LEADER

Technology Innovator

VIDEO TEST INSTRUMENTS

CATALOG 2008-2009 Vol.1

LEADER ELECTRONICS CORP.

COMPANY PROFILE

LEADER 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 increasing 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.

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Factory 2
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Headquarters

Factory 1

Headquaters 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.

CERTIFIED JQA MANAGEMENT SYSTEM
ISO 9001
ISO 14001
JQA-0733
JQA-EM5777

ABC Studio in New York

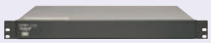
Fuji Television Wangan Studio in Tokyo

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	○	○	LV58SER01A	○ (LV7700 only)	○
	HD Analog Component					
	SD-SDI	○	○	LV58SER01A	○	○
	PAL/NTSC Component					
	PAL/NTSC Composite			LV58SER03		
	DVB ASI			LV58SER04		
Waveform Monitor		○	○	LV58SER01A	○	○
Read Out (Cursor Measurement)		○	○	LV58SER01A	○	○
Picture Display		○	○	LV58SER01A	○	○
Vector Display		○	○	LV58SER01A	○	○
Digital Audio AES/EBU Output				LV58SER40A		
Lissajous Display		○		LV58SER40A	○	○
Audio Monitor		○	○	LV58SER40A	○	○
Conversion matrix Y,P_B,P_R to GBR		○	○	LV58SER01A	○	○
Digial Data Dump		○	○	LV58SER01A	○	○
Equivalent Cable Length Measurement				LV58SER01A	○	○
Gamut Error (5 Bar)		○	○	LV58SER01A	○	○
On Screen Gamut Display		○	○	LV58SER01A		
Full-Line Selector		○	○	LV58SER01A/SER03	○	○
Eye Pattern				LV58SER02		
SCH Phase Measurement				LV58SER03		
Cinelite (PATENTED)		Option	○	Option		Option
Cinezone (PATENTED)		Option	○	Option		
Screen Capture		○	○	○	○	○
Frame Capture				LV58SER01A		
Ethernet with Telnet & SNMP				○	○	○
Universal AC Power Supply		12 V DC (10 to 18 V)	12 V DC (10 to 18 V)	○	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		○	○	○	○	○
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	○		○
	SD-SDI	SD/SDB	○		○ (525)
	PAL/NTSC Analog Composite	CS		NTSC	
Embeded Audio		○	○		○
AES/EBU Audio		DA			
Genlock		GLA	○		
Monoscope Pattern		○			
Moving Pattern		○	○		
Bitmap Logo Mark with Pattern		○			
ID Character		○	○		○
Analog Tri Level Sync Signal		GLA/BL	○		
Black Burst / HD Black		GLA/BL	○	○ (BB)	
Color Still Picture		OP70			
Error Monitor Function					○
Cable Length Measurement					○
Pathological & Check Field		○	○		
Universal AC Power Supply		○	○		○
Battery Powered					○
CE		Upon request	Upon request		
RoHS		○	○		
Page		38 to 41	42, 43	46	27

	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
○							
	○						
○							
	○			○			
OP73A		NTSC	PAL	○	○	NTSC	Analog Audio
○	○	○	○	○			
○	○			○	○		
○	○			○			
○	○				○	○	
○							
○							○
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○	○						
○							
○							
○							
○	○						
OP70							
OP73A							
Option							
○							
○							
○	○			○	○		
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

MULTI SDI MONITOR

LV 5380

LEADER

New

CE
Upon request

RoHS

HD-SDI

SD-SDI

8.4 Inches

4U size

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_B, C_R 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	

Audio Display	
Compliant Standard	SMPTE 299M (HD-SDI), SMPTE 272M (SD-SDI)
Quantization	20 bits
Synchronization	Must be synchronized to all video clocks
Channel Selection	Two groups (eight channels in the same SDI channel) selectable
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 Reclocks and transmits the selected SDI input signal
Output Impedance	75 Ω
Output Voltage	800 mVp-p ± 10 %
Maximum Return Loss	≥ 15 dB 5 MHz to the serial clock frequency
External Reference Input[*1]	
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_B, C_R signals into RGB and displays the result
Pseudo-Composite Display	Digitally converts component signals into composite signals and displays the result
Channel Assignments	The G, B, R order or R, G, B order selectable for RGB conversion display
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_B, C_R 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
CB, CR 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	Can display thumbnails of picture displays and audio level meters
5 Bar Display	
Bar Display	Displays the peak levels of Y, R, G, B, and composite
Channel Assignments	RGB or GBR selectable
Scale	mV or % selectable
Error Level	Based on gamut error level and composite gamut error level settings, user settable.

Picture Display	
Color Temperature	6500K or 9300K selectable
Quality Adjustment	Brightness, contrast, gain, bias, aperture
Display Size	Fit, full frame, real, and 4:3 full screen
Color	R, G, or B can be turned off separately. Variable chroma gain and monochrome available.
Frame Rate	Displays by converting the frame rate using the internal sync signal
Aspect Marker Display	4:3, 13:9, 14:9, or 16:9 selectable
Aspect Marker Format	Line, shadow (three types), black
Safety Marker Size	ARIB TR-B4, SMPTE RP-218, or user-defined selectable
Line Select	Displays a mark on the selected line
Gamut Error Display	Displays gamut error locations over the picture
Thumbnail Display	Displays thumbnails of audio level meters
Embedded Audio Display	
Lissajous Display	
Display Channels	2ch (single) or 8ch (multi) selectable
Display Mode	X-Y or L-R selectable
Level Meter Display	
Display Channels	2ch or 8ch display selectable
Meter	60 dB peak level, 90 dB peak level, or average selectable. (Peak level meters include setable peak hold indication.)
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	
Event Log	Stores up to 1,000 events
Data Dump Display	Dumps data by serial data sequence or by channel
Data Output	Can be saved in text format to USB memory or to a PC
Phase Difference Display	
Display	Displays numerically and graphically the phase difference between an SDI signal and the external sync signal
Display Range	
Vertical	±1 field (for interlace) ±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	
CRC Error	Detects transmission errors of HD-SDI signals
EDH Error	Detects transmission errors of SD-SDI signals
Gamut Error	
Gamut Error	Detects gamut errors
Detection Range Upper Limit	90.0 to 109.4 %
Lower Limit	-7.2 to +6.1 % (0.1 % steps)
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	I
Pollution Degree	2
Power Requirements	10 to 18 VDC, 30 W max.
Dimensions	215 (W) x176 (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 accurary between external reference and internal signal is ±1 clock cycle.

■Cinelite II (Option)

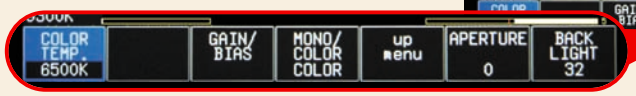
Cinelite

Cinezone

Picture Display

Versatile Picture Display

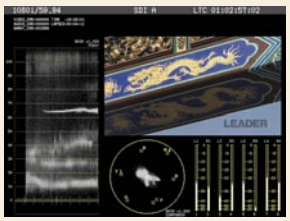
Picture adjustment options include color temperature (6500K/9300K), brightness, contrast, gain, bias, and aperture. You can switch the R, G, and B signals on and off.



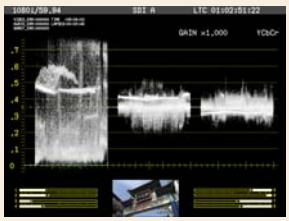
Picture adjustment menu

Picture and waveform time axis correspondence

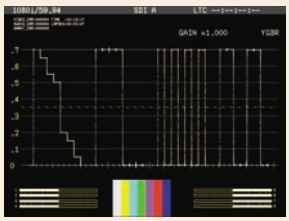
Multi-Screen Display



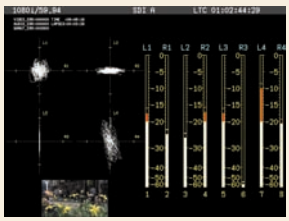
Waveforms



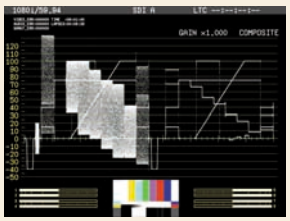
Y RGB Display



Audio Display



Composite Display

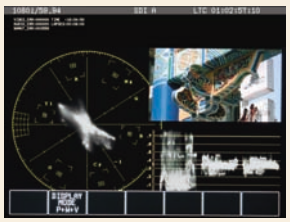


5 Bar/Picture/Gamut

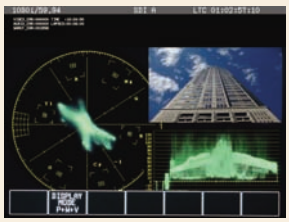
Gamut Error Display

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

Video Waveform Color Selection



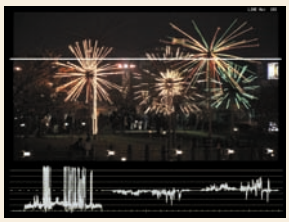
White display



Green display

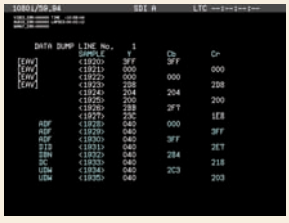
Various Markers

Line Selection



Phase Difference Display

Data Dump



Status

Aperture

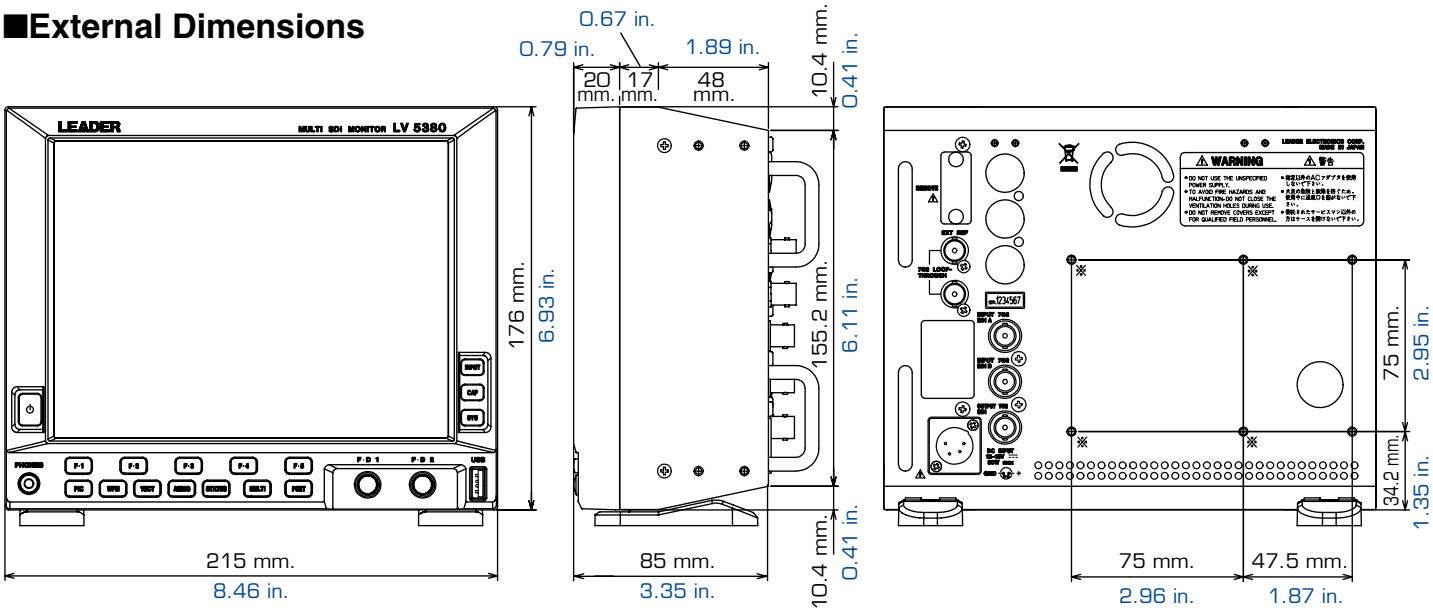
ON OFF

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 I Rack Mount (sold separately; tiltable)
LC 2129 Blank Panel (sold separately)

■AC Adapter LP 1960 (sold separately)

MULTI SDI MONITOR

LV 5330

LEADER

HD-SDI

SD-SDI

6.5 Inches

1.3 kg

CINELITE II

New

RoHS

The design is subject to change.

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_B C_R, 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

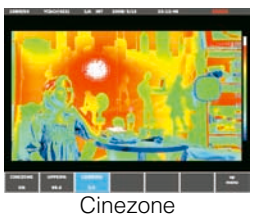
Video Formats and Corresponding Standards

	Format	Corresponding Standard
1	1080i/60	SMPTE 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	SMPTE RP211, 292M
10	1080PsF/29.97	
11	1080PsF/25	
12	1080PsF/24	
13	1080PsF/23.98	
14	720p/60	SMPTE 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	SMPTE 259M
23	625i/50	

Other Standards	
Ancillary Data Standard	SMPTE 291M
Embedded Audio Standard	SMPTE 299M (HD-SDI), SMPTE 272M (SD-SDI)
Format Setting	
Format Setting	Auto or manual setting from the supported formats
Sampling Frequency	74.25 MHz (HDTV), 74.25/1.001 MHz (HDTV), 13.5 MHz (SDTV)
External Synchronization	Auto setting from supported formats
Input/Output Connectors	
SDI Input	
Input Connector	Two BNC connectors (switching between A and B)
External Reference Input	
Input Signal	Tri-level sync or NTSC/PAL black burst
Input Connector	One pair of BNC connectors (15 kΩ passive loop-through) *Phase difference accurary between external reference and internal signal is ±1 clock cycle.
SDI Output	
Output Connector	One BNC connector (reclocks and transmits the selected SDI input signal)
Output Voltage	800 mVp-p±10 % outputs (75 Ω)
Headphone Output	
Output Signal	Extracts and outputs the embedded audio signal.
Sampling Frequency	Supports 48 kHz (must be synchronized to the video signal)
Output Connector	One stereo miniature jack, 32 Ω (16 to 600 Ω)
USB Memory	
Function	Stores screen captures, error logs, preset data, and data dumps, Also used for Firmware update.
Remote Control	
Function	Recalls presets, transmits errors, controls the tally indicator
Connector	D-sub 15-pin female
Ethernet	
Function	Enables remote control from an external computer and data transmission
Type:	10BASE-T/100BASE-TX auto switching, one RJ-45 jack
Viewfinder Input	
Function	Monitors composite video signals, picture only.
Input Signal	NTSC/PAL VBS signal
Input Connector	One BNC connector
Picture Display	
HDTV Display	Displays by sampling pixels
SDTV Display	Displays by interpolating pixels
Display	Color or black and white selectable
Frame Rate	Displays by converting the frame rate using the internal sync signal
Marker Display	Center marker, aspect marker, safe title marker, safe action marker
Adjustment:	Brightness, contrast, chroma, aperture
Cinelite Display	
f-STOP:	Measures relative brightness in f-stops
Measurement points	Three points specified using the cursor
Reference	Uses an object with an 18 % reflectance as reference
%DISPLAY	Displays luminance percentage (LEVEL%), RGB percentage (RGB%), and RGB numeric values
Measurement points	Three points specified using the cursor
Measurement areas	1x1, 3x3, 9x9
GAMMA	
0.45	Reference gamma
USER 1-3	User-defined gamma
USER A-E	Gamma downloaded from USB memory
On Picture Level Indicator	Switches the screen to black and white and displays the set luminance level in green
Cinezone Display	
Screen	Maps colors based on luminance levels. Linear or step selectable.
UPPER	Can be set from -6.3 % to 109.4 %. Displays white when the level is above the set level.
LOWER	Can be set from -7.3 % to 108.4 %. Displays Black when the level is below the set level.
Display Form	
Display Size	6.5-inch color XGA. Effective area 1024 x 768 dots
1 Screen Display	Picture display, Cinelite display, Cinezone display, waveform display, vectorscope display, status display, viewfinder display
2 Screen Display	Picture and waveform displays, waveform and vectorscope displays, waveform and picture displays, waveform and audio level displays, audio numeric and bar displays
4 Screen Display	Audio level display or status display selectable in addition to waveform display, vectorscope display, and picture display
Waveform Display	
Waveform Operation	
Display Modes	Overlay and parade
Timing Display	Displays by calculating Y-C_B and Y-C_R Uses bowtie signals (authorized by Tektronix, Inc.)
EAV-SAV period	Show or hide selectable
G, B, R Conversion	Converts Y, C_B, C_R signals into G, B, R and displays the result
Pseudo-Composite Display	Digitally converts component signals into composite signals and displays the result
Channel Assignments	The G, B, R order or R, G, B order selectable for G, B, R conversion display
Vertical Axis	
Gain	x1, x5, or variable selectable
Variable Gain	x0.2 to x2.0 at the x1 setting, x1.0 to x10.0 at the x5 setting
Amplitude Accuracy	≤ ±0.5 %
Frequency Characteristics HDTV	
Y Signal	≤ ±0.5 % 1 to 30 MHz
C_B, C_R signals	≤ ±0.5 % 0.5 to 15 MHz
Frequency Characteristics SDTV	
Y Signal	≤ ±0.5 % 1 to 5.75 MHz
C_B, C_R signals	≤ ±0.5 % 0.5 to 2.75 MHz
Horizontal Axis	
Line Magnification	x1 or x10 selectable
Field Magnification	x1, x20, or x40 selectable
Cursor Measurement	
Horizontal Cursors	2 (REF and DELTA)
Vertical Cursors	2 (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
Marker Display	
75 % Marker	Indicates the value corresponding to the peak chrominance signal of the 75 % color bar.
Vectorscope Display	
Scale	75 % or 100 % selectable
Gain	x1, x5, IQ-MAG, or variable selectable
Variable Gain	x0.2 to x2.0 at the x1 setting, x1.0 to x10.0 at the x5 setting
Amplitude Accuracy	≤ ±0.5 %
IQ Axis	Show or hide selectable
Pseudo-Composite Display	Digitally converts component signals into composite signals and displays the result
5 Bar Display	
Bar Display	Displays the peak levels of Y, R, G, B, and composite
Embedded Audio Display	
Display Channels	8-channel simultaneous display
Meter	60 dB peak level or 90 dB peak level
Group Selection	Select any two groups from groups 1, 2, 3, and 4
Channel Mapping	Mapping to L, R, SL(S), SR, C, LFE, RL, RR
Viewfinder	
Display Size	Full-screen display
Adjustment	Brightness, contrast, chroma, aperture
Status	
Data Dump Display	Dumps data by serial data sequence or by channel
Event log	Stores up to 1,000 events
Data output	To USB memory or over an Ethernet network
Screen Capture	Captures the displayed screen
Waveform Comparison	Superimposes the input signal over an image from memory.
Presets	30
Other Display Features	
LCD	6.5-inch color LCD
Backlight brightness	High or low selectable
Screen Display	Format, color system, date, time
Panel LED Illumination	Illuminates all keys
Environmental Conditions	
Operating Temperature	0 to 40 °C
Operating Humidity Range	≤ 85 %RH (no condensation)
Operating Environment	Indoors, or outdoors with no rain
Overvoltage Category	I
Pollution Degree	2
Power Requirements	12 VDC (10 to 18 V), 18 Wmax.
Dimensions and Weight	215 (W) x128 (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
Accessory	Instruction manual.....1
Option Sold Separately	AC adapter LP 1960

■Cinelite II

Cinelite



Cinezone

MULTI MONITOR

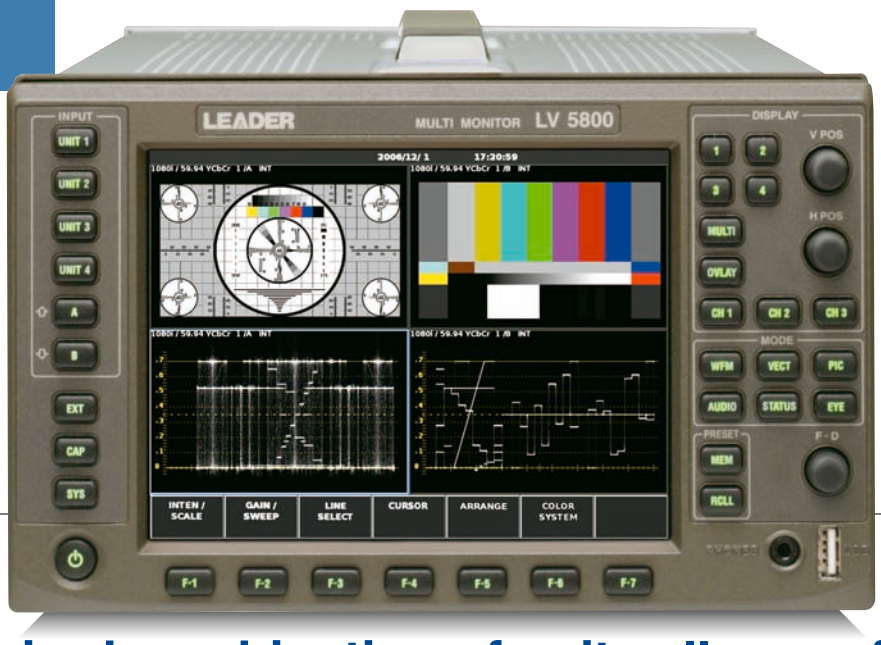
LV 5800

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

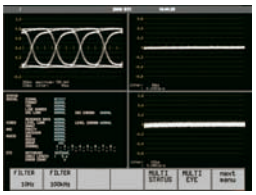
LV 5800 SPECIFICATIONS

LEADER

Slot	
Number of Slots for Input	4
Number of Slots for Output	2
LCD Display	
LCD Screen Type	6.3-inch TFT color
Display Format	XGA Effective area 1024 x 768 dots
Frame Frequency	59.94 MHz (The input signal and the display clock signal have not been synchronized.)
Backlight Brightness	Selects HIGH or LOW
Auto Shutoff	Sets the time for the backlight to shutoff automatically.
Display Screen	1-screen display, 2-screen display, 4-screen display
Screen Capture	
Capture	Image capture by the still picture of the display screen
Waveform Comparison	Superimposes the input signal over an image from memory.
Media	Internal memory (RAM) or a USB memory
Format	TIF, DPX
Data Output	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.
Presets	
Number of Presets	60
Media	Internal memory (RAM) or a USB memory
Recall Method	Through the front panel, remote connector, and Ethernet network (Switches 8 points and 60 points for recalling through the remote connector.)
Copy	Copies presets collectively to the USB memory or from the USB memory to the LV 5800.
External Reference Input	
Input Signal	Tri-level sync signal or NTSC/PAL black burst
Input Connector	BNC connector 1 system 2 connectors
Input Impedance	15 kΩ Passive Loop-through
Input Return Loss	≥30 dB
Maximum Input Voltage	±5 V (DC + peak AC)

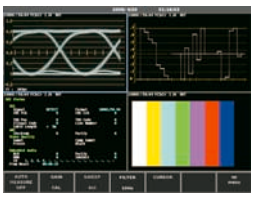
External Control Connector	
USB Connector	
Specifications	USB2.0
Function	Only a large capacity memory device is supported.
Ethernet Connector	
Corresponding Standard	IEEE802.3
Input/Output Connector	RJ-45
Function	Remote control from an external computer and monitoring of errors, etc.
Type	10BASE-T/100BASE-TX
Remote Connector	
Function	Recalling of presets, monitoring of errors
Control Signal	LV-TTL level (LOW active)
Control Connector	25-pin D-sub (female)
Headphone Output	
PHONES connector	Miniature jack (stereo)
Function	Like LV 58SER40A (DIGITAL AUDIO), it is effective when the unit that has audio decoding function is inserted.
Environmental Conditions	
Operating Temperature	0 to 40 °C
Operating Humidity	≤ 85 % RH(without condensation)
Operating Environment	Indoor use
Operating Altitude	Up to 2,000 m
Overvoltage Category	II
Pollution Degree	2
Power Requirements	90 to 250 VAC 50 Hz/60 Hz, 150 Wmax.
Dimensions and Weight	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
Accessories	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

Multi



EX, LV 58SER01A 2, LV58SER02 1 sets are installed

EX, LV 58SER01A 2 sets are installed

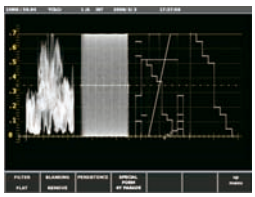


EX, LV 58SER01A/LV 58SER02 1 sets each are installed

4 input Picture

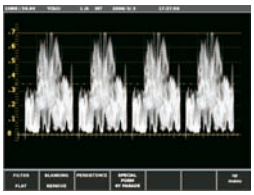
EX, LV 58SER01A 2 set are installed

Waveform

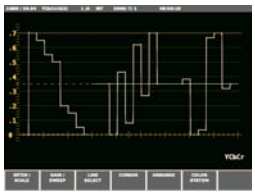


EX, LV 58SER01A 2 sets are installed

Wave form



EX, LV 58SER01A 2 set are installed (4Y PARADE)



EX, LV 58SER01A 1 set is installed

Vector

EX, LV 58SER01A 2 set are installed

Status

EX, LV 58SER01A 1 set is installed

Phase

EX, LV 58SER01A 1 set is installed

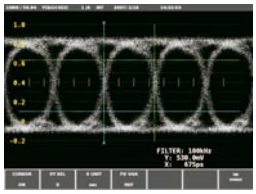
V-ANC

EX, LV 58SER01A 1 set is installed

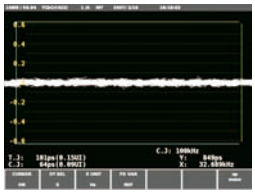
5 Bar

EX, LV 58SER01A 1 set is installed

EyePattern/Jitter

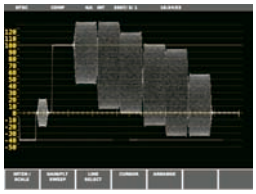


EX, LV 58SER02 1, LV 58SER 01A 1 set is installed



EX, LV 58SER02 1, LV 58SER 01A 1 set is installed

COMPOSITE

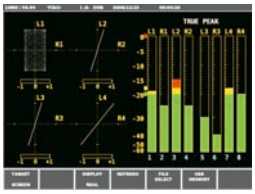


EX, LV 58SER03 1 set is installed

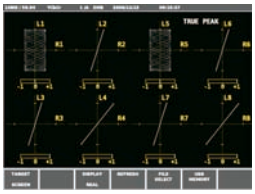
MPEG

EX, LV 58SER04 1 set is installed

Audio



EX, LV 58SER40A 1 set is installed



EX, LV 58SER40A 1 set is installed

Cinelite

Option

Cinezone

Option

LV 58SER01A SDI INPUT

Plug-In Unit for LV 5800

CINELITE II option

RoHS

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.

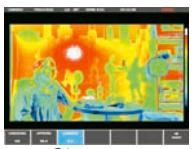
FEATURES

- **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_B,C_R 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	59.94	SMPTE 259M
		625	50	

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	
	12 bit	1080p	30/29.97/25/ 24/23.98	
		1080PsF	30/29.97/25/ 24/23.98	
		1080i	60/59.94/50	
Y,C_B,C_R 4:2:2	10 bit	1080p	60/59.94/50	
	12 bit	1080p	30/29.97/25/ 24/23.98	
		1080PsF	30/29.97/25/ 24/23.98	
		1080i	60/59.94/50	

Ancillary data standard	SMPTE 291M
Embedded audio standard	HD-SDI: SMPTE 299M SD-SDI: SMPTE 272M
Format Setting	Automatic setting
Input/Output Connector	
SDI Input	
Input Connector	BNC connector 2 connectors For single link A ch / B ch 2 systems For dual link link A / link B 1 system
Input Impedance	75 Ω
Input Return Loss	15 dB or more 5 MHz to serial clock frequency
Maximum Input Voltage	±2 V (DC + peak AC)
External Sync Signal Input	
Input Signal	Tri-level sync or NTSC/PAL black burst
Input Connector	BNC connector 1 system 2 connectors
SDI Output	
Output Connector	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
Output Impedance	75 Ω
Output Voltage	800 mVp-p ±10 %
Output Return Loss	15 dB or more 5 MHz to serial clock frequency
Waveform Display Function	
Waveform Operation	
Display Mode	
Overlay display	Displays component signals overlaid
Parade display	Displays component signals side by side
Gain Adjustment	x1 / x5 / variable
Blanking Period	Show / hide selectable
YC_BC_R→GBR conversion	Converts YC_BC_R signals into GBR and displays the result.
Pseudo-Composite Display	Digitally converts component signals into composite signals and displays the result.
Timing Display	Displays by calculating Y-C_B and Y-C_R Uses bowtie signals (authorised by Tektronix, inc.)
Channel Assignment	Selects GBR order or RGB order for the GBR conversion display
Line Select	Displays the selected line
Image Quality Adjustment	Brightness adjustment
Vertical axis	
Sensitivity	V scale 0 V to 0.7 V, -0.3 V to 0.7 V % scale 0 % to 100 %, -50 % to 100 %
Gain	x1, x5, and variable
Variable Gain	x0.2 to x10
Amplitude Accuracy	±0.5 %
Frequency Response HDTV	
Y Signal	±0.5 % 1 MHz to 30 MHz
C_B, C_R Signal	±0.5 % 0.5 MHz to 15 MHz
Low-pass Attenuation	20 dB or more at 20 MHz
Frequency Response SDTV	
Y Signal	±0.5 % 1 MHz to 5.75 MHz
C_B, C_R Signal	±0.5 % 0.5 MHz to 2.75 MHz
Low-pass Attenuation	20 dB or more at 3.8 MHz
Horizontal Axis	
Line Display	
Display Format	Overlay: 1H, 2H Parade: 1H, 2H, 3H Timing: Y-C_B,Y-C_R 4Y Parade*1: 4H

Magnification	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.
Field Display	
Display Format	Overlay: 1V, 2V (2V display not allowed for progressive) Parade: 1V, 2V, 3V
Time Base Accuracy	Magnification: x1, x20, x40 ±0.5 %
Cursor Measurement	
Configuration	Horizontal cursors: 2 cursors (REF and DELTA) Vertical cursors: 2 cursors (REF and DELTA)
Amplitude Measurement	Measured in [%] and [V]
Time Measurement	Displayed in [usec] or [msec]
Frequency Display	Displays the frequency in which the time between cursors is considered a cycle.
Vectorscope Display	
Scale	Selects 75 % or 100 % (Using a color bar)
Gain	Selects x1, x5, IQ-MAG or variable
Variable gain	x0.2 to x10
Amplitude Accuracy	±0.5 %
IQ Axis	Selects show or hide
Pseudo-Composite Display	Digitally converts component signals into composite signals and displays the result. (the color matrix for HDTV signal is converted into SDTV)
Image Quality Adjustment	Brightness adjustment
Phase Difference Display	
Display	Displays the phase difference between the SDI signal and external sync signal numerically and graphically Holds and displays eight phase difference values being measured
Display Range	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.
Sync Signal	HD tri-level sync or black burst
Phase Difference Measurement of Dual Link(future support)	Displays phase difference between Link A and B with the number of the parallel reclock. (including ±1 clock error)
Picture Display	
HDTV Display	Displayed by sampling the pixels (8 bit RGB)
SDTV Display	Displayed by interpolating pixels (8 bit RGB)
Marker Display	Center marker 4:3 or 16:9 marker display Safe action marker display Safe title marker display
Gamut Error Display	On picture indication of gamut errors
Line Select	Displays the selected line as a marker
Image Quality Adjustment	GBR gain adjustment, Contrast adjustment, Brightness adjustment
Status Display	
Status Display of SDI Signal	
Signal Detection	Detects the presence or absence of SDI signals.
Format	Auto format Detection
Equivalent Cable Length Measurement	Converts the SDI signal attenuation into a coaxial cable length and displays the result.
Embedded Audio Channel	Displays the embedded audio channel number.
Error Detection of SDI signals	
CRC Error	Detects transmission error of HD-SDI signals.
EDH Error	Detects transmission error of SD-SDI signals.
TRS Error	Detects errors in the TRS position and protection bit.
Line Number Error	Line number errors in the HD-SDI signals are being detected.
Illegal Code Error	Detects data in the range of 000h to 003h and 3FCh to 3FFh outside the TRS or ADF header.
Embedded Prohibition Error	Detects the presence or absence of embedded audio at the embedded prohibition line.
Cable Length Meter Error	Detects the signal attenuation and displays the result.
Error Detection of Embedded Audio	
BCH Error	Detects transmission errors of embedded audio packets in the HD-SDI signal.
DBN Error	Detects sequential errors in audio packets.
Parity Error	Detects parity errors in audio packets embedded in HD-SDI dignals
Error Detection of Ancillary Data	
Checksum Error	Detects transmission errors in the ancillary data.
Parity Error	Detects parity errors in the ancillary data header.
Image Evaluation	
Gamut Error	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)
Composite Gamut Error	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)
Level Error	Detects Y C_B C_R 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_B C_R upper limit: -400 mV to 399 mV (1-mV resolution) C_B C_R lower limit: -400 mV to 399 mV (1-mV resolution)
Freeze Detection	Detects video freeze
Black Detection	Detects blackouts of the video signal

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

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

Supported Formats	
Data Rate	
HD-SDI	SMPTE292M 1.485 Gbps, or 1.485/1.001 Gbps
SD-SDI	SMPTE259M 270 Mbps
Eye Pattern	
Method	Equivalent time sampling method
Amplitude Accuracy	800 mV ±5 % for 800 mV input
Time Axis	2 / 4 / 16 Eye pattern Display
Time Axis Accuracy	±3 %
Jitter Filter	10 Hz HPF 100 Hz HPF 1 kHz HPF 100 kHz HPF
Jitter Detection	
Method	Phase detection method
Time Axis	H rate or V rate
Time Axis Accuracy	±3 %
Jitter Filter	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.)
Power Consumption	Supplied from LV 5800 20 Wmax.
Weight	0.4 kg, 0.9 lbs
Accessories	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

Measured Signal	Composite video signal (NTSC/PAL)
Supported Standards	SMPTE 170M and ITU-R BT.470
Input	
Composite Video	Select A or B
Input Connector	BNC connector
Input Impedance	75 Ω
Input Return Loss	≥ 30 dB (up to 6 MHz)
Maximum Input Voltage	±5 V (DC + Peak AC)
Output	
Composite Video	
Output Signal	Active
Output Connector	BNC connector 1 system 1 connector
Output Impedance	75 Ω
Output Amplitude	1 Vp-p ± 5 %
Frequency Characteristics	± 5 % 25 Hz to 5 MHz +5 % to -10 % 5 MHz to 5.6 MHz
Display	
WAVE Display	Waveform display
VECTOR Display	Vectorscope display
PICTURE Display	Picture display
Waveform Display Section	
Vertical Axis	
Sensitivity	V Scale (PAL) -0.3 V to 0.7 V IRE Scale (NTSC) -40 IRE to 100 IRE
Gain	Select x1 or x5
Variable Gain	≤ 0.2 to ≥ 2
Amplitude Accuracy	±1 %
Frequency Characteristics	
Composite Signal	±2 % 25 Hz to 5 MHz +3 % to -7 % 5 MHz to 5.6 MHz
Step Response (for 1 V full scale, flat, 2T pulse, and 2T bar)	
Overshoot	±2 %
Preshoot	±1 %
Ringing	±2 %
Pulse/Bar Ratio	±1 %
Vertical Tilt	±1 %
Filter	Luminance filter
DC Restorer	Clamp to the back porch (fixed)
Horizontal Axis	
Operation Mode	Overlay Displays only a single waveform
Display Format	
Line Display	1H or 2H
Line Magnification	Select x1, x10 or x20
Field Display	1V or 2V
Field Magnification	Select x1, x20 or x40
Time Base Accuracy	±1 %
Vectorscope Display Section	
Sensitivity	Select 75 % or 100 % Using a color bar
Gain	Select x1, x5, or IQ-MAG
Variable Gain	0.2 to 2
Phase Accuracy	±2 °
Amplitude Accuracy	±3 %
Phase Adjustment Range	360°
Setup (NTSC)	Select 0 % or 7.5 %
NTSC Display (PAL)	Select NTSC or PAL display
IQ Axis	Select show or hide
SCH	Displays the SCH value numerically
Status Display Section	
Display	Displays the phase difference between the composite signal and external sync signal numerically and graphically. Holds and displays eight phase difference values being measured.
Display Range	
V direction	±1/2 frame
H direction	±1/2 Line
Synchronization Signal	NTSC/PAL black burst signals
General Specifications	
Environmental Conditions	Conforms to the LV 5800
Power Consumption	Supplied from the LV 5800 9 Wmax.
Weight	0.25 kg, 0.5 lbs
Accessories	Instruction manual 1
Picture Display	(Conforms to the LV 5800)
Line Selector	(Conforms to the LV 5800)
Cursor Measurement	(Conforms to the LV 5800)
Amplitude Measurement	Measure in terms of [IRE] or [V]
Screen Capture	(Conforms to the LV 5800)

LV 58SER04 MPEG DECODER

Plug-In Unit for LV 5800

New

RoHS

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.*1
- **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*2 Digital (AC-3)*3, 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.*4
- **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.*5

*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

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

LV 5800 Platform Options

Decoding Function	
Video Formats:	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)
Audio Signals	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.
Video Signal Waveform Display Function	
Waveform Operation	
Display Mode	Overlay display (displays component signals overlaid) Parade display (displays component signals side by side)
Y, C_B, C_R to G, B, R Conversion	Converts Y, C_B, C_R signals into G, B, R and displays the result
Pseudo-Composite Display	Displays component signals artificially as composite signals
Channel Assignment	G, B, R or R, G, B order (when displaying G, B, R converted signals)
Line Select	Displays the selected line
Image Quality Adjustment	Adjusts the brightness
Vertical Axis	
Sensitivity	
V Scale	0 to 0.7 V, -0.3 to 0.7 V
% Scale	0 to 100 %, -50 to 100 %
Gain	x1, x5, variable
Variable Gain	x0.2 to x2
Amplitude Accuracy	±0.5 %
HDTV Frequency Characteristics	
Y Signal	±0.5 % (1 to 30 MHz)
C_B,C_R signal	±0.5 % (0.5 to 15 MHz)
Low-pass Attenuation	20 dB or more (at 20 MHz)
SDTV Frequency Characteristics	
Y Signal	±0.5 % (1 to 5.75 MHz)
C_B,C_R signal	±0.5 % (0.5 to 2.75 MHz)
Low-pass Attenuation	20 dB or more (at 3.8 MHz)
Horizontal Axis	
Line Display	
Display Mode	Overlay: 1H, 2H *1 Parade: 1H, 2H, 3H
Magnification	x1, x10, x20, ACTIVE, BLANK
Field Display	
Display Mode	Overlay: 1V, 2V *1 Parade: 1V, 2V, 3V
Magnification	x1, x20, x40
Time Accuracy	±0.5 %
Cursor Measurement	
Composition	
Horizontal Cursors	2 cursors (REF and DELTA)
Vertical Cursors	2 cursors (REF and DELTA)
Amplitude Measurement	Percentage and voltage displays
Time Measurement	Displays time in seconds
Frequency Measurement	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.

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

LV 58SER20 DVI-I OUTPUT UNIT

Plug-In Unit for LV 5800

RoHS

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

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

LV 58SER40A DIGITAL AUDIO

Plug-In Unit for LV 5800

New

RoHS

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*1 for data in 8 AES/EBU channel pairs (16 channels)*2 and 2 analog audio channels.*3 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 DIGITAI AUDIO SPECIFICATIONS

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

MULTI SDI RASTERIZER

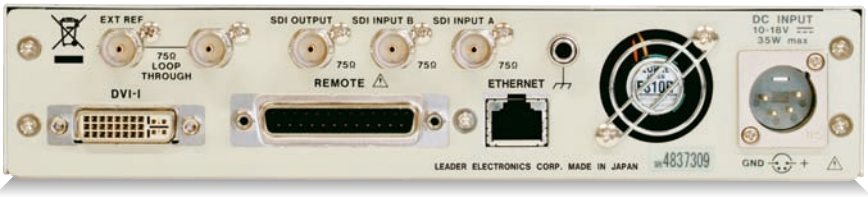
LV 7700 (HD/SD-SDI)
LV 7720 (SD-SDI)

LEADER

HD-SDI

SD-SDI

1U Half Rack Size



CE Upon request

RoHS

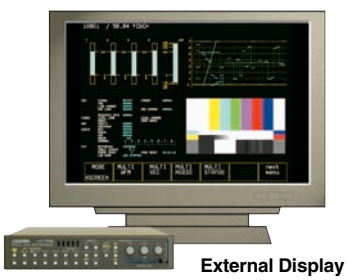
Compact, Low-Cost Multi SDI Rasterizer

The LV 7700 is capable of displaying the monitor waveform, image, and other data of HD-SDI and SD-SDI signals on an external display (SD-SDI signals only on the LV 7720). Display items include waveform monitor, vectorscope, audio monitor, simple picture display, as well as multi display on which these items can be arranged on a single screen. Its 1U half rack size reduces space consumption in broadcasting installations, etc. In addition, complete digital processing of SDI signals enables highly accurate measurements. It is also suitable as a monitoring device that monitors signals and detect errors via the network through the support of SNMP.

FEATURES

- **Two Serial Digital Inputs**
  The SDI input connectors on the LV 7700 can receive HD-SDI and SD-SDI signals. You can select auto or manual setting for the input signal format.
- **SDI Output**
  Equipped with an active output that reclocks the input signal.
- **Display**
  Equipped with a DVI-I connector of XGA resolution (1,024 x 768). Waveform, vectorscope, picture, audio, and status can be shown on an external LCD, etc. Multi display that displays these items on a single screen is also possible.
  - Waveform Display Function
  - Vectorscope Function
  - Picture Display Function
  - Line Selector Function
  - Embedded Audio Signal Display Function
  - Screen Capture Function
- **Extensive Analysis Functions**
  - Various Error Detection Functions
  - Event Log Function of SDI Signals
  - Digital Data Dump Function
  - Analysis Display Function
- **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).
- **5 BAR DISPLAY**
  Easy to read monitoring function that depicts both component RGB and composite Gumut Errors.
- **Preset Function**
  Up to 30 sets of panel control settings can be stored. Stored data can be recalled easily from the panel, Ethernet connector, or remote connector.
- **SNMP Support**
  In addition to controlling the LV 7700 from the panel, remote control is possible through Ethernet connection.
- **Web Server**
  The Web server function is used to remotely control the LV 7700/7720 and show the display using Internet Explorer on Windows via an Ethernet network.
- **External Synchronization**
  Accepts tri-level sync signals or black burst signals (NTSC and PAL).
- **All Panel LED Lighting**
  All panel LEDs can be turned on which makes it convenient for operations in extremely dark places.
- **Power Supply**
  DC operation is possible by connecting a 12 V external DC power supply with a current capacity of at least 3 A to the DC input connector.
  AC power operation (100 to 240 VAC) is also possible through the supplied AC adapter.
- **LV 7720 is upgradable to LV 7700 at our factory**
- **Closed Captioning monitoring is available**
- **Dedicated Rack Mount Adapter (Sold Separately)**
  By using the dedicated rack mount adapter that is sold separately, the LV 7700 can be rack mounted.
  - 2 units of LV 7700 fit in LR 2477
  - One unit of LV 7700 fit in LR 2480 (Not for 2 units)

LR 2480 Rackmount Adapter



External Display

Video Formats and Corresponding Standards

Video Signal Standards

	Format Name	Standard Supported
1	1080i/60	SMPTE 274M, 292M (LV 7700 only)
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	SMPTE RP211, 292M (LV 7700 only)
10	1080PsF/29.97	
11	1080PsF/25	
12	1080PsF/24	
13	1080PsF/23.98	
14	720p/60	SMPTE 296M, 292M (LV 7700 only)
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	SMPTE 259M
23	625i/50	

Other Standards

Ancillary Data Standard SMPTE 291M

Embedded Audio Standard SMPTE 299M (LV 7700 only)/ SD-SDI SMPTE 272M

Format Setting

Format Setting Auto setting or manual setting for the supported formats

Sampling Frequency 74.25 MHz (HDTV LV 7700 only), 74.25/1.001 MHz (HDTV LV 7700 only), 13.5 MHz (SDTV)

External Synchronization Auto setting for the supported formats

Input/Output Connector

SDI Input

Input Connector BNC connector 2 systems (A/B switching type)

External Synchronization Input

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

Input Connector BNC connector 1 system 2 connectors

SDI Output

Output Connector BNC connector 1 connector

Compact Flash Memory Card

Function Saves screen captures, error logs, preset data, and data dumps. Also used for firmware updates.

Remote Connector

Function Recalls presets and outputs errors

Control Connector D-sub 25 pin 1 connector (female) TTL level (low active)

Ethernet Connector

Function Remote control from an external computer and data output

Type 10BASE-T or 100BASE-TX auto switching

DVI-I Connector

Signal Format Single Link T.M.D.S, Analog R, G, B

Display Format XGA

Output Connector DVI-I 1 system

Display Format

Display Format XGA Effective area 1024 x 768 dots

Display

1 Screen Display Waveform display, vectorscope display, picture display, audio display, or status display

2 Screen Display Waveform display and vectorscope display
Waveform display and picture display
Waveform display and audio level display

4 Screen Display Select audio display or status display in addition to waveform display, vectorscope display, and picture display(5 Bar can be shown instead of Vectorscope.)

Waveform Display

Waveform Operation

Display Mode Overlay display: Displays component signals overlaid
Parade display: Displays component signals side by side
Timing Display: Displays by calculating Y-C_B and Y-C_R
Uses bowtie signals (authorized by Tektronix, Inc.)

EAV-SAV Period Select show or hide

G, B, R Conversion Converts Y, C_B, C_R signals into G, B, R and displays the result

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

Channel Assignment Select G, B, R order or R, G, B order during G, B, R conversion display

Line Select Displays the selected line

Vertical Axis

Gain Select × 1, × 5, or variable

Gain Variable × 0.2 to × 10.0

Horizontal Axis

Line Display Display Format Overlay: 1H, 2H
Parade: 1H, 2H, 3H
Timing: 2H

Field Display Magnification: Select × 1 or × 10
Display Format Overlay: 1 V, 2 V
(2V display not allowed for progressive)
Parade: 1 V, 2 V, 3 V
Magnification: Select × 1, × 20 or × 40

Time Base Accuracy ≤ ± 0.5 %

Cursor Measurement

Configuration Horizontal Cursors: 2 cursors (REF and DELTA)
Vertical Cursors: 2 cursors (REF and DELTA)

Vectorscope Display

Gain Select × 1, × 5, IQ-MAG, or variable

Gain Variable × 0.2 to × 10.0

Amplitude Accuracy ≤ ± 0.5 %

IQ Axis Select show/hide

Simple Picture Display

HDTV Display Displayed by sampling the pixels (LV 7700 only)

SDTV Display Displayed by interpolating pixels

Frame Rate Converts the frame rate using the internal synchronization signal and displays the result

Embedded Audio Display

Quantization HDTV 24 bits (LV 7700 only)/SDTV 20 bits

Lissajous Display

Display Channel Select 2-ch or 8-ch display

Display Mode Select X-Y or L-R

Sound Image Display

Display Channel Select 3-1 ch, 3-2 ch, or 3-2-2 ch.

Level Meter Display

Display Channel Simultaneous 8 ch display

Meter Select 60 dB peak level, 90 dB peak level, or average response meter

Status Display

SDI Signal Status Display

Signal Detection Detects the presence or absence of SDI signals

CRC Error Detects transmission errors of HD-SDI signals (LV 7700 only)

EDH Error Detects transmission errors of SD-SDI signals

BCH Error Detects transmission errors of embedded audio signals in the HD-SDI signal (LV 7700 only)

Checksum Error Detects transmission errors of ancillary data

Parity Error Detects parity errors in the ancillary data header

Gamut Error Detects gamut errors

Detection Range Upper limit: 90.0 % to 109.4 %, Lower limit -7.2 % to + 6.0 %
0.1 % steps

Composite Gamut Error Monitors the level error when the component signal is converted into composite signal

Detection Range Upper limit: 90.0 % to 135.0 %,
Lower limit -40 % to -20 %
0.1 % steps

Audio Information Detection Detects the presence or absence of audio on each channel

Equivalent Cable Length Measurement Displays the signal attenuation of the SDI signal by converting to cable length
Supported Cables HD-SDI Select LS-5CFB, 1694A, or L-7CHD (LV 7700 only)
SD-SDI Select L-5C2V, 8281, or 1505A

Error Count Up to 100,000 errors
Counts only the specified errors (1 count even if multiple errors occur within 1 second)

Data Dump Display

Display Format Displayed separately by serial data sequence or channel

Event Log

Number of Logs Up to 1,000 events

Audio Status

Voice Control Packets Analyzes and displays the voice control packets of the SDI signal

EDH Display (only for SD-SDI input)

EDH Displays the status of the EDH packets

Screen Capture

Capture Captures the display screen

Waveform Comparison Superimposes the input signal over an image from memory.

Media Internal memory (RAM) or compact flash card

Presets

Number of Presets 30

Environmental Conditions

Operating Temperature 0 to 40 ˚C

Operating Humidity ≤ 85 % RH (without condensation)

Operating Environment Indoor use

Operating Altitude Up to 2,000 m

Pollution Degree 2

Power Requirements 12 VDC (10 to 18 V), 35 W max.

Dimensions and Weight 215(W) × 44(H) × 400(D) mm, 2.3 kg
8 1/2(W) x 1 3/4(H) x 15 4/5(D) in, 5 lbs

Accessories AC adapter ·····1
Instruction manual ·····1

MULTI SDI MONITOR

LV 5750

LEADER

HD-SDI

SD-SDI

CINELITE option

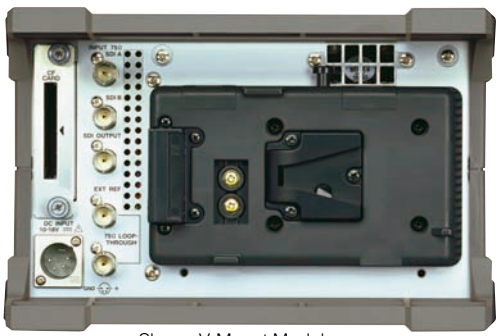
CE Upon request

RoHS

High performance packed into this compact model

The LV 5750 is a waveform monitor for HD-SDI and SD-SDI signals with a color TFT LCD monitor. It is a compact, portable model that contains a waveform monitor, vectorscope, audio level display, picture display, and status display.
Complete digital processing of SDI signals enables highly accurate measurements. In addition, extensive error detection functions and analysis functions are provided which enables the LV 5750 to be used as a SDI signal monitor.

■LV 5750 REAR PANEL



Shows V-Mount Model
available AntonBauer Model

FEATURES

- **Receives either HD-SDI or SD-SDI signals**
- **Employs a color TFT LCD monitor with XGA resolution**
- **Multi screen display, waveform display, vectorscope display, picture display, and embedded audio display**
- **Error detection for SDI signal monitoring**
- **Delivers embedded audio in SDI signals through stereo headphone output**
- **Provides screw holes for attaching a camera tripod**
- **Battery operation and DC power operation**
- **Ancillary Data Display**
- **SDI-EXT REF Phase Difference Display Function**
- **5 BAR DISPLAY**

■OPTIONS

- **FS 3032 Cinelite**

CineLite

- **Option Board**

*If you install this unit, you will not be able to use the compact memory card unit that comes standard.

RoHS

LV 5750-01
Ethernet Unit

RoHS

LV 5750-02
Remote Control Unit

Video Formats and Corresponding Standards

Video Signal Standards

	Format Name	Standard Supported
1	1080i/60	SMPTE 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	SMPTE RP211、292M
10	1080PsF/29.97	
11	1080PsF/25	
12	1080PsF/24	
13	1080PsF/23.98	
14	720p/60	SMPTE 296M、292M
15	720p/59.94	
16	720p/50	
17	720p/24	
18	720p/23.98	
19	525i/59.94	SMPTE 259M
20	625i/50	

Other Standards

•Ancillary data standard SMPTE 291M

•Embedded audio standard HD-SDI SMPTE 299M
SD-SDI SMPTE 272M

Format Setting Auto setting or manual setting from the supported formats

SDI Signal

Sampling Frequency 74.25 MHz(HDTV),74.25/1.001 MHz(HDTV)
13.5 MHz(SDTV)
4:2:2 YC_BC_R, signal

External Synchronization Auto setting from supported formats

Input/Output Connector

SDI Input

Input Connector BNC connector 2 systems (A/B switching type)

External Synchronization Input

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

Input Connector BNC connector 1 system 2 connectors

SDI Output

Output Connector BNC connector 1 connector

Headphone Output

Output Signal Separates and outputs the embedded audio signal in the SDI signal

IF Slot

Installable Units One of the following can be installed: compact flash memory card unit(Standard), remote control unit (sold separately), and Ethernet unit (sold separately)

Compact Flash Memory Card Unit

Function Saves screen captures, error logs, preset data, and data dumps. Also used for firmware updates.

Remote Control Unit (Sold Separately)

Function Recalls presets and outputs alarms

Control connector D-sub 25 pin 1 connector (female)
*If you install this unit, you will not be able to use the compact memory card unit that comes standard or the Ethernet unit that is sold separately.

Ethernet Unit (Sold Separately)

Function Remote control from an external computer

Type 10BASE-T/100BASE-TX Auto switching, one connector
*If you install this unit, you will not be able to use the compact memory card unit that comes standard or the remote control unit that is sold separately.

Display Format

Display Format XGA Effective area 1024 X 768 dots

Display

1 Screen Display Waveform display, vectorscope display, picture display, audio display, or status display

2 Screen Display Waveform and vectorscope display, waveform display and picture display, or waveform display and audio level display

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

Waveform Display

Waveform Operation

Display Mode Overlay display:Displays component signals overlaid Parade display:Displays component signals side by side

Timing Display Displays by calculating Y-C_B and Y-C_R
Uses bowtie signals (authorized by Tektronix, Inc.)

EAV-SAV Period Select show or hide

G, B, R Conversion Converts Y, C_B, C_R signals into G, B, R and displays the result

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

Channel Assignment Select G, B, R order or R, G, B order during G, B, R conversion display

Line Select Displays the selected line

Vertical Axis

Gain Select x1, x5, or variable (up to x10)

Amplitude Accuracy < ±0.5 %

Horizontal Axis

Line Display

Display format Overlay: 1H, 2H
Parade: 1H, 2H, 3H
Timing: 2H

Magnification Select x1 or x10

Field Display

Display format Overlay: 1V, 2V
(2V display not allowed for progressive)
Parade: 1V, 2V, 3V

Magnification Select x1, x20 or x40

Time Base Accuracy < ±0.5 %

Cursor Measurement

Configuration

Horizontal cursors: 2 cursors (REF and DELTA)
Vertical cursors: 2 cursors (REF and DELTA)

Vectorscope Display

Gain Select x1, x5, IQ-MAG, or variable

Amplitude Accuracy < ±0.5 %

IQ Axis Select show/hide

Simple Picture Display

HDTV Display Displayed by sampling the pixels

SDTV Display Displayed by interpolating pixels

Display Frame Rate Converts the frame rate using the internal synchronization signal and displays the result

Embedded Audio Display

Audio Signal Select two arbitrary groups from embedded audio signals in the SDI signal

Level Meter

Display Channel Simultaneous 8 ch display

Meter 60 dB peak level or 90 dB peak level

Reference Level Select -20 dB, -18 dB, or -12 dB

Scale Select absolute dB display or reference level 0 dB display

Status Display

SDI Signal Status Display

Signal Detection Detects the presence or absence of SDI signals

CRC Error Transmission error of HD-SDI signals

EDH Error Transmission error of SD-SDI signals

BCH Error Transmission error of embedded audio signals in the HD-SDI signal

Checksum Error Transmission error of ancillary data

Gamut Error Detects gamut errors

Detection Range Upper limit: 90.0 % to 109.4 %
Lower limit: -7.2 % to +6.0 %
0.1 % steps

Composite Gamut Error Monitors the level error when the component signal is converted into composite signal

Detection Range Upper limit: 90.0 % to 135.0 %
Lower limit: -40 % to -20 %
0.1 % steps

Audio Information Detection Detects the presence or absence of audio on each channel

Error Count Up to 100,000 errors

V-ANC Monitor NET-Q, CLOSED CAPTION

Data Dump Display

Display Format Counts only the specified errors
Displayed separately by serial data sequence or channel

Event Log

Number of Logs Up to 1,000 events

Audio Status

Voice Control Packets Analyzes and displays the voice control packets of the SDI signal

EDH Display

EDH Displays the status of the EDH packets

Screen Capture

Capture Captures the display screen

Waveform Comparison Superimposes the input signal over an image from memory.

Media Internal memory (RAM) or compact flash card

Presets

Number of Presets 30

Environmental conditions

Operating Environment Indoor/outdoor use (no rain water)

Operating Altitude Up to 2000 m

Overvoltage category I

Pollution Degree 2

Power Requirements 12 VDC (10 to 18 V), 30 W max.

Dimensions and Weight 215(W)x133(H)x103(D) mm (excluding protrusions)
221(W)x143(H)x168(D) mm (including protrusions)
2.5 kg
8 1/2(W) x 5 1/4(H) x 4 1/16(D) in.
8 45/64(W) x 5 41/64(H) x 6 5/8(D) in.
5.5 lbs

Accessory Instruction manual.....1

■OPTIONAL ACCESSORY

LR 2750-I

Rackmount adapter

MULTI SDI MONITOR

LV 5700A

LEADER

HD-SDI

SD-SDI

CINELITE option

CE Upon request

PATENTED:
Equivalent cable length measurement

The cabinet is sold separately.

HD-SDI/SD-SDI Color LCD Waveform Monitor

The LV 5700A is a waveform monitor for HD-SDI and SD-SDI signals. Employs color TFT LCD screen.
The functions of waveform monitors, vectorscopes, audio lissajous, and simple picture monitors are achieved with a single unit.
Complete digital processing of SDI signals enables highly accurate measurements. In addition, extensive error detection functions and analysis functions are provided which allow the LV 5700A to be used as SDI signal monitor.

FEATURES

•Two serial digital input systems
The SDI input connector on the LV 5700A supports free rates. Thus, either HD-SDI or SD-SDI signals can be applied to the same connector. You can select auto or manual setting for the input signal format.

•Display
Employs an LCD monitor with XGA resolution.
Various displays such as waveform display, vector display, picture display, and status display can be placed side by side on the XGA monitor. You can monitor these displays simultaneously.
Depending on the combination, bowtie, embedded audio, and data dump can also be displayed.
Furthermore, each display can be magnified.

■LV 5700A REAR PANEL

•Operation
The LV 5700A can be controlled through the panel and remotely controlled through a computer via the Ethernet network. In addition, presets can be recalled using the remote connectors on the rear panel.

•Extensive Analysis Functions
The LV 5700A can also be used as an analyzer to detect multiple types of transmission errors, detect gamut errors, display data dumps, ancillary data display, analyze the contents of voice control packets, measure the equivalent cable length, and so on.

•Output
Equipped with two active output connectors that reclock the input signal.
One connector is an HD-SDI/SD-SDI switching type serial output; the other is a dedicated SD-SDI output.
Other output connectors are the analog picture monitor output and the AES/EBU output that separates the embedded audio in the SDI signal.
An analog XGA output connector is also provided allowing the screen to be displayed on an external monitor.

•External Synchronization
Allows tri-level sync signals or B. B signals of NTSC and PAL to be input.

•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).

•5 BAR DISPLAY
Peak levels of video signals can be displayed in place of the vectors.

■OPTION

•FS 3030 Cinelite

Video Formats and Corresponding Standards

Video Signal Standards

	Format Name	Standard Supported
1	1080i/60	SMPTE 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	SMPTE RP211,292M
10	1080PsF/29.97	
11	1080PsF/25	
12	1080PsF/24	
13	1080PsF/23.98	
14	1035i/60	SMPTE 240M,292M
15	1035i/59.94	
16	720p/60	SMPTE 296M,292M
17	720p/59.94	
18	720p/50	
19	720p/30	
20	720p/29.97	
21	720p/25	
22	720p/24	
23	720p/23.98	
24	525i/59.94	SMPTE 259M
25	625i/50	

Other Standards

Ancillary data standard SMPTE 291M

Embedded audio standard HD-SDI SMPTE 299M
SD-SDI SMPTE 272M

Format Setting

Video System Select manual setting or automatic setting

Sampling Frequency HD: Auto switching between 74.25 MHz and 74.25/1.001 MHz
SD: 13.5 MHz

Input/Output Connector

SDI Input

Input Connector BNC connector 2 systems A and B, 75 Ω

External Reference Input

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

Input Connector BNC connector passive loop-through 1 system 2 connectors

XGA Output

Output Signal XGA signal

Output Connector D-sub 15 pin female

SDI Output

Output Connector BNC connector 2 connectors
One connector is a dedicated SD-SDI output connector
Reclocks and outputs the selected SDI input signal, 75Ω

Analog Output

Output Signal Y, P_B, P_R or GBR

Output Connector BNC connector 1 system 3 connectors

AES/EBU Output

Output Signal CH1/2, CH3/4, CH5/6, CH7/8
Separated from embedded audio and output
Select 2 groups (8 ch) from 4 groups (16 ch)

Output Connector BNC connector 4 connectors

Remote Connector

Function Recalling of presets

Control Signal TTL level (LOW active)

Control Connector D-sub 25 pin female 1 connector

Ethernet Connector

Function Remote control from an external computer and monitoring of errors, etc.

Input/Output Connector 10BASE-T/100BASE-TX 1 connector(RJ-45)

Display Format

XGA Effective area 1024 x 768 dots
1-screen display
Waveform display, vectorscope display, picture display, audio display, and status display
2-screen display
Waveform display and vectorscope display
Waveform display and picture display
Waveform display and audio waveform display
4-screen display
Select audio waveform display, audio level meter display, or status display in addition to waveform display, vectorscope display, and picture display.

Waveform Display

Waveform Operation

EAV-SAV Period Select show/hide

GBR Conversion Select Y, C_B, C_R or GBR conversion display

Pseudo-Composite Display Digitally converts component signals into composite signals and displays the result (the color matrix for HDTV signal is converted into SDTV)

Channel Assignment Select GBR order or RGB order for GBR conversion Display

Vertical Axis

Filter Flat, low-pass

Horizontal Axis

Operation Mode

Overlay Displays multiple waveforms overlaid

Parade Displays waveforms side by side

Timing Time difference between channels
Uses bowtie* signals

Display Format *Authorized by Tektronix, Inc.

Line display

Overlay: 1H, 2H
Parade: 1H, 2H, 3H

Line Magnification Timing: 2H

Field Display Select x1, X10, ACTIVE, or BLANK
Overlay: 1V, 2V

Field Magnification Parade: 1V, 2V, 3V

Scale Select x1 or x20

Scale Display

Voltage Scale 0 V to 0.7 V, -0.3 V to 0.7 V

% Scale 0 % to 100 %, -50 % to 100 %

Vectorscope Display

Sensitivity Select 75 % or 100 % Using a color bar

Gain Select x1, x5, or IQ-MAG

EAV-SAV Period Select show/hide

I, Q Axes Select show/hide

Simple Picture Display

HD Display Reduced display

SD Display Magnified display

Embedded Audio Display

Lissajous Display

Display Channel Select from 2 ch or 8 ch display

Display Method Select X-Y or L-R

Sound Image Display

Display Channel Select from 3-1 ch, 3-2 ch, and 3-2-2 ch displays

Peak Level Meter Display

Display Channel Simultaneous 8 ch display

Display Method Peak meter

Channel

Ch Mapping Can be mapped arbitrary from 1 ch to 8 ch

Status Display

SDI Signal Status Display

Signal Detection Detects the presence or absence of SDI signals

CRC Error Transmission error of HD-SDI signals

EDH Error Transmission error of SD-SDI signals

BCH Error Transmission error of embedded audio signals in the HD-SDI signal

Checksum Error Transmission error of ancillary data

Gamut Error Detects gamut errors

Composite Gamut Error Monitors the level error when the component signal is converted into composite signal

Audio Information Detection Detects the presence or absence of audio on each channel

Error Count Up to 100,000 errors

V-ANC Monitor NET-Q, CLOSED CAPTION

Data Dump Display

Display Format Counts only the specified errors
Displayed separately by serial data sequence or channel

Event Log

Number of Logs Up to 1,000 events

Audio Status

Voice Control Packets Analyzes and displays the voice control packets of the SDI signal

EDH Display

EDH Displays the status of the EDH packets

Line Selector

Operation Mode Interlocked type between waveform display, vector display, and picture display

Presets

Number of Presets 100 sets

Presets Items All setup items

Recall Method Through the front panel, remote connector, and Ethernet Switch 8 points or 100 points are available for recall through the remote connector

Cursor Measurement

Configuration Horizontal cursor: 2 lines (REF, Δ)
Vertical cursor: 2 lines (REF, Δ)

Amplitude Measurement Measured in [%] and [V]

Time Measurement Displayed in [ms] and [ms]

Frequency Measurement Displays the frequency in which the time between cursors is considered a cycle.

Screen Capture

Capture Captures the display screen

Waveform Comparison Superimposes the input signal over an image from memory.

Media Internal memory (RAM) or compact flash card

Data Output Save data in BMP format to a PC via a compact flash memory card or Ethernet network.

Environmental Conditions

Operating Temperature 0 to +40 ˚C

Operating Humidity ≤ 85 % RH (without condensation)

Operating Environment Indoor use

Operating Altitude Up to 2,000 m

Pollution Degree 2

Power Requirements 90 to 250 VAC, 50 Hz/60 Hz, 120 Wmax.
9 to 17 VDC(Option)

Dimentions and Weight 215 (W) x 133 (H) x 449 (D) mm 4.9 kg
8 1/2(W) x 5 1/4(H) x 17 11/16(D) in. 10.8 lbs

Accessories

Power cord.....1
Cover/Inlet stopper.....1
Screws for rack mounting (inch specification).....2
25-pin D-sub connector.....1
25-pin D-sub connector cover.....1
Instruction manual.....1

LV 5700A Multi-SDI Monitor Available Options

LEADER

NTSC/PAL Composite Analog Input Module (OP73A)

Plug-In Unit for LV 5700A

Upon request

Ideal for broadcast and field acquisition professionals, the option 73A adds expansion capabilities to accommodate analog NTSC/PAL composite inputs. Two composite inputs(auto-sensing) are provided and the selected input is fed to a monitoring output. Monitoring functions include waveform, vector and picture displays. SCH measurement is also provided for both NTSC and PAL and full line selection capabilities allow monitoring on a line-by-line basis.

OP73A NTSC/PAL COMPOSITE ANALOG SPECIFICATIONS

Standards Supported	
NTSC	NTSC-M, SMPTE 170M
PAL	PAL-B, G, H, I, ITU-R BT.470
Input	
Composite Video	Select A or B
Input Impedance	75 Ω
Input Return Loss	≥30 dB (up to 6 MHz)
Output	
Composite Video	
Output Signal	Active
Output Connector	BNC connector, 1 system 1 connector
Output Impedance	75 Ω
Output Amplitude	≤1 Vp-p ±5 %
Frequency Characteristics	25 Hz to 5 MHz within ±5 % 5 MHz to 5.6 MHz within +5 % to -10 %
Display	
WAVEFORM	Waveform display
VECTOR	Vectorscope display
PICTURE	Picture display
	* 2 screens mode, 4 screens mode, audio display, and status display are not available.
Waveform Display Section	
Vertical Axis	
Sensitivity	V Scale 1 Vp-p (-0.3 V to 0.7 V) IRE Scale 1 Vp-p (-40 IRE to 100 IRE)
Gain	x1, x5 Selectable
Variable Gain	x 0.1 or less to x5 or more
Amplitude Accuracy	≤1 %
Frequency Characteristics	
Composite Signal	25 Hz to 5 MHz within 2 % 5 MHz to 5.6 MHz within +3 % to -5 %
Step Response (for 1V full scale, flat, 2T pulse, and 2T bar)	Overshoot(±2 %), Preshoot(±1 %), Ringing(±2 %), Pulse/Bar Ratio(±1 %), Vertical Tilt(±1 %)
Filter	Luminance filter
DC Restorer	Clamp to the back porch (fixed)
Horizontal Axis	
Operation Mode	Overlay Displays only one single waveform
Display Format	
Line Display	Overlay 1H or 2H
Line Magnification	Select x1 or x10
Field Display	Overlay 1V or 2V
Field Magnification	Select x1 or x20
Time Base Accuracy	±1 %
Vectorscope Display Section	
Sensitivity	Select 75 % or 100 % (ref color bar pattern)
Setup	Select 0 % or 7.5 %
Gain	Select x1, x5 or IQ-MAG
Variable Gain	x0.1 or less to x10 or more
Phase Accuracy	±2 °
Amplitude Accuracy	±3 %
Phase Adjustment Range	360 °
IQ Axis	Select show or hide
SCH Measurement Section	
Accuracy	±5 ° (room temperature 25 °C)
Color Frame Area	±60 °

AES/EBU Digital Audio Module (8 Channels) (OP75)

Plug-In Unit for LV 5700A

Upon request

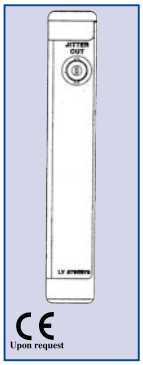
The LV 5700A Multi-SDI monitor is provided with audio monitoring, measurement and data analysis capabilities for embedded AES/EBU monitoring (audio is disembedded and output via 4 BNC connectors; 8 channels, as standard). Facilities using separate (non-embedded) AES/EBU audio will need to use the OP75 External AES/EBU Inputs option in order to monitor external AES/EBU. All of the embedded audio measurement, monitoring and analysis abilities of the LV 5700A are also available for monitoring external AES/EBU using the OP75.
Option 75 adds monitoring and display for 8-channels of AES/EBU digital audio inputs. Surround sound image, lissajous, bar graphs and digital levels are displayed. A speaker is also included to allow monitoring of the selected channel.

OP75 AES/EBU DIGITAL AUDIO SPECIFICATIONS

Format Supported	AES/EBU format 48 kHz
AES/EBU Digital Audio Input	
Input Channels	4 BNC, 8 channels (CH 1/2, 3/4, 5/6, 7/8)
Input Connector	BNC Connector
Input Impedance	75 Ω
Headphone Audio Output	
Output Channels	1 terminal
Output Connector	Miniature jack (stereo type)
Output Format	Stereo. Selects the channel from the menu to set up L, R channel
Built-In Loudspeaker	
Output Format	Mono. Outputs selected L channel sound to speaker output.

HD/SD Eye Pattern Module (OP70)

Plug-In Unit for LV 5700A



Upon request

This option model adds eye pattern display function of HD and SD-SDI signals to the standard LV 5700A model.
Measurements of various parameters such as the amplitude, rise time, fall time, timing jitter, and alignment jitter od SDI signals are possible from the displayed eye patterns.

For a description of the specifications other than those of the newly added eye pattern function, see the specifications of the standard model.

OP70 HD/SD EYE PATTERN SPECIFICATIONS

Standard Supported	HD SMPTE292M, SD SMPTE259M
Data Rate	HD 1.485 Gbps or 1.485/1.001 Gbps SD 270 Mbps
Eye Pattern Display	
Display	Displays the SDI input waveform before equalizing
Method	Equivalent time sampling method
Amplitude Accuracy	Within 800 mV ±5 % for 800 mV input
Time Axis	2 waveform display 100 ps/div 4 waveform display 200 ps/div 16 waveform display 800 ps/div
Time Axis Accuracy	Within ±3 %
Jitter Filter	10 Hz HPF, 100 Hz HPF, 1 kHz HPF 10 kHz HPF, 100 kHz HPF
Jitter Display	
Display	Displays the jitter component of the SDI input
Method	Phase detection method
Amplitude Accuracy	Within ±10 % when applying 10 KHz 1 UI jitter (using 100 Hz filter)
Jitter Filter	10 Hz HPF, 100 Hz HPF, 1 kHz HPF 10 kHz HPF, 100 kHz HPF
Jitter Output	
Output Connector	75 Ω BNC connector, 1 output
EXT REF Input for Eye Patterns	
Standard	HD SMPTE292M, SD SMPTE259M
Data Rate	HD 1.485 Gbps or 1.485/1.001 Gbps SD 270 Mbps
Input Connector	75 Ω BNC connector, 1 input
Input Format	HD SMPTE292M, SD SMPTE259M

Note: Option 70: Phase detection method is used for jitter measurement and functions are eye pattern, jitter display and histogram

SDI SYSTEM MARGIN CHECKER

LT 9610

LEADER

HD-SDI

SD-SDI

An operator checks cable performance

Built-in Signal Generator

color bar

check field

Up to 20 ID characters can be multiplexed in the test pattern of the signal generator.

Checks the Transmission Margin of the Coaxial Cable Laid in a HD-SDI/SD-SDI (525) System

The LT 9610 is a handy tool for checking the transmission margin of the coaxial cable laid in a HD-SDI/SD-SDI system. The HD-SDI/SD-SDI signal source and the HD-SDI/SD-SDI equivalent cable length display are built in. It converts the level of transmission attenuation of the coaxial cable under measurement to a cable length of a given cable type and displays the result.

FEATURES

- **Supports HD-SDI (1080i/59.94 1.485 Gbps) and SD-SDI (525i/59.94 270 Mbps).**
- **By converting the amount of transmission attenuation of the coaxial cable to a cable length of a given cable type, the following points are featured.**
  - The amount of transmission attenuation is intuitive as compared to displays such as the power value.
  - If the characteristics of the cable are degraded due to the cable wearing out, the length is indicated longer than the physical length. This enables the amount of degradation and transmission performance to be determined.
  - In a system in where different types of cables are used, the performance of the system (system margin) can easily be determined, because the cable length is displayed in terms of a given cable type.
- **Built-in Signal Generator**
  - Because the HD-SDI/SD-SDI signal generator is built in, there is no need to prepare a separate signal source. In addition, highly accurate measurement is possible, because the signal generator and the equivalent cable length meter can be calibrated as a single instrument.
  - The test pattern of the signal generator can be set to color bar or check field pattern. This enables the LV 7700 to be used as a simple standalone HD-SDI/SD-SDI signal generator.
  - Up to 20 ID characters can be multiplexed in the test pattern of the signal generator.
  - 8 channels (4 channels × 2 groups) of embedded audio can be embedded.
- **GO/NOGO Judgemant**
- **Built-in Error Monitor Function**
- **Battery Operation**

LT 9610 SPECIFICATIONS

Common	
Format	HDTV:1080i/59.94 SDTV:525i/59.94
Automatic Power Down	Power is turned off about five minutes after final key operation. This function can be disabled
Signal Generator	
Test Patterns	HDTV:Multi-format color bar/check field SDTV:100/0/75/0 Full field color bar/check field
Embedded Audio	
Channels	8ch (4ch X 2 groups)
Resolution	20 bits/24 bits switchable
Frequency	1 kHz
Level	-20/-18 dB switchable
ID Characters	Multiplex up to 20 alphanumeric characters (for HDTV and SDTV)
Cable Length Display	
Equivalent Cables	HDTV:L-7CHD, LS-5CFB SDTV:L-5C2V
Measurement Lange	HDTV:L-7CHD to 200 m, LS-5CFB to 130 m SDTV:L-5C2V to 300 m
Measurement Accuracy	±20 m
Resolution	L-7CHD:10 m, LS-5CFB and L-5C2V:5 m
Error Monitoring Function	
Monitoring items	• Transmission errors Format error, TRS error, CRC error(HDTV only), EDH error(SDTV only), Checksum error, line number error(HDTV only) • Equivalent cable length error/equivalent cable length warning When cable lengths larger than two threshold values are displayed, the system margin checker determines that it indicates warning/error.
Power Requirements	4 AAA nickel hybride batteries, AC adapter
Dimensions and Weight	240 (H)×94 (W)×40 (D) mm (projections excluded) Approx. 600 g (including the 4 AAA nickel hydride batteries) 9 1/6 (H)×3 3/10 (W)×1 1/5 (D) in. 1.3 lbs
Accessories	AC adapter .....1 Instruction manual 1

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_B, P_R, to GBR)

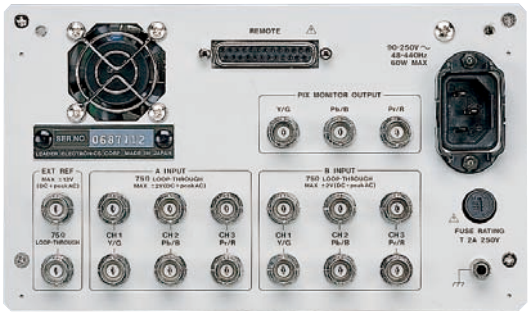
The LV 5152 Multi-format Waveform Monitor is designed to display analog component signals of multi-format DTV. This instrument features two analog component signal input systems. In addition to the waveform monitor function, vector, timing, and audio signal display functions are provided. Moreover, the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



Measurement Signal and Standards

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

Input System	
Signal Input	
Input Channel	CH1(Y/G),CH2(P_B/B),CH3(P_R/R),2-system
Input Connector	BNC
Retaurn Loss	≥ 30 dB, 50 kHz to 30 MHz (both power on/off)
Impedance	75 Ω passive loop-through
Maximum Input Voltage	±2 V (DC + peak AC)
EXT REF Input	
Input Channel	EXT REF, 1-system
Input Connector	BNC
Return Loss	≥ 30 dB, 50 kHz to 30 MHz (both power on/off)
Impedance	75 Ω passive loop-through
Maximum Input Voltage	±12 V (DC + peak AC)
Sync Amplitude	0.3 Vp-p ±6 dB
Picture Monitor Output	
Frequency Response	25 Hz to 30 MHz, within ± 5 %
Output Impedance	75 Ω
Output Connector	BNC, 1 system
Amplitude	1 V ± 5 %
Vertical Axis	
Deflection System	
Deflection Sensitivity	Within ± 1 %, GAIN x 1 Within ± 3 %, GAIN x 5
Variable Range	At least 0.5 to 1.2 times (both GAIN x 1 / x 5)
GBR Matrix	
Deflection Sensitivity	Within ± 1 %, GAIN x 1 Within ± 3 %, GAIN x 5
Frequency Response	x 1 GAIN
FLAT	Within ± 1 %, 25 Hz to 30 MHz (50 kHz ref., GBR Matrix OFF mode)
LOWPASS	
Attenuation	≥ 20 dB, at 20 MHz (50 kHz ref.)
DIF'D STEP	
Attenuation	≥ 20 dB, at 30 kHz (1.6 MHz ref.) ≥ 20 dB, at 7 MHz (1.6 MHz ref.)
Step Response	For 2T pulse, 2T bar Within ± 1 %, pulse/bar ratio Within ± 1 %, overshoot Within ± 1 %, preshoot Within ± 1 %, ringing Within ± 1 %, sag (vertical tilt)
DC Restorer	
Frequency Response	
Slow Mode	≤20 %, attenuation at 60 Hz input
Fast Mode	≥80 %, attenuation at 60 Hz input
Clamp	
Point	Back porch
Variable Range	0.5 to 2 µs, relative to sync pulse raising edge
Blanking Level Shift	≤1 % (10 to 90 % of APL Variation)
Horizontal Axis	
Operation Mode	Overlay: Displays waveforms overlaid Parade: Displays waveforms side by side Timing: For bowtie signal* measurement * Authorized by Tektronix, Inc.
Display Method	
Line:	1H, 2H, 3H
Line Magnified	1H MAG, 2H MAG, 3H MAG
Field:	1V, 2V, 3V
Field Magnified	1V MAG, 2V MAG, 3V MAG
Time Base Accuracy	Within ±3 % (0.1 µs/ div)
Linearity	Within ±3 %
Vectorscope Mode	
Frequency Range	≥ 1 MHz
Amplitude Accuracy	± 2 % (Y, P_B, P_R Input) ± 2 % (G, B, R Input)

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

WAVEFORM MONITOR

5222

LEADER

NTSC

PAL

SECAM

CE
Upon request

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.

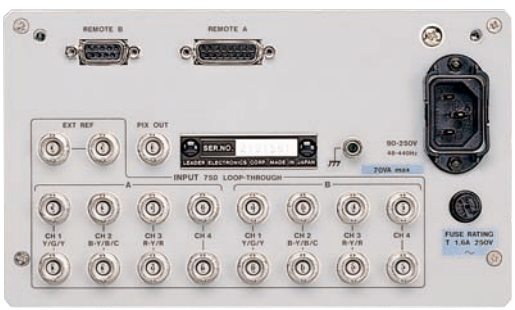
FEATURES

- **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**

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

Synchronization		
Sync Amplitude	5222: CH1A, 4A, 1B, 4B	
	(625)	**(525)**
INT	0.3 Vp-p ±6 dB	0.286 Vp-p ±6 dB
EXT	0.3 Vp-p ±6 dB	0.286 Vp-p ±6 dB
Remote Sync Sensitivity	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)	
Line Selector	**(625)**	**(525)**
Field 1, 3	Line 1 to 313	Line 1 to 263
Field 2, 4	Line 314 to 625	Line 1 to 262
ALL	Line 1 to 312	Line 1 to 262
Preset Function	Up to 10 panel settings, Recallable	
Controllable Functions	All front panel controls (except REMOTE, INTEN, ROTATION, FOCUS, GAIN VAR, POWER)	
Remote Control		
Combinations	5222 → 5212 (NTSC/PAL/SECAM)	
Controllable Functions	All front panel controls (except INTEN, ROTATION, FOCUS, GAIN VAR, POWER)	
Control Input	Rear panel D-sub, 15-pin (REMOTE A) D-sub, 9-pin (REMOTE B)	
Cursors		
Configuration	Horizontal cursors (REF, Δ) Vertical cursors (REF, Δ)	
Amplitude Measurement	Voltage between the REF and Δ cursors Unit: V, IRE, %	
Measurement Range	**(625)**	**(525)**
	0 to 2000.0 mV	0 to 2000.0 mV
	0 to 286.0%	0 to 280.0 IRE
Calibration Accuracy	0.5%, vertical	
Resolution	0.5 mV, 0.1 IRE, or 0.1%	
Time Measurement	Time between the REF and Δ cursors	
Measurement Range	±6 div or more from center	
Calibration Accuracy	±3%	
Resolution	1/80 div	
Frequency Measurement	Frequency between the REF and Δ cursors those apart 1 cycle	
Environmental Conditions		
Operating	Temperature: 0 to 40°C Humidity: ≤ 90% RH (without condensation)	
Spec-Guaranteed	Temperature: 10 to 35°C Humidity: ≤ 80% RH (without condensation)	
Power Requirements	90 to 250 VAC, 48 to 440 Hz	
Power Consumption	50 Wmax.	
Dimensions and Weight	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	
Supplied Accessories	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	
Optional Accessories	LR 2427B (Cabinet, with handle) LR 2404A (Cabinet, without handle) LR 2700A-I (Rack-Mount Adapter, inch size)	

■5222 REAR PANEL



WAVEFORM MONITOR

5861V(PAL) 5860V(NTSC)

LEADER

NTSC 5860V

PAL 5861V

CE
Upon request
(5861V only)

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 µs/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 that lines selected by the line selector, video output connector and other functions necessary for video signal monitoring are provided.

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 µs/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.

■5860V FRONT PANEL

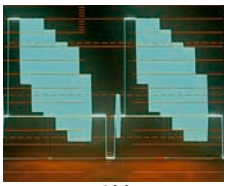
■5861V REAR PANEL

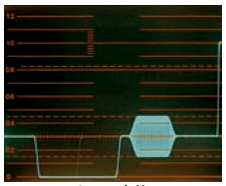
Model	5861V	5860V
CRT		
Type	150 mm rectangular, internal graticule with scale illumination	
Accelerating Potential	12 kV	
Effective Display Area	80 (V)×100 (H) mm	
Beam Rotator	Adjustable from the front panel	
Input Section		
Input Connector	A and B on the rear panel (loop-through, BNC connector)	
Input Impedance	1 Vp-p full scale range: 15 kΩ, 50 pF 4 Vp-p full scale range: 60 kΩ, 50 pF	
Maximum Input	±5 V (DC+peak AC), AC coupled	
Full Scale Graticule		
Full Scale	1.0 scale	140 IRE
SYNC	0.3 scale	40 IRE
VIDEO	0.7 scale	100 IRE
Deflection Accuracy		
1 V Full-scale Range	Within ±2% of 1.0 scale at 1 V input	Within ±2% of 140 IRE at 1 V input
4 V Full-scale Range	Within ±4% of 1.0 scale at 4 V input	Within ±4% of 140 IRE at 4 V input
Frequency Characteristics		
FLAT	25 Hz to 3.6 MHz ±2%, 3.6 MHz to 5 MHz+2%, –5% at 50 kHz reference	
LUM	More than 35 dB of attenuation at 4.43 Mz	——
IRE	——	Conforms to IRE STD23S-1 (1958); more than 22 dB of attenuation at 4.43 MHz
CHROMA	4.43 MHz bandpass filter	3.58 MHz bandpass filter
	Response: Within ±2% at filter FLAT	
DIF GAIN	4.43 MHz bandpass filter	3.58 MHz bandpass filter
	3 to 5.5 times of CHROMA amplitude	
DIF'D STEP	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%	
Transient Response	±1.5% or less in overshoot, preshoot, and ringing using the sin² pulse & bar signal at FLAT with 1 V full scale range.	±2 IRE or less in overshoot, preshoot, and ringing using the sin² pulse & bar signal at FLAT with 1 V full scale range.
Sag (Vertical window signal)	2% or less	
Variable Range	Input voltage of 1.0 full scale	Input voltage of 140 IRE full scale
1 V Full-scale Range	0.25 V or less to 1 V	
4 V Full-scale Range	1 V or less to 4 V	
DC Regeneration	Clamped at the back porch	

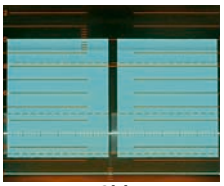
Model	5861V	5860V
Video Output		
Output Connector	BNC connector on the rear panel	
Output Voltage	1 V ±15% at full scale input	
Output Impedance	75 Ω ±10%	
Frequency Characteristics	25 Hz to 5 MHz ±5%	
Sweep		
1H Sweep	Display of 1H waveform	
2H Sweep	Display of 2H waveform	
1 µs/div	10 times magnification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

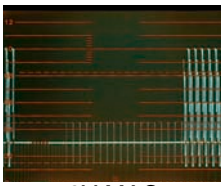
■5861V WAVEFORMS DISPLAY

•Sweep Range

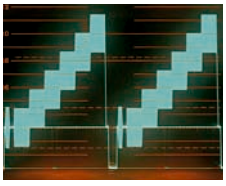

2H

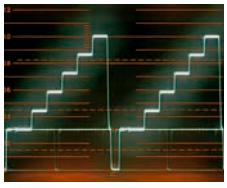

1 µs/div

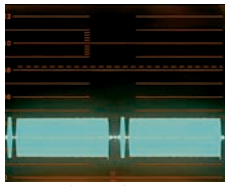

2V

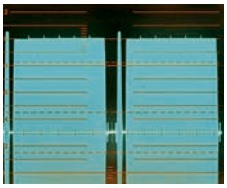

2V MAG

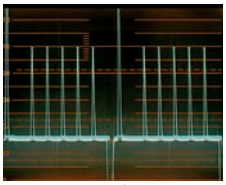
•Frequency Response Range


FLAT


LUM


CHROMA


DIF GAIN


DIF'D STEP

VECTOR SCOPE

5212

LEADER

NTSC

PAL

CE
Upon request

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.

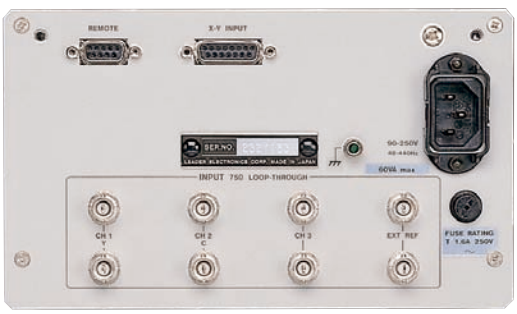
FEATURES

- **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. Yon 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**

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

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

■5212 REAR PANEL



VECTOR SCOPE

5850V(NTSC)

LEADER

NTSC

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.

FEATUREFS

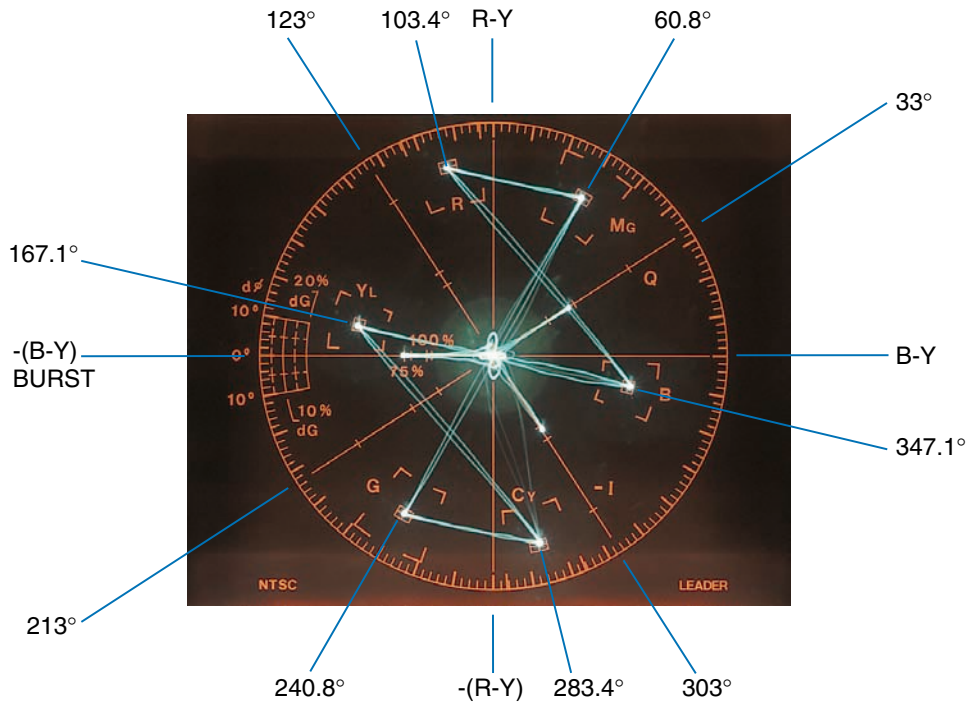
- The 150 mm rectangular CRT with internal graticule (with the scale illumination), it is possible to measure without parallax reading error.
- DP and DG measurements enable using the modulated staircase.
- Use with a waveform monitor to observe the vector VITS and VIR signals.
- The optional rackmount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

■5850V REAR PANEL

CRT	
Type	150 mm rectangular, internal graticule with scale illumination
Accelerating Potential	12 kV
Effective Display Area	80 (V)×100 (H) mm
Beam Rotator	Adjustable from the front panel
Graticule	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
Composite Video Signal Input	
Input	A, B and EXT REF on the rear panel (loop-through, BNC connector)
Input Impedance	A, B: 2 MΩ, EXT REF: 10 kΩ
Max. Input Voltage	±5 V (DC+peak AC)
Sensitvity	
Calibrated Value	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
EXT REF	Subcarrier: 2 Vp-p ±6 dB Black Burst: 0.43 Vp-p ±6 dB
Blanking Input	
Sensitivity	DC ±1 V
Polarity	Brightens With positive voltage
Chrominance	
Bandwidth	Center: Fsc=3.579545 MHz High Freq.=Fsc +500 kHz Low Freq.=Fsc -500 kHz
Phase Accuracy	±2°
Amplitude Accuracy	±3%
Differential Phase	±1°
Differential Gain	±1%
Measurement Item	
Vector Measurement	Phase and amplitude of chrominance component in 75% or 100% saturation color bar signal

Horizontal Synchronization	
Input	Synchronization by the horizontal sync signal of composite video signal from input A or B.
Sync Polarity	Negative
Sync Level Range	0.286 Vp-p ±6 dB
Subcarrier Signal Synchronization	
Synchronization by Burst Signal (of composite video signal)	
Sync Level Range	0.286 Vp-p ±6 dB
Synchronization by External Subcarrier Signal (which is applied to the EXT REF input)	
Subcarrier Signal Sync Level Range	2 Vp-p ±6 dB
Synchronization by Black Burst Signal (which is applied to the EXT REF input)	
Black Burst Sync Level Range	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)
Subcarrier Frequency	3.579545 MHz
Sync Capture Range	±50 Hz (0°C to 40°C)
Phase Adjustment Range	360°, continuously variable
Calibration	
Test Circle	Set the chrominance signal applied from the input connector in asynchronous mode.
Power Requirements	100, 120, 200, 240 VAC, selectable by internal wiring 50/60 Hz, 40 Wmax.
Dimensions and Weight	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
Accessories	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



MULTI FORMAT VIDEO GENERATOR MAINFRAME

LT 443D

LEADER

Upon request

RoHS

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

The LT 443D Signal Generator can be flexibly used for the multiformat 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 cannnot replace the unit.
- **Applicable to multiformat 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 multiformat 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

Compartment	
Number of compartments	4
ID Function	Automatically identifies the unit installed. *2 Refer to specifications of each unit.
LCD Panel	
Number of Characters	20 characters x 2 lines can be displayed (W/backlight)
Internal Clock	
Internal Reference Frequency	27 MHz
Memory Card Slot	
Applicable Card	Compact flash memory card (CFA TYPE-1) *3
Function	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.
External Interface	
Ethernet	10Base-T/100 Base-T (Automatic selection)
USB (Universal Serial Bus)	Applicable to USB 1.1 This function will be supported.
General Specifications	
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
Power Requirements	90 to 250 VAC, 50/60 Hz
Power Consumption	Approx. 150 W max. (Approx. 75 W max. *5)
Dimensions and Weight	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
Accessories	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.

Genlock Function	
Loop-Through Input	
Input Configuration	BNC connector, 75 Ω loop-through
Return Loss	≥ 30 dB (0.3 MHz to 30 MHz)
Reference Input Signal	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
Reference Input Signal Level	
• HDTV	Positive polarity: 300 mV Negative polarity: -300 mV
• 525p/625p	-300 mV
• NTSC	-286 mV
• PAL	-300 mV
Operation Modes	AUTO and MANUAL modes are provided for selecting INT or EXT mode.
Genlock Timing Variable Range	Fine adjustment between the H-PHASE (COARSE) steps.
• H-PHASE (FINE)	±1/2 line with respect to the input signal
• H-PHASE (COARSE)	±1 frame with respect to the input signal
• V-PHASE	Up to ±5 frames with respect to the input signal. (Variable range depends on the input signal format.)
• F-PHASE	
Analog Sync Signal Output	
BLACK 1/BLACK 2/BLACK 3 Output	
Format	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
Sync Level (into 75 Ω)	
• HDTV	Positive polarity: 300 mV ±6 mV Negative polarity: -300 mV ±6 mV
• 525p	-300 mV ±6 mV
• 625p	-300 mV ±6 mV
• NTSC	40 IRE ±1 IRE
• PAL	-300 mV ±6 mV
Rise and fall times	
• HDTV	54 ns ±20 ns
• 525p	70 ns ±10 ns
• 625p	100 ns ±10 ns
• NTSC	140 ns ±10 ns
• PAL	200 ns ±10 ns
Horizontal Sync Width	
• 1125-Line Format	Positive polarity: 593 ns ±40 ns Negative polarity: 593 ns ±40 ns
• 750-Line Format	Positive polarity: 539 ns ±40 ns Negative polarity: 539 ns ±40 ns
• 525p	2.35 µs ±0.05 µs
• 625p	2.35 µs ±0.1 µs
• NTSC/PAL	4.7 µs ±0.1 µs
Vertical Sync Width	5H (HDTV) / 6H (525p) / 5H (625p) / 3H (NTSC) / 2.5H (PAL)
Output Connector	BNC
Number of Outputs	1 each
Timing Variable Range	
• H-PHASE	Up to ±1 line-1 dot
• V-PHASE	Up to ±1 frame-1 line
• F-PHASE	Up to ±5 frames (depends on the input signal format.)

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.

Output	
• HD-SDI Video Output Specifications	1 system, 2 outputs (75 Ω, BNC)
• Specifications	Conforms to SMPTE 240M(Except for Return Loss) /274M/296M standards
SDI Characteristics	
• Bit Rate	1.485 Gbps, 1.485/1.001 Gbps
• Output Amplitude	800 mVp-p ±10%
• Overshoot	≤ 10 %
• Rise and Fall Time	≤ 270 ps (20 % to 80 %)
• Return Loss	≥ 15 dB (5 MHz to 742.5 MHz) ≥ 10 dB (742.5 MHz to 1.485 GHz)
Function	
• Applicable Format	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 The following formats will be supported: 720p/29.97, 720p/24, 720p/23.98, 720p/50, 720p/30, 720p/25
• Test Patterns	COLOR BAR 100 %, COLOR BAR 75 %, MULTIFORMAT COLOR BAR (ARIB STD-B28) FLAT FIELD 100 %, FLAT FIELD 50 %, FLAT FIELD 0 %, LINE SWEEP 100 %, MULTI BURST 100 %, BOWTIE 100 %, RAMP, SHALLOW RAMP, 10 STEP, PULSE & BAR, CHECK FIELD, RED RASTER 100 %, CROSS & DOT, MONOSCOPE
• Variable Timing	
Variable Range	Entire frame range
Variable In V	Line steps
H	Clock steps (74.25 MHz or 74.25/1.001 MHz)
• Simple Motion Picture Mode (Scroll)	
Direction	8 directions (vertical, horizontal, diagonal)
Speed (Range, Resolution)	
Field Frame Interlace	Variable in field steps
V Interlace	0 to 256 lines in 2 line steps
H Common	0 to 256 dots in 4 dot steps
• ID Character	ID characters can be displayed at the arbitrary position on the screen.
• Embedded Audio	
Number of Channels Embedded	8 channels (4 channels x 2 groups) Each group can be set ON/OFF
Sampling Frequency	48 kHz (sync to video signal)
Resolution	20 bits, 24 bits, selectable
Preemphasis	OFF, 50/15 µs, CCITT, selectable (CS bit is only selected.)
Frame Number	None
Frequency	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
Level	-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.

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

Analog Sync Signal Output	
BLACK 1, 2/BLACK 3, 4/BLACK 5, 6	
Format	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
Sync Level (into 75 Ω)	
• HDTV	Positive polarity: 300 mV ±6 mV Negative polarity: -300 mV ±6 mV
• 525p	-300 mV ±6 mV
• 625p	-300 mV ±6 mV
• NTSC	40 IRE ±1 IRE
• PAL	-300 mV ±6 mV
Rise and fall times	
• HDTV	54 ns ±20 ns
• 525p	70 ns ±10 ns
• 625p	100 ns ±10 ns
• NTSC	140 ns ±10 ns
• PAL	200 ns ±10 ns
Horizontal Sync Width	
• 1125-Line	Positive polarity: 593 ns ±40 ns Negative polarity: 593 ns ±40 ns
• 750-Line	Positive polarity: 539 ns ±40 ns Negative polarity: 539 ns ±40 ns
• 525p	2.35 µs ±0.05 µs
• 625p	2.35 µs ±0.05 µs
• NTSC/PAL	4.7 µs ±0.1 µs
Vertical Sync Width	5H (HDTV) / 6 H (525p) / 5H (625p) / 3H (NTSC) / 2.5H (PAL)
Output Connector	BNC (BLACK 1, 2/BLACK 3, 4/BLACK 5, 6)
Number of Outputs	2 each
Timing Variable Range	
• H-PHASE	Up to ±1 line-1 dot
• V-PHASE	Up to ±1 frame-1 line
• F-PHASE	Up to ±5 frames (depends on the input signal format.)

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

Output	
• SD-SDI Video Output	1 system, 2 outputs (75 Ω, BNC)
Specifications	
• Specifications	Conforms to ITU-R BT. 601, SMPTE 125M standards Conforms to ITU-R BT. 656, SMPTE 259M standards
SDI Characteristics	
• Bit Rate	270 Mbps
• Output Amplitude	800 mVp-p ±10 %
• Overshoot	≤ 10 %
• Rise and Fall Time	0.4 to 1.5 ns (20 % to 80 %)
• Return Loss	≥ 15 dB (5 MHz to 270 MHz)
Function	
• Applicable Format	525i/59.94-270 MHz, 625i/50-270 MHz
• Test Patterns	COLOR BAR 100%, COLOR BAR 75%, EBU COLOR BAR, BBC COLOR BAR, SMPTE COLOR BAR, RAMP & COLOR, FLAT FIELD 100%, FLAT FIELD 50%, FLAT FIELD 0%, FIELD ID, CROSSHATCH, LINE SWEEP 100%, LINE SWEEP 60%, MULTIBURST 100%, MULTI-BURST 60%, OVER SIZE RAMP, DIGITAL LIMIT RAMP, SHALLOW RAMP, 10 STEP, CHECK FIELD, MONOSCOPE, BOWTIE 100%, PULSE & BAR, RED RASTER, MULTIPULSE

• Variable Timing	
Variable Range	Entire frame range
Variable In V	Line steps
H	Clock steps (27 MHz)
• Simple Motion Picture Mode (Scroll)	
Direction	8 directions (vertical, horizontal, diagonal)
Speed (Range, Resolution)	
Field Frame	Variable in field steps
V	0 to 256 lines in 2 line steps
H	0 to 256 dots in 4 dot steps
• ID Characters	
Number of Characters	Up to 20
Size	32 x 32 dots, 64 x 64 dots, selectable
• Embedded Audio	
Number of Channels Embedded	8 channels (4 channels x 2 groups) Each group can be set ON/OFF respectively.
Sampling Frequency	48 kHz (sync to video signal)
Resolution	20 bits, 24 bits, selectable
Preemphasis	OFF, 50/15 µs, CCITT, selectable(CS bit is only selected.)
Frame Number	
Frequency	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
Level	-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.

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.

RoHS

Output	
• Number of Outputs	2
• Output Impedance	600 Ω, balanced
• Output Amplitude	0.775 Vrms (into 600 Ω at 0 dBm)
• Output Amplitude Accuracy	±0.5 dB (at 1 kHz)
• Output Amplitude Flatness	±0.5 dB (1 kHz ref.)
• Output Connector	XLR-3P x 2

Function	
• Sampling Frequency	48 kHz (Sync to video signal)
• Frequency	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
• Level	-40 to 4 dBm (settable in 1 dBm steps)

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.

Output	
• AES/EBU Digital Audio Output	
Number of Outputs	4 (2-channel output)
Output Amplitude	1 Vp-p ±0.1 V (into 75 Ω)
Output Connector	BNC
• Silence Signal (DARS grade 2) Output	
Number of Outputs	1 (2-channel output)
Output Amplitude	1 Vp-p ±0.1 V (into 75 Ω)
Output Connector	BNC
• 48 kHz Word Clock	
Number of Outputs	1
Output Amplitude	1 Vp-p ±0.1 V (into 75 Ω), 5 V CMOS, selectable
Output Connector	BNC
Signal Specifications	
• Specifications	ANSI S4.40 (AES3-1992), AES 11-1997 SMPTE 276M, AES-3id-2001

Function	
• Sampling Frequency	48 kHz (sync to video signal)
• Resolution	20 bits, 24 bits, selectable
• Preemphasis	OFF, 50/15 µs, CCITT, selectable (CS bit can only be selected.)
• Frequency	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
• Level	-60 to 0 dBFS (settable in 1 dB steps)
• Audio Click	1, 2, 3, 4 sec, none
• Output ON/OFF	Selectable
• Timing	
Variable Range	±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.

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.

Test Signal Output	
• Format	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 *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.
• Pattern	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 & BAR
• NATURAL Picture *5	Up to five screens of 24-bit full color BMP file can be simultaneously switched.
• APL	
MODE	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 %.
Time Interval	1 to 20 seconds (settable in one second steps)
• ID Charactor	
Number of Characters	Up to 20
Size	32 x 32 dots, 64 x64 dots, selectable
Display Position	Arbitrary position on the screen.
Blinking	OFF, 1 to 10 seconds (settable in one second steps)

• Simple Motion Picture Function	
Direction	8 directions (up, down, left, right, and combinations)
Speed	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.
• Timing Variable	The timing of OUTPUT 1 and 2 can be varied simultaneously.
H-PHASE	Up to ±1 line-1 dot
V-PHASE	Up to ±1 frame-1 line
F-PHASE	NTSC:Up to ±5 frames PAL: UP to ±2 frames
• Number of Outputs	2
Black Signal Output	
• format	Depends on the test signal format. (Supports the field Reference and 10 field ID)
• Output Signal	Analog black burst
• Format	The timing of OUTPUT 1 and 2 can be varied simultaneously.
• Timing Variable	
H-PHASE	Up to ±1 line-1 dot
V-PHASE	Up to ±1 frame-1 line
F-PHASE	NTSC:Up to ±5 frames PAL: UP to ±2 frames
• Number of Outputs	2 Systems (one each)
• Signal Level	1 Vp-p (into 75 Ω)
Horizontal Drive Pluse Output	
• Format	Depends on the test signal format.
• Signal Level	2 Vp-p (into 75 Ω)
• Signal Polarity	Negative
• Timing Variable	
H-PHASE	Up to ±1 line-1 dot
• Number of Outputs	1
Vertical Drive Pluse Output	
• Format	Depends on the test signal format.
• Signal Level	2 Vp-p (into 75 Ω)
• Signal Polarity	Negative
• Timing Variable	
V-PHASE	Up to ±1 frame-1 line
• Number of Outputs	1

MULTI FORMAT VIDEO GENERATOR

LT 4400

LEADER

HD-SDI

SD-SDI

New

CE
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 intermitent.
- **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.

SDI Output	
Number of Outputs	1 system, 2 outputs (75 Ω, BNC) HD-SDI/SD-SDI, selectable
Conform To	
HDTV	SMPTE 274M, SMPTE 296M, SMPTE 292M (except return loss)
SDTV	ITU-R BT 601, SMPTE 125M ITU-R BT 656, SMPTE 259M
Applicable Format	
HDTV	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
SDTV	525i/59.94-270 MHz, 625i/50-270 MHz
Timing Variable	
Variable Range	Entire frame range
Resolution	V: Settable in line steps H: Settable in clock steps (74.25 MHz, 74.25/1.001 MHz, 27 MHz)
Test Patterns	
HDTV	COLOR BAR 100 %, COLOR BAR 75 %, MULTIFORMAT COLOR BAR (ARIB STD-B28:75 % White, 100 % White, and + I signal, selectable), CHECK FIELD
SDTV	COLOR BAR 100 % (applicable to both 525i/59.94, 625i/50), COLOR BAR 75 %, SMPTE 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)
Safety Area Marker	
HDTV	Action safety area (90 %), Title safety area (80 %) 4:3 aspect ratio Selectable ON/OFF individually
SDTV	Action safety area (90 %), Title safety area (80 %) Selectable ON/OFF individually
ID Characters	
Number of Characters	Up to 20 characters
Size	
HDTV	32x32/64x64/128x128 dots selectable
SDTV	32x32/64x64 dots selectable
Display Position	Displays at an arbitrary position on the screen.
Freeze Confirmation Display	Blinking OFF, 1 to 10 seconds
Logo Mark	
Logo Mark Data	4-level monochrome data between 0 and 3
Maximum Size	320(dot) x 240(line) (QVGA size)
Display Position	Displays at an arbitrary position on the screen
Display Level	Set arbitrary levels for levels 0 to 3
Display Method	Simultaneous display with the ID character
File Format	
Before Conversion	24-bit full-color bitmap data (.bmp) format
After Conversion	LT 4400/LT 443D dedicated (.lg) format
Conversion Color Matrix	Y = 0.212*R + 0.701*G + 0.087*B
Conversion Method	Converts 256-level monochrome data(Y) to four levels (level 0 to 3) using arbitrary threshold values. Converted using the logo mark conversion application.
Transferring the Logo Mark Data	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.
Pattern Scroll (Simple Motion Picture Mode)	
Direction	8 directions (vertical, horizontal, diagonal)
Speed (Range, Resolution)	
Field and Frame	
Interlace	Variable in field steps
Others	Variable in frame steps
V Interlace	0 to 256 lines in 2 line steps
Others	0 to 256 lines in 1 line steps
H Common	0 to 256 dots in 4 line steps
Embedded Audio	
Number of Channels Embedded	16 Channels (4ch x 4group). Each group can be set ON/OFF
Sampling Frequency	48 kHz (sync to video signal)
Resolution	20 bits, 24 bits, selectable
Preemphasis	OFF, 50/15 ms, CCITT, selectable (CS bit can only be selected)
Frame Number	ON, OFF, selectable
Frequency	400 Hz /800 Hz /1 kHz, selectable (sets to each channel)
Level	Can be selected including silence (sets to each channel) -60 to 0 dBFS (settable in 1 dBFS steps)
Audio Click	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.
Genlock Function	
Reference Input Signal	
Input Configuration	BNC (75 Ω, loop through)
Input Signal	
NTSC black burst signal	EBU N14/SMPTE RP154/SMPTE 170M/SMPTE 318M
PAL black burst signal	ITU-R BT.470-6
HDTV tri-level sync signal	SMPTE 274M, SMPTE 296M
Sync Level	
NTSC black burst signal	-286 mV
PAL black burst signal	-300 mV
HDTV tri-level sync signal	±300 mV
Maximum Input Level	± 4.5 V (DC + peak AC)
Operating Input Level Range	± 6 dB
External Lock Range	± 10 ppm
Jitter	
Burst Lock Mode	≤ 0.5 °
Sync Lock Mode	≤ 1 ns
Operation Modes	
INTERNAL	Internal reference signal is used for operation. (INT mode)

AUTO (GO INTERNAL)	
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.	
MANUAL (GO INT)	
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.	
AUTO (STAYinSYNC)	
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.	
MANUAL (STAYinSYNC)	
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.	
Genlock Timing	
Variable Range	
NTSC black burst signal	± 5 frames
PAL black burst signal	± 2 frames
HDTV tri-level sync signal	1 frame (entire frame range)
Resolution	
H	0.0741 µs steps (13.5 MHz clock steps)
V	1 line steps
F	1 frame steps
Reference Point (at the time of the black burst input)	
NTSC	The phase coincident point of line 4 of the NTSC and line 1 of the HDTV
PAL	The phase coincident point of line 1 of the PAL and line 1 of the HDTV
Analog Sync Signal Output	
Format	
NTSC black burst signal	EBU N14, SMPTE RP154, SMPTE 170M, SMPTE 318M
HDTV tri-level sync	SMPTE 274M, SMPTE 296M
Output Signal	
Number of Outputs	6 Outputs (three output systems which equip with two connectors each)
Setting Output Format	Settable
Output Connector	
Output Impedance	75 Ω
Output Connector	BNC
Output Timing	
Setting	Three systems can be set individually.
Variable Range	
NTSC black burst signal	± 5 frames
PAL black burst signal	± 2 frames
HDTV tri-level sync	1 frame (entire frame range)
Setting Resolution	
NTSC black burst signal	0.0185 µs steps (54 MHz in clock steps)
HDTV tri-level sync	0.0135 µs steps (74.25/1.001 MHz in clock steps, or 74.25 MHz in clock steps)
Word Clock Output	
Frequency	48 kHz
Output Impedance	75 Ω unbalanced ("1 Vp-p" output)
Output Amplitude	1 Vp-p ± 0.1 V (into 75 Ω), or 5 V CMOS, selectable
Output Connector	BNC
Number of Outputs	1
Timing Variable	
Variable Range	± 1 AES/EBU frame
Setting Resolution	512 fs (24.576 MHz) steps
Memory Card Slot	
Function	Storing/reading preset data Reading logo data
Ethernet Connector	
Type	10BASE-T/100BASE-TX, auto switching
Function	Transferring operation status (e.g., genlock status) Remote control (e.g., pattern switching) SNMP supported (to be supported in the future)
LCD Panel	
Number of Characters	20 characters x 2 lines can be displayed (w/backlight)
Environmental Conditions	
Operating Temperature Range	0 to 40 °C
Operating Humidity Range	≤ 85 % RH (without condensation)
Spec-Guaranteed Temperature	10 to 30 °C
Spec-Guaranteed Humidity	≤ 85 % RH (without condensation)
Operating Environment	Indoor use
Operating Altitude	Up to 2000 m
Overvoltage Category	I
Pollution Degree	2
Power Requirements	DC12 V (10 to 18 V) 20 W
Dimensions and Weight	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
Accessories	AC adapter.....1 Instruction manual.....1

AUTO CHANGEOVER

LT 444/LT 4440

LEADER

CE
Upon request

RoHS

New
(LT 4440)

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.

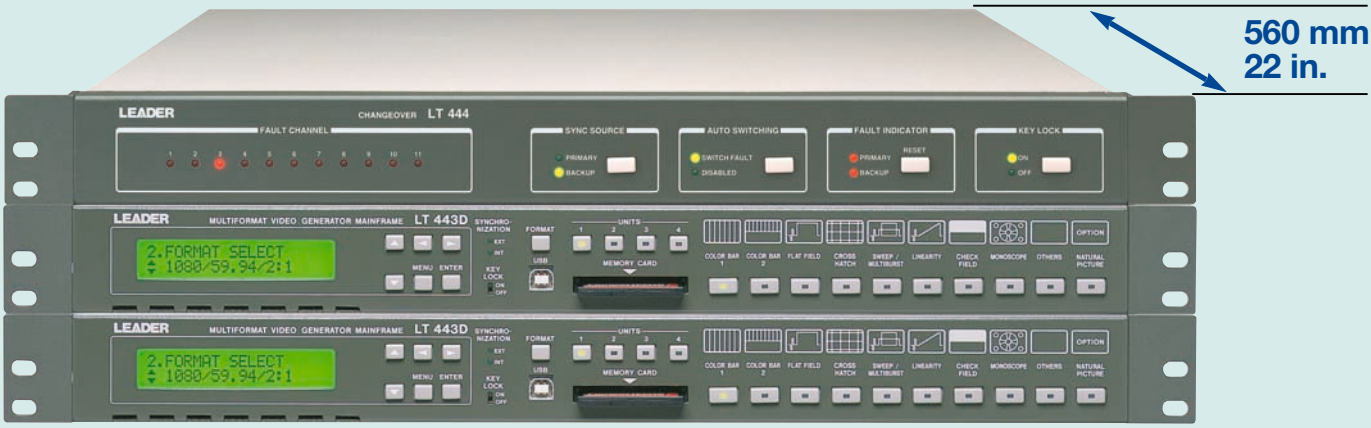
FEATURES

- **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

Inputs **PRIMARY inputs** **BACKUP input**	 1 input each for 11 channels (75 Ω BNC connector) 1 input each for 11 channels (75 Ω BNC connector)
Outputs **OUTPUT outputs**	 1 output each for 11 channels (75 Ω BNC connector)
Input/Output Characteristics (CH1 to CH11) **Return Loss**	 30 dB 0 to 10 MHz 15 dB 10 MHz to 750 MHz 10 dB 750 MHz to 1.5 GHz
Input Signal Type **Signal Type**	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
Determination Criteria of the Signal Level **Detection Level**	 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.
Error Display **Total Error LED** **Error Channel LED**	 Notifies errors by illuminating the error LED on the panel. Detects the channel causing the error and shows the channel by illuminating the corresponding LED.
Panel Key Lock **Time to Key Lock**	 The key lock is automatically enabled when key operation is not detected for 60 s.
External Control (REMOTE) Connector **Application** **Connector Type**	 For external remote control. 9-pin Dsub connector
Dimensions and Weight	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
Accessories	Rack supports ····2 Rack support attachment screws ····4 Power cord ····1 Instruction manual ····1

LT 444 is a Deeper Cabinet



The LT 444 can be configured in the system with the LT443D

LT 4440 is a Short Cabinet

The LT 4440 can be configured in the system with the LT4400

REAR PANEL

The photo is LT 444

NTSC SYNC GENERATOR

410BB

LEADER

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

Black Burst	
(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 ±10 Hz
Output Impedance	75 Ω
Number of Outputs	6
(2) Sync Signal and Color Burst	
Sync Signal	
Amplitude	286 ±14.3 mV
Blanking Level	0 ±20 mV
Rise/Fall Times	140 ±20 ns
Horizontal Sync Pluse Width	4.7 µs±100 ns
Vertical Sync Pluse Width	3H
Equalizing Pluse Width	2.3 µs±100 ns
Vertical Serration Pluse Width	4.7 µs±100 ns
Virtical Blanking Period	20H +1.5 µs
Color Burst	
Amplitude	286 ±14.3 mVp-p
Number of Cycles	9
Rise/Fall Times	300+200 ns, or 300-100 ns
SCH Phase	±10 °

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

■410BB REAR PANEL

STEREO AUDIO MONITOR

5835

LEADER

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

CRT	
Type	Rectangular, 150 mm
Accelerating Potential	Post acceleration 12 kV
Effective Display Area	100 (H)×75 (V) mm
Scale Illumination	Adjustable on the front panel
Beam Rotator	Adjustable on the front panel
Graticule	External graticule with phase graticule
X, Y-Axis	
Input Connector	Two types input.L and R Rear cannon connector XLR-3-31, XLR-3-32 (First earth, second hot, third cold)
Input Impedance	Balanced input.more than 20 kΩ, changing to 600 Ω in internal
Full Scale Input	At 775 mVrms input for L and R Full scale display in CRT (Y axis: L=R) (At CAL'D, RANGE 0 dB)
Bandwidth	20 Hz to 20 kHz ±0.5 dB
Phase Difference	20 Hz to 20 kHz ±1°
Gain Adjustment	RANGE (–20 dB, 0 dB, +10 dB) VARIABLE (approx, ±10 dB)
Stereo Polarity	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.
Calibration	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.
Z Axis	
Spot-Killer	The trace is blanked in the no-signal condition.
Front Panel Operation	POWER, INTEN, FOCUS, ILLUM, ROTAT, X-POSITION, Y-POSITION, RANGE, VARIABLE, STEREO POLARITY
Power Requirements	100, 120, 220, 240, VAC, 50/60 Hz Approx. 35 Wmax. (set at the factory before shipping)
Dimensions and Weight	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
Accessories	Power cord ·····1 Spare illumination lamp ·····2 Scale filter (for X-Y) ·····1 Screw, rack mounting (inch size) ·····2 Cover/Inlet stopper ·····1

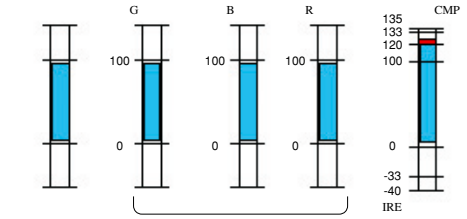
Overview of the 5 Bar Display

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_B, and C_R signals using matrix calculation.

Bar Display Details

●Contents of the 5 Bar Display

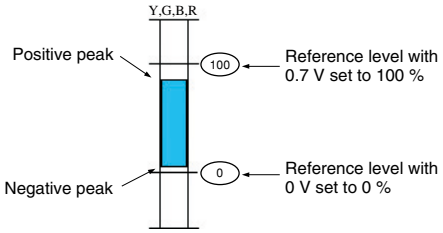


SDI Y signal level

The converted GBR levels of the SDI signal

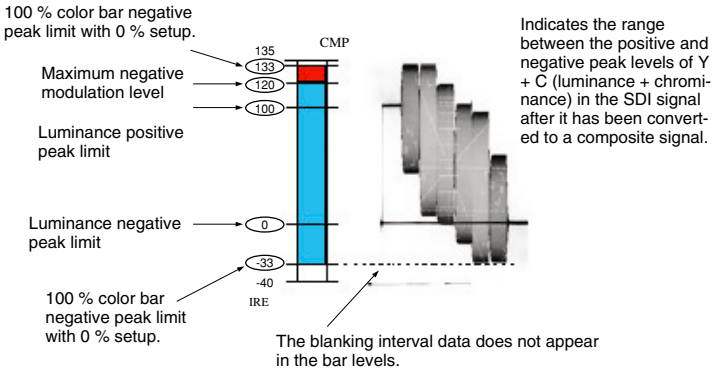
The combined luminance and chrominance signal level of the SDI signal after it has been converted to a composite signal.

●Contents of the Component Bar Display



Indicates the range between the negative and positive peak levels

●Contents of the Composite 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

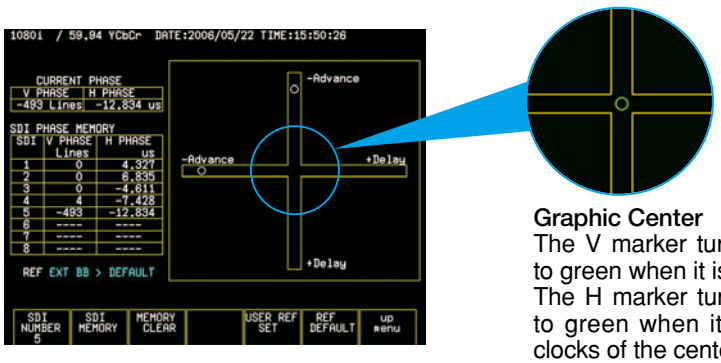
●A feature that shows the phase differences between SDI and external sync (EXT REF) signals.

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

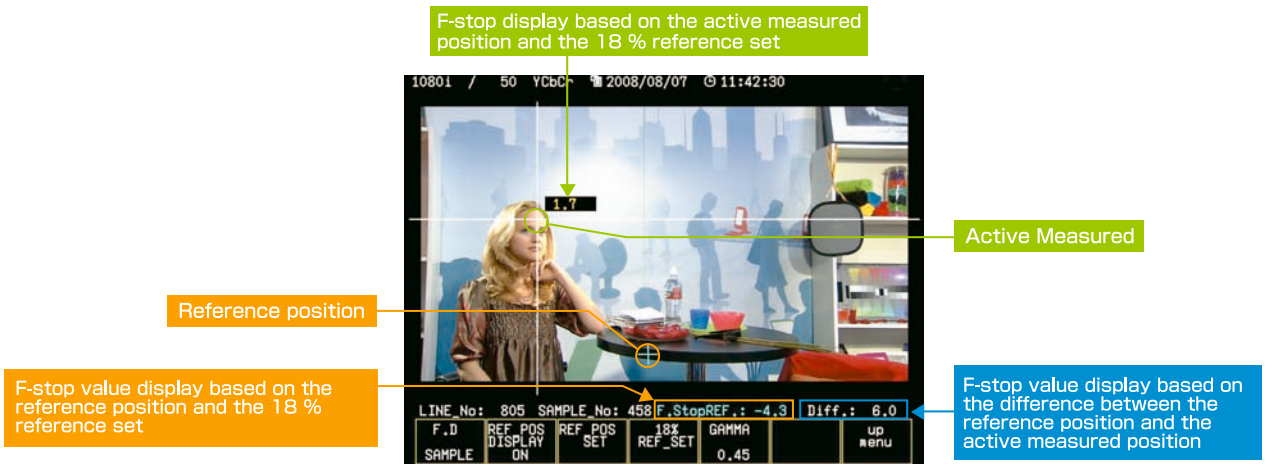
Patent pending

CINELITE

A feature that allows you to put the cros 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.



■ RGB 255 Display

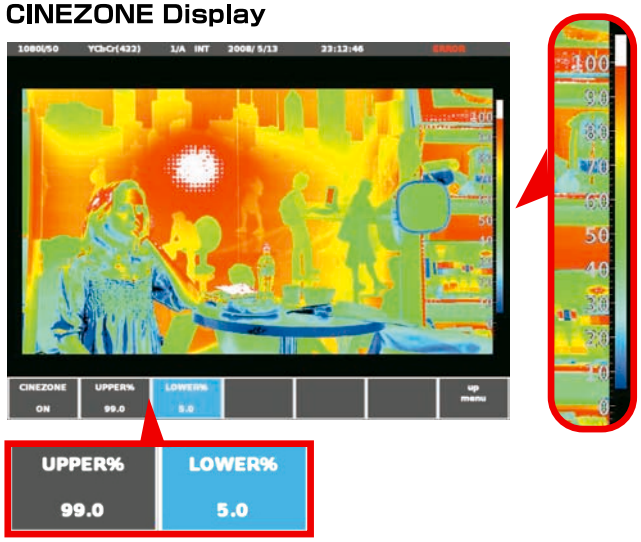
■ RGB % Display Mode

■ LUMINANCE % Display Mode

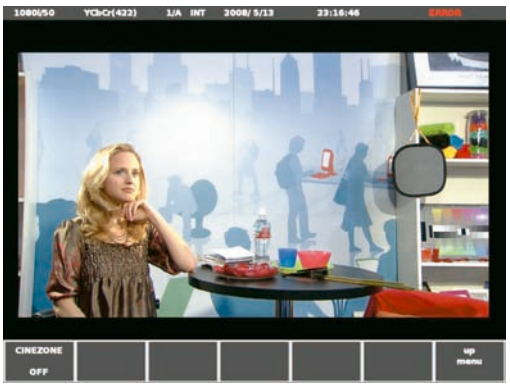
CINEZONE

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



■ Normal Display

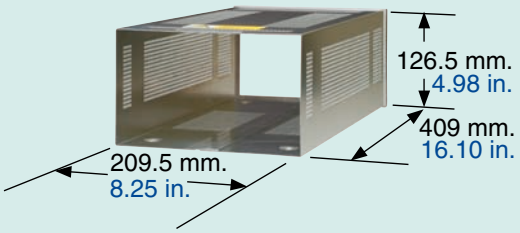


OPTIONAL ACCESSORIES

LEADER

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

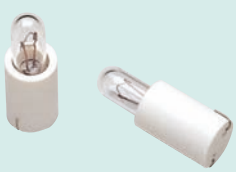
LC 2128
Front cover

LP 1960
AC Adapter

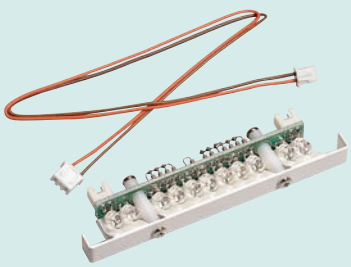
For LV 5380, LV 5330,LT 4400, LV 5750, LV 7700, LV 7720

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

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

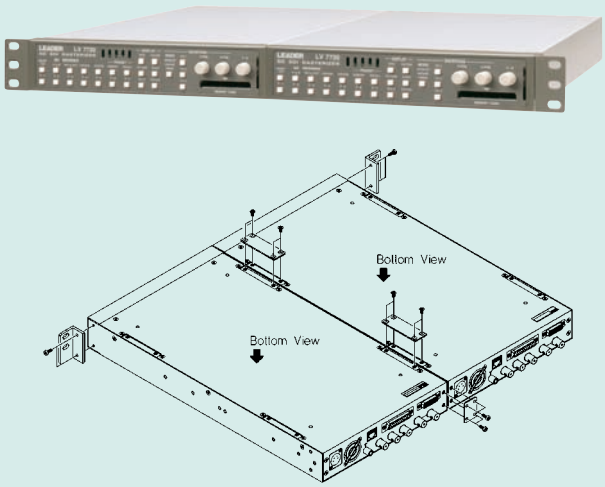


LI-2308 (LED)
Illumination lamp

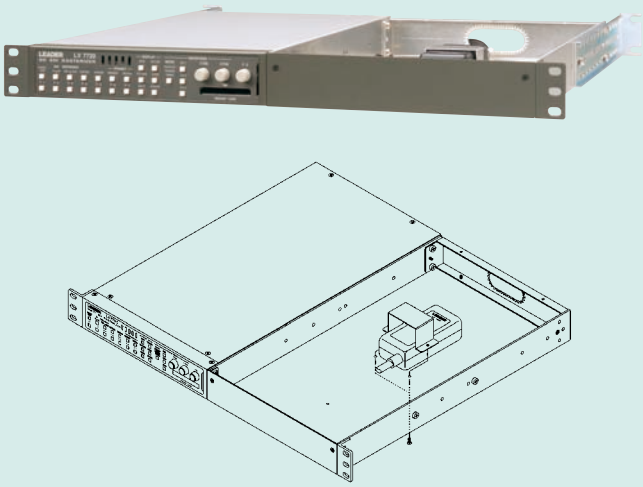


Dedicated Rack Mount Adapter (Sold Separately)

LR 2477
Rackmount adapter



LR 2480
Rackmount adapter



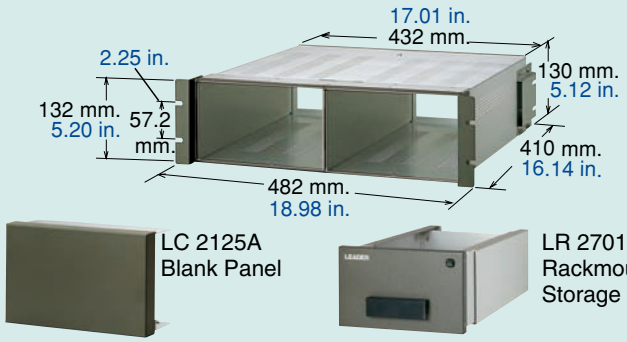
LR 2750-I
Rackmount adapter

LC 2125A
Blank Panel

For LV 5750

LR 2700A-I
Rackmount adapter

EIA standard, inch size



LC 2125A
Blank Panel

LR 2701
Rackmount
Storage box

Model	Product Name	Applicalle Model
LR 2700A-I	Rackmount adapter	LV 5800, LV 5152, 5212, 5222, LV 5700A,LV 5750, 5835, 5850V, 5860V, 5861V
LR 2701	Rackmount Strage 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.

LEADER

Technology Innovator

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.

ORDERING INSTRUCTIONS:
When inquiries or orders re 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 desighed to operate at the voltages which are with in ±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: ≤85 % RH (without condensation)

POWER REQUIREMENTS:
“ VA ” in the “ Power Consumption ” indicates the apparent power.

RoHS

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)

LEADER ELECTRONICS CORP.

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LEADER ELECTRONICS CORP.BEIJING OFFICE	PHONE:86-10-8511-8606/8607	FAX:86-10-8511-8608
LEADER INSTRUMENTS (H.K.)LTD.DONGGUAN OFFICE	PHONE:86-769-83829381,83829391	FAX:86-769-83819289
LEADER ELECTRONICS CORP.SHANGHAI OFFICE	PHONE:86-21-62756905,62759629	FAX:86-21-62751486
LEADER ELECTRONICS EUROPEAN OFFICE	PHONE:31-40-2565008	FAX:31-40-2565009

AGENT

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