LEADER

LT 4610SER02 12G-SDI

INSTRUCTION MANUAL

LEADER
ELECTRONIC MEASURING INSTRUMENTS

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1. SPECIFICATIONS

1.1 General

This product adds 12G-SDI, 3G-SDI, HD-SDI, and SD-SDI signal generators to the standard LT 4610. In addition to test pattern output of 4 outputs, color bars, and the like, the LT 4610SER02 can embed ID characters, safety area markers, and embedded audio in SDI signal outputs. For details on other features and precautions, see the instruction manual for the standard model.

1.2 Features

- **12G-SDI Support (4K)**

  SDI signal output supports 12G-SDI, 3G-SDI (level A and level B), HD-SDI (including dual link), and SD-SDI. The LT 4610SER02 is equipped with four SDI signal output connectors. The format is the same for all four outputs, but you can set different patterns and phases for each. (However, only two outputs are available for 3G-SDI level B and HD dual link.)

- **ID Character Overlay**

  ID characters can be overlaid at any position on the display. In addition, ID characters can be displayed in a blinking state for checking whether the display has frozen.

- **Safety Area Markers**

  90% and 80% safety area markers can be overlaid on the display. For 3G-SDI and HD-SDI, a 4:3 aspect marker can be overlaid.

- **Pattern Scrolling**

  Equipped with a function for scrolling patterns in eight directions. The speed can also be adjusted.

- **Moving Box**

  A moving box can be overlaid on the display. Its color, size, and moving speed can be varied.

- **Lip Sync**

  The LT 4610SER02 can output lip sync patterns in which the video and audio are synchronized. In combination with a waveform monitor that features a lip sync function, such as the Leader’s LV 5770A, it possible to accurately measure the offset between the video and audio in SDI signal transmissions.

- **User Pattern Generation**

  SD, HD (2K), and 4K user patterns can be displayed.

- **Audio Embedding**

  The LT 4610SER02 can embed 16 channels (4 channels × 4 groups) of 12G-SDI, 3G-SDI, HD-SDI, and SD-SDI audio signals. The frequency, level, and the like can be set for each channel.

1.3 Specifications

1.3.1 Compliant Standards

SDI Embedded Audio

3G, HD, HD(DL)	SMPTE ST 299
SD	SMPTE ST 272
SDI Payload ID	SMPTE ST 352

1.3.2 SDI Formats and Standards

SD Video Signal Formats and Standards

Color System	Quantization	Image	Field Frequency/Scanning	Corresponding Standard
YC_BC_R 4:2:2	10 bits	720×487	59.94/I	SMPTE ST 259
		720×576	50/I	

HD Video Signal Formats and Standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YC_BC_R 4:2:2	10 bits	1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 292-1 SMPTE ST 296
		1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 292-1
			30/29.97/25/24/23.98/P	
			30/29.97/25/24/23.98/PsF	

3G-A Video Signal Formats and Standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YC_BC_R 4:2:2	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-1
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 425-1 SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 425-1
			30/29.97/25/24/23.98/P	
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1 SMPTE ST 2048-2
			30/29.97/25/24/23.98/PsF	

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YC_BC_R 4:4:4	10 bits	1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 296 SMPTE ST 425-1
		1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 425-1
			30/29.97/25/24/23.98/P	
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1 SMPTE ST 2048-2
			30/29.97/25/24/23.98/PsF	
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 425-1
			30/29.97/25/24/23.98/P	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1 SMPTE ST 2048-2
			30/29.97/25/24/23.98/PsF	
RGB 4:4:4	10 bits	1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 296 SMPTE ST 425-1
		1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 425
			30/29.97/25/24/23.98/P	
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1 SMPTE ST 2048-2
			30/29.97/25/24/23.98/PsF	
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 425
			30/29.97/25/24/23.98/P	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1 SMPTE ST 2048-2
			30/29.97/25/24/23.98/PsF	

3G-B-DL, HD (DL) Video Signal Formats and Standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YCBCR 4:2:2	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 372 SMPTE ST 425-1
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 372 SMPTE ST 425-1 SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274 SMPTE ST 372 SMPTE ST 425-1
			30/29.97/25/24/23.98/P	
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372 SMPTE ST 425-1 SMPTE ST 2048-2
			30/29.97/25/24/23.98/PsF	

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YC_BC_R 4:4:4	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
RGB 4:4:4	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2

3G-B-DS Video Signal Formats and Standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YC_BC_R 4:2:2	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	
		1280×720	60/59.94/50/30/29.97/P	SMPTE ST 296
				SMPTE ST 425-1

3G(DL)-2K Video Signal Formats and Standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Corresponding Standard
YC_BC_R 4:2:2	12 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3
YC_BC_R 4:4:4	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3
	12 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3
RGB 4:4:4	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3
	12 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3

3G(DL)-4K Video Signal Formats and Standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Corresponding Standard
Square	YC_BC_R 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2048-1
2 sample interleave	YC_BC_R 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2048-1

HD (QL) Video Signal Formats and Standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Corresponding Standard
Square	YC_BC_R 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	-
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	-
				30/29.97/25/24/23.98/PsF	-

3G (QL) Video Signal Formats and Standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Corresponding Standard
Square	YC_BC_R 4:2:2	10 bits	3840×2160	60/59.94/50/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
	YC_BC_R 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
	RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Corresponding Standard
2 sample interleave	YC_BC_R 4:2:2	10 bits	3840×2160	60/59.94/50/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
	YC_BC_R 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
	RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1

12G Video Signal Formats and Standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Corresponding Standard
2 sample interleave	YC_BC_R 4:2:2	10 bits	3840×2160	60/59.94/50/P	SMPTE ST 2082-10 SMPTE ST 2036-1
			4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 2082-10 SMPTE ST 2036-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
	YC_BC_R 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
	RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2082-10 SMPTE ST 2036-1

1.3.3 Output Connectors

SDI Output Connector

Connector	BNC connector, 4 connectors
12G, 3G-A, HD, SD	4 outputs
3G(DL), HD(DL)	2 outputs
Output Impedance	75Ω
Output Amplitude	800mVp-p±10%
Output Return Loss	
5 MHz to 1.485 GHz	15 dB or more
1.485 to 2.97 GHz	10 dB or more
2.97 to 6 GHz	7 dB or more
6 to 12 GHz	4 dB or more
Rise and Fall Times	
3G	≤ 135 ps (20 to 80%)
HD, HD(DL)	≤ 270 ps (20 to 80%)
SD	0.4 ns to 1.5 ns (20 to 80%)
DC Offset	0±0.5V

1.3.4 SDI Video Output

● SDI Signal

Bit Rate	
12G	11.880Gbps, 11.880/1.001Gbps
3G	2.970Gbps, 2.970/1.001Gbps
HD, HD(DL)	1.485Gbps, 1.485/1.001Gbps
SD	270Mbps

● Timing Adjustment

Adjustment Unit	
V	Lines
H	Clocks (148.5 MHz, 148.5/1.001 MHz, 74.25 MHz, 74.25/1.001 MHz)

● Test Patterns

12G, 3G, HD	100% color bar, 75% color bar, multiformat color bar (ARIB STD-B28, pattern 2 area can be set to 100% white, 75% white, or +I), check field, flat field white 100%, black 0%, red 100%, green 100%, blue 100%
SD	
525/59.94I	100% color bar, 75% color bar, SMPTE color bar, check field, flat field white 100%, black 0%, red 100%, green 100%, blue 100%
625/50I	100% color bar, EBU color bar, BBC color bar, check field, flat field white 100%, black 0%, red 100%, green 100%, blue 100%
Automatic Switching	Automatically switches between selectable color bar patterns
Switch Time	1 to 255 sec

● User Pattern Display

Data Storage	Can store 8 pages of data each for SD, HD (2K), and 4K
File Format	24-bit full color bitmap format (.bmp)

* After turning on the power, perform a data memory transfer operation. Data memory transfer takes time (about 5 minutes for a 4K user pattern). If the power is cut off after a memory transfer, the data in the memory will be cleared. The stored data will be retained even when the power is turned off, so after turning on the power, perform a memory transfer operation again.

* If the power is cut off while data is being accessed, the data may become corrupted. Do not turn off the power while data is being accessed.

● Component On/Off

Function	Each of the Y/G, Cb/B, and Cr/R components can be turned on and off independently.
On	Outputs the specified Y/G, Cb/B, or Cr/R signal
Off	
Y/G	040h/040h
Cb/B	200h/040h
Cr/R	200h/040h

* Not available when the check field pattern is selected.

● Safety Area Markers

12G, 3G, HD	Action safe area (90%) Title safe area (80%) 4:3 aspect ratio (can be turned on and off separately)
SD	Action safe area (90%) Title safe area (80%) (can be turned on and off separately)

* Not available when the check field pattern is selected.

● Moving Box

Box Color	Select from white (88%), yellow (88%), cyan (88%), green (88%), blue (88%), red (88%), magenta (88%), black (88%)
Speed Setting V/H	LOW / MIDDLE / HIGH
Size Setting V/H	SIZE 1 to 5

* Not available when the check field pattern is selected.

● Pattern Scrolling

Direction	Eight directions (up, down, left, right, and their combinations)
Speed Range and Unit	
Interlace	In unit of fields
V	0 to 256 lines, in 1 line steps
H	0 to 256 dots, in 2 dot steps
Progressive	In unit of frames
V	0 to 256 lines, in 1 line steps
H	0 to 256 dots, in 2 dot steps

* Not available when the check field pattern is selected.

● ID Characters

Number of Characters	Up to 20 characters
Size [Dots]	32×32 / 64×64 / 128×128 / 256×256
Intensity	100%, 75% (black only for the background color)
Display Position	Anywhere on the display
Display Position Adjustment Resolution	
V	1 line
H	1 dot
Blinking Display (*1)	OFF, 1 to 9 sec
Scrolling (*1)	
Function	Scroll including the ID character background
Direction	Two directions (left and right)
Speed Range and Unit	
Interlace	In unit of fields 0 to 256 dots, in 2 dot steps
Progressive	In unit of frames 0 to 256 dots, in 2 dot steps

* Not available when the check field pattern is selected.

*1 The blinking display and scrolling can be used simultaneously.

● Logo Mark

Logo Mark Data	4-level monochrome data from level 0 to 3
Maximum Size	320 (dots) × 240 (lines) (QVGA size)
Number of Logo Marks That Can Be Saved in the LT 4610	Up to 4
Display Position	Anywhere on the display
Display Position Adjustment Resolution	
V	1 line
H	1 dot
Display Level	Any level from 0 to 3
File Format	
Before Conversion	24-bit full color bitmap format (.bmp)
After Conversion	Original format (.lg)
Conversion Color Matrix	Y = (0.212×R) + (0.701×G) + (0.087×B) Converts 256-level monochrome data (Y) to 4 levels (levels 0 to 3) using specified thresholds
Conversion Method	Using the logo application
Logo Mark Data Transfer	Save the data to a USB memory device and transfer to the LT 4610.

* Not available when the check field pattern is selected.

● Image Overlay

Display Precedence	ID characters > safety area markers > logo mark > test pattern (The display order cannot be changed.)
Simultaneous Display	ID characters, logo mark, safety area markers, and test pattern can be displayed simultaneously.

● Embedded Audio

Embedded Channels	Can be turned on and off at the group level
12G, 3G-A, HD, SD	16 channels (4 channels × 4 groups)
3G-B	32 channels (link A, link B, 4 channels each × 4 groups)
Sampling Frequency	48 kHz sampling (synced with the video signal)
Resolution	20 bits, 24 bits
Pre-emphasis	OFF, 50/15, CCITT (only the CS bit is switched)
Frequency	SILENCE / 400Hz / 800Hz / 1kHz
Level	-60 to 0 dBFs (1 dBFs steps)
Audio Click	OFF, 1 to 4 sec

* Audio (including packets) cannot be embedded when the check field pattern is selected.
* The frequency, level, and audio click can be set for each channel.
* The following limitations apply for SD (525/59.94I).
  • For 16 channel output, the resolution is set to 20 bits.
  • Up to three groups (12 channels) can be output at 24-bit resolution.

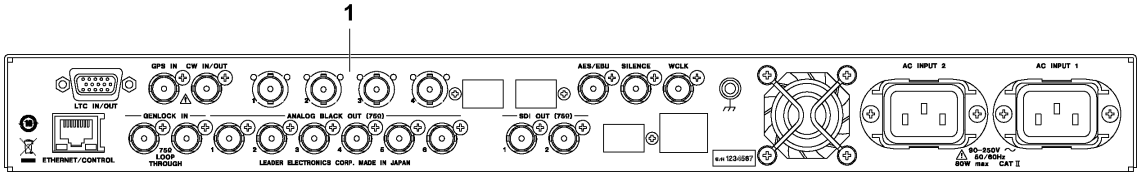
1.3.5 Lip Sync Patterns

Value	SDI1, SDI2, SDI3, and SDI4 can be set separately.

* Not available when the check field pattern is selected.
* Safety area markers, ID characters, and logo mark cannot be overlaid.
* The audio click setting of embedded audio is disabled, and audio synchronized to the lip sync pattern is output.

2. PANEL DESCRIPTION

2.1 Rear Panel

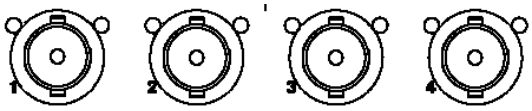


No.	Name	Description
1	12G-SDI	SDI output connectors. They output SD, HD, 3G, and 12G signals.

2.2 SDI Signal Output

2.2.1 12G-SDI Signal Output

Four SDI signals are output from the rear panel.
You can set the output signals on the 12G OPTION menu.



2.3 Menu Operations

There are 11 main types of menus. The menu switches in order each time you press the MENU key and in reverse order each time you press the ◀ key. (When the menu level is zero)

No.	Menu	Description	Reference
1	STATUS menu [STATUS] ▾GENLOCK ↵	Displays the LT 4610 status.	Main unit Instruction Manual Chapter 5
2	INFO menu [INFO] ▾GENLOCK ↵	Displays the settings entered in the LT 4610.	Main unit Instruction Manual Chapter 6
3	GENLOCK menu 0. GENLOCK ▾MODE ↵	Set the genlock.	Main unit Instruction Manual Chapter 7
4	BLACK menu 0. BLACK ▾BLK1 ↵	Set the black signal.	Main unit Instruction Manual Chapter 8
5	SDI menu 0. SDI ▾SDI1 ↵	Set the SDI signal.	Main unit Instruction Manual Chapter 9
6	AES/EBU menu 0. AES／EBU ▾AES／EBU ↵	Set the AES/EBU signal.	Main unit Instruction Manual Chapter 10
7	WCLK menu 0. WCLK TIMING ↵	Set the word-clock signal.	Main unit Instruction Manual Chapter 11
8	ETC menu 0. ETC LIPSYNC ↵	Set the lip sync function.	Main unit Instruction Manual Chapter 12
9	GPS OPTION menu 0. GPS OPTION ▾LTC ↵	Set the GPS signal.	Main unit Instruction Manual Chapter 13
10	12G OPTION menu 0. 12G OPTION ▾SDI1 ↵	Set the SDI (12G OPTION).	Chapter 3
11	SYSTEM menu 0. SYSTEM ▾LCD BACKLIGHT ↵	Configure the LT 4610 settings.	Main unit Instruction Manual Chapter 14

3. 12G OPTION MENU

The 12G OPTION menu is used to specify settings related to SDI output.
To display the SDI menu, press MENU several times until the following menu appears.

On the 12G OPTION menu, you can set SDI1 to SDI4. Common settings can be specified on SDI1. On SDI2 to SDI4, different settings can be specified for groups of channels.

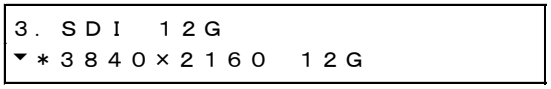
Note that for DUAL LINK, SDI2 and SDI4 cannot be set because only two outputs will be available. For QUAD LINK, SDI2 to SDI4 cannot be set because only one output will be available.

3.1 Setting the SDI Format

Under 12G OPTION→SDI1→FORMAT, you can set the SDI signal format.
For the available combinations of SYSTEM, STRUCTURE, and RATE, see section 1.3.2, “SDI Formats and Standards.”

3.1.1 Selecting the System

To select the SDI signal system, follow the procedure below.
You cannot select this for SDI2 to SDI4.
Changing this setting also changes the STRUCTURE And RATE settings.



Procedure

12G OPTION → SDI1 → FORMAT → SYSTEM

Parameter

SD	720x 487 / 720x 576
HD	1280x 720 / 1920x1080
HD(DL)	1920x1080 / 2048x1080
HD(QL)	3840x2160 Square / 4096x2160 Square
3G-A	1280x 720 / 1920x1080 / 2048x1080
3G-B-DL	1920x1080 / 2048x1080
3G-B-DS Dual	1280x 720 / 1920x1080
3G(DL)-A	1920x1080 / 2048x1080
3G(DL)-B-DL	1920x1080 / 2084x1080
3G(DL)-B-DS	3840x2160 Square / 3840x2160 2Sample / 4096x2160 Square / 4096x2160 2Sample
3G(QL)-A	3840x2160 Square / 3840x2160 2Sample / 4096x2160 Square / 4096x2160 2Sample
3G(QL)-B-DL	3840x2160 Square / 3840x2160 2Sample / 4096x2160 Square / 4096x2160 2Sample
12G	3840x2160 (default value) / 4096x2160

3.1.2 Selecting the Color System

To select the SDI signal color system and quantization accuracy, follow the procedure below.
Changing this setting also changes the RATE settings.

Procedure

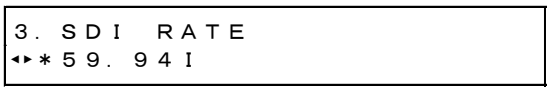
12G OPTION → SDI1 → FORMAT → STRUCTURE

Parameter

422(YCbCr)10-bit (default value) / 422(YCbCr)12-bit / 444(YCbCr)10-bit / 444(YCbCr)12-bit / 444(RGB)10-bit / 444(RGB)12-bit

3.1.3 Selecting the Frame Frequency

To select the SDI signal frame (field) frequency, follow the procedure below.



Procedure

12G OPTION → SDI1 → FORMAT → RATE

Parameter

60P / 59.94P (default value) / 50P / 48P / 47.95P / 30P / 29.97P / 25P /
24P / 23.98P /30PsF / 29.97PsF / 25PsF / 24PsF / 23.98PsF / 60I / 59.94I / 50I

3.2 Adjusting the Timing

Under 12G OPTION→SDI1→TIMING, you can adjust the SDI signal relative to the reference signal.
You can also set SDI2 to SDI4 separately.

3.2.1 Adjusting the Timing (Line)

To adjust the SDI signal relative to the reference signal at the line level, follow the procedure below.

Procedure

12G OPTION → SDI1 → TIMING → VERTICAL

Parameter

±561 (default value: 0)

3.2.2 Adjusting the Timing (Dot)

To adjust the SDI signal relative to the reference signal at the dot level, follow the procedure below. To the right of DOT, the value obtained by converting dots into time is displayed.

Procedure

12G OPTION → SDI1 → TIMING → HORIZONTAL

Parameter

±2061 (default value: 0)

3.3 Selecting the Pattern

To select a fixed pattern or a user pattern created on a PC, follow the procedure below. To select items use the ▲, ▼, ◀, and ▶ keys.
You can set SDI2 to SDI4 separately, but the fixed pattern and user pattern cannot be displayed simultaneously.

3.3.1 Switching between Fixed Pattern and User Pattern

To switch between fixed pattern and user pattern, follow the procedure below.

Procedure

12G OPTION → SDI1 → PATTERN → PATTERN SELECT

Parameter

FIX PATTERN (default value) / USER PATTERN

3.3.2 Selecting the Fixed Pattern

To select the fixed pattern, follow the procedure below.

Procedure

12G OPTION → SDI1 → PATTERN → PATTERN SELECT → FIX PATTERN

Parameter

COLOR BAR	100% (default value) / 75% / MULTI 100% / MULTI 75% / MULTI (+I) / SMPTE / EBU / BBC / ARIB STD-B66-2
MONITOR	FLAT FIELD 100% / FLAT FIELD 0% / RED FIELD 100% / GREEN FILED 100% / BLUE FIELD 100%
SDI	CHECK FIELD

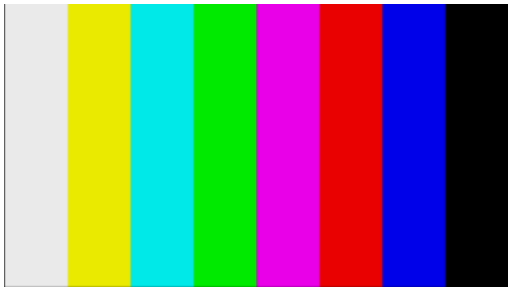
The selectable patterns depend on the SDI format as shown below.

Pattern			SDI format			
		Other than those on the right	720x487:SD	720x576:SD	3840x2160	4096x2160
COLOR BAR	100%	Y	Y	Y	Y	Y
	75%	Y	Y	N	Y	Y
	MULTI 100%	Y	N	N	Y	Y
	MULTI 75%	Y	N	N	Y	Y
	MULTI (+I)	Y	N	N	Y	Y
	SMPTE	N	Y	N	N	N
	EBU	N	N	Y	N	N
	BBC	N	N	Y	N	N
	ARIB STD-B66-2	N	N	N	Y	L*
MONITOR	-	Y	Y	Y	Y	Y
SDI	-	Y	Y	Y	N	N

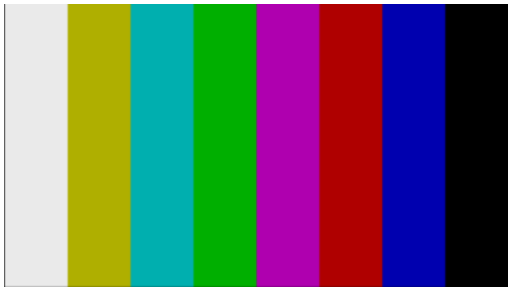
(Y: Can be selected, N: Cannot be selected, L: Can be selected but a portion of the area will not display anything)

* Because ARIB STD-B66-2 is a fixed pattern that is 3840x2160 in size, 256 dots on the right side will not display anything if displayed in the 4096x2160 size.

100%



75%



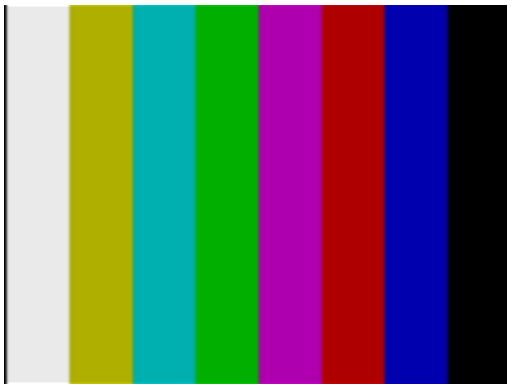
MULTI 100%

MULTI 75%

MULTI (+I)

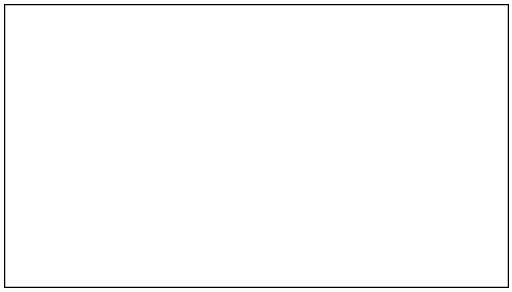
SMPTE

EBU

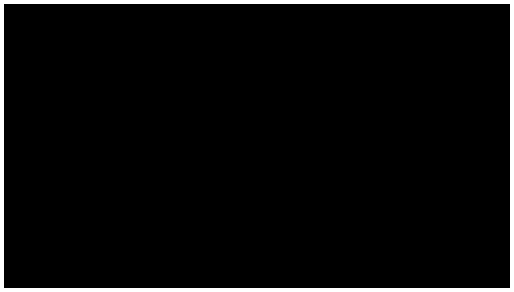


BBC

FLAT FIELD 100%

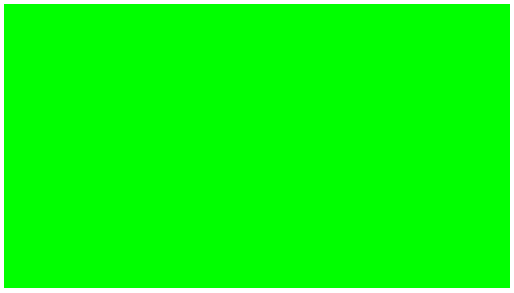


FLAT FIELD 0%

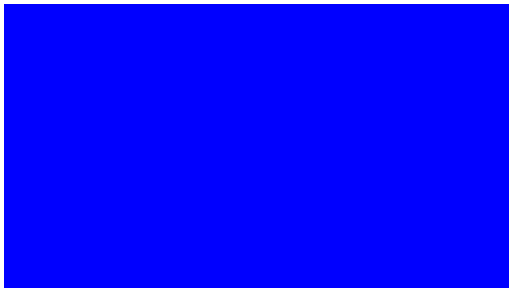


RED FIELD 100%

GREEN FILED 100%



BLUE FIELD 100%



CHECK FIELD

3.3.3 Displaying a User Pattern

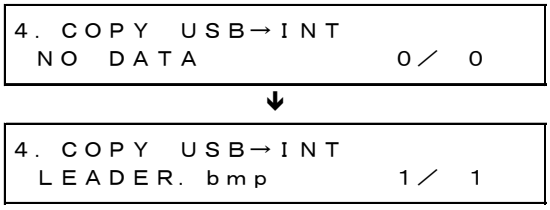
This section describes the procedure for displaying a user pattern.
In this example, the user pattern file name is “LEADER.bmp.”

1. Place the image file in the appropriate folder according to its image size in the USB memory device.

USB memory device
└ LT4610_USER
  └ USER_PATTERN
    ├ 4K
    │ └ ********.bmp
    ├ HD
    │ └ ********.bmp
    └ SD
      └ ********.bmp

2. On the COPY USB→INT menu, import the image file into the LT 4610. In this example, a 4K user pattern is imported into INT1 of the LT 4610.

[See also] 3.3.6, “Copying a User Pattern to the LT 4610”



3. On the SELECT menu, select the user pattern. If the ► mark is not shown in front of the file name, you need to transfer the file first.

[See also] 3.3.4, “Selecting a User Pattern”

```
4. USER PATTERN 1 2SI
▸*INT1    LEADER.bmp
```

(When the file has not been transferred to memory)

```
4. USER PATTERN 1 2SI
▸*INT1  ▸ LEADER.bmp
```

(When the file has been transferred to memory)

4. If the file has not been transferred to memory, you will be asked whether you want to transfer it. In the case of a 4K user pattern, it takes about 5 minutes.

```
5. FILE TRANSFER
   □OK          ■CANCEL
```

5. Set the colorimetry and range when transferring a user pattern. Select any values of your choice.

```
6. COLORIMETRY
 □601   ■709   □2020
```

```
7. RANGE
   ■NARROW   □FULL
```

6. Set whether to automatically transfer the selected user pattern on the next startup.

An asterisk appears in front of the file name for the user pattern with power on recall set to on.

```
8. POWER ON RECALL
     □YES       ■NO
```

Example

```
4. USER PATTERN 1 2SI
▸*INT1  ▸*LEADER.bmp
```

(When power on recall is set to on)

7. When the settings are complete, the file transfer begins. Do not turn off the power while the transfer is in progress.

```
   COPY USER PATTERN
     ■■□□□□□□□□   25%
```

When the transfer is complete, the user pattern is displayed.

3.3.4 Selecting a User Pattern

To select a user pattern stored in the LT 4610, follow the procedure below. User patterns are stored in separate folders (SD, HD (2K), and 4K) according to the SDI format.
The data in the folder corresponding to the selected SDI format is automatically displayed.

To display a user pattern, the pattern must first be transferred to memory. If the pattern has already been transferred, a ► mark is displayed in front of the file name.

The power on recall function is available for automatically transferring a user pattern of your choice at startup. You can set this function in the procedure for transferring user patterns to memory. An asterisk appears in front of the file name for the user pattern to be transferred using power on recall.

You need to set COLORIMETRY to BT.601, BT.709, or BT.2020 and RANGE to NARROW or FULL when transferring a file to memory.

Procedure

12G OPTION → SDI1 → PATTERN → PATTERN SELECT → USER PATTERN

3.3.5 Deleting a User Pattern

To delete user pattern data from the LT 4610, follow the procedure below. You can select any of the folders, regardless of the current SDI format.

Procedure

12G OPTION → SDI1 → PATTERN → DELETE

To clear a user pattern, follow the procedure below.

1. **Select the format.**

   Select SD, HD (2K), or 4K.

2. **Select the user patterns you want to delete.**

   Select from INT_1 to INT_8.

3. **Select the OK.**

3.3.6 Copying a User Pattern to the LT 4610

To copy up to eight user patterns from a USB memory device to the LT 4610, follow the procedure below. (Copy the user pattern data that you created on a PC to the USB memory device in advance.)
The following menu appears when a USB memory device with the following folder structure is connected.

USB memory device
└ LT4610_USER
  └ USER_PATTERN
    └ 4K
    └ HD
    └ SD

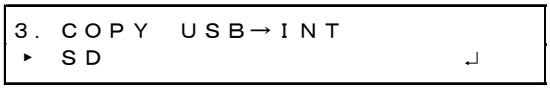
Procedure

12G OPTION → SDI1 → PATTERN → COPY USB→INT

To copy a user pattern, follow the procedure below.

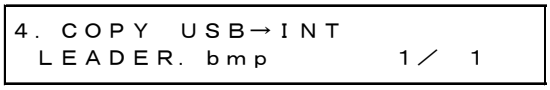
1. Select the format.

Select SD, HD (2K), or 4K.



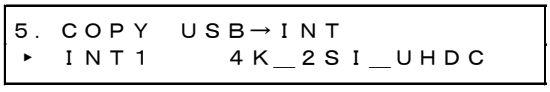
2. Select the copy source in the USB memory device.

Here, bmp files in the folder corresponding to the selected format in the USB memory device are displayed.

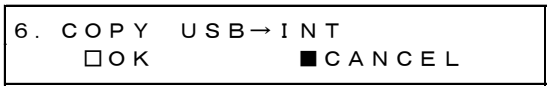


3. Select the copy destination in the LT 4610.

If there is already a user pattern stored in the LT 4610, it will be overwritten.



4. Select the OK.



● **USB Memory Device File Structure**

User patterns are copied from the USER_PATTERN folder of the USB memory device.

```
USB memory device
└ LT4610_USER
   └ USER_PATTERN
      ├ 4K
      │  └ ********.bmp
      ├ HD
      │  └ ********.bmp
      └ SD
         └ ********.bmp
```

4K folder: Save image files that are 3840×2160 or 4096×2160.

HD folder: Save image files that are 1280×720, 1920×1080, or 2048×1080.

SD folder: Save image files that are 720×487 or 720×576.

3.3.7 Copying a User Pattern to a USB Memory Device

To copy user pattern data from the LT 4610 to a USB memory device, follow the procedure below.

The following menu appears when a USB memory device with the following folder structure is connected.

```
USB memory device
└ LT4610_USER
   └ USER_PATTERN
      └ 4K
      └ HD
      └ SD
```

Procedure

12G OPTION → SDI1 → PATTERN → COPY INT→USB

To copy a user pattern, follow the procedure below.

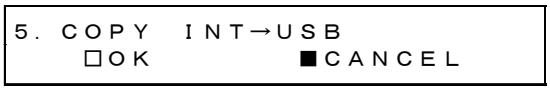
1. Select the format.

Select SD, HD (2K), or 4K.

2. Select the copy source in the LT 4610.

Select from INT_1 to INT_8.

3. Select the OK.



● USB Memory Device File Structure

User patterns are stored in the USER_PATTERN folder of the USB memory device.

USB memory device
└ LT4610_USER
  └ USER_PATTERN
    ├ 4K
    │ └ ********. bmp
    ├ HD
    │ └ ********. bmp
    └ SD
      └ ********.bmp

4K folder: Image files that are 3840×2160 or 4096×2160 are stored.

HD folder: Image files that are 1280×720, 1920×1080, or 2048×1080 are stored.

SD folder: Image files that are 720×487 or 720×576 are stored.

3.4 Turning YCbCr On and Off

To turn individual components in a YCbCr or GBR signal on and off, follow the procedure below.
This is invalid when the pattern is check field.

```
3. SDI  COMPONENT
*■Y／G     ■Cb／B     ■Cr／R
```

Procedure

12G OPTION → SDI1 → VIDEO → COMPONENT

Parameter

ON (default value) / OFF

3.5 Turning Safety Area Markers On and Off

To turn on and off the 90% marker, 80% marker, and 4:3 marker separately, follow the procedure below.
If the 4:3 marker is off, the 90% marker and 80% marker are displayed at the outer frame of the picture. If it is on, the 4:3 marker is assumed to be 100%.

For SD, you cannot set the 4:3 marker. Moreover, this is invalid when the pattern is check field.

```
3. SDI  SAFETY  AREA
 *□90%    □80%    □4:3
```

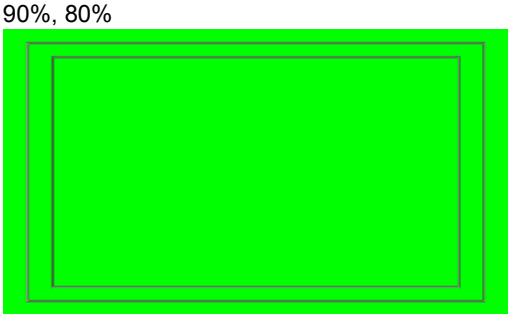
Procedure

12G OPTION → SDI1 → VIDEO → SAFETY AREA

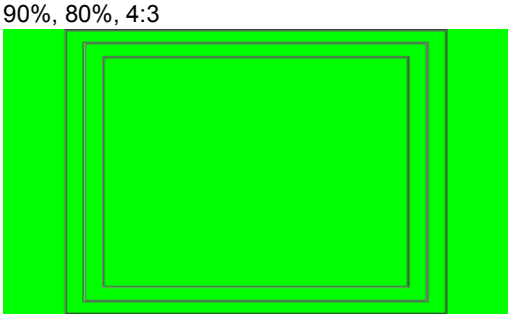
Parameter

ON / OFF (default value)

90%, 80%



90%, 80%, 4:3



3.6 Configuring the Pattern Scroll Feature

Under 12G OPTION→SDI1→VIDEO→SCROLL, you can configure pattern scrolling.
This is invalid when the pattern is check field.

3.6.1 Turning Scrolling On and Off

To turn scrolling on and off, follow the procedure shown below.

Procedure

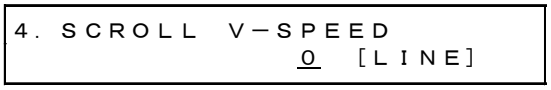
12G OPTION → SDI1 → VIDEO → SCROLL → ON/OFF

Parameter

ON / OFF (default value)

3.6.2 Setting the Vertical Scroll Speed

To select the pattern scroll speed and direction, follow the procedure below.
The unit is line/field (frame). Setting a positive value scrolls upward and a negative value downward.



Procedure

12G OPTION → SDI1 → VIDEO → SCROLL → V-SPEED

Parameter

±256 (default value: 0)

3.6.3 Setting the Horizontal Scroll Speed

To select the pattern scroll speed and direction, follow the procedure below.
The unit is dot/field (frame). Setting a positive value scrolls to the right and a negative value to the left. You can set the value in 2-dot steps.

Procedure

12G OPTION → SDI1 → VIDEO → SCROLL → H-SPEED

Parameter

±256 (default value: 0)

3.7 Setting the Pattern Change

Under 12G OPTION→SDI1→VIDEO→PATTERN CHANGE, you can set the pattern change. This is invalid when the pattern is check field.

```
2. SDI VIDEO
◆PATTERN CHANGE      ↵
```

3.7.1 Turning Pattern Change On and Off

To turn pattern change on and off, follow the procedure shown below.
If set to ON, the pattern is switched automatically between the available color bar patterns for the current format.

```
4. PATTERN CHANGE
   □ON          ■OFF
```

Procedure

12G OPTION → SDI1 → VIDEO → PATTERN CHANGE → ON/OFF

Parameter

ON / OFF (default value)

3.7.2 Setting the Pattern Change Speed

To select the pattern change interval, follow the procedure below.

```
4. PATTERN CHG SPEED
                +1 [SEC]
```

Procedure

12G OPTION → SDI1 → VIDEO → PATTERN CHANGE → SPEED

Parameter

+1 to +255 (default value: +1)

3.8 Setting ID Characters

Under 12G OPTION→SDI1→VIDEO→ID CHARACTER, set the ID characters.
A character string that you created on the LT 4610 can be displayed in a pattern.
This is invalid when the pattern is check field or when LIPSYNC on the ETC menu is set to ON.
You can also set SDI2 to SDI4 separately.

```
2. SDI VIDEO
ID CHARACTER                ↵
```

3.8.1 Turning ID Characters On and Off

To turn ID characters on and off, follow the procedure below.

```
4. ID CHARACTER
   □ON          ■OFF
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → ON/OFF

Parameter

ON / OFF (default value)

3.8.2 Recalling ID Characters

To recall ID characters that have been saved in the LT 4610 using the STORE menu, follow the procedure below.

```
4. ID RECALL
▸ LT4610.id        INT_1
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → RECALL

Parameter

INT_1 to INT_4

3.8.3 Creating ID Characters

To create ID characters, follow the procedure below. You can enter up to 20 characters.

The ID character background is displayed in black for 20 characters worth. If you enter " ◀ " at the end of the ID character string, only the background of the entered characters will be displayed in black. (" ◀ " will not appear.)
If you enter " ◀ " in the middle of the ID character string, characters after this character will disappear, and you will not be able to edit them.

```
4. ID SET
LT4610◂
```

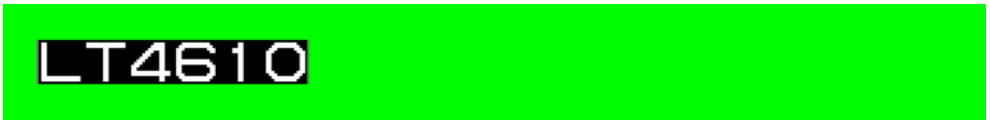
Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → SET

Parameter

◀ ! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [¥] ^ _ → ←
(Default setting: LT4610 ◀)

ID SET = LT4610 ◀



ID SET = LT4610

3.8.4 Setting the Vertical Position of ID Characters

To set the vertical position of the ID characters, follow the procedure below.
The value represents the coordinate at the top of the ID characters. The top of the pattern is 0.

```
4. ID V-POSI
                0 [LINE]
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → V-POSI

Parameter

0 to 1079 (default value: 0)

3.8.5 Setting the Horizontal Position of ID Characters

To set the horizontal position of the ID characters, follow the procedure below.
The value represents the coordinate at the left end of the ID characters. The left end of the pattern is 0.

```
4. ID  H-POSI
                    0  [DOT]
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → H-POSI

Parameter

0 to 1919 (default value: 0)

3.8.6 Selecting the Size of ID Characters

To set the size of ID characters, follow the procedure below.
The size of x1 is 32×32 dot/character.

```
4. ID  SIZE
 ■x1   □x2   □x4   □x8
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → SIZE

Parameter

x1 (default value) / x2 / x4 / x8

3.8.7 Selecting the Level of ID Characters

To set the intensity level of ID characters, follow the procedure below.

```
4. ID  LEVEL
   ■100%     □75%
```

Procedure

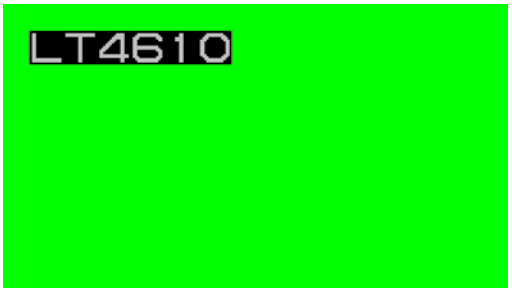
12G OPTION → SDI1 → VIDEO → ID CHARACTER → LEVEL

Parameter

100% (default value) / 75%

ID LEVEL = 100%

ID LEVEL = 75%



3.8.8 Turning ID Character Blinking On and Off

To turn ID character blinking on and off, follow the procedure below.

```
5. ID BLINK
   □ON          ■OFF
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → BLINK → ON/OFF

Parameter

ON / OFF (default value)

3.8.9 Setting the ID Character On-Time

To set the on-time of ID character blinking, follow the procedure below.

```
5. ID BLINK ON TIME
                  1 [SEC]
```

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → BLINK → ON TIME

Parameter

1 to 9 (default value: 1)

3.8.10 Setting the ID Character Off-Time

To set the off-time of ID character blinking, follow the procedure below.

```
5. ID BLINK OFF TIME
                  1 [SEC]
```

Procedure

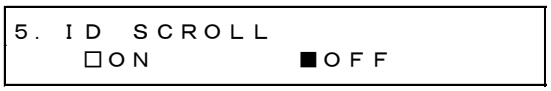
12G OPTION → SDI1 → VIDEO → ID CHARACTER → BLINK → OFF TIME

Parameter

1 to 9 (default value: 1)

3.8.11 Turning ID Character Scrolling On and Off

To turn scrolling on and off, follow the procedure shown below.
If set to ON, the ID characters scroll horizontally over the pattern.



Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → SCROLL → ON/OFF

Parameter

ON / OFF (default value)

3.8.12 Setting ID Character Scroll Speed

To set the ID character scroll speed and direction, follow the procedure below.
The unit is dot/field (frame). Setting a positive value scrolls to the right and a negative value to the left. You can set the value in 2-dot steps.

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → SCROLL → SPEED

Parameter

±256 (default value: 0)

3.8.13 Saving ID Characters

To store up to four sets of ID characters that you create on the SET menu, follow the procedure below.
Only the characters are saved. Position, size, and the like are not saved.

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → STORE

To save ID characters, follow the procedure below.

1. **Enter a file name.**

   Select STORE. The file name input menu appears. This is the name assigned to the ID characters and is also the file name when the ID characters are copied to a USB memory device.

   The characters that you can use are as follows. Up to eight characters can be entered.
   ◀ 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
   _

   Enter " ◀ " to clear characters that follow it. " ◀ " is not entered in the file name.

2. **Select the save destination in the LT 4610.**

   Select from INT_1 to INT_4. If there are already ID characters stored at the destination, they are overwritten.

3. **Select the OK.**

3.8.14 Copying ID Characters to the LT 4610

To copy up to four sets of ID characters from a USB memory device to the LT 4610, follow the procedure below. This feature is useful when you want to use multiple LT 4610s with the same settings. (Copy the ID characters to the USB memory device in advance by using the COPY INT→USB menu.)
This setting appears when a USB memory device is connected.

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → COPY USB→INT

To copy ID characters, follow the procedure below.

1. Select the copy destination in the LT 4610.

Select from INT_1 to INT_4. If there are already ID characters stored in the LT 4610, they are overwritten.

2. Select the copy source in the USB memory device.

The id file in the 12G_ID folder of the USB memory device is displayed here.

3. Select the OK.

● USB Memory Device File Structure

ID characters are copied from the 12G_ID folder of the USB memory device.

USB memory device
└ LT4610_USER
  └ 12G_ID
    └ ********.id

3.8.15 Copying ID Characters to a USB Memory Device

To copy ID characters in id format (dedicated format) from the LT 4610 to a USB memory device, follow the procedure below. This feature is useful when you want to use multiple LT 4610s with the same settings. (Save the ID characters in the LT 4610 in advance by using the STORE menu.)
This setting appears when a USB memory device is connected.

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → COPY INT→USB

To copy ID characters, follow the procedure below.

1. Select the copy source in the LT 4610.

Select ALL or from INT_1 to INT_4.

2. Select the OK.

If there are already ID characters with the same file names stored in the USB memory device, they will be overwritten. If ALL is selected and ID characters with the same file name are saved in INT_1 to INT_4, only a single set with the largest number (INT_*) is saved.

● USB Memory Device File Structure

ID characters are copied to the 12G_ID folder of the USB memory device.

● "******.id" example**

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3.8.16 Clearing ID Characters

To clear ID characters that have been saved in the LT 4610 using the STORE menu, follow the procedure below.

Procedure

12G OPTION → SDI1 → VIDEO → ID CHARACTER → DELETE

To clear ID characters, follow the procedure below.

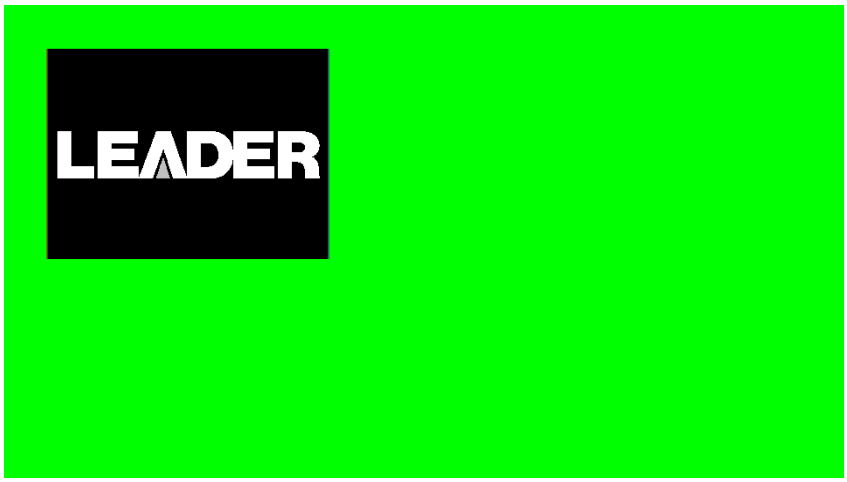
1. **Select the ID characters you want to clear.**

   Select ALL or from INT_1 to INT_4.

2. **Select the OK.**

3.9 Setting Logos

Under 12G OPTION→SDI1→VIDEO→LOGO, you can set the logo.
A 4-level monochrome image that you created on your PC can be displayed in a pattern.
This is invalid when the pattern is check field or when LIPSYNC on the ETC menu is set to ON.
You can also set SDI2 to SDI4 separately.



3.9.1 Display procedure

This section describes the procedure from creating a logo to displaying it in a pattern. In this example, the logo file name is “LEADER.bmp.”

1. Create a logo on your PC.

Create an image in bmp format according to the following conditions.

File name:	Up to eight characters (excluding the extension) consisting of alphanumeric characters or underscore.
File format:	24 bits, 256 colors or 16 colors
File size:	Up to 320 dots × 240 lines (width × height)

LEADER.bmp

2. Using the accompanying Logo App, convert it to lg format.

The image is converted into 4-level monochrome data.

LEADER.lg

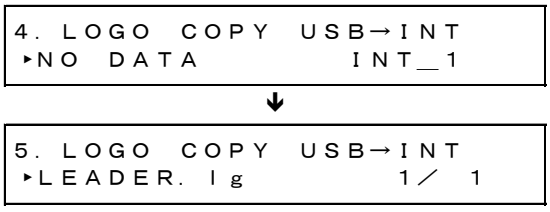
3. Place the converted logo in the USB memory device.

USB memory device
└ LT4610_USER
  └ 12G_LOGO
    └ LEADER.lg

4. On the COPY USB→INT menu, import the logo into the LT 4610.

In this example, the file is imported into INT_1 of the LT 4610.

[See also] Section 3.9.8, “Copying Logos to the LT 4610”



5. On the SELECT menu, select the logo.

[See also] Section 3.9.3, “Selecting a Logo”

```
4. LOGO SELECT
▸*LEADER. Ig        INT_1
```

6. On the ON/OFF menu, select ON.

[See also] Section 3.9.2, “Turning the Logo On and Off”

```
4. LOGO
   ■ON          □OFF
```

3.9.2 Turning the Logo On and Off

To turn the logo on and off, follow the procedure below.

```
4. LOGO
   □ON          ■OFF
```

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → ON/OFF

Parameter

ON / OFF (default value)

3.9.3 Selecting a Logo

To select the logo to be displayed, follow the procedure below.
A logo must be copied to INT_1 to INT_4 in advance using the COPY USB→INT menu.

```
4. LOGO SELECT
▸*LEADER. Ig        INT_1
```

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → SELECT

Parameter

INT_1 to INT_4 (default value: INT_1)

3.9.4 Setting the Vertical Logo Position

To set the vertical logo position, follow the procedure below.
The value represents the coordinate at the top of the logo. The top of the pattern is 0.

```
4. LOGO  V-POSI
                 0  [LINE]
```

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → V-POSI

Parameter

0 to 1079 (default value: 0)

3.9.5 Setting the Horizontal Logo Position

To set the horizontal logo position, follow the procedure below.
The value represents the coordinate at the left end of the logo. The left end of the pattern is 0.

```
4. LOGO  H-POSI
                 0  [DOT]
```

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → H-POSI

Parameter

0 to 1919 (default value: 0)

3.9.6 Setting the Logo Level

To set the logo intensity level, follow the procedure below.
Logos are made of 4-level monochrome data (LEVEL0, LEVEL1, LEVEL2, LEVEL3). You can set the display intensity level for each level.
When LOGO BACKGND is set to ON, LEVEL0 is invalid.

```
5. LOGO  LEVEL0
          100h  (  0%)
```

```
5. LOGO  LEVEL1
          590h  ( 33%)
```

```
5. LOGO  LEVEL2
          A20h  ( 66%)
```

```
5. LOGO  LEVEL3
          EB0h  (100%)
```

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → LEVEL → LEVEL0 / LEVEL1 / LEVEL2 / LEVEL3

Parameter

100h(0%) to EB0h(100%)
(LEVEL0 default value: 100h(0%), LEVEL1 default value: 590h(33%),
LEVEL2 default value: A20h(66%), LEVEL3 default value: EB0h(100%))

3.9.7 Setting the Logo Transparency

To select whether to make the area set to LEVEL0 transparent, follow the procedure below.

```
5. LOGO BACKGND
   □ON          ■OFF
```

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → BACKGND

Parameter

ON:	The area is made transparent.
OFF:	The area is not made transparent. (default setting)

LOGO BACKGND = ON

LOGO BACKGND = OFF

3.9.8 Copying Logos to the LT 4610

To copy up to four logos from a USB memory device to the LT 4610, follow the procedure below. (Copy the logos to the USB memory device or place the logos created on your PC in advance by using the COPY INT→USB menu.)
This setting appears when a USB memory device is connected.

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → COPY USB→INT

To copy logos, follow the procedure below.

1. Select the copy destination in the LT 4610.

Select from INT_1 to INT_4. If there are already logos stored at the destination, they are overwritten.

```
4. LOGO COPY USB→INT
▸NO DATA          INT_1
```

2. Select the copy source in the USB memory device.

The lg file in the 12G_LOGO folder of the USB memory device is displayed here.

```
5. LOGO COPY USB→INT
▸LEADER.lg          1/ 1
```

3. Select the OK.

```
6. LOGO COPY USB→INT
   ■OK          □CANCEL
```

● USB Memory Device File Structure

Logos are copied from the 12G_LOGO folder of the USB memory device.

3.9.9 Copying Logos to a USB Memory Device

To copy logos in lg format (dedicated format) from the LT 4610 to a USB memory device, follow the procedure below. Copy a logo to the LT 4610 in advance using the COPY USB→INT menu.
This setting appears when a USB memory device is connected.

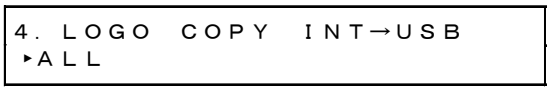
Procedure

12G OPTION → SDI1 → VIDEO → LOGO → COPY INT→USB

To copy logos, follow the procedure below.

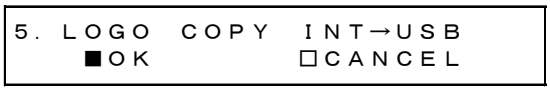
1. Select the copy source in the LT 4610.

Select ALL or from INT_1 to INT_4.



2. Select the OK.

If there are already logos with the same file names stored in the USB memory device, they will be overwritten. If ALL is selected and logos with the same file name are saved in INT_1 to INT_4, only a single set with the largest number (INT_*) is saved.



● USB Memory Device File Structure

Logos are copied to the 12G_LOGO folder of the USB memory device. (See section 3.9.8, “Copying Logos to the LT 4610.”)
For details on selecting the date and time of files, see the LT 4610 SYNC GENERATOR instruction manual.

3.9.10 Clearing a Logo

To clear the logos that you copied to the LT 4610 using the COPY USB→INT menu, follow the procedure below.

Procedure

12G OPTION → SDI1 → VIDEO → LOGO → DELETE

To clear logos, follow the procedure below.

1. **Select the logos you want to clear.**

   Select ALL or from INT_1 to INT_4.

2. **Select the OK.**

3.10 Setting the Moving Box

Under 12G OPTION→SDI1→VIDEO→MOVING BOX, you can set the moving box.
This is invalid when the pattern is check field.

3.10.1 Turning the Moving Box On and Off

To turn moving box on and off, follow the procedure below.

Procedure

12G OPTION → SDI1 → VIDEO → MOVING BOX → ON/OFF

Parameter

ON / OFF (default value)

3.10.2 Setting the Box Color

To set the moving box color, follow the procedure below.

```
4. BOX COLOR
▸* WHITE
```

Procedure

12G OPTION → SDI1 → VIDEO → MOVING BOX → BOX COLOR

Parameter

WHITE (default value) / YELLOW / CYAN / GREEN / BLUE / RED / MAGENTA / BLACK

3.10.3 Setting the Vertical Moving Speed

To set the moving speed, follow the procedure below.

```
4. MOVING BOX V-SPEED
◂▸* MIDDLE
```

Procedure

12G OPTION → SDI1 → VIDEO → MOVING BOX → V-SPEED

Parameter

LOW / MIDDLE (default value) / HIGH

3.10.4 Setting the Horizontal Moving Speed

To set the moving speed, follow the procedure below.

```
4. MOVING BOX H-SPEED
◂▸* MIDDLE
```

Procedure

12G OPTION → SDI1 → VIDEO → MOVING BOX → H-SPEED

Parameter

LOW / MIDDLE (default value) / HIGH

3.10.5 Setting the Vertical Box Size

To set the vertical size of the box, follow the procedure below.

```
4. MOVING BOX V-SIZE
◂▸* SIZE2
```

Procedure

12G OPTION → SDI1 → VIDEO → MOVING BOX → V-SIZE

Parameter

SIZE1 / SIZE2 (default value) / SIZE3 / SIZE4 / SIZE5

3.10.6 Setting the Horizontal Box Size

To set the horizontal size of the box, follow the procedure below.

```
4. MOVING BOX H-SIZE
◂▸* SIZE2
```

Procedure

12G OPTION → SDI1 → VIDEO → MOVING BOX → H-SIZE

Parameter

SIZE1 / SIZE2 (default value) / SIZE3 / SIZE4 / SIZE5

3.11 Turning Lip Sync On and Off

To turn lip sync pattern on and off, follow the procedure below.

When turned on, the LT 4610 outputs lip sync patterns. Combining this with our lip-sync-compatible waveform monitor makes it possible to measure the offset between the video signal and the audio signal that occurs in the transfer route for each channel. For details, see the instruction manual of the waveform monitor.

This is invalid when the SDI signal pattern is check field.

```
4. SDI 1 LIPSYNC
   □ON          ■OFF
```

Procedure

12G OPTION → SDI1 → VIDEO → LIPSYNC → ON/OFF

Parameter

ON / OFF (default value)

If set to ON, set all audio channels as follows on the SDI menu for SDI signals and the AES/EBU menu for AES/EBU signals.
These settings are factory default settings.

	Item	Value
SDI menu	AUDIO ON/OFF	ON
	FREQ	1kHz
	LEVEL	-20
	RESOLUTION	20BIT
	EMPHASIS	OFF
AES/EBU menu	AES/EBU ON/OFF	ON
	FREQ	1kHz
	LEVEL	-20
	RESOLUTION	20BIT
	EMPHASIS	OFF

3.12 Configuring Embedded Audio

16 (HD(DL)) audio channels (32 channels for 3G-B) can be embedded in an SDI signal. (Embedding is not possible when the pattern is a check field.)

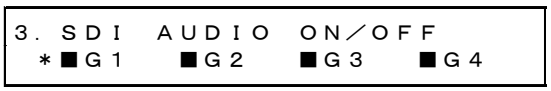
Channels 1 to 4, 5 to 8, 9 to 12, and 13 to 16 are called group 1, 2, 3, and 4, respectively. The frequency, level, and the like can be set for each channel separately.

In addition, if you link the group 2 settings to the group 1 settings, you only need to set group 1, and the group 2 settings will automatically be set to the same values as group 1.

<table>
<tr><td rowspan="17">SDI signal</td><td rowspan="16">Link A
(HD(DL), 3G-B only)</td><td rowspan="4">Group 1</td><td>Ch1</td></tr>
<tr><td>Ch2 (Ch1 also possible)</td></tr>
<tr><td>Ch3 (Ch1 also possible)</td></tr>
<tr><td>Ch4 (Ch1 also possible)</td></tr>
<tr><td rowspan="4">Group 2
(can also be set
equal to group 1)</td><td>Ch5</td></tr>
<tr><td>Ch6 (Ch5 also possible)</td></tr>
<tr><td>Ch7 (Ch5 also possible)</td></tr>
<tr><td>Ch8 (Ch5 also possible)</td></tr>
<tr><td rowspan="4">Group 3
(can also be set
equal to group 1)</td><td>Ch9</td></tr>
<tr><td>Ch10 (Ch9 also possible)</td></tr>
<tr><td>Ch11 (Ch9 also possible)</td></tr>
<tr><td>Ch12 (Ch9 also possible)</td></tr>
<tr><td rowspan="4">Group 4
(can also be set
equal to group 3)</td><td>Ch13</td></tr>
<tr><td>Ch14 (Ch13 also possible)</td></tr>
<tr><td>Ch15 (Ch13 also possible)</td></tr>
<tr><td>Ch16 (Ch13 also possible)</td></tr>
<tr><td>Link B
(HD(DL), 3G-B only)
(can also be set to link A)</td><td colspan="2">Same as link A</td></tr>
</table>

3.12.1 Turning the Audio On and Off

To turn the audio on or off at the group level, follow the procedure below.



Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B) → ON/OFF

Parameter

ON (default value) / OFF

3.12.2 Selecting the Resolution

To select the resolution for the selected group, follow the procedure below.
If the output signal is 525/59.94I, not all groups can be set to 24BIT. Up to three groups can be set to 24BIT.

Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B) → G1 / G2 / G3 / G4 → RESOLUTION

Parameter

20BIT (default value) / 24BIT

3.12.3 Selecting the Pre-emphasis Mode

To select the pre-emphasis mode for the selected group, follow the procedure below.

Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B) → G1 / G2 / G3 / G4 → EMPHASIS

Parameter

50/15 / CCITT / OFF (default value)

3.12.4 Selecting the Frequency

To select the frequency of the selected channel, follow the procedure below.

Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B)
→ G1 → CH1 / CH2 / CH3 / CH4 → FREQ
→ G2 → CH5 / CH6 / CH7 / CH8 → FREQ
→ G3 → CH9 / CH10 / CH11 / CH12 → FREQ
→ G4 → CH13 / CH14 / CH15 / CH16 → FREQ

Parameter

SILENCE / 400Hz / 800Hz / 1kHz (default value)

3.12.5 Setting the Level

To set the level of the selected channel, follow the procedure below.

```
5. G1／CH1  LEVEL
              －20  [dBFS]
```

Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B)
→ G1 → CH1 / CH2 / CH3 / CH4 → LEVEL
→ G2 → CH5 / CH6 / CH7 / CH8 → LEVEL
→ G3 → CH9 / CH10 / CH11 / CH12 → LEVEL
→ G4 → CH13 / CH14 / CH15 / CH16 → LEVEL

Parameter

-60 to 0 (default value: -20)

3.12.6 Setting Clicks

You can insert click sounds into the selected channel. Follow the procedure below to set the insertion interval to a value other than OFF.

```
5. G1／CH1  CLICK
▸*OFF
```

Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B)
→ G1 → CH1 / CH2 / CH3 / CH4 → CLICK
→ G2 → CH5 / CH6 / CH7 / CH8 → CLICK
→ G3 → CH9 / CH10 / CH11 / CH12 → CLICK
→ G4 → CH13 / CH14 / CH15 / CH16 → CLICK

Parameter

OFF (default value) / 1sec / 2sec / 4sec

3.12.7 Settings Shared by Links

If the output signal is HD(DL) or 3G-B, the link B settings can be linked to link A settings by following the procedure below to select ON. In this situation, link B cannot be set.

```
4. SDI  L－B  EQUAL  L－A
     ■ON          □OFF
```

Procedure

12G OPTION → SDI1 → AUDIO → LINK-B → EQUAL TO LINK-A

Parameter

ON / OFF (default value)

3.12.8 Settings Shared by Groups

You can link the group 2 settings to the group 1 settings by following the procedure below to set G2 EQUAL TO G1 to ON. In this situation, group 2 cannot be set.
The same holds true for G3 EQUAL TO G1 and G4 EQUAL TO G3.

Procedure

12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B)
→ G2 → EQUAL TO G1
→ G3 → EQUAL TO G1
→ G4 → EQUAL TO G3

Parameter

ON / OFF (default value)

3.12.9 Settings Shared by Channels

You can link the channel 2 setting to the channel 1 setting by following the procedure below to set G1/CH2 EQUAL CH1 to ON. In this situation, channel 2 cannot be set.
The same holds true for the other similar settings.

Procedure

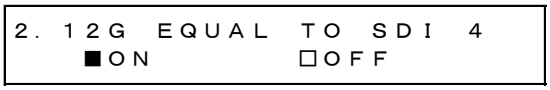
12G OPTION → SDI1 → AUDIO (→ LINK-A / LINK-B)
→ G1 → CH2 / CH3 / CH4 → EQUAL TO CH1
→ G2 → CH6 / CH7 / CH8 → EQUAL TO CH5
→ G3 → CH10 / CH11 / CH12 → EQUAL TO CH9
→ G4 → CH14 / CH15 / CH16 → EQUAL TO CH13

Parameter

ON / OFF (default value)

3.13 Common SDI Signal Settings

You can link the SDI2 and SDI3 settings to the SDI1 setting and the SDI4 setting to the SDI3 setting by following the procedure below to select ON.
When linked, SDI2 to SDI4 cannot be set.



Procedure

12G OPTION → SDI2 → EQUAL TO SDI1
12G OPTION → SDI3 → EQUAL TO SDI1
12G OPTION → SDI4 → EQUAL TO SDI3

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