MULTI RASTERIZER

LV 7800

LEADER

■ Squeeze Feature

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

External Display

3G option

HD-SDI option

SD-SDI option

Dual Link 2K option

CE Upon request

Multi Rasterizer

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

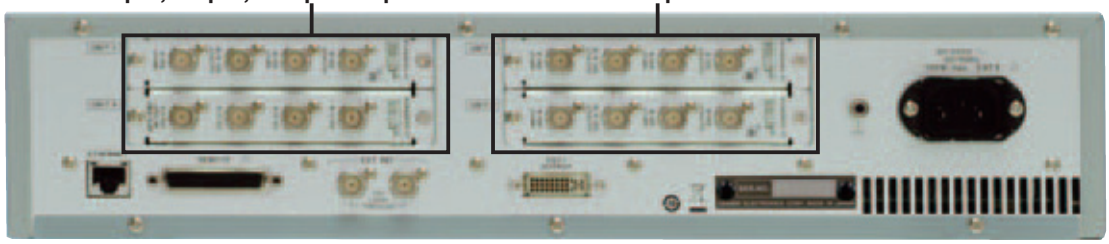
* If you only use the flanges on the front panel to mount the instrument, the instrument case may be deformed, or the instrument may fall.

FEATURES

- **Slots for Four Units**
  The LV 7800 is equipped with two input slots and two input/output slots, which means you can install a maximum of four units.
  Each input and output unit operates independently.
- **External Sync Signal Input**
  The LV 7800 can receive tri-level sync signals and NTSC or PAL black burst signals. You can display video signal waveforms in phase with an external sync signal.
- **DVI-I Connector**
  You can view the various LV 7800 displays on an external XGA (1024 x 768) display by connecting the display to the DVI-I connector.
  Additionally, the vector, picture, and audio displays support displays with aspect ratios of 16:9 / 16:10 (in squeeze mode).
- **Preset Settings**
  The LV 7800 can store up to 60 frequently used setting configurations. You can also directly recall preset settings that have been assigned to the shortcut button.
- **Key Lock**
  The key lock feature is useful in preventing mistaken changes to the settings and in preventing accidental operations on the LV 7800.
- **USB Port**
  By connecting a USB memory device to the front panel USB port, you can take screen captures, record data, and save preset settings.
- **Ethernet Port**
  By running TELNET or FTP on a PC that is connected to the LV 7800 through the rear panel Ethernet port, you can control the LV 7800 remotely, monitor errors, and transfer files. (SNMP is also supported.)
- **Parallel Remote Connector**
  You can load preset settings, detect errors, switch inputs, and apply analog audio signals* through the rear panel remote connector.
  *To measure analog audio signals, an LV 58SER40A (DIGITAL AUDIO) unit is necessary.

■Rear Panel (LV 58SER01A x 3 and LV 58SER40A x 1 for installation example)

Slots for input, output, or input/output units **Slots for input units**



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

LV 58SER01A SDI input

LV 58SER04 MPEG decoder

Necessary for connecting two external displays

LV 58SER20 DVI-I output unit

LV 58SER02 Eye pattern unit
(Eye pattern & Jitter)

LV 58SER06 3G-SDI INPUT

LV 58SER21 Analog component output

NEW

LV 58SER03A Qri svk` , @j ml pfdp

LV 58SER07 3G-SDI Eye pattern
(Eye pattern & Jitter)

LV 58SER40A Digital audio I/O
(Dolby Decoding Capability Option)

LV 7800 SPECIFICATIONS

LEADER

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

Unit \ LV 7800 Slots	Does the Slot Support the Units			
	SLOT1 (Input)	SLOT2 (Input)	SLOT3 (Input/Output)	SLOT4 (Input/Output)
LV 58SER01A (SDI INPUT)	Yes	Yes	Yes	Yes
LV 58SER02 (EYE PATTERN)	Yes*	Yes*	Yes*	Yes*
LV 58SER03A (TRI SYNC / COMPOSITE)	Yes	Yes	Yes	Yes
LV 58SER04 (MPEG DECODER)	Yes	Yes	Yes	Yes
LV 58SER06 (3G-SDI INPUT)	Yes	Yes	Yes	Yes
LV 58SER07 (3G-SDI EYE PATTERN)	Yes*	No	Yes*	No
LV 58SER20 (DVI-I OUTPUT)	No	No	Yes	Yes
LV 58SER21 (ANALOG COMPONENT OUTPUT)	No	No	Yes	Yes
LV 58SER40A (DIGITAL AUDIO)	Yes*	Yes*	Yes*	Yes*

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

DVI-I Output	
Output Connector	1
Signal Format	Single link T.M.D.S Analog RGB
Display Format	XGA(The effective resolution is 1024 x 768.) Wide displays are also supported (squeeze mode). * Only if the LCD panel has a resolution conversion feature.
DDC	Not supported
HOT PLUG	Not supported
Screen Capture	
Screen Capture	Capture the screen to an image file (only one screen capture is stored in internal memory)
Media	Internal memory (RAM) and USB memory
Data Output	Save screen captures in bitmap format to USB memory or send them to a PC over an Ethernet connection.
Preset Settings	
Number of Presets	60
Media	Internal memory (RAM) and USB memory
Recall Method	Front panel, remote connector, or Ethernet command
Copying Saved Settings	Copy preset settings to USB memory.
Loading Saved Settings	Copy all preset settings from USB memory to the LV 7800.
External Sync Signal Input	
Input Connector	1 pair of BNC connectors
Input Signal	Tri-level sync or NTSC/PAL black burst
Input Impedance	Passive loopthrough, 15 kΩ
Input Return Loss	30 dB or higher
Maximum Input Voltage	±5 V (DC + peak AC) * If the video signal waveform is displayed using an external sync signal as a reference, the waveform phase one clock before or after an SDI signal is inserted or the power is turned on is indefinite.
External Control Connectors	
USB Port	
Compliant Standard	2.0
Device	Only large-memory devices are supported.
Function	Take screen captures, record data, and save preset settings
Ethernet Port	
Compliant Standard	IEEE802.3 10BASE-T/100BASE-T
Connector	RJ-45
Function	Control the LV 7800 and monitor errors from a PC and save screen captures and data to a PC
Remote Connector	
Connector	25-pin D-sub (female)
Signal	LV-TTL level (Low active)
Function	Load preset settings, detect errors, switch inputs, and receive analog audio signals* * To measure analog audio signals, an LV 58SER40A (DIGITAL AUDIO) unit is necessary.
Headphone Output*	
Output Signal	SDI-embedded audio signal, or an audio signal that was received from an external source
Output Connector	One 6.3-mm stereo jack
Volume Adjustment	Volume knob * Headphone output is enabled when an LV 58SER40A (DIGITAL AUDIO) unit is installed.
Environmental Conditions	
Operating Temperature	0 to 40 °C
Operating Humidity	85 %RH or less (no condensation)
Operating Environment	Indoors
Operating Altitude	Up to 2,000 m
Overvoltage Category	II
Pollution Degree	2
Power Supply Requirements	90 to 250 VAC, 50-60 Hz, 150 W max.
Dimensions and Weight	482 (W) x 88 (H) x 450 (D) mm (not including protrusions), 8.5 kg 19 (W) x 3 1/2(H) x 17 3/4 (D) inch, 19 lbs.
Accessories	Instruction manual.....1 Power cord.....1 Cover/Inlet stopper.....1 25-pin D-sub connector.....1 25-pin D-sub connector cover.....1

■Display Examples

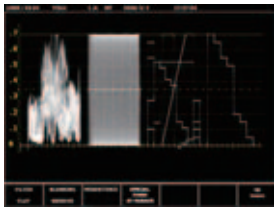
Multi-Screen

EX, LV 58SER01A, LV 58SER02 1 set each are installed

4 Inputs Picture

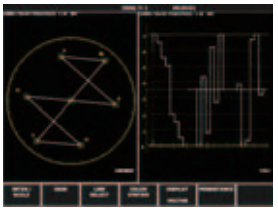
EX, LV 58SER01A 2 sets are installed

Waveform/4Y Palade



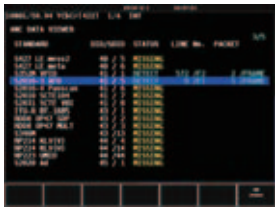
EX, LV 58SER01A 2 sets are installed

Waveform/Vector



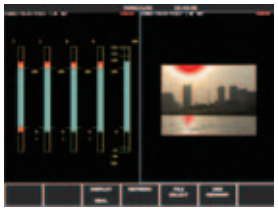
EX, LV 58SER01A 1 set is installed

Anc Date Viewer



EX, LV 58SER01A 1 set is installed

5 Bar/Gamut

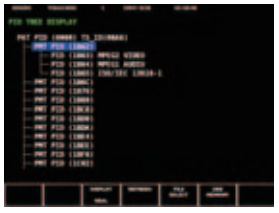


EX, LV 58SER01A 1 set is installed

EyePattern/Jitter

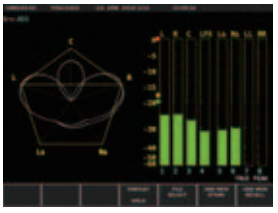
EX, LV 58SER01A 2, LV58SER02 1 set are installed

MPEG



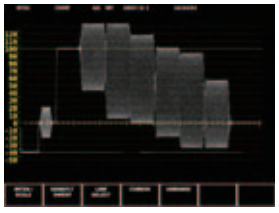
EX, LV 58SER04 1 set is installed

Audio



EX, LV 58SER40A 1 set is installed

Composite



EX, LV 58SER03 1 set is installed

■LV 7800-01 REMOTE CONTROLLER (sold separately)

Control over the Ethernet
The LV 7800-01 Remote Controller can control several instruments by simply changing the IP address of the device.
482 (W) x 44 (H) x 110 (D) mm,
19 (W) x 1 3/4 (H) x 4 3/8 (D) Inch

■LV 7800 op70 Speakers (Factory option)

You can have two 0.8 W stereo speakers installed in the LV 7800 rasterizer as a factory option. These speakers enable you to check audio. When you remove the headphones, the audio output switches to the speakers. (LV 58SER40A installed)

0.8 W +0.8 W

LV 5800/LV 7800 Platform Options

LEADER

LV 58SER01A SDI INPUT (HD-SDI, SD-SDI, HD-SDI DUAL)

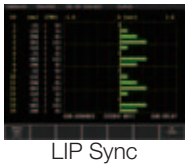
Plug-In Unit

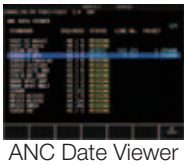
HD-SDI
SD-SDI
Dual Link 2K
AFD

CINELITE II option

This SDI input unit can be installed into to the input slot of an LV 5800 (multi monitor) or into an LV 7800 (multi rasterizar). You can install a maximum of four LV 58SER01A units into these instruments. By operating the instrument, you can display SDI signals' video signal waveforms, vector waveforms, pictures, error detection results, and so on.


CIE Chart


LIP Sync


ANC Date Viewer


AFD

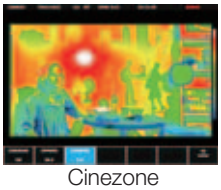
FEATURES

- **2-Channel Serial Digital I/O**
  An SDI input unit contains 2 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**
  The 5 BAR display allows simultaneous monitoring of component and composite gamut.
- **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**
- **Closed Caption Display Function**
- **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**
- **AFD Display**
- **CIE 1931 XY Chromaticity Diagram Display**
- **Lip Sync Display Function**
  Combining the LV 58SER01A with an LT 4400 (in which an LT 4400SER01 is installed) and an LV 58SER40(A) makes it possible to measure the offset between the video signal and the signal that occurs in the transfer route.

■OPTION

- **FS 3033 Cinelite II (Cinelite and Cinezone)**
  CINELITE On-Picture Measurements, CINEZONE false color displays and peaking function facilitate quick camera foucus and exposure setups.


Cinelite


Cinezone

LV 58SER01A SDI INPUT SPECIFICATIONS

Video Formats and Corresponding Standards
Single Link System Video

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

Dual Link System Video

Format	Quantization	Scanning	Frame (Field) Rates	Corresponding Supported
RGB 4:4:4	10 bit	1080p	30/29.97/25/24/23.98	SMPTE 372 (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	
GBR 4:4:4 (2K)	12 bit	1080p	24/23.98	(2048x1080)
		1080PsF	24/23.98	

Ancillary data standard	SMPTE 291M
Embedded audio standard	HD-SDI: SMPTE 299M SD-SDI: SMPTE 272M
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
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.
During single link	A ch/B ch switchable 1 system B ch fixed 1 system
During 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	
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
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 x2.0
Amplitude Accuracy	±0.5 %
Horizontal Axis	
Line Display	
Display Format	Overlay: 1H, 2H Parade: 1H, 2H, 3H Timing: Y-C_B,Y-C_R 4Y Parade*1: 4H *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.
Magnification	x1, x10, x20
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 x2.0
Amplitude Accuracy	±0.5 %
IQ Axis	Selects show or hide
Pseudo-Composite Display	Artificially converts component signals into composite signals and displays the result. (the color matrix for HDTV signal is converted into SDTV)
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	Marks sections containing gamut errors within the picture
Line Select	Displays the selected line as a marker
English Subtitle Display	Displays English subtitles in the picture display You can select which type of subtitles to decode and display from EIA-708, EIA/CEA-608-B(EIA-708-B), EIA/CEA-608-B(EIA/CEA-608-B), and VBI(EIA/CEA-608-B line 21).
Corresponding Standards	SMPTE 334M CIA/EIA-608-B
AFD Display	Displays abbreviations for SMPTE 2016-1-2007 standard AFD codes
Status Display	
Status Display of SDI Signal	
Signal Detection	Detects the presence or absence of SDI signals.
Format	Detected among the supported video signal formats (Detects only the frame rate during dual link)
Embedded Audio Channel	Displays the embedded audio channel number. (Supported only link A during dual link)
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. (Supports only link A during dual link)
Cable Length Meter Error	Detects the signal attenuation and displays the result.
Phase Difference Error in Dual Link	Measures the phase difference between link A and link B to detect the error. it will be made the error If phase difference exceeds 100 clocks. (Phase difference measurement inclueds the error of ±1 clock.)
Error Level Setting	
Component Gamut	Common with the gamut error
Composite Gamut	Common with the composite gamut error
Freeze Detection	Detects video freeze according to the specified time (Dual link is not supported.)
Black Detection	Detects blackouts in the video (Dual link is not supported.)
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 Quality 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 (Dual link is not Supported)	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)
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.(Select link A, link B, or link A/B to be displayed for dual link)
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	
(only link A is supported for dual link)	
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 (only SMPTE 352M is supported for dual link)
Display Content	Analyzes and displays the Format ID.
Closed Caption Data Display	
(not supported for dual link)	
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	
(not supported for dual link)	
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	
(not supported for dual link)	
Standard Supported	ARIB TR-B23
Arbitrary ANC Packet Display	
(only link A is supported for dual link)	
Method of Specifying ANC	Selects DID or SDID
Time Code Display	
(only link A is supported for dual link)	
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

Function Name	Standard	DID	SDID
EIA-708 CC decode function	SMPTE334M	161h	101h
EIA/CEA-608-B CC decode function (EIA-708-B)	SMPTE334M	161h	101h
EIA/CEA-608-B CC decode function (EIA/CEA-608-B)	SMPTE334M	161h	102h
VBI (EIA/CEA-608-B Line21) CC decode function	CEA/EIA-608-B		

Closed Caption Processing	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 the instrument; 18 Wmax.
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.

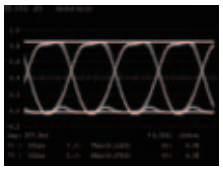
LV 5800/LV 7800 Platform Options

LEADER

LV 58SER02 EYE PATTERN UNIT (HD-SDI, SD-SDI)

Plug-In Unit

The LV 58SER02 is an optional unit that can be inserted into an LV 5800 (MULTI MONITOR) input slot or the LV 7800 (MULTI RASTERIZER), and it can be used to display eye patterns. The LV 58SER02 can be used to display the eye patterns of SDI signals and measure jitter when it is used with the LV 58SER01A (SDI INPUT), and it can be used to display the eye patterns of DVB-ASI signals when it is used with the LV 58SER04 (MPEG DECODER).


Eye Pattern


Jitter

FEATURES

- **Supports HD-SDI, SD-SDI and DVB-ASI**
- **6 Systems of Eye Pattern Displays and Jitter Measurement**
  Displays the SDI signal eye pattern or measures the jitter of 1 system among up to 6 systems by combining 3 SDI input units and selecting A or B among the 3 modules. (2 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.

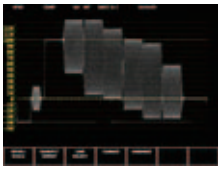
LV 58SER02 EYE PATTERN UNIT SPECIFICATIONS

Supported Formats	
Data Rate	
HD-SDI	SMPTE292M 1.485 Gbps, or 1.485/1.001 Gbps
SD-SDI	SMPTE259M 270 Mbps
Eye Pattern	
Display	Displays the input waveform before equalizing
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
Amplitude Accuracy	±10 % (typical value for when the input jitter is 1 UI, input jitter frequency is 10 kHz, the filter setting is 100 Hz, and the gain setting is x8)
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
Cursor Measurement	Jitter measurement using cursors
Automatic Measurement	Displays the amount of jitter in seconds (sec) and unit intervals (UIp-p) (* Doesn't support JITTER measurement of a DVB-ASI standard Eye pattern only.)
Power Consumption	Supplied from the instrument; 20 Wmax.
Weight	0.4 kg, 0.9 lbs.
Accessories	Coaxial cable.....1 Instruction manual.....1

LV 58SER03A TRI SYNC / COMPOSITE

Plug-In Unit

This unit is installed in the LV 5800 (MULTI MONITOR) or LV 7800 (MULTI RASTERIZER), and it is used to display and measure the analog NTSC or PAL video signals. The LV 5800's newest functions related to waveforms such as the waveform monitor, vectorscope, simple picture monitor, and EXT REF phase display function 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.


Composite

FEATURES

- **HD Tri-Level Sync Signal Monitoring**
  HD tri-level sync signal waveform display
  Display of the phase difference between the HD tri-level sync signal and external sync input signal (HD tri-level sync signals are not displayed on the vector display and picture display.)
- **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 58SER03A TRI SYNC / COMPOSITE 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
Maximum Input Voltage	±5 V (DC + Peak AC)
Output	
Composite Video	
Output Signal	Active
Output Connector	BNC connector 1 system 1 connector
Output Amplitude	1 Vp-p ± 5 %
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 %
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
Picture Display	
Marker Display	16:9 marker display Safe action marker display Safe title marker display Center marker display
Display Size	Reduced display, full frame display, and actual size display
Line Select	Displays a marker for the selected line.
Image Quality Adjustment	Brightness adjustment, contrast adjustment, RGB level adjustment, and RGB bias adjustment
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
Power Consumption	Supplied from the instrument; 9 Wmax.
Weight	0.25 kg, 0.5 lbs.
Accessory	Instruction manual 1

LV 58SER03A

LV 58SER04 MPEG DECODER

Plug-In Unit

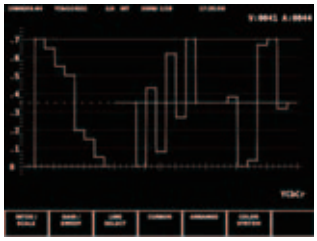
The LV 58SER04 is an input unit that receives MPEG-2 TS (DVB-ASI) audio and video signals, decodes them, and transfers them to the LV 5800 (MULTI MONITOR) or the LV 7800 (MULTI RASTERIZER) to be displayed. After a signal is decoded, its video signal waveforms, vectors, pictures, and audio signals can be displayed. The LV 58SER04A can also be used to monitor errors defined by ETSI ETR-290, to display PAT and PMT data, and to display TS bit rates and the bit rates for each PID. These features are ideal for continuous monitoring of MPEG-2 TS signals in broadcasting stations and similar facilities. When combined with other units, the LV 58SER04 can also:

- Display eye patterns for DVB-ASI signals (when combined with the LV 58SER02)
- Display levels and Lissajous curves for audio signals (when combined with the LV 58SER40A)

PID

TMCC

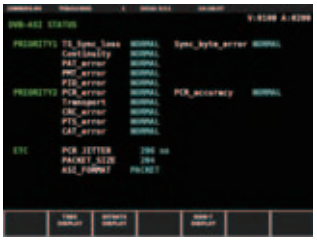
BIT RATE



Waveform

Vector

SFN



DVB-ASI STATUS

LV 5800/LV 7800 Platform Options

LEADER

FEATURES

- **DVB-ASI Input Connector**
  The LV 58SER04 comes with one DVB-ASI input connector.
- **Video Decoding**
  The LV 58SER04 decodes compressed MPEG-2 TS video data (MPEG-2 Video 4:2:2,4:2:0) and displays video signal waveforms, vectors, and pictures.*1
- **Audio Decoding**
  The LV 58SER04 can be combined with the LV 58SER40A (DIGITAL AUDIO) to decode MPEG-2 TS audio data, show Lissajous curves, sound images, and sound levels, and transmit digital audio signals.*1
  The decodable audio data types are MPEG-2 AAC, Dolby Digital (AC-3), LPCM (SMPTE 302M), and MPEG-1 Layer 2.*2
- **PID Search**
  The LV 58SER04 can automatically search for the PID of audio and video data.
- **Error Detection**
  The LV 58SER04 monitors and displays ETSI ETR 290 priority 1 and 2 errors.*3
- **Status Display**
  The LV 58SER04 can display PID bitrates, PCR jitter, selected PID dumps, PAT, and PMT.
- **Eye Pattern Display**
  You can install the LV 58SER02 (EYE PATTERN unit) with the LV 58SER04 to display DVB-ASI eye patterns.*4

*1 The LV 58SER04 cannot descramble scrambled broadcasts, and it may not be able to decode all MPEG-2 formats.
The LV 58SER04 can only decode one stream of audio and video data at a time. You cannot decode and display different audio and video data streams simultaneously on the multi display using only one MPEG-2 input unit. If you display the decoded data stream using the multi display and then change the decoded PID, the PID for every screen will change.
*2 To decode Dolby Digital (AC-3), the LV 58SER40A (DIGITAL AUDIO) must be equipped with the Dolby E option.
*3 There are some limitations on error detection.
*4 Jitter cannot be measured or displayed.

LV 58SER04 MPEG DECODER SPECIFICATIONS

Standards	
Corresponding 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
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
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
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 %
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.)
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
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
Power Consumption	Supplied from the instrument; 20 Wmax.
Weight	0.4 kg, 0.9 lbs.
Accessory	Instruction manual.....1

LV 58SER06 3G-SDI INPUT (3G-SDI, HD-SDI, SD-SDI, HD-SDI DUAL)

Plug-In Unit

This 3G-SDI input unit can be installed into an input slot of an LV 5800 (multi monitor) or into an LV 7800 (multi rasterizer).
The LV 58SER06 supports 3G-SDI levels A and B, and it can be used to display information such as 3G-SDI signals' video waveforms, vector waveforms, pictures, and error detection results on an LV 5800 or LV 7800.
Additionally, by combining the LV 58SER06 with the LV 58SER40A, you can display information such as the Lissajous curves and level meters of embedded audio signals.
What's more, the LV 58SER06 can generate 3G-SDI signals and test patterns.

FEATURES

- **2 Serial Digital Inputs**
  The LV 58SER06 has two switchable 3G-SDI input connectors for monitoring.
- **2 Serial Digital Outputs**
  The LV 58SER06 can reclock input signals that are received by the input terminal that has been selected with the input key (3G-SDI A or 3G-SDI B) and generate these reclocked signals from the 3G-SDI A/B output connector.
  From the 3G-SDI B output connector, the LV 5800 can transmit a reclocked signal from the 3G-SDI signal that is received through the 3G-SDI B input connector.
- **Test Pattern Signal Outputs**
  The LV 58SER06 can operate as a 3G-SDI signal pattern generator to generate a 3G-SDI signal from the two output terminals.
- **Video Signal Display**
  The LV 58SER06 can be used to display 3G-SDI signals' video signal waveforms, vector waveforms, and pictures on not only the 1-screen display, but 2- and 4-screen multi displays.
- **Error Detection**
  The LV 58SER01A can detect CRC and other 3G-SDI signal errors that are related to embedded audio signals and ancillary data.
- **Automatic Video Format Setting**
  The LV 58SER06 automatically sets the video format based on payload ID packets.
- **5 Bar Display**
  You can use the 5 bar display to simultaneously monitor component and composite gamut.
- **Embedded Audio Extraction**
  By combining the LV 58SER06 with a digital audio unit (the LV 58SER40A), you can perform actions such as displaying level meters and Lissajous curves. You can also generate AES/EBU signals.

LV 58SER06 MPEG DECODER SPECIFICATIONS

Video Formats and Corresponding Standards

3G-SDI Video System

	Color System	Quantization	Scanning	Frame Frequency	Corresponding Standard
3G-SDI-A	Y, C_B, C_R 4:2:2	10 bits	1080p	60, 59.94, 50	SMPTE 424M SMPTE 425M
3G-SDI-B		10 bits	1080p	60, 59.94, 50	

Single Link System Video

	Color System	Quantization	Scanning	Frame Frequency	Corresponding Standard
HD-SDI	Y,C_B,C_R 4:2:2	10 bit	1080i	60/59.94/50	SMPTE 274M SMPTE 292
			1080p	30/29.97/25/24/23.98	
			1080PsF	30/29.97/25/24/23.98	
			720p	60/59.94/50/ 30/29.97/25/24/23.98	SMPTE 296M SMPTE 292
SD-SDI	Y,C_B,C_R 4:2:2	10 bit	525i	59.94	SMPTE 259M
			625i	50	

Dual Link System Video

	Color System	Quantization	Scanning	Frame Frequency	Corresponding Standard
HD-SDI DUAL	GBR 4:4:4	10 bit	1080i	30/29.97/25/24/23.98	SMPTE 372
			1080p	30/29.97/25/24/23.98	
			1080PsF	60/59.94/50	
	GBR 4:4:4	12 bit	1080i	30/29.97/25/24/23.98	
			1080p	30/29.97/25/24/23.98	
			1080PsF	60/59.94/50	
	Y,C_B,C_R 4:2:2	10 bit	1080p	60/59.94/50	
	Y,C_B,C_R 4:2:2	12 bit	1080i	60/59.94/50	
			1080PsF	30/29.97/25/24/23.98	
			1080p	30/29.97/25/24/23.98	
	RGB 4:4:4 (2K)	12 bit	1080p	24/23.98	(2048x1080)
			1080PsF	24/23.98	

Other Standards	
Ancillary Data	SMPTE 291M
Embedded Audio	SMPTE 299M (Only the audio data of data stream 1 is supported.)
Format Setting	Manual and automatic
Manual	Manually set the frame frequency
Automatic	The LV 58SER06 detects the format information within the payload ID (SMPTE 325M) and automatically sets the format.
Output Signal	Depending on your selection, the LV 58SER06 generates a reclocked signal (input loop-through) from the input signal or generates a test pattern signal, and transmits it from the 3G-SDI A/B output connector and the 3G-SDI B output connector.
3G-SDI A/B Output Connector	
When Set to Input Reclock	Generates a reclocked signal from the signal received through the selected input channel.
When Set to Test Pattern	Generates a test pattern signal
3G-SDI B Output Connector	
When Set to Input Reclock	Generates a reclocked signal from the signal received through input channel B
When Set to Test Pattern	Generates a test pattern signal
Test Pattern Generation	
Format	Y, C_B, C_R 4:2:2 1080p/60, 59.94, 50
Corresponding Standard	SMPTE424M and SMPTE425M
Pattern	100 % color bar (100 % white, 100 % saturation),75 % color bar (100 % white, 75 % saturation),100 % white, 50 % white, black, check field, equalizer, and PLL
Embedded Audio	Not supported
Bit Rate	2.97 Gbps or 2.97/1.001 Gbps
Oscillation Clock	Driven by the internal oscillator 148.5 MHz ± 10 ppm or 148.5/1.001 MHz ± 10 ppm
Input/Output Connectors	
3G-SDI Input	
Input Connectors	2 BNC connectors 2 connections (channels A and B)
Maximum Input Voltage	±2 V (DC + AC peak)
3G-SDI Output Connectors	
Function	Generation of reclocked signals from the input signals and generation of test patterns
Output Voltage	800 mVp-p ± 10 %
Waveform Display	
Waveform Operations	
Display Modes	
Overlay	Overlays component signals
Parade	Displays component signals side by side
Blanking Period	Show or hide
Y, C_B, C_R to GBR Conversion	Converts the Y, C_B, C_R signal to GBR and displays it
Pseudo-Composite Display	Displays component signals artificially as composite signals
Channel Assignment	Displayed in GBR or RGB order (when displaying GBR converted signals)
Line Select	Displays the selected line
imge Quality Adjustment	Brightness adjustment and waveform color selection (white, green, or multi color) (Multi color is only available on the 1-screen display.)
Vertical Axis	
Sensitivity	
V Scale	0 to 0.7 V or –0.3 to 0.7 V
% Scale	0 to 100 % or –50 to 100 %
Gain	x1, x5, or variable
Variable Gain	x0.2 to x10

LV 5800/LV 7800 Platform Options

LEADER

Amplitude Accuracy	±0.5 %
Horizontal Axis	
Line Display	
Display Format	Overlay: 1H, 2H Parade: 1H, 2H, 3H
Magnification	x1, x10, x20, ACTIVE, or BLANK
Cursor Measurement	
Composition	
Horizontal Cursors	2 (REF and DELTA)
Vertical Cursors	2 (REF and DELTA)
Amplitude Measurement	Percentage and voltage displays
Time Measurement	Second display
Frequency Measurement	Computes and displays the frequency with the length of one period set to the time between two cursors
Vectorscope Display	
Scale	75 % or 100 % (color bar)
Gain	x1, x5, IQ-MAG, or variable
Variable Gain	x0.2 to x10
Amplitude Accuracy	±0.5 %
IQ Axis	Show or hide
Pseudo-Composite Display	Converts component signals into composite signals with artificially added burst and displays the results (The color matrix is converted to SDTV.)
Picture Display	
Display Format	Samples pixels and displays them (R, G, and B each use 8 bits)
Marker Displays	Center marker, 4:3 marker, safe action marker,and safe title marker
Gamut Error Display	Marks the areas of the picture that exhibit gamut errors
Line Select	Marks the selected line
Display Sizes	Compressed and full frame
Status Display	
3G-SDI Signal Status Display	
Signal Detection	Detects the presence of a 3G-SDI signal
Format	Detects from the supported video signal formats (When the LV 58SER06 is configured to automatically set the format, the format is detected from the payload ID.)
Embedded Audio Channel	Displays the embedded audio channel number (Only the audio data of data stream 1 is supported.)
3G-SDI Signal Error Detection	
CRC Error	Detects 3G-SDI signal transmission errors
TRS Error	Detects TRS position and protection bit errors
Line Number Error	Detects 3G-SDI signal line number errors
Illegal Code Error	Detects data within the range of 000h to 003h and 3FC to 3FF in locations other than the TRS and ADF headers
Ancillary Data Error Detection	
Checksum Error	Detects ancillary data transmission errors
Parity Error	Detects ancillary data header parity errors
Image Quality Error Detection	
Frequency Response	Approx. 1 MHz LPF (IEEE STD 205 response) and approx. 2.8 MHz LPF (removes transient composite gamut and gamut errors due to overshoot and other anomalies)
Gamut Error	Detects time-specified gamut errors
Upper Limit	90.8 to 109.4 %
Lower Limit	–7.2 to 6.1 %
Area Specification	0.1 to 5.0 %
Time Specification	1 to 60 frames
Composite Gamut Error	Detects level errors that occur when component signals are converted to composite signals
Upper Limit	90.0 to 135.0 %
Lower Limit	–40.0 to 20.0 %
Area Specification	0.1 to 5.0 %
Time Specification	1 to 60 frames
Embedded Audio Error Detection (Only data stream 1 is supported for 3G-SDI level B.)	
BCH Error	Detects transmission errors in the audio packets that are embedded in 3G-SDI signals
DBN Error	Detects audio packet continuity errors
Parity Error	Detects parity errors in the audio packets that are embedded in 3G-SDI signals
Embedded Position Error	Detects the presence of audio in lines where it should not be embedded
Event Log	
Recorded Events	Errors, changes in the input channel, and time stamps

5 Bar Display	
Bar Display	Displays the Y GBR component and composite gamut (When you are using line select, only the component gamut of the selected line is detected.)
Error Level Setting	
Component Gamut	The same as the gamut error
Composite Gamut	The same as the composite gamut error
Frequency Response	The same as the gamut error
Analysis Features	
Data Dump Display	
Display Format	Displays data separated by serial data sequence or by channel (The 3G-SDI level B data dump can display data stream 1, data stream 2, and data stream 1 and 2 simultaneously.)
Line Select	Displays the selected line
Sample Select	Displays from the selected sample
Jump Feature	Moves to EAV or SAV with the press of a single button
Data Output	Data can be saved as text files to USB memory or to a PC over an Ethernet
Audio Control Packet Display (Only data stream 1 is supported for 3G-SDI level B.)	
Display Details	Displays audio control packet analysis
Display Format	Text, hexadecimal, and binary
Group Selection	Select one group from four available groups
Format ID Display	
Corresponding Standard	SMPTE 352M
Display Details	Displays payload ID packet analysis
ANC Packet Display (Only data stream 1 is supported for 3G-SDI level B.)	
ANC Specification Method	DID/SDID
Display Format	Hexadecimal and binary
Time Code Display (Only data stream 1 is supported for 3G-SDI level B.)	
Supported Time Codes	LTC and VITC (SMPTE 12M-2)
Display Mode	The instrument's internal clock or the time code
Embedded Audio Processing	
Clock Generation	Generated from the video clock
Synchronization	All audio channels must be synchronized to the video clock.
Phases	All phases must be in-sync.
Channel Separation	You may select a maximum of 4 groups of 16 channels each. (Only data stream 1 is supported for 3G-SDI level B.) * You need an LV 58SER40A unit to display and generate audio.
Frame Capture Feature	
Function	Captures frame data
Capture Timing	Manual and automatic (error capture)
Display	Displays the captured frame data or superimposes the captured frame data over the input signal
Media	Internal memory (RAM) and USB memory You can only record one frame of data to the internal memory.
Data Output	Screen captures can be saved as .dpx files, .tif files, or in a file format that the instrument can load. They can be saved to USB memory or sent to a PC through an Ethernet connection.
Data Input	Data saved to USB memory can be loaded and displayed on the instrument.*1
Error Capturing	Automatically captures frame data when an error occurs *1 Captured data cannot be displayed unless the instrument is receiving a 3G-SDI signal that matches the format of the captured signal.
Environmental Conditions	Conforms to those for the LV 5800 or LV 7800
Power Consumption	Supplied from the instrument; 18 W max.
Weight	0.24 kg 0.53 lbs.
Accessory	Instruction manual 1

LV 58SER07 3G-SDI EYE PATTERN (3G-SDI, HD-SDI, SD-SDI)

Plug-In Unit

3G HD-SDI SD-SDI

The LV 58SER07 is a display unit. When it is inserted into one of the input slots of the LV 5800 or LV 7800 along with the LV 58SER06 (3G-SDI INPUT), it enables the display and measurement of the eye patterns and jitter of serial digital signals.
The LV 58SER07 enables the measurement and observation of the physical characteristics of not only 3G-SDI signals but also HD-SDI and SD-SDI signals.

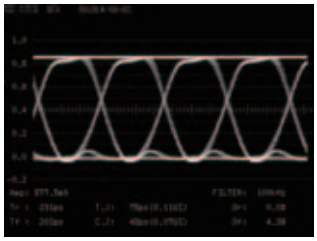
FEATURES

- **Support for Three Types of SDI Signals**
  When the LV 58SER07 is used with the LV 58SER06 (3G-SDI INPUT), it enables the display of eye patterns, the display of jitter, and the execution of automatic measurements not only for 3G-SDI signals (both levels A and B) but also for HD-SDI and SD-SDI signals.
- **Two Switchable SDI Inputs**
  The LV 58SER07 has two input connectors that each support three different SDI signal types. The controls on the LV 5800 or LV 7800 panel can be used to switch between the two inputs. (*1)
- **Eye Pattern Display**
  Measurements of 3G-SDI signals have low noise and wide bandwidth characteristics thanks to the use of a new kind of circuit.
- **Jitter Display**
  Because a phase detection method is used, accurate jitter measurements can be performed even on degraded signals for which eye patterns would not be useful. Also, V rate and H rate sweep displays synchronized to the video signal are useful for analyzing jitter that originates in digital video data.
- **Simultaneous Eye Pattern and Jitter Display**
  When a serial digital signal is selected in the multi screen display of the LV 5800 or LV 7800, its eye pattern and jitter waveform can be displayed simultaneously. (*2)
- **Filter Settings**
  The measurement of the timing jitter and alignment jitter of an SDI signal can be performed through the switching of filters in the eye pattern and jitter displays.
- **Automatic Measurement**
  The automatic measurement feature enables the automatic measurement of the amplitude, rise and fall times, and jitter level of serial digital signals. The level of timing jitter and alignment jitter can be measured.
- **Alarm Monitoring**
  The LV 58SER07 can display alarms and make log entries when the values that it monitors exceed their user-specified threshold values. The LV 58SER07 can monitor the rise time (Tr), the fall time (Tf), the difference between the rise and fall time (Tr-Tf), the timing jitter, and the alignment jitter of a serial digital signal. (*3)

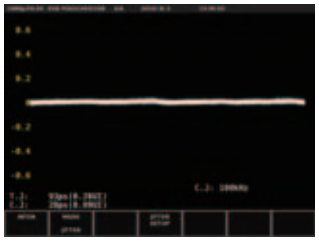
*1 When the LV 58SER07 is inserted in a device, only one LV 58SER06 (3G-SDI INPUT) can be inserted in the device with it. Also, multiple LV 58SER07s cannot be inserted into the same device or inserted into a device with the LV 58SER02. The LV58SER07 cannot be used with the LV 58SER01A.
*2 Simultaneous eye pattern and jitter display can only be performed for a single signal. The simultaneous display of different signals is not possible.
*3 Alarm display and log recording are only valid in the eye pattern and jitter displays of the LV 58SER07. Alarm monitoring cannot be performed in the background.

LV 58SER07 SPECIFICATIONS

Supported Formats	
Data Rates	
3G-SDI	SMPTE 424M 2.970 Gbps or 2.970/1.001 Gbps
HD-SDI	SMPTE 292 1.485 Gbps or 1.485/1.001 Gbps
SD-SDI	SMPTE 259M 270 Mbps
Input Connectors	
Eye-Pattern and Jitter Display Input Connectors	
Function	Input of SDI signals for eye pattern and jitter display
Input Connectors	2 switchable BNC connectors with A and B channels
Input Impedance	75 Ω
Connection Method	Connect to the rear panel of the LV 5800 or LV 7800 using a BNC cable.
Output Connectors	
Dedicated Connectors for Output to the LV 58SER06	
Function	Dedicated output connectors for connecting to the LV 58SER06 INPUT connector
Output Connectors	2 BNC connectors
Output Impedance	75 Ω
Eye Pattern	
Display	Displays the input waveform before equalizing
Method	Equivalent time sampling
Jitter Filters	10 Hz, 100 Hz, 1 kHz, 100 kHz, TIMING, and ALIGNMENT
Cursor Measurement	Amplitude measurement using Y cursors, time measurement using X cursors, and rise time and fall time measurement using the Tr and Tf cursors
Jitter Detection	
Display	Displays the jitter component of an SDI input signal
Method	Phase detection method
Gain	x8, x2, or x1
Jitter Filters	10 Hz, 100 Hz, 1 kHz, 100 kHz, TIMING, and ALIGNMENT
Cursor Measurement	Jitter value measurement through the use of cursors
Automatic Measurement	Timing jitter and current jitter (the number of seconds is indicated by sec, and the unit interval is indicated by UIp-p) through the use of a phase detection method, amplitude, and rise and fall times of eye pattern waveforms
Environmental Conditions	Same as the LV 5800/7800
Power Consumption	Supplied from the instrument; 20 W max.
Weight	0.5 kg 1.1 lbs.
Accessories	Instruction manual.....1 Coaxial cable.....2



Eye Pattern



Jitter

LV 5800/LV 7800 Platform Options

LEADER

LV 58SER20 DVI-I OUTPUT UNIT

Plug-In Unit

The LV 58SER20 is a dedicated output unit for the Leader LV 5800 (MULTI MONITOR) and LV 7800 (MULTI RASTERIZER). By installing it, you can output the LCD panel display to an external monitor.

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 the instrument; 5 W max.
Weight	0.2 kg, 0.53 lbs.
Accessory	Instruction manual.....1

LV 58SER21 ANALOG COMPONENT OUTPUT

Plug-In Unit

The LV 58SER21 converts one of the video signals received by the LV 58SER01A or LV 58SER04 unit in the LV 5800 or LV 7800 into an analog component signal and transmits the signal.
You can use the LV 58SER21 to display a video signal on an analog picture monitor.

FEATURES

- **Analog component signal output**
  The video signal being measured on the LV 5800 can be displayed on the analog picture monitor.
  Two selectable output modes are provided: to output the signal displayed in the selected area on the mainframe screen, and to output the signal of selected unit.
- **Converting the output signal format**
  The output signal can be converted into the Y, P_B, P_R or GBR regardless of the color format of input video signal.

LV 58SER21 ANALOG COMPONENT OUTPUT SPECIFICATIONS

Video Formats
Dual Link System Video
Signal Corresponding Formats

Format	Quantization	Scanning	Frame (Field) Frequency
GBR 4:4:4	10 bit	1080p	30/29.97/25/24/23.98
		1080PsF	
		1080i	60/59.94/50
	12 bit	1080p	30/29.97/25/24/23.98
		1080PsF	
		1080i	60/59.94/50
Y,C_B,C_R 4:2:2	12 bit	1080p	30/29.97/25/24/23.98
		1080PsF	
		1080i	60/59.94/50

*The phase difference between link A and B is automatically corrected up to 100 clocks (approximately 1.4 s) and displayed.

Single Link System Video
Signal Corresponding Formats

Format	Quantization	Scanning	Frame (Field) Frequency
Y,C_B,C_R 4:2:2	10 bit	1080i	60/59, 94/50
		1080p	30/29.97/25/24/23.98
		1080PsF	30/29.97/25/24/23.98
		720p	60/59.94/50 30/29.97/25/24/23.98
		525	59.94
		625	50

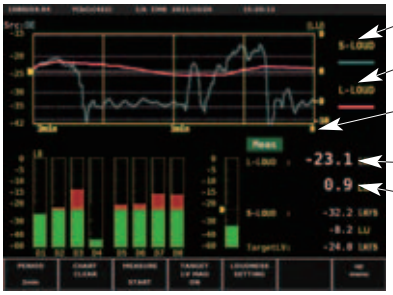
Analog Output	
Output Signal	YP_BP_R or GBR (the sync information is added to the Y or G channel)
Output Connector	1 set of 3 BNC connectors
Output Impedance	75 Ω
Output Level	
Video Level	700 mVp-p ±3 %
Sync	
HD	600 mVp-p ±10 %
SD	300 mVp-p ±10 %
Phase Difference	±2 ns
Power Consumption	Supplied from the instrument; 9 Wmax.
Weight	0.26 kg, 0.57 lbs.
Accessory	Instruction manual.....1

LV 58SER40A DIGITAL AUDIO (Dolby Decoding Capability Optional)

Plug-In Unit

The LV 58SER40(A) (DIGITAL AUDIO) operates as an AES/EBU I/O unit when installed in an LV 5800 input slot or the LV 7800 or as an AES/EBU output unit when installed in an 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 5800/7800, 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 signals, MPEG-2 AAC signals, and LPCM signals 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)**
  The LV 58SER40(A) is equipped with 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). This unit operates as an AES/EBU I/O unit when installed in an LV 5800 input slot or the LV 7800 or as an AES/EBU output unit when installed in an LV 5800 output slot.
- **Loudness Display**
  - Level meter supports true peak, PPM, and VU.
  - Momentary, short-term, and long-term loudness values are displayed in LUFS and LU.
  - Support for audio signals embedded in SDI signals and AES/EBU input signals (Dolby*4 compressed audio and uncompressed audio)
  - Chart feature that makes it possible to monitor audio level variation over time for up to 2 hours
  - Absolute value display mode
  - ARIB, EBU, ATSC, and ITU-R BS.1770-2 loudness measurement modes
  - Long term loudness logging feature.
- **Surround Display (5 LEAF)**
- **Headphone Output**
- **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)**

*4 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 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, Rs, Lt, Rt
Surround Formats	NORMAL/PHANTOMC
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	TRUE PEAK, PPM type I, PPM type II, VU/ LOUDNESS-F/LOUDNESS-S
Peak Hold Mode Selection	(when the meter response mode is VU) TRUE PEAK, PPM type I, PPM type II
Peak Hold Time	0.5 to 5.0 s (in 0.5-s steps), HOLD
Display dynamic range*5	-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 *5 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
Loudness Display	
Function	Displays total loudness values on a graph. Values are displayed in red if they exceed the threshold.
Measurement function	2 min, 10 min, 30 min, 1 h, 2 h
Headphone Output	
Output Connector	3.5 mm stereo mini jack
Output Power	121.5 mWrms max. (into 8 Ω)
Power Consumption	Supplied from the instrument; 9 Wmax.
Weight	0.27 kg, 0.6 lbs.
Accessories	Instruction manual .....1 Analog audio cable 1

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