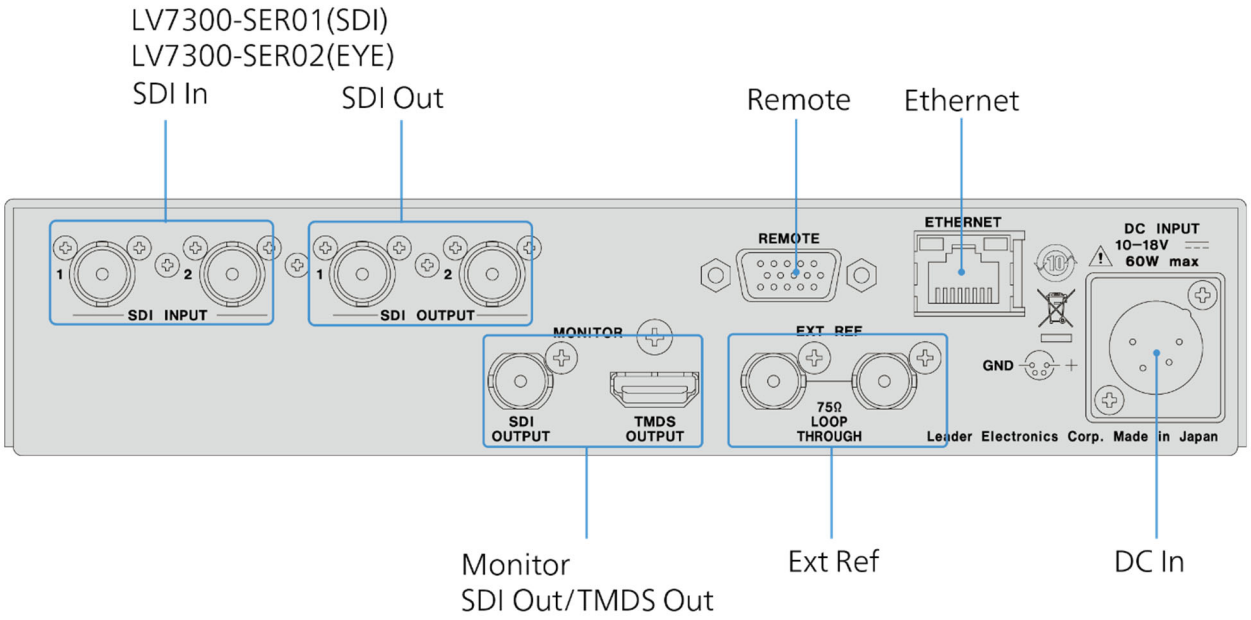
LV5350

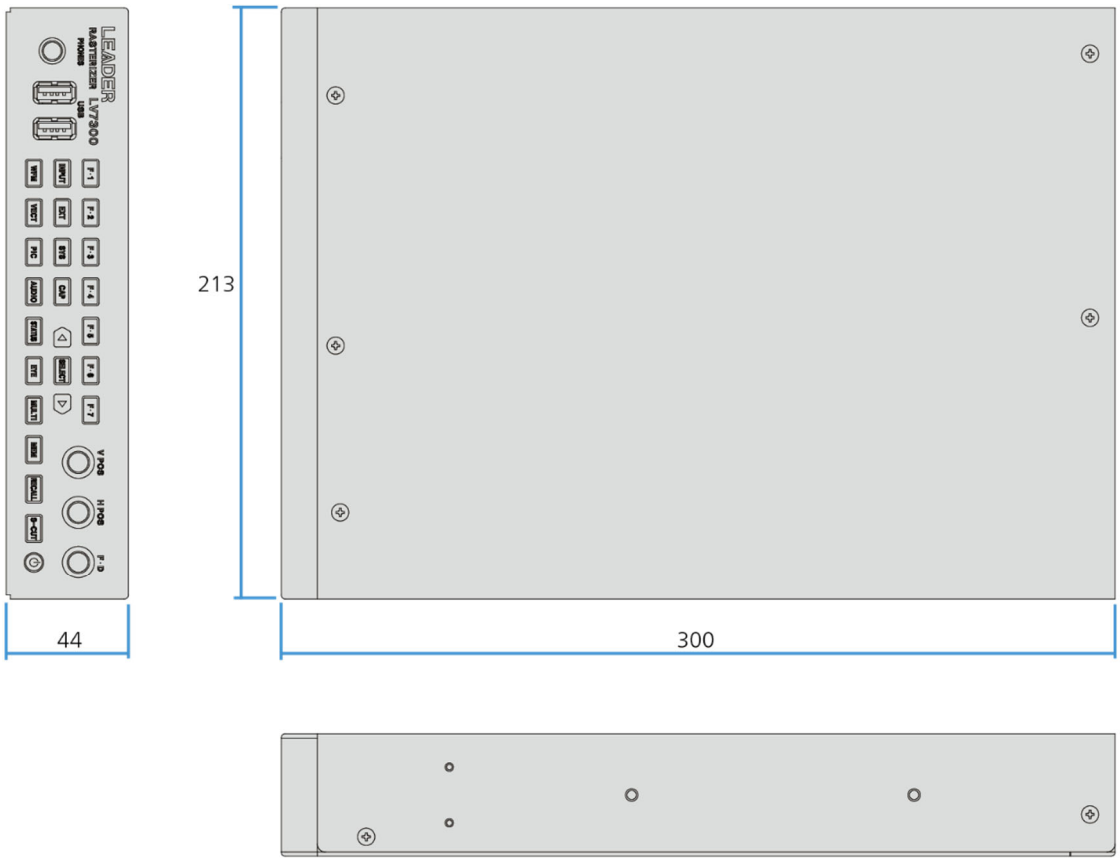

SDI In
SDI Out
SDI INPUT
1
12G
2
3G
SDI OUTPUT
1
2
DC INPUT
10–18V
GND
60W max
EXT REF
75Ω
LOOP
THROUGH
REMOTE
ETHERNET
Leader Electronics Corp. Made in Japan
DC In
EXT ref
Remote
Ethermet


215
132
Leader
WAVEFORM MONITOR LV5350
WFM
VECT
PIC
AUDIO
STATUS
EYE
MULTI
V POS
H POS
F-D
USB
F-1
F-2
F-3
F-4
F-5
F-6
F-7
INPUT
EXT
SYS
CAP
MEM
RCLL
S-CUT


85

LV7300


LV7300-SER01(SDI)
LV7300-SER02(EYE)
SDI In
SDI Out
Remote
Ethernet
SDI INPUT
SDI OUTPUT
REMOTE
ETHERNET
DC INPUT
10–18V
60W max
MONITOR
SDI OUTPUT
TMDS OUTPUT
EXT REF
75Ω LOOP THROUGH
GND
Leader Electronics Corp. Made in Japan
Monitor
SDI Out/TMDS Out
Ext Ref
DC In


213
44
300

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