About LEADER professional video test measurement



Leader Electronics Corp.

http://www.leader.co.jp/







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 - Capture and compare
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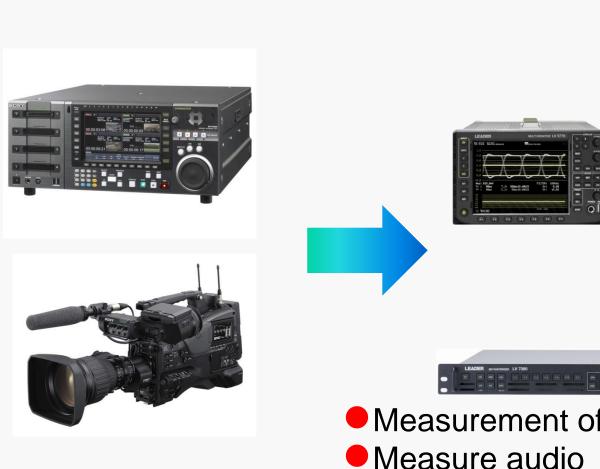


Leader Electronics products





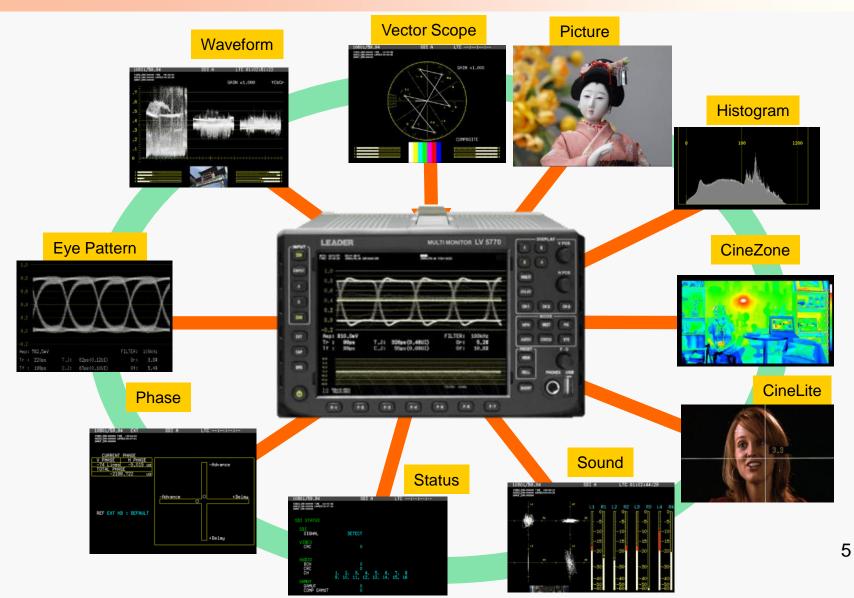
Waveform monitor / Rasterizer



- Measurement of video image Measure audio Measure SDI signal

Various measurement mode of our Waveform monitor

LEADER



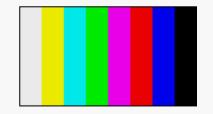


Generator



 Generate reference signal
 Synchronize to the input synchronization signal(Genlock)

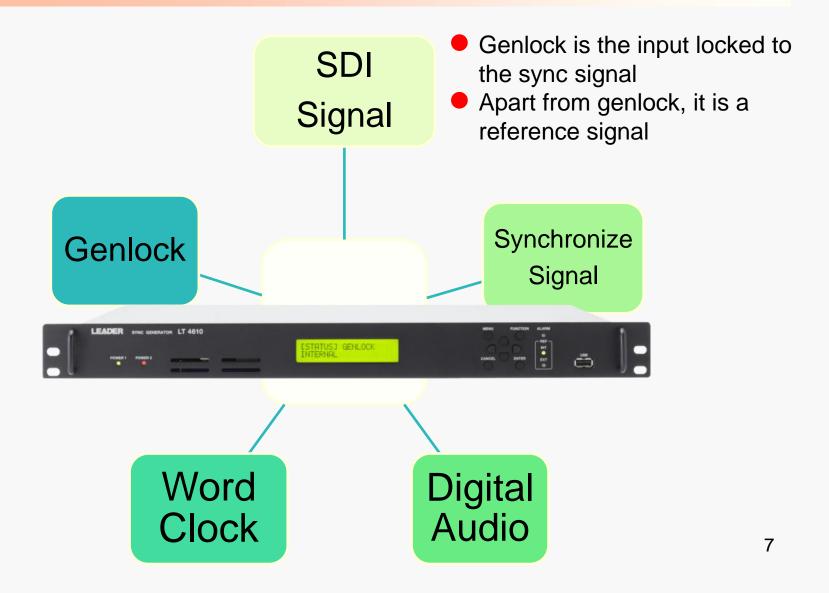




Test pattern



Generator





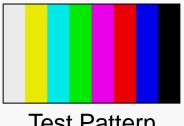
Generator / Waveform monitor



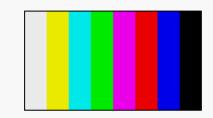
Reference signal



Measure reference signal that passed through equipment



Test Pattern

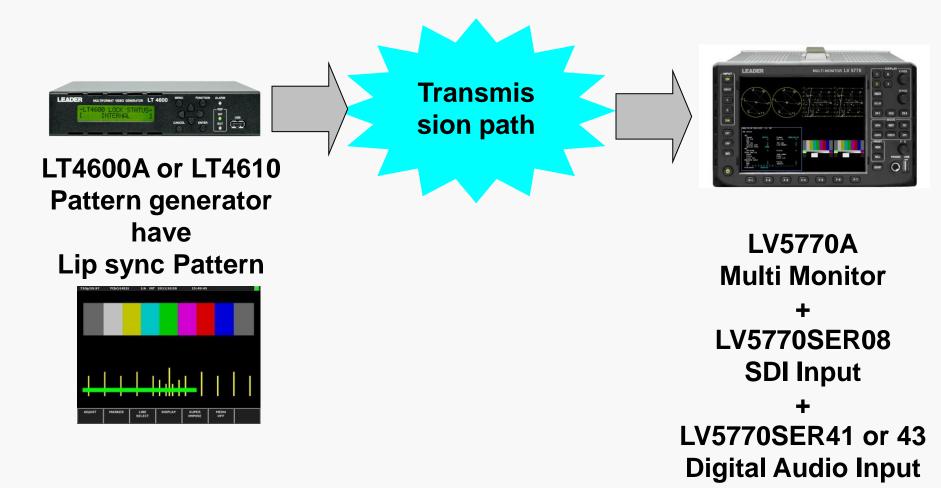




Synchronization signal (BB or 3Tri)



Lip sync [AV delay] measurement





Lip sync [AV delay] measurement

There are two kinds of measurement of lip sync

720p/29.97	YCbCr(422)	1/A INT	2011/10/26	15:49:43	
			ыл		
			1 111 1		

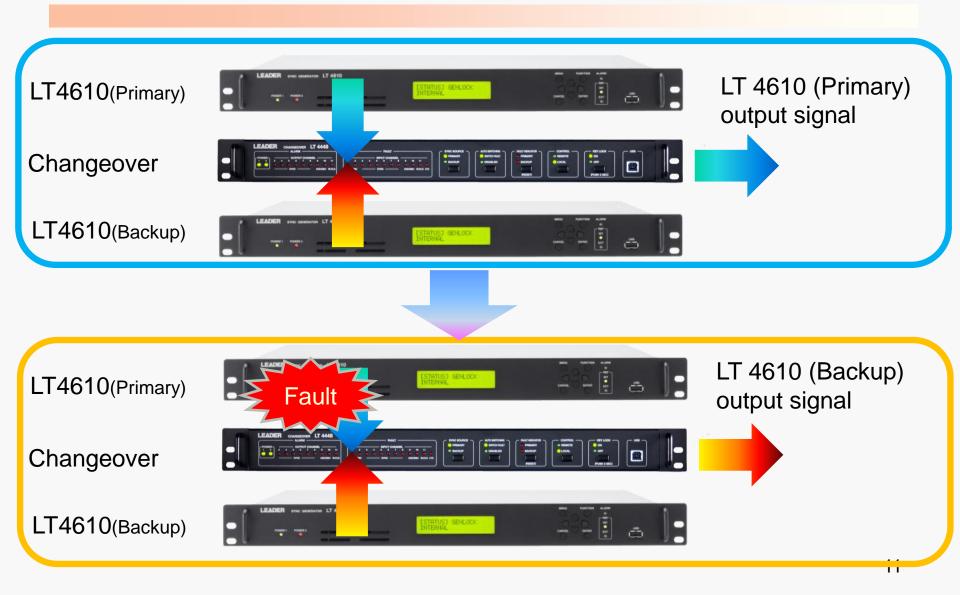
Measure by display and sound

	2/03/27 8:37:12 SDI-A SDI A	1080	1/59,94 YCbCr(422) AUD: SD:	LTC:::	- ‡ 3 ³ USB
CH		RW]	-50	0 [ms]	50
1	1508 (45)			
2	1508 (45)			
3	1508 (45)			
4	1508 (45)			
5	1511 (45)			
6	1511 (45)			
7	1511 (45)			
8	1511 (45)			
			AUD.ADVANCE	[VIDEO REF]	AUD.DELAY

Measurement by measurement value display



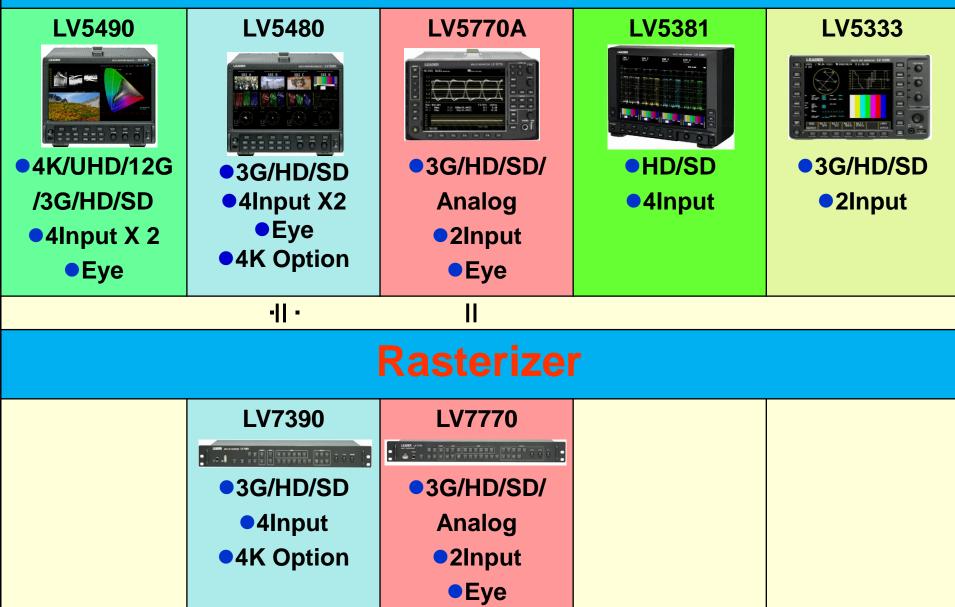
Changeover



Variety products



Waveform monitor



LV5490 4K/12G/3G/HD/Dual/SD Waveform Monitor



Leader Electronics Corp. http://www.leader.co.jp





Key features

4K Video Format

The LV 5490 supports 4K video formats (4096 × 2160 and 3840 × 2160) based on 3G dual link and quad link and HD quad link. Up to four 3G dual link 4K video signals can be displayed by switching. Up to two 3G quad link or HD quad link 4K video signals can be displayed by switching.



Division

Selects the division transmission system when SDI System is 4K. Square / 2 Sample Interleave

Full High Definition LCD

The LV 5490 is equipped with a 9-inch LCD with excellent viewing angle and color reproducibility. It can also be used as a high-quality high definition picture monitor.



Key features

• Free Layout

The LV 5490 can display not only the video signal waveform, vector waveform, picture, and the like of an input SDI signal simultaneously, but it can also display multiple input signals simultaneously and overlay them for comparison. The measurement screens can be adjusted in size and position as you like. Different layout configurations can be achieved simply by using the mouse.

Eight Inputs and Simultaneous Four Input Display

The LV 5490 has four SDI input connectors compatible with 3G, HD, and SD and can display up to four SDI input signals simultaneously. It also has four additional SDI I/O connectors.

Pattern Generator Function and Reclock Output

External Monitor Output and SDI Routing

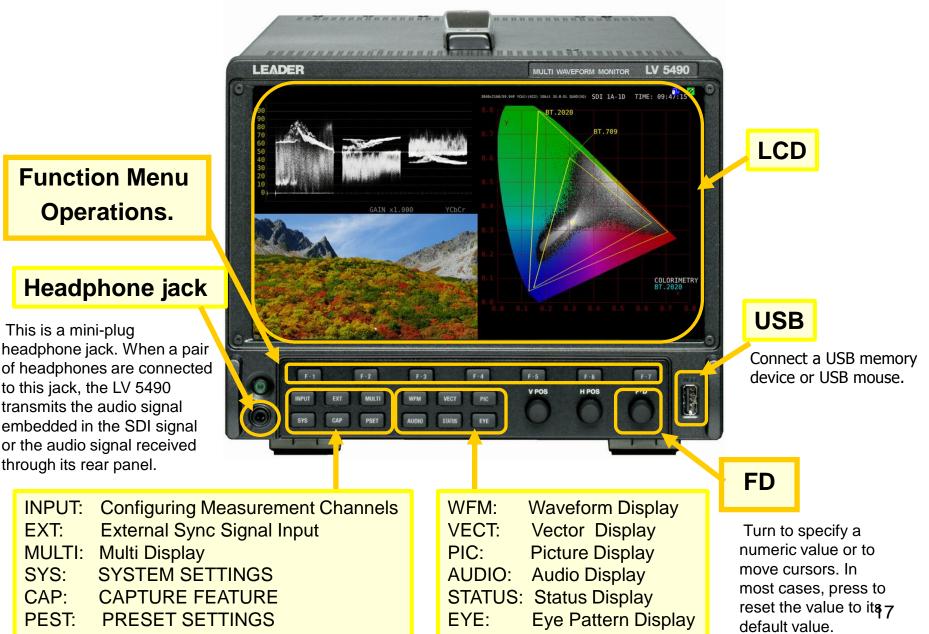


Key features

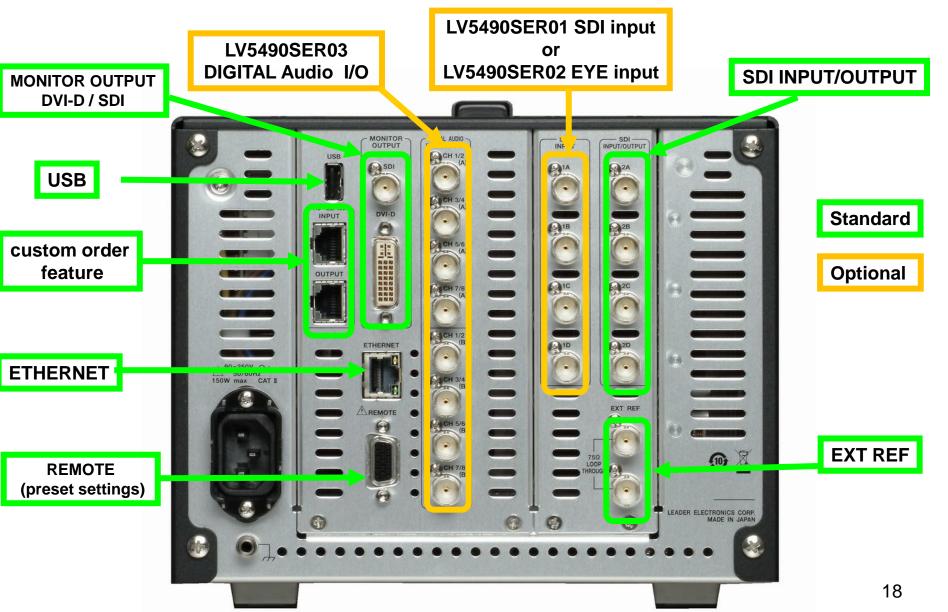
- USB Mouse Operation
- SDI Signal Analysis
- Screen Capture
- Frame Capture
- Time Code Display
- External Remote Connector
- Frequency Phase Adjustment
- Frequency Deviation Display



PANEL DESCRIPTION



LV5490 Rear Panel





Option

- SDI Input (LV5490SER01)
- SDI Input and Eye Pattern Display (LV5490SER02)
- Embedded Audio Display/ Digital Audio I/O (LV5490SER03)

Focus Assist (LV5490SER04)

A new focusing algorithm based on nonlinear super-resolution technology has been developed, allowing highly sensitive focusing even on low-contrast images that were difficult to be focused in on in the past.

CIE Diagram (LV5490SER05)

Chromaticity diagrams based on ITU-R BT.601, ITU-R BT.709, and ITU-R BT.2020 colorimetries can be displayed.

Display mode supports CIE 1931 (xy display) and CIE 1976 (u'v' display).

12G-SDI Input (LV5490SER06)

- HDR Display (LV5490SER07)
- IP/12G-SDI input (LV5490SER08)
- 12G-SDI Eye Pattern Display (LV5490SER09)
- Camera Video S/N (LV5490SER10)

LV5480 4HD Input Waveform Monitor



Equivalent to LV 5490

LV7390 4 Input Full HD Rasterizer

4 Input 3G/HD/SD





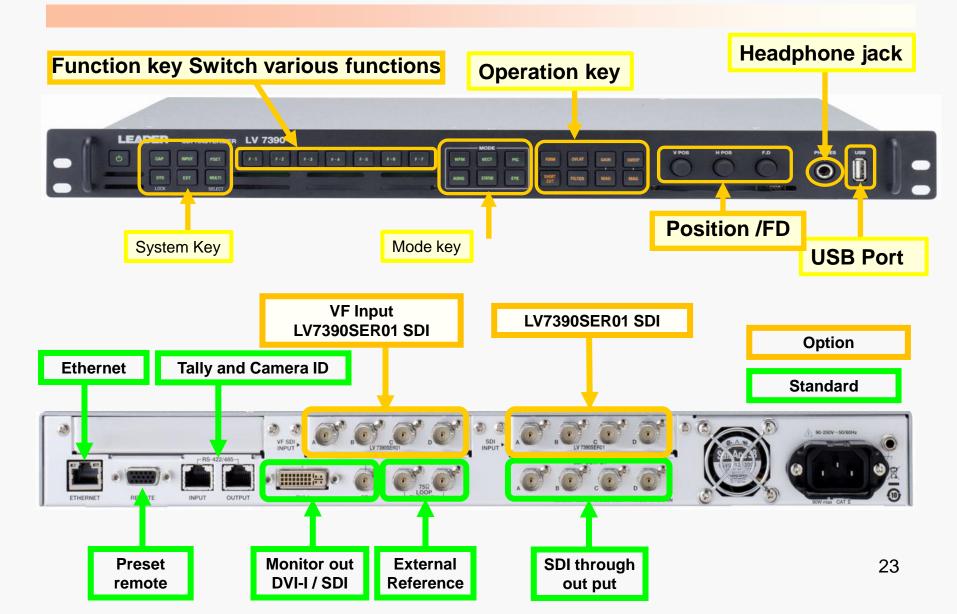
LEADER LV7390 4 Input Full HD Rasterizer

- Up to 4 SDI signals can be measured at the same time.
- Input signals correspond to 3G-SDI, HD-SDI and SD-SDI.
- The measurement screen is output with full HD resolution SDI and DVI-I.
- •We have a free layout function that allows you to arrange the display screen freely.
- It responds to speedy operation by the new operation key.





LV7390 4 Input Full HD Rasterizer





Options

 SDI Input Option
 LV 7390SER01 SDI INPUT Supports 3G / HD / SD-SDI format

 Digital Audio
 LV 7390SER03 DIGITAL AUDIO UNIT AES/EBU Input / Output

 VF SDI Input Option
 LV 7390SER01 SDI INPUT Supports 3G / HD / SD-SDI format

4K/HDR Option
 LV 7390SER20 4K
 4K and HDR option



LV5770A Multi Waveform Monitor



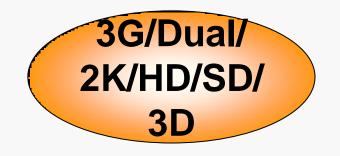




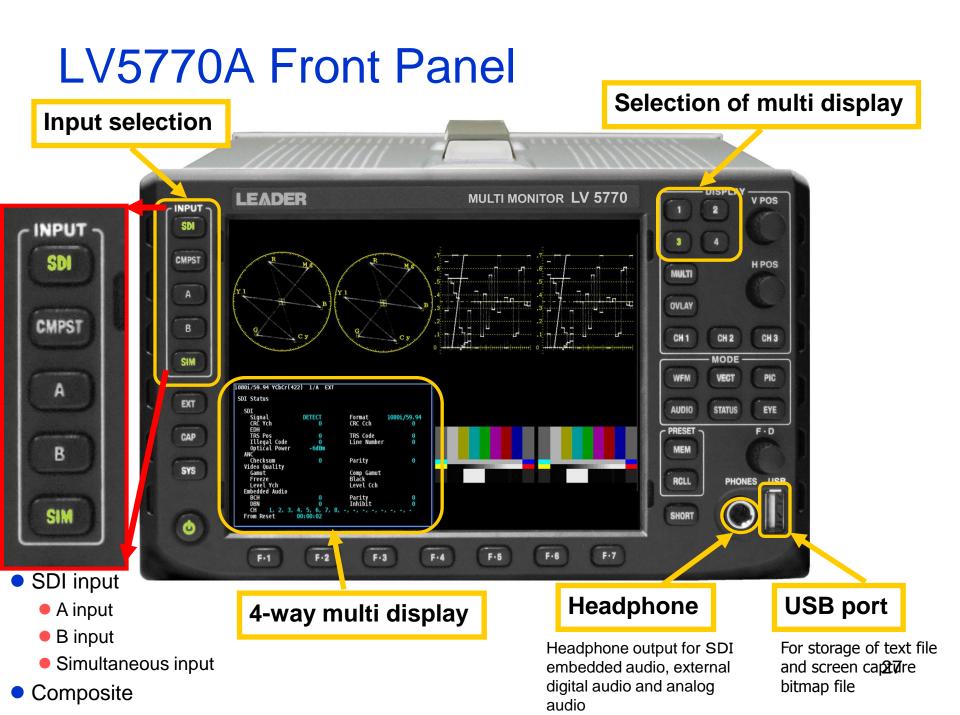
LEADER

LV5770A Multi waveform monitor

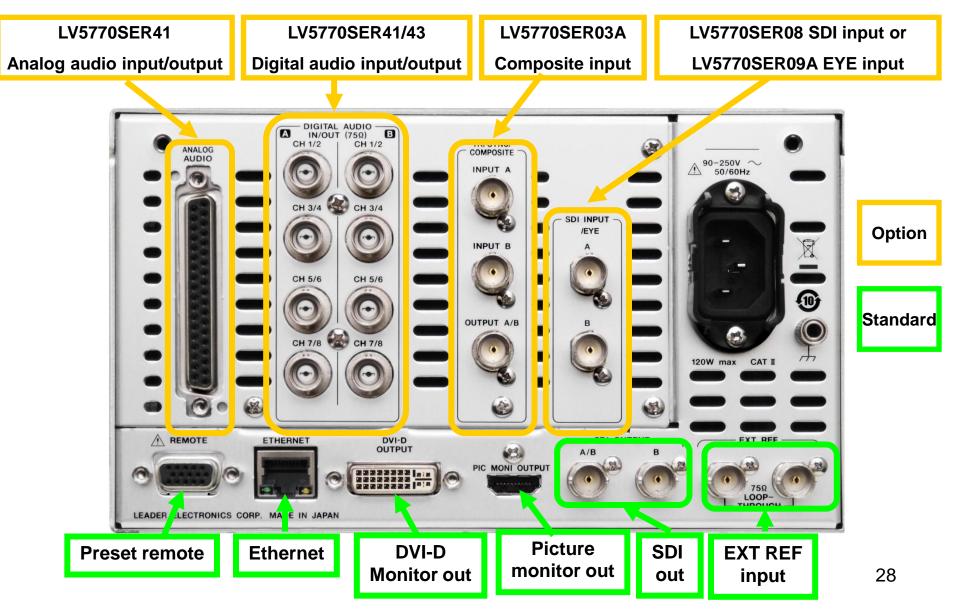
- Low cost, high performance
- Monitoring two 3G-SDI, HD-SDI or SD-SDI signal at the same time
- Waveform, Vector, Picture of two input signals can be overlaid or display side by side
- Embedded audio level meters display
- Error display for transmission error, 5BAR display for gamut error
- Cinelitell for easy luminance and chrominance checking
- •6.3 inches TFT LCD XGA resolution display and DVI-D monitor output
- Picture monitor output
- Frame capture/screen capture for storage or compare
- Control remotely using Ethernet connector (WEB server, Telnet, FTP, SNMP) and remote connector (preset recall)
- Headphone connector







LV5770A Rear Panel





LV5770A Multi waveform monitor

• Variety of factory option units(sold separately)

- LV 5770SER08 SDI INPUT
 - 3G/HD Dual link/HD/SD-SDI format compliance
 - 2 signals overlaid or side by side display. 2 loop through SDI outputs.
- LV 5770SER09A SDI INPUT/EYE
 - LV 5770SER08 plus eye pattern display function
- LV 5770SER41 DIGITAL AUDIO (Loudness function)
 Supports embedded audio, external digital audio (8ch)
- •LV 5770SER42 ANALOG AUDIO

Supports up to 8ch of analog audio

LV 5770SER43 DIGITAL AUDIO (Loudness function)

Supports embedded audio, external digital audio (16ch)

LV 5770SER03A COMPOSITE VIDEO INPUT

Supports NTSC/PAL video signal and tri-level signal





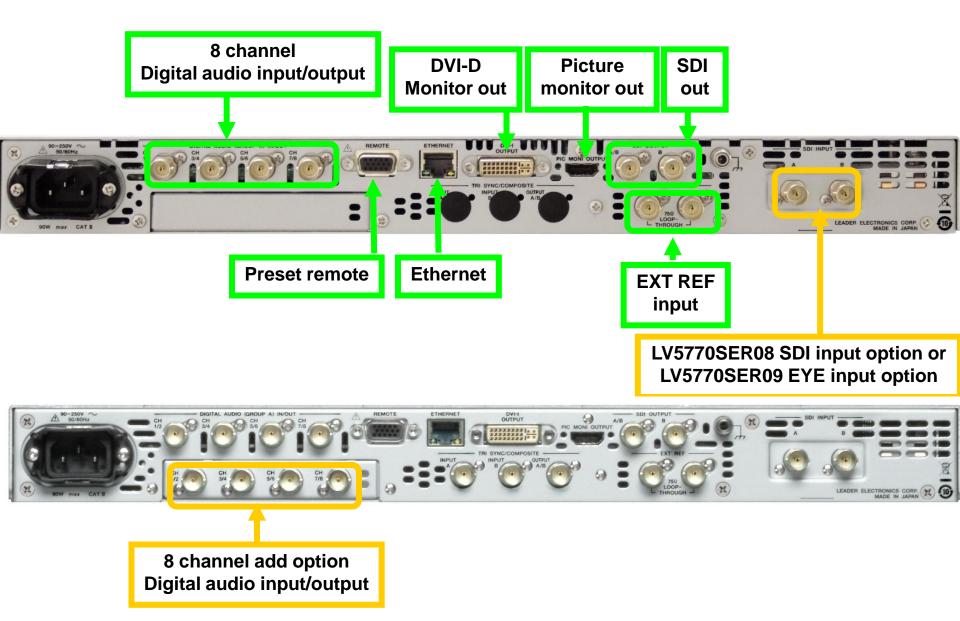


LV7770 Multi SDI Rasterizer



Equivalent to LV5770A

LV7770 Rear Panel



LEADER

LV5381 4 Input Waveform Monitor

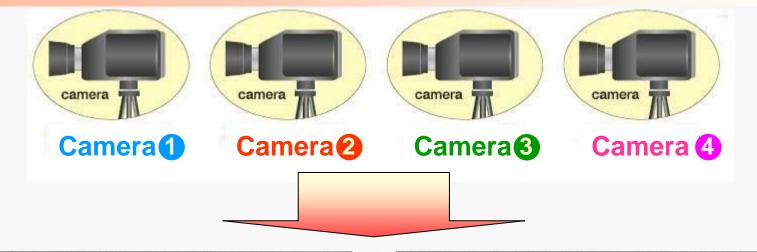
- Low cost and hi performance
- High quality colour calibrated 8.4" Screen
- •HD and SD 4 input simultaneous display
- CineLite and CineZone are standard
- Sound, Dual 2k, Status are optional
- Size 215(W) x 176(H) x 85(D) 2kg







LV5381 4 Input Waveform Monitor









LV5381 Rear panel





LV5333 Compact SDI Monitor

Compact Portable SDI Picture, Waveform, Vector Monitor

- High-brightness screen 6,5"
- Ideal for use on any SDI camera
- Patented measurement tools Gamut 5BAR,CineLite ,CineZone and CineSearch included
- Formats are 3G-SDI (A,B), HD-SDI,SD-SDI
- Size 215(W)x128(H)x63(D)mm
- Weight only 1,3k







Battery option



LV 5333 OP70 Battery adapter V mount



LV 5333 OP71 Battery adapter QR gold mount



LV5330 in Rack Mount

OB Van or Studio





Variety products



Generator



LT4600A



BB/3Tri X 6
3G/HD/SD-SDI X2
AES_EBU/WC
Genlock

Changeover

LT4448

BB/3Tri X 6 • 3G/HD/SD-SDI X2
AES_EBU/WC Web • Browser Setting



LT4610 シンク ジェネレータ



- Genlock function
 Analog black output X 6 output
 SDI output X 2 lines
 AES / EBU serial digital audio output
 Word clock output
- Time code by option
 GPS by option
 Optional 4K 12GSDI output



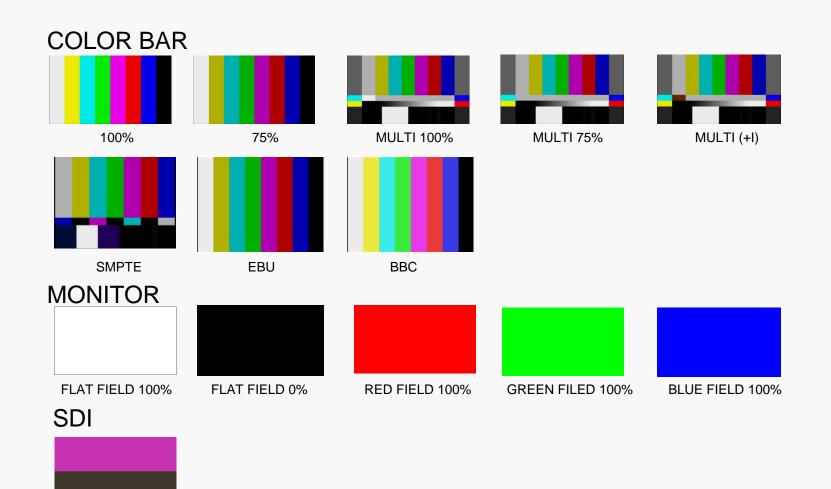
出力信号

- SDI Signal
 - It outputs signals that are the basis of 3G-SDI, HD-SDI, SD-SDI.
 - The color bar and the check signal of the stress signal are output as the image on the SDI signal.
 - The reference tone signal is output to the sound of the SDI signal.
 - 2 outputs
- Synchronize Signal
 - BB(Black Burst) Signal or 3Tri Signal 6 outputs
- Digital Audio
 - AES/EBU A tone signal that is a reference for digital audio is output
- Word clock
 - Output digital audio synchronization signal



SDI Output Patterns

CHECK FIELD







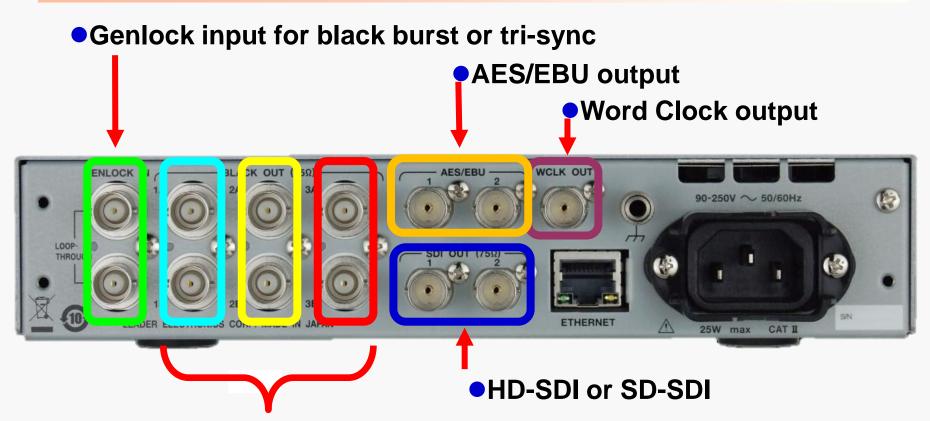
LT4600A Multi format video generator

3G-SDI/HD-SDI/SD-SDI 1U Half



- Genlock function
- Analog black output X 6 output
- SDI output X 2 lines
- AES / EBU serial digital audio output
- Word clock output





3 pair black burst or tri-sync output
You can setup difference formats and timing



LT4448 Changeover









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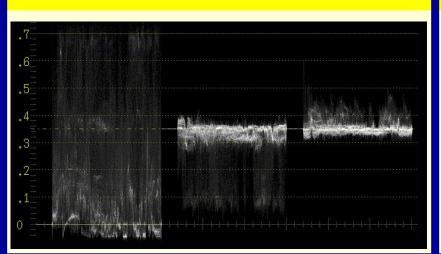
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Display functions

Waveform

Vectorscope





Picture



Status

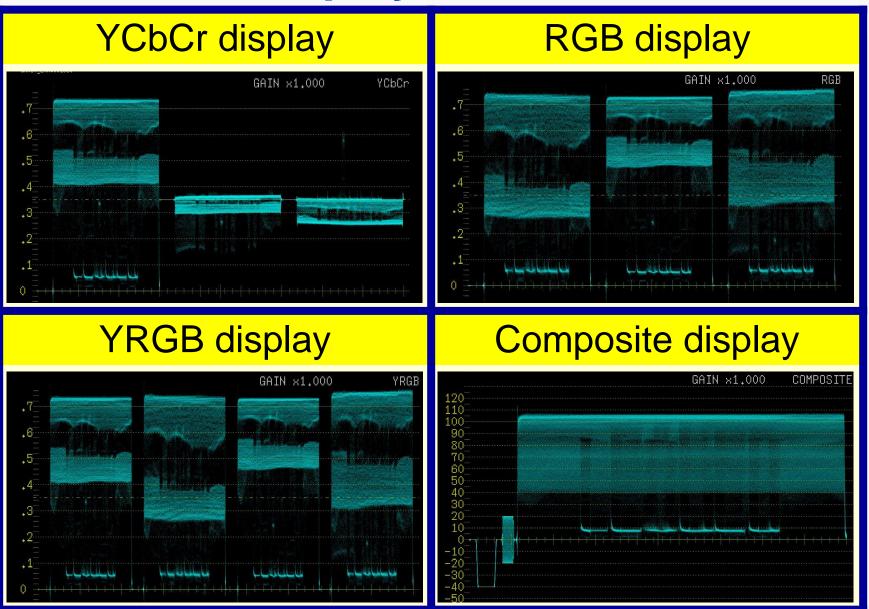
DATE: 12/03/29 SDI-A TIME: 15:04:47 10801/59.94 YDDCr4 SDI STATUS	(422)	801-8 10801/59.94 YCbCr(422)	USB
SDI			
Signal	DETECT	Format	1080i/59.94
CRC			
TRS Pos		TRS Code	0
Illegal Code		Line Number	0
ANC			
Checksum		Parity	0
Video Quality			
Gamut		Comp Gamut	
Freeze		Black	
Level Ych		Level Cch	
Embedded Audio			
BCH		Parity	0
DBN		Inhibit	0
Audio Sample			
	3, 4, 5, 6,	7, 8, -, -, -, -,	-, -, -, -

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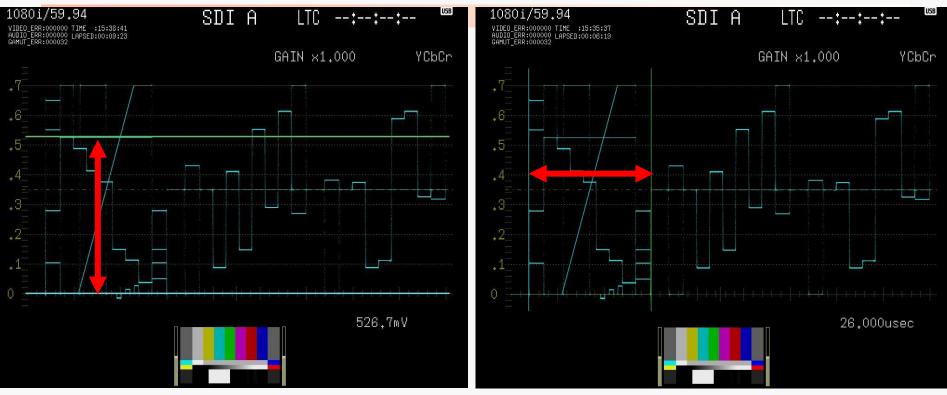


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Waveform display function



LEADER Waveform cursors measurement function



X cursor

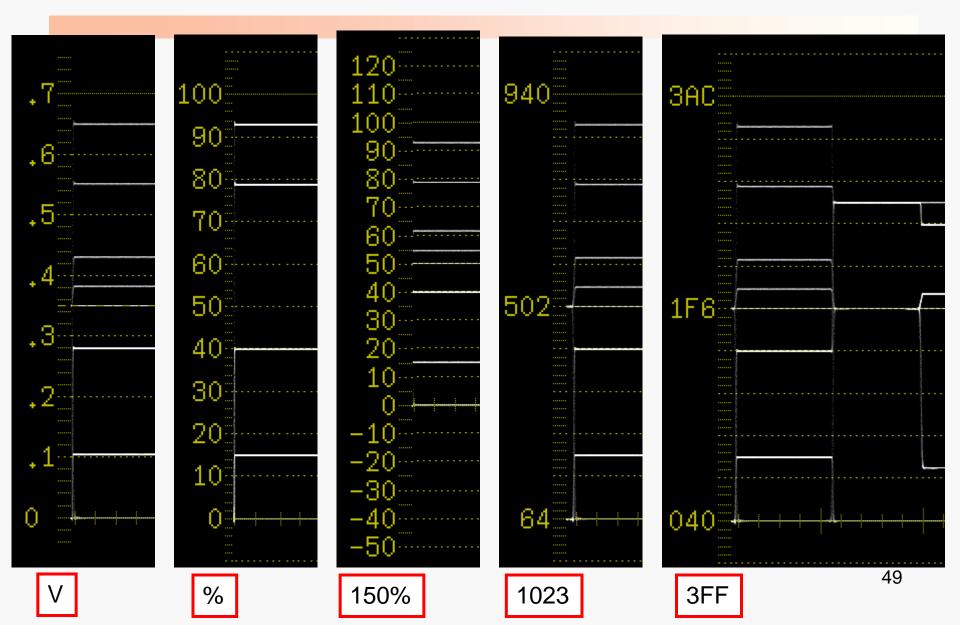
- Unit = mV Unit = %
- Unit = R%

Y cursor Unit = second Unit = Hz

- The amplitude while pressing the REFSET will be the criterion
- •Unit = DEC
- 0 to 100% is displayed in decimal as 64 to 940
- 0 to 100% is displayed in hexadecimal as 040 to 3AC

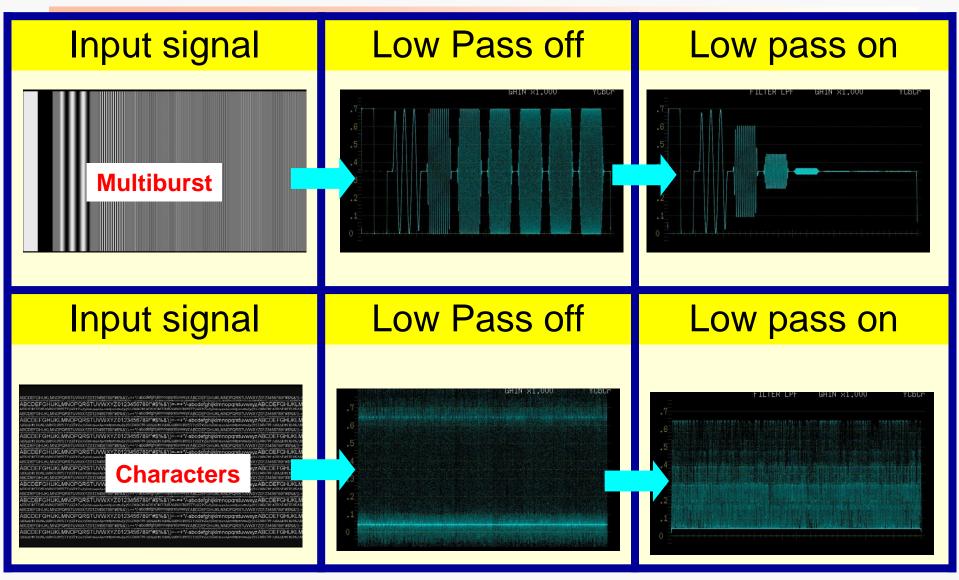


Waveform scale unit





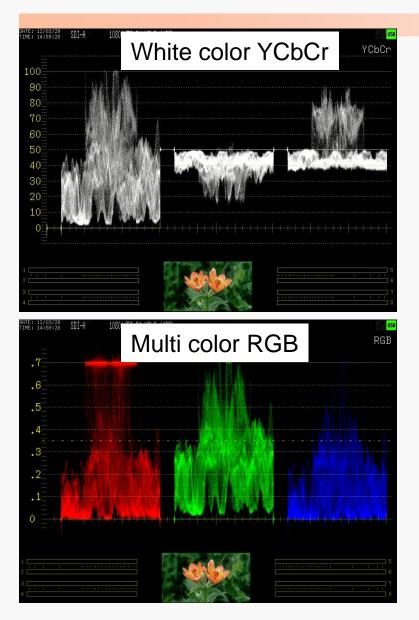
Low pass filter function

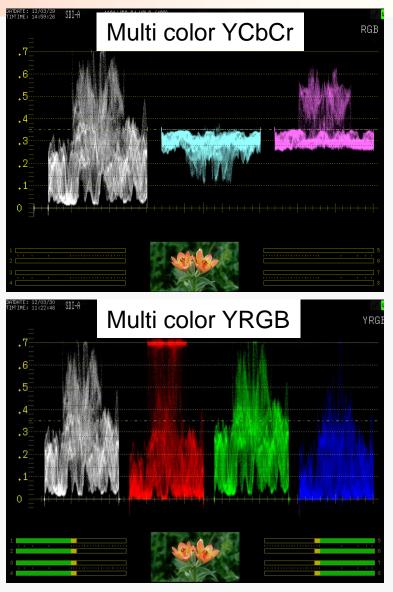


Convenience for waveform with overshoot or undershoot



Waveform multi colors setting

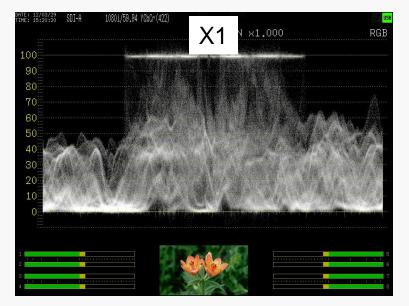


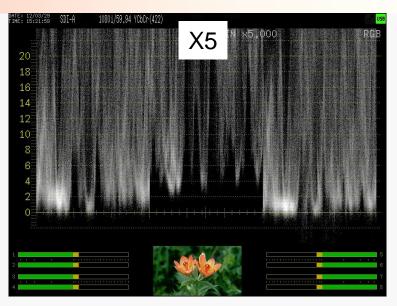


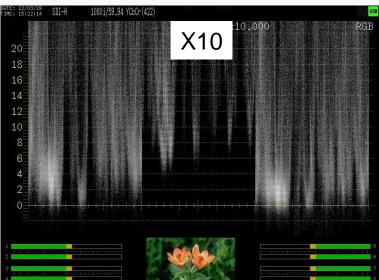
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Waveform gain expansion



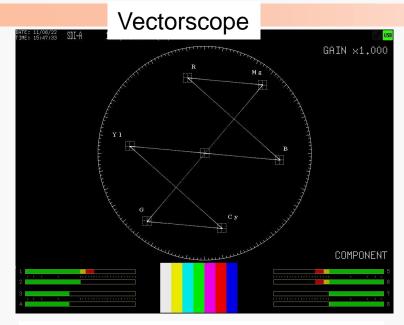




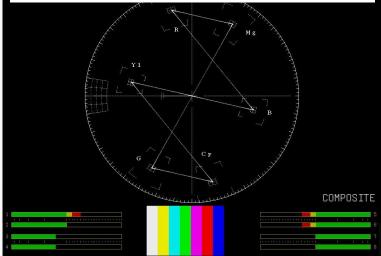
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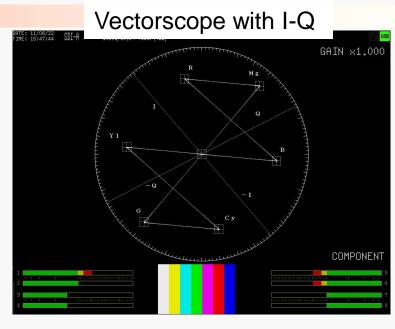


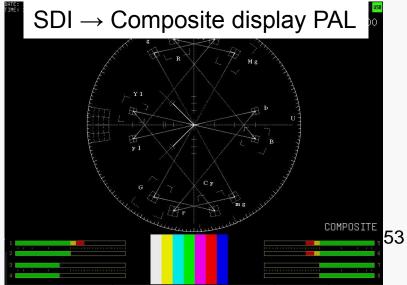
Vectorscope



SDI \rightarrow Composite display NTSC



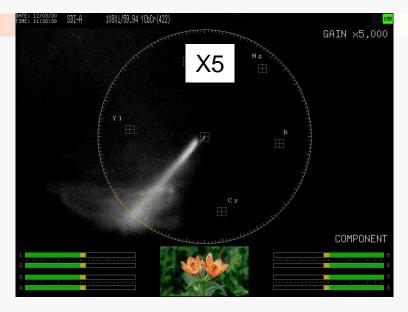


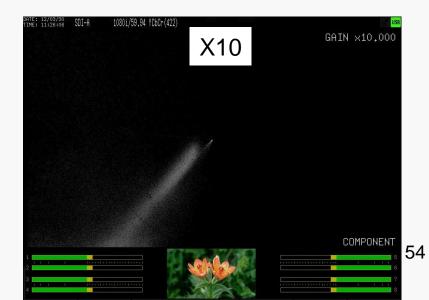




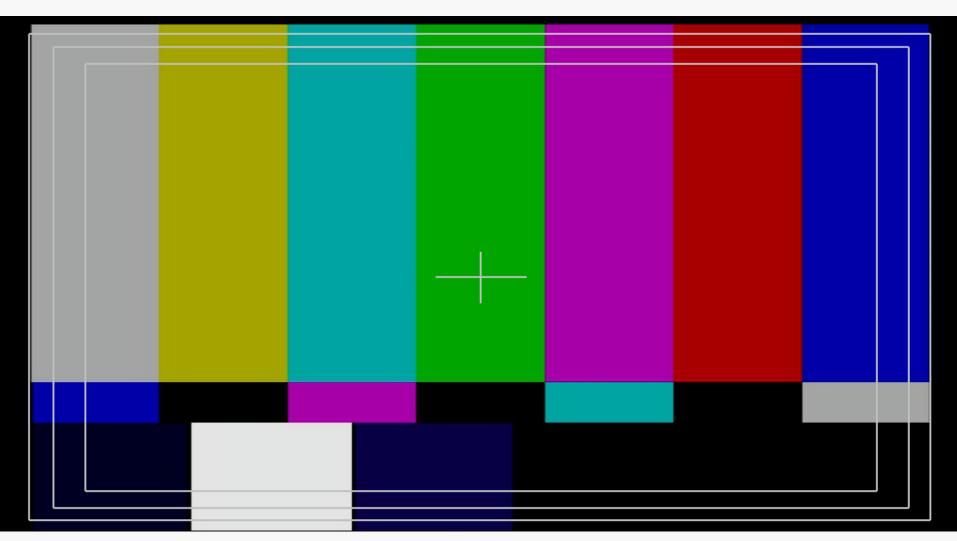
Vectorscope gain expansion





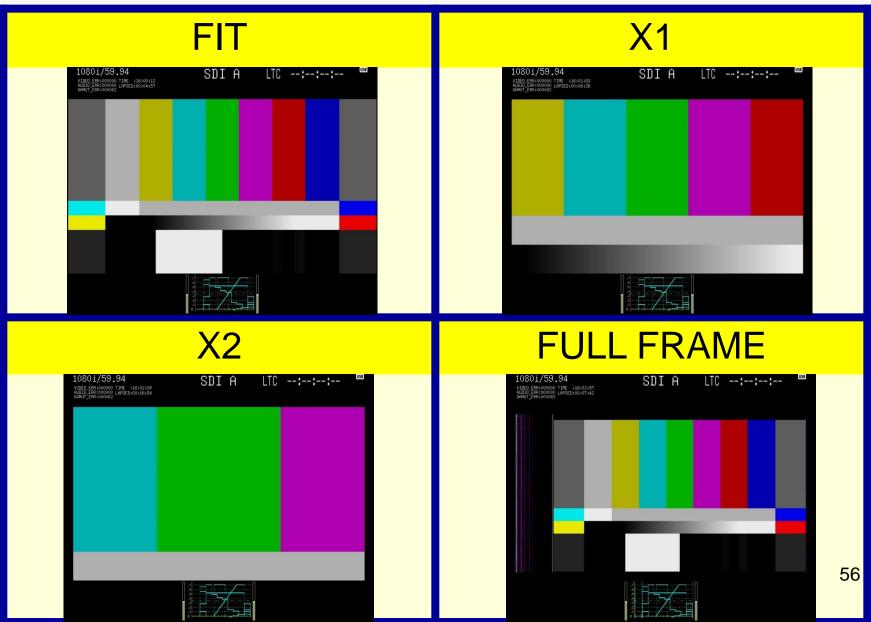


Picture display markers Safe Action/Safe Title/Center/Aspect





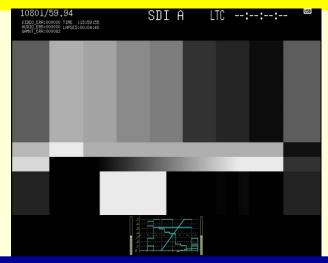
Picture display



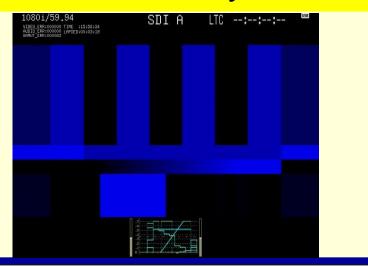


Picture display

Monochrome







Shadow marker





Status function

Error status

DATE: 12/03/29 SDI-A TIME: 15:04:47 10801/59.94 YCbCrd SDI STATUS	(422)	<mark>SDI-8</mark> 10801/59,94 YCbCr(422)	U58
SDI			
Signal	DETECT	Format	1080i/59.94
CRC			
TRS Pos		TRS Code	0
Illegal Code		Line Number	0
ANC			
Checksum		Parity	0
Video Quality			
Gamut		Comp Gamut	
Freeze		Black	
Level Ych		Level Cch	
Embedded Audio			
BCH		Parity	0
DBN		Inhibit	0
Audio Sample			
CH 1, 2,	3, 4, 5, 6,	7, 8, -, -, -, -,	-, -, -, -
SinceReset	00:31:06		

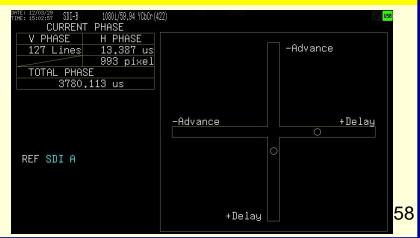
Data dump

DATE: 12/03/29 TIME: 15:02:33 SD	I-B 1080	i/59.94 YCbCr(422)		
DATA D	UMP	LINE No.	1	
		SAMPLE	Y	Cb/Cr
[EAV]		<1920>	3FF	3FF
[EAV]		<1921>	000	000
[EAV]		<1922>	000	000
[EAV]		<1923>	2D8	2D8
ĒN LI	N	<1924>	204	204
LN LI	N	<1925>	200	200
CRC CI	RC	<1926>	2BB	2F7
CRC CI	RC	<1927>	230	1E8
A)	DF	<1928>	040	000
A)	DF	<1929>	040	3FF
A)	DF	<1930>	040	3FF
D	ID	<1931>	040	2E7
D	BN	<1932>	040	134
D	B	<1933>	040	218
11	nu	/109/15	040	120

Error log

DATE: 12/03/29 TIME: 15:01:41 SDI-B 10	30i/59,94 YCbCr(422)	USB State
EVENT LOG LIST	SAMPLE No.= 105 <<	<pre>NOW LOGGING >></pre>
105+ 0010/09/0	14+E0+97 1090;/E0 (
105: 2012/03/29 104: 2012/03/29		
103: 2012/03/2		
102: 2012/03/2		
101: 2012/03/2		
100: 2012/03/2		
99: 2012/03/2	9 14:58:24 - 1080i/59.9	
98: 2012/03/2	9 14:58:22 – 1080i/59.9	34 MUTE:FF,
97: 2012/03/2		
) 14:56:50 - 1080i/59.9	
95: 2012/03/2		
94: 2012/03/2		MUTE:FF,
93: 2012/03/2		
92: 2012/03/2 91: 2012/03/2		
	9 14:56:48 - 10801/59.8	
	9 14:56:47 - 10801/59.9	

Timing comparison





Status function

ANC PACKET SUMMARY

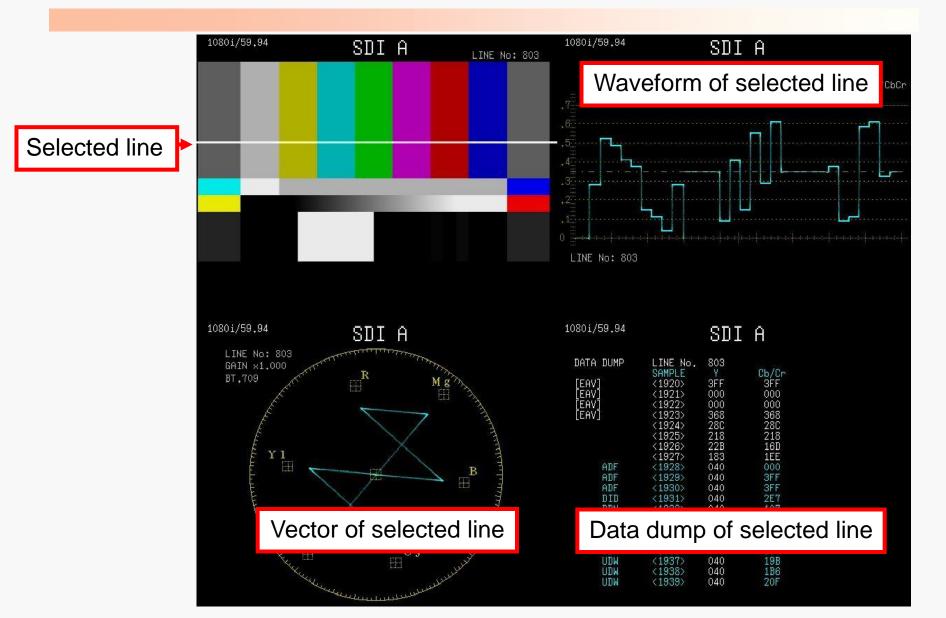
0ATE: 12/03/28 SDI-A TIME: 15:10:04 10801/59.94 YCCCr(422) ANC PACKET SUMMARY SDI=B 10801/59.94 YCbCr(422) AUDIO CONTROL PACKET DETECT EDH MISSING MISSING LTC VITC MISSING PAYLOAD ID MISSING V-ANC SMPTE EIA-708 708CC MISSING 608CC MISSING EIA-608 MISSING PROGRAM MISSING DATA BROADCAST MISSING VBI MISSING MISSING AFD V-ANC ARIB CLOSED CAPTION 1 MISSING CLOSED CAPTION 2 MISSING CLOSED CAPTION 3 MISSING NET-Q MISSING

ANC DATA VIEWER

DATE: 12/03/29 SDI-A TIME: 15:09:26 10801/59.94 YCbCr(422) ANC DATA VIEWER	10801/39.94 (CDCP(422)			<mark>ి ^{లకం}</mark> 1/5
STANDARD	DID/SDID	STATUS	LINE No.	PACKET
S291M MARK DEL	80/	MISSING		
S291M END PKT	84/	MISSING		
S291M START PKT	88/	MISSING		
ARIB B.27 CC	CF/	MISSING		
S299M ctrl G4	E0/	MISSING		
S299M ctrl G3	E1/	MISSING		1 Carl Collinguation
S299M ctrl G2	E2/	DETECT	9/F1	2/FRAME
S299M ctrl G1	E3/	DETECT	9/F1	2/FRAME
S299M aud G4	E4/	MISSING		
S299M aud G3	E5/	MISSING		
S299M aud G2	E6/	DETECT	1125/F2	1602/FRAME
S299M aud G1	E7/	DETECT	1125/F2	1602/FRAME
S272M ctrl G4	EC/	MISSING		
S272M ctrl G3	ED/	MISSING		



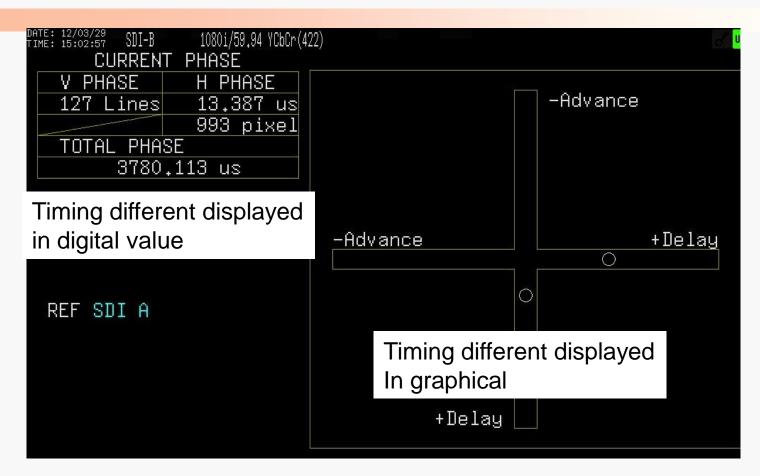
Line select





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Timing comparison

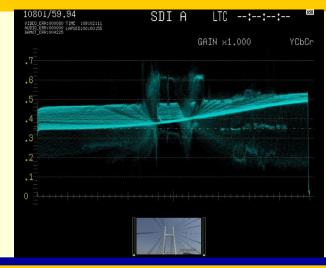


- Compares SDI signal and external sync (Black burst or Tri-level)
- Compare between 2 SDI signals (A/B inputs)



1 input display

Waveform



Picture



Vectorscope



Multi display



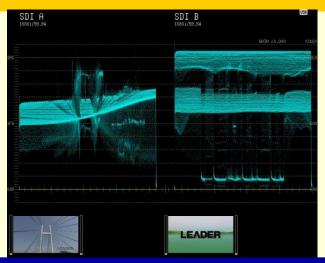
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2 inputs display

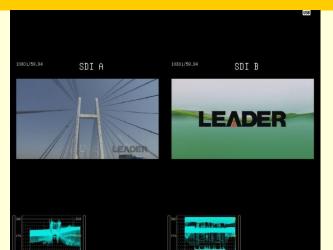
Waveform



Vectorscope



Picture



Multi display



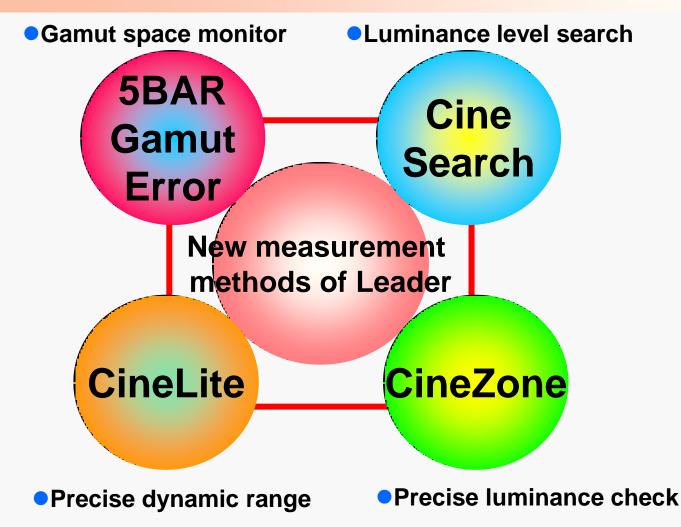


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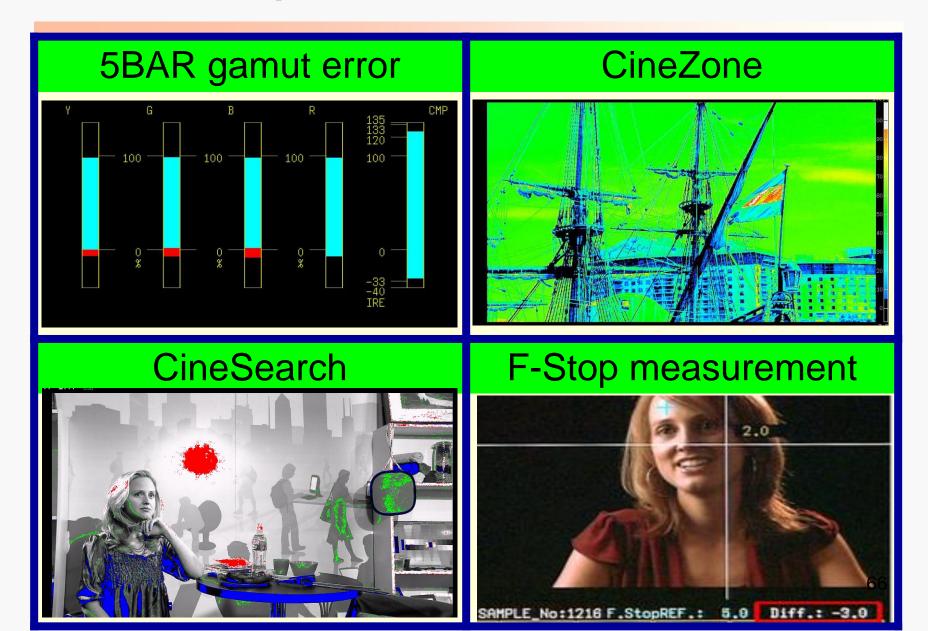
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 - USB port
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 - HTTP server (WEB server)
- Other options
- Company profile



Advanced Measurement Methods Provided By Leader



LEADER Leader unique measurement functions





Leader unique measurement functions

Luminance measurement

RGB measurement



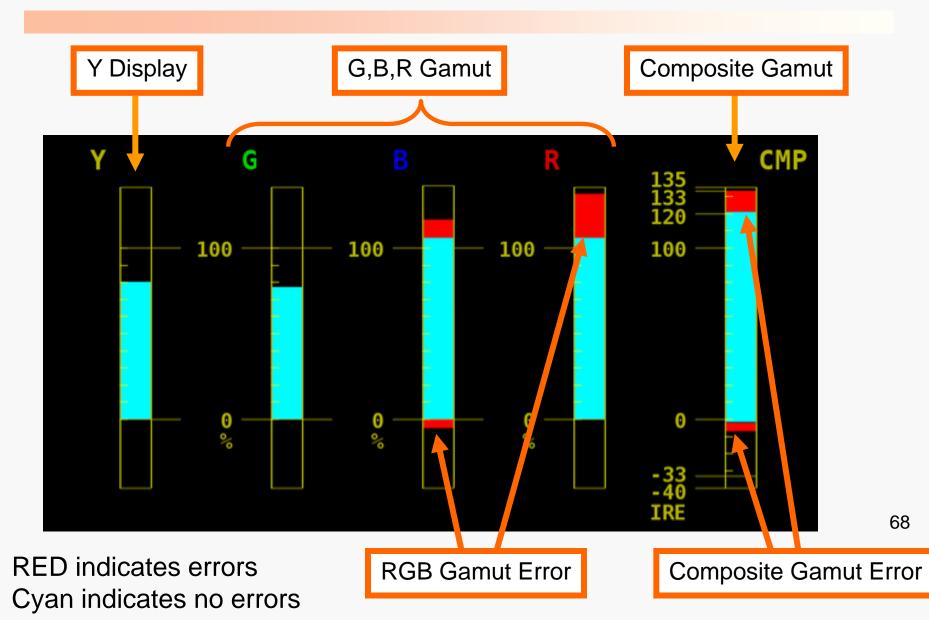


RGB 255 measurement



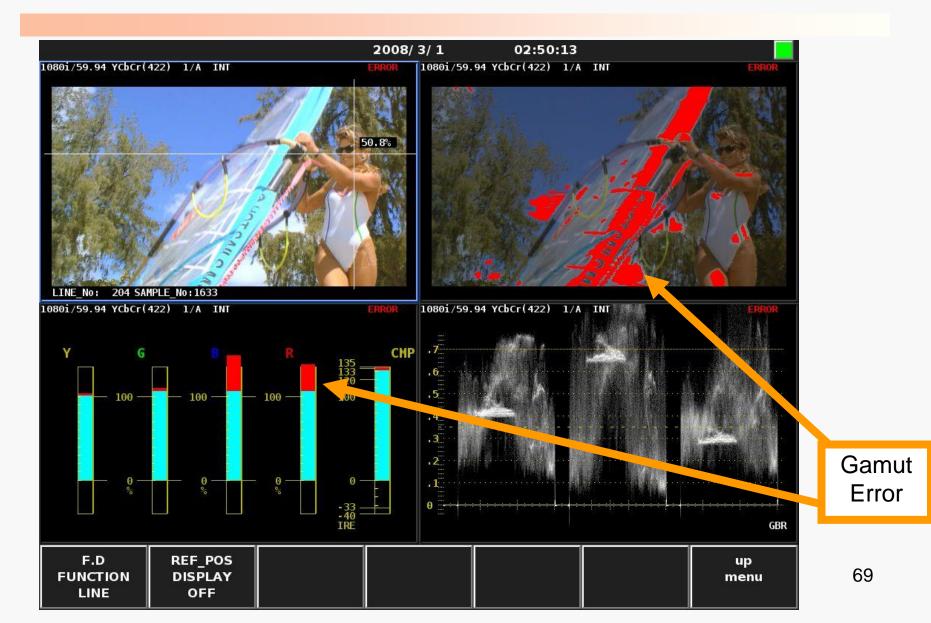


5BAR Gamut Error

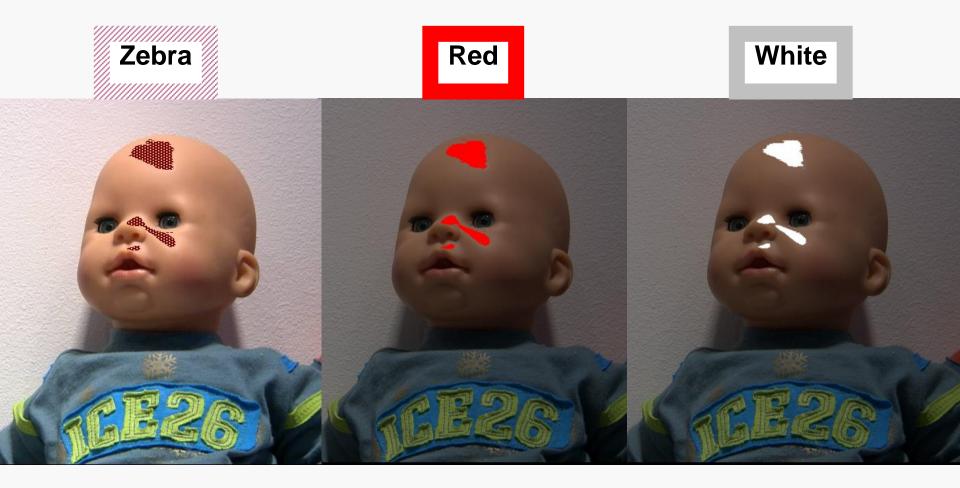


LEADER

5BAR Gamut Error (On-screen gamut error display)



LEADER 5BAR Gamut Error (Color of errors selectable)

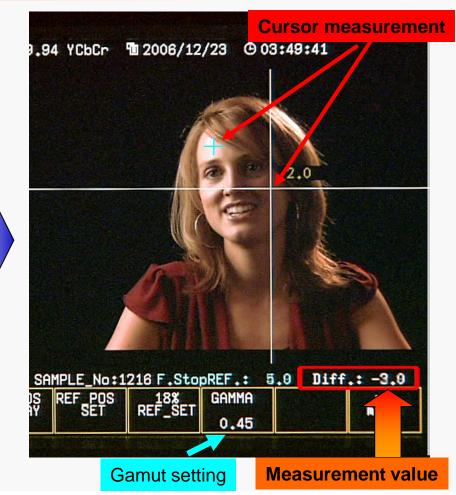


You can select



CINELITE F-STOP measurement



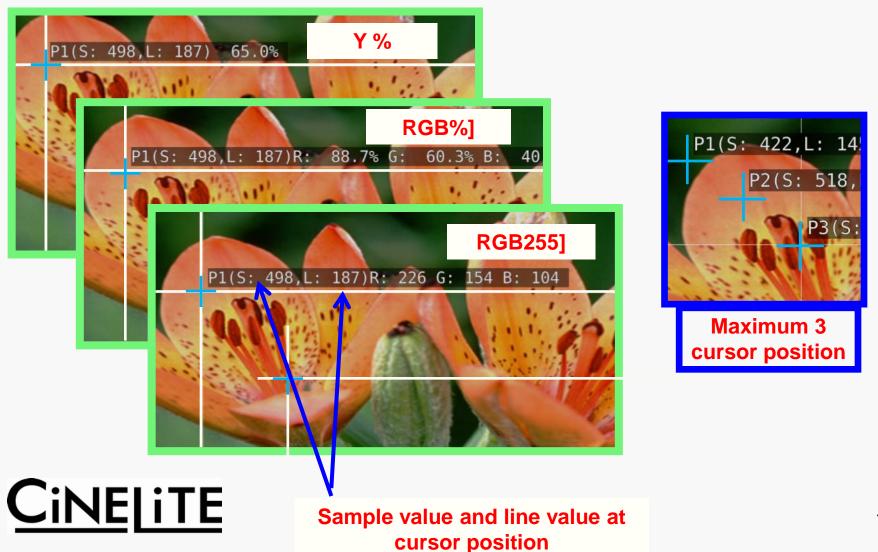


This picture is showing 3 stops Difference between the forehead and the left side of the face

Using cursors to select the area for measuring. The differential STOP value of 0.45 gamma curve will be displayed. The original gamma value is also supported.



CineLite cursor position measurement



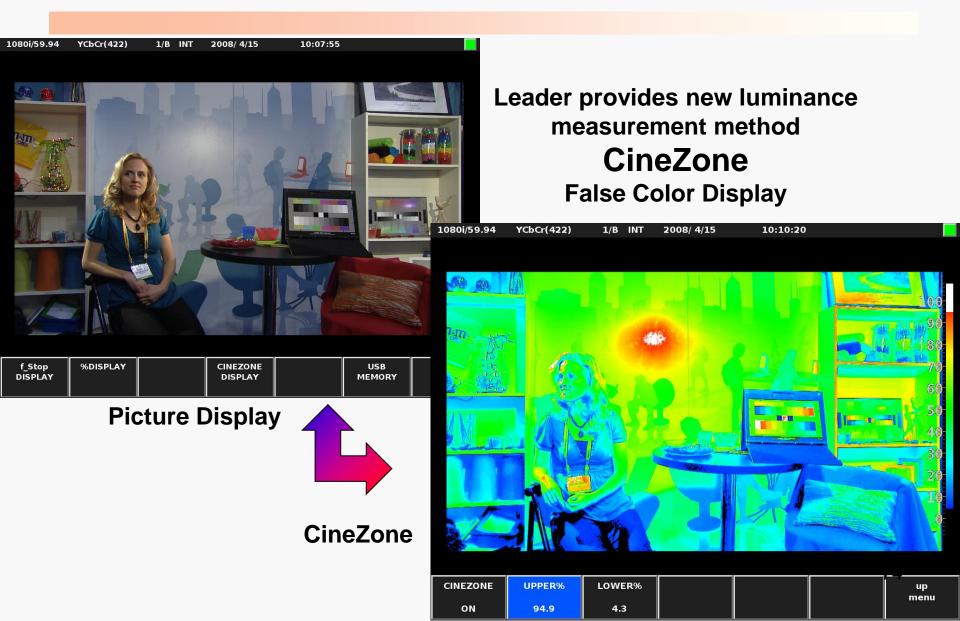


CineLite Advance





CineZone





CineZone False Color Display



Luminance signal is displayed with color. The distribution of the luminance signal within the picture can be checked easily



CineZone Luminance reference levels setting





CineZone Luminance reference levels setting

Luminance



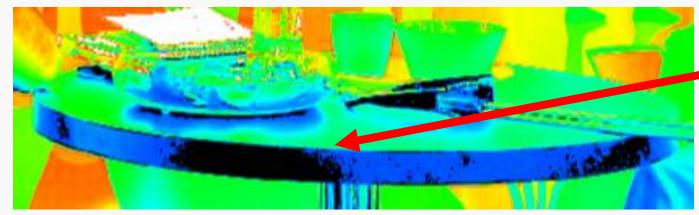


Example of CINEZONE

Picture Display



CineZone



In this picture, the surrounding edge of the table is crushed in black.

When using CineZone measurement, the difference of luminance can be seen clearly in detail even though in the black object.

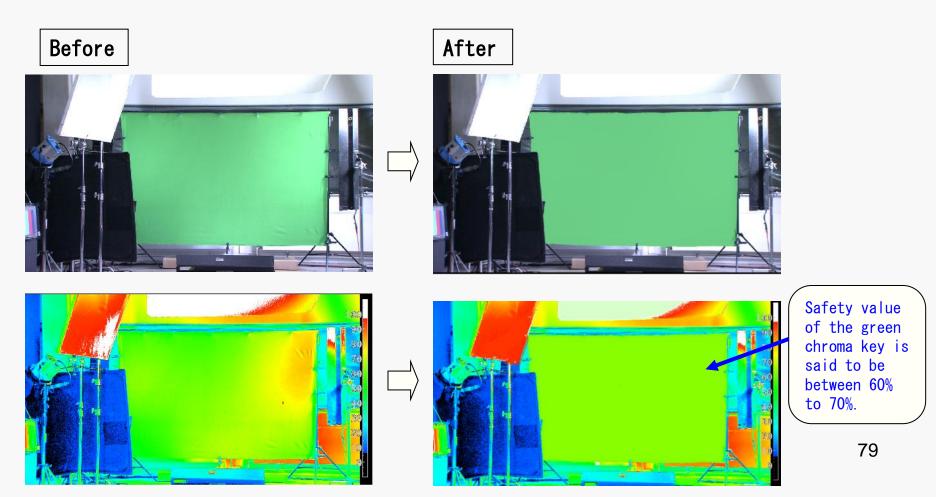
It is very useful for post production when level difference is important.

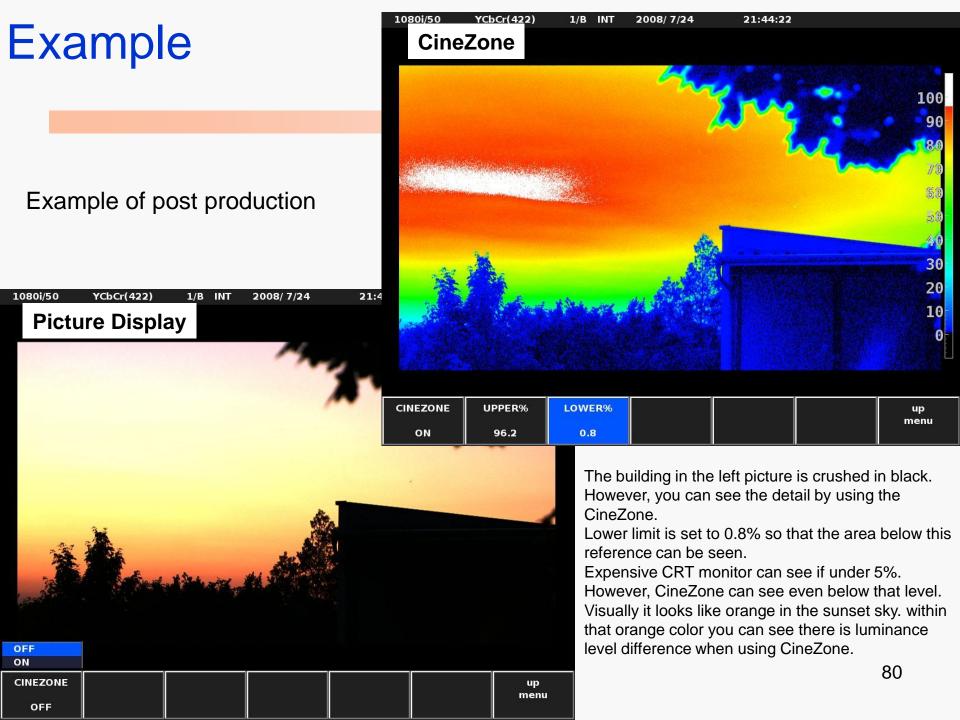


Example of CINEZONE

Chroma key should be uniform brightness of the background.

It is difficult to check the deviation of the luminance in the real image, but you can easily adjust the color unevenness in CINEZONE.

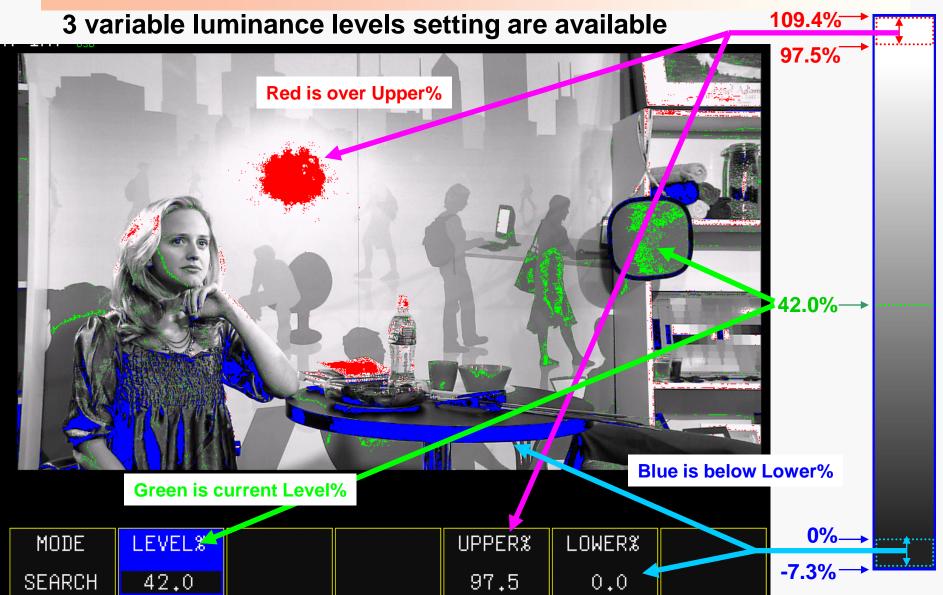




LEADER

CineSearch Luminance search function No.1

Luminance



LEADER CineSearch Example of search level with variable setting Change Search level

		 	<u> </u>					
	<image/> <image/>							F
DE	LEVEL%	DE	LEVEL%	DE	LEVEL%	DE	LEVEL%	
RCH	8.3	RCH	22.0	RCH	70.0	RCH	87.0	



Luminance measurement comparison

Mode	Performance	Good /Bad
CineZone	Specific location can be measured	++
CineLite	Cross cursor measurement is possible	+
Wave Form	Overall measurement is possible. Minimum unit is 1 line	+
Picture	Can not measure	-
Vector	Can not measure	-



Comparison chart

Function	Leader	Tektronix	Videotek	
WFM	Yes	Yes	Yes	
Vector	Yes	Yes	Yes	
Picture	Yes	Yes	Yes	
Sound	Yes	Yes	Yes	
Gamut	5Bar	Diamond	RGB Ring	
	(Easy)	Arrowhead	Composite Ring	
F-Stop	Cinelite	Can't	Can't	
%Measure				
Luminance	CineZone	Can't	Can't	
zoning				
Easy Level Adjust	CineSearch	WFM	WFM	
Multi camera	Yes	None	None	
measure				



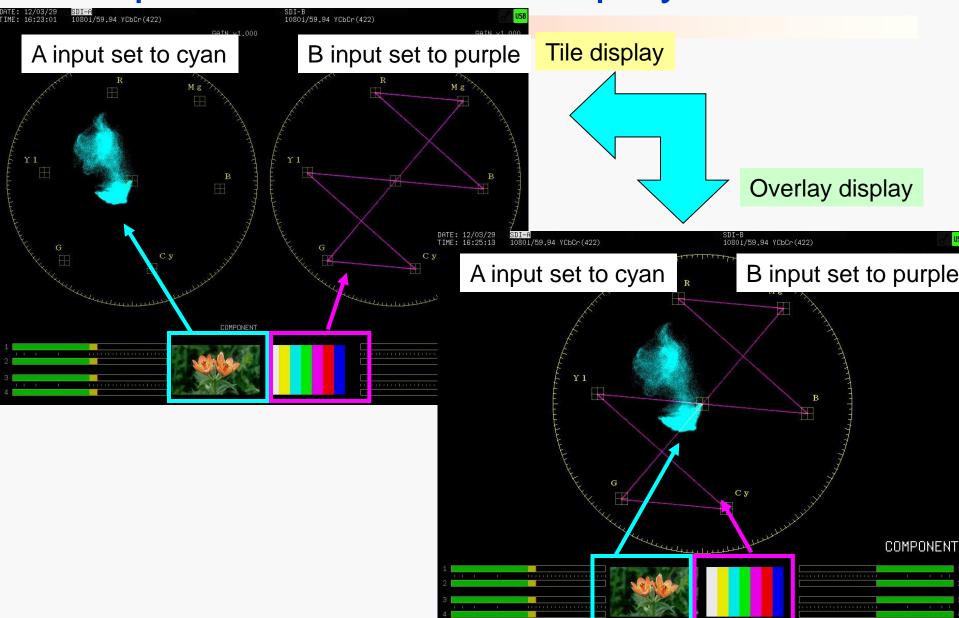
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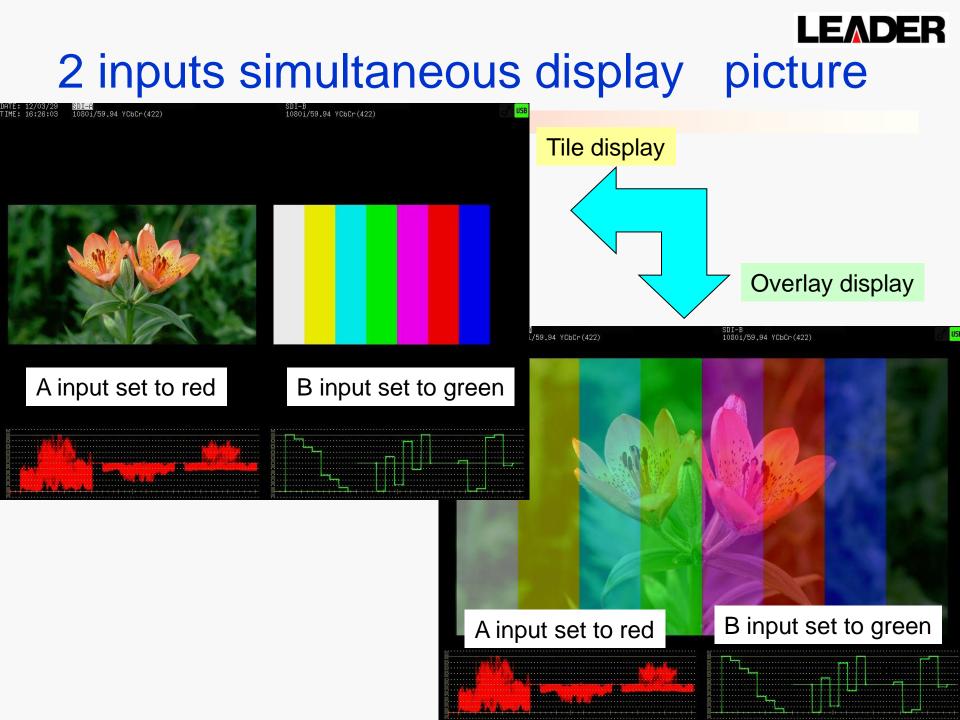
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LEADER 2 inputs simultaneous display waveform SDI-B 1080i/59.94 YCbCr(422) SDI-A 1080i/59.94 YCbCr(422) ME: 12/03/29 **Tile display** A input set to cyan B input set to purple **Overlay display** DATE: 12/03/29 TIME: 14:53:17 SDI—A 1080i/59.94 YCbCr(422) SDI-B 1080i/59.94 YCbCr(422) GΑ A input set to cyan B input set to purple 10σ 90 80 70 60 50 40 30 20 10 0

2 inputs simultaneous display vector

LEADER







USB

USB port

- **1.** Stores screen capture to bitmap file format
- 2. Load and display stored screen capture file
- **3.** A frame capture file save
- 4. Load and display stored frame capture file
- 5. TIF file capture (1920x1080)
- 6. DPX file capture
- 7. Stores and recall preset setting
- 8. Stores error log data
- 9. Stores data dump data
- **10.** Software update



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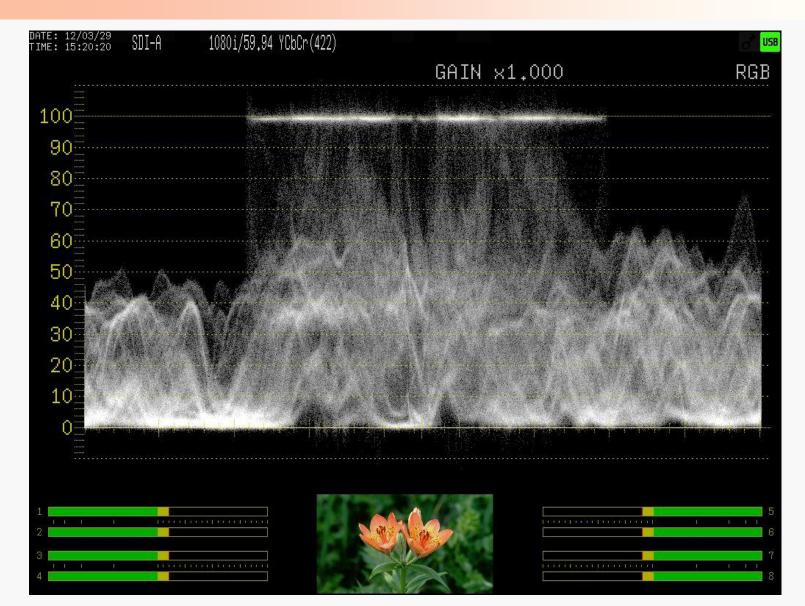
e.g. BMP file 1/2



90



e.g. BMP file 2/2



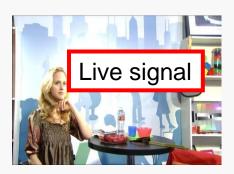
91



Capture and Load













e.g. Error log TXT file (CSV file)

2012/03/30 11:33:05 3: 2012/03/30 11:32:48,A,NO SIGNAL 4: 2012/03/30 11:32:49,-,1080i/59.94 ,...,MUTE:FF,..., 7: 2012/03/30 11:32:49,A,NO SIGNAL 8: 2012/03/30 11:32:49,-,NO SIGNAL 9: 2012/03/30 11:32:49,-,1080i/59.94 ,,,,MUTE:FF,,,, 11: 2012/03/30 11:32:49,-,1080i/59.94 ,,CRC:FF,,MUTE:FF,,,CODE:FF, 13: 2012/03/30 11:32:49,-,1080i/59.94 ,...,MUTE:FF,..., 14: 2012/03/30 11:32:49,A,NO SIGNAL 15: 2012/03/30 11:32:49,-,NO SIGNAL 16: 2012/03/30 11:32:49,-,1080i/59.94 ...,MUTE:FF,...



e.g. Data Dump

```
DATE&TIME 2005/03/02 11:54:11
MODULE 1
SDI A
REF INT
FORMAT 1080i / 60
LINE NUMBER 1
SAMPLE:DATA
ADDR: Y , Cb/Cr
0000 :040 ,200
0001 :040 ,200
0002 :040 ,200
0003 :040 ,200
2195 :040 ,200
2196 :3FF ,3FF
2197 :000 ,000
2198 :000 ,000
2199 :2AC ,2AC
```



TIF file capture





Frame Capture

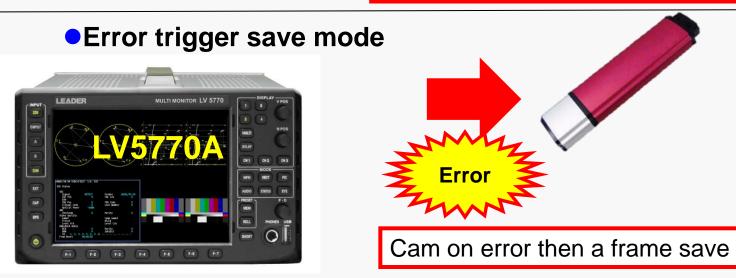
•Manual save mode



• 1 frame capture file also contains ANC data It is a data file of one frame including all.



Push capture button then a frame save



Frame capture has manual capture mode and error trigger mode

These are error trigger dome

SDI Error

- TRS Error, Line Number Error, CRC Error. EDH Error and Illegal Code Error
- Ancillary Data Error Setup
 - Parity Error and Checksum Error
- Embedded Audio Error Setup



- BCH Error, DBN Error, Parity Error and Inhibit Line Error
- Video Error

Gamut Error, Composite Gamut Error and Level Error

After capture

You can analyze Wavefrom, Vectorscope, Picture, Serial Data dump on LV5770A and Frame viewer Software on Computer



Frame Capture Viewer for Windows



LEADER

Frame Capture Viewer for Windows

📕 FrameCaptureViewer - [20080416045928.frm]										
File(E) View(V) Tools(T) Help(H)										
LINE No.	SAMPLE	< 0>	< 1>	< 2>	< 3>	< 4>	< 5>	< 60		
	Y	040	040	040	040	040	040	040		
LINE1	Cb/Cr	200	200	200	200	200	200	200		
	Y	040	040	040	040	040	040	040		
LINE2	Cb/Cr	200	200	200	200	200	200	200		
	Y	040	040	040	040	040	040	040		
LINE3	Cb/Cr	200	200	200	200	200	200	200		
	Y	040	040	040	040	040	040	040		
LINE4	Cb/Cr	200	200	200	200	200	200	200		
LINE5	Y	040	LINE No.	SAMPLE	<2195>	<2196>	<2197>	<2198>	<2199>	
	Cb/Cr	200	LINE1121	Y	040	3FF	000	000	810	
	Y	040		Cb/Cr	200	3FF	000	000	31C	
LINE6	Cb/Cr	200	LINE1122	Y	040	3FF	000	000	31C	
	Y	040		Cb/Cr	200	3FF	000	000	31C	
LINE7	Cb/Cr	200	LINE1123	Υ	040	3FF	000	000	31C	
LINE8	Y	040		Cb/Cr	200	3FF	000	000	31C	
	Cb/Cr	200	LINE1124	Y	040	3FF	000	000	3B0	
	Y	040		Cb/Cr	200	3FF	000	000	3B0	
LINE9			LINE1125	<u>Y</u>	040	3FF	000	000	3B0	
				Cb/Cr	200	3FF	000	000	3B0	



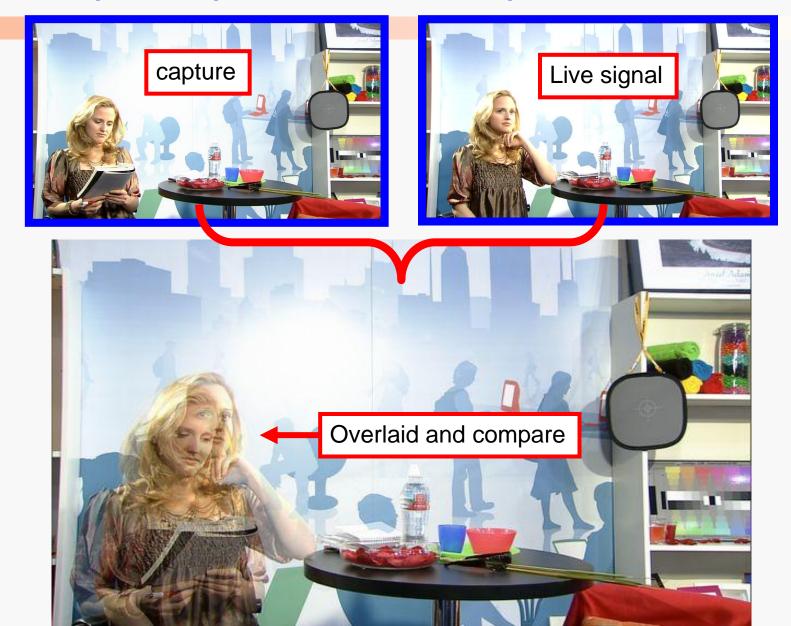
Frame Capture Viewer for Windows

Error search	FrameCapture Viewer -[LV5490TestData.frm]								
- Direction	File(F) View(V) Tools(T) Help(H)								
O Up Search(S)	i 🖆 ≣ ≣ 📑 📑 📑 👫 🖉 🕏 😵								
Own Close	LINE No.	SAMPLE	< 1622 >	< 1623 >	< 1624 >	< 1625 >	< 16		
Result	LINE3	Y	040	040	040	040	04		
Result	LINES	Cb/Cr	200		_		20		
Line : Line6	LINE4	Y	040	Erro	[•] point	40	04		
Sample + 1632	LINE4	Cb/Cr	200			00	20		
Sample : 1622	LINE5	Y	040	0	040	040	04		
	LINES	Cb/Cr	200	200	200	200	20		
	LINE6	Y	000	040	040	040	04		
		Cb/Cr	200	200	200	200	20		
	LINE7	Y	040	040	040	040	04		
Error search		Cb/Cr	200	200	200	200	20		
	LINE8	Y	040	040	040	040	04		
		Cb/Cr	200	200	200	200	20		
	LINE9	Y	040	040	040	040	04		
	LINES	Ch/Cr	200	200	200	200	20		



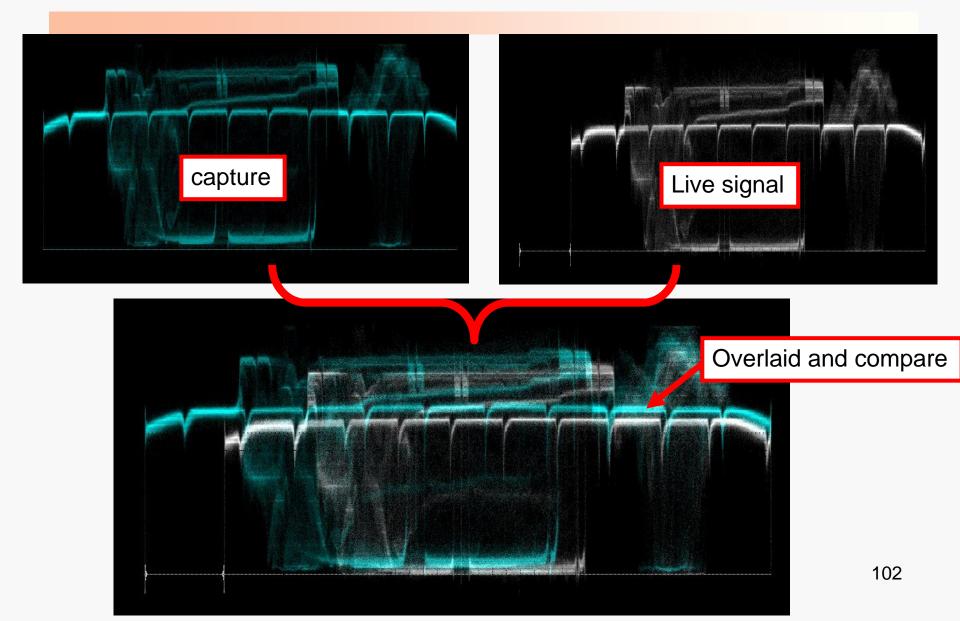
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Compares pictures with capture function

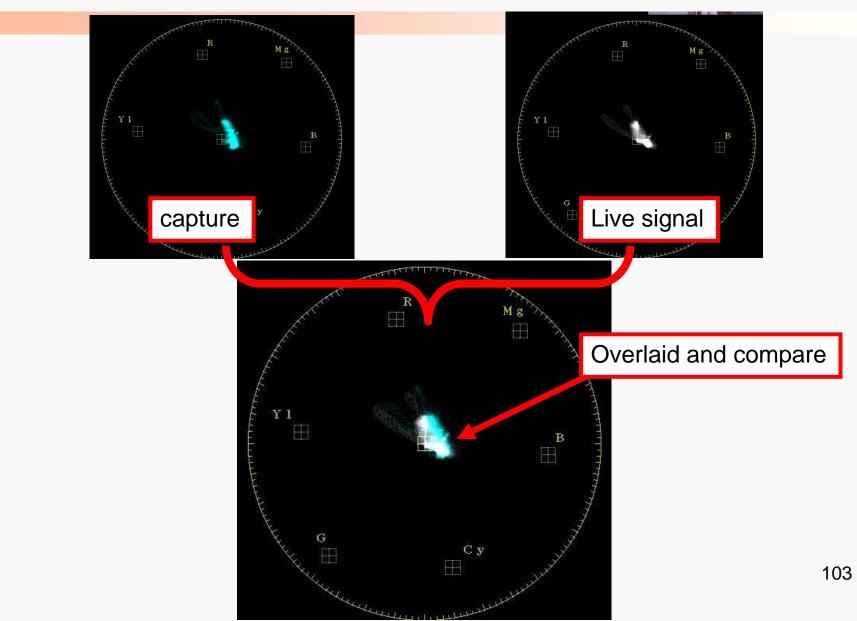




Compares waveforms with capture function



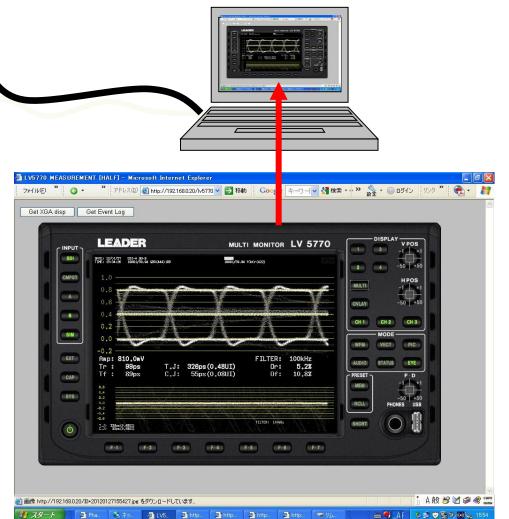
LEADER Compare vectors with capture function



HTTP server (WEB server)(1)



- LV5770A and PC connection via Ethernet
- Using IE or firefox internet browser, no special software is required
- Remotely control the unit by click on the panel button of the displayed image
- The screen will be refreshed approximately every 5 to 10 seconds automatically



HTTP server (WEB server) (1)

Get XGA disp Get Event Log	 Captures the screen in BMP file with XGA (1024X768 dot) resolution Get the error log in text format
LV5770 MEASUREMENT [HALF] - Microsoft Internet Explorer ファイル(E) * ③ ・ * アドレスの 創 http://192169-corW5770 • 予移動 Google キーワー ・ 3 検索 Get XGA disp Get Event Log	 ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >> ・・ >>
NPUT 1 1	$ \begin{array}{c} \textbf{D} \textbf{I} \textbf{SPLAY} & \textbf{V} \textbf{POS} \\ \textbf{1} & \textbf{2} & \textbf{1} \textbf{4} \textbf{5} \textbf{5} \textbf{1} \\ \textbf{3} & \textbf{4} & \textbf{-50} \textbf{+50} \\ \textbf{H} \textbf{DS} \textbf{1} & \textbf{1} \textbf{1} \textbf{1} \textbf{1} \textbf{1} \textbf{1} \\ \textbf{50} \textbf{1} \textbf{50} \textbf{+50} \\ \textbf{CH1} & \textbf{CH2} & \textbf{CH3} \end{array} $
画像 http://192.168.0.20/ID+20120127155427.jpg をダウンロードしています	



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Other options

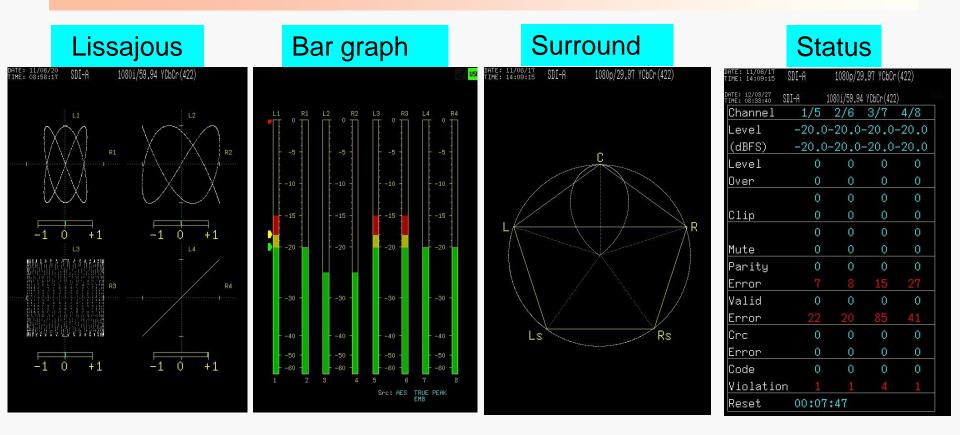
LV5770SER41 Digital audio 8ch

LV5770SER42 Analog audio

- LV5770SER43 Digital audio 16ch
- LV5770SER09A EYE pattern
- LV5770SER03A Tri sync/ Composite

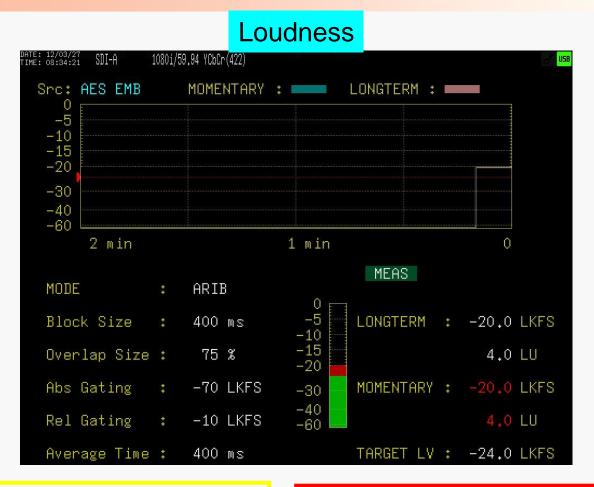


LV5770SER41/42/43 Audio





LV5770SER41 Audio



Current model LV5770SER41 Loudness with out Level meter

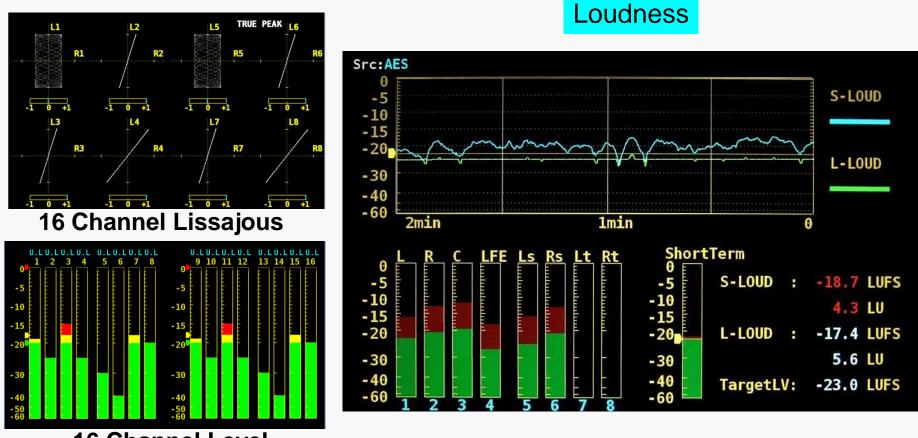
Loudness measurement value

Long term

Momentary or Short term



LV5770SER43 Audio



16 Channel Level

LV5770SER43

Loudness with Level meter

Loudness measurement value

Long term

Momentary or Short term



Audio Dolby E Option

Dolby-E Metadata

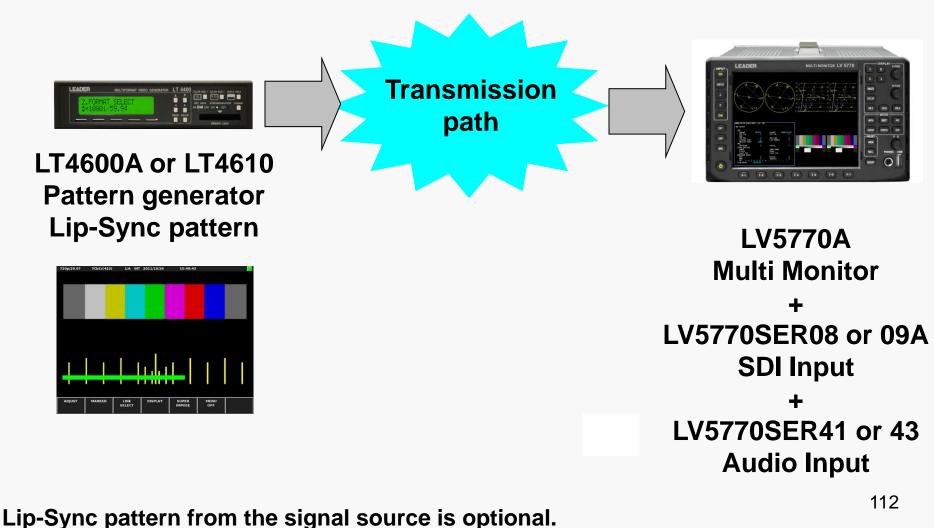
DATE: 11/10/19 TIME: 17:02:20 SDI-A 1080 Dolby E Common Me Prog Desc Text	i/59.94 YCbCr(422) etadata Status		JSB
Bitstrm Format	DE 20bit	SMPTE Timecode	01:00:00:01
Prog Config	8×1	Framerate	25fps
AC-3 Metadata Sta	atus		
Datarate	Not Specified	Lowpass Filter	off
Bitstrm Mode	Main Complete	LFE Filter	off
Coding Mode	1/0	Srnd Phase Shift	off
		Srnd Attenuator	off
Center Mix Lvl	-3.0dB	RF Ov Protect	off
Srnd Mix Lvl	-3.0dB		
Dolby Srnd Mode	not indicate	Dialnorm Lvl	-27dB
LFE Channel	off		
Mix Lvl	not exist		
Room Type	not exist		
Copyright Bit	Not Protected		
Orig Bitstrm	Original		
DC Filter	off	Sno: DE TRUE	PEAK AES

Frame location

DATE: 11/10/19 TIME: 17:02:02 SDI-	·A 101	80i/59.94 '	/CbCr(422)	
Channel D1/D5D2/D6D3/D7D4/D8				
Level	-20.0-	20.0-	20.0-	20.0
(dBFS)	-20.0-	20.0-	20.0-	20.0
Level	0	0	0	0
Over	0	0	0	0
	0	0	0	0
Clip	0	0	0	0
	0	0	0	0
Mute	0	0	0	0
Dolby CRC	Error	0		
Frame Location H: V:				
mode:				
	ch		1	2
Parity Error			0	0
Validity Error			0	0
CRC Error			0	0
Code Violation			0	0
Reset 00:00:07				



Lip-Sync [AV Delay] for LV5770A is standard



The latest software version of the LV5770A supports Lip-Sync function as standard.



Lip-Sync [AV Delay] measurement

Two types of Lip-Sync [AV Delay] measurement

720p/29.97	YCbCr(422)	1/A INT	2011/10/26	15:49:43		
4			ı.lı.ı	μI		
ADJUST	MARKER	LINE SELECT	DISPLAY	SUPER IMPOSE	MENU OFF	

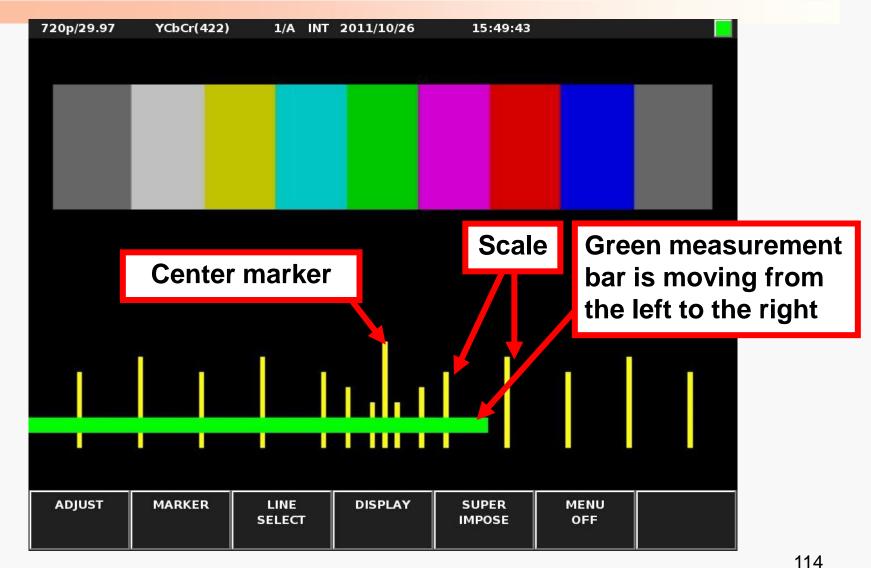
Measures with display and audio

DATE: 12/03/27 TIME: 08:37:12 SDI-	1080	i/59.94 YCbCr(422)	LTC:::	USB
REF: SDI A		AUD: SD	IA	
CH [ms] [f	FRM]	-50	0 [ms]	50
<mark>1</mark> 1508 (45)			
2 1508 (45)			
<mark>3</mark> 1508 (45)			
4 1508 (45)			
<mark>5</mark> 1511 (45)			
6 1511 (45)			
7 1511 (45)			
8 1511 (45)			
		AUD.ADVANCE	[VIDEO REF] AL	JD.DELAY

Measures with measurement value



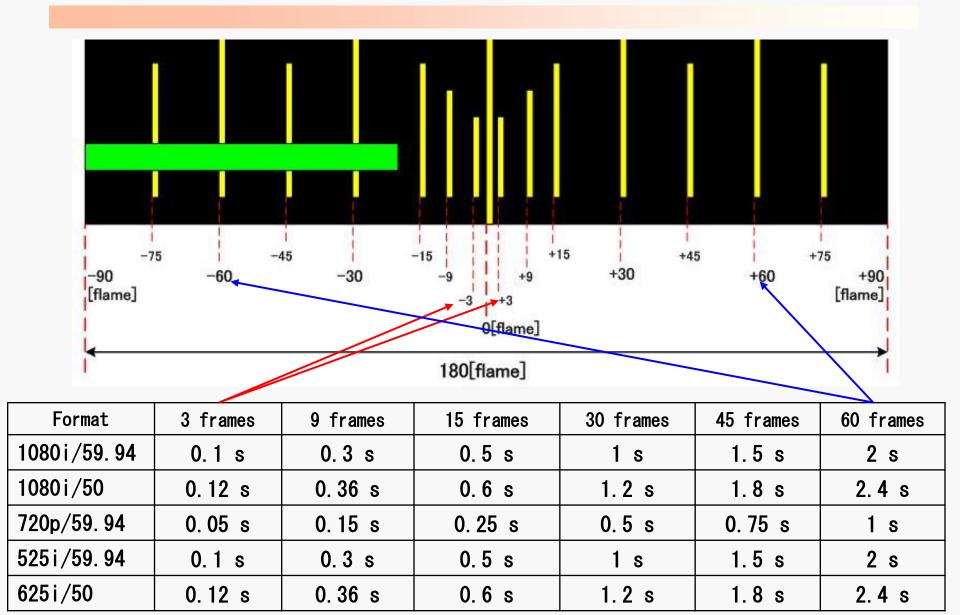
Measures with display and audio



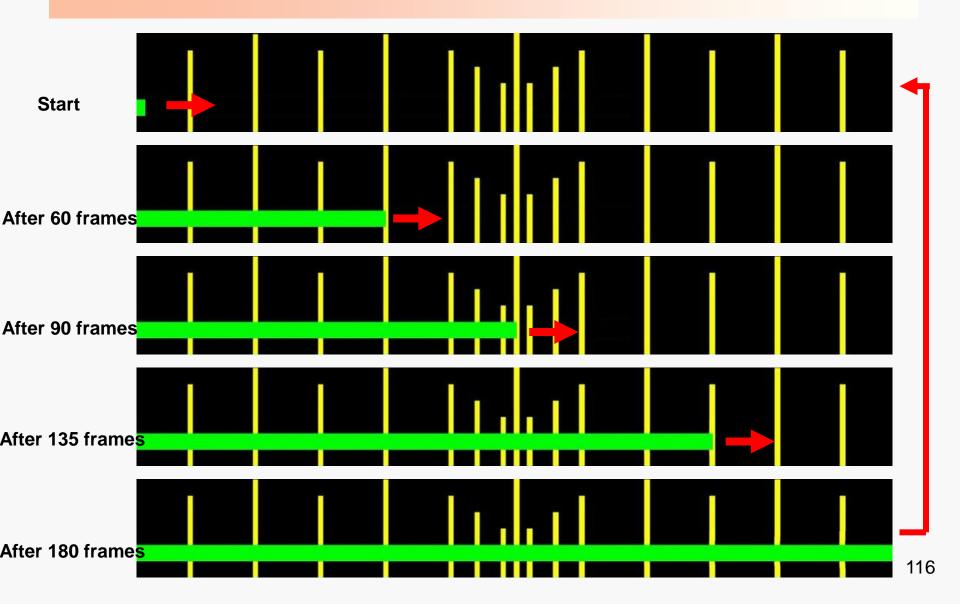
Lip-Sync measurement screen in picture mode



Lip-Sync pattern marker



Measurement bar movement in display **LEADER** and audio measurement





Measures with measurement value

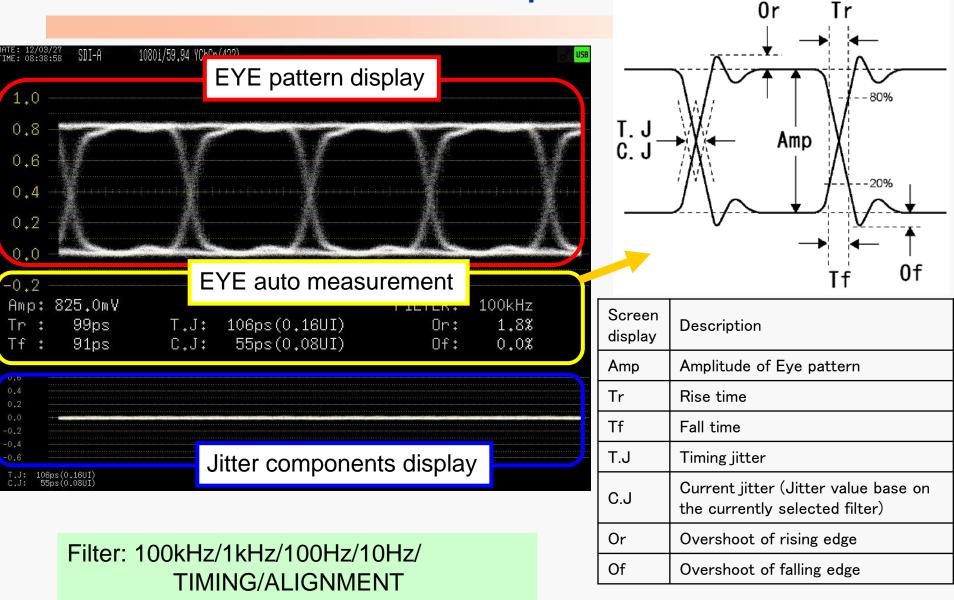
Embedded audio channel



Lip-Sync auto measurement screen, 8ch audio simultaneous measurement is possible

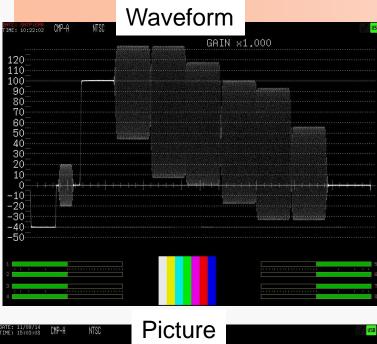


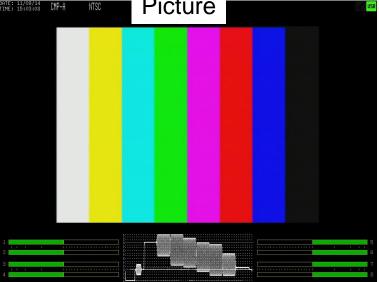
LV5770SER09A EYE pattern



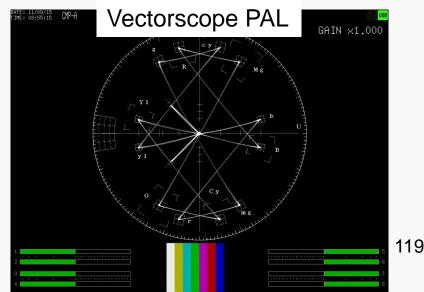
LEADER

LV5770SER03A Tri sync/ Composite

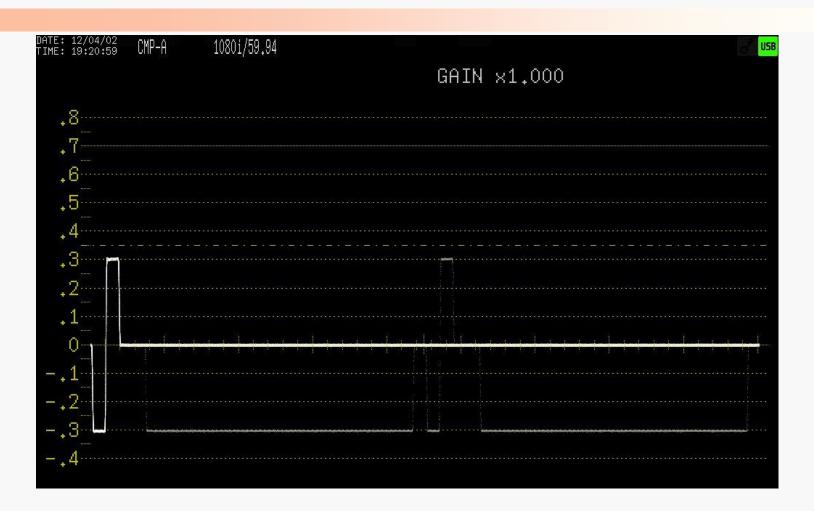








LV5770SER03A Tri sync/ Composite



Tri-level sync signal display



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Corporate Profile

- Company name
 - LEADER ELECTRONICS CORP.
- Headquarters
 - 2-6-33 Tsunashima-Higashi,Kohoku-ku, Yokohama 223-8505, Japan
 - Phone: 81-45-541-2123 Fax: 81-45-541-2823
- Initiation
 - 1954 May (have been in business for 64 years)
- Business
 - Manufacture and sales of electronic measuring instruments
- Capital
 - 1,163 million JPY (10.4 million US\$ 1US\$=112 JPY)
- Number of employees
 - Total : 66
- Annual sales
 - 2,000 million JPY: 18 million US\$ (term ending March, 2015)
 - 2,000 million JPY: 18 million US\$ (term ending March, 2016)
 - 1,900 million JPY: 17 million Euro (term ending March, 2017)
- Stock offering
 - Nov. 1991
- Overseas Subsidiaries
 - U.S.A.LEADER INSTRUMENTS CORP.
 - Leader Beijing
 - Leader Korea
 - Leader Europe
- Regional Offices
 - LEADER ELECTRONICS CORP. SHANGHAI OFFICE
- Service Center
 - LEADER BEIJING TECHNICAL SERVICE CENTER







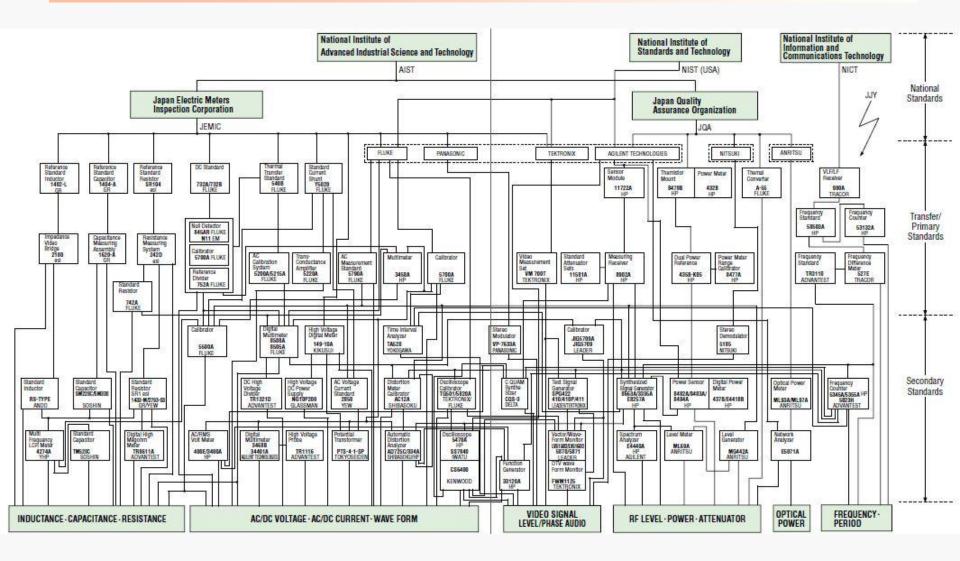
Master calibrator in standard room



Voltage standards

1000

LEADER Traceability of national standard



HISTORY OF LEADER ELECTRONICS HD-SDI WFM THE WORLD'S FIRST LV5150D ~ THE NEWEST MODEL LV5330

1996 LV5150D

• The world's first HD-SDI waveform monitor Used for production of digital HD program of Nagano Winter Olympic in 1998. Development started upon the request from NHK, etc. The only WFM exist for a year without competition.

1999 LV5152DA

• The world's first HD-SDI/analog multi format WFM It was the worldwide de facto standard at that time.

2001 LV5170D

 The world's first 2CRT HD-SDI VECTOR / WFM Correspond to increased exclusive use of LV5152DA for Vector/WFM

2002 LV5700

 The world's first built-in XGA LCD, 5 major features (+1 more optional feature) Rasterizer WFM, VECTOR, PIC.MONITOR, DATA STATUS, SOUND IMAGE DISPLAY

2003 LV5700

• The world's first DUAL LINK A-LINK display. Dual-Link compliance WFM development requested for production of "Star Wars"

2004 LV5700A

Improved LV5700 to keep up with user's needs

2004 LV5700A

 Developing specifications for the Athens Olympic Satisfied all needs of the Athens Olympic Association, it became main WFM for the Athens Olympic.

2004 LV5750

• The world's first portable WFM with 4-screen multi display The depth is 1/4 of LV5700,

2005 LV7700

• External display unit is released

2007 LV5800

- The world's first Flexible module concept is released 2008 LV5380
- High resolution 8inch monitor is released 2008 LV5330
- The world's first Ultra compact 6inch monitor is released















ACHIEVEMENTS OF LEADER ELECTRONICS HD-SDI WFM in Japan

Broadcasting Stations

- Ever since the development of the world's first HD-SDI monitor LV5770, our products are highly evaluated and trusted.
- Introduce to digital broadcasting stations where using HD-SDI including NHK.
- Reconstruct broadcasting stations to support digital broadcasting, and many LV5700 are used.
 - A lot of broadcasting stations used to Leader ELECTRONICS HD-SDI WFM.
 - NHK Tokyo, Nagoya, broadcasting stations in Osaka, Asahi Broadcasting stations
- It is used by the studio in the Antarctic Continent, where repairing and exchanging is very difficult. This is a proof of acquiring the reliability.
- POST PRODUCTION, PRODUCTION
 - Adoption of HDTV telecine, digital cinema increased.
 - HDTV program production is increasing rapidly.



ACHIEVEMENTS OF LEADER ELECTRONICS HD-SDI WFM in Europe

Broadcasting

- BBC research & Scotland
- ZDF Germany
- BR Germany
- RAI Italy
- ORF Austria
- RTBF Belgium
- Antenne 3 France
- Fountain studio London

Hardware manufacturing

- Thomson Grass Valley Camera's
- Axon converters
- OB Vans
 - HD30.com, Wige, Outside Broadcast



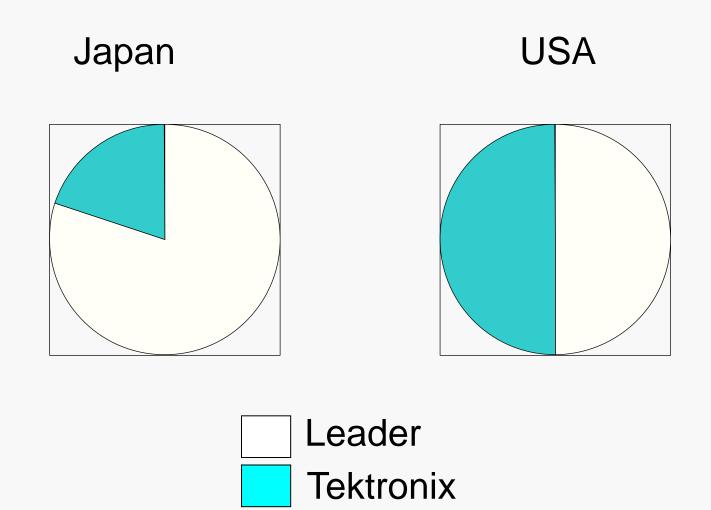
ACHIEVEMENTS OF LEADER ELECTRONICS HD-SDI WFM-1

Used by major event organizer

- 1998 LV5150D Nagano Winter Olympic
- 2002 LV5700 NHK Antarctic High Vision Studio
- 2002 LV5700 Soccer / World cup (Japan)
- 2004 LV5700A Athens Olympic (60units)
- 2006 LV5700A Turin Olympic(40units)
- 2008 LV5800 Beijing Olympic(80units)
- 2010 LV5800 Vancouver Olympic(40Units)
- 2012 LV5770 London Olympic(65Units)
- 2014 LV5770 Sochi Olympic(45Units)
- 2016 LV5770A,LV5490 Brazil Olympic(66Units)
- 2018 LV5770A,LV5490 Pyeong Olympic(46Units)



Market share to Tektronix





Market share to Tektronix

• Why Leader Strongly?

Products are very stable

- Very simple use. We have only maximum 3layer menu.
- We listen customers request. Always try customer side.



End Thank you very much

Leader Electronics Corp.