

# VIDEO HD DIGITAL WAVEFORM MONITOR

## LV 5152DA HD-SDI Monitor Conforming to 720p, 1080i, and 1035i Standards Digital Data Dump Function, Gamut Error Monitoring Function

CE  
Upon request



HD-SDI



The cabinet is sold separately.

## LV 5152DA HD DIGITAL WAVEFORM MONITOR

### GENERAL

The LV 5152DA HD Digital Waveform Monitor is designed to display 720p, 1080i, 1035i-line serials digital signal and analog signals. This instrument features two serial digital input systems and one analog component signal input system. In addition to the waveform monitor function, vector, bowtie, and audio signal display functions are provided.

Digital input signal can be analyzed since transmission error monitoring function, equivalent cable length measurement function, and digital video data dump function are provided.

Option 70: Waveform monitor function for NTSC component and composite signal is optionally equipped as factory option (No vector display)

### FEATURES

- **Two serial digital input systems and one output system**  
Serial digital signal input systems conforming to BTA S-004B standards; active output system to re-send the input signal.
- **Analog signal input system (Y, P<sub>B</sub>, P<sub>R</sub> or GBR)**  
This input system enables the monitoring of both analog and digital signals since the analog input is provided.
- **Digital data dump function**  
Since parallel digital video data can be displayed in hexadecimal format, this instrument is convenient to trace troubles.
- **Equivalent cable length measurement**  
Indicates the serial digital signal level applied to the input connector as the coaxial cable (LS-5CFB) length instead of the actual level.
- **Digital audio output conforming to SMPTE 276M**  
Digital audio signal separated from the serial digital signal can be output.

- **Digital input error monitoring function**  
Error logger function and contents display function of HD-SDI are provided.
- **Vectorscope function (SMPTE 240M, 274M)**  
Displays color difference signal in vector format. The analog GBR signal is converted into color difference signal with a matrix and displayed in vector format.
- **Picture monitor output**  
A D/A converter converts a serial digital signal into an analog signal, which is then output to the picture monitor. Y, P<sub>B</sub>, P<sub>R</sub> or G, B, R format can be selected. Input analog signals are directly output in analog mode.
- **Conversion matrix, Y, P<sub>B</sub>, P<sub>R</sub> into GBR (SMPTE 240M, 274M)**  
Simplifies signal level monitoring.
- **Full-line selector mode**  
Enables the selection and display of arbitrary video signal lines in each field. Since up to 15 lines can be continuously displayed, waveform is displayed with sufficient intensity.
- **Measurements using cursor**  
Ensures level measurement with 0.5% accuracy.
- **Lissajous display for stereo audio signal**  
Analog stereo audio signal can be displayed in lissajous format.
- **Preset memory function**  
Stores/recalls up to 10 panel settings to reduce set-up time by presetting frequently used measurement conditions.
- **Timing display**  
Time difference and amplitude difference between channels can be monitored by using the timing display mode.

# SPECIFICATIONS

# LV 5152DA

## Standards

### Digital/Analog/Video Format

	Video-System	standards
1	1920x1035/60i	BTA S-001B, 002B SMPTE 240M, 260M
2	1920x1035/59.94i	
3	1920x1080/60i, 30sF	SMPTE 274M
4	1920x1080/59.94i, 29.97sF	
5	1920x1080/50i, 25sF	
6	1920x1080/30p	
7	1920x1080/29.97p	
8	1920x1080/25p	
9	1920x1080/24p	
10	1920x1080/23.98p	
11	1920x1080/24sF	
12	1920x1080/23.98sF	
13	1280x720/60p	SMPTE 296M
14	1280x720/59.94p	
15	*NTSC (ANALOG ONLY)	

\*OPTION 70

**Serial Digital Format:** BTA S-004B, SMPTE 292M  
**Subsidiary Data Format:** BTA S-005B, SMPTE 291M  
**Embedded Audio Format:** BTA S-006B, SMPTE 299M

## Input

### Serial Digital Input

**Input Connector:** 75 Ω BNC, 2-system  
**Return Loss:** ≥15 dB, 5 MHz to 742.5 MHz  
 ≥10 dB, 742.5 MHz to 1.485 GHz  
**Impedance:** 75 Ω, terminated

### Analog Input

**Input Channel:** CH1 (Y/ G), CH2 (P<sub>B</sub>/ B), CH3 (P<sub>R</sub>/ R),  
 passive loop-through, 1-system  
**Return Loss:** ≥30 dB, 50 kHz to 30 MHz (both power on/ off)  
**Impedance:** 75 Ω passive loop-through

### Analog EXT REF Input

**Input Channel:** EXT REF, passive loop-through, 1-system  
**Return Loss :** ≥30 dB, 50 kHz to 30 MHz (both power on/ off)  
**Impedance:** 75 Ω passive loop-through

## Sync (Analog)

**Sync Amplitude:** 0.3 V<sub>p-p</sub> ±6 dB

## Output

### Serial Digital Active Output

**Output Signal:** Reoutput the selected input signal out of 2 systems  
**Output Level:** 800 mV<sub>p-p</sub> ±10 %

### Analog Picture Monitor Output

Y, P<sub>B</sub>, P<sub>R</sub> or GBR (Digital input, selectable)  
**Amplitude:** 1 V ±5 %

**Frequency Response:** 25 Hz to 30 MHz, within ±5 %  
**Output Connector:** BNC, 3-connectors, 1-system

### Digital Output

**Output Signal:** 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.

**Output Impedance:** 75 Ω  
**Output Connector:** 4-BNC  
**Amplitude:** 1.0 V ±10 %  
**Sampling Frequency:** 48 kHz  
**Quantization Accuracy:** 16, 18, 20, 24 bits

## Vertical Axis

**Deflection Sensitivity:** Within ±1 %, GAIN×1  
 Within ±3 %, GAIN×5

### Frequency Response (GAIN×1, Analog)

**FLAT:** Within ±1 %, 25 Hz to 30 MHz  
 (15 to 35 °C, 50 kHz ref.)

### LOWPASS

**Attenuation:** ≥20 dB, at 20 MHz (50 kHz ref.)

### DIF'D STEP

**Attenuation:** ≥20 dB, at 30 kHz (1.6 MHz ref.)  
 ≥20 dB, at 7 MHz (1.6 MHz ref.)

## DC Restorer

### Frequency Response

**Slow Mode:** ≤20 %, attenuation at 60 Hz input  
**Fast Mode:** ≥80 %, attenuation at 60 Hz input

### Clamp

**Point:** Back porch  
**Variable Range:** 0.5 to 2 μs, relative to sync pulse raising edge  
**Blanking Level Shift:** ≤1 % (10 to 90 % of APL Variation)

## Horizontal Axis

**Operation Mode:** Overlay: Displays waveforms overlaid  
 Parade: Displays waveforms side by side  
 Timing: For bowtie signal\* measurement  
 \* Authorized by Tektronix, Inc.

### Display Method

**Line:** 1H, 2H, 3H  
**Line Magnified:** 1H MAG, 2H MAG, 3H MAG  
**Field:** 1V, 2V, 3V  
**Field Magnified:** 1V MAG, 2V MAG, 3V MAG  
**Time Base Accuracy:** Within ±3 % (0.1 μs/ div)  
**Linearity:** Within ±3 %

## Vector Mode

**Amplitude Accuracy:** ±2 % (Y, P<sub>B</sub>, P<sub>R</sub> input), ±2 % (G, B, R input)  
**Sync Blanking:** Blanks sync dot

## Picture Mode

Displays picture using Y or G signal

## Audio Mode

**Calibration Accuracy:** ±0.5 dB of full scale  
**Full Scale:** 0, 2, 4 dBm (menu selectable)  
**Bandwidth:** Within -3 dB at 20 kHz  
**X-Y Phase Accuracy:** Within 1 ° at 20 kHz

## Calibration Signal

1 V ±0.5 %

## Digital Function

**Error Display:** LED on the front panel, Menu shows detail  
**Data Dump Function:** Displays 10 bits digital data in hexadecimal notation after parallel conversion is made.  
**Equivalent Cable Length Meter Function:** Compares serial digital signal level with reference signal (800 mV<sub>p-p</sub>) and displays level as the cable length.  
**Display Accuracy:** ±20 m

## Gamut Error Display

**Error Detection Range:** LED on the front panel. Menu shows detail  
 Exceeding -35 mV and 735 mV  
**Detector Setting Accuracy:** ≤ ±5 mV

## Line Selector

**Operation Field:** Intensifies a selected line  
 FLD1, FLD2, ALL (at Interlace)  
**Selectable Line:** Line 1 to 750, 1 to 1125  
 Line 1 to 525(OPTION70)

## Line Window

**Window Range:** Intensifies selected line and displays multiple lines  
 1 to 15 lines

## Preset Function

**Preset/ Recall:** Up to 10 front panel controls  
**Controls:** All front panel controls (except INTEN, READ-OUT INTEN, ROTATION, FOCUS, ILLUM, POWER)

## Remote Control

**Control Signal:** TTL (low active)  
**Control Input:** D-sub, 25-pin (REMOTE), rear panel

## Cursor Measurement

**Configuration:** Two horizontal cursors (REF, Δ)  
 Two vertical cursors (REF, Δ)  
**Amplitude Measurement:** Voltage (V or %) between the REF and Δ cursors  
**Measurement Range:** 0 to 2000 mV, 0 to 280.0 %  
**Accuracy:** ±0.5 %  
**Resolution:** 1 mV or 0.1 %  
**Amplitude Ratio Measurement:** Amplitude between the REF and Δ cursors relative to 100 % REF is displayed in R%.  
**Time Measurement:** Measures time between the REF and Δ cursors  
**Measurement Range:** At least ±6 div from graticule center  
**Accuracy:** ±3 %  
**Resolution:** 1/ 80 div  
**Time Ratio Measurement:** When [ R % ] is selected with the menu, time between the REF and Δ cursors relative to 100 % REF is displayed in R%.  
**Frequency Measurement:** Frequency of one cycle between the REF and Δ cursors

## CRT

**Effective Display Area:** 80 x 100 mm  
**Graticule:** Internal (waveform)  
 External (vector)  
 Electronically-generated (vector, audio)

## Environmental Conditions

**Operating Temperature:** 0 to 40 °C  
**Operating Humidity:** ≤ 90 % RH (without condensation)  
**Operating Environment:** Indoor use  
**Operating Altitude:** up to 2000 m  
**Overvoltage Category:** II  
**Pollution Degree:** 2

## Power Requirements

90 to 250 VAC, 48 to 440 Hz, 100 W max.

## Dimensions and Weight

215 (W)×132 (H)×429 (D) mm, 5.5 kg

## Accessories

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

## Optional Accessories

LR 2427B (Cabinet, with handle)  
 LR 2404A (Cabinet, without handle)  
 LR 2700A-I (Rack-Mount Adapter, inch size)