Leader

LT4448

CHANGEOVER

3G/LTC/DUAL AC POWER/SNMP/WEB BROWSER

3G SDI | HD SDI | SD SDI

General

The LT4448 is a changeover unit that automatically switches the signal from the primary signal to the backup signal when problems are detected in the primary signal.
A single LT4448 has 11 BNC channels and 3 LTC channels. These channels can receive SDI,NTSC/PAL black burst, HD tri-level sync, AES/EBU digital audio, word-clock signals, and LTC signals. SDI signals are switched with relays; all other signals are switched with electronic switches. The LT4448 has redundant power supplies. Alarms are generated when errors occur.
The LT4448 is used in combination with the LT4610/LT4611 (SYNC GENERATOR) or the LT4600A(MULTIFORMAT VIDEO GENERATOR).

Features

Input / Output
Provides 11 channels (a single channel consists of a primary input, a backup input, and an output) on a single LT4448.

Input Signal Switching
Relays are used to switch channels 1 and 2. Electronic switches are used to switch channels 3 to 11. In addition to the electronic switches, channels 3 to 11 are also equipped with high-speed, error detection circuits. The LT4448 provides 3 channels of LTC.

Input Signal Selection
Channel 1 and 2 inputs are dedicated inputs for SDI (3G/HD/SD), NTSC/PAL Black burst and Tri-Level Sync signals.
Channel 3 to 8 inputs are dedicated inputs for NTSC/PAL Black burst and Tri-Level Sync signals. Channel 9 and 10 inputs are dedicated inputs for AES/EBU digital audio signals. Channel 11 input is a dedicated input for word-clock signals (TTL). For LTC signals, dedicated LTC inputs / outputs (2Vp-p,differencial input) are provided.

LTC Channel
There are 3 LTC channels. Each has 2 inputs (primary, backup) and 1 output. In addition, the LT4448 can be connected to the LT4610 (SYNC GENERATOR) with a dedicated cable (optional).

Fault detection
When an input signal level error is detected, the panel fault LED on the LT4448 illuminates as well as the panel LED that indicates the channel which is causing the problem. This feature allows for quick notification of the error. Channels 3 to 11 are equipped with high-speed fault detection circuits. When interruptions occur in the primary signal, these enable the LT4448 to switch to a backup signal with barely any noticeable disturbances showing on a monitor.

Power Supply Start Time
A delay for starting the fault detection at power up can be set to approximately 1 minute or approximately 4 minutes, depending on the rise time of the system signal source that the LT4448 is connected to.

SNMP Ready
Error monitoring over an Ethernet network is possible. Traps are issued for error detection, panel control, and remote control. In addition, the error details and DIP switch settings (except for the user defined fault detection level) can be read as status information. IP address configuration software is included. (Windows 8 , Windows 10)

Redundant Power Supply
Redundant power supply provides extra reliability. Alarms are generated when an error occurs.

Web Browser
The LT4448 can be controlled by a web browser.

Combination of LT4610 and LT4448

Combination of LT4600A and LT 4448

Specifications

Compliant Standard

SDI Signal

3G-SDI	SMPTE ST 372,424,425
HD-SDI (Include Dual Link).	SMPTE ST 274,292,296
SD-SDI	SMPTE ST 125,259

Sync Signal

NTSC Black Burst Signal	SMPTE ST 170,318,154
PAL Black Burst Signal	ITU-R BT.1700,EBU N14
Tri-Level Sync Signal	SMPTE ST 274,296
AES/EBU Digital Audio Signal	AES3,SMPTE ST 276
LTC Signal	SMPTE 12M-1

I/O Connectors

Primary Input Connectors

Ch1 to 10	10 input connectors (75Ω BNC)
Ch11	1 input connector (TTL, 75Ω BNC)

Backup Input Connectors

Ch1 to 10	10 input connectors (75Ω BNC)
Ch11	1 input connector (TTL, 75Ω BNC)

Output	10 output connectors (75 Ω BNC)
	1 output connector (+5V CMOS, 75Ω BNC)

LTC Connectors

Connector	25-pin D-sub (input and output shared)
Number of Inputs	3 systems each 2 inputs (PRIMARY, BACKUP)
Number of Outputs	3 systems 1 output (OUTPUT)

I/O Characteristics

Ch1 and 2(typical)

Return Loss	30dB (0 to10MHz)
	15dB (10 to1.5GHz)
	10dB (1.5 to 3GHz)
Insertion Loss	0.2dB (0 to 10MHz)
	0.5dB (10 to 500MHz)
	2.0dB (1.5 to 3GHz)
Crosstalk	-60dB (0 to 10MHz)
	-48dB (10MHz to 1.5GHz)
	-40dB (1.5 to 3GHz)
Impedance	External termination
Maximum Input Voltage	±5V

Ch3 to 10

Return Loss	30dB (0 to 10MHz, Internally terminated)
Insertion Loss	0.3dB (0 to 10MHz)
Crosstalk	-55dB (0 to 10MHz)
	-45dB (10 to 30MHz)
Input Impedance	75Ω
Output Impedance	75Ω
Maximum Input Voltage	±1.5V

Ch11

Input Impedance	Approx. 4kΩ
Output Impedance	Approx. 60Ω
Maximum Input Voltage	0V/+5V (TTL)

LTC

Input Impedance	10kΩ (Balance)
Input Signal Level	0.5～4Vp-p
Output Impedance	600Ω (Balance)
Output Signal Level	2Vp-p±10%
Input Channel number	LTC1,LTC2,LTC3 (3CH inputs)
Output Channel number	LTC1,LTC2,LTC3 (3CH outputs)

GPI(Shared with LTC Connector)

LT4610 Alarm outputs

Input	PRIMARY,BACKUP each1
Output	PRIMARY,BACKUP each1
Output Method	Through
Output Signal Level	5V CMOS

Input Signals

Setting Method	Select the input signal type with DIP switches or Web (Browser) for each channel.
Ch1 and2	NTSC black burst signal PAL black burst signal HD tri-level signal SD-SDI signal (270Mb/s) HD-SDI signal (1.485Gb/s) 3G-SDI signal (2.97Gb/s)
Ch3 to 8	NTSC black burst signal PAL black bust signal HD tri-level sync signal
CH9 and10	AES/EBU digital audio signal
11ch	Word-clock signal (TTL)
LTC	LTC Signal

Signal Switching

Switching Method	
Ch1 and 2	Relays
Ch3 to 11, LTC	Electrical switches
Switch Time of the Relay (*1)	
Ch1 and 2	2ms or less
High-speed Switch Time	
Ch3 to 11,LTC	100ns or less
Switch Time due to Fault Detection	
Ch1 and 2, LTC	70ms or less
Ch3 to 8	
High-Speed Detection	1.5H or less
Low-Speed Detection	60ms or less
Ch9 and 10	
High-Speed Detection	6us or less
Low-Speed Detection	60ms or less
Ch11	
High-Speed Detection	60us or less
Low-Speed Detection	60ms or less

*1 This is the time it takes for the signal to stabilize after the relay is switched.

Fault Detection

Fault Indication	Indicates with LEDs the problematic signal system (PRIMARY or BACKUP) if a fault is detected.
Fault Channel Indication	Indicates with LEDs the problematic channels when a fault is detected
DC Offset	±30mV (sync signal only)
High-Speed Detection	Detects a fault when a signal drops out.
Low-Speed Detection	Detects a fault when a signal level falls below the detection level.
Detection Level	2 to 5 dB below the specified level.
Detection Reference	
Ch1 to 11	Select LOW, HIGH, or user-defined level with DIP switches for each input signal type.

LOW Level (*1)

NTSC Black Burst Signal	-180 to -227mV (-286mV)
PAL Black Burst Signal	-190 to -238mV (-300mV)
HD Tri-Level Signal	337 to 476mV (600mV)
SD-SDI Signal (270Mb/s)	450 to 635mV (800mV)
HD-SDI Signal (1.485Gb/s)	450 to 635mV (800mV)
3G-SDI Signal (2.97Gb/s)	450 to 635mV (800mV)
AES/EBU Digital Audio Signal	631 to 794mV (1000mV)
Word-clock Signal	1515 to 1907mV (2400mV)

HIGH Level (*1)

NTSC Black Burst Signal	-210～-264mV (-286mV)
PAL Black Burst Signal	-220～-277mV (-300mV)
HD Tri-Level Signal	379～535mV (600mV)
SD-SDI Signal (270Mb/s)	505～713mV (800mV)
HD-SDI Signal (1.485Gb/s)	505～713mV (800mV)
3G-SDI Signal (2.97Gb/s)	505～713mV (800mV)
AES/EBU Digital Audio Signal	734～924mV (1000mV)
Word-clock Signal	1759～2215mV (2400mV)

User-defied level (*2)

Ch1 to 8	-100～-700mV (when a signal that is equivalent to a horizontal sync signal is applied)
Ch9 and 10	100～1400mV (p-p value of input signal)
Ch11	500～3000mV (high level of input signal)
LTC	Signal amplitude 300mVp-p or less

Time from When the LT4448 Turns On to When Error Detection Starts (*3)

Approx. 10s (no delay)
Approx. 1min. (60 to 80s)
Approx. 2min. (120 to 140s)
Approx. 4min. (240 to 320s)

*1 Depending on the instrument that you are using, there will be deviations in the detection level within the ranges shown.
The parenthetical values are levels during normal operation.
*2 Depending on the shape of the waveform, the detection level that you have set may not be reached.
*3 The recommended setting when the power is started simultaneously with the LT4610 is about 2 minutes.

Alarm Detection

Alarm Indications	Indicates with LEDs when errors are detected in output signals (channels 3 to 11), or power supply.
Detection Setting	ON / OFF (*1)

*1 If set to OFF, the alarm detection is disabled only for the output connector.

Key Lock

Lock and Unlock	Hold down the KEY LOCK key.
Auto Key Lock	Automatically locks the keys after 60 seconds of inactivity (no key operations)

External Control Connectors

Remote Connector

Use	Remote control
Input	SYNC SOURCE, AUTO SWITCHING, RESET
Output	SYNC SOURCE, FAULT
Connector	9-pin D-sub (female)
Locking Screws	#4-40 inch screw

Ethernet Port

Use	Monitoring of error occurrence and remote control by external PC.
Compliant Status	10BASE-T / 100BASE-TX (Auto switching)
Protocol	
SNMP(SNMPv2c)	Remote monitoring, alarm .
HTTP	Control by Browser
Supported browsers	FireFox (latest) Google Chrome (latest) Microsoft Edge (latest) IE9 or later (IE9, IE10, IE11)
Connector	RJ-45
SNMP Read Community (*1)	LDRUser (factory default)
SNMP Write Community (*1)	LDRAdm (factory default)
SNMP Trap Community (*1)	LDRUser (factory default)
SNMP negotiation	AUTO

*1 The SNMP Community name can be changed with the included software or the HTTP server feature.

USB Port

Use	IP address configuration
Compliant Standards	USB 2.0
Connector	Type B

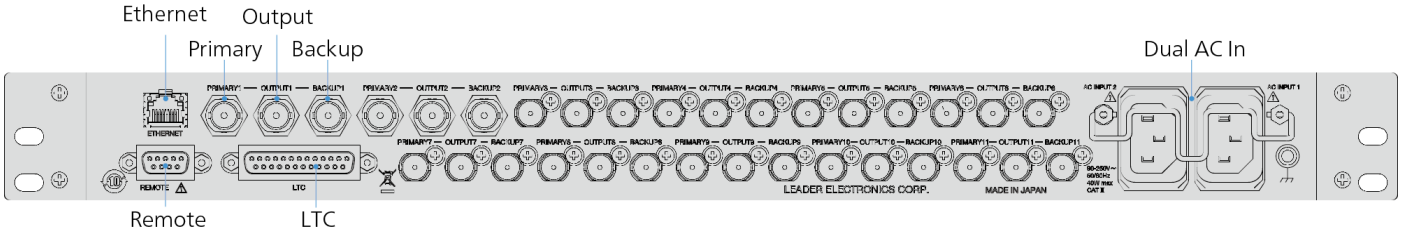
General Specifications

Voltage	AC 90 to 250VAC（50/60Hz）
Power Consumption	25Wmax
Dimensions(WHD)	426 × 44 × 400mm (excluding protrusions)
Weight	4.0kg

Related Accessories

LC 2183 LTC Connection Cables
Conversion cables (1.5 m) for the 25-pin D-sub LTC connector of the LT4448, the two 15-pin D-sub LTC connectors for PRIMARY and BACKUP connected to the LT4610/LT4611, and the three XLR connectors for LTC output.

Rear Panel



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⚠ Safety Precautions

In order to use the product correctly and safely, carefully read the instruction manual prior to first use.

Specified product specifications are subject to change without notice.

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