

ANALOG HDTV & COMPONENT WAVEFORM MONITOR



- Four Channel Operation
- Auto Recognition Setup & 525/60, 625/50, 1125/60 Systems
- Full Line Select
- Δ Volts and Δ Time Cursors
- Presets for Twelve Observation Setups
- Component Vector Display
- Betacam, MII, SMPTE, YPbPr and RGB

Model 5100

A four-channel waveform monitor, the 5100 monitors the three channels associated with component operations and adds the fourth channel for simultaneous composite observations. Waveforms may be observed in both overlaid and parade forms. A vector display using electronic tolerance-limit targets shows chroma signal accuracy at a glance and channel selection is automatic when vector display is chosen. The timing display automatically inverts CH2 and 3 (Pb and Pr) to be added to Y in the 2H sweep mode to display either the bowtie or Leader's "shark fin" pattern for precise measurement of interchannel timing errors. A four-page menu offers user-friendly setup to select the proper mode of operation. System selection sets sweep rates to operate with 525/60, 625/50 or 1125/60 (HDTV) systems. Selection is made from the menu and automatic operation may also be selected in which the 5100 recognizes incoming signals and sets itself for proper operation.

Bandwidth of all four vertical channels extends to 30 MHz to accommodate HDTV signals in the FLAT filter mode selection. Also included is a low-pass filter mode and a differential-step mode to facilitate linearity measurements in all four channels. On-screen cursors with front panel position controls allow easy and precise measurements of voltage or time spans on observed waveforms. The PRESET mode stores the 5100's front-panel setup conditions for instant recall.

Flexibility in synchronization permits the operator to reference the 5100 to sync from channel 1, channel 4 or external (rear panel jack). Remote control operation extends control functions for console or other remote uses. The high degree of built-in adaptability extends to the power supply, a switching-mode system that accommodates power mains found throughout the world (90-250 V ac, 48-440 Hz), and includes operation from 12 V dc battery or vehicle power.

- 1 Input selectors: CH1-CH4, one, all or any combination. Selection is automatic in vector and timing modes.
- 2 Mode selectors: WFM (waveform operations) VECT (vector display with electronic graticule calibrated to match the signal), TIMING (a 2H waveform showing Y added to inverted Pb and Pr for bowtie or shark fin timing waveforms).
- 3 REF selector chooses CH1, CH4 or external reference for sync purposes.
- 4 FILTER selector for FLAT, LOW-PASS or DIF STEP vertical amplifier response, the latter for linearity measurements.

- 5 SWEEP controls: 1, 2 or PARADE with LINE and FIELD selection.
- 6 System controls call up menus and help execute setup to suit signal being processed, add or remove on-screen readouts.
- 7 Four PIX MONitor output jacks (YPbPr, GBR or Composite).
- 8 REMOTE control connector (TTL).
- 9 DC INPUT (4-pin XLR type) connector.
- 10 EXT REF loop-through jacks.
- 11 Four loop-through input jacks.



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Rear Panel

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KEY SPECIFICATIONS (5100)

INPUTS

Channel
CH-1, 2, 3, 4, EXT REF
Impedance
15 k Ω or more
Maximum Voltage
 ± 2 V (DC + AC p-p)
Return Loss
40 dB or more (50 kHz - 6 MHz)

CRT

Size
150 mm rectangular
100 x 80 mm (H x V)
Accelerating Voltage
16.5 kV/2 kV

Graticule
Internal for waveform monitoring
Electronic for vector monitoring

COMPATIBLE SYSTEMS

Analog Component (525/60 and 625/50)
NTSC and PAL Composite
HDTV (1125/60)

VECTOR DISPLAY

Frequency Response
1 MHz
Amplitude Accuracy
 $\pm 2\%$
Electronic Graticule Accuracy
 $\pm 3\%$
Input
CH1, CH2, CH3, (Y, R-Y, B-Y or G, B, R)

TIMING DISPLAY INPUT

Using shark fin or bowtie signal
Vertical Deflection (Waveform)

Sensitivity
1V full scale ($\pm 2\%$)
x5 ($\pm 3\%$)
Variable Range
0.7 - 2 V (x1 full scale)
0.14 - 0.4 V (x5 full scale)

FREQUENCY RESPONSE

Flat
25 Hz - 10 MHz $\pm 2\%$
30 MHz + 3%, - 5% (50 kHz reference)
Low Pass

NTSC Component
- 30 dB at 3.58 MHz

DIF'D Step
NTSC Component
- 20 dB at 14 kHz, 2 MHz

HDTV
- 20 dB at 84 kHz, 12 MHz

TRANSIENT RESPONSE

1V full scale, FLAT, 2T pulse, 2T bar

Overshoot
 $\pm 2\%$
Preshoot
 $\pm 2\%$
Ringing
 $\pm 2\%$
Pulse/Bar Ratio
 $\pm 1\%$ or less
Vertical Tilt
 $\pm 2\%$ or less
DC Restorer
Back porch clamp
PIX MONITOR OUT (4 CHANNELS)
Level
1 V $\pm 5\%$ at 1.0 amplitude on CRT
Frequency Characteristics
50 kHz to 30 MHz $\pm 5\%$ (dc clamped)

Impedance
75 Ω
CALIBRATION
Voltage
1 V p-p $\pm 1\%$
Frequency
100 kHz

HORIZONTAL DEFLECTION
WAVEFORM MONITOR SECTION
NTSC & PAL Composite/Analog
Component (525/60, 625/50)

1H Sweep: Display 1H
2H Sweep: Display 2H
1 μ s/div: Display 10 times expansion of 2H ($\pm 3\%$)
0.2 μ s/div: Display 25 times expansion of 1H ($\pm 3\%$)
1V Sweep: Display 1V
2V Sweep: Display 2V
V MAG: Display 20 times expansion of 1V or 2V
Parade: 3 waveforms of CH1, CH2, CH3
Component/Composite: 2 waveforms of CH1 and CH4
HDTV (1125/60)

1H Sweep: Display 1H
2H Sweep: Display 2H
0.5 μ s/div: Display 10 times expansion of 2H ($\pm 3\%$)
0.1 μ s/div: Display 25 times expansion of 1H ($\pm 3\%$)
1V Sweep: Display 1V
2V: Display 2V
V MAG: Display 20 times expansion of 1V or 2V
Parade: 3 waveforms of CH1, CH2, CH3
4 waveforms of CH1, CH2, CH3, CH4
Trace Length: 12.4 div approx.
Linearity: $\pm 3\%$ or less

LINE SELECTOR

525/60, 625/60 Mode
1H Display: One of 525, 625 lines
2H Display: Two of 525, 625 lines
1V Display: Intensify one waveform of one field
2V Display: Intensify one waveform of one frame
1125/60 Mode
1H Display: One of 1125 lines
2H Display: Two of 1125 lines
1V Display: Intensify one waveform of one field
2V Display: Intensify one waveform of one frame

REMOTE CONTROL

Control Function: Selection of 12 presets
Control Signal: TTL (low active)
Terminal: D-sub 15 pin connector on rear panel
Cursor Accuracy
 $\pm 1\%$

POWER REQUIREMENTS

AC: 90-250 V (48 Hz - 440 Hz), 63 W
DC: 11 - 20 V, 4.0 A at 12 V dc

PHYSICAL

Size (W x H x D)
8 $\frac{3}{8}$ x 5 $\frac{1}{4}$ x 18 $\frac{1}{4}$ in.
214 x 132 x 464 mm

Weight

15.4 lbs., 7 kg

SUPPLIED ACCESSORIES

D-Sub Connector 15-pin with Shell
5 Spare Illumination Lamps
2 Spare Fuses
2 Rackmount Screws (8-30 UNC)

AVAILABLE OPTIONS

Rackmount Adapter (LR-2400VI)
Front Cover (LC-2077)
Battery Bracket (LC-2222)
Viewing Hood (LH-2015)
White Phosphor CRT (-305)