Leader Digest catalog Vol.3



Leader

Company Profile



Engineering the future of test and measurement.

Since its founding in 1954, Leader Electronics has constantly refined measurement technology to support innovation within our industry. That commitment is even stronger today, in this time of drastic change.

Leader Electronics continues to expand its global business in the field of electronic measurement instruments and video distribution, providing revolutionary hardware and software solutions to help solve our customers' evolving challenges.

Leading measurement solutions from Leader

Leader's products are high-performance measuring instruments designed specifically for the needs of the video industry, spanning television, movies, and streaming media.

We proudly provide products incorporating the latest digital measurement and monitoring technology to a host of broadcasters, producers, distributors, editors, and equipment manufacturers worldwide.

In addition, we develop instruments for consumer electronics and electronic parts manufacturers, field maintenance equipment, and automation solutions for production testing.

In August 2019, Leader Electronics acquired PHABRIX Ltd. to grow our abilities to serve our customers.



ZEN SERIES

The ZEN series LV5600 / LV5300A / LV5350 WAVEFORM MONITORS and LV7600 / LV7300 RASTERIZERS are precision measurement tools to address all your video and audio testing needs. Designed with the future in mind, the Zen series supports up to 12G-SDI as well as up to 25G video over IP interfaces. The test and measurement of video signals is straightforward with waveform, vector, picture and eye pattern displays. Comprehensive status displays, error logs and an ANC Data Viewer help you troubleshoot your system when there are problems. The Zen series also offers complete audio monitoring, for discrete digital, analog, or embedded audio. Audio monitoring views include multichannel level metering, Lissajous, status, and loudness measurement.

LV5600

2K/4K/IP/4 INPUT WAVEFORM MONITOR





ZEN

LV7600



LV7600

2K/4K/IP/4 INPUT RASTERIZER



Dimensions (WHD mm): 426x44x300 (1U Full Rack size)

LV5300A

LV5350

2K/4K/2 INPUT WAVEFORM MONITOR

12GSDI 6GSDI 3GSDI 4K HDsbi SDsbi EYE



EYE Pattern Display Size: 7 inches Dimensions (WHD mm) :215x132x120 (3U 1/2 Rack size) Power supply: DC10V~DC18V





LV 5350

Display Size: 7 inches Dimensions (WHD mm):215x85 x120 (3U ½ Rack size) Power supply: DC10V~DC18V

LV7300 2K/4K/2 INPUT RASTERIZER





Dimensions (WHD mm): 215x44x300 (1U 1/2 Rack size) Power supply : DC10V \sim DC18V

LV7290 **REMOTE CONTROLLER**

Enables long distance operation through Ethernet Controls up to 8 units from one controller Applicable model: LV5900A/LV5600/LV5300A/LV5350/LV7600/LV7300 Dimensions (WHD mm): 482x44x110 (1U Full Rack size)



















ZEN SERIES OPTION

LV5600/ LV7600 Hardware options

Decorintion	M	odel	Function		
Description	LV5600	LV7600	Fullction		
SDI INPUT	LV560	0-SER01	SD,HD,3G SDI input *1		
SDI INPUT/EYE	LV5600	D-SER02A	SD,HD,3G SDI input and EYE pattern display *1		
DIGI/ANA AUDIO	LV5600-SER03	LV7600-SER03	Digital/ Analog audio input & output display		
DOLBY	LV5600-SER04	LV7600-SER04	Dolby Digital, Dolby E decode and metadata *2		
10G IP INPUT	LV5600-SER05	LV7600-SER05	10G IP input *1		
25G IP INPUT	LV5600-SER06	LV7600-SER06	25G IP input *1 *3		

*1 A minimum of one of LV5600-SER01, LV5600-SER02A, LV5600-SER05 or LV5600-SER06 required for LV5600

A minimum of one of LV5600-SER01, LV5600-SER02A, LV7600-SER05 or LV7600-SER06 required for LV7600

*2 Requires LV5600-SER03 for LV5600, LV7600-SER03 for LV7600

*3 For 4K, only a single stream is supported. You also need the SER28

LV5600/ LV7600 Software options

Description	Мо	del	Function		
Description	LV5600	LV7600	T unction		
HDR	LV5600-SER23	LV7600-SER23	HDR measurement		
TSG	LV5600-SER24	LV7600-SER24	SDI signal generation *1		
FOCUS ASSIST	LV5600-SER25	LV7600-SER25	Focus assist display		
LAYOUT	LV5600-SER26	LV7600-SER26	Customized layout /Display assignment		
TALLY	LV5600-SER27	LV7600-SER27	Tally display		
4К	LV5600-SER28	LV7600-SER28	4K signal support(3G-Quad,3G-Dual,HD-Quad)		
12G-SDI	LV5600-SER29	LV7600-SER29	12G-SDI / 6G-SDI *2		
VIDEO NOISE METER	LV5600-SER30	LV7600-SER30	Camera signal to noise measurement		
COLORIMETRY ZONE	LV5600-SER31	LV7600-SER31	Colors outside the color gamut display function		
25G IPTSG	LV5600-SER32	LV7600-SER32	25G IP signal generation function *3		
EXTENDED VECTOR	LV5600-SER40	LV7600-SER40	RGB Vector , YCbCr Vector		
	. I T				

*1 To support 4K, LV5600-SER28 and LV7600-SER28 are required. To support 12G-SDI, LV5600-SER28 + LV5600-SER29 and LV7600-SER28 + LV7600-SER29 are required.

*2 LV5600-SER28 is required for LV5600. LV7600-SER28 is required for LV7600.

*3 LV5600-SER06 is required for LV5600. LV7600-SER06 is required for LV7600. To support 4K, LV5600-SER28 and LV7600-SER28 are required.

LV5600 / L	.V7600 Com	bination Chart	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
LV5600	-SER01	SDI INPUT	Y	Υ	Y	Y	Υ	Υ	Υ								Υ	Y		
LV5600-	SER02A	SDI INPUT/EYE								Υ	Υ	Υ	Υ	Υ	Υ	Υ			Υ	Υ
LV5600-SER03	LV7600-SER03	DIGITAL/ANALOG AUDIO		Y	Y	Y	Y	Y	Υ		Y	Υ	Y	Υ	Y	Y	Y	Υ	Υ	Υ
LV5600-SER04	LV7600-SER04	DOLBY			Y		Y		Υ			Υ		Υ		Y		Y		Υ
LV5600-SER05	LV7600-SER05	10G IP INPUT				Y	Y						Y	Υ						
LV5600-SER06	LV7600-SER06	25G IP INPUT						Υ	Υ						Υ	Y	Υ	Y	Υ	Y
LV5600-SER23,24, 25,26,27,28,29, 30,31	LV7600-SER23,24, 25,26,27,28,29, 30,31	HDR,TSG,FOCUS ASSIST,LAYOUT,TALLY, 4K,12G-SDI,VIDEO NOISE METER, COLORIMETRY ZONE	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В
LV5600-SER32	LV7600-SER32	25G IP TSG															Y	Y	Y	Y

Y is the option selected. B is a choice.

Δ

LV5300A / LV5350 / LV7300 Hardware options

Description		Model		Function		
Description	LV5300A	LV5300A LV5350 LV73		Fullction		
SDI INPUT	—	Standard feature	LV7300-SER01	SD,HD,3G SDI input *1		
SDI INPUT/EYE	Standard feature	—	LV7300-SER02	SD,HD,3G SDI input and EYE pattern display *1		
BATTERY ADAPTER V MOUNT	LV5300-SER11	LV5350-SER11	—	V mount type battery adapter		
BATTERY ADAPTER QR GOLD	LV5300-SER12	LV5350-SER12	_	QR gold mount type battery adapter		
*4 511 11/2000 05004 11/2000 050	02 :					

*1 Either LV7300-SER01 or LV7300-SER02 is required for LV7300.

LV5300A / LV5350 / LV7300 Software options

Description		Model		Function		
Description	LV5300A	LV5350	LV7300	T unction		
AUDIO	LV5300-SER20	LV5350-SER20	LV7300-SER20	AUDIO display – 8 channels of embedded plus phase		
CLOSED CAPTION	LV5300-SER21	LV5350-SER21	LV7300-SER21	EIA-608, 708, TELETEXT, Japanese subtitle display		
CIE	LV5300-SER22	LV5350-SER22	LV7300-SER22	CIE Chart display		
HDR	LV5300-SER23	LV5350-SER23	LV7300-SER23	HDR measurement		
TSG	LV5300-SER24	LV5350-SER24	LV7300-SER24	SDI signal generation		
FOCUS ASSIST	LV5300-SER25	LV5350-SER25	LV7300-SER25	Focus assist display		
LAYOUT	LV5300-SER26	LV5350-SER26	LV7300-SER26	Customized layout		
TALLY	LV5300-SER27	LV5350-SER27	LV7300-SER27	Tally display		
4K	LV5300-SER28	LV5350-SER28	LV7300-SER28	4K(12G-SDI/6G-SDI/3G-SDI Dual)		
EXTENDED VECTOR	LV5300-SER40	LV5350-SER40	LV7300-SER40	RGB Vector , YCbCr Vector		

LV5600-SER01 LV7300-SER01 **SDI INPUT** LV5600-SER02A LV7300-SER02 SDI INPUT WITH EYE PATTERN

Options add SDI inputs to the product. The LV5600-SER02A and LV7300-SER02 options offer SDI inputs with EYE pattern and Jitter functions



with histogram

NOTE: The LV5300A comes standard with EYE, and EYE features are not available on the LV5350.

LV5600-SER03 LV7600-SER03 DIGITAL/ANALOG AUDIO LV5600-SER04 LV7600-SER04 DOLBY E DECODING FUNCTION

Supports AES/EBU Audio and Analog Audio in/out. Features include audio bars, Lissajous, surround, loudness displays and Lip Sync(AV delay) as well as audio error reporting.

Additionally LV5600-SER04 / LV7600-SER04 option is installed, Dolby E, Dolby Digital, Dolby Digital Plus can be decoded and displayed.

LV5600-SER05 LV7600-SER05 10G IP INPUT (SMPTE ST 2022-6.SMPTE 2110-20) LV5600-SER05 LV7600-SER05

25G IP INPUT (SMPTE ST 2022-6, SMPTE 2110-20)

IP interface options for LV5600 / LV7600, supporting SMPTE ST 2022-6, SMPTE 2110-20/-30/-40, NMOS IS-04 and IS-05 for 3G/HD and 4K video.

LV5300-SER11 LV5350-SER11 BATTERY IDX LV5300-SER12 LV5350-SER12 BATTERY ANTON BAUER

LV5300-SER11/LV5350-SER11 Battery mount adapter for V mount Battery



For LV5300A/LV5350

LV5300-SER20 LV5350-SER20 LV7300-SER20 AUDIO DISPLAY FUNCTION

Provide Lissaious, and surround displays, Lip Sync(AV delay), in addition to monitoring channel levels and errors such as mutes or clicks.



Audio display

For LV5300A/LV5350

LV5300-SER21 LV5350-SER21 LV7300-SER21 CLOSED CAPTION

Decode and display closed caption of CEA-608/CEA-708, Teletext and OP47 subtitle with rendering on the picture.



Closed caption display

LV5300-SER22 LV5350-SER22 LV7300-SER22 **CIE CHART DISPLAY FUNCTION**

Enable support for ITU-R BT.601, ITU-R BT.709, and ITU-RBT.2020 colorimetry. (LV5600 and LV7600 are standard features.)



LV5600-SER23 LV7600-SER23 LV5300-SER23 LV5350-SER23 LV7300-SER23 HDR FUNCTION

Enable complete monitoring of the luminance levels of HDR signals, with support for HLG, PQ, and S-Log 3 as specified in ITU-R BT.2100.

the OOTF.



HDR zone display

LV5600-SER24 LV7600-SER24 LV5300-SER24 LV5350-SER24 LV7300-SER24 SDI SIGNAL GENERATION FUNCTION

Options provide HD SDI test pattern generation for 2K-HD/3G and 4K-3G quad/12G SDI formats. Please note, for 12G-SDI test signals, both the 4K and 12G-SDI options are required. (LV5300A, LV5350 and LV7300 are output from SDI output terminal 2 according to the output setting.)

LV5600-SER25 LV7600-SER25 LV5300-SER25 LV5350-SER25 LV7300-SER25 FOCUS ASSIST FUNCTION

Enable focus detection, using a new algorithm optimized for high resolution images. Focus can easily be adjusted with sensitivity even in low contrast scenes. Focus Assist (Green indicates focus)



LV5600-SER26 LV7600-SER26 LV5300-SER26 LV5350-SER26 LV7300-SER26 CUSTOMIZED LAYOUT FUNCTION

LV5600-SER26, LV7600-SER26, LV5300-SER26, LV5350-SER26, LV7300-SER26 enables both the location and size of displays such as waveform, vector, picture to be customized by the user. With display assignment, any given signal can also be rendered in up to 4 different views. (Display assignment is only for LV5600-SER26 and LV7600-SER26)



Customized layout display

LV5600-SER27 LV7600-SER27 LV5300-SER27 LV5350-SER26 LV7300-SER27 TALLY DISPLAY FUNCTION



Enable remote tally display. In the LV5600 and LV7600, camera ID, iris and tally are available via RS - 422/485 connectors.



LV5600-SER28 LV7600-SER28 LV5300-SER28 LV5350-SER28 LV7300-SER28 **4K FORMAT** LV5600-SER29 LV7600-SER29 12G-SDI

LV5600/LV7600

LV5600/LV7600 supports 4K formats of 3G-SDI dual and guad-link, HD-SDI quad link when the LV5600-SER28 or LV7600-SER28 is installed. LV5600 SER29/ LV7600-SER29 is required for 4K 12G SDI.

LV5300A/LV5350/LV7300

LV5300A/LV5350/LV7300 supports 4K 12G-SDI (single link) when LV5300-SER28, LV5350-SER28, or LV7300-SER28 is installed.

LV5600-SER30 LV7600-SER30 VIDEO NOISE METER

Enables measurement of the video noise included in the intensity or RGB components of SDI signals. A window for measuring noise can be set. Selectable area for measurement to allow for effects of the lens or similar.



This feature simplifies the task of identifying the reproduction errors which can occur when transmitting video content produced in BT.709, DCI-P3 or BT.2020 wide color gamut or when converting content from BT.2020 to narrow color gamut.

LV5600-SER32 LV7600-SER32 4K/HD IP TEST PATTERN GENERATOR

IP test pattern signal generation function that can generate HD and 4K (3840 x 2160) test patterns in compliance with the IP transmission standard (SMPTE ST 2110-20/30/31/40).

* LV5600SER06 / LV7600-SER06 is required.

Results 5.17 mVrms -42.62 dB

Noise meter display

ZEN SERIES REAR PANEL



LV5900A

8K 4K 12Gsbi 3Gsbi HDsbi EYE MADI

8K Multi Waveform Monitor Compatible with 8K Video

The LV5900A waveform monitor supports SMPTE ST 2082-12, which is used to receive 7680 (8192) \times 4320/59.94P YC_BC_R 10bit 8K video via 12G-SDI QUAD LINK. As it supports not only 8K but also a 4K input and four simultaneous HD inputs, you can use it as a high-end 8K system and switch between other systems as needed.

The waveform, vector, picture, and eye pattern displays allow for the measurement and quality control of various video signals. The status display allows you to view various error statuses and check on system stability by viewing event logs and long-term charts.



Dimensions (WHD mm): 223 x 172 x 360 (4U size)

LVB440 IP PROBE

Ultimate IP Analysis and Monitoring

Supports 8K/4K uncompressed





The LVB440 dual 40 gigabit Ethernet IP probe monitors high-bitrate IP broadcast media traffic from outside production studios, broadcasting networks, and master control centers, enabling quick troubleshooting and quality assurance. The LVB440 supports both ST2110 and ST2022-6 uncompressed video with dual 40 gigabit bit rate inputs, delivering a real-time analysis solution for broadcast stations and network operators handling large numbers of streams. Uncompressed video and audio packets can be analyzed with microsecond accuracy. Up to eight clients can simultaneously view analysis data on standard Web browsers or the optional aluminum kit.

- •10, 25, 40, 50 and 100 gigabit on dual interfaces.
- Simultaneous analysis of multiple 8K, 4K, 3G, HD, and SD IP streams.
- •Supports uncompressed 8K/4K/3G/HD/SD.
- ST2110 and ST2022-6.
- Provides revolutionary functions for monitoring and analyzing high-bitrate broadcast media traffic.
- Continuously surveys all layers of media transpor on an IP network and allows quick identification of potential problems.
- Maximizes Quality of Service (QoS).
- Provides remote monitoring via browser with support of up to eight simultaneous users.

PHABRIX RASTERIZER QxL/Qx



Advanced Rasterizer for Hybrid IP/SDI, 4K/UHD, HDR/WCG and Generation

QxL 25G IP/12G SDI



Formats supported

- IP SMPTE 2110/2022-7 over 10G IP
- IP SMPTE 2022-6 over 10G IP
- IP SMPTE 2110/2022-7/2022-6 over 25G IP (QxL Only)
- •3G/1.5G-SDI
- •12G/6G/3G/1.5G-SDI UHD
- UHD over 25G IP (QxL Only)

SDI stress tool

Unmatched ability to test the performance of equipment or designs, with the ability to customize test signals with

- Control of jitter insertion frequency and amplitude
- SDI scrambler and sync bit Insertion on/off
- SDI Bit Error (BER) insertion tool
- Control of SDI driver amplitude +/-15%
- Control of pre-emphasis, rise/fall time
- Generation of PRBS-7, 9, 15, 23, 31
- Reported cumulative errors
- Pathological signal detector

Qx 10G IP/12G SDI



ST2110 and ST2022-6 monitoring

- Monitoring of redundancy, video, audio, and ancillary data
- SIPS and PTP status report
- ST2110-30 Class C (80 channel max. at 125 us)
- NMOS ready

ST2110 analysis

- ST 2110 analysis and debugging tools to support engineers
- Simultaneously measures the packet timing interval of up to four IPs
- Measures ST2110-21 network compatibility model (Cinst) and virtual receiver buffer model (VRX)
- Timing measurement of video, audio, ANC, and PTP

PHABRIX Rx Series



The Rx series delivers advanced 3G/HD/SD signal generation, analysis, and monitoring for closed captions and loudness compliance testing and for video and audio problem solving. Waveform, vector, picture, audio and eye pattern monitoring from any location.





PHABRIX Rx2000

- 4 channel SDI signal analyzer/generator 3G/HD/SD)
- Monitoring via dual built-in screens and audio speakers
- Full high definition HDMI and SDI rasterizer outputs

PHABRIX Rx1000

- 4 channel SDI signal analyzer/generator 3G/HD/SD)
- Full high definition HDMI and SDI rasterizer outputs

PHABRIX Rx500

- 2 channel SDI signal analyzer/generator 3G/HD/SD)
- Full high definition HDMI and SDI rasterizer outputs

PHABRIX Sx Series Ultimate Analyzer and Generator Combination



SFP is optional.





PHABRIX SxTAG

- Supports SFP optical HD-SDI input/output
- Supports IP ST 2022-6 and ST 2110
- Supports composite input/output (BB, tri-level)
- 3G-SDI, HD-SDI, SD-SDI video signal generator
- Supports balanced analog and digital audio input/output
- Equipped with picture monitor, waveform monitor, vectorscope,
- audio monitor, and signal data analysis functions

PHABRIX SxE

- Eye pattern and jitter analyzer for 3G-SDI, HD-SDI, and SD-SDI signals
- 3G-SDI, HD-SDI, and SD-SDI video signal generator
- Equipped with picture monitor, waveform monitor, vectorscope, audio monitor, and signal data analysis functions
- Audio monitoring is possible using the AES/EBU digital audio signal generator, level monitor, and speaker.

PHABRIX SxD

- 3G-SDI, HD-SDI, SD-SDI, Dual Link (SMPTE372M), and 3G-A/3G-B (SMPTE425M) video signal generator and analyzer
- Equipped with picture monitor, waveform monitor, vectorscope, audio monitor, and signal data analysis functions
- * The SxD has two SDI input and SDI output connectors.
- * The SxD does not have AES input or output connectors.

PHABRIX SxA

- 3G-SDI, HD-SDI, and SD-SDI video signal generator and analyzer
- Equipped with picture monitor, waveform monitor, vectorscope, audio monitor, and signal data analysis functions
- Audio monitoring is possible using the AES/EBU digital audio signal generator, level monitor, and speaker.

Multiple outputs, GPS, Timecode, Dual power supply

The LT4610 is a sync generator capable of generating triple-rate SDI (3G-SDI / HD-SDI / SD-SDI) signals. This generator features dual redundant power supplies for maximum reliability. Its SDI, 6 analog black sync, and audio word clock signal output can be synchronized. Furthermore, the genlock function has the STAY IN SYNC function that holds phase when an abnormality occurs in the input signal, making it possible to build a highly stable system.

mensions (WHD mm): 482x44x400	Option sold separately					
(1U size type)	Model number	Model name				
	LT4610SER01	GPS/TC				
	LT4610SER02	12G-SDI				
	LT4610SER03	PTP				
610SER24 is a software option to add 12G-SDI	LT4610SER04	GPS/BDS/TC				
output to LT4610SER02.	LT4610SER24	8K				

LT4600A

Di

*LT4 8K c

Multi Format Video Generator

Compact, 1U half-rack size supports triple-rate SDI

The LT 4600A multi-format video generator is a compact, 1U half-rack size SDI video signal generator that supports the triple-rate SDI (3G-SDI/HD-SDI/SD-SDI) format. In addition to test pattern output including color bars and SDI check fields, the LT 4600A is equipped with numerous other features such as ID characters, QVGA logo marks, safety area markers, audio embedding, genlock for external reference input signals, and three analog black signal outputs.

ASACA DUX-214

4K 12G / 3G / HD Audio Channel ID Signal Generator

Audio channel ID on voice signal can be output. (channel one to channel sixteen on voice)

	Audio channel ID (voice signal)	Se	elected audio to ←Tone length- 3s	one → 1	
1ch 贝	Channel one	mute	1kHz tone	mute	other channels are mute
v 2ch Д	Channel two	mute	1kHz tone	mute	other channels are mute
∨ 3ch Д	Channel three	mute	1kHz tone	mute	other channels are mute
v 4ch √	Channel four	mute	1kHz tone	mute	other channels are mute

LT4611 8K 4K 12Gsbi 3Gsdi SDsbi BB LTC PTP Sync Generator

HDsdi

GPS

Flexible Sync Generator, Dual power supply

LT4611 also offers a redundant power supply design for reliability. Standard features include the genlock function, 3 line analog black sync signal output, and audio word clock signal output. Other functions can be added to this sync generator as options, allowing the unit to have the flexibility to match the features of the LT4610 as needed.

Option sold separately Model Dimensions (WHD mm): 482x44x400 Model name number (1U size type) LT4610SER01 GPS/TC LT4610SER02 12G-SDI LT4610SER03 PTP LT4610SER04 GPS/BDS/TC SYNC 3 OUT ADD 1T4611SFR21 LT4611SER22 SDI OUTPUT LT4611SER23 AUDIO OUTPUT *LT4611SER24 is a software option to add 12G-SDI LT4611SER24 8K

8K output to LT4610SER02.

3Gsbi HDsbi SDsbi BB LTC

Changeover

LT4448

For LT4610 / LT4611 / LT4600A – LTC capable

The LT4448 is equipped with 11 inputs / outputs, (PRIMARY, BACKUP, OUTPUT), plus LTC, and utilizes 2 input switching relays and 9 electronic switches. SDI, NTSC / PAL black burst, HD Trilevel Sync, AES / EBU digital audio, word clock, and LTC signals are supported. Faults are easily identified on the LED panel. The power supply is duplexed, with alarm notification of faults, and SNMP is also supported. Designed to be used in combination with LT4610, LT4611, LT4600A.

Dimensions (WHD mm): 426x44x400 (1U size type)

Combination of LT4610 and LT4448

Combination of LT4600A and LT4448

GENERATOR REAR PANEL

●LT4610 SYNC GENERATOR

ASACA VC4000

4K Multi Format Converter

VC4000 is a television format converter that, converts 4K, HDTV and SDTV formats with different frame rates and minimizes jerkiness even with fast moving images. Supports up conversion, down conversion and cross conversion.

ASTRODESIGN SB-4024-A /SB-4027 4K Conversion Board

The SB-4024-A / SB-4027 is a high quality, multi-function, spacesaving cross converter board that solves common problems in 4K HDR production sites. It is a converter board that supports resolution conversion, format conversion, and color gamut conversion between 4K and HD inputs and outputs. (SB-4027 supports 12G-SDI)

ASTRODESIGN BE-4028 Board Enclosure

Two types of frames for the SB-4024-A /4027

BRIDGE VB120

IP Monitoring Probe

HARDWARE PROBE The VB120 broadcast probe offers a cost-effective and powerful monitoring solution, covering the most commonly available signal formats. In particular, the VB120 is capable of monitoring IP unicasts and multicasts, OTT/ABR streams as well as a whole range of RF formats. The VB120 probe hardware is custom designed and built to telco-grade standards for maximum reliability and minimum maintenance. Each VB120 blade consumes less than 12W of power. This substantially reduces power consumption and air conditioning needs in installations. The VB120 can be paired with a full set of interface blades to cover signal formats such as DVB-T/T2, DVB-S/S2, DVB-C/C2, QAM-B, 8VSB, ISDB-T and ASI.

BRIDGE VB220

IP Network Probe

HARDWARE & SOFTWARE PROBES The VB220 Probe is the perfect choice in any network where digital video is carried across an IP-based infrastructure. Built specifically to high-end industry needs, this network service tool is ideal for both pure IP networks and hybrid networks with IP transport cores such as in digital cable and terrestrial networks. The VB220 probe hardware is custom-designed and built to telco-grade standards for maximum reliability and minimum maintenance. Each VB220 blade consumes less than 12W of power. This substantially reduces power consumption and air conditioning needs in installations. The VB220 can be paired with a full set of interface blades to cover signal formats such as DVB-T/T2, DVB-S/S2, DVB-C/C2, QAM-B, 8VSB and ASI.

BRIDGE VB330

Hardware, Appliance and Software

The VB330 Probe is the flagship in Bridge Technologies product offering towards broadband and media operators. With dual 10G Ethernet connectivity and a massive multiprocessor architecture the VB330 can deliver monitoring and analytics of thousands of streams and a multitude of technologies in real-time and in parallel. The VB330 is deployed either on dedicated embedded hardware, as a pre-configured and pre-installed appliance or as a software-only solution. This gives the operator greater flexibility when it comes to tailoring the monitoring solution towards the underlying system architecture in the best possible manner. Feature parity is ensured across the various deployment options, varying only in factors such as scalability, power consumption and longevity. The web-based user experience and feature availability stays the same across all the deployment alternatives.

BRIDGE NOMAD

Portable IP Probe

NOMAD covers all the monitoring needs encountered in hybrid IP multicast, OTT and RF networks. It is the ultimate all-in-one monitoring and analysis solution for the technician on the move. NOMAD features a plethora of award-winning and patented technologies, the culmination of 12 years of accumulated engineering knowledge and R&D in IP and broadcast monitoring.

Technical Information

CIE Chart (Applicable models : Zen series , LV5900A)

The CIE chart is a chromaticity diagram display which represents ITU-R BT.601, ITU-R BT.709, ITU-R BT.2020 color spaces. Both CIE 1931(xy) and CIE 1976(u'v') modes are supported. Multiple color spaces can be shown on the chromaticity chart, allowing content to be verified as BT.2020 or BT.709 color space. Colors are represented either as the full chromaticity coordinate space, or superimposed on the frame data shown on the color chart. Individual points may be directly measured with CineLIte Advance. The chromaticity value is automatically indicated where the cursor is positioned on the chart display.

xy coordinate chart

u'v' coordinate chart

xy coordinate color chart

Cursor points shown in blue

HDR waveform display

HDR point measurement

PQ setting HLG setting system GAMMA OFF HLG setting system GAMMA ON S-Log3 setting system GAMMA OFF

- Cursor can be easily positioned using a USB mouse
- Up to 3 points can be measured at the same time

BT.2020 Color Space Verification of HDR Color Bars (Applicable models: LV5900A, all Zen series models)

BT.2020 color space vectorscope

BT.2020 and BT.709 values differ on vectorscope displays.

If BT.2020 color bars are used, the result is centered in the targets, when using the vectorscope display and the BT.2020 setting.

UHDTV / HDR color bar compatible Vectorscope (Applicable models: LV5900A, all Zen series models) You can see both 75% of BT.2020 and 75% of ITU-R BT.709 color bar signals mapped to BT.2020 color gamut. (The conversion from 709 to 2020 is ITU-R BT.2087)

UHDTV Color Bar(ARIB STD-B66)

You can see both 75% of BT.2020 and 75% of ITU-R BT.709 color bar signals mapped to BT.2020 color gamut. (The conversion from 709 to 2020 is ITU-R BT.2087)

HDR Color Bar (ARIB STD-B72,ITU-R BT.2111)

You can see both 75% of BT.2020 and HLG OETE specified by BT.2087 and BT.709 color bar using linear matrix.

Colorimetry Zone Display (Applicable models: LV5600, LV7600)

When converting from a wide color gamut to a narrow color gamut, such as when creating content for simulcast, it is easier to check if the color has been replaced with a color different from the image.

External Sync Signal Input and Waveform Display (Applicable models: LV5600, LV7600 and LV5900A)

The phase difference and synchronization states of SDI or IP video signals can be shown graphically based on an external reference sync signal (black burst, tri-level sync). Further more, the waveform of the applied external reference sync signal can be displayed,

external reference sync signal can be displayed, allowing for the early discovery of problems related to the sync signal.

Lip Sync (Applicable models: LV5900A, Zen series, LT4610, LT4611 and LT4600A)

- Measures the time difference between audio and video signals.
- Can measure video and audio delays in microwave circuits and IP circuits during relay.
- Fluctuations in IP lines and the like are easy to identify.
- Measurement resolution: 1 ms
- Measurement system requirements

Measurement system consisting of LV5600-SER03/LV7600-SER03 (DIGITAL/ANALOG AUDIO) installed in the LV5600/LV7600 or the LV5300-SER20/LV5350-SER20/LV7300-SER20 (AUDIO) installed in the LV5300A/LV5350/LV7300 and combined with the LT4610/LT4611 or LT4600A.

Loudness Display (Applicable models: LV5600, LV7600 and LV5900A)

- Variety of triggers including panel, remote, time code, and mute
- Chart function to display loudness over time
- Both absolute and relative values are reported
- Loudness measurement of ARIB / EBU / ATSC / ITU-R BS.1770
- Logging of integrated loudness values

Selectable measurement time 2min/10min/30min/1h/2h

Custom Layout (Applicable models: Zen series, LV5900A)

Using the touch screen or mouse input, multiple measurement displays can be sized and located on the screen to meet the specific needs of the user.

Ex: Waveform, Vector and CIE display added

Customized Layout (Applicable models: LV5600, LV7600 and LV5900A)

Up to 4 channels can be displayed at the same time in the simultaneous mode, allowing for the monitoring of multiple feeds.

Enhanced layout configuration

Resulting layout display of 4 SDI feeds

Single Input Multi Display (Applicable models: LV5600, LV7600 and LV5900A)

One input signal can be assigned to multiple inputs for comparison, whether SDI or IP. (Only available with SD/HD/3G-A/3G-B-DL signals)

Example of simultaneous display of the same input signal on composite and YCbCr screens

Example of simultaneous display of the same input signal on HDR ZONE (HLG) and SDR picture screens

SR Live Metadata Display (Applicable models: all Zen series models)

This feature decodes and displays "SR Live Metadata" packets, advocated by Sony Imaging Products & Solutions Inc.

1920x1080/59.94P YCbCr(422) 10bit 3G-A					SDI A	TIME: 09:34:54		
SR I	_ive Packet							
INTE	ERFACE LINE No.	14						
No.	ITEM	VALUE	CTRL[Abs]	No.	ITEM	VALUE	CTRL[Abs]	
	Table Version	V 1.00	++	14	Knee	OFF	OFF	
2	OETF	HLG	++	15	Knee Point	96%	[-15]	
3	Trasfer Matrix	BT.2020	++	16	Knee Slope	0.19	[+37]	
4	Color Gamut	WIDE-BC	++	17	Knee Saturation	OFF	OFF	
5	Conversion Mode	SR AIR ON	++	18	Knee Saturation Level	0.50	[+0]	
6	HDR Look	Live	Live	19	Soft Knee			
7	HDR Black Compression	ON	ON	20	Knee Radius			
8	SDR Gain	-5.2dB	[-5.2dB]	21	SDR White Clip	ON	ON	
9	Master Black	1.03%	[+4.7]	22	SDR White Clip Level	109%	[-94]	
10	HDR Black Offset	∆-0.99%	[-4.5]	23	HDR Knee	OFF	OFF	
11	Gamma Table	STD 5	STD 5	24	HDR Knee Point	349%	[+0]	
12	Gamma Step	0.45	0.45	25	HDR Knee Slope	0.65	[+0]	
13	Gamma Level	0.95	[-12]					

SR Live Metadata display example

SCTE-104 analysis display (Applicable models: all Zen series models)

SCTE-104 Packet			
Single			
init_request_data		alive_request_data	Detected message
config_request_data		fault_request_data	Delected message
Multiple			
inject_section_data_request		splice_request_data	splice_null_request_data
start_schedule_download_re	equest_data	time_signal_request_data	transmit_schedule_request_data
component_mode_DPI_reque	est_data	encrypted_DPI_request_data	insert_descriptor_request_data
insert_DTMF_descriptor_req	uest_data	insert_avail_descriptor_request_data	insert_segmentation_descriptor_request_data
proprietary_command_reque	st_data	schedule_component_mode_request_d	ata schedule_definition_data
insert_tier_data		insert_time_descriptor	insert_audio_descriptor
delete_ControlWord_data		update_ControlWord_data	
4: 2020/02/22 12:04:24	SAMPLE NO.4		
4: 2020/03/23 12:04:34			Log list
3: 2020/03/23 12:04:34			
2: 2020/03/23 12:04:34	B NU SIGNA		
1:2020/03/23 12:04:33	A 1920X108	SPLICE_REQUEST_D	ATA,SPLICE_NULL_REQUEST_DATA,TRANSMIT_SCHEDUL···

1920x1080/59.941 YCbCr(422) 10bit HD 2020/10/26 17:24:31 SCTE104: splice 2020/10/26 17:24:31 SCTE104: splice 2020/10/26 17:24:31 SCTE104: splice 2020/10/26 17:24:31 SCTE104: splice Splice Type : 2 (START IMMED) Splice ID :: 0xHHHH(H (1234567890) Program ID :: 0xHHHH(12345) Program ID :: 0xHHH(1234

SCTE-104 detection screen (TEXT display)

SCTE-104 message is displayed on the picture screen.

IP Display (Applicable models: LV5600, LV7600)

Both SMPTE ST2022-6 and SMPTE 2110-20 based real-time IP transports at up to 2K image formats can be monitored. Transmission problems such as packet loss, checksum errors, as well as jitter can be monitored. Available media flows can also be identified by protocol and address. Both IP and SDI feeds can be simultaneously displayed in standard views such as waveform or picture to ensure SDI and IP operations in hybrid facilities.

IP measurement screen

∆T4-T3

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Management

Мах

Sync Follow up Delay request Delay response Announce 0.174 us

0.024 us

-0.045 us

0.073 us

0.026 us

0.069 us

-0.043 us

information (UTC), and the maximum, minimum, and measured time difference values per second

Displays the number of PTP messages per second

Displays the time difference per second on a time-lapse graph

40

0.5

0.0

PTP and RTP timing measurements

PTP time information and timestamps can be compared to verify whether video, audio, and ANC signals are synchronized to PTP.

Displaying the NMOS Screen

PTP Function (Applicable models : LT4610, LT4611)

PTP is a time synchronization protocol as defined in IEEE1588. Messages are exchanged in time-stamped IP packets between master clocks, slaves, and other timed devices in order to accurately determine time throughout the network.

ACCESSORIES

LR2561 RACK-MOUNT ADAPTER

LR2561 is a rack mount adapter that allows two LV5600s to be mounted side by side or an LV5600 and LV5350 or LV5300A to be mounted side by side in an EIA 19-inch rack. Applicable model: LV5600

LR2490 Rack Mount Adapter

The LR2490 is a dual rack mount adapter used to install LV5900A waveform monitors into a 19-inch EIA standard rack.

It allows two LV5900As to be installed side by side.

Applicable model: LV5900A

LR2478 Rack Mount Adapter

The LR2478 is a dual rack mount

LC2148 SFP+ MULTI-MODE

Applicable model: LV5600-SER05,SER06

LV7600-SER05,SER06

LT4610-SER03

850nm, 10GBASE-SR/SW

Maximum distance: 300m

be installed side by side. Applicable model: LT4600A

adapter used to install Leader's 1RU

half-rack size products into a 19-inch

EIA standard rack. It allows two units to

LC2566 BLANK PANEL The LC2566 is a blank panel for the LR2561 rack mount adapter. Use it when installing a single LV5600 waveform monitor in the LR2561. Applicable model : LV5600

LC2190 Blank Panel

The LC2190 is a blank panel for the LR2490 rack mount adapter. It can be used when installing a single LV5900A waveform monitor into the LR2490. Applicable model: LV5900A

LR2481 Rack Mount Adapter The LR2481 is a rack mount adapter used to install a Leader 1RU half-rack size product into a 19-inch EIA standard rack. One side is a blank panel. Applicable model: LT4600A

LC2145 SFP+ SINGLE-MODE Function: 1310nm, 10GBASE-LR/LW Maximum distance: 10,000m Applicable model: LV5600-SER05,SER06 LV7600-SER05,SER06 LT4610-SER03

LR2530 RACK-MOUNT ADAPTER

mounted side by side on a 19-inch EIA

Applicable model: LV5300A, LV5350

LR2731 RACK-MOUNT ADAPTER

inch EIA standard rack with a blank

panel on another side.

Applicable model: LV7300

GST90A12 AC ADAPTER

LV5300A/LV5350/LV7300

models.

Applicable model:

AC adapter and AC cord for applicable

Sold separately except for LV7300.

One rasterizer can be mounted on a 19-

Two waveform monitors can be

standard rack.

LC2151 SFP28 MULTI-MODE Function: 850 nm, 25GBASE-SR Long-distance: 70 m max. (OM3), 100 m max. (OM4) Applicable model: LV5600-SER06 LV7600-SER06

LC2535 BLANK PANEL For use with a single waveform monitor and LR2530. Applicable model: LV5350

LR2732 RACK-MOUNT ADAPTER Two rasterizers can be mounted side by side on a 19-inch EIA standard rack. Applicable model: LV7300

LC2141 SFP TRANSCEIVER RJ-45 1000BASE-T Applicable model: LT4610-SER03

LC2152 SFP28 SINGLE-MODE Function: 1310 nm, 25GBASE-LR Long-distance: 10, 000 m max. Applicable model: LV5600-SER06 LV7600-SER06

LC2183 LTC CABLE Conversion cable consists of 1 (one) 25 pin D-sub LTC connector and 2 (two) 15 pin D-sub LTC connector for PRIMARY/ BACKUP, and 3 (three) XLR connectors for LTC output (1.5m) Applicable model: LT4448

AU-217 ANTENNA Connector : TNC (F) Frequency band : 1575~1606 MHz Impedance : 50Ω Applicable model : LT4610-SER01,SER04

ACCESSORIES

ACCESSORIES LIST

PRODUCT NAME	MODEL	APPLICABLE MODEL	REMARKS
RACK-MOUNT ADAPTER	LR2490	LV5900A	Two waveform monitors can be mounted side by side in a 4U space on a 19-inch EIA rack
RACK-MOUNT ADAPTER	LR2561	LV5600	Two units can be mounted side by side in a 3U space on a 19-inch EIA rack
RACK-MOUNT ADAPTER	LR2530	LV5300A/LV5350	Two units can be mounted side by side in a 3U space on a 19-inch EIA rack
RACK-MOUNT ADAPTER	LR2731	LV7300	One rasterizer can be mounted in a 1U space on a 19-inch EIA rack. Same rack used for Left or Right mount.
RACK-MOUNT ADAPTER	LR2732	LV7300	Two rasterizers can be mounted side by side in a 1U space on a 19-inch EIA rack
RACK-MOUNT ADAPTER	LR2478	LT4600A	Two units can be mounted side by side in a 1U space on a 19-inch EIA rack
RACK-MOUNT ADAPTER	LR2481	LT4600A	One units can be mounted in a 1U space on a 19-inch EIA rack. Same rack used for Left or Right mount.
BLANK PANEL	LC2190	LV5900A	
BLANK PANEL	LC2566	LV5600	
BLANK PANEL	LC2535	LV5300A/LV5350	
SFP TRANSCEIVER RJ-45	LC2141	LT4610-SER03	1000BASE-T
SFP+ MULTI-MODE	LC2148	LV5600-SER05,SER06/ LV7600-SER05,SER06/ LT4610-SER03	10GE, 850nm, 10GBASE-SR/SW
SFP+ SINGLE-MODE	LC2145	LV5600-SER05,SER06/ LV7600-SER05,SER06/ LT4610-SER03	10GE, 1310nm, 10GBASE-LR/LW
SFP28 MULTI-MODE	LC2151	LV5600-SER06/ LV7600-SER06	25GE, 850nm, 25GBASE-SR
SFP28 SINGLE-MODE	LC2147	LV5600-SER06/ LV7600-SER06	25GE, 1310nm, 25GBASE-LR
AC ADAPTER	GST90A12	LV5300A/LV5350/ LV7300	Separately sold : LV5300A/LV5350, Included with LV7300
GPS/GNSS ANTENNA	AU-217	LT4610-SER01	High noise resistance and waterproof performance.
LTC CABLE	LC2183	LT4448	Conversion cable consists of 1(one) 25 pin D-sub LTC connector and 2 (two) 15 pin D-sub LTC connector for PRIMARY/BACKUP, and 3 (three) XLR connectors for LTC output (1.5m)

Leader

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Specified product specifications are subject to change without notice. March. 2022	

* This Short Form catalog has been simplified. Please check additional product information on our website. URL:www.leader.co.jp/en