

# LEADER

  
Technology Innovator

# VIDEO TEST INSTRUMENTS

CATALOG 2008-2009 Vol.2



LEADER ELECTRONICS CORP.

# COMPANY PROFILE

**L**EADER Since LEADER ELECTRONICS CORP. was established in 1954, has focused its attention on international markets. LEADER established local corporations in U.S.A. in 1969 and Hong Kong in 1980. Many other positive measures have also been taken before other companies. In July 1995, LEADER's own service center was set up in Shanghai for better service/maintenance in China. In 2003, Regional Offices were established in Beijing and Dongguan to support LEADER products, which are becoming increasingly popular in view of the growing Japanese presence in China. In 2005, The Technical Service Center was established in Beijing. LEADER ELECTRONICS is keeping abreast of the times with the establishment of LEADER ELECTRONICS EUROPEAN OFFICE in The Netherlands in 2006. LEADER ELECTRONICS now has a global network linking its agents in 62 countries/areas.

Company name

**LEADER ELECTRONICS CORP.**

**Headquarters**

2-6-33 Tsunashima-Higashi,  
Kohoku-ku, Yokohama 223-8505, Japan  
Phone: 81-45-541-2123 Fax: 81-45-541-2823

**Headquarters annex**

2-6-21 Tsunashima-Higashi  
Kohoku-ku, Yokohama 223-0052, Japan

**Factory 1**

6-11-28 Tsunashima-Higashi  
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**Factory 2**

5-10-35 Tsunashima-Higashi,  
Kohoku-ku, Yokohama 223-0052, Japan



Headquarters



Factory 1



Headquarters annex



Factory 2



## Audit and Registration of ISO9001 and ISO14001, the internal standard for Quality and Environmental Management Systems

The electronic measuring instrument, the mother tool of electronics, consistently requires the highest technology and quality. The history of LEADER ELECTRONICS CORP. is indeed the history of the pursuit of higher technology and quality. In December 1994, we received an audit and successfully registered ISO9001, the international standard for quality management systems, and furthermore, as our basic policy of product development considering the environment, we received an audit and successfully registered ISO14001 in April 2007, that is the international standard for an environmental management system. It gives us great satisfaction to offer products manufactured with outstanding technologies and quality, and moreover, to contribute to society through activities that take into consideration the environment.








**ABC Studio in New York**





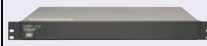

**Fuji Television Wangan Studio in Tokyo**

# Selection Guide









## Waveform Monitor

		MULTI MONITOR				
		LV 5380 	LV 5330 	LV 5800 	LV7700/7720 	LV 5750 
Display		8.4-inch TFT color	6.5-inch TFT color	6.3-inch TFT color	DVI-I out	6.3-inch TFT color
Format	HD-SDI	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/> (LV7700 only)	<input type="radio"/>
	HD Analog Component					
	SD-SDI	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	PAL/NTSC Component					
	PAL/NTSC Composite			LV58SER03		
	DVB ASI			LV58SER04		
	Waveform Monitor	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Read Out (Cursor Measurement)	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Picture Display	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Vector Display	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Digital Audio AES/EBU Output			LV58SER40A		
	Lissajous Display	<input type="radio"/>		LV58SER40A	<input type="radio"/>	<input type="radio"/>
	Audio Monitor	<input type="radio"/>	<input type="radio"/>	LV58SER40A	<input type="radio"/>	<input type="radio"/>
	Conversion matrix Y,P <sub>B</sub> ,P <sub>R</sub> to GBR	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Digital Data Dump	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Equivalent Cable Length Measurement			LV58SER01A	<input type="radio"/>	<input type="radio"/>
	Gamut Error (5 Bar)	<input type="radio"/>	<input type="radio"/>	LV58SER01A	<input type="radio"/>	<input type="radio"/>
	On Screen Gamut Display	<input type="radio"/>	<input type="radio"/>	LV58SER01A		
	Full-Line Selector	<input type="radio"/>	<input type="radio"/>	LV58SER01A/SER03	<input type="radio"/>	<input type="radio"/>
	Eye Pattern			LV58SER02		
	SCH Phase Measurement			LV58SER03		
	Cinelite (PATENTED)	Option	<input type="radio"/>	Option		Option
	Cinezone (PATENTED)	Option	<input type="radio"/>	Option		
	Screen Capture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Frame Capture			LV58SER01A		
	Ethernet with Telnet & SNMP			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Universal AC Power Supply	12 V DC (10 to 18 V)	12 V DC (10 to 18 V)	<input type="radio"/>	12 V DC (10 to 18 V)	12 V DC (10 to 18 V)
	CE	Upon request	Upon request	Upon request	Upon request	Upon request
	RoHS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Page	6 to 9	10, 11	12 to 19	20, 21	22, 23

## Signal Generator/SDI System Margin Checker

		SIGNAL GENERATOR			SYSTEM MARGIN CHECKER
		LT 443D 	LT 4400 	410BB 	LT 9610 
Format	HD-SDI	HD/HDB	<input type="radio"/>		<input type="radio"/>
	SD-SDI	SD/SDB	<input type="radio"/>		<input type="radio"/> (525)
	PAL/NTSC Analog Composite	CS		NTSC	
	Embedded Audio	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>
	AES/EBU Audio	DA			
	Genlock	GLA	<input type="radio"/>		
	Monoscope Pattern	<input type="radio"/>			
	Moving Pattern	<input type="radio"/>	<input type="radio"/>		
	Bitmap Logo Mark with Pattern	<input type="radio"/>			
	ID Character	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>
	Analog Tri Level Sync Signal	GLA/BL	<input type="radio"/>		
	Black Burst / HD Black	GLA/BL	<input type="radio"/>	<input type="radio"/> (BB)	
	Color Still Picture	OP70			
	Error Monitor Function				<input type="radio"/>
	Cable Length Measurement				<input type="radio"/>
	Pathological & Check Field	<input type="radio"/>	<input type="radio"/>		
	Universal AC Power Supply	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>
	Battery Powered				<input type="radio"/>
	CE	Upon request	Upon request		
	RoHS	<input type="radio"/>	<input type="radio"/>		
	Page	38 to 41	42, 43	46	27

# Video Test Instruments

	VECTOR/WAVEFORM MONITOR	WAVEFORM MONITOR			VECTOR SCOPE		AUDIO MONITOR
LV 5700A	LV 5152	5860V	5861V	5222	5212	5850V	5835
							
6.3-inch TFT color	CRT	CRT	CRT	CRT	CRT	CRT	CRT
<input type="checkbox"/>	<input type="checkbox"/>						
<input type="checkbox"/>	<input type="checkbox"/>						
OP73A		NTSC	PAL	<input type="checkbox"/>	<input type="checkbox"/>	NTSC	Analog Audio
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>						
<input type="checkbox"/>	<input type="checkbox"/>						
<input type="checkbox"/>	<input type="checkbox"/>						
<input type="checkbox"/>	<input type="checkbox"/>						
OP70	<input type="checkbox"/>						
OP73A							
Option							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		
Upon request			Upon request	Upon request	Upon request		
24 to 26	28, 29	32, 33	32, 33	30, 31	34, 35	36, 37	47



LV 5750 in use on the set.

Dean Krueger, DP & DIT



Upon request



**CINELITE II**  
option

The design is subject to change.

## Compact Multi-SDI Monitor

The LV 5380 is a multi-SDI monitor equipped with a precision video signal waveform and vectorscope display via a high-fidelity TFT LCD that produces high-quality picture displays. It also offers an embedded audio signal display featuring Lissajous and level-meter configurations. Additional features include simultaneous display of two SDI signals, screen capture to USB memory, and on-picture gamut error monitoring. All these features are integrated into a thin, light instrument that allows it to be used in any video production or monitoring application.

### FEATURES

- **High-Quality TFT LCD**  
Employs an XGA TFT LCD (1,024x768) that produces high-quality picture displays.
- **Extensive Video Signal Displays**  
The waveform monitor display has gain adjustment, sweep, and cursor measurement features along with RGB and pseudo-composite information. The LV 5380 also provides vectorscope and embedded audio Lissajous and Level-meter displays.
- **Multi-Functional Picture Display**  
The picture display has various adjustment features such as color temperature selection, brightness, contrast, gain, and bias. Other features include monochrome, chroma up, on-image gamut error, and safety marker displays.
- **Multi-Screen Display and 2-Channel Simultaneous Display**
  - 1) You can switch to multi-screen which simultaneously shows video signal waveforms and pictures.
  - 2) You can switch to multi-screen which simultaneously shows video signal waveforms, picture, vectorscope, and audio levels.
  - 3) You can display two SDI signals simultaneously.
- **Dual link input \*1**
- **Status Display**  
The LV 5380 can display SDI signal's data dump and error logs as well as the phase difference between the external sync signal and SDI signal.

- **Display Mode Switch Keys**  
For quick operation, the LV 5380 provides dedicated keys for switching between different display modes such as video waveform, vectorscope, and picture displays. In addition, all keys can be back-lit.
- **Stereo Headphone Output**  
Delivers SDI signal's embedded audio signals in stereo through the headphone output jacks.
- **External Sync Signal Input**  
Accepts tri-level sync signals or NTSC/PAL black burst signals.
- **Presets**  
Stores up to 30 front panel presets.
- **Last Memory**  
Equipped with a feature that stores panel settings to memory.
- **75-mm VESA Mounting**  
Provides 75-mm VESA mounting holes on the rear panel that allows the LV 5380 to be mounted on an arm or stand. Tripod mounting facilities also provided.
- **External Remote Connector (Factory Option)**  
An external remote connector can be installed as a factory option. In addition, one of the connectors can be modified so that a tally indicator can be displayed on the screen.
- **Battery Mount (Factory Option)\*2**  
A battery adapter can be installed on the rear panel as a factory option.
  - **OP73 : BATTERY MOUNT IDX (V-Mount)**
  - **OP74 : BATTERY MOUNT ANTON (AntonBauer)**
- **OP70: Cinelite II (Cinelite+Cinezone) (Option)**  
Leader's CINELITE and CINEZONE features are added as a single option in this instrument. For details on CINELITE & CINEZONE, please see page #49.

\*1 To be supported in the future

\*2 If you install the battery mount, you cannot use the 75-mm VESA mounting holes.

Video Formats and Corresponding Standards				
Format	Quantization	Scanning	Frame (Field) Frequency	Corresponding Standard
Y, C <sub>b</sub> , C <sub>r</sub> 4:2:2	10bit	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 RP211 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	SMPTE 259M
Audio Display		SMPTE 299M (HD-SDI), SMPTE 272M (SD-SDI)		
Compliant Standard		20 bits		
Quantization		Must be synchronized to all video clocks		
Synchronization		Two groups (eight channels in the same SDI channel) selectable		
Channel Selection				
Input/Output Connectors				
SDI Input				
Input Connectors		Two BNC connectors		
Input Impedance		75 Ω		
Input Return Loss		≥ 15 dB 5 MHz to the serial clock frequency		
Maximum Input Voltage		±2 V (DC + ACpeak)		
SDI Output				
Output Connector		One BNC connector		
Output Impedance		Reclocks and transmits the selected SDI input signal		
Output Voltage		75 Ω		
Maximum Return Loss		800 mVp-p ± 10 %		
Maximum Return Loss		≥ 15 dB 5 MHz to the serial clock frequency		
External Reference Input*				
Input Signal		Tri-level sync or NTSC/PAL black burst		
Input Connectors		One pair of BNC connectors		
Input Impedance		15 kΩ passive loop-through		
Headphone Output				
Output Signal		Extracts and transmits the embedded audio signal (when synchronized to the video signal)		
Sampling Frequency		Supports 48 kHz		
Output Connector		One stereo miniature jack		
Impedance		16 Ω		
LCD				
LCD Type		8.4-inch color XGA TFT. Effective area 1,024 x 768 dots		
Backlight Brightness		32 adjustable levels		
Auto Shutoff		Time to turn off the LCD can be set.		
Screen Capture				
Capture		Captures the screen to an image file		
Waveform Comparison		Superimposes the input signal over an image from memory.		
Data Output		Screen captures can be saved as bitmap files to USB memory or to a PC over the Ethernet.		
Data Input		Data saved to USB memory can be loaded and displayed on the LV 5380.		
Presets				
Display Mode Presets		Only stores settings specific to each display mode		
Number of Presets		30 total. Display Mode Presets: Five presets for each display mode.		
Waveform Display				
Waveform Operation				
Display Mode				
Overlay Display		Overlays component signals		
Parade Display		Displays component signals side by side		
Blanking Period		H and V blanking periods can be masked		
RGB Conversion		Converts Y, C <sub>b</sub> , C <sub>r</sub> signals into RGB and displays the result		
Pseudo-Composite Display		Digitally converts component signals into composite signals and displays the result		
Channel Assignments				
Line Select		Displays the selected line		
Vertical Axis				
Gain		x1 or x5 selectable		
Variable Gain		x0.2 to x2.0		
Amplitude Accuracy		±0.5 %		
Frequency Characteristics HDTV				
Y Signal		≤ ±0.5 % for 1 to 30 MHz		
C <sub>b</sub> , C <sub>r</sub> Signals		≤ ±0.5 % for 0.5 to 15 MHz		
Low-Pass Attenuation		≥ 20 dB (at 20 MHz)		
Frequency Characteristics SDTV				
Y Signal		≤ ±0.5 % for 1 to 5.75 MHz		
C <sub>b</sub> , C <sub>r</sub> Signals		≤ ±0.5 % for 0.5 to 2.75 MHz		
Low-Pass Attenuation		≥ 20 dB (at 3.8 MHz)		
Horizontal Axis				
Line Display		x1, x10, x20, ACTIVE, or BLANK selectable		
Field Display		x1, x20, or x40 selectable		
Cursor Measurement				
Types		Two horizontal cursors (REF and DELTA) Two vertical cursors (REF and DELTA)		
Amplitude Measurement		Measures in % or V		
Time Measurement		Measures in usec or msec		
Frequency Display		Displays the frequency by assuming the interval between the cursors to be one period		
Scale				
Type		% scale or V scale selectable		
Color		Selectable from seven colors		
Thumbnail Display		Can display thumbnails of picture displays and audio level meters		
Vectorscope Display				
Gain		x1, x5, or IQ-MAG selectable		
Variable Gain		x0.2 to x2.0		
Amplitude Accuracy		±0.5 %		
Scale				
Type		75 % or 100 % selectable		
IQ Axis		Show or hide selectable		
Color		Selectable from seven colors		
Pseudo-Composite Display		Digitally converts component signals into composite signals and displays the result		
Thumbnail Display				
Types		Can display thumbnails of picture displays and audio level meters		
5 Bar Display				
Bar Display				
Channel Assignments		Displays the peak levels of Y, R, G, B, and composite		
Scale		RGB or GBR selectable		
Error Level		mV or % selectable Based on gamut error level and composite gamut error level settings, user settable.		

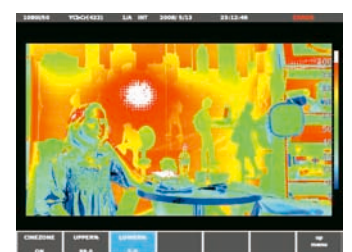
Picture Display		6500K or 9300K selectable
Color Temperature		Brightness, contrast, gain, bias, aperture
Quality Adjustment		Fit, full frame, real, and 4:3 full screen
Display Size		R, G, or B can be turned off separately. Variable chroma gain and monochrome available.
Color		Displays by converting the frame rate using the internal sync signal
Frame Rate		4:3, 13:9, 14:9, or 16:9 selectable
Aspect Marker Display		Line, shadow (three types), black
Aspect Marker Format		ARIB TR-B4, SMPTE RP-218, or user-defined selectable
Safety Marker Size		Displays a mark on the selected line
Line Select		Displays gamut error locations over the picture
Gamut Error Display		Displays thumbnails of audio level meters
Thumbnail Display		
Embedded Audio Display		2ch (single) or 8ch (multi) selectable
Lissajous Display		X-Y or L-R selectable
Display Channels		
Display Mode		
Level Meter Display		2ch or 8ch display selectable
Display Channels		60 dB peak level, 90 dB peak level, or average selectable. (Peak level meters include settable peak hold indication.)
Meter		
Channels		
Group Selection		Select any two groups within the same SDI channel from groups 1, 2, 3, and 4
Audio Information Detection		Detects the presence of each audio channel
Sampling Frequency		48 kHz (must be synchronized with the video signal)
Status Display		Stores up to 1,000 events
Event Log		Dumps data by serial data sequence or by channel
Data Dump Display		Can be saved in text format to USB memory or to a PC
Data Output		
Phase Difference Display		Displays numerically and graphically the phase difference between an SDI signal and the external sync signal
Display		
Range		±1 field (for interlace)
Vertical		±1/2 frame (for progressive)
Horizontal		±1 line
Error Count		
Error Count		Counts up to 999,999 video, audio, and gamut errors separately
Count Period		Counts all errors that occur in one field as one error
Video Errors		Detects transmission errors of HD-SDI signals
CRC Error		Detects transmission errors of SD-SDI signals
EDH Error		
Gamut Error		Detects gamut errors
Gamut Error		90.0 to 109.4 %
Detection Range Upper Limit		-7.2 to +6.1 % (0.1 % steps)
Lower Limit		
Composite Gamut Error		Monitors level errors when component signals are converted to composite signals
Detection Range Upper Limit		90.0 to 135.0 %
Lower Limit		-40 to -20 % (0.1 % steps)
Audio Errors		
CRC Error		Detects CRC errors in channel status bits
BCH Errors		Detects transmission errors of HD-SDI audio packets
Time Display		
Current Time Display		Time display based on the internal clock
Elapsed Time		Time elapsed since the error count was cleared
Time Code		LTC or VITC selectable (complies with SMPTE RP-188)
Other Display Features		
ID Display		ID can be assigned to each input channel.
Tally Indicator		One of the remote connectors can be modified so that tally indication can be shown on the screen (to be supported in the future).
Front Panel		
Key LEDs		All keys illuminate dimly. (The selected key illuminates brightly.)
Last Memory		Backs up panel settings to memory
Environmental Conditions		
Operating Temperature		0 to 40 °C
Operating Humidity Range		≤ 85 % RH (without condensation)
Operating Environment		Indoors
Overvoltage Category		1
Pollution Degree		2
Power Requirements		10 to 18 VDC, 30 W max.
Dimensions		215 (W) x 176 (H) x 85 (D) mm (excluding projections) 8 1/2(W) x 6 15/16(H) x 3 3/8(D) in. (excluding projections)
Weight		2.0 kg, 4.5 lbs
Accessory		Instruction manual.....1 Ferrite Core .....1
Option Sold Separately		AC adapter LP 1960 Rack mount LR 2751 I Blank Panel LC 2129

- \*1
- The video signal waveform display and vectorscope display may be delayed by up to 1 frame with respect to the picture display.
  - V sweep cannot be displayed when the video signal waveform displays for two simultaneous inputs are shown.
  - Phase difference accuracy between external reference and internal signal is ±1 clock cycle.

## ■ Cinelite II (Option)



Cinelite



Cinezone

## Picture Display

### Versatile Picture Display

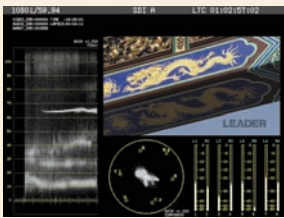
Picture adjustment options include color temperature (6500K/9300K), brightness, contrast, gain, bias, and aperture. You can switch the R, G, and B signals on and off.



Picture adjustment menu

Picture and waveform time axis correspondence

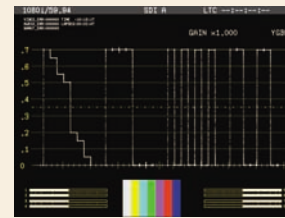
## Multi-Screen Display



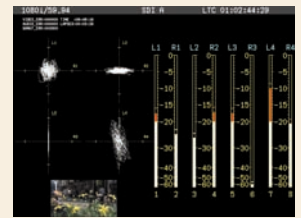
## Waveforms



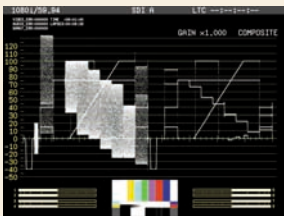
## Y RGB Display



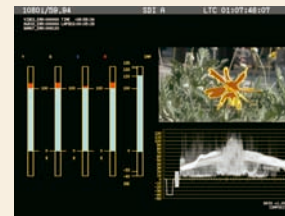
## Audio Display



## Composite Display



## 5 Bar/Picture/Gamut

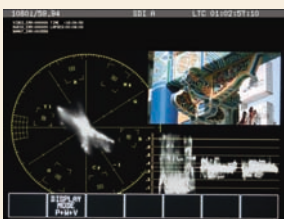


## Gamut Error Display

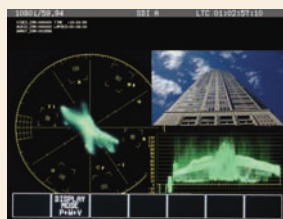


Changes the color of gamut error areas in the picture display.

## Video Waveform Color Selection



White display



Green display

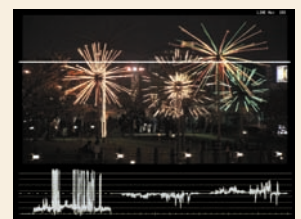
## Various Markers



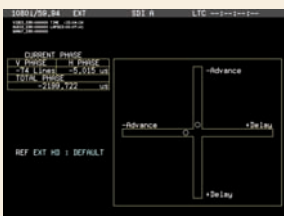
Marker display menu



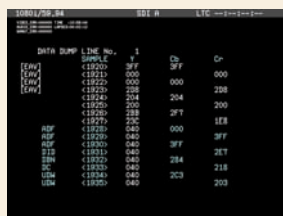
## Line Selection



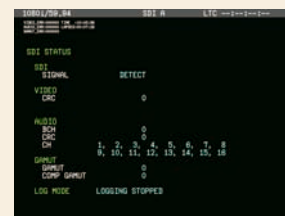
## Phase Difference Display



## Data Dump



## Status



## Aperture



ON OFF





FIT Display Size (with audio levels)

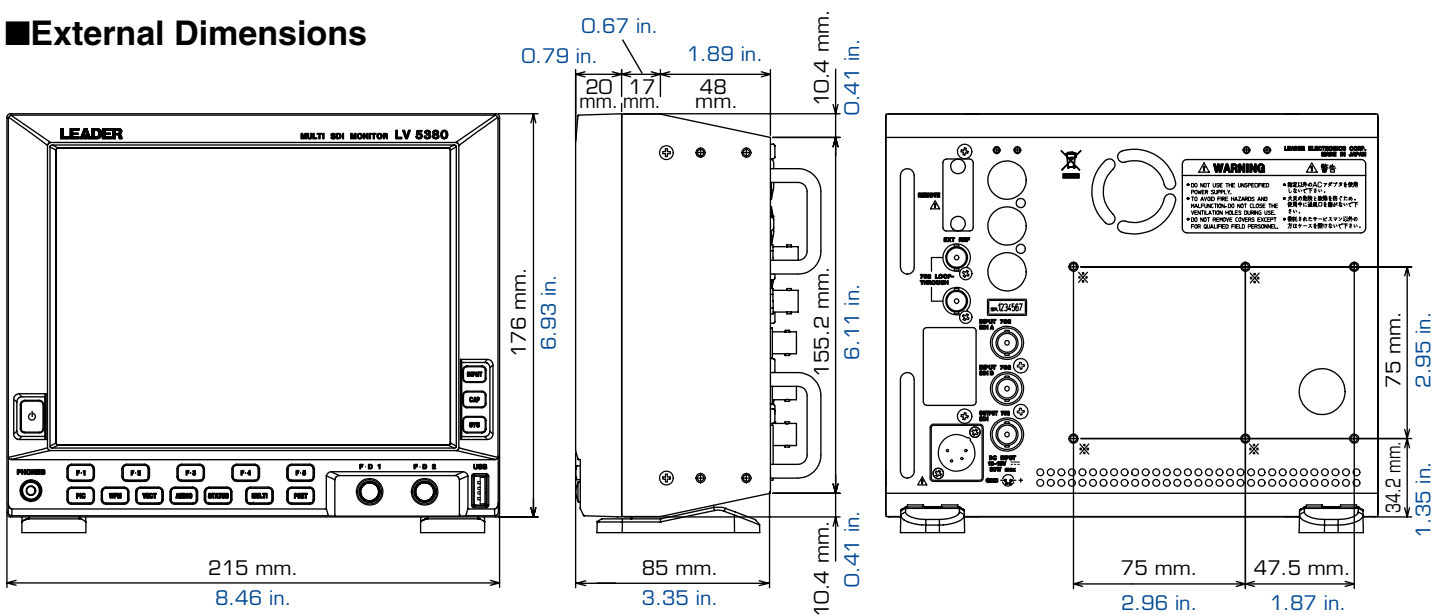


REAL Display Size  
(pixel to pixel correlation)



MONOCHROME Display

**External Dimensions**



**LV 5380 REAR PANEL**



**Rack Mounting**

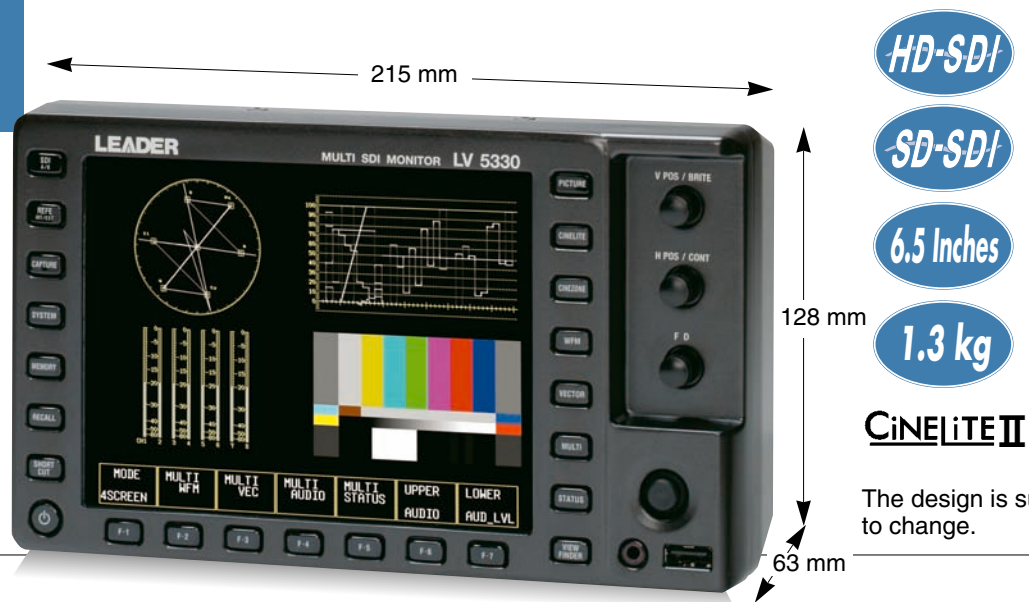
LV 5380 dual mount example



- LR 2751 | Rack Mount (sold separately; tiltable)
- LC 2129 | Blank Panel (sold separately)

**AC Adapter LP 1960 (sold separately)**





## Compact, Slim & Lightweight Multi-SDI Test Monitor

The LV 5330 is a compact and lightweight multi-SDI test monitor specifically designed for oncamera and portable applications. Picture, waveform, vector, audio and status screens can be displayed individually or in multi-screen representations. The instrument is also equipped with on-picture measurement functions, Cinelite and Cinezone, and helps facilitate measurements that are easily understood by both technical and operations personnel. High-accuracy measurement and monitoring facilities also include settable error level monitoring and alarms as well as extensive data analysis. A screen capture function facilitates communication between production and post production personnel and aids in project documentation.

### FEATURES

#### • Two Serial Digital Inputs

Two SDI input connectors (channels A and B) support HD-SDI and SD-SDI signals. The selected SDI input is passed through an SDI output connector to facilitate switched monitor output operation.

#### • Display

A built-in 6.5-inch XGA TFT LCD (1,024x768) provides brilliant and clear representations of waveforms, vectors, pictures, audio level meters, status, etc. The multi-screen feature allows these displays to be shown simultaneously in tiled windows.

#### • Picture display

Brightness, contrast, and saturation is adjustable and aspect ratio, safe action and safe title markers can be displayed. The edge enhancement feature provides visual assistance with focus.

#### • Cinelite II (Cinelite and Cinezone)

The Cinelite on-picture measurement feature displays the luminance of any three user definable points and provides luminance measurements in %, RGB levels (or %) as well as in f-stops. The Cinezone feature uses false-colors to represent luminance values on the display enabling quick confirmation of the luminance distribution levels on the display.

#### • Waveform Monitoring

Parade, overlay, Y C<sub>B</sub> C<sub>R</sub>, RGB, and pseudo-composite displays are available.

#### • Vectorscope

Vectorscope display is available and accommodates both 75 % and 100 % saturation levels; pseudo-composite vectorscope display is also available.

#### • 5 Bar Display

The 5 Bar display enables simultaneous monitoring of component and composite gamut.

#### • Line Selector

Selects any line of the video signal to be displayed and provides waveform, vector and 5-bar representations of the selected line. A line marker on the picture facilitates visual selection of the appropriate line.

#### • Audio Level Meter

Up to 8 channels of embedded audio signals can be displayed using audio bar level meters.

\*The SD-SDI audio quantization precision is up to 20 bits.

#### • Viewfinder

The camera's composite video output (in NTSC or PAL) can be shown on the picture display. The edge enhancement feature assists you in focusing the camera.

#### • Screen Capture

The displayed screen can be captured and saved to internal memory or USB memory.

#### • Extensive Analysis Features

- Various types of error detection
- SDI signal event log
- Digital data dump

#### • Flexible Control

- Instrument can be remote controlled from a PC over an Ethernet network.
- Internal memory holds up to 30 presets allowing quick access to your favorite instrument setups. Personalize your LV 5330 by loading your own custom presets via USB thumb-drive.

#### • External Synchronization

Accepts tri-level sync or NTSC/PAL black burst signals.

#### • Stereo Headphone Output

Extracts embedded audio signals and sends 2 user selectable audio channels to the headphone jack.

#### • Panel LED Illumination

You can illuminate all of the panel keys; a useful feature when working in a dark environment.

#### • Power Supply

XLR DC input connector is provided; accepts 12Vdc- 18Vdc. A V-mount battery adapter is also available as a factory option.

#### • Tripod Mounting

A Screw(1/4.in) hole attaching a camera tripod is provided on the bottom panel of the LV 5330.

#### • Battery Mount (Factory Option)

A battery adapter can be installed on the rear panel as a factory option.

#### • BATTERY MOUNT IDX (V-MOUNT)\*1

#### • BATTERY MOUNT ANTON (AntonBauer)

\*1 To be supported in the future

<b>Video Formats and Corresponding Standards</b>	<table border="1"> <thead> <tr> <th>Format</th> <th>Corresponding Standard</th> </tr> </thead> <tbody> <tr><td>1 1080i/60</td><td rowspan="9">SMPT E 274M, 292M</td></tr> <tr><td>2 1080i/59.94</td></tr> <tr><td>3 1080i/50</td></tr> <tr><td>4 1080p/30</td></tr> <tr><td>5 1080p/29.97</td></tr> <tr><td>6 1080p/25</td></tr> <tr><td>7 1080p/24</td></tr> <tr><td>8 1080p/23.98</td></tr> <tr><td>9 1080PsF/30</td></tr> <tr><td>10 1080PsF/29.97</td><td rowspan="5">SMPT E RP211, 292M</td></tr> <tr><td>11 1080PsF/25</td></tr> <tr><td>12 1080PsF/24</td></tr> <tr><td>13 1080PsF/23.98</td></tr> <tr><td>14 720p/60</td><td rowspan="11">SMPT E 296M, 292M</td></tr> <tr><td>15 720p/59.94</td></tr> <tr><td>16 720p/50</td></tr> <tr><td>17 720p/30</td></tr> <tr><td>18 720p/29.97</td></tr> <tr><td>19 720p/25</td></tr> <tr><td>20 720p/24</td></tr> <tr><td>21 720p/23.98</td></tr> <tr><td>22 525i/59.94</td><td rowspan="2">SMPT E 259M</td></tr> <tr><td>23 625i/50</td></tr> </tbody> </table>	Format	Corresponding Standard	1 1080i/60	SMPT E 274M, 292M	2 1080i/59.94	3 1080i/50	4 1080p/30	5 1080p/29.97	6 1080p/25	7 1080p/24	8 1080p/23.98	9 1080PsF/30	10 1080PsF/29.97	SMPT E RP211, 292M	11 1080PsF/25	12 1080PsF/24	13 1080PsF/23.98	14 720p/60	SMPT E 296M, 292M	15 720p/59.94	16 720p/50	17 720p/30	18 720p/29.97	19 720p/25	20 720p/24	21 720p/23.98	22 525i/59.94	SMPT E 259M	23 625i/50
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<b>Other Standards</b> <b>Ancillary Data Standard</b> <b>Embedded Audio Standard</b> <b>Format Setting</b> <b>Format Setting</b> <b>Sampling Frequency</b> <b>External Synchronization</b>	SMPT E 291M SMPT E 299M (HD-SDI), SMPT E 272M (SD-SDI) Auto or manual setting from the supported formats 74.25 MHz (HDTV), 74.25/1.001 MHz (HDTV), 13.5 MHz (SDTV) Auto setting from supported formats																													
<b>Input/Output Connectors</b> <b>SDI Input</b> <b>Input Connector</b> <b>External Reference Input</b> <b>Input Signal</b> <b>Input Connector</b>  <b>SDI Output</b> <b>Output Connector</b>  <b>Output Voltage</b> <b>Headphone Output</b> <b>Output Signal</b> <b>Sampling Frequency</b>  <b>Output Connector</b> <b>USB Memory</b> <b>Function</b>  <b>Remote Control</b> <b>Function</b> <b>Connector</b> <b>Ethernet</b> <b>Function</b>  <b>Type:</b> <b>Viewfinder Input</b> <b>Function</b> <b>Input Signal</b> <b>Input Connector</b>	Two BNC connectors (switching between A and B) Tri-level sync or NTSC/PAL black burst One pair of BNC connectors (15 k $\Omega$ passive loop-through) *Phase difference accuracy between external reference and internal signal is $\pm 1$ clock cycle. One BNC connector (reclocks and transmits the selected SDI input signal) 800 mVp-p $\pm 10$ % outputs (75 $\Omega$ ) Extracts and outputs the embedded audio signal. Supports 48 kHz (must be synchronized to the video signal) One stereo miniature jack, 32 $\Omega$ (16 to 600 $\Omega$ ) Stores screen captures, error logs, preset data, and data dumps. Also used for Firmware update. Recalls presets, transmits errors, controls the tally indicator D-sub 15-pin female Enables remote control from an external computer and data transmission 10BASE-T/100BASE-TX auto switching, one RJ-45 jack Monitors composite video signals, picture only. NTSC/PAL VBS signal One BNC connector																													
<b>Picture Display</b> <b>HDTV Display</b> <b>SDTV Display</b> <b>Display</b> <b>Frame Rate</b>  <b>Marker Display</b>  <b>Adjustment:</b>	Displays by sampling pixels Displays by interpolating pixels Color or black and white selectable Displays by converting the frame rate using the internal sync signal Center marker, aspect marker, safe title marker, safe action marker Brightness, contrast, chroma, aperture																													
<b>Cinelite Display</b> <b>f-STOP:</b> <b>Measurement points</b> <b>Reference</b> <b>%DISPLAY</b>  <b>Measurement points</b> <b>Measurement areas</b> <b>GAMMA</b> <b>0.45</b> <b>USER 1-3</b> <b>USER A-E</b> <b>On Picture Level Indicator</b>	Measures relative brightness in f-stops Three points specified using the cursor Uses an object with an 18 % reflectance as reference Displays luminance percentage (LEVEL%), RGB per- centage (RGB%), and RGB numeric values Three points specified using the cursor 1x1, 3x3, 9x9 Reference gamma User-defined gamma Gamma downloaded from USB memory Switches the screen to black and white and displays the set luminance level in green																													
<b>Cinezone Display</b> <b>Screen</b>  <b>UPPER</b>  <b>LOWER</b>	Maps colors based on luminance levels. Linear or step selectable. Can be set from -6.3 % to 109.4 %. Displays white when the level is above the set level. Can be set from -7.3 % to 108.4 %. Displays Black when the level is below the set level.																													
<b>Display Form</b> <b>Display Size</b> <b>1 Screen Display</b>  <b>2 Screen Display</b>	6.5-inch color XGA. Effective area 1024 x 768 dots Picture display, Cinelite display, Cinezone display, waveform display, vectorscope display, status dis- play, viewfinder display Picture and waveform displays, waveform and vec- torscope displays, waveform and picture displays, waveform and audio level displays, audio numeric and bar displays																													

<b>4 Screen Display</b>	Audio level display or status display selectable in addition to waveform display, vectorscope display, and picture display
<b>Waveform Display</b> <b>Waveform Operation</b> <b>Display Modes</b> <b>Timing Display</b>  <b>EAV-SAV period</b> <b>G, B, R Conversion</b>  <b>Pseudo-Composite Display</b>  <b>Channel Assignments</b>  <b>Vertical Axis</b> <b>Gain</b> <b>Variable Gain</b>  <b>Amplitude Accuracy</b> <b>Frequency Characteristics HDTV</b> <b>Y Signal</b> <b>C<sub>B</sub>, C<sub>R</sub> signals</b> <b>Frequency Characteristics SDTV</b> <b>Y Signal</b> <b>C<sub>B</sub>, C<sub>R</sub> signals</b> <b>Horizontal Axis</b> <b>Line Magnification</b> <b>Field Magnification</b> <b>Cursor Measurement</b> <b>Horizontal Cursors</b> <b>Vertical Cursors</b> <b>Amplitude Measurement</b> <b>Time Measurement</b> <b>Frequency Display</b>  <b>Marker Display</b> <b>75 % Marker</b>	Overlay and parade Displays by calculating Y-C <sub>B</sub> and Y-C <sub>R</sub> Uses bowtie signals (authorized by Tektronix, Inc.) Show or hide selectable Converts Y, C <sub>B</sub> , C <sub>R</sub> signals into G, B, R and displays the result Digitally converts component signals into composite signals and displays the result The G, B, R order or R, G, B order selectable for G, B, R conversion display x1, x5, or variable selectable x0.2 to x2.0 at the x1 setting, x1.0 to x10.0 at the x5 setting $\leq \pm 0.5$ % $\leq \pm 0.5$ % 1 to 30 MHz $\leq \pm 0.5$ % 0.5 to 15 MHz $\leq \pm 0.5$ % 1 to 5.75 MHz $\leq \pm 0.5$ % 0.5 to 2.75 MHz x1 or x10 selectable x1, x20, or x40 selectable 2 (REF and DELTA) 2 (REF and DELTA) Measures in % or V Measures in usec or msec Displays the frequency by assuming the interval between the cursors to be one period Indicates the value corresponding to the peak chromi- nance signal of the 75 % color bar.
<b>Vectorscope Display</b> <b>Scale</b> <b>Gain</b> <b>Variable Gain</b>  <b>Amplitude Accuracy</b> <b>IQ Axis</b> <b>Pseudo-Composite Display</b>	75 % or 100 % selectable x1, x5, IQ-MAG, or variable selectable x0.2 to x2.0 at the x1 setting, x1.0 to x10.0 at the x5 setting $\leq \pm 0.5$ % Show or hide selectable Digitally converts component signals into composite signals and displays the result
<b>5 Bar Display</b> <b>Bar Display</b>	Displays the peak levels of Y, R, G, B, and composite
<b>Embedded Audio Display</b> <b>Display Channels</b> <b>Meter</b> <b>Group Selection</b> <b>Channel Mapping</b>	8-channel simultaneous display 60 dB peak level or 90 dB peak level Select any two groups from groups 1, 2, 3, and 4 Mapping to L, R, SL(S), SR, C, LFE, RL, RR
<b>Viewfinder</b> <b>Display Size</b> <b>Adjustment</b>	Full-screen display Brightness, contrast, chroma, aperture
<b>Status</b> <b>Data Dump Display</b> <b>Event log</b> <b>Data output</b>	Dumps data by serial data sequence or by channel Stores up to 1,000 events To USB memory or over an Ethernet network
<b>Screen Capture</b> <b>Waveform Comparison</b>	Captures the displayed screen Superimposes the input signal over an image from memory.
<b>Presets</b>	30
<b>Other Display Features</b> <b>LCD</b> <b>Backlight brightness</b> <b>Screen Display</b> <b>Panel LED Illumination</b>	6.5-inch color LCD High or low selectable Format, color system, date, time Illuminates all keys
<b>Environmental Conditions</b> <b>Operating Temperature</b> <b>Operating Humidity Range</b> <b>Operating Environment</b> <b>Overvoltage Category</b> <b>Pollution Degree</b>	0 to 40 $^{\circ}$ C $\leq 85$ %RH (no condensation) Indoors, or outdoors with no rain 1 2
<b>Power Requirements</b>	12 VDC (10 to 18 V), 18 Wmax.
<b>Dimensions and Weight</b>	215 (W) x 128 (H) x 63 (D) mm (excluding projections), 1.3 kg 8 1/2 (W) x 5 3/64 (H) x 2 31/64 (D) in. 2.9 lbs
<b>Accessory</b>	Instruction manual ..... 1
<b>Option Sold Separately</b>	AC adapter LP 1960

## ■ Cinelite II



Cinelite



Cinezone

# MULTI MONITOR

## LV 5800

# LEADER

CE  
Upon request

RoHS

Please use exclusive cabinet for Model LV 5800 (photograph shows LR 2427B) The Panel design is subject to change. The cabinet is sold separately.



HD-SDI

SD-SDI

CINELITE II  
option

AFD Ready

PATENTED:  
Equivalent cable  
length measurement

## Your Desired combination of units allows a flexible waveform monitor

The LV 5800 is a new type of multi monitor that allows you freely configure various input and output units according to your application.

You can construct a versatile system by combining dedicated input and output units.

In particular, simultaneous display and error monitoring of multiple SDI inputs are possible, and four-waveform parade display on the waveform monitor is also supported.

### FEATURES

- Four Input Slots**  
Up to four input units can be inserted. Each input unit operates independently.
- Two Output Slots**  
Up to two output units can be inserted. Each output unit operates independently.
- Display Function**  
Employs a color TFT LCD monitor with XGA resolution (1,024 x 768). The display function of each unit can be displayed on a full screen or 4 screen multi display. The 4 screen display allows arbitrary combination of signals of different input units to be displayed.
- Capture Function**  
In addition to simply displaying the image data, this capture function allows you to superimpose the input signal

and the captured data views, allows you to save the data to USB memory and to reload the data into the LV 5800 later, and allows you to view the captured data as bitmap data on a computer.

- Ethernet Connector**  
Remote control through TELNET or FTP, error monitoring, and file transfer are possible by connecting a PC to the Ethernet connector on the rear panel.
- Remote Connector**  
The remote connector on the rear panel allows recalling of presets, detection of errors, and switching of inputs.
- Low Noise Cooling System**  
Equipped with a low noise fan. Fan speed controlled using a temperature sensor. If the fan stops due to a malfunction, an alarm can be displayed on the screen through the revolution sensor.
- Headphone Socket**  
Sound can be monitored when the LV 58SER40A is installed.

### Unit List

- **LV 58SER01A** SDI INPUT
- **LV 58SER02** EYE PATTERN UNIT
- **LV 58SER03** COMPOSITE VIDEO UNIT
- **LV 58SER04** MPEG DECODER
- **LV 58SER20** DVI-I OUTPUT UNIT
- **LV 58SER40A** DIGITAL AUDIO

### ■ LV 5800 REAR PANEL



LV 58SER20/LV 58SER40A/LV 58SER02/LV 58SER01A x 2 for installation example

<b>Slot</b> Number of Slots for Input Number of Slots for Output	4 2	<b>External Control Connector</b> <b>USB Connector</b> Specifications Function <b>Ethernet Connector</b> Corresponding Standard <b>Input/Output Connector</b> Function  <b>Type</b> <b>Remote Connector</b> Function <b>Control Signal</b> <b>Control Connector</b> <b>Headphone Output</b> <b>PHONES connector</b> Function	USB2.0 Only a large capacity memory device is supported.  IEEE802.3 RJ-45 Remote control from an external computer and monitoring of errors, etc. 10BASE-T/100BASE-TX  Recalling of presets, monitoring of errors LV-TTL level (LOW active) 25-pin D-sub (female)  Miniature jack (stereo) Like LV 58SER40A (DIGITAL AUDIO), it is effective when the unit that has audio decoding function is inserted.
<b>LCD Display</b> LCD Screen Type Display Format Frame Frequency  <b>Backlight Brightness</b> <b>Auto Shutoff</b>  <b>Display Screen</b>	6.3-inch TFT color XGA Effective area 1024 x 768 dots 59.94 MHz (The input signal and the display clock signal have not been synchronized.) Selects HIGH or LOW Sets the time for the backlight to shutoff automatically. 1-screen display, 2-screen display, 4-screen display	<b>Environmental Conditions</b> <b>Operating Temperature</b> <b>Operating Humidity</b> <b>Operating Environment</b> <b>Operating Altitude</b> <b>Overvoltage Category</b> <b>Pollution Degree</b> <b>Power Requirements</b>	0 to 40 °C ≤ 85 % RH(without condensation) Indoor use Up to 2,000 m II 2 90 to 250 VAC 50 Hz/60 Hz, 150 Wmax.
<b>Screen Capture</b>  <b>Waveform Comparison</b> <b>Media</b> <b>Format</b>	Image capture by the still picture of the display screen Superimposes the input signal over an image from memory. Internal memory (RAM) or a USB memory TIF, DPX	<b>Dimensions and Weight</b>	215(W) x 133(H) x 449(D) mm 5 kg 8 1/2(W) x 5 1/4(H) x 17 11/16(D) in 11 lbs
<b>Data Output</b>  <b>Presets</b> Number of Presets <b>Media</b> <b>Recall Method</b>  <b>Copy</b>	Save displayed test screens or full-frame captures in various formats, including BMP, DPX, and TIFF. Save data to a PC via a USB memory or Ethernet network. 60 Internal memory (RAM) or a USB memory Through the front panel, remote connector, and Ethernet network (Switches 8 points and 60 points for recalling through the remote connector.) Copies presets collectively to the USB memory or from the USB memory to the LV 5800.	<b>Accessories</b>	Power cord .....1 Cover/Inlet stopper.....1 Screws for rack mounting (inch specification) .....2 Instruction manual .....1 25-pin D-sub connector .....1 25-pin D-sub connector cover .....1
<b>External Reference Input</b> <b>Input Signal</b> <b>Input Connector</b> <b>Input Impedance</b> <b>Input Return Loss</b> <b>Maximum Input Voltage</b>	Tri-level sync signal or NTSC/PAL black burst BNC connector 1 system 2 connectors 15 kΩ Passive Loop-through ≥30 dB ±5 V (DC + peak AC)		

<h3>Multi</h3> <p>EX, LV 58SER01A 2, LV58SER02 1 sets are installed</p>	<p>EX, LV 58SER01A 2 sets are installed</p>	<p>EX, LV 58SER02 1, LV 58SER01 2 sets each are installed</p>	<h3>4 input Picture</h3> <p>EX, LV 58SER01A 2 set are installed</p>	<h3>Waveform</h3> <p>EX, LV 58SER01A 2 sets are installed</p>
<h3>Wave form</h3> <p>EX, LV 58SER01A 2 set are installed (4Y PARADE)</p>	<h3>Vector</h3> <p>EX, LV 58SER01A 1 set is installed</p>	<h3>Status</h3> <p>EX, LV 58SER01A 1 set is installed</p>	<h3>Phase</h3> <p>EX, LV 58SER01A 1 set is installed</p>	
<h3>V-ANC</h3> <p>EX, LV 58SER01A 1 set is installed</p>	<h3>5 Bar</h3> <p>EX, LV 58SER01A 1 set is installed</p>	<h3>EyePattern/Jitter</h3> <p>EX, LV 58SER02 1, LV 58SER 01A 1 set is installed</p>	<h3>COMPOSITE</h3> <p>EX, LV 58SER03 1 set is installed</p>	
<h3>MPEG</h3> <p>EX, LV 58SER04 1 set is installed</p>	<h3>Audio</h3> <p>EX, LV 58SER40A 1 set is installed</p>	<h3>Cinelite</h3> <p>Option</p>	<h3>Cinezone</h3> <p>Option</p>	

## LV 58SER01A SDI INPUT

Plug-In Unit for LV 5800



This unit is an SDI input unit that installed in a LV 5800 input slot. The unit allows waveform display, picture display, and error detection of the SDI signal on the LV 5800. Combination with other optional units allows various displays such as the eye pattern display of the SDI signal (LV 58SER02) and the Lissajous and level displays of the embedded audio (LV 58SER40A). The SDI signal that is inputted to the ACH or the BCH can be outputted respectively from the ACH/BCH Reclockout output connector by interlocking with the input key of the front panel.

## FEATURES

### • Two-Channel Serial Digital I/O

An SDI input unit contains two channels of SDI input connectors. The two connectors can also function as a dual link input of a single channel. SDI output that is reclocked using a serial signal is provided for each input. In addition, the SDI signal that is inputted to the ACH or the BCH can be outputted respectively from the ACH/BCH Reclockout output connector by interlocking with the input key of the front panel.

### • Video Signal Display Function

In addition to displaying the video waveforms, vectors, and pictures of the SDI signal on a full screen, 2- and 4-screen multi display can be shown. The multi display allows arbitrary combination of a single or multiple input signals to be displayed. (Multi display in which link A and link B are separated during dual link operation is not allowed.)

### • Error Detection Function

Detects various errors related to the SDI, embedded audio, and ancillary data including CRC errors and EDH errors.

### • Ancillary Data Analysis

Supports various types of ancillary data for analysis display. In particular.

### • 5 BAR DISPLAY

Peak levels of video signals can be displayed in place of the vectors.

### • SDI-EXT REF Phase Difference Display Function

The SDI-EXT REF phase difference display function shows the phase difference between the SDI signal and the external sync signal (EXT REF).

### • Simultaneous Monitoring of Component and Composite Gamut Using the 5 Bar Displays

### • Japanese Caption Display Function (to be supported in the future)

### • Embedded Audio Demultiplex Function

The unit is equipped with a function for demultiplexing the embedded audio signal.

Level meter and Lissajous displays can be achieved when used in combination with the digital audio unit (LV 58SER40A). The signal can also be output as AES/EBU.

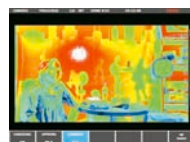
### • Dual link input

### ■ OPTION

### • FS 3033 Cinelite II (Cinelite and Cinezone)



Cinelite



Cinezone

## LV 58SER01A SDI INPUT SPECIFICATIONS

### Video Formats and Corresponding Standards Single Link System Video Signal Corresponding Formats and Corresponding Standards

Format	Quantization	Scanning	Frame(Field) Frequency	Standard Supported
Y,C <sub>s</sub> ,C <sub>r</sub> 4:2:2	10bit	1080i	60/59.94/50	SMPTE 274M SMPTE 292M
		1080p	30/29.97/25/ 24/23.98	
		1080PsF	30/29.97/25/ 24/23.98	SMPTE RP211 SMPTE 292M
		720p	60/59.94/50/ 30/29.97/25/ 24/23.98	SMPTE 296M SMPTE 292M
		525 625	59.94 50	SMPTE 259M

### Dual Link System Video Signal Corresponding Formats and Corresponding Standards

Format	Quantization	Scanning	Frame(Field) Frequency	Standard Supported	
GBR 4:4:4	10 bit	1080p	30/29.97/25/ 24/23.98	SMPTE 372M (1920x1080)	
		1080PsF	30/29.97/25/ 24/23.98		
		1080i	60/59.94/50		
		1080p	30/29.97/25/ 24/23.98		
12 bit	1080PsF	30/29.97/25/ 24/23.98			
	1080i	60/59.94/50			
Y,C <sub>s</sub> ,C <sub>r</sub> 4:2:2	10 bit	1080p	60/59.94/50		
		1080p	30/29.97/25/ 24/23.98		
		1080PsF	30/29.97/25/ 24/23.98		
		1080i	60/59.94/50		

### Ancillary data standard Embedded audio standard Format Setting

### Input/Output Connector SDI Input Input Connector

### Input Impedance Input Return Loss Maximum Input Voltage External Sync Signal Input Input Signal Input Connector SDI Output Output Connector

### Output Impedance Output Voltage Output Return Loss

### Waveform Display Function Waveform Operation Display Mode

### Overlay display Parade display Gain Adjustment Blanking Period Y,C<sub>s</sub>,C<sub>r</sub>→GBR conversion Pseudo-Composite Display

### Timing Display

### Channel Assignment

### Line Select Image Quality Adjustment Vertical axis Sensitivity

### Gain Variable Gain Amplitude Accuracy Frequency Response HDTV Y Signal C<sub>s</sub>, C<sub>r</sub> Signal Low-pass Attenuation Frequency Response SDTV Y Signal C<sub>s</sub>, C<sub>r</sub> Signal Low-pass Attenuation

### Horizontal Axis Line Display Display Format

SMPTE 291M  
HD-SDI: SMPTE 299M SD-SDI: SMPTE 272M  
Automatic setting

BNC connector 2 connectors  
For single link A ch / B ch 2 systems  
For dual link link A / link B 1 system  
75 Ω  
15 dB or more 5 MHz to serial clock frequency  
±2 V (DC + peak AC)

Tri-level sync or NTSC/PAL black burst  
BNC connector 1 system 2 connectors

BNC connector 2 connectors  
Reclocks serially and outputs the input signal.  
For single link A ch / B ch 2 systems  
For dual link link A / link B 1 system  
75 Ω  
800 mVp-p ±10 %  
15 dB or more 5 MHz to serial clock frequency

Displays component signals overlaid  
Displays component signals side by side  
x1 / x5 / variable  
Show / hide selectable  
Converts Y,C<sub>s</sub>,C<sub>r</sub> signals into GBR and displays the result.  
Digitally converts component signals into composite signals and displays the result.  
Displays by calculating Y-C<sub>s</sub> and Y-C<sub>r</sub>  
Uses bowtie signals (authorised by Tektronix, inc.)  
Selects GBR order or RGB order for the GBR conversion display  
Displays the selected line  
Brightness adjustment

V scale 0 V to 0.7 V, -0.3 V to 0.7 V  
% scale 0 % to 100 %, -50 % to 100 %  
x1, x5, and variable  
x0.2 to x10  
±0.5 %

±0.5 % 1 MHz to 30 MHz  
±0.5 % 0.5 MHz to 15 MHz  
20 dB or more at 20 MHz

±0.5 % 1 MHz to 5.75 MHz  
±0.5 % 0.5 MHz to 2.75 MHz  
20 dB or more at 3.8 MHz

Overlay: 1H, 2H  
Parade: 1H, 2H, 3H  
Timing: Y-C<sub>s</sub>, Y-C<sub>r</sub>  
4Y Parade\*1: 4H

<b>Magnification</b>	Selects x1, x10, x20, ACTIVE, or BLANK *1 As for 4Y parade mode, two LV 58SER01A (SDI INPUT unit) should be inserted, and four inputs need to synchronize in the same format each other together.
<b>Field Display Display Format</b>	Overlay: 1V, 2V (2V display not allowed for progressive) Parade: 1V, 2V, 3V Magnification: x1, x20, x40 ±0.5 %
<b>Time Base Accuracy Cursor Measurement Configuration</b>	Horizontal cursors: 2 cursors (REF and DELTA) Vertical cursors: 2 cursors (REF and DELTA) Measured in [%] and [V] Displayed in [usec] or [msec] Displays the frequency in which the time between cursors is considered a cycle.
<b>Amplitude Measurement Time Measurement Frequency Display</b>	
<b>Vectorscope Display Scale Gain Variable gain Amplitude Accuracy IQ Axis Pseudo-Composite Display</b>	Selects 75 % or 100 % (Using a color bar) Selects x1, x5, IQ-MAG or variable x0.2 to x10 ±0.5 % Selects show or hide Digitally converts component signals into composite signals and displays the result. (the color matrix for HDTV signal is converted into SDTV) Brightness adjustment
<b>Image Quality Adjustment</b>	Brightness adjustment
<b>Phase Difference Display Display</b>	Displays the phase difference between the SDI signal and external sync signal numerically and graphically Holds and displays eight phase difference values being measured
<b>Display Range</b>	V direction ±1/2 Frame H direction ±1 Line *The phase difference display in the H direction may fluctuate in the range of ±1 clock when the signal is switched. HD tri-level sync or black burst
<b>Sync Signal Phase Difference Measurement of Dual Link(future support)</b>	Displays phase difference between Link A and B with the number of the parallel reclock. (including ±1 clock error)
<b>Picture Display HDTV Display SDTV Display Marker Display</b>	Displayed by sampling the pixels (8 bit RGB) Displayed by interpolating pixels (8 bit RGB) Center marker 4:3 or 16:9 marker display Safe action marker display Safe title marker display
<b>Gamut Error Display Line Select Image Quality Adjustment</b>	On picture indication of gamut errors Displays the selected line as a marker GBR gain adjustment, Contrast adjustment, Brightness adjustment
<b>Status Display Status Display of SDI Signal Signal Detection Format Equivalent Cable Length Measurement</b>	Detects the presence or absence of SDI signals. Auto format Detection
<b>Embedded Audio Channel Error Detection of SDI signals CRC Error EDH Error TRS Error Line Number Error</b>	Converts the SDI signal attenuation into a coaxial cable length and displays the result. Displays the embedded audio channel number.
<b>Illegal Code Error</b>	Detects transmission error of HD-SDI signals. Detects transmission error of SD-SDI signals. Detects errors in the TRS position and protection bit. Line number errors in the HD-SDI signals are being detected.
<b>Embedded Prohibition Error</b>	Detects data in the range of 000h to 003h and 3FCh to 3FFh outside the TRS or ADF header.
<b>Cable Length Meter Error Error Detection of Embedded Audio BCH Error</b>	Detects the presence or absence of embedded audio at the embedded prohibition line. Detects the signal attenuation and displays the result.
<b>DBN Error Parity Error</b>	Detects transmission errors of embedded audio packets in the HD-SDI signal. Detects sequential errors in audio packets. Detects parity errors in audio packets embedded in HD-SDI signals
<b>Error Detection of Ancillary Data Checksum Error Parity Error Image Evaluation Gamut Error</b>	Detects the signal attenuation and displays the result. Detects transmission errors of embedded audio packets in the HD-SDI signal. Detects sequential errors in audio packets. Detects parity errors in audio packets embedded in HD-SDI signals
<b>Composite Gamut Error</b>	Detects Gamut Errors by specifying duration and size. Upper limit: 90.8 % to 109.4 % (0.1 % steps) Lower limit: -7.2 % to +6.1 % (0.1 % steps) Monitors the level error when the component signal is converted into composite signal Upper limit: 90.0 % to 135.0 % (0.1 % steps) Lower limit: -40.0 % to 20.0 % (0.1 % steps) Detects Y C <sub>u</sub> C <sub>v</sub> level errors Y upper limit: -51 mV to 766 mV (1-mV resolution) Y lower limit: -51 mV to 766 mV (1-mV resolution) C <sub>u</sub> C <sub>v</sub> upper limit: -400 mV to 399 mV (1-mV resolution) C <sub>u</sub> C <sub>v</sub> lower limit: -400 mV to 399 mV (1-mV resolution) Detects video freeze Detects blackouts of the video signal
<b>Level Error</b>	
<b>Freeze Detection Black Detection</b>	

<b>Event Log Number of Logs</b>	Error items, time stamps, etc.
<b>5 Bar Display Bar Display</b>	Displays the Y GBR component Gamut and composite Gamut
<b>Analysis Function Data Dump Display Display Format</b>	Displayed by serial data sequence or channel separation. Displays the selected line Displays the selected sample Move to EAV or SAV by one-key operation Save data in text format to a PC via or Ethernet or USB memory.
<b>Line Select Sample Select Jump Function Data Output</b>	
<b>Audio Control Packets Display Content Group Selection</b>	Analyzes and displays the audio control packets One group is selected from four groups.
<b>EDH Display Standard Supported Display Content</b>	SMPTE RP-165 Analyzes and displays the EDH packets. Displays the received CRC errors.
<b>Format ID Display Standard Supported Display Content</b>	SMPTE 352M ARIB STD-B39 Analyzes and displays the Format ID.
<b>Closed Caption Data Display Standard Supported Display Content</b>	ARIB STD-B37,EIA/CEA-608,EIA-708 Analyzes and displays the closed caption data.
<b>Inter-Stationary Control Data (NET-Q) Display Standard Supported Display Content Log Function</b>	ARIB STD-B39 Analyzes and displays the Inter-Stationary Control Data. Logs Q signals
<b>V-ANC User Data Display Standard Supported Arbitrary ANC Packet Display Method of Specifying ANC Time Code Display Corresponding Time Code Display Method</b>	ARIB TR-B23  Selects DID or SDID  Selects LTC or VITC SMPTE RP-188 Switches the display of internal clock, and the time code.
<b>Embedded Audio Processing Clock Generation System</b>	SD-SDI: Generated from the video clock HD-SDI: Generated from the video clock Dual link (future support): Generated from the video clock
<b>Closed Caption Processing (future support)  SMPTE System</b>	The closed caption data that is multiplexed in the SDI signal can be overlaid on the picture display. CEA/EIA-608-B embedded in the CDP packets as defined in CEA/EIA-708-B. CEA/EIA-608-B VBI(CEA/EIA-608-B Line21)
<b>Cable Length Measurement Detection method</b>	Converts the SDI signal attenuation into a coaxial cable length and displays the result.
<b>Supported Cables</b>	HD-SDI: Selects L-7CHD, LS-5CFB, or 1694A SD-SDI: Selects LS-5C2V, 8281, or 1505A HD-SDI: From under 5 m to 130 m or more (For L-7CHD: From under 10 m to 200 m or more) *Less than 10 m to greater than or equal to 200 m for L-7CHD SD-SDI: From under 50 m to 300 m or more
<b>Display Range</b>	±20 m 5 m (For L-7CHD: 10 m)
<b>Accuracy Resolution</b>	
<b>Frame Capture Function Media Internal Memory Capacity</b>	Internal memory (RAM) or USB memory Video data 1 Frame 2 Systems For Dual Link mode: 1 Frame 1 system Save capture data to a PC via Ethernet network or a USB memory.
<b>Data Output</b>	Recalls and displays the Picture/ Waveform/ Vector of 1 frame capture data. The capture data saved in the USB memory can be read back. (Reading back operation is possible only if an SDI input of the same format as the captured data is available) Simultaneous display of captured data and real data.
<b>Recalling Capture Data</b>	
<b>Waveform Comparison</b>	
<b>Power Consumption</b>	Supplied from LV 5800 70 Wmax. (If one unit is installed to the LV 5800) 18 Wmax. (additional power consumption for each additional unit installed to the LV 5800)
<b>Weight</b>	0.28 kg, 0.6 lbs
<b>Accessory</b>	Instruction manual ..... 1

**Precautions Concerning Dual Link Operation**  
Aliasing occurs in the V sweep display of 1080p/60, 59.94, and 50, because the unit processes the sampling data. The picture display is processed using 8 bits even if the quantization is set to 12 bits.  
In addition, waveform display in external synchronization mode is not allowed if 1080p/60 (59.94) or 1080p/50 signal is applied.

## LV 58SER02 EYE PATTERN UNIT

Plug-In Unit for LV 5800



RoHS

This unit displays eye patterns. It is installed in a LV 5800 input slot. By combining with the LV 5800 input unit, eye pattern waveforms of SDI signals can be monitored. Automatic measurement of parameters such as amplitude, rise time, and fall time is also possible.

### FEATURES

- **HD-SDI, SD-SDI Format Support**
- **6 Systems of Eye Pattern Displays and Jitter Measurement**

Displays the SDI signal eye pattern or measures the jitter of one system among up to 6 systems by combining 3 SDI input units and selecting A or B among the three modules. (Two Eye units cannot be installed simultaneously.)

- **Eye Pattern Display**

Displays the eye pattern of the timing jitter or alignment jitter by switching the filter.

- **Jitter Measurement**

The jitter measurement by the phase detection method allows accurate jitter measurement even if the eye is barely open. In addition, timing jitter and alignment jitter can be measured.

- **Automatic Measurement**

The eye pattern display allows automatic measurement of the eye pattern amplitude, rise time, and fall time. The jitter display allows automatic measurement of the timing jitter and alignment jitter values.

- **Jitter Display Using Video Sweep**

Allows V sweep and H sweep displays.

- **Simultaneous Display on the Multi Display**

The multi display allows the eye pattern waveform and jitter waveform to be displayed simultaneously. In addition, the eye pattern display screen automatically measures the eye pattern amplitude, rise time, and fall time, while the jitter display screen automatically measures the timing jitter and alignment jitter.

- **Alarm Monitoring**

The alarm monitor mode allows the eye pattern amplitude, rise time, and fall time to be monitored with respect to the threshold level specified in advance. It also monitors the timing jitter and alignment jitter using the phase detection method. An alarm is displayed when the threshold level is exceeded. The alarm can also be logged.

### LV 58SER02 EYE PATTERN UNIT SPECIFICATIONS

<b>Supported Formats</b> <b>Data Rate</b> HD-SDI SD-SDI <b>Eye Pattern Method</b> <b>Amplitude Accuracy</b> <b>Time Axis</b> <b>Time Axis Accuracy</b> <b>Jitter Filter</b>	SMPTE292M 1.485 Gbps, or 1.485/1.001 Gbps SMPTE259M 270 Mbps  Equivalent time sampling method 800 mV $\pm 5\%$ for 800 mV input 2 / 4 / 16 Eye pattern Display $\pm 3\%$ 10 Hz HPF 100 Hz HPF 1 kHz HPF 100 kHz HPF
<b>Jitter Detection Method</b> <b>Time Axis</b> <b>Time Axis Accuracy</b> <b>Jitter Filter</b>	Phase detection method H rate or V rate $\pm 3\%$ 10 Hz HPF 100 Hz HPF 1 kHz HPF 100 kHz HPF (* Doesn't support JITTER measurement of a DVB-ASI standard Eye pattern only.)
<b>Power Consumption</b>	Supplied from LV 5800 20 Wmax.
<b>Weight</b>	0.4 kg, 0.9 lbs
<b>Accessories</b>	Coaxial cable .....1 Instruction manual .....1

## LV 58SER03 COMPOSITE VIDEO INPUT UNIT

Plug-In Unit for LV 5800



New

RoHS

The LV 58SER03 provides the LV 5800 with two composite (NTSC/ PAL) inputs. The LV 5800's newest functions related to waveforms such as the waveform monitor, vectorscope, and simple picture monitor can be used on analog video signals of NTSC and PAL formats.

For a description of the specifications other than those of this newly added option, see the specifications of the standard model.

This unit in combination with the LV 58SER01A is suitable for monitoring in a mixed environment containing SDI and composite signals.

### FEATURES

- **Input/Output**

There are two input connectors: INPUT A and INPUT B. The selected channel is output from the PIX OUT connector on the rear panel.

- **Display**

Waveform display, vectorscope display, picture display, and EXT REF phase display function are available. In addition, the luminance component can be displayed using a low-pass filter.

- **SCH Measurement Function**

You can perform SCH measurements which are essential when editing the composite signal.

- **EXT REF Phase Display Function**

Compares the input signal to the V.H sync signal of the external reference signal and displays the phase difference numerically and graphically.

This function makes synchronization phase management easy.

- **Miscellaneous**

Cursors can be used to measure the amplitude and time, with high accuracy.



**LV 58SER03 COMPOSITE VIDEO INPUT UNIT SPECIFICATIONS**

<b>Measured Signal Supported Standards</b>	Composite video signal (NTSC/PAL) SMPTE 170M and ITU-R BT.470
<b>Input Composite Video Input Connector Input Impedance Input Return Loss Maximum Input Voltage</b>	Select A or B BNC connector 75 Ω ≥ 30 dB (up to 6 MHz) ±5 V (DC + Peak AC)
<b>Output Composite Video Output Signal Output Connector Output Impedance Output Amplitude Frequency Characteristics</b>	Active BNC connector 1 system 1 connector 75 Ω 1 V <sub>p-p</sub> ± 5 % ± 5 % 25 Hz to 5 MHz +5 % to -10 % 5 MHz to 5.6 MHz
<b>Display WAVE Display VECTOR Display PICTURE Display</b>	Waveform display Vectorscope display Picture display
<b>Waveform Display Section Vertical Axis Sensitivity Gain Variable Gain Amplitude Accuracy Frequency Characteristics Composite Signal Step Response (for 1 V full scale, flat, 2T pulse, and 2T bar) Overshoot Preshoot Ringing Pulse/Bar Ratio Vertical Tilt Filter DC Restorer</b>	V Scale (PAL) -0.3 V to 0.7 V IRE Scale (NTSC) -40 IRE to 100 IRE Select x1 or x5 ≤ 0.2 to ≥ 2 ±1 % ±2 % 25 Hz to 5 MHz +3 % to -7 % 5 MHz to 5.6 MHz ±2 % ±1 % ±2 % ±1 % ±1 % Luminance filter Clamp to the back porch (fixed)

<b>Horizontal Axis Operation Mode Display Format Line Display Line Magnification Field Display Field Magnification Time Base Accuracy</b>	Overlay Displays only a single waveform  1H or 2H Select x1, x10 or x20 1V or 2V Select x1, x20 or x40 ±1 %
<b>Vectorscope Display Section Sensitivity Gain Variable Gain Phase Accuracy Amplitude Accuracy Phase Adjustment Range Setup (NTSC) NTSC Display (PAL) IQ Axis SCH</b>	Select 75 % or 100 % Using a color bar Select x1, x5, or IQ-MAG 0.2 to 2 ±2 ° ±3 % 360 ° Select 0 % or 7.5 % Select NTSC or PAL display Select show or hide Displays the SCH value numerically
<b>Status Display Section Display</b>	Displays the phase difference between the composite signal and external sync signal numerically and graphically. Holds and displays eight phase difference values being measured.
<b>Display Range V direction H direction Synchronization Signal</b>	±1/2 frame ±1/2 Line NTSC/PAL black burst signals
<b>General Specifications Environmental Conditions Power Consumption</b>	Conforms to the LV 5800 Supplied from the LV 5800 9 Wmax.
<b>Weight</b>	0.25 kg, 0.5 lbs
<b>Accessories</b>	Instruction manual ..... 1
<b>Picture Display</b>	(Conforms to the LV 5800)
<b>Line Selector</b>	(Conforms to the LV 5800)
<b>Cursor Measurement Amplitude Measurement</b>	(Conforms to the LV 5800) Measure in terms of [IRE] or [V]
<b>Screen Capture</b>	(Conforms to the LV 5800)

**LV 58SER04 MPEG DECODER Plug-In Unit for LV 5800**



The LV 58SER04 is an input unit that receives MPEG-2 TS (DVB-ASI) signals and displays video/audio information on the LEADER LV 5800 (Multi Monitor). Because it contains an MPEG-2 video decoder and audio decoder, it can display the signal using the video signal waveform display, vectorscope display, picture display, and audio display. The LV 58SER04A can also be used to monitor errors defined by ETSI ETR-290, to display PAT and PMT data, and to display the TS bit rate and the bit rate for each PID. These features are ideal for continuous monitoring of MPEG-2 TS signals in broadcasting stations and similar facilities. In addition, the LV 58SER04 can do the following when combined with other units.

- Eye pattern display of DVB-ASI signals (when combined with the LV 58SER02).
- Lissajous and level displays of audio signals (when combined with the LV 58SER40A).

**FEATURES**

- **DVB-ASI Input Connector**  
The unit comes with one DVB-ASI input connector.
- **Video Decoding**  
Decodes compressed video data on the MPEG-2 TS (MPEG-2 Video 4:2:2, 4:2:0) and displays a video signal waveform, vectorscope, or picture.<sup>\*1</sup>

- **Audio Decoding**  
Combine with the LV 58SER40A (DIGITAL AUDIO) to decode audio data on the MPEG-2 TS and show Lissajous, sound image, and level meter displays as well as outputs digital audio signals. The decodable audio data types are MPEG-2 AAC, Dolby<sup>®</sup> Digital (AC-3)<sup>\*3</sup>, and LPCM (SMPTE 302M)
- **PID Search**  
Video and audio search for PID automatically.
- **Error Detection**  
Monitors and displays ETSI ETR 290 priority 1 and 2 errors.<sup>\*4</sup>
- **Status Display**  
Displays packet bit rates and measures PCR jitter. Displays PAT, PMT, and a selected packet dump.
- **Eye Pattern Display**  
Combine with the LV 58SER02 (EYE PATTERN unit) to display DVB-ASI eye patterns.<sup>\*5</sup>

\*1 Cannot descramble broadcast scrambling. May not be able to decode all MPEG-2 data formats.  
\*2 Dolby is a trademark of Dolby Laboratories.  
\*3 When decoding Dolby Digital(AC-3), Dolby E option is necessary for the LV 58SER40A(DIGITAL AUDIO)separately.  
\*4 There are some limitations on the error detection feature.  
\*5 Jitter cannot be displayed even if the LV 58SER02 is used.

**LV 58SER04 MPEG DECODER SPECIFICATIONS**

<b>Standards Supported Standards Profile and Level</b>	ISO/IEC 13818-1 MP@HL, MP@ML, 422@ML, 422P@HL
<b>DVB-ASI I/O Input Connector Input Connector Number of Input Connectors Maximum Input Voltage Input Signal Serial Clock Transmission Mode Maximum Bit Rate Supported Packet Sizes Packet Size Detection</b>	BNC-R 1 connector, 75 Ω ±2 V (DC + peak AC)  270 MHz Packet/Burst 66 Mbps 188, 204, and 208 bytes Audio Detects supported packet sizes

<b>Decoding Function</b> <b>Video Formats:</b>	1920x1080i / 59.94, 60, 50 (4:2:0,4:2:2) 1440x1080i / 59.99, 60, 50 (4:2:0,4:2:2) 1280x720p / 59.94, 60, 50 (4:2:0,4:2:2) 720x480i / 59.94 (4:2:0,4:2:2) 720x576i / 50 (4:2:0,4:2:2)
<b>Audio Signals</b>	MPEG-2 AAC, Dolby Digital(AC-3), MPERG-1 LAYER-2 LPCM(SMPTE 302M) (LV 58SER40A (DIGITAL AUDIO) is necessary separately. In addition, when decoding Dolby Digital (AC-3), Dolby E option is necessary) *This unit decodes only one set of video data and audio data. Even if you use the LV 5800 multi display, the unit cannot decode different video and audio streams simultaneously. If you assign the display showing the data that this unit is decoding to multiple displays and you change the PID of the data being decoded, the PIDs on all displays change simultaneously.
<b>Video Signal Waveform Display Function</b> <b>Waveform Operation</b> <b>Display Mode</b>	Overlay display (displays component signals overlaid) Parade display (displays component signals side by side)
<b>Y, C<sub>b</sub>, C<sub>r</sub> to G, B, R Conversion</b>	Converts Y, C <sub>b</sub> , C <sub>r</sub> signals into G, B, R and displays the result
<b>Pseudo-Composite Display</b>	Displays component signals artificially as composite signals
<b>Channel Assignment</b>	G, B, R or R, G, B order (when displaying G, B, R converted signals)
<b>Line Select</b> <b>Image Quality Adjustment</b>	Displays the selected line Adjusts the brightness
<b>Vertical Axis</b> <b>Sensitivity</b> <b>V Scale</b> <b>% Scale</b> <b>Gain</b> <b>Variable Gain</b> <b>Amplitude Accuracy</b> <b>HDTV Frequency Characteristics</b> <b>Y Signal</b> <b>C<sub>b</sub>, C<sub>r</sub> signal</b> <b>Low-pass Attenuation</b> <b>SDTV Frequency Characteristics</b> <b>Y Signal</b> <b>C<sub>b</sub>, C<sub>r</sub> signal</b> <b>Low-pass Attenuation</b>	0 to 0.7 V, -0.3 to 0.7 V 0 to 100 %, -50 to 100 % x1, x5, variable x0.2 to x2 ±0.5 % ±0.5 % (1 to 30 MHz) ±0.5 % (0.5 to 15 MHz) 20 dB or more (at 20 MHz) ±0.5 % (1 to 5.75 MHz) ±0.5 % (0.5 to 2.75 MHz) 20 dB or more (at 3.8 MHz)
<b>Horizontal Axis</b> <b>Line Display</b> <b>Display Mode</b>	Overlay: 1H, 2H *1 Parade: 1H, 2H, 3H x1, x10, x20, ACTIVE, BLANK
<b>Magnification</b> <b>Field Display</b> <b>Display Mode</b>	Overlay: 1V, 2V *1 Parade: 1V, 2V, 3V x1, x20, x40 ±0.5 %
<b>Magnification</b> <b>Time Accuracy</b> <b>Cursor Measurement</b> <b>Composition</b> <b>Horizontal Cursors</b> <b>Vertical Cursors</b> <b>Amplitude Measurement</b> <b>Time Measurement</b> <b>Frequency Measurement</b>	2 cursors (REF and DELTA) 2 cursors (REF and DELTA) Percentage and voltage displays Displays time in seconds Displays the frequency by considering the time between cursors to be a cycle *1 The 2V display is not allowed if the input signal is progressive.

<b>Vectorscope Display</b> <b>Scale</b> <b>Gain</b> <b>Variable Gain</b> <b>Amplitude Accuracy</b> <b>IQ Axis</b> <b>Pseudo-Composite Display</b>	75 %, 100 % (for the color bars) x1, x5, IQ-MAG, variable x0.2 to x2 ±0.5 % Show or hide Displays component signals by converting to composite signals that have burst added artificially. (The color matrix for HDTV signals is converted to SDTV.) Adjusts the brightness
<b>Image Quality Adjustment</b>	Adjusts the brightness
<b>Picture Display</b> <b>HDTV Display</b> <b>SDTV Display</b> <b>Marker Display</b>	Displayed by sampling pixels Displayed by interpolating pixels Center marker display 4:3 or 16:9 marker display Safe action marker display Safe title marker display Marks the selected line Optimized display, actual size display GBR level adjustment, contrast adjustment, brightness adjustment
<b>Line Select</b> <b>Display Size</b> <b>Image Quality Adjustment</b>	Adjusts the brightness
<b>Section and PCR Information</b> <b>PAT</b> <b>PAT Detection</b>	Automatically recognizes packets whose PID is 0000h as PAT Measures the PAT cycle in 1-ms intervals PAT dump display
<b>Cycle Measurement</b> *2 <b>PAT data display</b>	
<b>PMT</b> <b>PMT Detection</b> <b>Cycle Measurement</b> *2 <b>PMT data display</b>	Select the PID of the PMT to be decoded Measures the PMT cycle in 1-ms intervals PMT dump display
<b>NIT</b> <b>NIT Detection</b>	Automatically detects packets with the NIT PID specified by the PAT. Measures the NIT cycle in 1-ms intervals
<b>Cycle Measurement</b> *2 <b>CAT</b> <b>CAT Detection</b> <b>Cycle Measurement</b> *2	Recognizes packets whose PID is 0001h as CAT Measures the CAT cycle in 1-ms intervals
<b>PCR</b> <b>PCR detection</b>	Automatically detects packets with the PCR PID specified by the selected PMT Measures the PCR cycle in 1-ms intervals Measures the PCR accuracy based on the internal reference clock
<b>Cycle Measurement</b> *2 <b>PCR jitter</b>	
<b>Dump Display</b> <b>Function</b>	Dump display of the PAT, PMT, and the dump display of the selected packet
<b>Notation</b>	Displays binary and hexadecimal values and contents
<b>Bit Rate Display</b> <b>Function</b>	Displays the bit rate and cycle of the main sections and packets
<b>Bar Display</b>	Displays the occupied bandwidth with respect to the TS bit rate using bars
<b>Displayed Sections</b> <b>Displayed Packets</b>	NIT, CAT, PAT, and PMT Video, audio, PCR, and null
<b>General Specifications</b> <b>Environmental Conditions</b> <b>Power Supply</b>	Conforms to the LV 5800 Supplied from the LV 5800 70 W max. (if one unit is installed to the LV 5800) 20 W max. (additional power consumption for each additional unit installed to the LV 5800)
<b>Weight</b>	0.4 kg, 0.9 lbs
<b>Accessory</b>	Instruction manual.....1

## LV 58SER20 DVI-I OUTPUT UNIT

Plug-In Unit for LV 5800



This unit is a DVI-I OUTPUT unit that outputs the contents displayed on the front LCD panel from the DVI-I connector to an external monitor. The unit is installed in a LV 5800 output slot.

## FEATURES

### •DVI-I Connector

The connector allows the screen displayed on the LV 5800 to be shown on an external monitor.

The DVI output provides both digital and analog output allowing the signal to be used on a wide variety of XGA-compatible monitors.

## LV 58SER20 DVI-I OUTPUT UNIT SPECIFICATIONS

<b>DVI-I Connector</b> <b>Signal Format</b>	Single Link T.M.D.S Analog RGB
<b>Display Format</b> <b>DDC Function</b> <b>HOT PLUG Detection Function</b> <b>Output Connector</b>	XGA (Effective area 1024x768 dots) Not supported Not supported DVI-I 1 system
<b>Power Consumption</b>	Supplied from LV 5800 5 Wmax.
<b>Weight</b>	0.2 kg, 0.4 lbs
<b>Accessory</b>	Instruction manual.....1

RoHS

**LV 58SER40A DIGITAL AUDIO**

Plug-In Unit for LV 5800



The LV 58SER40(A) (DIGITAL AUDIO) operates as an AES/EBU I/O unit when installed in a LV 5800 input slot or as an AES/EBU output unit when installed in a LV 5800 output slot. It allows the LV 5800 to display Lissajous, sound image, level meter, and signal status displays\*<sup>1</sup> for data in 8 AES/EBU channel pairs (16 channels)\*<sup>2</sup> and 2 analog audio channels.\*<sup>3</sup> If the LV 58SER01A (SDI INPUT) is installed in the LV 5800, this unit can process AES/EBU signals that are embedded in SDI signals. If the LV 58SER04 (MPEG DECODER) is installed, this unit can process MPEG-1 Layer 2, MPEG-2 AAC, AC3 and LPCM that are embedded in DVB-ASI signals.

\*1 All AES/EBU signals must be synchronized. This unit only supports 48 kHz sampling frequency.

\*2 The standard LV 58SER40(A) provides 4 AES/EBU channel pairs (8 channels). Installing the optional I/O expansion unit expands the I/O connectors to 8 AES/EBU channel pairs (16 channels).

\*3 The LV 58SER40 does not support the measurement of analog audio signals.

**FEATURES**

**• 8 AES/EBU I/O Pairs (16 Channels)**

This unit operates as an AES/EBU I/O unit when installed in a LV 5800 input slot or as an AES/EBU output unit when installed in a LV 5800 output slot.

**• Headphone Output**

When you install this unit into an LV 5800 input slot, you can listen to the selected channel audio using a headphone.

**• Various Display Features**

This unit enables the LV 5800 to display the following items on the AES/EBU input signals.

- Single Lissajous display between any two channels
  - Multi Lissajous display that simultaneously shows 4 or 8 single Lissajous displays of different channel pair combinations.
  - Sound image display
  - Meter display
- The unit also enables the LV 5800 to display the following AES/EBU signal status bits.
- Channel status bit
  - User bit
  - Validity bit
  - Parity bit

\* You cannot assign the audio measurement display to multiple areas.

**• Analog Audio Input**

The LV 58SER40A can measure analog audio signals on 2 channels.

**• Dolby Decoding Capability (Optional)**

\* Dolby E, Dolby Digital is a trademark of Dolby Laboratories.

**LV 58SER40A DIGITAL AUDIO SPECIFICATIONS**

<b>Input and Output Signals Supported Formats Sampling Frequency</b>	IEC60958, Dolby E* (option), Dolby Digital* (option) 48 kHz
<b>Rear BNC Connectors Maximum Input Voltage Output Voltage I/O Connectors Input/Output Impedance Input and Output Switching</b>	± 5V (DC + AC <sub>peak</sub> ) 1.0 V <sub>p-p</sub> ± 10% (into 75 Ω) BNC connectors (eight channels in four-channel pairs) 75 Ω Whether to use the connectors as audio signal input connectors or as output connectors for audio signals that are embedded in SDI or DVB-ASI signals is selectable on the LV 5800.
<b>Analog Audio Input Maximum Input Voltage Input Connector Input Impedance</b>	+18 dBm (6.2 Vrms) D-Sub 25-pin connector on the LV 5800 (DC-coupled balanced input) At least 5 kΩ * The LV 58SER40 does not support analog audio input.
<b>Waveform Displays Lissajous Display Sound Image Display Channel Mapping Surround Formats</b>	Single Lissajous display between any two channels Multi Lissajous display that simultaneously shows 4 or 8 single Lissajous displays of different channel pair combinations. L, R, C, LFE, Ls(S), Rs, LL, RR 3-1, 3-2, 3-2-2
<b>Correlation Meter</b>	Displays the correlation between 2 channels in the range of -1 to 1
<b>Meter Display During Multi Lissajous Display During Single Lissajous Display</b>	Displays the levels of 8 channels or 16 channels on a bar graph Displays the levels of 2 selected channels on a bar graph
<b>Response Mode Selection<sup>1</sup> LV 58SER40A LV 58SER40 Peak Hold Mode Selection<sup>1</sup> LV 58SER40A LV 58SER40 Peak Hold Time Display dynamic range<sup>2</sup> Reference Level Setting Warning Level Setting Over Level Setup</b>	TRUE PEAK, PPM type I, PPM type II, VU TRUE PEAK, PPM, VU (when the meter response mode is VU) TRUE PEAK, PPM type I, PPM type II TRUE PEAK, PPM 0.5 to 5.0 s (in 0.5-s steps), HOLD -60 dBFS, -90 dBFS -40.0 to 0.0 dBFS -40.0 to 0.0 dBFS -40.0 to 0.0 dBFS *1 The LV 58SER40 PPM (Peak Program Meter) and the LV 58SER40A PPM type I are equivalent. *2 Fixed at -60 dBFS when measuring an analog audio signal.
<b>Status Display Channel Status Bit Display User Data Bit Display Dolby E Metadata Display Dolby Digital Metadata Display Error Detection Level Over Detection Detection Setting Clip Detection Detection Setting Mute Detection Detection Setting Parity Error Detection Validity Error Detection CRC Error Detection Code Violation Detection</b>	Dump display, text display Dump display Text display Text display Counts the number of errors for each channel Counts the number of times the input signal level exceeds the specified level -40.0 to 0.0 dBFS Detects an error when the number of maximum signal values that are received consecutively exceeds the specified number of samples and counts the number of times this error occurs 1 to 100 samples Detects an error when the length of a received mute signal exceeds the specified duration, and counts the number of times this error occurs 1 to 5000 ms Counts the number of times the input signal parity bit differs from the parity bit value that the LV 58SER40(A) calculates Counts the number of times the input signal validity bit is 1 Counts the number of times the input signal CRC value differs from the CRC value that the LV 58SER40(A) calculates Counts the number of times the input signal bi-phase modulation status is in error
<b>Headphone Output Output Connector Output Power</b>	3.5 mm stereo mini jack 121.5 mW <sub>rms</sub> max. (into 8 Ω)
<b>General Specifications Environmental Conditions Power Consumption</b>	The same as the LV 5800 9 W <sub>max</sub> , supplied from the LV 5800
<b>Weight</b>	0.27 kg, 0.6 lbs
<b>Accessories</b>	Instruction manual ..... 1 Analog audio cable (LV 58SER40A only) ..... 1

## LV 5800/LV 7800 Platform Options

### LV 58SER06 3G-SDI INPUT



This 3G-SDI input unit can be installed into an input slot of an LV 5800 (multi monitor) or into an LV 7800 (multi rasterizer).

The LV 58SER06 supports 3G-SDI levels A and B, and it can be used to display information such as 3G-SDI signals' video waveforms, vector waveforms, pictures, and error detection results on an LV 5800 or LV 7800.

Additionally, by combining the LV 58SER06 with the LV 58SER40A, you can display information such as the Lissajous curves and level meters of embedded audio signals. What's more, the LV 58SER06 can generate 3G-SDI signals and test patterns.

### FEATURES

#### Two Serial Digital Inputs

The LV 58SER06 has two switchable 3G-SDI input connectors for monitoring.

#### Two Serial Digital Outputs

The LV 58SER06 can reclock input signals that are received by the input terminal that has been selected with the input key (3G-SDI A or 3G-SDI B) and generate these reclocked signals from the 3G-SDI A/B output connector.

From the 3G-SDI B output connector, the LV 5800 can transmit a reclocked signal from the 3G-SDI signal that is received through the 3G-SDI B input connector.

#### Test Pattern Signal Outputs

The LV 58SER06 can operate as a 3G-SDI signal pattern generator to generate a 3G-SDI signal from the two output terminals.

#### Video Signal Display

The LV 58SER06 can be used to display 3G-SDI signals' video signal waveforms, vector waveforms, and pictures on not only the 1-screen display, but 2- and 4-screen multi displays.

#### Error Detection

The LV 58SER01A can detect CRC and other 3G-SDI signal errors that are related to embedded audio signals and ancillary data.

#### Automatic Video Format Setting

The LV 58SER06 automatically sets the video format based on payload ID packets.

#### 5 Bar Display

You can use the 5 bar display to simultaneously monitor component and composite gamut.

#### Embedded Audio Extraction

By combining the LV 58SER06 with a digital audio unit (the LV 58SER40A), you can perform actions such as displaying level meters and Lissajous curves. You can also generate AES/EBU signals.

### SPECIFICATIONS

#### Video Formats and Corresponding Standards

##### 3G-SDI Video Signal Formats and Corresponding Standards

Color System	Quantization	Format		Corresponding Standard
		Scanning	Frame Frequency	
Y, C <sub>B</sub> , C <sub>R</sub> 4:2:2	10 bits	1080p	60, 59.94, 50	SMPTE 424M SMPTE 425M

#### Other Standards

**Ancillary Data:** SMPTE 291M

**Embedded Audio:** SMPTE 299M

(Only the audio data of data stream 1 is supported.)

#### Format Setting:

**Manual:** Manually set the frame frequency

**Automatic:** The LV 58SER06 detects the format information within the payload ID (SMPTE 325M) and automatically sets the format.

#### Output Signal

Depending on your selection, the LV 58SER06 generates a reclocked signal (input loop-through) from the input signal or generates a test pattern signal, and transmits it from the 3G-SDI A/B output connector and the 3G-SDI B output connector.

#### 3G-SDI A/B Output Connector

**When Set to Input Reclock:** Generates a reclocked signal from the signal received through the selected input channel.

**When Set to Test Pattern:** Generates a test pattern signal

#### 3G-SDI B Output Connector

**When Set to Input Reclock:** Generates a reclocked signal from the signal received through input channel B

**When Set to Test Pattern:** Generates a test pattern signal

#### Test Pattern Generation

**Format:** Y, C<sub>B</sub>, C<sub>R</sub> 4:2:2 1080p/60, 59.94, 50

**Corresponding Standard:** SMPTE424M and SMPTE425M

**Pattern:** 100 % color bar (100 % white, 100 % saturation), 75 % color bar (100 % white, 75 % saturation), 100 % white, 50 % white, black, check field, equalizer, and PLL

**Embedded Audio:** Not supported

**Bit Rate:** 2.97 Gbps or 2.97/1.001 Gbps

**Oscillation Clock:** Driven by the internal oscillator

148.5 MHz ± 10 ppm or 148.5/1.001 MHz ± 10 ppm

#### I/O Connectors

##### 3G-SDI Input Connectors

**Input Connectors:** 2 BNC connectors  
2 connections (channels A and B)

##### Input Impedance:

75 Ω

##### Input Return Loss:

15 dB or greater (5 MHz to 1.485 GHz)

10 dB or greater (1.485 to 2.97 GHz)

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

##### 3G-SDI Output Connectors

**Function:** Generation of reclocked signals from the input signals and generation of test patterns

**Output Connectors:** 2 BNC connectors

**Output Impedance:** 75 Ω

**Output Return Loss:** 15 dB or greater (5 MHz to 1.485 GHz)

10 dB or greater (1.485 to 2.97 GHz)

**Output Voltage:** 800 mVp-p ± 10 %

#### Waveform Display

##### Waveform Operations

##### Display Modes

**Overlay:** Overlays component signals

**Parade:** Displays component signals side by side

**Blanking Period:** Show or hide

**Y, C<sub>B</sub>, C<sub>R</sub> to GBR Conversion:** Converts the Y, C<sub>B</sub>, C<sub>R</sub> signal to GBR and displays it

**Pseudo-Composite Display:** Displays component signals artificially as composite signals

**Channel Assignment:** Displayed in GBR or RGB order (when displaying GBR converted signals)

**Line Select:** Displays the selected line

**Display Adjustment:** Brightness adjustment and waveform color selection (white, green, or multi color)  
(Multi color is only available on the 1-screen display.)

<b>Vertical Axis</b>	
<b>Sensitivity</b>	
<b>V Scale:</b>	0 to 0.7 V or -0.3 to 0.7 V
<b>% Scale:</b>	0 to 100 % or -50 to 100 %
<b>Gain:</b>	×1, ×5, or variable
<b>Variable Gain:</b>	×0.2 to ×10
<b>Amplitude Accuracy:</b>	±0.5 %
<b>Frequency Response</b>	
<b>Y Signal:</b>	±0.5 % (1 to 60 MHz)
<b>C<sub>B</sub>, C<sub>R</sub> Signal:</b>	±0.5 % (0.5 to 30 MHz)
<b>Low-Pass Attenuation:</b>	20 dB or greater (at 40 MHz)
<b>Horizontal Axis</b>	
<b>Line Display</b>	
<b>Display Format:</b>	Overlay: 1H, 2H Parade: 1H, 2H, 3H
<b>Magnification:</b>	×1, ×10, ×20, ACTIVE, or BLANK
<b>Field Display</b>	
<b>Display Format:</b>	Overlay: 1V Parade: 1V, 2V, 3V
<b>Magnification:</b>	×1, ×20, ×40
<b>Time Accuracy:</b>	±0.5 %
<b>Cursor Measurement</b>	
<b>Composition</b>	
<b>Horizontal Cursors:</b>	2 (REF and DELTA)
<b>Vertical Cursors:</b>	2 (REF and DELTA)
<b>Amplitude Measurement:</b>	Percentage and voltage displays
<b>Time Measurement:</b>	Second display
<b>Frequency Measurement:</b>	Computes and displays the frequency with the length of one period set to the time between two cursors
<b>Vectorscope Display</b>	
<b>Scale:</b>	75 % or 100 % (color bar)
<b>Gain:</b>	×1, ×5, IQ-MAG, or variable
<b>Variable Gain:</b>	×0.2 to ×10
<b>Amplitude Accuracy:</b>	±0.5 %
<b>IQ Axis:</b>	Show or hide
<b>Pseudo-Composite Display:</b>	Converts component signals into composite signals with artificially added burst and displays the results (The color matrix is converted to SDTV.)
<b>Display Adjustment:</b>	Brightness adjustment and waveform color selection (white or green)
<b>Picture Display</b>	
<b>Display Format:</b>	Samples pixels and displays them (R, G, and B each use 8 bits)
<b>Marker Displays:</b>	Center marker, 4:3 marker, safe action marker, and safe title marker
<b>Gamut Error Display:</b>	Marks the areas of the picture that exhibit gamut errors
<b>Line Select:</b>	Marks the selected line
<b>Display Sizes:</b>	Compressed and full frame
<b>Image Quality Adjustment:</b>	G, B, R level; contrast; and brightness adjustment
<b>Status Display</b>	
<b>3G-SDI Signal Status Display</b>	
<b>Signal Detection:</b>	Detects the presence of a 3G-SDI signal
<b>Format:</b>	Detects from the supported video signal formats (When the LV 58SER06 is configured to automatically set the format, the format is detected from the payload ID.)
<b>Embedded Audio Channel</b>	
	Displays the embedded audio channel number (Only the audio data of data stream 1 is supported.)
<b>3G-SDI Signal Error Detection</b>	
<b>CRC Error:</b>	Detects 3G-SDI signal transmission errors
<b>TRS Error:</b>	Detects TRS position and protection bit errors
<b>Line Number Error:</b>	Detects 3G-SDI signal line number errors
<b>Illegal Code Error:</b>	Detects data within the range of 000h to 003h and 3FC to 3FF in locations other than the TRS and ADF headers
<b>Ancillary Data Error Detection</b>	
<b>Checksum Error:</b>	Detects ancillary data transmission errors
<b>Parity Error:</b>	Detects ancillary data header parity errors
<b>Image Quality Error Detection</b>	
<b>Frequency Response:</b>	Approx. 1 MHz LPF (IEEE STD 205 response) and approx. 2.8 MHz LPF (removes transient composite gamut and gamut errors due to overshoot and other anomalies)
<b>Gamut Error:</b>	Detects time-specified gamut errors
<b>Upper Limit:</b>	90.8 to 109.4 %
<b>Lower Limit:</b>	-7.2 to 6.1 %
<b>Area Specification:</b>	0.1 to 5.0 %
<b>Time Specification:</b>	1 to 60 frames
<b>Composite Gamut Error:</b>	Detects level errors that occur when component signals are converted to composite signals
<b>Upper Limit:</b>	90.0 to 135.0 %
<b>Lower Limit:</b>	-40.0 to 20.0 %
<b>Area Specification:</b>	0.1 to 5.0 %
<b>Time Specification:</b>	1 to 60 frames
<b>Embedded Audio Error Detection</b>	
(Only data stream 1 is supported for 3G-SDI level B.)	

<b>BCH Error:</b>	Detects transmission errors in the audio packets that are embedded in 3G-SDI signals
<b>DBN Error:</b>	Detects audio packet continuity errors
<b>Parity Error:</b>	Detects parity errors in the audio packets that are embedded in 3G-SDI signals
<b>Embedded Position Error:</b>	Detects the presence of audio in lines where it should not be embedded
<b>Event Log</b>	
<b>Recorded Events:</b>	Errors, changes in the input channel, and time stamps
<b>5 Bar Display</b>	
<b>Bar Display:</b>	Displays the Y GBR component and composite gamut (When you are using line select, only the component gamut of the selected line is detected.)
<b>Error Level Setting</b>	
<b>Component Gamut:</b>	The same as the gamut error
<b>Composite Gamut:</b>	The same as the composite gamut error
<b>Frequency Response:</b>	The same as the gamut error
<b>Analysis Features</b>	
<b>Data Dump Display</b>	
<b>Display Format:</b>	Displays data separated by serial data sequence or by channel (The 3G-SDI level B data dump can display data stream 1, data stream 2, and data stream 1 and 2 simultaneously.)
<b>Line Select:</b>	Displays the selected line
<b>Sample Select:</b>	Displays from the selected sample
<b>Jump Feature:</b>	Moves to EAV or SAV with the press of a single button
<b>Data Output:</b>	Data can be saved as text files to USB memory or to a PC over an Ethernet
<b>Audio Control Packet Display (Only data stream 1 is supported for 3G-SDI level B.)</b>	
<b>Display Details:</b>	Displays audio control packet analysis
<b>Display Format:</b>	Text, hexadecimal, and binary
<b>Group Selection:</b>	Select one group from four available groups
<b>Format ID Display</b>	
<b>Corresponding Standard:</b>	SMPTE 352M
<b>Display Details:</b>	Displays payload ID packet analysis
<b>ANC Packet Display (Only data stream 1 is supported for 3G-SDI level B.)</b>	
<b>ANC Specification Method:</b>	DID/SDID
<b>Display Format:</b>	Hexadecimal and binary
<b>Time Code Display (Only data stream 1 is supported for 3G-SDI level B.)</b>	
<b>Supported Time Codes:</b>	LTC and VITC (SMPTE 12M-2)
<b>Display Mode:</b>	The instrument's internal clock or the time code
<b>Embedded Audio Processing</b>	
<b>Clock Generation:</b>	Generated from the video clock
<b>Synchronization:</b>	All audio channels must be synchronized to the video clock.
<b>Phases:</b>	All phases must be in-sync.
<b>Channel Separation:</b>	You may select a maximum of 4 groups of 16 channels each. (Only data stream 1 is supported for 3G-SDI level B.)
* You need an LV 58SER40A unit to display and generate audio.	
<b>Frame Capture Feature</b>	
<b>Function:</b>	Captures frame data
<b>Capture Timing:</b>	Manual and automatic (error capture)
<b>Display:</b>	Displays the captured frame data or superimposes the captured frame data over the input signal
<b>Media:</b>	Internal memory (RAM) and USB memory You can only record one frame of data to the internal memory.
<b>Data Output:</b>	Screen captures can be saved as .dpx files, .tif files, or in a file format that the instrument can load. They can be saved to USB memory or sent to a PC through an Ethernet connection.
<b>Data Input:</b>	Data saved to USB memory can be loaded and displayed on the instrument.*1
<b>Error Capturing:</b>	Automatically captures frame data when an error occurs
*1 Captured data cannot be displayed unless the instrument is receiving a 3G-SDI signal that matches the format of the captured signal.	
<b>Environmental Conditions</b>	
	Conforms to those for the LV 5800 or LV 7800
<b>Power Consumption</b>	
	Supplied by the LV 5800 or LV 7800; 18 W max. (This is the power consumption for a single LV 58SER06 unit installed in an LV 5800 or LV 7800.)
<b>Weight</b>	
	0.24 kg
<b>Accessory</b>	
	Instruction manual ..... 1

# VIDEO MULTI RASTERIZER

## Simultaneous Multiple Input Viewing and Monitoring



Monitor not included



## LV 7800 MULTI RASTERIZER

### GENERAL

The LV 7800 is a new-concept multi rasterizer that enables you to freely combine all the LV 5800 series input and output units to provide flexible support for a variety of situations.

### FEATURES

- Slots for Four Units**  
The LV 7800 is equipped with two input slots and two input/output slots, which means you can install a maximum of four units. Each input and output unit operates independently.
- External Sync Signal Input**  
The LV 7800 can receive tri-level sync signals and NTSC or PAL black burst signals. You can display video signal waveforms in phase with an external sync signal.
- DVI-I Connector**  
You can view the various LV 7800 displays on an external XGA (1024 × 768) display by connecting the display to the DVI-I connector. Additionally, the vector, picture, and audio displays support displays with aspect ratios of 16:9 (in squeeze mode).

### Squeeze mode



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

- Preset Settings**  
The LV 7800 can store up to 60 frequently used setting configurations. You can also directly recall preset settings that have been assigned to the shortcut button.
- Key Lock**  
The key lock feature is useful in preventing mistaken changes to the settings and in preventing accidental operations on the LV 7800.
- USB Port**  
By connecting a USB memory device to the front panel USB port, you can take screen captures, record data, and save preset settings.
- Ethernet Port**  
By running TELNET or FTP on a PC that is connected to the LV 7800 through the rear panel Ethernet port, you can control the LV 7800 remotely, monitor errors, and transfer files. (SNMP is also supported.)
- Parallel Remote Connector**  
You can load preset settings, detect errors, switch inputs, and apply analog audio signals\* through the rear panel remote connector.  
\*To measure analog audio signals, an LV 58SER40A (DIGITAL AUDIO) unit is necessary.

### Display Examples

<p>Multi-Screen</p> <p>EX, LV 58SER01A, LV 58SER02 1 sets each are installed</p>	<p>4 Input Picture</p> <p>EX, LV 58SER01A 2 set are installed</p>	<p>Waveform/4YPalade</p> <p>EX, LV 58SER01A 2 sets are installed</p>	<p>Waveform/Vector</p> <p>EX, LV 58SER01A 1 set is installed</p>	<p>Status</p> <p>EX, LV 58SER01A 1 set is installed</p>
<p>5 Bar/Gamut</p> <p>EX, LV 58SER01A 1 set is installed</p>	<p>EyePattern/Jitter</p> <p>EX, LV 58SER01A 2, LV58SER02 1 sets are installed</p>	<p>MPEG</p> <p>EX, LV 58SER04 1 set is installed</p>	<p>Audio</p> <p>EX, LV 58SER40A 1 set is installed</p>	<p>Composite</p> <p>EX, LV 58SER03 1 set is installed</p>

# SPECIFICATIONS

# LV 7800

## Input/Output Slots

**SLOT1, SLOT2:** Slots for input units  
**SLOT3, SLOT4:** Slots for input, output, or input/output units  
**Combinations of Supported Units**

Unit	LV 7800 Slots			
	Does the Slot Support the Units			
	SLOT1 (Input)	SLOT2 (Input)	SLOT3 (Input/Output)	SLOT4 (Input/Output)
LV 58SER01A (SDI INPUT)	Yes	Yes	Yes	Yes
LV 58SER02 (EYE PATTERN)	Yes*	Yes*	Yes*	Yes*
LV 58SER03 (COMPOSITE INPUT)	Yes	Yes	Yes	Yes
LV 58SER04 (MPEG DECODER)	Yes	Yes	Yes	Yes
LV 58SER06 (3G-SDI INPUT)	Yes	Yes	Yes	Yes
LV 58SER20 (DVI-I OUTPUT)	No	No	Yes	Yes
LV 58SER21 (ANALOG COMPONENT OUTPUT)	No	No	Yes	Yes
LV 58SER40A (DIGITAL AUDIO)	Yes*	Yes*	Yes*	Yes*

\* Only one of this type of unit can be installed in an LV 7800.

## DVI-I Output

**Output Connector:** 1  
**Signal Format:** Single link T.M.D.S Analog RGB  
**Display Format:** XGA(The effective resolution is 1024 × 768.) Wide displays are also supported (squeeze mode). \* Only if the LCD panel has a resolution conversion feature.  
**DDC:** Not supported  
**HOT PLUG:** Not supported

## Screen Capture

**Screen Capture:** Capture the screen to an image file (only one screen capture is stored in internal memory)  
**Media:** Internal memory (RAM) and USB memory  
**Data Output:** Save screen captures in bitmap format to USB memory or send them to a PC over an Ethernet connection.

## Preset Settings

**Number of Presets:** 60  
**Media:** Internal memory (RAM) and USB memory  
**Recall Method:** Front panel, remote connector, or Ethernet command  
**Copying Saved Settings:** Copy preset settings to USB memory.  
**Loading Saved Settings:** Copy all preset settings from USB memory to the LV 7800.

## External Sync Signal Input

**Input Connector:** 1 pair of BNC connectors  
**Input Signal:** Tri-level sync or NTSC/PAL black burst

**Input Impedance:** Passive loopthrough, 15 kΩ  
**Input Return Loss:** 30 dB or higher  
**Maximum Input Voltage:** ±5 V (DC + peak AC)  
 \* 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.

## External Control Connectors

### USB Port

**Compliant Standard:** 2.0  
**Device:** Only large-memory devices are supported.  
**Function:** Take screen captures, record data, and save preset settings

### Ethernet Port

**Compliant Standard:** IEEE802.3 10BASE-T/100BASE-T  
**Connector:** RJ-45  
**Function:** Control the LV 7800 and monitor errors from a PC and save screen captures and data to a PC

### Remote Connector

**Connector:** 25-pin D-sub (female)  
**Signal:** LV-TTL level (Low active)  
**Function:** Load preset settings, detect errors, switch inputs, and receive analog audio signals\*

## Headphone Output\*

**Output Signal:** SDI-embedded audio signal, or an audio signal that was received from an external source  
**Output Connector:** One 6.3-mm stereo jack  
**Volume Adjustment:** Volume knob  
 \* Headphone output is enabled when an LV 58SER40A (DIGITAL AUDIO) unit is installed.

## Environmental Conditions

**Operating Temperature:** 0 to 40 °C  
**Operating Humidity:** 85 %RH or less (no condensation)  
**Operating Environment:** Indoors  
**Operating Altitude:** Up to 2,000 m  
**Overvoltage Category:** II  
**Pollution Degree:** 2

## Power Supply Requirements

90 to 250 VAC, 50-60 Hz, 150 W max.

## Dimensions and Weight

482 (W) × 88 (H) × 450 (D) mm (not including protrusions), 8.5 kg

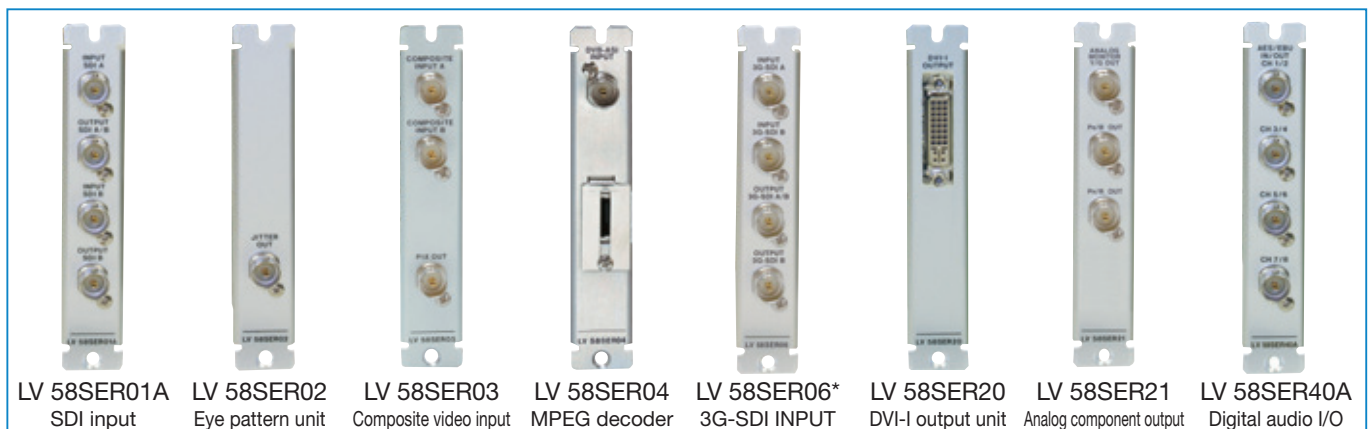
## Accessories

Instruction manual ..... 1  
 Power cord ..... 1  
 Cover/Inlet stopper ..... 1  
 25-pin D-sub connector..... 1  
 25-pin D-sub connector cover..... 1

## Rear Panel (LV 58SER01A × 3 and LV 58SER40A × 1)



## Optional Units (Factory Option) Each unit is the same as the 5800 series units.



\* To be supported in the future

## Low-Cost Multi SDI Rasterizer

CE  
Upon request

### ■ Squeeze Feature



Supports aspect ratios of 4:3, 16:9, and 15:9.

External Display



HD-SDI

SD-SDI

CINELITE II

RoHS



## LV 7330 MULTI SDI RASTERIZER

### GENERAL

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 I/O

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 relocked SDI signal.

#### ■ DVI Output

The various LV 7330 displays are transferred through a DVI-I connector to an XGA (1024 × 768) display. The LV 7330 also uses a squeeze method to support aspect ratios of **16:9 (1366 × 768)** and **15:9 (1280 × 768)**.

#### ■ 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 CE/AEIA-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 level meter supports loudness metering and is useful for managing the volume level experienced by the listener.

\* 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 remember 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 (SNMP will be supported in the future)

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.



# SPECIFICATIONS

# LV 7330

## Video Signal Formats and Corresponding Standards

### Single Link System Video

Color System	Quantization	Format		Corresponding Standards
		Scanning	Frame(Field) Rate	
Y, C <sub>b</sub> , C <sub>r</sub> 4:2:2	10 bits	1080i	60/59.94/50	SMPTE 274M SMPTE 292M
		1080p	30/29.97/25/24/23.98	
		1080PsF	30/29.97/25/24/23.98	SMPTE RP211 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) Frequency	
GBR 4:4:4	10 bits	1080p	30/29.97/25/24/23.98	SMPTE 372M (1920x1080)
		1080PsF	30/29.97/25/24/23.98	
		1080i	60/59.94/50	
	12 bits	1080p	30/29.97/25/24/23.98	
		1080PsF	30/29.97/25/24/23.98	
Y, C <sub>b</sub> , C <sub>r</sub> 4:2:2	10 bits	1080p	60/59.94/50	
		1080p	30/29.97/25/24/23.98	
		1080PsF	30/29.97/25/24/23.98	
12 bits	1080p	60/59.94/50		
	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

**Synchronization:** All audio channels must be synchronized to the video clock.

**Channel Separation:** 2 groups of 8 channels are selectable.

## Input/Output Connectors

### SDI Input

**Input Connector:** 2 BNC connectors (A/B switching)

**Input Impedance:** 75 Ω

**Input Return Loss:** ≥15 dB for 5 MHz to the serial clock frequency

**Maximum Input Voltage:** ±2V (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

**Supported Formats:** IEC 60958

**Sampling Frequency:** 48 kHz

### SDI Output

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

**Output Impedance:** 75 Ω

**Output Voltage:** 800 mVp-p ± 10 %

### DVI-I Output

**Output Connector:** 1 DVI-I connector

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

**Output 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

**Volume Adjustment:** Configured in the menu

**Impedance:** 32 Ω (16 to 600 Ω)

## Control Connectors

### USB Connector

**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 Signal:** TTL level (active-low logic)

**Control Connector:** 15-pin D-sub (female)

### Ethernet (SNMP will be supported in the future)

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

**Compliant Standard:** IEEE802.3

**Input/Output Connectors:** 1 RJ-45 connector

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

## Display Form

**1 Screen Display:** Picture display, CINELITE display, CIN-EZONE 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

**Format Display:** Displays the video signal format at the top of the screen.

**Color System Display:** Displays the video signal color system at the top of the screen.

**Date Display:** Displays the date according to the internal clock at the top of the screen

**Time or Time Code Display:** Displays the time according to the internal clock or a time code at the top of the screen

**Time code:** LTC, VITC, or D-VITC

## 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

**Recall Method:** Front panel or remote connector or Ethernet command.

**Copying:** Preset configurations can be copied as a group to or from USB memory.

## Video Signal Waveform Display

### Waveform Operations

#### Display Modes

**Overlay:** Overlays component signals.

**Parade:** Displays component signals side by side.

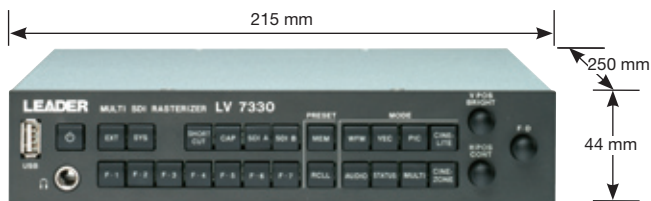
<b>Timing:</b>	Computes and displays Y-C <sub>B</sub> and Y-C <sub>R</sub> . Uses a bowtie signal.
<b>Blanking Period:</b>	Show or hide
<b>RGB Conversion:</b>	Converts a Y,C <sub>B</sub> ,C <sub>R</sub> signal into an RGB signal and displays the result.
<b>Pseudo-Composite Display:</b>	Artificially converts component signals into composite signals and displays the result.
<b>Channel Assignment:</b>	In RGB conversion display, the order can be set to GBR order or RGB order.
<b>Line Select:</b>	Displays the selected line.
<b>Sweep Modes:</b>	H and V
<b>Vertical Axis</b>	
<b>Gain:</b>	×1 or ×5
<b>Variable Gain:</b>	×0.2 to ×2.0
<b>Amplitude Accuracy:</b>	±0.5 %
<b>HD Frequency Characteristics</b>	
<b>Y Signal:</b>	±0.5 % for 1 to 30 MHz
<b>C<sub>B</sub>,C<sub>R</sub> Signals:</b>	±0.5 % for 0.5 to 15 MHz
<b>Low-Pass Attenuation:</b>	≥ 20 dB (at 20 MHz)
<b>SD Frequency Characteristics</b>	
<b>Y Signal:</b>	±0.5 % for 1 to 5.75 MHz
<b>C<sub>B</sub>,C<sub>R</sub> Signals:</b>	±0.5 % for 0.5 to 2.75 MHz
<b>Low-Pass Attenuation:</b>	≥ 20 dB (at 3.8 MHz)
<b>Horizontal Axis</b>	
<b>Line Display:</b>	×1, ×10, ×20, ACTIVE, or BLANK
<b>Field Display:</b>	×1, ×20, or ×40
<b>Cursor Measurement Composition</b>	
<b>Horizontal Cursors:</b>	2 (REF and DELTA)
<b>Vertical Cursors:</b>	2 (REF and DELTA)
<b>Amplitude Measurement:</b>	%, or V
<b>Time Measurement:</b>	usec/msec
<b>Frequency Display:</b>	Computes and displays the frequency with the length of one period set to the time between two cursors.
<b>Scale</b>	
<b>Type:</b>	%, or V
<b>75 % Marker:</b>	Displays where the location of the peak of a 75 % color bar chrominance signal would be.
<b>Display Colors:</b>	7 colors to choose from
<b>Vector Display</b>	
<b>Gain:</b>	×1, ×5, or IQ-MAG
<b>Variable Gain:</b>	×0.2 to ×2.0
<b>Amplitude Accuracy:</b>	±0.5 %
<b>Blanking Period:</b>	Masked
<b>Scale</b>	
<b>Type:</b>	75 % or 100 % (color bar)
<b>IQ Axis:</b>	Show or hide
<b>Display Colors:</b>	7 colors to choose from
<b>Line Select:</b>	Displays the selected line
<b>Pseudo-Composite:</b>	Artificially converts component signals into composite signals and displays the result.
<b>5 Bar Display</b>	
<b>Function:</b>	Displays five peak levels: those of the Y, R, G, B and composite signals.
<b>Error Level:</b>	Based on gamut error level and composite gamut error level settings.
<b>Filter:</b>	Removes transient errors (The filter characteristics are the same as for gamut errors.)
<b>Line Select:</b>	Displays the selected line
<b>Phase Difference Display</b>	
<b>Display:</b>	Displays the phase difference between an SDI signal and the external sync signal both numerically and graphically.
<b>Display Range</b>	
<b>Vertical:</b>	±1 field (for interlace) ±1/2 frame (for progressive)
<b>Horizontal*:</b>	±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.	

<b>Picture Display</b>	
<b>Image Quality Adjustment:</b>	Brightness, contrast, chroma level, and aperture
<b>Display Sizes:</b>	FIT, ×1, or ×2 (HD) FIT ×2 (SD)
<b>Color Selection:</b>	Color or monochrome
<b>Frame Rate:</b>	The frame rate is converted and displayed using the internal sync signal.
<b>Marker Displays</b>	
<b>Center Marker</b>	
<b>Aspect Markers</b>	
<b>HD:</b>	4:3, 14:9, 13:9, 2.35:1, 1.85:1, and 1.66:1
<b>SD:</b>	16:9, 14:9, 13:9, 2.35:1, 1.85:1, and 1.66:1
<b>Safe Action Markers:</b>	95 %, 93 %, and 90 %
<b>Safe Title Markers:</b>	88 % and 80 %
<b>Line Select:</b>	Marks the selected line
<b>CINELITE Display</b>	
<b>Function:</b>	f-Stop display, percentage display, and level display
<b>f-Stop Display:</b>	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 %.
<b>f-Stop Gamma Correction</b>	
<b>Reference Gamma:</b>	0.45 (ITU-R BT709)
<b>User-Defined Correction Tables:</b>	3
<b>External Correction Tables:</b>	5 (read from USB memory)
<b>Percentage Display:</b>	Displays luminance or RGB components as percentages.
<b>Level Display:</b>	Displays luminance or RGB components with 256 levels (8 bits).
<b>Measured points:</b>	3
<b>Measurement sizes:</b>	1 pixel, 3 × 3 pixels, or 9 × 9 pixels
<b>CINEZONE Display</b>	
<b>Function:</b>	Displays the luminance levels in the picture using different colors
<b>Display Colors:</b>	Linear (1024 colors) or step (12 colors)
<b>Upper Limit Setting:</b>	-6.3 to 109.4 % (values above the upper limit are displayed using white)
<b>Lower Limit Setting:</b>	-7.3 to 108.4 % (values below the lower limit are displayed using black)
<b>Level Search Display:</b>	Displays a specified luminance level ±0.5 % using green on an otherwise monochrome picture display.
<b>Luminance Level Setting:</b>	-7.3 to 109.4 %
<b>Embedded Audio Display</b>	
<b>Lissajous Display</b>	
<b>Displayed Channels:</b>	2 channels or 8 channels (only for embedded audio)
<b>Display Mode:</b>	X-Y or MATRIX
<b>Sound Image Display</b>	
<b>Channel Mapping:</b>	L, R, C, LFE, Ls(s), Rs, LL, RR
<b>Surround Formats:</b>	3-1, 3-2, 3-2-2
<b>Level Meter Display</b>	
<b>Displayed Channels:</b>	8ch / 2ch
<b>Meter:</b>	60 dB peak level, 90 dB peak level, average, or loudness
<b>Peak Hold Time:</b>	0.5 to 5.0 seconds/HOLD (when displaying the peak level)
<b>Channels</b>	
<b>Group Selection:</b>	You can select any 2 groups from groups 1, 2, 3, and 4.
<b>Audio Information:</b>	Detects the presence of each audio channel
<b>Sampling Frequency:</b>	48 kHz (must be synchronized to the video signal)
* The LV 7330 cannot display Lissajous curves, 8-channel level meters, or sound images for AES/EBU signals that it receives.	
<b>Status Display</b>	
<b>SDI Signal Error Detection</b>	
<b>Signal Detection:</b>	Detects the presence of an SDI signal
<b>TRS Error:</b>	Detects TRS location and protection bit errors

<b>Line Number Error:</b>	Detects HD-SDI signal line number errors
<b>CRC Error:</b>	Detects HD-SDI signal transmission errors
<b>EDH Error:</b>	Detects SD-SDI signal transmission errors
<b>Gamut Error:</b>	Detects gamut errors
<b>Detection Range Upper Limit:</b>	90.8 to 109.4 % (0.1 % step)
<b>Detection Range Lower Limit:</b>	-7.2 to 6.1 % (0.1 % step)
<b>Filter:</b>	Removes transient errors
	Low-pass (HD: 5 MHz LPF, SD: 1.8 MHz LPF)
<b>Composite Gamut Error:</b>	Detects level errors that occur when component signals are converted to composite signals
<b>Detection Range Upper Limit:</b>	90.0 to 135.0 % (0.1 % step)
<b>Detection Range Lower Limit:</b>	-40.0 to -20.0 % (0.1 % step)
<b>Filter:</b>	Removes transient errors
	Low-Pass (HD: 5 MHz, SD: 1.8 MHz)
<b>Parity Error:</b>	Detects ancillary data header parity errors
<b>Checksum Error:</b>	Detects ancillary data transmission errors
<b>BCH Error:</b>	Detects errors in the transmission of the audio signal embedded in an HD-SDI signal
<b>Audio CRC Error:</b>	Detects CRC errors in channel status bits
<b>Audio Information Detection:</b>	Detects the presence of each audio channel
<b>Error Count:</b>	Up to 100,000 errors (Only the specified errors are counted.)
<b>Count Period:</b>	Only one error is counted for each second or frame.
<b>Event Log Display</b>	
<b>Recording Capacity:</b>	Up to 1,000 events
<b>Description:</b>	Records all events from start to finish
<b>Recorded Events:</b>	Errors, changes in input type, time stamps, etc.
<b>Data Output:</b>	Event logs can be saved to USB memory or sent to a PC through an Ethernet connection as text data.
<b>Data Dump Display</b>	
<b>Display Modes:</b>	Display data separated by serial data sequence or by channel
<b>Line Select:</b>	Displays the selected line
<b>Sample Select:</b>	Displays from the selected sample
<b>Jump Feature:</b>	Jumps to an EAV or SAV
<b>Data Output:</b>	Event logs can be saved to USB memory or sent to a PC through an Ethernet connection as text data.
<b>Audio Status Display</b>	
<b>Control Packets:</b>	Analyzes and displays SDI signal audio control packets

<b>Channel Status:</b>	Analyzes and displays or displays the dump of the channel status of the embedded audio signal
<b>EDH Display</b>	
<b>EDH packets:</b>	Analyzes and displays received EDH packets
<b>Closed Caption Display</b>	
<b>Compliant Standard:</b>	ARIB STD-B37/CEA-608, ELA-708
<b>Display Details:</b>	Analyzes and displays the closed caption signal.
<b>Inter-Stationary Control Data Display (NET-Q)</b>	
<b>Compliant Standard:</b>	ARIB STD-B39
<b>Display Details:</b>	Analyzes and displays inter-stationary control data
<b>Data Broadcast Trigger Signal Display</b>	
<b>Compliant Standard:</b>	ARIB STD-B35
<b>V-ANC User Data Display</b>	
<b>Standard Supported:</b>	ARIB TR-B23
<b>Time Code Display</b>	
<b>Corresponding Time Code:</b>	Selects LTC or VITC SMPTE RP-188
<b>Display Method:</b>	Switches the display of internal clock, and the time code.
<b>Front Panel</b>	
<b>Key LEDs:</b>	You can dimly light all of the keys by pressing the shortcut key.
<b>Power Switch:</b>	Turns the power on and off. If power is removed when the switch is on, the instrument will turn on when power is restored.
<b>Last Memory:</b>	Backs up the panel settings.
<b>Environmental Conditions</b>	
<b>Operating Temperature:</b>	0 to 40°C
<b>Operating Humidity:</b>	85 %RH or less (no condensation)
<b>Power Supply</b>	
<b>Voltage:</b>	10 to 18 VDC
<b>Power Consumption:</b>	18 W max.
<b>Dimensions</b>	
	215(W) × 44(H) × 250(D) mm (excluding protruding parts)
<b>Weight</b>	
	1.3 kg
<b>Accessories</b>	
	Instruction manual..... 1
	AC adapter (LP 1960)..... 1
	15-pin D-sub connector..... 1
	15-pin D-sub connector cover ..... 1
	Ferrite core..... 1

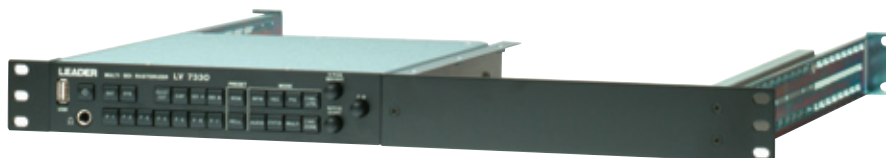
### ■ LV 7330 Front Panel



### ■ LV 7330 Rear Panel



### ■ Rack Mounting



LR 2481 Rack Mount Adapter (sold separately)

# MULTI FORMAT WAVEFORM MONITOR

## LV 5152



The cabinet is sold separately.

## Displays Analog Component Signals of Multi-Format DTV Monitoring with Conversion Matrix (Y, P<sub>B</sub>, P<sub>R</sub>, to GBR)

The LV 5152 Multi-format Waveform Monitor is designed to display analog component signals of multi-format DTV. This instrument features two analog component signal input systems. In addition to the waveform monitor function, vector, timing, and audio signal display functions are provided. Moreover, the full line selector function and control setting menu are provided.

### FEATURES

- **Comply DTV for U.S.A. and Europe**  
Accepts eight analog video formats for DTV-USA and three analog video formats for DTV-Europe.
- **Two analog signal input systems (Y, P<sub>B</sub>, P<sub>R</sub> or GBR) are provided.**
- **Picture monitor output is provided.**
- **Vectorscope function (SMPTE 274M, 296M)**  
Displays color difference signal of component signals in vector format.  
The analog GBR signal is converted into color difference signal with a matrix and displayed in vector format.
- **Conversion matrix, Y, P<sub>B</sub>, P<sub>R</sub> into GBR (SMPTE 274M, 296M)**  
Simplifies signal level monitoring.
- **Measurements using cursor**  
Ensures level measurement with 0.5% accuracy.
- **Preset memory function**  
Stores/recalls up to 10 panel settings to reduce setup time by presetting frequently used measurement conditions.

### • Basic Operation Mode

#### WFM(Waveform monitor mode)

Displays up to three channel waveforms.

#### VEC(Vectorscope mode)

Vector display of P<sub>B</sub> and P<sub>R</sub> channel input signals.

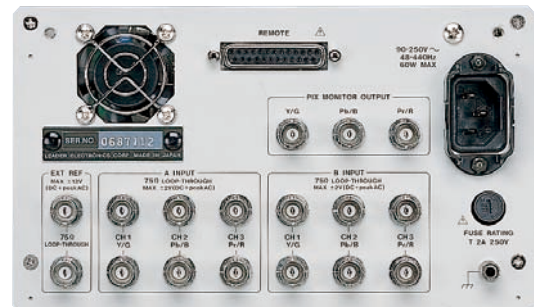
#### PIC(Picture monitor mode)

Monochrome display of Y/G channel input signals.

#### AUDIO(Audio mode)

Lissajous display of analog stereo audio signal.

### ■ LV 5152 REAR PANEL



<b>Measurement Signal and Standards</b>	No	Format	FullLine/Flame Frequency	Complied Spec.
	1	1080/60i	1125/29.97(30)	SMTPE 274M
	2	1080/50i	1125/25	SMTPE 274M
	3	1080/24P	1125/23.98(24)	SMTPE 274M
	4	1080/24sF	1125/23.98(24)	SMTPE 274M
	5	720/60P	750/59.94(60)	SMPTE 296M
	6	720/50P	750/25	SMPTE 296M
	7	480/60P	525/59.94(60)	SMPTE 293M
	8	480/60i	525/59.97(30)	SMPTE 253M
	9	1080/50i	1250/25	SMTPE 295M
	10	576/50P	625/50	ITU-R BT.1358
	11	576/50i	625/25	ITU-R BT.601-4
<b>Input System</b>				
<b>Signal Input</b>	CH1(Y/G),CH2(P <sub>B</sub> /B),CH3(P <sub>R</sub> /R),2-system			
<b>Input Channel</b>	BNC			
<b>Return Loss</b>	≥ 30 dB, 50 kHz to 30 MHz (both power on/off)			
<b>Impedance</b>	75 Ω passive loop-through			
<b>Maximum Input Voltage</b>	±2 V (DC + peak AC)			
<b>EXT REF Input</b>				
<b>Input Channel</b>	EXT REF, 1-system			
<b>Input Connector</b>	BNC			
<b>Return Loss</b>	≥ 30 dB, 50 kHz to 30 MHz (both power on/off)			
<b>Impedance</b>	75 Ω passive loop-through			
<b>Maximum Input Voltage</b>	±12 V (DC + peak AC)			
<b>Sync Amplitude</b>	0.3 V <sub>p-p</sub> ±6 dB			
<b>Picture Monitor Output</b>				
<b>Frequency Response</b>	25 Hz to 30 MHz, within ± 5 %			
<b>Output Impedance</b>	75 Ω			
<b>Output Connector</b>	BNC, 1 system			
<b>Amplitude</b>	1 V ± 5 %			
<b>Vertical Axis</b>				
<b>Deflection System</b>				
<b>Deflection Sensitivity</b>	Within ± 1 %, GAIN x 1 Within ± 3 %, GAIN x 5			
<b>Variable Range</b>	At least 0.5 to 1.2 times (both GAIN x 1 / x 5)			
<b>GBR Matrix</b>				
<b>Deflection Sensitivity</b>	Within ± 1 %, GAIN x 1 Within ± 3 %, GAIN x 5			
<b>Frequency Response</b>	x 1 GAIN			
<b>FLAT</b>	Within ± 1 %, 25 Hz to 30 MHz (50 kHz ref., GBR Matrix OFF mode)			
<b>LOWPASS</b>				
<b>Attenuation</b>	≥ 20 dB, at 20 MHz (50 kHz ref.)			
<b>DIF'D STEP</b>				
<b>Attenuation</b>	≥ 20 dB, at 30 kHz (1.6 MHz ref.) ≥ 20 dB, at 7 MHz (1.6 MHz ref.)			
<b>Step Response</b>	For 2T pulse, 2T bar Within ± 1 %, pulse/bar ratio Within ± 1 %, overshoot Within ± 1 %, preshoot Within ± 1 %, ringing Within ± 1 %, sag (vertical tilt)			
<b>DC Restorer</b>				
<b>Frequency Response</b>	≤20 %, attenuation at 60 Hz input			
<b>Slow Mode</b>	≥80 %, attenuation at 60 Hz input			
<b>Fast Mode</b>				
<b>Clamp</b>				
<b>Point</b>	Back porch			
<b>Variable Range</b>	0.5 to 2 μs, relative to sync pulse raising edge			
<b>Blanking Level Shift</b>	≤1 % (10 to 90 % of APL Variation)			
<b>Horizontal Axis</b>				
<b>Operation Mode</b>	Overlay: Displays waveforms overlaid Parade: Displays waveforms side by side Timing: For bowtie signal* measurement * Authorized by Tektronix, Inc.			
<b>Display Method</b>				
<b>Line:</b>	1H, 2H, 3H			
<b>Line Magnified</b>	1H MAG, 2H MAG, 3H MAG			
<b>Field:</b>	1V, 2V, 3V			
<b>Field Magnified</b>	1V MAG, 2V MAG, 3V MAG			
<b>Time Base Accuracy</b>	Within ±3 % (0.1 μs/ div)			
<b>Linearity</b>	Within ±3 %			
<b>Vectorscope Mode</b>				
<b>Frequency Range</b>	≥ 1 MHz			
<b>Amplitude Accuracy</b>	± 2 % (Y, P <sub>B</sub> , P <sub>R</sub> Input) ± 2 % (G, B, R Input)			

<b>Variable Range</b>	At least 0.5 to 1.2 times (both GAIN x1 / x5) (for vertical and horizontal axes)
<b>Graticule</b>	Electronic graticule
<b>Sync Blanking</b>	Blanks sync dot
<b>Picture Monitor Mode</b>	Displays picture using the Y or G signal. The picture is horizontally reduced in size because the CRT aspect ratio is not 16:9.
<b>Audio Mode</b>	
<b>Calibration Accuracy</b>	±0.5 dB of full scale
<b>Full Scale</b>	0, 2, 4 dBm (menu selectable)
<b>Bandwidth</b>	Within -3 dB at 20 kHz
<b>X-Y Phase Accuracy</b>	Within 1 ° at 20 kHz
<b>Calibration Signal</b>	1 V ±0.5 %
<b>Line Selector</b>	WFM, VEC, PIC
<b>Operation Mode</b>	FLD1, FLD2, ALL (at Interlace)
<b>Operation Field</b>	Only ALL at 1080/50i (1250Line).
<b>Display</b>	The selected line is intensified
<b>Line Window</b>	
<b>Function</b>	Displays brighter by overlaying multiple lines resulting in higher effective refresh rate. 1 to 15 lines
<b>Window Range</b>	WFM, VEC, PIC
<b>Operation Mode</b>	FLD1, FLD2, ALL (at Interlace)
<b>Operation Field</b>	
<b>Preset Function</b>	
<b>Preset/ Recall Controls</b>	Up to 10 front panel controls All front panel controls (except INTEN, READOUT INTEN, ROTATION, FOCUS, ILLUM, POWER)
<b>Remote Control</b>	
<b>Control Signal</b>	TTL (low active)
<b>Control Input</b>	D-sub, 25-pin (REMOTE), rear panel
<b>Cursor Measurement</b>	
<b>Configuration</b>	Two horizontal cursors (REF, Δ) Two vertical cursors (REF, Δ)
<b>Amplitude Measurement</b>	Voltage (V or %) between the REF and Δ cursors
<b>Measurement Range</b>	0 to 2000 mV, 0 to 280.0 %
<b>Accuracy</b>	±0.5 %
<b>Resolution</b>	1 mV or 0.1 %
<b>Amplitude Ratio Measurement</b>	Amplitude between the REF and Δ cursors relative to 100 % REF is displayed in R%.
<b>Time Measurement</b>	Measures time between the REF and Δ cursors
<b>Measurement Range</b>	At least ±6 div from graticule center
<b>Accuracy</b>	±3 %
<b>Resolution</b>	1/ 80 div
<b>Time Ratio Measurement</b>	When [ R% ] is selected with the menu, time between the REF and Δ cursors relative to 100 % REF is displayed in R%.
<b>Frequency Measurement</b>	Frequency of one cycle between the REF and Δ cursors
<b>CRT</b>	
<b>Effective Display Area</b>	80 x 100 mm
<b>Graticule</b>	Internal (waveform) External (vector) Electronically-generated (vector, audio)
<b>Environmental Conditions</b>	
<b>Operating Temperature</b>	0 to 40 °C
<b>Operating Humidity</b>	≤ 90 % RH (without condensation)
<b>Operating Environment</b>	Indoor use
<b>Operating Altitude</b>	up to 2000 m
<b>Overvoltage Category</b>	II
<b>Pollution Degree</b>	2
<b>Power Requirements</b>	90 to 250 VAC, 48 to 440 Hz, 60 W max.
<b>Dimensions and Weight</b>	215 (W) x 132 (H) x 429 (D) mm, 5.5 kg 8 1/2(W) x 5 1/4(H) x 16 3/4(D) in., 12.1 lbs
<b>Accessories</b>	Illumination lamp.....5 25-pin D-sub connector.....1 25-pin D-sub connector cover.....1 Screw, rack mounting (inch size) .....2 Cover, inlet stopper .....1 Power cord .....1 Instruction manual .....1
<b>Optional Accessories</b>	LR 2427B (Cabinet, with handle) LR 2404A (Cabinet, without handle) LR 2700A-I (Rack-Mount Adapter, inch size)



PAT. PEND.  
The cabinet is sold separately.

## Precise Video Signal Level Measurements with Cursor Provides Full Component Monitoring Capability

The Model 5222 is a precision Waveform Monitor designed to monitor video signals. The 5222 with its bright CRT adds such extra features to conventional waveform monitors as a line selector, picture monitor mode, X-Y display mode for stereo audio signals, and menu screen for setting functions.

These instruments have eight video inputs and one external reference input channel. Up to four waveforms, component or composite signals, and the external reference can be displayed side-by-side to reduce system size. These instruments can also be remotely controlled when combined with the 5212 Vectorscope.

### FEATURES

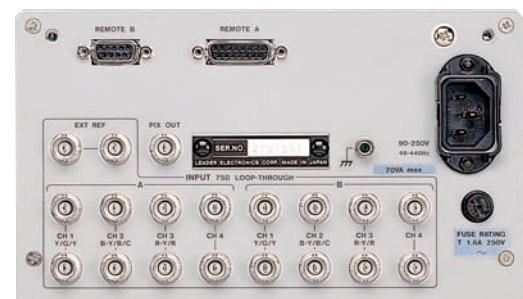
- **Precise measurements with cursor**  
The cursor permits signal level measurements with 0.5% accuracy.
- **Full line selector**  
Since one or two lines of a video signal can be displayed, you can conveniently observe VITS, VIR, or teletext signals. The function also helps to test video camera characteristics.
- **Picture display function**  
These instruments can display video signals as a TV picture even without a picture monitor.  
In the line selector mode, the selected line is highlighted for identification on the picture.

- **Eight video inputs and one external reference input channel**  
These instruments have eight video inputs and one external reference input channel. Up to four waveforms, including the external reference, can be displayed simultaneously. The parade (side-by-side) or ALT (overlaid) display is selectable.  
The component signal can be displayed in the bowtie configuration. (Bowtie signal: U.S. PATENT 4,829,366 is used with permission of Tektronix, Inc.)
- **Menu function**  
For user-friendly front panel control, a menu controller is provided for various functions.
- **Dual filter**  
Both FLAT and LUM (low-pass filter) filtered characteristics can be displayed simultaneously.
- **Preset function**  
The front panel settings, including vertical and horizontal positioning, can be stored in memory, and recalled from the front panel or via the remote control connector on the rear panel. You can reduce setup time by presetting frequently used measuring conditions.
- **Clamp position setting**  
The clamp point can be set at any position, with the position being highlighted on the waveform.
- **RGB/YRGB display function**
- **Y/C input connectors**
- **Bright CRT, accelerating potential of 16.5 kV**
- **Universal AC power supply, 90 to 250 V**

<b>CRT</b> Type Accelerating Potential Effective Display Area Graticule	150 mm rectangular (P4) 16.5 kV 100 (H) × 80 (V) mm Illuminated internal graticule	
<b>Input</b> Input Channel	<b>(625)</b> CHA: 1, 2, 3, 4 CHB: 1, 2, 3, 4	<b>(525)</b> CH1, 2, 3
Input Impedance Maximum Input Voltage Return Loss Isolation between Channels Gain Difference Between Channels Loop Through Isolation	≥15 kΩ, 75 Ω loop-through ±2 V (DC+peak AC) ≥40 dB, 50 kHz to 6 MHz ≥60 dB, (Fsc) ≤0.5% CH1 to CH4 ≥70 dB (Fsc)	
<b>Measurement Signal</b>	NTSC/PAL/SECAM video signal (625/50)	
<b>Vertical Axis</b> Deflection Factor	±1%: 1 Vp-p full scale (140 IRE ref) ±3%: ×5 ±0.5%: Cursor measurement	
<b>Variable Range</b>	0.5 Vp-p to 1.45 Vp-p: ×1 full scale 0.1 Vp-p to 0.29 Vp-p: ×5	
<b>Filter</b> FLAT	Within ±2% (25 Hz to 6 MHz) Within +2 to -5% (6 MHz to 8 MHz) (50 kHz ref.)	
<b>LUM</b> Attenuation	≥35 dB (Fsc)	
<b>CHROMA</b> Band-Pass Filter	<b>(625)</b>	<b>(525)</b>
Bandwidth Bandwidth error Amplitude error	Fac ±2.4 MHz 2.4 MHz ±200 kHz ≤1% (Fsc)	Fac ±2.2 MHz 2.2 MHz ±200 kHz ≤1% (Fsc)
<b>DIF'D STEP</b> Gain Attenuation Attenuation Step Response Overshoot Preshoot Ringing Pulse/Bar Ratio Vertical Tilt DG	400 kHz band-pass filter ×5 ±10% (FLAT ref.) ≥20 dB (14 kHz, 2 MHz) 400 kHz ref. ≥40 dB (Fsc) 400 kHz ref. For 1 V full scale, FLAT, 2T pulse, 2T bar ±2% or less ±1% or less ±2% or less Within ±1% (0.99: 1 to 1.01: 1) Within 1% ≤1%	
<b>DC Restoration</b> Frequency Response Slow Mode	≤20% (absolute attenuation value for 60 Hz input)	
<b>Fast Mode</b>	≥80% (absolute attenuation value for 60 Hz input)	
<b>Clamp Point</b> Variable Range	Back porch 5 to 7 μs or more (with respect to sync pulse leading edge)	
<b>Blanking Level Shift</b>	≤1% (With 10 to 90% APL or color burst on/off)	
<b>Video Output</b> Frequency Response Input /Output Gain Ratio Return Loss DG, DP	Within ±3% (25 Hz to 6 MHz) 1.1 ±3% (75 Ω term.) ≥30 dB (50 kHz to 6 MHz) ≤1%, ≤1°	
<b>Horizontal Axis</b> Time Accuracy	Within ±3% (1 μs/div) Within ±3% (0.2 μs/div)	
<b>Sweep Length</b> Linearity Position Control Range	12.5 div ±0.7 div Within ±3% Anywhere in the screen	
<b>RGB/YRGB</b> Selectable Staircase Input Maximum Input Voltage	Factory setting: RGB 10 V ±15%, 9 divisions display ±12 V (DC+peak AC)	
<b>CAL</b> Amplitude	1 V ±0.5%	
<b>EXT REF</b> Input Impedance Return Loss Maximum Input Voltage	≥15 kΩ, 75 Ω loop-through ≥40 dB (50 kHz to 6 MHz) ±12 V (DC+peak AC)	

<b>Synchronization</b> Sync Amplitude	5222: CH1A, 4A, 1B, 4B <b>(625)</b>   <b>(525)</b>	
<b>INT</b>	0.3 Vp-p ±6 dB   0.286 Vp-p ±6 dB	
<b>EXT</b>	0.3 Vp-p ±6 dB   0.286 Vp-p ±6 dB	
<b>Remote Sync Sensitivity</b>	143 mV to 4 V composite sync amplitude 2.0 to 5.0 V square wave or 4.0 V composite sync (activates at sync leading edge)	
<b>Line Selector</b> Field 1, 3 Field 2, 4 ALL	<b>(625)</b> Line 1 to 313 Line 314 to 625 Line 1 to 312	<b>(525)</b> Line 1 to 263 Line 1 to 262 Line 1 to 262
<b>Preset Function</b> Controllable Functions	Up to 10 panel settings, Recallable All front panel controls (except REMOTE, INTEN, ROTATION, FOCUS, GAIN VAR, POWER)	
<b>Remote Control</b> Combinations Controllable Functions	5222 → 5212 (NTSC/PAL/SECAM) All front panel controls (except INTEN, ROTATION, FOCUS, GAIN VAR, POWER)	
<b>Control Input</b>	Rear panel D-sub, 15-pin (REMOTE A) D-sub, 9-pin (REMOTE B)	
<b>Cursors</b> Configuration	Horizontal cursors (REF, Δ) Vertical cursors (REF, Δ)	
<b>Amplitude Measurement</b> Measurement Range	<b>(625)</b> 0 to 2000.0 mV 0 to 286.0%	<b>(525)</b> 0 to 2000.0 mV 0 to 280.0 IRE
<b>Calibration Accuracy</b> Resolution	0.5%, vertical 0.5 mV, 0.1 IRE, or 0.1%	
<b>Time Measurement</b> Measurement Range Calibration Accuracy Resolution	Time between the REF and Δ cursors ±6 div or more from center ±3% 1/80 div	
<b>Frequency Measurement</b>	Frequency between the REF and Δ cursors those apart 1 cycle	
<b>Environmental Conditions</b> Operating	Temperature: 0 to 40°C Humidity: ≤ 90% RH (without condensation)	
<b>Spec-Guaranteed</b>	Temperature: 10 to 35°C Humidity: ≤ 80% RH (without condensation)	
<b>Power Requirements</b> Power Consumption	90 to 250 VAC, 48 to 440 Hz 50 Wmax.	
<b>Dimensions and Weight</b>	215 (W) × 132 (H) × 429 (D) mm, 4.2 kg 8 1/2 (W) × 5 1/4 (H) × 16 3/4 (D) in., 9.3 lbs	
<b>Supplied Accessories</b>	Illumination lamp .....5 Screw, rack mounting (inch size) .....2 15-pin D-sub connector .....1 Metal case, 15-pin D-sub connector .....1 Power cord .....1 Cover, inlet stopper .....1 Screw lock .....2 E-ring .....1 Instruction manual .....1	
<b>Optional Accessories</b>	LR 2427B (Cabinet, with handle) LR 2404A (Cabinet, without handle) LR 2700A-I (Rack-Mount Adapter, inch size)	

■5222 REAR PANEL





## Measurements of Composite Video Signal Amplitude, Timing, and Frequency Response

The 5861V and 5860V Waveform Monitors are oscilloscopes that are capable of quick monitoring amplitude, time and frequency response, etc. of composite TV signals, which are hard for ordinary oscilloscopes to measure.

The waveform monitor is equipped with various modes and trigger functions that are optimum to video signal monitoring. Such various modes as 2H, 1H, 1  $\mu$ s/div, 2V, 1V, and 2V MAG can be selected by the horizontal axis sweep. As FLAT, LUM (5861V), IRE (5860V), CHROMA, DIF GAIN and DIF'D STEP can be switched, it is possible to observe various characteristics of video signals.

Furthermore, the line selector function is provided for observing VITS and VIR signals which are inserted during the vertical blanking period. In addition, the blanking output connector for blanking other periods than lines selected by the line selector, video output connector and other functions necessary for video signal monitoring are provided.

### ■5860V FRONT PANEL



### FEATURES

- Depending on synchronization system and subcarrier frequency, the 5860V is compatible with the M system, and 5861V is compatible with the B, C, D, G, H, I, and K systems.
- Differentiated-step methods are used to display the differential of staircase signals to make measuring the linearity of transmission system luminance components easier.
- Built-in line selector function for monitoring VITS and VIR signals, a blanking output and a video output.
- Horizontal sweep mode selection from 2H, 1H, 1  $\mu$ s/div, 2V, 1V, and 2V MAG. The frequency response of the vertical axis is switchable among FLAT, LUM (5861V), IRE (5860V), CHROMA, DIF GAIN, and DIF'D STEP.
- K factor scale provided for checking of frequency characteristics.

### ■5861V REAR PANEL



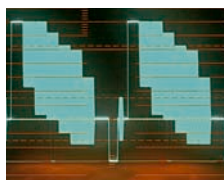


Model	5861V	5860V
<b>CRT</b>		
<b>Type</b>	150 mm rectangular, internal graticule with scale illumination	
<b>Accelerating Potential</b>	12 kV	
<b>Effective Display Area</b>	80 (V) × 100 (H) mm	
<b>Beam Rotator</b>	Adjustable from the front panel	
<b>Input Section</b>		
<b>Input Connector</b>	A and B on the rear panel (loop-through, BNC connector)	
<b>Input Impedance</b>	1 Vp-p full scale range: 15 kΩ, 50 pF 4 Vp-p full scale range: 60 kΩ, 50 pF	
<b>Maximum Input</b>	±5 V (DC+peak AC), AC coupled	
<b>Full Scale Graticule</b>		
<b>Full Scale</b>	1.0 scale	140 IRE
<b>SYNC</b>	0.3 scale	40 IRE
<b>VIDEO</b>	0.7 scale	100 IRE
<b>Deflection Accuracy</b>		
<b>1 V Full-scale Range</b>	Within ±2% of 1.0 scale at 1 V input	Within ±2% of 140 IRE at 1 V input
<b>4 V Full-scale Range</b>	Within ±4% of 1.0 scale at 4 V input	Within ±4% of 140 IRE at 4 V input
<b>Frequency Characteristics</b>		
<b>FLAT</b>	25 Hz to 3.6 MHz ±2%, 3.6 MHz to 5 MHz+2%, -5% at 50 kHz reference	
<b>LUM</b>	More than 35 dB of attenuation at 4.43 Mz	—
<b>IRE</b>	—	Conforms to IRE STD23S-1 (1958); more than 22 dB of attenuation at 4.43 MHz
<b>CHROMA</b>	4.43 MHz bandpass filter	3.58 MHz bandpass filter
<b>DIF GAIN</b>	4.43 MHz bandpass filter	3.58 MHz bandpass filter
<b>DIF'D STEP</b>	3 to 5.5 times of CHROMA amplitude For measuring the linearity of luminance 450 kHz bandpass filter Response at filter "FLAT" 400 kHz: Within ±2% 500 kHz: Within +0, -20% 14 kHz, 2 MHz: Within -90% 3.58 MHz (5861V), 4.43 MHz (5860V): -99%	
<b>Transient Response</b>	±1.5% or less in overshoot, preshoot, and ringing using the sin <sup>2</sup> pulse & bar signal at FLAT with 1 V full scale range.	±2 IRE or less in overshoot, preshoot, and ringing using the sin <sup>2</sup> pulse & bar signal at FLAT with 1 V full scale range.
<b>Sag (Vertical window signal) Variable Range</b>	2% or less Input voltage of 1.0 full scale	Input voltage of 140 IRE full scale
<b>1 V Full-scale Range</b>	0.25 V or less to 1 V	
<b>4 V Full-scale Range</b>	1 V or less to 4 V	
<b>DC Regeneration</b>	Clamped at the back porch	

Model	5861V	5860V
<b>Video Output</b>		
<b>Output Connector</b>	BNC connector on the rear panel	
<b>Output Voltage</b>	1 V ±15% at full scale input	
<b>Output Impedance</b>	75 Ω ±10%	
<b>Frequency Characteristics</b>	25 Hz to 5 MHz ±5%	
<b>Sweep</b>		
<b>1H Sweep</b>	Display of 1H waveform	
<b>2H Sweep</b>	Display of 2H waveform	
<b>1 μs/div</b>	10 times magnification of 2H sweep, 1 μs/div ±3%	
<b>1V Sweep</b>	Display of 1 V waveform	
<b>2V Sweep</b>	Display of 2 V waveform	
<b>2V MAG Sweep</b>	Approx. 20 times magnification of 2V sweep ±3%	
<b>Linearity</b>	RGB is standard. (YRGB is optional.)	
<b>RGB/YRGB Display</b>	10 V ±15%/9 div	
<b>Staircase</b>	±12 V (DC+peak AC)	
<b>Maximum Input Voltage</b>	1H display at 2H sweep 1V display at 2V sweep	
<b>Sweep Line Length</b>	RGB: 30% × 3 or composite display YRGB: 22% × 4 of composite display	
<b>Composite to YRGB</b>	Remote control from external or internal control signal	
<b>Control Signal</b>	12 to 15 V (negative or positive), 15 mA	
<b>Control Signal</b>	9-pin MT socket on the rear panel	
<b>RGB and YRGB Input</b>	9-pin D-sub connector (option)	
<b>External Synchronization</b>		
<b>Input Connector</b>	2 terminals, BNC, loop-through type on the rear panel	
<b>Input Impedance</b>	15 kΩ	
<b>Input Sensitivity</b>	0.143 to 5 Vp-p (Level of sync signal in composite video signal)	
<b>Maximum Input Voltage</b>	±8 Vp-p	
<b>Line Selector</b>		
<b>Display Line</b>	13 to 22 and 325 to 334 lines	14 to 21 lines of first and second fields
<b>Blanking Output</b>		
<b>Output Connector</b>	BNC connector on the rear panel	
<b>Voltage Level</b>	0 V: selected by line selector -2 V: for other duration	
<b>Calibrator</b>		
<b>Waveform</b>	Square waveform	
<b>Amplitude</b>	1 Vp-p ±1%	
<b>Frequency</b>	32 kHz	
<b>Environmental Conditions</b>		
<b>Operating</b>	Temperature: 0 to 40°C	
<b>Power Requirements</b>	100, 120, 200, 240 VAC, 50/60 Hz, 50 Wmax.	
<b>Dimensions and Weight</b>	215 (W) × 132 (H) × 429 (D) mm, 7.4 kg 8 1/2 (W) × 5 1/4 (H) × 16 3/4 (D) in., 16.3 lbs	
<b>Accessories</b>	Scale illumination lamp .....5 9-pin MT plug .....1 Cover/Inlet stopper .....1 Screw, rack mounting(inch size) .....2 Power cord .....1 Instruction manual .....1	

## ■ 5861V WAVEFORMS DISPLAY

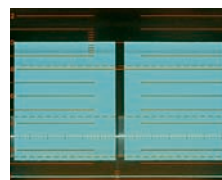
### • Sweep Range



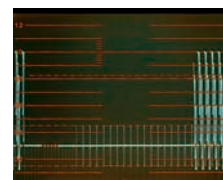
2H



1 μs/div

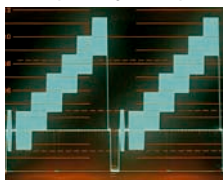


2V



2V MAG

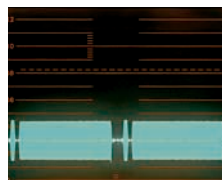
### • Frequency Response Range



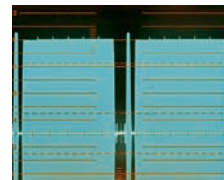
FLAT



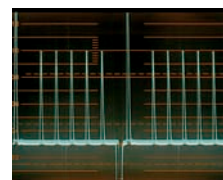
LUM



CHROMA



DIF GAIN



DIF'D STEP



PAT. PEND.  
The cabinet is sold separately.

## Precise DG/DP Measurements with CRT Readout Three Video Inputs, One External Reference Input X-Y Display Capability, Auto Phase & Mag Burst

The Model 5212 is precision Vectorscope designed to monitor video signals. The 5212 with its bright CRT features a vector display, DG/DP function to measure differential gain and differential phase with a line display, X-Y display mode for stereo audio signals, and menu screen for setting functions. These instruments have three video inputs and one external reference input channel. Up to four waveforms, including the external reference, can be displayed. The newly developed digital phase control ensures a phase measurement accuracy of within 1%. These instruments can also be remotely controlled when combined with the 5222 Waveform Monitor.

### FEATURES

- **Three video inputs and one external reference input channel**  
Up to four waveforms, including the external reference, can be displayed simultaneously.
- **Digital phase control**  
The newly developed digital phase control ensures a phase measurement accuracy of within 1% and display resolution of within 0.1° with alphanumeric readout.
- **DG/DP measuring function**  
These instruments enable accurate measurement of differential gain (DG) and differential phase (DP) with alphanumeric readout.

- **X-Y display function**

The level and phase of stereo audio signals can be measured.

- **Menu function**

For user-friendly front panel control, a menu controller is provided for various functions.

- **Preset function**

The front panel settings, including vertical and horizontal positioning, can be stored in memory, and recalled from the front panel or via the remote control connector on the rear panel. You can reduce setup time by presetting frequently used measuring conditions.

- **Automatic NTSC/PAL system discriminator**

The 5212 automatically selects the NTSC or PAL color system.

- **Y/C input**

The C signal vector can be displayed by respectively applying the Y signal and C-signal to the CH1 and CH2 input connectors.

- **Remote control**

These instruments can also be remotely controlled when combined with the 5222 Waveform Monitor. The line selected by the waveform monitor is displayed automatically.

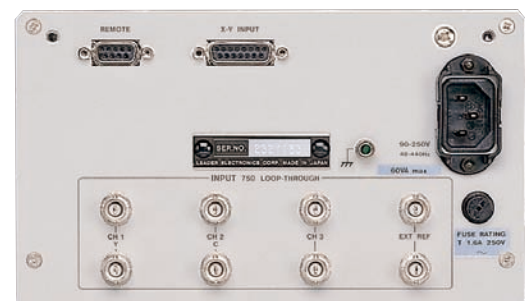
- **Bright CRT, accelerating potential of 16.5 kV**

- **Universal AC power supply, 90 to 250 V**

<b>CRT</b> Type Accelerating Potential Effective Display Area Graticule	150 mm rectangular (P4) 16.5 kV 100 (H)×80 (V) mm Illuminated internal graticule	
<b>Input</b> Input Channel Input Impedance Maximum Input Voltage Return Loss Isolation Between Channels Gain Difference Between Channels Phase Difference Between Channels Loop-Through Isolation	CH1, CH2, CH3, EXT ≥15 kΩ, 75 Ω loop-through ±12 V (DC+peak AC) ≥40 dB (50 kHz to 6 MHz) ≥70 dB (Fsc) ≤±0.5% ≤±0.5% (Fsc) ≥70 dB (Fsc)	
<b>Synchronization</b> Sync Amplitude CH1, 2, 3 Video Signal EXT Video Signal Subcarrier Signal Selection	<b>PAL</b> Burst, sync amplitude 0.3 Vp-p ±6 dB Burst, sync amplitude 0.3 Vp-p ±6 dB 2 Vp-p ±6 dB Video or subcarrier, selectable	<b>NTSC</b> Burst, sync amplitude 0.286 Vp-p ±6 dB Burst, sync amplitude 0.286 Vp-p ±6 dB
<b>Vector Mode</b> Bandwidth Upper -3 dB Point Lower -3 dB Point Center Frequency (Fsc) Display Phase Accuracy Amplitude Accuracy Digital Phase Control Phase Accuracy Subcarrier Regeneration Pull-In Range Pull-In Time Phase Control Range Phase Shift Phase Shift Burst Jitter Position Variable Range Vertical Position Horizontal Position	<b>PAL</b> Fsc+500 kHz ±100 kHz Fsc-500 kHz ±100 kHz 4.43361875 MHz Color bars 75%, 100% MAG mode setting OFF: Within ±1° BURST: Within ±2° ×5 MAG: Within ±2° OFF: Within ±3% BURST: Within ±3% ×5 MAG: Within ±5% Within ±0.5° Within ±150 Hz Within 1 sec 360° Within ±2° (Fsc ±50 Hz) Within ±2° (Burst amplitude ±6 dB) ≤±0.5° At least ±8 mm from center At least ±8 mm from center	<b>NTSC</b> Fsc+500 kHz ±100 kHz Fsc-500 kHz ±100 kHz 3.579545 MHz
<b>DG/DP Mode</b> Measurement Accuracy DG DP Position Control Range Vertical Position Horizontal Position Auto Setup DG Setup Accuracy DP Setup Accuracy	Within ±0.5% Within ±0.5% ±40 mm ±4 mm from center At least ±8 mm from center At CAL position Within ±2% Within ±2°	
<b>X-Y Mode</b> Input Input Impedance Calibration Accuracy Input Amplitude Maximum Input Voltage Frequency Response X-Y Phase Difference Input Connector V Position Control Range H Position Control Range	DC-coupled differential inputs (Balanced input) ≥20 kΩ Within ±3% 0 dBm to 12 dBm (600 Ω) (0.775 V to 3.1 Vrms) ±12 V (DC+peak AC) DC to 20 kHz, ≤3 dB ≤1° (20 kHz) 15-Pin D-sub connector (rear panel) At least ±8 mm from center At least ±8 mm from center	

<b>GAIN</b> GAIN Variable Range Phase Shift by GAIN	+3 dB to -14 dB or more Within ±1° (+3 dB to -6 dB)
<b>Auto Phase Accuracy</b>	Burst phase is set to -(B-Y) axis. Within ±2°
<b>REF SET</b> VECT Mode DG Mode DP Mode	PHASE display is set to 0.0° DG display is set to 0.00% DP display is set to 0.00°
<b>Preset Function</b> Controllable Functions	Up to 10 panel settings All front panel controls (except INTEN, FOCUS, ROTATION, ILLUM, GAIN, VAR, POWER), and Menu (SYSTEM, DISPLAY)
<b>Remote Control</b> Combinations Line Selection Recall Function Controllable Functions Control Signal Input Connector	5222 → 5212 (NTSC/PAL) Full line selection capability Window display capability Available INPUT, REF, Y/C, RECALL TTL, low active D-sub, 9-pin (rear panel)
<b>CRT Readout</b> Color System Phase Display Resolution NTSC Setup REF Channel DG Display Resolution DP Display Resolution X-Y Display Recall Mode Y/C Display	NTSC/PAL (SYNC ABSENT) 0.0° to 359.9° 0.1° SETUP 7.5%/SETUP 0% CH1, CH2, CH3, EXT +10.00% to -10.00% (DG mode) 0.01% +10.00° to -10.00° (DP mode) 0.01° X-Y scale is displayed (X-Y mode). Address to be recalled Y/C is displayed (Y/C mode).
<b>Environmental Conditions</b> Operating Spec-Guaranteed	Temperature: 0 to 40°C Humidity: ≤ 90% RH (without condensation) Temperature: 10 to 35°C Humidity: ≤ 80% RH (without condensation)
<b>Power Requirements</b> Power Consumption	90 to 250 VAC, 48 to 440 Hz 55 Wmax.
<b>Dimensions and Weight</b>	215 (W)×132 (H)×429 (D) mm, 4 kg 8 1/2 (W)×5 1/4 (H)×16 3/4 (D) in., 8.8 lbs
<b>Supplied Accessories</b>	Illumination lamp .....5 Screw, rack mounting (inch size) .....2 15-pin D-sub connector .....1 Metal case, 15-pin D-sub connector .....1 9-pin to 9-pin D-sub connector cable .....1 Power cord .....1 Cover, inlet stopper .....1 Screw lock .....6 E-ring .....3 Instruction manual .....1
<b>Optional Accessories</b>	LR 2427B (Cabinet, with handle) LR 2404A (Cabinet, without handle) LR 2700A-I (Rack-Mount Adapter, inch size)

5212 REAR PANEL





## Vector Display for Composite Video Signal

The 5850V Vectorscope is designed to simultaneously measure the amplitude and phase of chrominance components contained in a composite video signal.

To measure phase (i.e., direction with respect to burst signal) and amplitude (i.e., length from center) in vector format, the chrominance components containing color information of the video signal are first demodulated, then displayed on the CRT. VITS and VTR can also be displayed in vector format by applying blanking signal output from the waveform monitor to Z INPUT of the vectorscope.

### FEATURES

- The 150 mm rectangular CRT with internal graticule (with the scale illumination), it is possible to measure without parallax reading error.
- DP and DG measurements enable using the modulated staircase.
- Use with a waveform monitor to observe the vector VITS and VIR signals.
- The optional rackmount adapter enables a pattern generator, color monitor, and vectorscope to be integrated in a system.

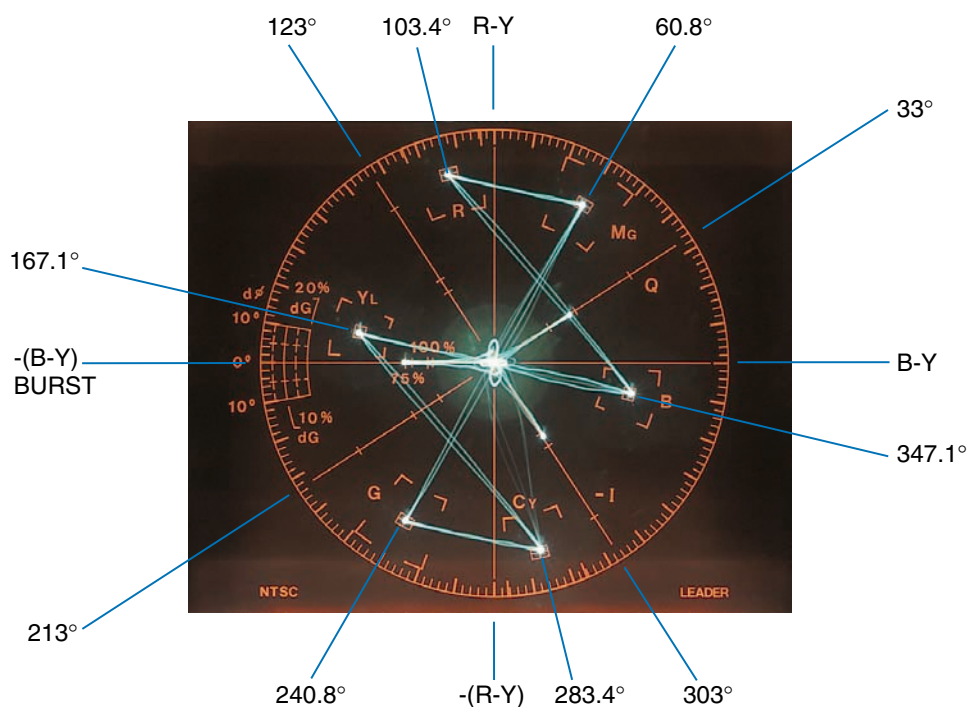
### ■5850V REAR PANEL



<b>CRT Type</b>	150 mm rectangular, internal graticule with scale illumination
<b>Accelerating Potential</b>	12 kV
<b>Effective Display Area</b>	80 (V) × 100 (H) mm
<b>Beam Rotator</b>	Adjustable from the front panel
<b>Graticule</b>	Internal scale Allowable frame: ±20%/ ±10° of standard color bar, circle, angle, R-Y axis, B-Y axis, I axis, Q axis, DG and DP, ±2.5 IRE/±2.5° of standard color bar, and ±20 %/ ±10° of burst signal
<b>Composite Video Signal Input Input</b>	A, B and EXT REF on the rear panel (loop-through, BNC connector)
<b>Input Impedance</b>	A, B: 2 MΩ, EXT REF: 10 kΩ
<b>Max. Input Voltage</b>	±5 V (DC+peak AC)
<b>Sensitivity</b>	
<b>Calibrated Value</b>	Color Saturation: 75%, 100%, full scale Amplitude: 1 Vp-p, 1.24 Vp-p Variable Range: 0.5 to 5 times of the calibrated value
<b>EXT REF</b>	Subcarrier: 2 Vp-p ±6 dB Black Burst: 0.43 Vp-p ±6 dB
<b>Blanking Input</b>	DC ±1 V
<b>Sensitivity</b>	Brightens With positive voltage
<b>Polarity</b>	
<b>Chrominance Bandwidth</b>	Center: Fsc=3.579545 MHz High Freq.=Fsc +500 kHz Low Freq.=Fsc -500 kHz
<b>Phase Accuracy</b>	±2°
<b>Amplitude Accuracy</b>	±3%
<b>Differential Phase</b>	±1°
<b>Differential Gain</b>	±1%
<b>Measurement Item</b>	
<b>Vector Measurement</b>	Phase and amplitude of chrominance component in 75% or 100% saturation color bar signal

<b>Horizontal Synchronization Input</b>	Synchronization by the horizontal sync signal of composite video signal from input A or B.
<b>Sync Polarity</b>	Negative
<b>Sync Level Range</b>	0.286 Vp-p ±6 dB
<b>Subcarrier Signal Synchronization</b>	
<b>Synchronization by Burst Signal (of composite video signal)</b>	
<b>Sync Level Range</b>	0.286 Vp-p ±6 dB
<b>Synchronization by External Subcarrier Signal (which is applied to the EXT REF input)</b>	
<b>Subcarrier Signal Sync Level Range</b>	2 Vp-p ±6 dB
<b>Synchronization by Black Burst Signal (which is applied to the EXT REF input)</b>	
<b>Black Burst Sync Level Range</b>	0.43 Vp-p ±6 dB
	Note: The external subcarrier signal is switched to and from the black burst signal internally. (set in black burst mode at shipment)
<b>Subcarrier Frequency</b>	3.579545 MHz
<b>Sync Capture Range</b>	±50 Hz (0°C to 40°C)
<b>Phase Adjustment Range</b>	360°, continuously variable
<b>Calibration</b>	
<b>Test Circle</b>	Set the chrominance signal applied from the input connector in asynchronous mode.
<b>Power Requirements</b>	100, 120, 200, 240 VAC, selectable by internal wiring 50/60 Hz, 40 Wmax.
<b>Dimensions and Weight</b>	215 (W) × 132 (H) × 429 (D) mm, 7.3 kg 8 1/2 (W) × 5 1/4 (H) × 16 3/4 (D) in, 16.1 lbs
<b>Accessories</b>	Illumination lamp .....5 Cover/Inlet stopper .....1 Screw, rack mounting (inch size) .....2 Power cord .....1 Instruction manual .....1

## THE ANGLES FOR EACH HUE 5850V





## Various plug-in units expand the capability of the Multifformat Signal Generator.

The LT 443D Signal Generator can be flexibly used for the multifformat digital broadcast systems. Various plug-in units enable the output of SDI signals (i.e., HDTV, SDTV), sync signals, and analog signals. By using these signals and genlock functions, users can customize this signal generator as desired.

### FEATURES

#### • Plug-in units provide various functions

Since up to four plug-in units can be installed in the mainframe (consisting of a power supply, main signal generator, and controller), users can customize this signal generator as desired.

\*1 The plug-in unit is installed at the factory; user cannot replace the unit.

#### • Applicable to multifformat HDTV

For the SDI signals, 14 HDTV format unit and 525 line/625 line SDTV unit are provided. The NTSC/PAL analog video signal unit is also available.

Since each unit can output the signal simultaneously, a multifformat system can be constructed to satisfy user's requirements.

#### • Various sync output

Two units can simultaneously output HD signals with 74.25 MHz clock and 74.25/1.001 MHz clock.

#### • Easy-to-use sync signals

For today's modern age of digital TV systems, BB signal (for NTSC/PAL) and HDTV tri-level sync signals can be generated from the Analog BB Unit.

#### • Ethernet provided

Since the ethernet capability is provided as standard. This feature can remotely control various functions and monitor the genlock status.

#### • User-friendly operability

Leader's traditional design and operability concepts are also reflected in this instrument. User-friendly operation includes significantly reduced power-on initialization time is advantageous to a high-performance instrument.

#### • Reading logo mark data

### ■ OPTION

#### LT 443D-70 (NATURAL Picture Memory: Option 70)

This option adds the NATURAL picture pattern output capability to the LT 443D mainframe.

A compact flash memory card is used as an additional memory to store the NATURAL picture pattern.

### LT 443D SPECIFICATIONS

<b>Compartment</b> Number of compartments ID Function	4 Automatically identifies the unit installed. *2 Refer to specifications of each unit.
<b>LCD Panel</b> Number of Characters	20 characters x 2 lines can be displayed (W/backlight)
<b>Internal Clock</b> Internal Reference Frequency	27 MHz
<b>Memory Card Slot</b> Applicable Card Function	Compact flash memory card (CFA TYPE-1) *3 Storing/reading preset data Reading logo mark data Reading NATURAL PICTURE data *4 *3 No compact flash memory card is supplied as standard accessory. Memory cards produced by following manufacturers should be procured (as of August 2002):SanDisk *4 The NATURAL picture function is only usable when the LT 443D-70 Option is installed in the mainframe.
<b>External Interface</b> Ethernet USB (Universal Serial Bus)	10Base-T/100 Base-T (Automatic selection) Applicable to USB 1.1 This function will be supported.
<b>General Specifications</b> Environmental Conditions	Operating Temperature Range 0 to 40 °C Operating Humidity Range ≤ 90% RH (without condensation) Spec-Guaranteed Temperature Range 10 to 35 °C Spec-Guaranteed Humidity Range ≤ 85% RH (without condensation) Operating Environment Indoor use Operating Altitude Up to 2000 m Overvoltage Category II Pollution Degree 2
<b>Power Requirements</b> Power Consumption Dimensions and Weight	90 to 250 VAC, 50/60 Hz Approx. 150 W max. (Approx. 75 W max. *5) 426 (W) x 44 (H) x 560 (D) mm, Approx. 7 kg *5 *5 When four plug-in units (i.e., LT 443D-HD, LT 443D-SD, LT 443D-BL, LT 443D-GL) are installed. 16 3/4 (W) x 1 3/4 (H) x 22 (D) in., 15.4 lbs
<b>Accessories</b>	Power cord.....1 Cover/Inlet stopper .....1 Rack Support (right and Left) .....1 Screw (for rack support) .....4 Rubber Feet.....5 Logo Mark Software CD-R.....1 Instruction manual .....1

**LT 443D-GLA GENLOCK UNIT**

Plug-In Unit For LT 443D



RoHS

This unit provides genlock capability to lock the LT 443D mainframe with the external reference signal, and three independent black signal generators.

The NTSC/PAL black burst signals, principal 20 types of HDTV analog tri-level sync signal formats, and 525p/625p analog sync signals can be used as an external reference signal.

The following black burst signal formats can be selected.

For NTSC/PAL system, black burst signal with field reference pulse is provided. For NTSC system, black burst with 10-field sequence identification conforming to the SMPTE 318M standards is provided.

The instrument continues operation since the flywheel mode is provided even if the external reference signal is accidentally removed in genlock mode. By logging the genlock status, the time can be obtained when the external reference signal is removed. The log information can be stored on

the CF CARD.

The genlock timing can be adjusted for the entire color frame range when the NTSC/PAL black burst signal is applied; entire frame range when the HDTV analog tri-level sync signal is applied.

Three black burst signal output systems with selectable formats are available as follows:

For NTSC/PAL system, standard black burst signal and black burst signal with field reference pulse are provided. For NTSC system, 10-field black burst signal with ID conforming to the SMPTE 318M standards, 525p/625p analog sync signal, and HDTV analog tri-level sync signal are provided.

The format and output signal timing of each output can be respectively set. The black signal timing can be adjusted for the entire color frame range when the NTSC/PAL black burst signal is applied; entire frame range when the HDTV analog tri-level sync signal is applied.

<p><b>Genlock Function</b></p> <p><b>Loop-Through Input</b></p> <p><b>Input Configuration</b></p> <p><b>Return Loss</b></p> <p><b>Reference Input Signal</b></p> <p><b>Reference Input Signal Level</b></p> <ul style="list-style-type: none"> <li>• HDTV</li> <li>• 525p/625p</li> <li>• NTSC</li> <li>• PAL</li> </ul> <p><b>Operation Modes</b></p> <ul style="list-style-type: none"> <li>• AUTO</li> <li>• MANUAL</li> </ul> <p><b>Genlock Timing Variable Range</b></p> <ul style="list-style-type: none"> <li>• H-PHASE (FINE)</li> <li>• H-PHASE (COARSE)</li> <li>• V-PHASE</li> <li>• F-PHASE</li> </ul>	<p>BNC connector, 75 Ω loop-through                  ≥ 30 dB (0.3 MHz to 30 MHz)                  HDTV tri-level sync signal conforming to SMPTE 240M/274M/296M standards                  525p/625p analog sync signal conforming to SMPTE 293M/ITU-R BT 1358 standards                  NTSC black burst signal conforming to EBU N14/SMPTE RP-154/SMPTE 170M/SMPTE 318M standards                  PAL black burst signal conforming to ITU-R BT. 470-6 standards</p> <p>Positive polarity: 300 mV                  Negative polarity: -300 mV                  -300 mV                  -286 mV                  -300 mV</p> <p>AUTO and MANUAL modes are provided for selecting INT or EXT mode.</p> <p>Fine adjustment between the H-PHASE (COARSE) steps.                  ±1/2 line with respect to the input signal                  ±1 frame with respect to the input signal                  Up to ±5 frames with respect to the input signal.                  (Variable range depends on the input signal format.)</p>	<p><b>Sync Level (into 75 Ω)</b></p> <ul style="list-style-type: none"> <li>• HDTV</li> <li>• 525p</li> <li>• 625p</li> <li>• NTSC</li> <li>• PAL</li> </ul> <p><b>Rise and fall times</b></p> <ul style="list-style-type: none"> <li>• HDTV</li> <li>• 525p</li> <li>• 625p</li> <li>• NTSC</li> <li>• PAL</li> </ul> <p><b>Horizontal Sync Width</b></p> <ul style="list-style-type: none"> <li>• 1125-Line Format</li> <li>• 750-Line Format</li> <li>• 525p</li> <li>• 625p</li> <li>• NTSC/PAL</li> </ul> <p><b>Vertical Sync Width</b></p> <p><b>Output Connector</b></p> <p><b>Number of Outputs</b></p> <p><b>Timing Variable Range</b></p> <ul style="list-style-type: none"> <li>• H-PHASE</li> <li>• V-PHASE</li> <li>• F-PHASE</li> </ul>	<p>N14/SMPTE RP-154/SMPTE 170M/SMPTE 318M standards                  PAL black burst signal conforming to ITU-R BT. 470-6 standards</p> <p>Positive polarity: 300 mV ±6 mV                  Negative polarity: -300 mV ±6 mV                  -300 mV ±6 mV                  -300 mV ±6 mV                  40 IRE ±1 IRE                  -300 mV ±6 mV</p> <p>54 ns ±20 ns                  70 ns ±10 ns                  100 ns ±10 ns                  140 ns ±10 ns                  200 ns ±10 ns</p> <p>Positive polarity: 593 ns ±40 ns                  Negative polarity: 593 ns ±40 ns                  Positive polarity: 539 ns ±40 ns                  Negative polarity: 539 ns ±40 ns                  2.35 μs ±0.05 μs                  2.35 μs ±0.1 μs                  4.7 μs ±0.1 μs                  5H (HDTV) / 6H (525p) / 5H (625p) / 3H (NTSC) / 2.5H (PAL)                  BNC                  1 each</p> <p>Up to ±1 line-1 dot                  Up to ±1 frame-1 line                  Up to ±5 frames (depends on the input signal format.)</p>
<p><b>Analog Sync Signal Output</b></p> <p><b>BLACK 1/BLACK 2/BLACK 3 Output Format</b></p>	<p>HDTV tri-level sync signal conforming to SMPTE 240M/274M/296M standards                  525p/625p analog sync signal conforming to SMPTE 293M/ITU-R BT 1358 standards                  NTSC black burst signal conforming to EBU</p>		

**LT 443D-HD HD-SDI UNIT/LT 443D-HDB (HD-SDI Out x 2, HD-SDI Black Out x 2) UNIT**

Plug-In Unit For LT 443D



RoHS

The LT 443D-HD HD-SDI Unit adds the 14 format HD-SDI signal output capability to the LT 443D mainframe. Various functions (e.g., ID character, simple motion pictures, embedded audio, NATURAL picture pattern\*) are provided.

\*The NATURAL picture function is only usable when the LT 443D-70 Option is installed in the mainframe.

<p><b>Output</b></p> <ul style="list-style-type: none"> <li>• HD-SDI Video Output Specifications</li> <li>• Specifications</li> </ul> <p><b>SDI Characteristics</b></p> <ul style="list-style-type: none"> <li>• Bit Rate</li> <li>• Output Amplitude</li> <li>• Overshoot</li> <li>• Rise and Fall Time</li> <li>• Return Loss</li> </ul> <p><b>Function</b></p> <ul style="list-style-type: none"> <li>• Applicable Format</li> </ul> <p><b>Test Patterns</b></p>	<p>1 system, 2 outputs (75 Ω, BNC)</p> <p>Conforms to SMPTE 240M(Except for Return Loss) /274M/296M standards</p> <p>1.485 Gbps, 1.485/1.001 Gbps                  800 mVp-p ±10%                  ≤ 10 %                  ≥ 270 ps (20 % to 80 %)                  ≥ 15 dB (5 MHz to 742.5 MHz)                  ≥ 10 dB (742.5 MHz to 1.485 GHz)</p> <p>1035i/60, 1035i/59.94, 1080i/60, 1080i/59.94, 1080i/50, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 1080PsF/24, 1080PsF/23.98, 720p/60, 720p/59.94</p> <p>The following formats will be supported:                  720p/29.97, 720p/24, 720p/23.98, 720p/50, 720p/30, 720p/25</p> <p>COLOR BAR 100 %, COLOR BAR 75 %, MULTIFOR-MAT COLOR BAR (ARIB STD-B28) FLAT FIELD 100 %,</p>	<ul style="list-style-type: none"> <li>• Variable Timing</li> <li>• Variable Range</li> <li>• Variable In V</li> <li>• H</li> <li>• Simple Motion Picture Mode (Scroll)</li> <li>• Direction</li> <li>• Speed (Range, Resolution)</li> <li>• Field Frame Interlace</li> <li>• V Interlace</li> <li>• H Common</li> <li>• ID Character</li> <li>• Embedded Audio</li> <li>• Number of Channels Embedded</li> <li>• Sampling Frequency</li> <li>• Resolution</li> <li>• Preemphasis</li> <li>• Frame Number</li> <li>• Frequency</li> <li>• Level</li> </ul>	<p>FLAT FIELD 50 %, FLAT FIELD 0 %, LINE SWEEP 100 %, MULTI BURST 100 %, BOWTIE 100 %, RAMP, SHAL-LOW RAMP, 10 STEP, PULSE &amp; BAR, CHECK FIELD, RED RASTER 100 %, CROSS &amp; DOT, MONOSCOPE</p> <p>Entire frame range                  Line steps                  Clock steps (74.25 MHz or 74.25/1.001 MHz)</p> <p>8 directions (vertical, horizontal, diagonal)</p> <p>Variable in field steps                  0 to 256 lines in 2 line steps                  0 to 256 dots in 4 dot steps                  ID characters can be displayed at the arbitrary position on the screen.</p> <p>8 channels (4 channels x 2 groups)                  Each group can be set ON/OFF                  48 kHz (sync to video signal)                  20 bits, 24 bits, selectable                  OFF, 50/15 μs, CCITT, selectable (CS bit is only selected.)                  None                  50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1.0 k, 1.2 k, 1.5 k, 1.6 k, 2.0 k, 2.4 k, 3.0 k, 3.2 k, 4.0 k, 4.8 k, 5.0 k, 6.0 k, 8.0 k, 9.6 k, 10 k, 12 k, 15 k, 16 k, 20 kHz, silence                  -60 to 0 dBFS (settable in 1 dB steps)                  *Frequency, level, and audio click can be set to each channel.                  *When the CHECK FIELD pattern is selected, no audio signal is embedded.</p>
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**LT 443D-BL ANALOG BLACK UNIT**

Plug-In Unit For LT 443D



The LT 443D-BL Analog Black Signal Unit adds the 20 HDTV format analog tri-level sync signal, 525p/625p analog sync signals, and NTSC/PAL black burst signals output capability to the LT 443D mainframe.

Three independent output systems (six outputs, two outputs per system) are provided to output multiformat black sync signal. The format and output signal timing can be respectively set each output.

The ten-field black signal with ID conforming to the SMPTE 318M standards is also available.

The entire range of timing can be set for the 525p/625p analog sync signals and NTSC/PAL black burst signals in 54 MHz clock steps. The entire range of timing can also be set for the HDTV analog tri-level sync signal in 74.25 MHz or 74.25/1.001 MHz clock steps.

RoHS

<p><b>Analog Sync Signal Output</b> BLACK 1, 2/BLACK 3, 4/BLACK 5, 6 Format</p> <p><b>Sync Level (into 75 Ω)</b></p> <ul style="list-style-type: none"> <li>• HDTV</li> <li>• 525p</li> <li>• 625p</li> <li>• NTSC</li> <li>• PAL</li> </ul> <p><b>Rise and fall times</b></p> <ul style="list-style-type: none"> <li>• HDTV</li> <li>• 525p</li> </ul>	<p>HDTV tri-level sync signal conforming to SMPTE 240M/274M/296M standards 525p/625p analog sync signal conforming to SMPTE 293M/ITU-R BT 1358 standards NTSC black burst signal conforming to SMPTE RP-154/SMPTE 170M/SMPTE 318M standards PAL black burst signal conforming to ITU-R BT. 470-6 standards</p> <p>Positive polarity: 300 mV ±6 mV Negative polarity: -300 mV ±6 mV -300 mV ±6 mV 40 IRE ±1 IRE -300 mV ±6 mV</p> <p>54 ns ±20 ns 70 ns ±10 ns</p>	<ul style="list-style-type: none"> <li>• 625p</li> <li>• NTSC</li> <li>• PAL</li> </ul> <p><b>Horizontal Sync Width</b></p> <ul style="list-style-type: none"> <li>• 1125-Line</li> <li>• 750-Line</li> </ul> <ul style="list-style-type: none"> <li>• 525p</li> <li>• 625p</li> <li>• NTSC/PAL</li> </ul> <p><b>Vertical Sync Width</b> <b>Output Connector</b> <b>Number of Outputs</b> <b>Timing Variable Range</b></p> <ul style="list-style-type: none"> <li>• H-PHASE</li> <li>• V-PHASE</li> <li>• F-PHASE</li> </ul>	<p>100 ns ±10 ns 140 ns ±10 ns 200 ns ±10 ns</p> <p>Positive polarity: 593 ns ±40 ns Negative polarity: 593 ns ±40 ns Positive polarity: 539 ns ±40 ns Negative polarity: 539 ns ±40 ns 2.35 μs ±0.05 μs 2.35 μs ±0.05 μs 4.7 μs ±0.1 μs 5H (HDTV) / 6H (525p) / 5H (625p) / 3H (NTSC) / 2.5H (PAL) BNC (BLACK 1, 2/BLACK 3, 4/BLACK 5, 6) 2 each</p> <p>Up to ±1 line-1 dot Up to ±1 frame-1 line Up to ±5 frames (depends on the input signal format.)</p>
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**LT 443D-SD SD-SDI UNIT/LT 443D-SDB (SD-SDI Out x 2, SD-SDI Black Out x 2) UNIT**

Plug-In Unit For LT 443D



The LT 443D-SD SD-SDI Unit adds the 525/625 line format SD-SDI signal (4:2:2 component signal) output capability to the LT 443D mainframe. Various functions (e.g., ID character, simple motion pictures, embedded audio, NATURAL picture pattern\*) are provided.

\*1: The NATURAL picture function is only usable when the LT 443D-70 Option is installed in the mainframe.

RoHS

<p><b>Output</b></p> <ul style="list-style-type: none"> <li>• SD-SDI Video Output</li> </ul> <p><b>Specifications</b></p> <ul style="list-style-type: none"> <li>• Specifications</li> </ul> <p><b>SDI Characteristics</b></p> <ul style="list-style-type: none"> <li>• Bit Rate</li> <li>• Output Amplitude</li> <li>• Overshoot</li> <li>• Rise and Fall Time</li> <li>• Return Loss</li> </ul> <p><b>Function</b></p> <ul style="list-style-type: none"> <li>• Applicable Format</li> <li>• Test Patterns</li> </ul>	<p>1 system, 2 outputs (75 Ω, BNC)</p> <p>Conforms to ITU-R BT. 601, SMPTE 125M standards Conforms to ITU-R BT. 656, SMPTE 259M standards</p> <p>270 Mbps 800 mVp-p ±10 % ≤ 10 % 0.4 to 1.5 ns (20 % to 80 %) ≥ 15 dB (5 MHz to 270 MHz)</p> <p>525i/59.94-270 MHz, 625i/50-270 MHz COLOR BAR 100%, COLOR BAR 75%, EBU COLOR BAR, BBC COLOR BAR, SMPTE COLOR BAR, RAMP &amp; COLOR, FLAT FIELD 100%, FLAT FIELD 50%, FLAT FIELD 0%, FIELD ID, CROSSHATCH, LINE SWEEP 100%, LINE SWEEP 60%, MULTIBURST 100%, MULTIBURST 60%, OVER SIZE RAMP, DIGITAL LIMIT RAMP, SHALLOW RAMP, 10 STEP, CHECK FIELD, MONOSCOPE, BOWTIE 100%, PULSE &amp; BAR, RED RASTER, MULTIPULSE</p>	<ul style="list-style-type: none"> <li>• Variable Timing</li> <li>• Simple Motion Picture Mode (Scroll)</li> <li>• ID Characters</li> <li>• Embedded Audio</li> </ul> <p><b>Sampling Frequency</b> <b>Resolution</b> <b>Preemphasis</b> <b>Frame Number</b> <b>Frequency</b></p> <p><b>Level</b></p>	<p>Entire frame range Line steps Clock steps (27 MHz)</p> <p>8 directions (vertical, horizontal, diagonal)</p> <p>Variable in field steps 0 to 256 lines in 2 line steps 0 to 256 dots in 4 dot steps</p> <p>Up to 20 32 x 32 dots, 64 x 64 dots, selectable</p> <p>8 channels (4 channels x 2 groups) Each group can be set ON/OFF respectively. 48 kHz (sync to video signal) 20 bits, 24 bits, selectable OFF, 50/15 μs, CCITT, selectable(CS bit is only selected.) ON/OFF, selectable 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1.0 k, 1.2 k, 1.5 k, 1.6 k, 2.0 k, 2.4 k, 3.0 k, 3.2 k, 4.0 k, 4.8 k, 5.0 k, 6.0 k, 8.0 k, 9.6 k, 10 k, 12 k, 15 k, 16 k, 20 kHz, silence -60 to 0 dBFS (settable in 1 dB steps) *Frequency, level, and audio click can be set to each channel. *When the CHECK FIELD pattern is selected, no audio signal is embedded.</p>
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**LT 443D-AA ANALOG AUDIO UNIT**

Plug-In Unit For LT 443D



Installing the LT 443D-AA Analog Audio Unit in the LT 443D mainframe can output analog audio signal (two systems).

Output characteristics (e.g., output level, frequency) can be independently set for each output system.

The sound sampling frequency is synchronized with the video signal of plug-in unit installed in the mainframe.

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<p><b>Output</b></p> <ul style="list-style-type: none"> <li>• Number of Outputs</li> <li>• Output Impedance</li> <li>• Output Amplitude</li> <li>• Output Amplitude Accuracy</li> <li>• Output Amplitude Flatness</li> <li>• Output Connector</li> </ul>	<p>2 600 Ω, balanced 0.775 Vrms (into 600 Ω at 0 dBm) ±0.5 dB (at 1 kHz) ±0.5 dB (1 kHz ref.) XLR-3P x 2</p>	<p><b>Function</b></p> <ul style="list-style-type: none"> <li>• Sampling Frequency</li> <li>• Frequency</li> <li>• Level</li> </ul>	<p>48 kHz (Sync to video signal) 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1.0 k, 1.2 k, 1.5 k, 1.6 k, 2.0 k, 2.4 k, 3.0 k, 3.2 k, 4.0 k, 4.8 k, 5.0 k, 6.0 k, 8.0 k, 9.6 k, 10 k, 12 k, 15 k, 16 k, 20 kHz, silence -40 to 4 dBm (settable in 1 dBm steps)</p>
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**LT 443D-DA DIGITAL AUDIO UNIT**

Plug-In Unit For LT 443D



RoHS

Installing the LT 443D-DA Digital Audio Unit in the LT 443D mainframe can output AES/EBU digital audio signals (four systems), silence signals (one system), and 48 kHz word clock signals. The AES/EBU signal characteristics (e.g., output level, frequency) can be independently set for each output system. The sampling frequency is synchronized with the video signal of plug-in unit installed in the mainframe.

<p><b>Output</b></p> <ul style="list-style-type: none"> <li>• AES/EBU Digital Audio Output                     <ul style="list-style-type: none"> <li>Number of Outputs</li> <li>Output Amplitude</li> <li>Output Connector</li> </ul> </li> <li>• Silence Signal (DARS grade 2) Output                     <ul style="list-style-type: none"> <li>Number of Outputs</li> <li>Output Amplitude</li> <li>Output Connector</li> </ul> </li> <li>• 48 kHz Word Clock                     <ul style="list-style-type: none"> <li>Number of Outputs</li> <li>Output Amplitude</li> <li>Output Connector</li> </ul> </li> </ul> <p><b>Signal Specifications</b></p> <ul style="list-style-type: none"> <li>• Specifications</li> </ul>	<p>4 (2-channel output) 1 Vp-p ±0.1 V (into 75 Ω) BNC</p> <p>1 (2-channel output) 1 Vp-p ±0.1 V (into 75 Ω) BNC</p> <p>1 1 Vp-p ±0.1 V (into 75 Ω), 5 V CMOS, selectable BNC</p> <p>ANSI S4.40 (AES3-1992), AES 11-1997 SMPTE 276M, AES-3id-2001</p>	<p><b>Function</b></p> <ul style="list-style-type: none"> <li>• Sampling Frequency</li> <li>• Resolution</li> <li>• Preemphasis</li> <li>• Frequency</li> </ul> <ul style="list-style-type: none"> <li>• Level</li> <li>• Audio Click</li> <li>• Output ON/OFF</li> <li>• Timing Variable Range</li> </ul>	<p>48 kHz (sync to video signal) 20 bits, 24 bits, selectable OFF, 50/15 μs, CCITT, selectable (CS bit can only be selected.) 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1.0 k, 1.2 k, 1.5 k, 1.6 k, 2.0 k, 2.4 k, 3.0 k, 3.2 k, 4.0 k, 4.8 k, 5.0 k, 6.0 k, 8.0 k, 9.6 k, 10 k, 12 k, 15 k, 16 k, 20 kHz, silence -60 to 0 dBFS (settable in 1 dB steps) 1, 2, 3, 4 sec, none Selectable</p> <p>±1 AES/EBU frame Settable in 512 fs (24.576 MHz) steps *The timing can be varied with respect to the Video Unit installed in the LT 443D mainframe. The settings are common to the digital audio, silence and word clock signals. *Frequency, level, and audio click can be set to each channel. Other items (except timing) can be respectively set to the 2-channel output.</p>
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**LT 443D-CS ANALOG COMPOSITE UNIT**

Plug-In Unit For LT 443D



RoHS

The LT 443D-CS Analog Composite Unit adds the NTSC/PAL analog composite signal output capability to the LT 443D mainframe. Various functions (e.g., ID character, simple motion pictures, embedded audio, NATURAL picture pattern \*1) are provided. \*1: The NATURAL picture function is only usable when the Option LT 443D-70 is installed in the mainframe.

<p><b>Test Signal Output</b></p> <ul style="list-style-type: none"> <li>• Format</li> </ul> <ul style="list-style-type: none"> <li>• Pattern</li> </ul> <ul style="list-style-type: none"> <li>• NATURAL Picture *5</li> </ul> <ul style="list-style-type: none"> <li>• APL MODE</li> </ul> <ul style="list-style-type: none"> <li>• Time Interval</li> <li>• ID Character</li> <li>• Number of Characters</li> <li>• Size</li> <li>• Display Position</li> <li>• Blinking</li> </ul>	<p>NTSC, NTSC+REFERENCE *2, NTSC+ID *3, NTSC+REFERENCE+ID *2 *3, NTSC+SETUP, NTSC+SETUP+REF *2, NTSC+SETUP+ID *3, NTSC+SETUP+REF+ID *2 *3, PAL *4, PAL+REFERENCE *4 *2</p> <p>*2 REFERENCE and REF denote Field Reference. *3 ID denotes 10 field ID. *4 The 25-Hz offset subcarrier is used for the PAL system. COLOR BAR 100%, COLOR BAR 75%, EBU COLOR BAR, BBC COLOR BAR, SMPTE COLOR BAR, FLAT FIELD 100%, FLAT FIELD 50%, FLAT FIELD 0%, CROSSHATCH 1, CROSSHATCH 2, LINE SWEEP 100%, LINE SWEEP 60%, MULTIBURST 100%, MULTIBURST 60%, SHALLOW RAMP, 10 STEP, MOD 10 STEP, RAMP, MOD RAMP, MONOSCOPE, RED RASTER, WINDOW, PULSE &amp; BAR Up to five screens of 24-bit full color BMP file can be simultaneously switched.</p> <p>APL OFF, APL HIGH, APL LOW, APL(BOUNCE), BOUNCE APL (BOUNCE) is switched at a preset time interval for APL HIGH and APL LOW. BOUNCE is switched at a preset time interval for FLAT FIELD 100 % and FLAT FIELD 0 %.</p> <p>1 to 20 seconds (settable in one second steps)</p> <p>Up to 20 32 x 32 dots, 64 x64 dots, selectable Arbitrary position on the screen. OFF, 1 to 10 seconds (settable in one second steps)</p>	<ul style="list-style-type: none"> <li>• Simple Motion Picture Function                     <ul style="list-style-type: none"> <li>Direction</li> <li>Speed</li> </ul> </li> <li>• Timing Variable                     <ul style="list-style-type: none"> <li>H-PHASE</li> <li>V-PHASE</li> <li>F-PHASE</li> </ul> </li> <li>• Number of Outputs                     <ul style="list-style-type: none"> <li>Black Signal Output</li> <li>format</li> </ul> </li> <li>• Output Signal                     <ul style="list-style-type: none"> <li>Format</li> <li>Timing Variable                             <ul style="list-style-type: none"> <li>H-PHASE</li> <li>V-PHASE</li> <li>F-PHASE</li> </ul> </li> </ul> </li> <li>• Number of Outputs                     <ul style="list-style-type: none"> <li>Signal Level</li> </ul> </li> <li>Horizontal Drive Pluse Output                     <ul style="list-style-type: none"> <li>Format</li> <li>Signal Level</li> <li>Signal Polarity</li> <li>Timing Variable                             <ul style="list-style-type: none"> <li>H-PHASE</li> </ul> </li> </ul> </li> <li>• Number of Outputs                     <ul style="list-style-type: none"> <li>Vertical Drive Pluse Output                             <ul style="list-style-type: none"> <li>Format</li> <li>Signal Level</li> <li>Signal Polarity</li> <li>Timing Variable                                     <ul style="list-style-type: none"> <li>V-PHASE</li> </ul> </li> </ul> </li> </ul> </li> <li>• Number of Outputs</li> </ul>	<p>8 directions (up, down, left, right, and combinations) H: 0 to 256 dots in 4 dot steps V: 0 to 256 lines in 2 line steps (Pattern can be scrolled in field time steps.) *5 The Option LT 443D-70 should be installed in the mainframe to enable this function. The timing of OUTPUT 1 and 2 can be varied simultaneously. Up to ±1 line-1 dot Up to ±1 frame-1 line NTSC:Up to ±5 frames PAL: UP to ±2 frames 2</p> <p>Depends on the test signal format. (Supports the field Reference and 10 field ID) Analog black burst The timing of OUTPUT 1 and 2 can be varied simultaneously.</p> <p>Up to ±1 line-1 dot Up to ±1 frame-1 line NTSC:Up to ±5 frames PAL: UP to ±2 frames 2 Systems (one each) 1 Vp-p (into 75 Ω)</p> <p>Depends on the test signal format. 2 Vp-p (into 75 Ω) Negative</p> <p>Up to ±1 line-1 dot 1</p> <p>Depends on the test signal format. 2 Vp-p (into 75 Ω) Negative</p> <p>Up to ±1 frame-1 line 1</p>
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Upon request

RoHS



## Applicable to both HD-SDI and SD-SDI systems, 1U half-rack size

The compact, 1U half-rack sized, LT 4400 Multiformat Video Generator is applicable to both HD-SDI and SD-SDI systems. The various output capabilities are provided: color bar, SDI check field test pattern, ID characters, logomark in QVGA size, safety-area marker, superimposing embedded audio, genlock mode to synchronize external reference signal, and three independent analog black signal systems.

### FEATURES

#### • Applicable to both HD-SDI and SD-SDI systems

Applicable to both HDTV (18 types of HDTV formats) and SDTV (525i/59.94, 625i/50) systems. The HDTV or SDTV can be selected.

#### • Superimposing ID characters

The ID characters can be superimposed at the arbitrary position on the screen. The character blinks to indicate the freeze status.

#### • Superimposing logomark

A logomark up to 320 (pixel) x 240 (line) in QVGA size can be superimposed at an arbitrary position on the screen. The logomark is converted from the bit map to four-grade monochrome data.

#### • Safety-area marker

The 90 % and 80 % safety-area markers can be superimposed on the screen. The 4:3 aspect-ratio marker can also be superimposed in HDTV format.

#### • Superimposing embedded audio

The 16 channels of embedded audio signals (4 channels x 4 groups) can be superimposed. The frequency and level can be respectively set for each channel.

#### • Genlock mode

This instrument can be locked by a NTSC/PAL black burst or HDTV tri-level sync signals for variable timing. The NTSC/PAL black burst signals with field reference pulse signal, and NTSC/PAL black burst signal with 10-field ID are also applicable.

#### • Stay-in sync function

This function ensures the stable operation in genlock mode even when the external reference signal is accidentally intermittent.

#### • Analog black signal output

Three independent analog black signal output systems are provided. The black burst signal with the same format as the SDI output, or HDTV tri-level sync signal with the same format of clock frequency can be selected for variable timing. The NTSC/PAL black burst signals with field reference pulse signal, and NTSC black burst signal with 10-field ID are also applicable.

#### • Pattern scroll (Simple motion picture mode)

The simple motion picture mode is provided to scroll the pattern.

#### • Word clock output

The 48 kHz word clock output is provided to synchronize the audio signal.

#### • Applicable to SNMP

The network system can easily be constructed since this instrument supports SNMP. (Not available currently)

#### ■ OPTION

##### • OP70:FULL SIZE LOGO Option

Applicable to the LOGO MARK of a full screen  
The Logo Mark of full screen size (up to 1920 x 1080 pixels) can be displayed.

<b>SDI Output</b>	1 system, 2 outputs (75 Ω, BNC) HD-SDI/SD-SDI, selectable
<b>Number of Outputs Conform To</b>	SMPT 274M, SMPT 296M, SMPT 292M (except return loss) ITU-R BT 601, SMPT 125M ITU-R BT 656, SMPT 259M
<b>Applicable Format</b>	1080i/60, 1080i/59.94, 1080i/50, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 1080PsF/24, 1080PsF/23.98, 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25, 720p/24, 720p/23.98
<b>HDTV</b>	525i/59.94-270 MHz, 625i/50-270 MHz
<b>SDTV</b>	Entire frame range V: Settable in line steps H: Settable in clock steps (74.25 MHz, 74.25/1.001 MHz, 27 MHz)
<b>Timing Variable</b>	
<b>Variable Range</b>	
<b>Resolution</b>	
<b>Test Patterns</b>	COLOR BAR 100 %, COLOR BAR 75 %, MULTIFORMAT COLOR BAR (ARIB STD-B28:75 % White, 100 % White, and + I signal, selectable), CHECK FIELD
<b>HDTV</b>	COLOR BAR 100 % (applicable to both 525i/59.94, 625i/50), COLOR BAR 75 %, SMPT COLOR BAR (applicable to 525i/59.94), EBU COLOR BAR/BBC COLOR BAR (applicable to 625i/50), CHECK FIELD (applicable to both 525i/59.94, 625i/50)
<b>SDTV</b>	
<b>Safety Area Marker</b>	Action safety area (90 %), Title safety area (80 %) 4:3 aspect ratio Selectable ON/OFF individually
<b>HDTV</b>	Action safety area (90 %), Title safety area (80 %) Selectable ON/OFF individually
<b>SDTV</b>	
<b>ID Characters</b>	Up to 20 characters
<b>Number of Characters</b>	
<b>Size</b>	
<b>HDTV</b>	32x32/64x64/128x128 dots selectable
<b>SDTV</b>	32x32/64x64 dots selectable
<b>Display Position</b>	Displays at an arbitrary position on the screen.
<b>Freeze Confirmation Display</b>	Blinking OFF, 1 to 10 seconds
<b>Logo Mark</b>	
<b>Logo Mark Data</b>	4-level monochrome data between 0 and 3 320(dot) x 240(line) (QVGA size)
<b>Maximum Size</b>	Displays at an arbitrary position on the screen
<b>Display Position</b>	Set arbitrary levels for levels 0 to 3
<b>Display Level</b>	Simultaneous display with the ID character
<b>Display Method</b>	
<b>File Format</b>	
<b>Before Conversion</b>	24-bit full-color bitmap data (.bmp) format
<b>After Conversion</b>	LT 4400/LT 443D dedicated (.lg) format
<b>Conversion Color Matrix</b>	$Y = 0.212^*R + 0.701^*G + 0.087^*B$ Converts 256-level monochrome data(Y) to four levels (level 0 to 3) using arbitrary threshold values. Converted using the logo mark conversion application. Saves the data to a commercially sold Compact Flash card and inserts it to the LT 4400. *The data loaded from CF card to the LT 4400 cannot be held when the power is turned OFF.
<b>Conversion Method</b>	
<b>Transferring the Logo Mark Data</b>	
<b>Pattern Scroll (Simple Motion Picture Mode)</b>	
<b>Direction</b>	8 directions (vertical, horizontal, diagonal)
<b>Speed (Range, Resolution)</b>	
<b>Field and Frame</b>	
<b>Interface</b>	Variable in field steps
<b>Others</b>	Variable in frame steps
<b>V Interface</b>	0 to 256 lines in 2 line steps
<b>Others</b>	0 to 256 lines in 1 line steps
<b>H Common</b>	0 to 256 dots in 4 line steps
<b>Embedded Audio</b>	
<b>Number of Channels Embedded</b>	16 Channels (4ch x 4group). Each group can be set ON/OFF
<b>Sampling Frequency</b>	48 kHz (sync to video signal)
<b>Resolution</b>	20 bits, 24 bits, selectable
<b>Preemphasis</b>	OFF, 50/15 ms, CCITT, selectable (CS bit can only be selected)
<b>Frame Number</b>	ON, OFF, selectable
<b>Frequency</b>	400 Hz /800 Hz /1 kHz, selectable (sets to each channel)
<b>Level</b>	Can be selected including silence (sets to each channel) -60 to 0 dBFS (settable in 1 dBFS steps)
<b>Audio Click</b>	1 sec/2 sec/3 sec/4 sec/OFF (sets to each channel) * When the CHECK FIELD pattern is selected, no audio signal is embedded. * In the SDTV format, resolution becomes 20 bits when the 16ch is output.
<b>Genlock Function</b>	
<b>Reference Input Signal</b>	BNC (75 Ω, loop through)
<b>Input Configuration</b>	
<b>Input Signal</b>	EBU N14/SMPTE RP154/SMPTE 170M/SMPTE 318M ITU-R BT.470-6 SMPT 274M, SMPT 296M
<b>NTSC black burst signal</b>	
<b>PAL black burst signal</b>	
<b>HDTV tri-level sync signal</b>	
<b>Sync Level</b>	
<b>NTSC black burst signal</b>	-286 mV
<b>PAL black burst signal</b>	-300 mV
<b>HDTV tri-level sync signal</b>	±300 mV
<b>Maximum Input Level</b>	± 4.5 V (DC + peak AC)
<b>Operating Input Level Range</b>	± 6 dB
<b>External Lock Range</b>	± 10 ppm
<b>Jitter</b>	
<b>Burst Lock Mode</b>	≤ 0.5 °
<b>Sync Lock Mode</b>	≤ 1 ns
<b>Operation Modes</b>	
<b>INTERNAL</b>	Internal reference signal is used for operation. (INT mode)

<b>AUTO (GO INTERNAL)</b>	
	The EXT is automatically selected when the external reference signal is applied to the GENLOCK input. The INT mode is automatically selected when the external reference signal is removed.
<b>MANUAL (GO INT)</b>	
	The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after power is turned on. The INT mode is automatically selected when no external reference signal is applied to the GENLOCK input or signal format does not match the specified format.
<b>AUTO (STAYinSYNC)</b>	
	The EXT mode is automatically selected when the external reference signal is applied to the GENLOCK input after power is turned on. If the external reference signal is accidentally removed during operation, the instrument continues operation under the conditions immediately before the signal is removed since STAYinSYNC mode is provided. After the external reference signal is recovered, the system is automatically locked.
<b>MANUAL (STAYinSYNC)</b>	
	The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after power is turned on. If the external reference signal is accidentally removed during operation, the instrument continues operation under the conditions immediately before the signal is removed since STAYinSYNC mode is provided. The STAYinSYNC mode will be held until the reset operation is performed via the front panel even after the external reference signal is recovered.
<b>Genlock Timing</b>	
<b>Variable Range</b>	
<b>NTSC black burst signal</b>	± 5 frames
<b>PAL black burst signal</b>	± 2 frames
<b>HDTV tri-level sync signal</b>	1 frame (entire frame range)
<b>Resolution</b>	
<b>H</b>	0.0741 μs steps (13.5 MHz clock steps)
<b>V</b>	1 line steps
<b>F</b>	1 frame steps
<b>Reference Point (at the time of the black burst input)</b>	
<b>NTSC</b>	The phase coincident point of line 4 of the NTSC and line 1 of the HDTV
<b>PAL</b>	The phase coincident point of line 1 of the PAL and line 1 of the HDTV
<b>Analog Sync Signal Output Format</b>	
<b>NTSC black burst signal</b>	EBU N14, SMPTE RP154, SMPTE 170M, SMPTE 318M
<b>HDTV tri-level sync</b>	SMPTE 274M, SMPTE 296M
<b>Output Signal</b>	
<b>Number of Outputs</b>	6 Outputs (three output systems which equip with two connectors each) Settable
<b>Setting Output Format</b>	
<b>Output Connector</b>	
<b>Output Impedance</b>	75 Ω
<b>Output Connector</b>	BNC
<b>Output Timing</b>	
<b>Setting</b>	Three systems can be set individually.
<b>Variable Range</b>	
<b>NTSC black burst signal</b>	± 5 frames
<b>PAL black burst signal</b>	± 2 frames
<b>HDTV tri-level sync</b>	1 frame (entire frame range)
<b>Setting Resolution</b>	
<b>NTSC black burst signal</b>	0.0185 μs steps (54 MHz in clock steps)
<b>HDTV tri-level sync</b>	0.0135 μs steps (74.25/1.001 MHz in clock steps, or 74.25 MHz in clock steps)
<b>Word Clock Output</b>	
<b>Frequency</b>	48 kHz
<b>Output Impedance</b>	75 Ω unbalanced ("1 Vp-p" output)
<b>Output Amplitude</b>	1 Vp-p ± 0.1 V (into 75 Ω), or 5 V CMOS, selectable
<b>Output Connector</b>	BNC
<b>Number of Outputs</b>	1
<b>Timing Variable</b>	
<b>Variable Range</b>	± 1 AES/EBU frame
<b>Setting Resolution</b>	512 fs (24.576 MHz) steps
<b>Memory Card Slot</b>	
<b>Function</b>	Storing/reading preset data Reading logo data
<b>Ethernet Connector</b>	
<b>Type</b>	10BASE-T/100BASE-TX, auto switching
<b>Function</b>	Transferring operation status (e.g., genlock status) Remote control (e.g., pattern switching) SNMP supported (to be supported in the future)
<b>LCD Panel</b>	
<b>Number of Characters</b>	20 characters x 2 lines can be displayed (w/backlight)
<b>Environmental Conditions</b>	
<b>Operating Temperature Range</b>	0 to 40 °C
<b>Operating Humidity Range</b>	≤ 85 % RH (without condensation)
<b>Spec-Guaranteed Temperature</b>	10 to 30 °C
<b>Spec-Guaranteed Humidity</b>	≤ 85 % RH (without condensation)
<b>Operating Environment</b>	Indoor use
<b>Operating Altitude</b>	Up to 2000 m
<b>Overvoltage Category</b>	1
<b>Pollution Degree</b>	2
<b>Power Requirements</b>	DC12 V (10 to 18 V) 20 W
<b>Dimensions and Weight</b>	213(W) x 44(H) x 400(D) mm (excluding projections), 1.8 kg 8 3/8(W) x 1 3/4(H) x 15 4/5(D) in., 4 lbs
<b>Accessories</b>	AC adapter ..... 1 Instruction manual ..... 1



## The LT 444/LT 4440 is a changeover unit that switches to the backup system when failures occur.

The LT 444/LT 4440 is a changeover unit that automatically switches the signal from the primary signal to the backup signal when problems are detected in the primary signal. If a switch occurs from the primary signal to the backup signal, the LT 444/LT 4440 indicates the channel that caused the problem on the LED front panel.

### FEATURES

#### • Input/Output

Provides 11 channels (a single channel consists of PRIMARY input, BACKUP input, and OUTPUT output) on a single LT 444.

#### • Delay for Starting the Monitor

The delay for starting the error monitor at power up can be set to FAST or SLOW depending on the rise time of the system signal source being connected.

#### • Determination Criteria of the Signal Level

The internal preset switch allows level detection switching among SD-SDI, AES/EBU digital audio, NTSC or PAL analog black burst, HD analog tri-level sync, HD-SDI (only supported on channels 1 to 6), and other signals.

#### • Error Display

When a signal level error is detected, the LT 444 illuminates the error LED on the front panel as well as the LED panel that indicates the channel causing the problem. This feature allows quick investigation of the problem.

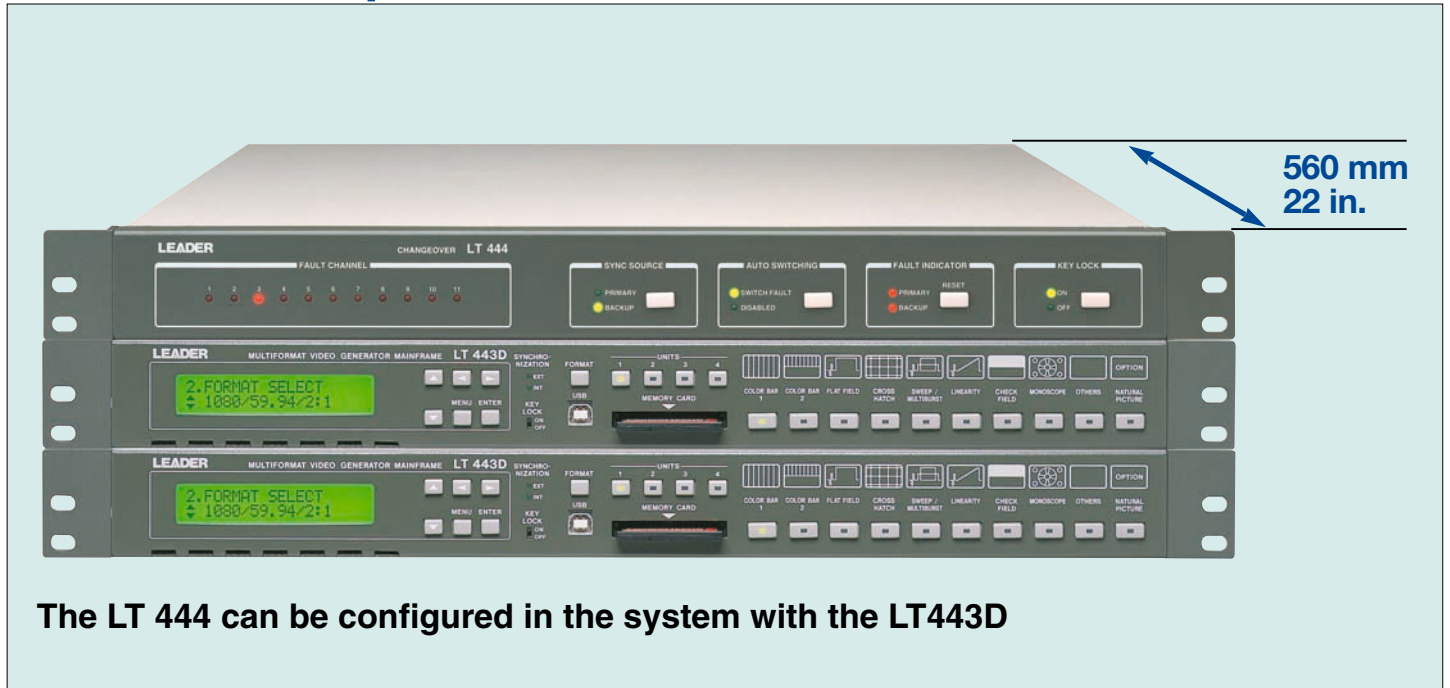
#### • Dimension

- LT 444 is a Deeper Cabinet

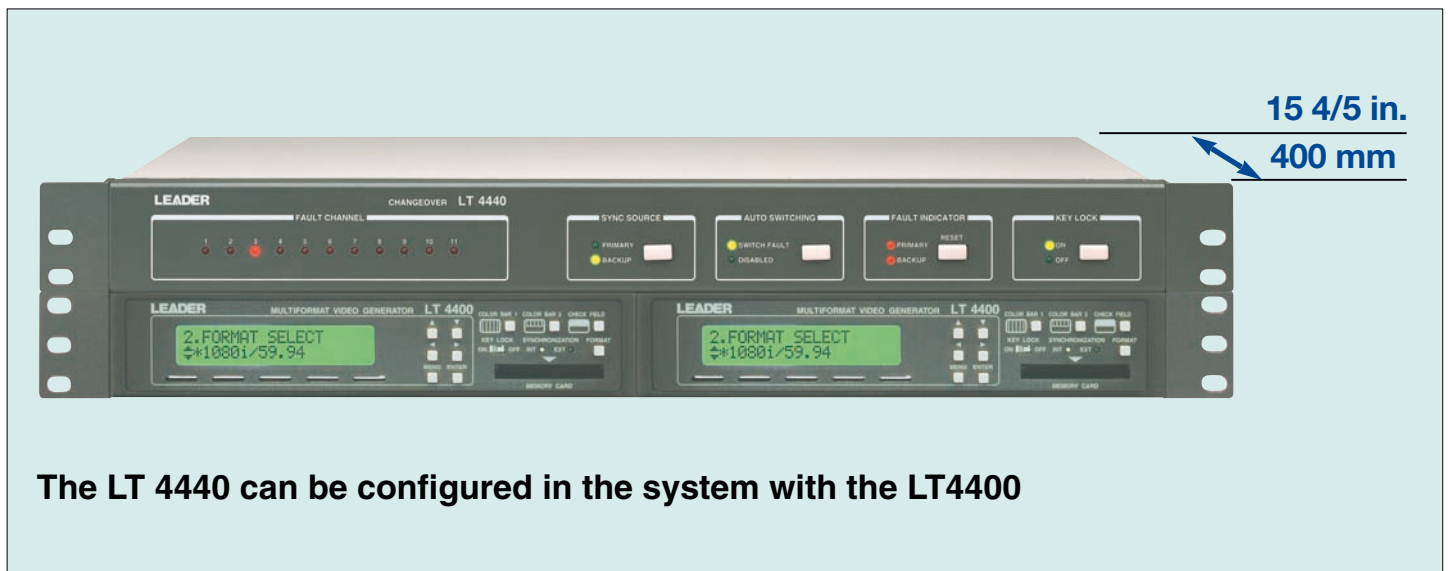
### SPECIFICATIONS

<b>Inputs</b> <b>PRIMARY inputs</b>	1 input each for 11 channels (75 Ω BNC connector)
<b>BACKUP input</b>	1 input each for 11 channels (75 Ω BNC connector)
<b>Outputs</b> <b>OUTPUT outputs</b>	1 output each for 11 channels (75 Ω BNC connector)
<b>Input/Output Characteristics (CH1 to CH11)</b> <b>Return Loss</b>	30 dB 0 to 10 MHz 15 dB 10 MHz to 750 MHz 10 dB 750 MHz to 1.5 GHz
<b>Input Signal Type</b> <b>Signal Type</b>	Set the type of input signal applied to the LT 444 using the internal dip switch. HD-SDI (CH1 to CH6 only) SD-SDI (270 Mb/s) SD-SDI (143 Mb/s) AES/EBU digital audio Tri-level sync signal NTSC black burst PAL black burst
<b>Determination Criteria of the Signal Level</b> <b>Detection Level</b>	Detects an error when the amplitude of the input signal drops by 2 to 5 dB from the defined level and makes the switch. The detection level can be set to LOW or HIGH for each signal type.
<b>Error Display</b> <b>Total Error LED</b>	Notifies errors by illuminating the error LED on the panel.
<b>Error Channel LED</b>	Detects the channel causing the error and shows the channel by illuminating the corresponding LED.
<b>Panel Key Lock</b> <b>Time to Key Lock</b>	The key lock is automatically enabled when key operation is not detected for 60 s.
<b>External Control (REMOTE) Connector</b> <b>Application</b> <b>Connector Type</b>	For external remote control. 9-pin Dsub connector
<b>Dimensions and Weight</b>	426 (W) x 44 (H) x 560 (D) mm(LT 444) 426 (W) x 44 (H) x 400 (D) mm(LT 4440) (excluding protrusions), 4 kg 16 3/4 (W) x 1 3/4 (H) x 22 (D) in.(LT 444) 16 3/4 (W) x 1 3/4 (H) x 15 4/5 (D) in.(LT 4440) (excluding protrusions), 8.8 lbs
<b>Accessories</b>	Rack supports .....2 Rack support attachment screws .....4 Power cord .....1 Instruction manual .....1

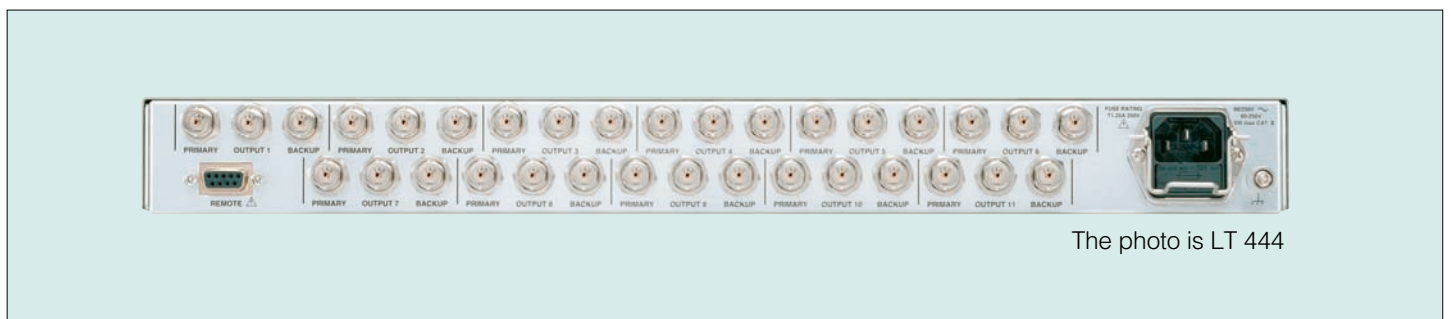
## LT 444 is a Deeper Cabinet



## LT 4440 is a Short Cabinet



## REAR PANEL





## Provides six black burst outputs

The 410BB is an NTSC Sync Generator that provides sync generator signals for other video equipment.

### FEATURES

- Provides six black outputs
- Provides composite sync and subcarrier outputs
- Provides SMPTE color bars output
- Digital waveform generation provides highly accurate and stable signals.
- Supplies two 1 kHz outputs of audio tone
- The low-profile rackmount size easily fits into system configuration

### 410BB SPECIFICATIONS

<b>Black Burst</b>	
(1) System and other System	NTSC-M, conforms to SMPTE 170M standards
Number of Scanning Lines	525, interlaced
Field Frequency	59.94 Hz
Line Frequency	15.73426 kHz
Subcarrier Frequency	3.579545 MHz $\pm$ 10 Hz
Output Impedance	75 $\Omega$
Number of Outputs	6
(2) Sync Signal and Color Burst	
Sync Signal	
Amplitude	286 $\pm$ 14.3 mV
Blanking Level	0 $\pm$ 20 mV
Rise/Fall Times	140 $\pm$ 20 ns
Horizontal Sync Pluse Width	4.7 $\mu$ s $\pm$ 100 ns
Vertical Sync Pluse Width	3H
Equalizing Pluse Width	2.3 $\mu$ s $\pm$ 100 ns
Vertical Serration Pluse Width	4.7 $\mu$ s $\pm$ 100 ns
Vertical Blanking Period	20H + 1.5 $\mu$ s
Color Burst	
Amplitude	286 $\pm$ 14.3 mVp-p
Number of Cycles	9
Rise/Fall Times	300+200 ns, or 300-100 ns
SCH Phase	$\pm$ 10 $^\circ$

<b>Composite Sync</b>	
Amplitude	4 $\pm$ 0.2 V into 75 $\Omega$
Output Impedance	75 $\Omega$
Polarity	Negative
Timing	$\pm$ 100 ns, compared with black burst
Rise/Fall Times	140 $\pm$ 20 ns
Number of Outputs	1
<b>Subcarrier</b>	
Amplitude	2 $\pm$ 0.2 Vp-p into 75 $\Omega$
Output Impedance	75 $\Omega$
Frequency	3.579545 MHz $\pm$ 10 Hz
Phase	$\pm$ 10 $^\circ$ , compared with black burst
Number of Outputs	1
<b>SMPTE Color Bar Specifications</b>	
Full Amplitude	Conforms to SMPTE ECR1-1978 standards.
Number of Outputs	1 Vp-p $\pm$ 20 mVp-p into 75 $\Omega$
<b>Analog Audio Tone</b>	
Frequency	1 kHz $\pm$ 100 Hz
Output Waveform	Sine Wave
Output Amplitude	0 $\pm$ 0.5 dBm, or 4 $\pm$ 0.5 dBm, selectable by internal switching
Output Impedance	600 $\Omega$ , balanced
Output Connector	XLR type (3-pin), cannon
Number of Outputs	2
<b>Others</b>	
Power Requirements	100, 120, 220, 240 VAC, 50/60 Hz, 20 Wmax. selectable by internal wiring
Size and Weight	426 (W) $\times$ 44 (H) $\times$ 400 (D) mm, 6 kg 16 3/4(W) $\times$ 1 3/4(H) $\times$ 15 4/5(D) in., 13.3 lbs
Environmental Conditions	Temperature: 0 to 35 $^\circ$ C Humidity: $\leq$ 85 % RH (without condensation)
Spec-Guaranteed Accuracy	Temperature: 0 to 40 $^\circ$ C Humidity: $\leq$ 85 % RH (without condensation)
Operating	Temperature: -10 to 50 $^\circ$ C
Storage	Temperature: -10 to 50 $^\circ$ C
<b>Accessories</b>	Rack support .....1 set Power cord .....1 Instruction manual .....1

### 410BB REAR PANEL





PAT. PEND.

### ■5835 REAR PANEL

## Lissajous Display of Stereo Audio Signals Display with LED of Stereo Polarity Discrimination

The 5835 is a Stereo Audio Monitor that provides a lissajous pattern display of stereo audio signal on a CRT screen, enabling monitoring of the phase and level of the signal.

The lissajous pattern display of the stereo signal is provided with the left and right axes inclined at 45 degrees, enabling a good visual presentation of audio effects such as broadening and apparent position.

The 5835 features a stereo polarity discrimination function, a spot killer, and two Cannon-type inputs, making it ideal for use in not only program editing, but in checking of transmission equipment as well. All this makes the 5835 a useful stereo audio monitor for broadcast, production, and recording studios or remote pickup applications as well.

### FEATURES

- Parallel-connected male and female type XLR Cannon connectors are provided as standard for the balanced input configuration, enabling direct monitoring the lines required in broadcasting, production, and recording studios, or remote pickup applications.
- A stereo polarity discrimination function (patent pending) enables easy extraction and screen display of the audio signal during editing of commercial tapes, and when monitoring the output waveform from a broadcast stereo signal, thereby greatly simplifying the task of checking the phase of the stereo signal.
- The 5835 is housed in an standard EIA half-rack size cabinet, simplifying rack mounting and use in systems in combination with other equipment.
- A 150 mm post-acceleration (12 kV) type CRT ensures a bright display.
- The scale-illumination lamp can be replaced easily from the front panel.
- A spot killer blanks the trace with no signal applied to prevent burn-in of the CRT phosphor.

### 5835 SPECIFICATIONS

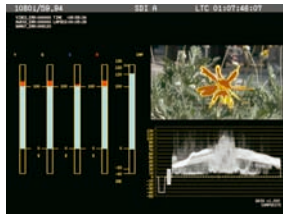
<b>CRT</b>	
<b>Type</b>	Rectangular, 150 mm
<b>Accelerating Potential</b>	Post acceleration 12 kV
<b>Effective Display Area</b>	100 (H) × 75 (V) mm
<b>Scale Illumination</b>	Adjustable on the front panel
<b>Beam Rotator</b>	Adjustable on the front panel
<b>Graticule</b>	External graticule with phase graticule
<b>X, Y-Axis</b>	
<b>Input Connector</b>	Two types input. L and R Rear cannon connector XLR-3-31, XLR-3-32 (First earth, second hot, third cold)
<b>Input Impedance</b>	Balanced input. more than 20 kΩ, changing to 600 Ω in internal
<b>Full Scale Input</b>	At 775 mVrms input for L and R Full scale display in CRT (Y axis: L=R) (At CAL'D, RANGE 0 dB)
<b>Bandwidth</b>	20 Hz to 20 kHz ±0.5 dB
<b>Phase Difference</b>	20 Hz to 20 kHz ±1°
<b>Gain Adjustment</b>	RANGE (-20 dB, 0 dB, +10 dB) VARIABLE (approx. ±10 dB)
<b>Stereo Polarity</b>	An LED display lights yellow when stereo signal is in reversed phase (L-R). The LED hold time is a minimum of approximately 5 seconds.
<b>Calibration</b>	When the range is calibrated, a 1 kHz sine signal is input to the left and right channels enabling rotation adjustment and checking of gain.
<b>Z Axis</b>	
<b>Spot-Killer</b>	The trace is blanked in the no-signal condition.
<b>Front Panel Operation</b>	POWER, INTEN, FOCUS, ILLUM, ROTAT, X-POSITION, Y-POSITION, RANGE, VARIABLE, STEREO POLARITY
<b>Power Requirements</b>	100, 120, 220, 240, VAC, 50/60 Hz Approx. 35 Wmax. (set at the factory before shipping)
<b>Dimensions and Weight</b>	215 (W) × 132 (H) × 429 (D) mm, Approx. 7 kg 8 1/2 (W) × 5 1/4 (H) × 16 3/4 (D) in., Approx. 15.4 lbs
<b>Accessories</b>	Power cord .....1 Spare illumination lamp .....2 Scale filter (for X-Y) .....1 Screw, rack mounting (inch size) .....2 Cover/Inlet stopper .....1

## Overview of the 5 Bar Display

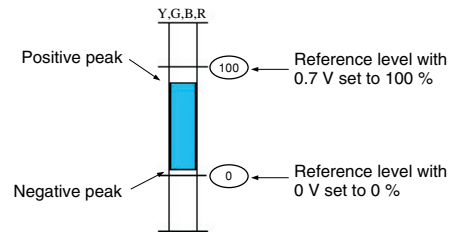
### 5 Bar Display Enables the Simultaneous Observation of Digital Broadcasts and Composite Levels

In the 5 bar display, video signal peak levels can be displayed instead of vectors. Five different bars are used to simultaneously display five different levels: luminance (Y), green (G), blue (B), red (R), and composite (COMP). The 5 bar display functions as a mode of the vector display. It is viewable as an alternate display under the vectorscope menu.

The G, B, R, and COMP bars are converted from the SDI Y, C<sub>B</sub>, and C<sub>R</sub> signals using matrix calculation.

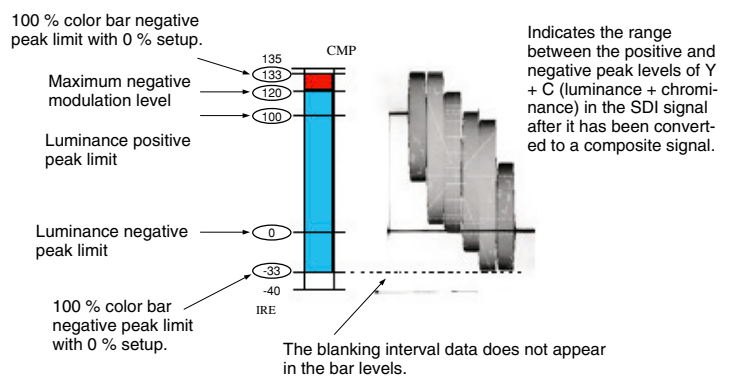


### Contents of the Component Bar Display



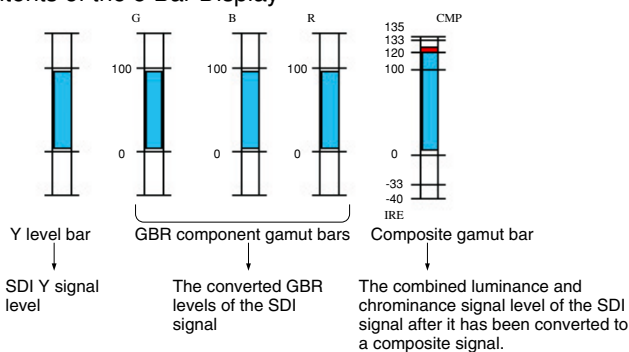
Indicates the range between the negative and positive peak levels

### Contents of the Composite Bar Display



### Bar Display Details

#### Contents of the 5 Bar Display



## Overview of the SDI-EXT REF Phase Difference Display

### SDI-EXT REF Phase Difference Display

#### Overview

The SDI-EXT REF phase difference display shows the phase differences between an SDI signal and an external sync signal (EXT REF).

#### Features

Graphic and Numeric Displays of SDI and External Sync Signal (EXT REF) Phase Differences

Traditionally, the most common SDI phase adjustment method was to determine the phase difference by switching between an internal and external sync signal and observing the waveform

shift. However, you can view phase differences and adjust phases more easily by using the SDI-EXT REF phase difference display.

**Relative SDI Signal Phase Differences Are Displayable**  
 By setting a particular SDI-EXT REF phase difference to zero, you can display relative SDI signal phase differences.

**Store Up to Eight Different Phase Differences**  
 You can store up to eight different phase differences. This allows you to store up to eight different switcher SDI signal phases.

### SDI-EXT REF Phase Difference Display

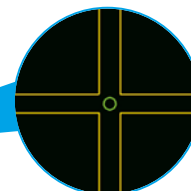
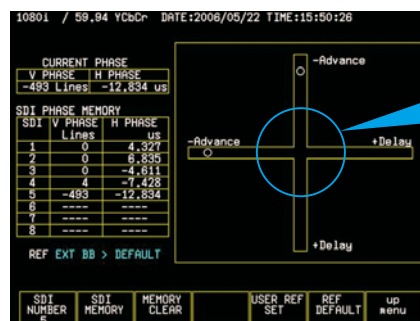
● A feature that shows the phase differences between SDI and external sync (EXT REF) signals.

#### Numeric Display

The current phase differences between the applied SDI and EXT REF signals are indicated numerically under CURRENT PHASE.

#### Phase Difference Log

You can store up to eight sets of measured values. This is useful in cases such as when you use a device such as a switcher to change inputs and match phases.



#### Graphic Center

The V marker turns from white to green when it is in the center. The H marker turns from white to green when it is within ±3 clocks of the center.

● You can readily determine the phase difference between an SDI and external sync (EXT REF) signal through graphic and numeric phase difference representations. You can also determine the phase differences between different SDI signals by setting the difference for one signal to zero.

● You can record up to eight phase differences. You can quickly determine the phase differences between multiple inputs.



**CiNELiTE II (option)** LEADER ELECTRONICS Brings You a New Way of Monitoring Waveforms Patent pending

**CINELITE**

A feature that allows you to put the cross bars on any location of the picture display and view the luminance, RGB levels, and relative exposure at that point.

■ **F-Stop Display Mode (relative exposure)**

You can easily and accurately measure exposure values directly from the camera signal. This feature is fundamentally different from conventional spot measurement. It is especially useful for making lighting arrangements when filming.

F-stop display based on the active measured position and the 18% reference set



Reference position

Active Measured

F-stop value display based on the reference position and the 18% reference set

F-stop value display based on the difference between the reference position and the active measured position

■ **RGB 255 Display**



■ **RGB % Display Mode**



■ **LUMINANCE % Display Mode**



**CINEZONE**

You can achieve a flawless picture when filming. This feature is especially useful for making lighting arrangements. You can easily and accurately confirm dark areas with approximately 5% luminance, areas with approximately 45% of the luminance of the film subject, and bright areas with luminances of 80% or more.

■ **CINEZONE Display**



<b>UPPER%</b>	<b>LOWER%</b>
99.0	5.0

■ **Normal Display**



# OPTIONAL ACCESSORIES

Useful for incorporating video equipment system

**LR 2404A**  
Cabinet

without handle ⚠

**LR 2427B**  
Cabinet

with handle ⚠

**LR 2751-I**  
Rackmount adapter

For LV 5380

**LC 2126**  
Metal Cabinet

For LV 5750

**LH 2139**  
Viewing Hood

A must for outdoor use

For LV 5750

**LC 2127**  
Tripod Mounting Plate

For LV 5750

**LC 2128**  
Front cover

**LP 1960**  
AC Adapter

For LV 5380, LV 5330, LT 4400, LV 5750, LV 7700, LV 7720

**LI 2306** (A set of 5 pcs.)  
Illumination lamp

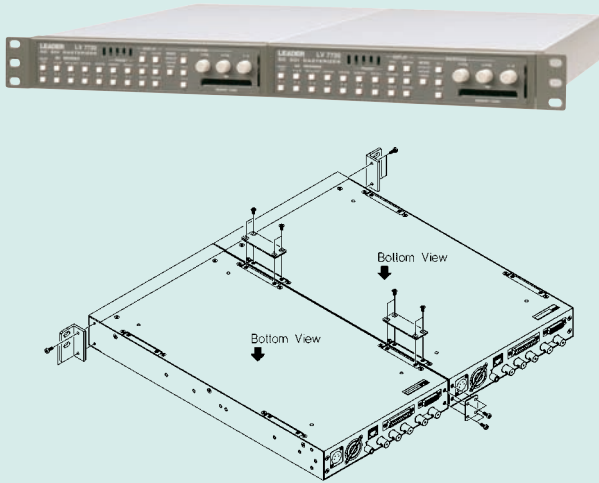
**LI 2307** (A set of 2 pcs.)  
Illumination lamp

**LI-2308** (LED)  
Illumination lamp

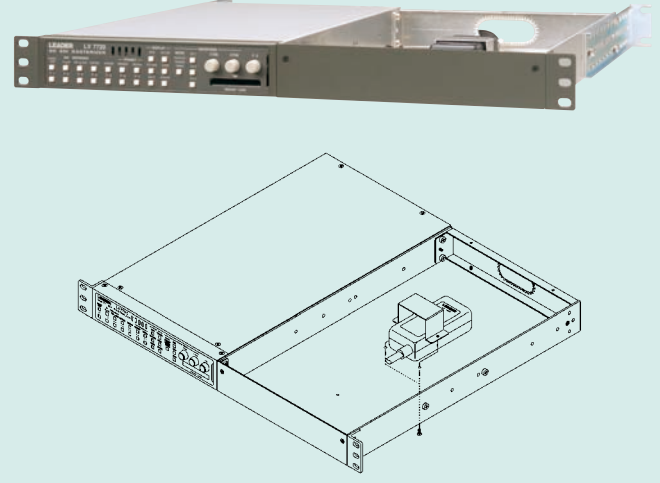
# OPTIONAL ACCESSORIES

## Dedicated Rack Mount Adapter (Sold Separately)

**LR 2477**  
Rackmount adapter



**LR 2480**  
Rackmount adapter



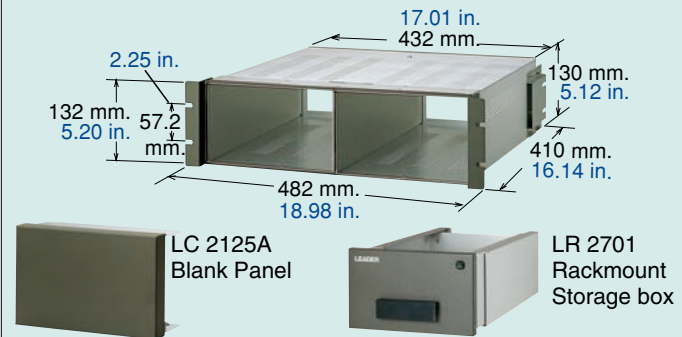
**LR 2750-I**  
Rackmount adapter



For LV 5750

**LR 2700A-I**  
Rackmount adapter

EIA standard, inch size



Model	Product Name	Applicable Model
LR 2700A-I	Rackmount adapter	LV 5800, LV 5152, 5212, 5222, LV 5700A, LV 5750, 5835, 5850V, 5860V, 5861V
LR 2701	Rackmount Storage Box	LR 2701 is designed to be appropriated for the storage box LR 2700I/AI, Rackmount Adaptor
LR 2750-I	Rackmount adapter	LV 5750 only
LR 2751-I	Rackmount adapter	LV 5380 only
LR 2404A	Cabinet (without handle)	LV 5800, LV 5700A, LV 5152, 5212, 5222
LR 2427B	Cabinet (with handle)	
LR 2477	Rackmount adapter	2 units of LV 7700/LT 4400 fit in LR 2477
LR 2480	Rackmount adapter	One unit of LV 7700 or LT 4400 fit in LR 2480 (Not for 2 units)
LI 2306	Illumination lamp	Replacing with a lamp for 5222, 5850V, 5860V, etc.
LI 2307	Illumination lamp	Replacing with a lamp for 5835
LI 2308	Illumination lamp (LED)	Replacing with a lamp for 5850V, 5860V
LC 2128	Front cover	LV 5700A, LV 5750
LR 2125A	Blank Panel	LR 2700A-I, LR 2750-I

\* White CRT is standard.

\* Description and specifications in this catalog are subject to change without previous notice.

\* ⚠ Caution: Use a cabinet with the specified model number. If you use a cabinet that has not been specified, ventilation will not take place properly, and damage to the instrument, smoke emission, or fire may result.

# ACCESORIES For Video Test-Instruments

## Dedicated Rack Mount Adapter (Sold separately)

**Rack Mount Adapter**

**LR 2751 I** RoHS



For : LV 5380

**Rack Mount Adapter**

**LR 2752** RoHS



for : LV 5330

**Blank Panel (Sold Separately)**

**LC 2129** RoHS



For : LR 2751I

**Blank Panel (Sold Separately)**


**LC 2130** RoHS



for : LR 2752

**Handle**

**LH 2140** RoHS




for : LV 5380

※ The LV 5380 is sold separately.

**Rack Mount Adapter**


**LR 2481** **For one Unit** RoHS



For : LV 7330, LT 4400

**Rack Mount Adapter**

**LR 2478** **For two Units** RoHS



For : LV 7330, LT 4400

Model	Product Name	Applicable Model
LR 2751-I	Rackmount adapter	LV 5380
LR 2752	Rackmount adapter	LV 5330
LR 2478	Rackmount adapter	2 units of LV 7330/LT 4400 fit in LR 2478
LR 2481	Rackmount adapter	One unit of LV 7330 or LT 4400 fit in LR 2481 (Not for 2 units)
LC 2129	Blank panel	LR 2751-I only
LC 2130	Blank panel	LR 2752 only
LH 2140	Handle	LV 5380

## Also available following accessories



Battery attachment for LV 5330 and LV 5380  
Model No. : C-EB(XLR)  
Model Name : External Battery Terminal (V-Mount : IDX)

There are two kinds of battery adapters for LV 5330 and LV 5380. Please refer to the following table for the difference.

Model No.	Battery Status Display	Installation
Battery Mount IDX (V-Mount)	Yes	Factory
C-EB(XLR)	No	Customer



Carrying Case for LV 5330  
Model No. : i0812-2790  
Model Name : Carrying case for LV 5330

**SPECIFICATION CHANGES:** LEADER ELECTRONICS CORP. reserves the right to discontinue the sale of instruments and/or change the specifications of instruments at any time without responsibility for the incorporation of new features in the instruments already sold.

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# LEADER



## SPECIFICATION CHANGES:

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## ORDERING INSTRUCTIONS:

When inquiries or orders are made, please specify operating voltage and AC frequency of the instrument the VOLTAGE of the power supply etc. of the instruments to be used. The instruments can be furnished for AC line voltages of 100, 120, 220, or 240 volts and designed to operate at the voltages which are within  $\pm 8\%$  of the rated line voltage.

## ENVIRONMENTAL CONDITIONS:

Our products can be used under the following conditions unless stated otherwise.

<Operating range>

1. Temperature: 0 to 40 °C

2. Humidity:  $\leq 85\%$  RH (without condensation)

## POWER REQUIREMENTS:

"VA" in the "Power Consumption" indicates the apparent power.



About Green-Leaf Mark

Models marked with "Green Leaf" meet the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (Directive 2002/95/EC RoHS).



EU WEEE Directive

The EU WEEE Directive applies to this product and its accessories. When disposing of this product or its accessories, follow the regulations in your country or region. (WEEE Directive: Waste Electrical and Electronic Equipment)

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AGENT