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

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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
Records 1 screen in the internal 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

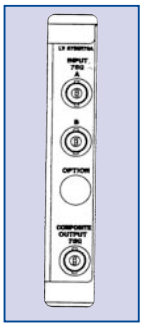
Power cord.....1
Cover/Inlet stopper.....1
Screws for rack mounting (inch specification).....2
25-pin D-sub connector.....1
25-pin D-sub connector cover.....1
Instruction manual.....1

LV 5700A Multi-SDI Monitor Available Options

LEADER

NTSC/PAL Composite Analog Input Module (OP73A)

Plug-In Unit for LV 5700A



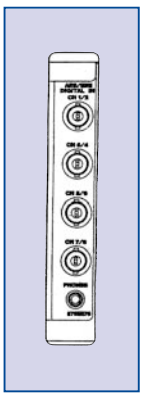
Ideal for broadcast and field acquisition professionals, the option 73A adds expansion capabilities to accommodate analog NTSC/PAL composite inputs. Two composite inputs(auto-sensing) are provided and the selected input is fed to a monitoring output. Monitoring functions include waveform, vector and 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



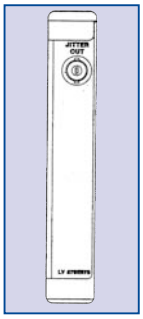
The LV 5700A Multi-SDI monitor is provided with audio monitoring, measurement and data analysis capabilities for embedded AES/EBU monitoring (audio is disembedded and output via 4 BNC connectors; 8 channels, as standard). Facilities using separate (non-embedded) AES/EBU audio will need to use the OP75 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



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

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