



## Applicable To Both HD-SDI And SD-SDI Systems, 1U Half-Rack Size

The 1U half-rack sized compact LT4400 Multifformat Video Generator applicable to both HD-SDI and SD-SDI systems outputs SDI video signals.

The various output capabilities are provided: color bar, SDI check field test pattern, ID characters, logomark in QVGA size, safety-area marker, superimposing embedded audio, genlock mode to synchronize external reference signal, and three independent analog black signal systems.

### FEATURES

- **Applicable To Both HD-SDI And SD-SDI Systems**  
Applicable to both HDTV (18 types of HDTV formats) and SDTV (525i/59.94, 625i/50) systems. The HDTV or SDTV can be selected.
- **Superimposing ID Characters**  
The ID characters can be superimposed at the arbitrary position on the screen. The character blinks to indicate the freeze status.
- **Superimposing Logomark**  
The logomark up to 320 (dot) x 240 (line) in QVGA size can be superimposed at the arbitrary position on the screen. The logomark is converted from the bit map to four-grade monochrome data.
- **Safety-Area Marker**  
The 90 % and 80 % safety-area markers can be superimposed on the screen. The 4:3 aspect-ratio marker can also be superimposed in HDTV format.
- **Superimposing Embedded Audio**  
The 16 channels of embedded audio signals (4 channels x 4 groups) can be superimposed. The frequency and level can be respectively set to each channel.

- **Genlock Mode**

This instrument can be locked by the NTSC/PAL black burst signals and HDTV tri-level sync signal for variable the timing. The NTSC/PAL black burst signals with field reference pulse signal, and NTSC/PAL black burst signal with 10-field ID are also applicable.

- **Stay-In Sync Function**

This function ensures the stable operation in genlock mode even when the external reference signal is accidentally intermitted.

- **Analog Black Signal Output**

Three independent analog black signal output systems are provided. The black burst signal with the same format as the SDI output, or HDTV tri-level sync signal with the same format of clock frequency can be selected for variable the timing. The NTSC/PAL black burst signals with field reference pulse signal, and NTSC black burst signal with 10- field ID are also applicable.

- **Pattern Scroll (Simple Motion Picture Mode)**

The simple motion picture mode is provided to scroll the pattern.

- **Word Clock Output**

The 48 kHz word clock output is provided to synchronize the audio signal.

- **Applicable To SNMP**

The network system can easily be constructed since this instrument supports SNMP. (Not available currently)

### OPTION

- **OP70: FULL SIZE LOGO Option**

Applicable to the LOGO MARK of a full screen

The Logo Mark of full screen size (up to 1920 x 1080 dot) can be displayed.

#### ● LT4400 REAR PANEL



# LT4400 SPECIFICATIONS

<b>SDI Output</b>	1 system, 2 outputs (75 Ω, BNC) HD-SDI/SD-SDI, selectable
<b>Number of Outputs Conform To</b>	SMPTE 274M, SMPTE 296M, SMPTE 292M (except return loss) ITU-R BT 601, SMPTE 125M ITU-R BT 656, SMPTE 259M
<b>Applicable Format</b>	
<b>HDTV</b>	1080i/60, 1080i/59.94, 1080i/50, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 1080PsF/24, 1080PsF/23.98, 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25, 720p/24, 720p/23.98
<b>SDTV</b>	525i/59.94-270 MHz, 625i/50-270 MHz
<b>Timing Variable</b>	Entire frame range
<b>Variable Range</b>	V: Settable in line steps H: Settable in clock steps (74.25 MHz, 74.25/1.001 MHz, 27 MHz)
<b>Resolution</b>	
<b>Test Patterns</b>	
<b>HDTV</b>	COLOR BAR 100 %, COLOR BAR 75 %, MULTIFORMAT COLOR BAR (ARIB STD-B28:75 % White, 100 % White, and +1 signal, selectable), CHECK FIELD COLOR BAR 100 % (applicable to both 525i/59.94, 625i/50), COLOR BAR 75 %, SMPTE COLOR BAR (applicable to 525i/59.94), EBU COLOR BAR/BBC COLOR BAR (applicable to 625i/50), CHECK FIELD (applicable to both 525i/59.94, 625i/50)
<b>SDTV</b>	
<b>Safety Area Marker</b>	
<b>HDTV</b>	Action safety area (90 %), Title safety area (80 %) 4:3 aspect ratio Selectable ON/OFF individually
<b>SDTV</b>	Action safety area (90 %), Title safety area (80 %) Selectable ON/OFF individually
<b>ID Characters</b>	
<b>Number of Characters</b>	Up to 20 characters
<b>Size</b>	
<b>HDTV</b>	32x32/64x64/128x128 dots selectable
<b>SDTV</b>	32x32/64x64 dots selectable
<b>Display Position</b>	Displays at an arbitrary position on the screen.
<b>Freeze Confirmation Display</b>	Blinking OFF, 1 to 10 seconds
<b>Logo Mark</b>	
<b>Logo Mark Data</b>	4-level monochrome data between 0 and 3
<b>Maximum Size</b>	320(dot) x 240(line) (QVGA size)
<b>Display Position</b>	Displays at an arbitrary position on the screen
<b>Display Level</b>	Set arbitrary levels for levels 0 to 3
<b>Display Method</b>	Simultaneous display with the ID character
<b>File Format</b>	
<b>Before Conversion</b>	24-bit full-color bitmap data (.bmp) format
<b>After Conversion</b>	LT4400/LT443D dedicated (.lg) format
<b>Conversion Color Matrix</b>	Y = 0.212*R + 0.701*G + 0.087*B Converts 256-level monochrome data(Y) to four levels (level 0 to 3) using arbitrary threshold values. Converted using the logo mark conversion application. Saves the data to a commercially sold Compact Flash card and inserts it to the LT4400. *The data loaded from CF card to the LT4400 cannot be held when the power is turned OFF.
<b>Conversion Method</b>	
<b>Transferring the Logo Mark Data</b>	
<b>Pattern Scroll (Simple Motion Picture Mode)</b>	
<b>Direction</b>	8 directions (vertical, horizontal, diagonal)
<b>Speed (Range, Resolution)</b>	
<b>Field and Frame</b>	
<b>Interface</b>	Variable in field steps
<b>Others</b>	Variable in frame steps
<b>V Interface</b>	0 to 256 lines in 2 line steps
<b>Others</b>	0 to 256 lines in 1 line steps
<b>H Common</b>	0 to 256 dots in 4 line steps
<b>Embedded Audio</b>	
<b>Number of Channels Embedded</b>	16 Channels (4ch x 4group). Each group can be set ON/OFF
<b>Sampling Frequency</b>	48 kHz (sync to video signal)
<b>Resolution</b>	20 bits, 24 bits, selectable
<b>Preemphasis</b>	OFF, 50/15 ms, CCITT, selectable (CS bit can only be selected)
<b>Frame Number</b>	ON, OFF, selectable
<b>Frequency</b>	400 Hz /800 Hz /1 kHz, selectable (sets to each channel)
<b>Level</b>	Can be selected including silence (sets to each channel) -60 to 0 dBFS (settable in 1 dBFS steps)
<b>Audio Click</b>	1 sec/2 sec/3 sec/4 sec/OFF (sets to each channel) * When the CHECK FIELD pattern is selected, no audio signal is embedded. * In the SDTV format, resolution becomes 20 bits when the 16ch is output.
<b>Genlock Function</b>	
<b>Reference Input Signal</b>	BNC (75 Ω, loop through)
<b>Input Configuration</b>	
<b>Input Signal</b>	
<b>NTSC black burst signal</b>	EBU N14/SMPTE RP154/SMPTE 170M/SMPTE 318M
<b>PAL black burst signal</b>	ITU-R BT.470-6
<b>HDTV tri-level sync signal</b>	SMPTE 274M, SMPTE 296M
<b>Sync Level</b>	
<b>NTSC black burst signal</b>	-286 mV
<b>PAL black burst signal</b>	-300 mV
<b>HDTV tri-level sync signal</b>	±300 mV
<b>Maximum Input Level</b>	± 4.5 V (DC + peak AC)
<b>Operating Input Level Range</b>	± 6 dB
<b>External Lock Range</b>	± 10 ppm
<b>Jitter</b>	
<b>Burst Lock Mode</b>	≤ 0.5 °
<b>Sync Lock Mode</b>	≤ 1 ns
<b>Operation Modes</b>	
<b>INTERNAL</b>	Internal reference signal is used for operation. (INT mode)

<b>AUTO (GO INTERNAL)</b>	
	The EXT is automatically selected when the external reference signal is applied to the GENLOCK input. The INT mode is automatically selected when the external reference signal is removed.
<b>MANUAL (GO INT)</b>	
	The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after power is turned on. The INT mode is automatically selected when no external reference signal is applied to the GENLOCK input or signal format does not match the specified format.
<b>AUTO (STAYinSYNC)</b>	
	The EXT mode is automatically selected when the external reference signal is applied to the GENLOCK input after power is turned on. If the external reference signal is accidentally removed during operation, the instrument continues operation under the conditions immediately before the signal is removed since STAYinSYNC mode is provided. After the external reference signal is recovered, the system is automatically locked.
<b>MANUAL (STAYinSYNC)</b>	
	The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after power is turned on. If the external reference signal is accidentally removed during operation, the instrument continues operation under the conditions immediately before the signal is removed since STAYinSYNC mode is provided. The STAYinSYNC mode will be held until the reset operation is performed via the front panel even after the external reference signal is recovered.
<b>Genlock Timing</b>	
<b>Variable Range</b>	
<b>NTSC black burst signal</b>	± 5 frames
<b>PAL black burst signal</b>	± 2 frames
<b>HDTV tri-level sync signal</b>	1 frame (entire frame range)
<b>Resolution</b>	
<b>H</b>	0.0741 μs steps (13.5 MHz clock steps)
<b>V</b>	1 line steps
<b>F</b>	1 frame steps
<b>Reference Point</b>	
<b>NTSC</b>	(at the time of the black burst input) The phase coincident point of line 4 of the NTSC and line 1 of the HDTV
<b>PAL</b>	The phase coincident point of line 1 of the PAL and line 1 of the HDTV
<b>Analog Sync Signal Output Format</b>	
<b>NTSC black burst signal</b>	EBU N14, SMPTE RP154, SMPTE 170M, SMPTE 318M
<b>HDTV tri-level sync</b>	SMPTE 274M, SMPTE 296M
<b>Output Signal</b>	
<b>Number of Outputs</b>	6 Outputs (three output systems which equip with two connectors each) Settable
<b>Setting Output Format</b>	
<b>Output Connector</b>	75 Ω
<b>Output Impedance</b>	BNC
<b>Output Connector</b>	
<b>Output Timing</b>	Three systems can be set individually.
<b>Setting</b>	
<b>Variable Range</b>	
<b>NTSC black burst signal</b>	± 5 frames
<b>PAL black burst signal</b>	± 2 frames
<b>HDTV tri-level sync</b>	1 frame (entire frame range)
<b>Setting Resolution</b>	
<b>NTSC black burst signal</b>	0.0185 μs steps (54 MHz in clock steps)
<b>HDTV tri-level sync</b>	0.0135 μs steps (74.25/1.001 MHz in clock steps, or 74.25 MHz in clock steps)
<b>Word Clock Output</b>	
<b>Frequency</b>	48 kHz
<b>Output Impedance</b>	75 Ω unbalanced (*1 Vp-p* output)
<b>Output Amplitude</b>	1 Vp-p ± 0.1 V (into 75 Ω), or 5 V CMOS, selectable
<b>Output Connector</b>	BNC
<b>Number of Outputs</b>	1
<b>Timing Variable</b>	
<b>Variable Range</b>	± 1 AES/EBU frame
<b>Setting Resolution</b>	512 fs (24.576 MHz) steps
<b>Memory Card Slot</b>	
<b>Function</b>	Storing/reading preset data Reading logo data
<b>Ethernet Connector</b>	
<b>Type</b>	10BASE-T/100BASE-TX, auto switching
<b>Function</b>	Transferring operation status (e.g., genlock status) Remote control (e.g., pattern switching) SNMP supported (to be supported in the future)
<b>LCD Panel</b>	
<b>Number of Characters</b>	20 characters x 2 lines can be displayed (w/backlight)
<b>Environmental Conditions</b>	
<b>Operating Temperature Range</b>	0 to 40 °C
<b>Operating Humidity Range</b>	≤ 85 % RH (without condensation)
<b>Spec-Guaranteed Temperature</b>	10 to 30 °C
<b>Spec-Guaranteed Humidity</b>	≤ 85 % RH (without condensation)
<b>Operating Environment</b>	Indoor use
<b>Operating Altitude</b>	Up to 2000 m
<b>Overvoltage Category</b>	1
<b>Pollution Degree</b>	2
<b>Power Requirements</b>	DC12 V (10 to 18 V) 20 W
<b>Dimensions and Weight</b>	213(W) x 44(H) x 400(D) mm (excluding projections), 1.8 kg 8 1/2(W) x 1 3/4(H) x 15(D) in. (excluding projections), 4 lbs.
<b>Accessories</b>	AC adapter ..... 1 Instruction manual ..... 1