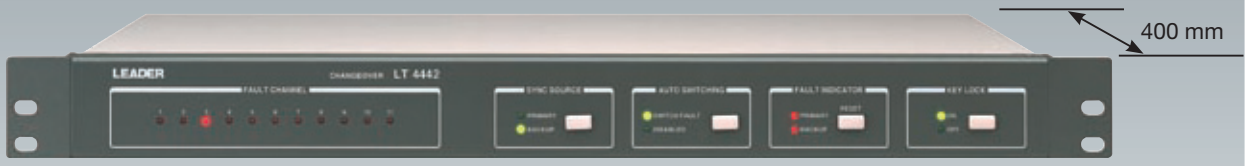
VIDEO CHANGEOVER

The LT4442 is a changeover unit that switches to the backup system when failures occur.

New

RoHS



LT 4442 CHANGEOVER

GENERAL

The LT 4442 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. Two systems of input signals (primary and backup) are connected to the LT 4442, and the LT 4442 detects errors in the amplitude of the primary input signal.

A single LT 4442 provides 11 channels. Depending on the configuration of the internal switches, SDI (channels 1 to 3 only), analog black burst, tri-level sync, AES/EBU digital audio, and word-clock signals can be received by the channels.

Relays are used to switch channels 1 to 3. Electronic switches are used to switch channels 4 to 11.

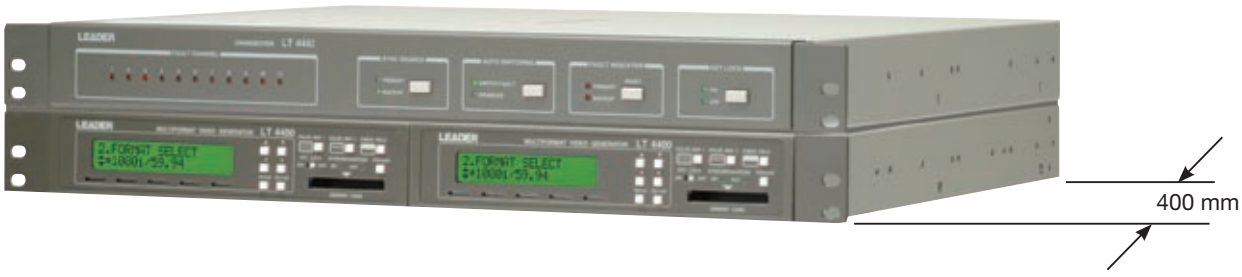
In addition to the electronic switches, channels 4 to 11 are also equipped with high-speed, error detection circuits. When trouble such as a signal interruption occurs, the LT 4442 can quickly switch to a signal that has a small amount of glitches. (NTSC or PAL analog black burst, tri-level sync, AES/EBU digital audio, and word-clock signals can be received.)

If a switch occurs from a primary signal to a backup signal, the LT 4442 lights the panel LED that indicates the channel that is causing the problem.

FEATURES

- **Provides 11 channels (a single channel consists of a primary input, a backup input, and an output) on a single LT 4442.**
- **The LT 4442 uses electronic switches for switching channels 4 to 11. It also uses high-speed detection circuits for detecting errors. These enable the LT 4442 to switch to a backup signal with barely any disturbances shown on the screen when problems such as interruptions occur in the primary signal.**
- **The channel 9 and 10 inputs are dedicated inputs for AES/EBU digital audio signals.**
- **The channel 11 input is a dedicated input for word-clock signals. The channel receives TTL signals and transmits +5 V CMOS signals.**
- **The delay for starting the error monitoring at power up can be set to FAST or SLOW depending on the rise time of the system signal source that the LT 4442 is connected to.**
- **By using the internal preset switches, you can switch between the level detection of SDI (only supported on channels 1 to 3), NTSC or PAL analog black burst, and HD analog tri-level sync signals.**
- **AES/EBU digital audio and word-clock signals are received through dedicated connectors.**
- **When a signal level error is detected, the LT 4442 lights the error LED on the panel as well as the panel LED that indicates the input channel that is causing the problem. This feature allows quick investigation of the problem.**
- **The depth of the LT 4442 matches the LT 4400. This enables you to construct a system that is 2U in size by combining the LT 4442 with the LT 4400.**

LT 4442 and LT 4400 Combination



SPECIFICATIONS LT 4442

Input

Primary Input: 10 input connectors (75 Ω BNC connectors)
1 input connector (TTL input, 75 Ω BNC connector)

Backup Input: 10 input connectors (75 Ω BNC connectors)
1 input connector (TTL input, 75 Ω BNC connector)

Output

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

I/O Characteristics

Return Loss

Relay Switches (CH1–CH3): 30 dB (0 to 10 MHz)
15 dB (10 to 750 MHz)
10 dB (750 MHz to 1.5 GHz)
Electronic Switches (CH4–CH10): 30 dB (0 to 10 MHz, internally terminated)
Electronic Switches (CH11): TTL input

Insertion Loss

Relay Switches (CH1–CH3): 0.2 dB (0 to 10 MHz)
0.5 dB (10 to 200 MHz)
2.0 dB (200 MHz to 1.5 GHz)
Electronic Switches (CH4–CH10): 0.3 dB (0 to 10 MHz)
Electronic Switches (CH11): TTL input

Crosstalk

Relay Switches (CH1–CH3): -60 dB (0 to 10 MHz)
-30 dB (10 MHz to 1.0 GHz)
-20 dB (1.0 to 1.5 GHz)
Electronic Switches (CH4–CH10): -55 dB (0 to 10 MHz)
-45 dB (10 to 30 MHz)
Electronic Switches (CH11): TTL input

Maximum Switch Voltage

Relay Switches (CH1–CH3): ±5 V
Electronic Switches (CH4–CH10): ±1.5 V
Electronic Switches (CH11): -0 V; +5 V for dedicated TTL word-clock input

Amount of Time to Switch Channels Using Panel Switches

Relay Switches (CH1–CH3): 10 ms or less
Electronic Switches (CH4–CH11): 100 ns or less

Error Detection Switch Time

Time until the LT 4442 switches to a backup signal after the primary signal is interrupted

Relay Switches (CH1–CH3): 70 ms or less
Electronic Switches (CH4–CH8): 90 µs or less
When the LT 4442 is receiving NTSC or PAL black burst signals, it detects the first loss of the horizontal sync signal as an error. When the LT 4442 is receiving tri-level sync signals, it detects the second loss of the horizontal sync signal as an error.
Electronic Switches (CH9, CH10): 6 µs or less
When the LT 4442 is receiving AES/EBU signals, it detects the loss of the signal for 5 µs or more as an error.
Electronic Switches (CH11): 60 µs or less
When the LT 4442 is receiving word-clock signals, it detects the loss of the signal for 50 µs or more as an error.

Time until Determination Starts

You can select from two types of delays for starting the error monitoring at power up depending on the rise time of the system signal source that the LT 4442 is connected to.

FAST: 1 minute or more (60 to 80 seconds)
SLOW: 4 minutes or more (240 to 320 seconds)

Types of Input Signals

Use the internal DIP switches to select the types of signals that you will apply to each of the LT 4442 channels.

Signal Type

Relay Switches (CH1–CH3): HD-SDI (1.485 Gb/s), SD-SDI (270 Mb/s), SD-SDI (143 Mb/s), tri-level sync, NTSC black burst, and PAL black burst
Electronic Switches (CH4–CH8): NTSC black burst, PAL black burst, and tri-level sync
Electronic Switches (CH9, CH10): AES/EBU
Electronic Switches (CH11): Word-clock signal (TTL)

Determination Criteria of the Signal Level

Detection Level: When the input signal amplitude falls 2 to 5 dB below the defined level, the LT 4442 detects an error and switches to the backup signal.
The detection level varies slightly depending on the type of signal specified using the internal DIP switches.
The detection level can be set to LOW or HIGH for each signal type.

Detection Reference Level

When the Determination Criteria Is Set to Low

HD-SDI (1.485 Gb/s):	450 to 635 mV	(800 mV)
SD-SDI (270 Mb/s):	450 to 635 mV	(800 mV)
SD-SDI (143 Mb/s):	450 to 635 mV	(800 mV)
AES/EBU Digital Audio:	631 to 794 mV	(1000 mV)
NTSC Black Burst:	-180 to -227 mV	(-286 mV)
PAL Black Burst:	-190 to -238 mV	(-300 mV)
Tri-Level Sync:	337 to 476 mV	(600 mV)
Word Clock (TTL):	1515 to 1907 mV	(2400 mV)

When the Determination Criteria Is Set to High

HD-SDI (1.485 Gb/s):	505 to 713 mV	(800 mV)
SD-SDI (270 Mb/s):	505 to 713 mV	(800 mV)
SD-SDI (143 Mb/s):	505 to 713 mV	(800 mV)
AES/EBU Digital Audio:	734 to 924 mV	(1000 mV)
NTSC Black Burst:	-210 to -264 mV	(-286 mV)
PAL Black Burst:	-220 to -277 mV	(-300 mV)
Tri-Level Sync:	379 to 535 mV	(600 mV)
Word Clock (TTL):	1759 to 2215 mV	(2400 mV)

*1 The parenthetical values are the signal levels during normal operation.

User-Defined Detection Level Setting

User Settings 1 and 2

CH1 to CH8: Can be set to a value from -100 to -700 mV*2
CH9 and CH10: Can be set to a value from 150 to 1400 mV*3
CH11: Can be set to a value from 500 to 3000 mV*4

Depending on the shape of the waveform, the standard detection level may not be reached.
*2 When a signal that is equivalent to an H.SYNC waveform is applied.
*3 This is the p-p value of an AES/EBU digital audio signal.
*4 This is the high-level value of a word-clock (TTL) signal.

Error Display

Total Error LED: Notifies the user of errors by making the error LED on the panel blink.
Error Channel LED: Detects the channel that is causing the error and notifies the user of this error by lighting the corresponding LED.

Panel Key Lock

Time until Keys Are Locked: Keys are automatically locked when no key operations are detected for 60 seconds.

External Control (REMOTE) Connector

Application: Remote control
Input: RESET, AUTO SWITCHING, and TOGGLE SYNC
Output: FAULT and SYNC SOURCE
Connector Type: 9-pin D-sub connector

Environmental Conditions

Operating Temperature Range: 0 to 45 °C
Operating Humidity Range: 90 %RH or less (no condensation)
Operating Environment: Indoors
Elevation: Up to 2,000 m
Overvoltage Category: II
Pollution Degree: 2

Power Requirements

90 to 250 VAC (no switching necessary); 50/60 Hz

Power Consumption

25 W max.

Dimensions and Weight

426 (W) × 44 (H) × 400 (D) mm
(Not including protrusions)
3.5 kg

Accessories

Rack Supports 2
Rack Support Mounting Screws 4
Power Cord 1
Instruction Manual 1
Cover/Inlet Stopper 1

Rear Panel