

## Checks the Transmission Margin of the Coaxial Cable Laid in a HD-SDI/SD-SDI System



### LT 9610 SDI SYSTEM MARGIN CHECKER

#### ● GENERAL

The LT 9610 is a handy tool for checking the transmission margin of the coaxial cable laid in a HD-SDI/SD-SDI system. The HD-SDI/SD-SDI signal source and the HD-SDI/SD-SDI equivalent cable length display are built in. It converts the level of transmission attenuation of the coaxial cable under measurement to a cable length of a given cable type and displays the result.

#### Built-in Signal Generator



color bar



check field

Up to 20 ID characters can be multiplexed in the test pattern of the signal generator.



An operator checks cable performance

#### ● FEATURES

- Supports HD-SDI (1080i/59.94 1.485 Gbps) and SD-SDI (525i/59.94 270 Mbps).
- By converting the amount of transmission attenuation of the coaxial cable to a cable length of a given cable type, the following points are featured.
  - The amount of transmission attenuation is intuitive as compared to displays such as the power value.
  - If the characteristics of the cable are degraded due to the cable wearing out, the length is indicated longer than the physical length. This enables the amount of degradation and transmission performance to be determined.
  - In a system in which different types of cables are mixed, the performance of the system (system margin) can easily be determined, because the cable length is displayed in terms of a given cable type.
- Built-in Signal Generator
  - Because the HD-SDI/SD-SDI signal generator is built in, there is no need to prepare a separate signal source. In addition, highly accurate measurement is possible, because the signal generator and the equivalent cable length meter can be calibrated as a whole.
  - The test pattern of the signal generator can be set to color bar or check field pattern. This enables the LV 7700 to be used as a simple standalone HD-SDI/SD-SDI signal generator.
  - Up to 20 ID characters can be multiplexed in the test pattern of the signal generator.
  - 8 channels (4 channels x 2 groups) of embedded audio can be embedded.
- GO/NOGO Judgement
- Built-in Error Monitor Function
- Battery Operation

## ● SPECIFICATIONS

## LT 9610

### Common

#### Standard Supported

**HDTV:** SMPTE 274M, 292M  
**SDTV:** SMPTE 125M, 259M

#### Format

**HDTV:** 1080i/59.94  
**SDTV:** 525i/59.94

**Input/Output Connector:** BNC 1 connector each 75 Ω Return loss 15 dB (5 MHz to serial clock)

**Auto Power Down:** Power turns off approx 5 minutes after the last key operation Can be disabled

**Display:** STN monochrome LCD 64 dots vertical x 128 dots horizontal Contrast adjustment available

### Signal Generator

**Format:** Manual switching through panel keys

#### Test Pattern

**HDTV:** Multi format color bar check field  
**SDTV:** 100/0/75/0 full field color bar/check field

#### Embedded Audio

**Embedded Channels:** 8 ch (4 ch x 2 groups), ON/OFF selectable at the group level

**Sampling Frequency:** 48 kHz sampling (synchronized to the video signal)

**Resolution:** 20 bits/24 bits switchable

**Pre-emphasis:** OFF, 50/15 μs, and CCITT switchable (switches only the CS bit)

**Frame Number:** Enable/Disable switchable

**Frequency:** 1 kHz

**Level:** -20/-18 dB switchable

**ID Character:** Multiplex up to 20 alphanumeric characters (for HDTV and SDTV)

**Character Size:** 32 x 32 dots

**HDTV:** x 1 / x 2 / x 4

**SDTV:** x 1 / x 2

### Cable Length Display

**Format:** Auto switching through the input SDI signal

#### Equivalent Cable Length Type

**HDTV:** L-7CHD, LS-5CFB  
**SDTV:** L-5C2V

#### Measurement Range

**HDTV:** L-7CHD to 200 m LS-5CFB to 130 m  
**SDTV:** L-5C2V to 300 m

**Measurement Accuracy:** ± 20 m

**Measurement Resolution:** 7CHD:10 m LS-5CFB and L-5C2V: 5 m

### Error Monitor Function

#### Monitor Items

**Format Error:** Indicates an error when the input signal is not 1080i/59.94, 525i/59.94 or when the signal is degraded to a point that the format cannot be determined. Monitored at all times. If a format error is detected, the words [FORMAT ERROR] blink with white and black inverted, and other errors are not monitored.

**TRS Error:** Detects TRS (Timing Reference Signal) errors in the input SDI signal. Monitor ON/OFF selectable. If a TRS error is detected, the word [TRS] blinks with white and black inverted.

#### CRC Error (HDTV only):

Indicates an error if the CRC multiplexed in the input HD-SDI signal and the CRC calculated within the LT 9610 do not match. The intensity signal is CRC-Y, and the chrominance difference signal is CRC-C. Monitor ON/OFF selectable. If a CRC error is detected, the word [CRC-Y] or [CRC-C] blinks with white and black inverted.

#### EDH error

#### (SDTV only):

Indicates an error if the CRC multiplexed in the input SD-SDI signal and the CRC calculated within the LT 9610 do not match. Monitor ON/OFF selectable. If an EDH error is detected, the word [EDH] blinks with white and black inverted.

#### Checksum Error (HDTV only):

Detects errors in the check sum that is included in the ancillary data of the input HD-SDI signal. Monitor ON/OFF selectable. If a checksum error is detected, the words [CHECK SUM] blink with white and black inverted.

#### Line Number Error (HDTV only):

Indicates an error if the line number multiplexed in the input HD-SDI signal and the line number counted within the LT 9610 do not match. Monitor ON/OFF selectable. If a line number error is detected, the words [LINE NUMBER] blink with white and black inverted.

#### Equivalent Cable Length Error:

Indicates an error if the cable length display is greater than the specified threshold value. Monitor ON/OFF selectable independently for HDTV and SDTV. If an equivalent cable length error is detected, the word [LENGTH] blinks with white and black inverted. Threshold setting resolution LS-5CFB, L-5C2V: 5 m L-7CHD: 10 m

#### Equivalent Cable Length Warning:

Indicates a warning if the cable length display is greater than the specified threshold value. Monitor ON/OFF selectable independently for HDTV and SDTV. If an equivalent cable length warning is detected, the word [WARNING] blinks with white and black inverted. Threshold setting resolution LS-5CFB, L-5C2V: 5 m L-7CHD: 10 m

\* If the threshold value of the equivalent cable length warning is greater than that of the equivalent cable length warning, error monitor takes priority.

#### Hold Function

**Hold Off:** Indicates error detection only when an error is detected.

**Hold On:** The indication of the error detection is held once an error is detected.

**Preset Function:** Releases the error detection indication status when using hold on.

### Environmental Conditions

**Operating Temperature:** 0 to 40 °C

**Operating Humidity:** ≤85 % RH (without condensation)

**Spec-Guaranteed Temperature:** 10 to 30 °C

**Spec-Guaranteed Humidity:** ≤85 % RH (without condensation)

**Operating Environment:** Indoor use

**Operating Altitude:** 2,000 m

**Overvoltage Category:** I

**Pollution Degree:** 2

**Power Requirements:** 4 AAA nickel hydride batteries, AC adapter

**Dimensions and Weight:** 240 (H) x 94 (W) x 40 (D) mm (projections excluded)  
 Approx. 600 g (including the 4 AAA nickel hydride batteries)

#### Accessories:

AC adapter ..... 1  
 Instruction manual ..... 1