MULTI FORMAT VIDEO GENERATOR

LT 4400

LEADER

HD-SDI

SD-SDI

1U size (half Rack)

CE
Upon request

Multi Format Video Generator

The compact, 1U half-rack sized, LT 4400 Multiformat Video Generator is applicable to both HD-SDI and SD-SDI systems.
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**
  A logo mark up to 320 (pixel) x 240 (line) in QVGA size can be super imposed at an arbitrary position on the screen. The logo mark 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 for each channel.
- **Stay-in sync function**
  This function ensures the stable operation in genlock mode even when the external reference signal is accidentally intermitent.

- **Genlock mode**
  This instrument can be locked by a NTSC/PAL black burst or HDTV tri-level sync signals for variable 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.
- **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 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.

■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 pixels) can be displayed.

LT 4400SER01 : LIP SYNC Option (Factory option)

By adding the LT 4400SER01 option to the LT 4400, you can accurately measure the lip sync of the video and audio in an SDI signal.
To measure the lip sync, use Leader's LV 5800, LV 7800, LV 5770 and LV 7770.

SDI Output

Number of Outputs	1 system, 2 outputs (75 Ω, BNC) HD-SDI/SD-SDI, selectable
HDTV	SMPTE ST 274, SMPTE ST 296, SMPTE ST 292 (except return loss)
SDTV	ITU-R BT 601, SMPTE ST 125 ITU-R BT 656, SMPTE ST 259
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	
Variable Range	Entire frame range
Resolution	V: Settable in line steps 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 + I signal, selectable), CHECK FIELD
SDTV	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)
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 9 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	LT 4400/LT 443D 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.
Conversion Method	Converted using the logo mark conversion application.
Transferring the Logo Mark Data	Saves the data to a commercially sold Compact Flash card and inserts it to the LT 4400. *The data loaded from CF card to the LT 4400 cannot be held when the power is turned OFF.
Pattern Scroll (Simple Motion Picture Mode)	
Direction	8 directions (vertical, horizontal, diagonal)
Speed (Range, Resolution)	
Field and Frame	
Interlace	Variable in field steps
Others	Variable in frame steps
V	0 to 255 lines in 1 line steps
H	0 to 254 dots in 2 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	Silence/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	
Input Configuration	BNC (75 Ω, loop through)
Input Signal	
NTSC black burst signal	SMPTE ST RP154/SMPTE ST 170/SMPTE ST 318
PAL black burst signal	EBU N14, ITU-R BT.470-6
HDTV tri-level sync signal	SMPTE ST 274, SMPTE ST 296
Sync Level	
NTSC black burst signal	-286 mV
PAL black burst signal	-300 mV
HDTV tri-level sync signal	±300 mV
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 (at the time of the black burst input)	
NTSC	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	SMPTE ST RP154, SMPTE ST 170, SMPTE ST 318
HDTV tri-level sync	SMPTE ST 274, SMPTE ST 296
Output Signal	
Number of Outputs	6 Outputs (three output systems which equip with two connectors each)
Setting Output Format	Settable
Output Connector	
Output Connector	BNC
Output Timing	
Setting	Three systems can be set individually.
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/PAL 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 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) HTTP, TELNET, SNMP supported.
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)
Operating Environment	Indoor use
Operating Altitude	Up to 2000 m
Overvoltage Category	I
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 3/8(W) x 1 3/4(H) x 15 4/5(D) inch, 4 lbs.
Accessories	AC adapter ....1 Instruction manual ....1 Refer also to the accessory page.