



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

SDI Output	1 system, 2 outputs (75 Ω, BNC) HD-SDI/SD-SDI, selectable
Number of Outputs Conform To	SMPTE 274M, SMPTE 296M, SMPTE 292M (except return loss) ITU-R BT 601, SMPTE 125M ITU-R BT 656, SMPTE 259M
Applicable Format	
HDTV	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
SDTV	525i/59.94-270 MHz, 625i/50-270 MHz
Timing Variable	Entire frame range
Variable Range	V: Settable in line steps
Resolution	H: Settable in clock steps (74.25 MHz, 74.25/1.001 MHz, 27 MHz)
Test Patterns	
HDTV	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)
SDTV	
Safety Area Marker	
HDTV	Action safety area (90 %), Title safety area (80 %) 4:3 aspect ratio Selectable ON/OFF individually
SDTV	Action safety area (90 %), Title safety area (80 %) Selectable ON/OFF individually
ID Characters	
Number of Characters	Up to 20 characters
Size	
HDTV	32x32/64x64/128x128 dots selectable
SDTV	32x32/64x64 dots selectable
Display Position	Displays at an arbitrary position on the screen.
Freeze Confirmation Display	Blinking OFF, 1 to 10 seconds
Logo Mark	
Logo Mark Data	4-level monochrome data between 0 and 3
Maximum Size	320(dot) x 240(line) (QVGA size)
Display Position	Displays at an arbitrary position on the screen
Display Level	Set arbitrary levels for levels 0 to 3
Display Method	Simultaneous display with the ID character
File Format	
Before Conversion	24-bit full-color bitmap data (.bmp) format
After Conversion	LT4400/LT443D dedicated (.lg) format
Conversion Color Matrix	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.
Conversion Method	
Transferring the Logo Mark Data	
Pattern Scroll (Simple Motion Picture Mode)	
Direction	8 directions (vertical, horizontal, diagonal)
Speed (Range, Resolution)	
Field and Frame	
Interface	Variable in field steps
Others	Variable in frame steps
V Interface	0 to 256 lines in 2 line steps
Others	0 to 256 lines in 1 line steps
H Common	0 to 256 dots in 4 line steps
Embedded Audio	
Number of Channels Embedded	16 Channels (4ch x 4group). Each group can be set ON/OFF
Sampling Frequency	48 kHz (sync to video signal)
Resolution	20 bits, 24 bits, selectable
Preemphasis	OFF, 50/15 ms, CCITT, selectable (CS bit can only be selected)
Frame Number	ON, OFF, selectable
Frequency	400 Hz /800 Hz /1 kHz, selectable (sets to each channel)
Level	Can be selected including silence (sets to each channel) -60 to 0 dBFS (settable in 1 dBFS steps)
Audio Click	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.
Genlock Function	
Reference Input Signal	BNC (75 Ω, loop through)
Input Configuration	
Input Signal	
NTSC black burst signal	EBU N14/SMPTE RP154/SMPTE 170M/SMPTE 318M
PAL black burst signal	ITU-R BT.470-6
HDTV tri-level sync signal	SMPTE 274M, SMPTE 296M
Sync Level	
NTSC black burst signal	-286 mV
PAL black burst signal	-300 mV
HDTV tri-level sync signal	±300 mV
Maximum Input Level	± 4.5 V (DC + peak AC)
Operating Input Level Range	± 6 dB
External Lock Range	± 10 ppm
Jitter	
Burst Lock Mode	≤ 0.5 °
Sync Lock Mode	≤ 1 ns
Operation Modes	
INTERNAL	Internal reference signal is used for operation. (INT mode)

AUTO (GO INTERNAL)	
	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.
MANUAL (GO INT)	
	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.
AUTO (STAYinSYNC)	
	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.
MANUAL (STAYinSYNC)	
	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.
Genlock Timing	
Variable Range	
NTSC black burst signal	± 5 frames
PAL black burst signal	± 2 frames
HDTV tri-level sync signal	1 frame (entire frame range)
Resolution	
H	0.0741 μs steps (13.5 MHz clock steps)
V	1 line steps
F	1 frame steps
Reference Point	
NTSC	(at the time of the black burst input) The phase coincident point of line 4 of the NTSC and line 1 of the HDTV
PAL	The phase coincident point of line 1 of the PAL and line 1 of the HDTV
Analog Sync Signal Output Format	
NTSC black burst signal	EBU N14, SMPTE RP154, SMPTE 170M, SMPTE 318M
HDTV tri-level sync	SMPTE 274M, SMPTE 296M
Output Signal	
Number of Outputs	6 Outputs (three output systems which equip with two connectors each) Settable
Setting Output Format	
Output Connector	75 Ω
Output Impedance	BNC
Output Connector	
Output Timing	Three systems can be set individually.
Setting	
Variable Range	
NTSC black burst signal	± 5 frames
PAL black burst signal	± 2 frames
HDTV tri-level sync	1 frame (entire frame range)
Setting Resolution	
NTSC black burst signal	0.0185 μs steps (54 MHz in clock steps)
HDTV tri-level sync	0.0135 μs steps (74.25/1.001 MHz in clock steps, or 74.25 MHz in clock steps)
Word Clock Output	
Frequency	48 kHz
Output Impedance	75 Ω unbalanced (*1 Vp-p* output)
Output Amplitude	1 Vp-p ± 0.1 V (into 75 Ω), or 5 V CMOS, selectable
Output Connector	BNC
Number of Outputs	1
Timing Variable	
Variable Range	± 1 AES/EBU frame
Setting Resolution	512 fs (24.576 MHz) steps
Memory Card Slot	
Function	Storing/reading preset data Reading logo data
Ethernet Connector	
Type	10BASE-T/100BASE-TX, auto switching
Function	Transferring operation status (e.g., genlock status) Remote control (e.g., pattern switching) SNMP supported (to be supported in the future)
LCD Panel	
Number of Characters	20 characters x 2 lines can be displayed (w/backlight)
Environmental Conditions	
Operating Temperature Range	0 to 40 °C
Operating Humidity Range	≤ 85 % RH (without condensation)
Spec-Guaranteed Temperature	10 to 30 °C
Spec-Guaranteed Humidity	≤ 85 % RH (without condensation)
Operating Environment	Indoor use
Operating Altitude	Up to 2000 m
Overvoltage Category	1
Pollution Degree	2
Power Requirements	DC12 V (10 to 18 V) 20 W
Dimensions and Weight	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.
Accessories	AC adapter.....1 Instruction manual.....1