



OPTION 70: NTSC input  
**PATENTED:** Equivalent cable length measurement

The cabinet is sold separately.

## HD Digital Waveform Monitor

The LV 5152DA HD Digital Waveform Monitor is designed to display 720p, 1080i and 1035i-line formats of serial digital and component analog signal inputs. The instrument features two serial digital input systems and one analog component signal input system: in addition the waveform monitoring, vectorscope, timing with bowtie, and audio signal display functions are provided. Digital input signals can be analyzed for transmission error monitoring, equivalent cable length measurement and digital video data dump functions are provided.

Option 70: Waveform monitor for NTSC component and composite signals is a factory option. (No composite vector display)

### FEATURES

- **Two Serial Digital Input Systems And One Output System**  
 Serial digital signal input systems conform to SMPTE 292M, and BTA S-004B standards; active SDI output system to resend the selected SDI input.
- **Analog Signal Input System (Y, P<sub>B</sub>, P<sub>R</sub> or GBR)**  
 The analog input system enables the monitoring and then the comparison of the analog to digital signals in waveform, vector and picture modes. Full bandwidth Y, P<sub>B</sub>, P<sub>R</sub> may be transcoded and output as GBR.
- **Digital Data Dump (LV 5152DA only)**  
 Since parallel digital video data can be displayed in hexadecimal format, the trigger on error is convenient to troubleshoot with.
- **Equivalent Cable Length Measurement**  
 Indicates the serial digital signal level applied to the input connector as the coaxial cable length instead of the actual level.
- **Digital Audio Output Conforms To SMPTE 276M**  
 Digital audio signals are separated from the serial digital signal and output as four AES/EBU pairs.
- **Digital Input Error Monitoring**  
 Error logger and contents display functions for HD-SDI are provided.
- **Gamut Error Monitoring**  
 Monitors incorrect level of signals converted from Y, P<sub>B</sub>, P<sub>R</sub> into GBR format.
- **Vectorscope (SMPTE 240M, 274M)**  
 Displays color difference signals in vector format. The HD-SDI signal is decoded to analog GBR, converted into color difference signals with a matrix and displayed in vector format.
- **Picture Monitor Output**  
 SDI signals go through a D/A converter to a component analog signal, which is then output to the picture monitor. Y, P<sub>B</sub>, P<sub>R</sub> or G, B, R formats can be selected to match monitor input requirements. Component analog signals can be monitored and output as Y, P<sub>B</sub>, P<sub>R</sub> or transcoded to GBR.
- **Conversion Matrix, Y, P<sub>B</sub>, P<sub>R</sub> Into GBR (SMPTE 240M, 274M)**  
 Selectable waveform format of Y, P<sub>B</sub>, P<sub>R</sub> to GBR simplifies signal level monitoring. Additionally, GBR parade order is selectable as RGB.
- **Full-line Selector Mode**  
 Enables the selection and display of video lines from field 1 or 2 or both fields. Since up to 15 lines can be displayed, the waveform is refreshed and displayed with sufficient intensity.
- **Measurements Using Cursors**  
 Level, time and frequency measurements are accomplished with 0.5% accuracy.
- **Lissajous Display For Stereo Audio Signal**  
 Analog stereo audio signals can be displayed in standard X-Y lissajous format.
- **Preset Memory Function**  
 Stores/recalls up to 10 panel settings to reduce setup time by presetting frequently used measurement conditions.
- **Timing Display**  
 The timing display mode can monitor time and amplitude differences between channels in analog and digital modes.

LV 5152DA / 5150DA SPECIFICATIONS

<b>Standards</b> Digital/Analog - Video Format	<b>Video System</b>		<b>Standards</b>	
	1	1920 x 1035 / 60i	BTA S-001B, 002B	
	2	1920 x 1035 / 59.94i	SMPTE 240M, 260M	
	3	1920 x 1080 / 60i, 30sF	SMPTE 274M	
	4	1920 x 1080 / 59.94i, 29.97sF		
	5	1920 x 1080 / 50i, 25sF		
	6	1920 x 1080 / 30p		
	7	1920 x 1080 / 29.97p		
	8	1920 x 1080 / 25p		
	9	1920 x 1080 / 24p		
	10	1920 x 1080 / 23.98p		
	11	1920 x 1080 / 24sF		
	12	1920 x 1080 / 23.98sF		
	13	1280 x 720 / 60p		SMPTE 296M
	14	1280 x 720 / 59.94p		(Not available for LV 5150DA)
15	* NTSC (ANALOG ONLY)	SMPTE 170M, 253M		
* OPTION70				
<b>Serial Digital Format</b> <b>Ancillary Data Format</b> <b>Embedded Audio Format</b>	BTA S-004B, SMPTE 292M BTA S-005B, SMPTE 291M BTA S-006B, SMPTE 299M			
<b>Input</b> <b>Serial Digital Input</b> <b>Input Connector</b> <b>Return Loss</b>	75 Ω BNC, 2-system ≥15 dB, 5 MHz to 742.5 MHz ≥10 dB, 742.5 MHz to 1.485 GHz 75 Ω, terminated			
<b>Impedance</b> <b>Analog Input</b> <b>Input Channel</b>	CH1 (Y/ G), CH2 (Pa/ B), CH3 (P <sub>B</sub> / R), passive loop-through, 1-system			
<b>Return Loss</b> <b>Impedance</b> <b>Analog EXT REF Input</b> <b>Input Channel</b> <b>Return Loss</b> <b>Impedance</b>	EXT REF, passive loop-through, 1-system ≥30 dB, 50 kHz to 30 MHz (both power on/ off) 75 Ω passive loop-through			
<b>Sync (Analog)</b> <b>Sync Amplitude</b>	0.3 Vp-p ±6 dB			
<b>Output</b> <b>Serial Digital Active Output</b> <b>Output Signal</b> <b>Output Level</b> <b>Analog Picture Monitor Output</b>	Outputs the selected SDI input signal 800 mVp-p ±10%			
<b>Amplitude</b> <b>Frequency Response</b> <b>Output Connector</b> <b>Digital Output</b> <b>Output Signal</b>	Y, Pa, P <sub>B</sub> or GBR (Digital input, selectable) 1 V ±5% 25 Hz to 30 MHz, within ±5% BNC, 3-connectors, 1-system			
<b>Output Impedance</b> <b>Output Connector</b> <b>Amplitude</b> <b>Sampling Frequency</b> <b>Quantization Accuracy</b>	CH1/ 2, CH3/ 4, CH5/ 6, CH7/ 8, AES/EBU Format The relative phase of the output signal of the sound group 1 (CH 1 to 4) and the sound group 2 (CH 5 to 8) has not been guaranteed. Within the same sound group the phase are matched. 75 Ω 4 BNC 1.0 V ±10% 48 kHz 16, 18, 20, 24 bits			
<b>Vertical Axis</b> <b>Deflection Sensitivity</b>	Within ±1%, GAIN x1 Within ±3%, GAIN x5			
<b>Frequency Response (GAIN x1, Analog)</b> <b>FLAT</b> <b>LOWPASS</b> <b>Attenuation</b> <b>DIF'D STEP</b> <b>Attenuation</b>	Within ±1%, 25 Hz to 30 MHz (15 to 35°C / 50 kHz ref.) ≥20 dB, at 20 MHz (50 kHz ref.) ≥20 dB, at 30 kHz (1.6 MHz ref.) ≥20 dB, at 7 MHz (1.6 MHz ref.)			
<b>DC Restorer</b> <b>Frequency Response</b> <b>Slow Mode</b> <b>Fast Mode</b> <b>Clamp</b> <b>Point</b> <b>Variable Range</b> <b>Blanking Level Shift</b>	≥20%, attenuation at 60 Hz input ≥80%, attenuation at 60 Hz input Back porch 0.5 to 2 μs, relative to sync pulse rising edge ≤1% (10 to 90% of APL Variation)			
<b>Horizontal Axis</b> <b>Operation Mode</b> <b>Overlay</b> <b>Parade</b> <b>Parade</b> <b>Timing</b>	Displays waveforms overlaid Displays waveforms side-by-side For bowtie signal* measurement * Authorized by Tektronix, Inc.			
<b>Display Method</b> <b>Line</b> <b>Line Magnified</b> <b>Field</b> <b>Field Magnified</b> <b>Time Base Accuracy</b> <b>Linearity</b>	1H, 2H, 3H 1H MAG, 2H MAG, 3H MAG 1V, 2V, 3V 1V MAG, 2V MAG, 3V MAG Within ±3% (0.1 s/ div) Within ±3%			
<b>Vector Mode</b> <b>Amplitude Accuracy</b> <b>Sync Blanking</b>	±2% (Y, Pa, P <sub>B</sub> input), ±2% (G, B, R input) Blanks sync dot			
<b>Picture Mode</b>	Displays picture using Y or G signal			
<b>Audio Mode</b> <b>Calibration Accuracy</b> <b>Full Scale</b>	±0.5 dB of full scale 0, 2, 4 dBm (menu selectable)			

<b>Bandwidth</b> <b>X-Y Phase Accuracy</b>	20 kHz within -3 dB Within 1°C at 20 kHz
<b>Calibration Signal</b>	1 V ±0.5%
<b>Digital Function</b> <b>Error Display</b> <b>Data Dump Function</b> (only LV 5152DA) <b>Equivalent Cable Length Meter Function</b>	LED on the front panel, Menu shows detail Displays 10 bits digital data in hexadecimal notation after parallel conversion is made. Compares serial digital signal level with reference signal (800 mVp-p) and displays level as the cable length. ±20 m
<b>Display Accuracy</b>	±20 m
<b>Gamut Error Display</b> <b>Error Detection Range</b> <b>Detector Setting Accuracy</b>	LED on the front panel. Menu shows detail Exceeding - 35 mV and 735 mV 5 mV
<b>Line Selector</b> <b>Operation Field</b> <b>Selectable Line</b>	Intensifies a selected line FLD1, FLD2, ALL (at Interlace) Line 1 to 750 (except LV 5150DA), 1 to 1125 Line 1 to 525 (Option70)
<b>Line Window</b> <b>Window Range</b>	Intensifies selected line and displays multiple lines 1 to 15 lines
<b>Preset Function</b> <b>Preset/ Recall</b> <b>Controls</b>	Up to 10 front panel controls All front panel controls (except INTEN, READOUT INTEN, ROTATION, FOCUS, ILLUM, POWER)
<b>Remote Control</b> <b>Control Signal</b> <b>Control Input</b>	TTL (low active) D-sub, 25-pin (REMOTE), rear panel
<b>Cursor Measurement</b> <b>Configuration</b>	Two horizontal cursors (REF, Δ) Two vertical cursors (REF, Δ)
<b>Amplitude Measurement</b> <b>Measurement Range</b> <b>Accuracy</b> <b>Resolution</b> <b>Amplitude Ratio Measurement</b>	Voltage (V or %) between the REF and Δ cursors 0 to 2000 mV, 0 to 280.0% ±0.5% 1 mV or 0.1% Amplitude between the REF and Δ cursors relative to 100% REF is displayed in R%.
<b>Time Measurement</b> <b>Measurement Range</b> <b>Accuracy</b> <b>Resolution</b> <b>Time Ratio Measurement</b>	Measures time between the REF and Δ cursors At least 6 div from graticule center ±3% 1/ 80 div When [ R% ] is selected with the menu, time between the REF and Δ cursors relative to 100% REF is displayed in R%.
<b>Frequency Measurement</b>	Frequency of one cycle between the REF and Δ cursors
<b>CRT</b> <b>Effective Display Area</b> <b>Graticule</b>	80 x 100 mm Internal (waveform) External (vector) Electronically-generated (vector, audio)
<b>Environmental Conditions</b> <b>Operating Temperature</b> <b>Operating Humidity</b> <b>Spec-Guaranteed Temperature</b> <b>Spec-Guaranteed Humidity</b> <b>Operating Environment</b> <b>Operating Altitude</b> <b>Overvoltage Category</b> <b>Pollution Degree</b>	0 to 40°C ≤ 90% RH (without condensation) 10 to 35°C ≤ 80% RH (without condensation) Indoor use up to 2000 m II 2
<b>Power Requirements</b>	90 to 250 VAC, 48 to 440 Hz, 130 VA max.
<b>Dimensions and Weight</b>	215 (W) x 132 (H) x 429 (D) mm, 5.5 kg 8 1/2 (W) x 5 1/4 (H) x 16 3/4 (D) in., 12.1 lbs.
<b>Supplied Accessories</b>	Illumination lamp ..... 5 25-pin D-sub connector ..... 1 25-pin D-sub connector cover ..... 1 Screw, rack mounting (inch size) ..... 2 Cover, inlet stopper ..... 1 Power cord ..... 1 Instruction manual ..... 1
<b>Optional Accessories</b>	Cabinet: LR-2427 (with handle), LR-2404 (without handle)

● LV 5152DA REAR PANEL

