

# 100-MHz 3-Channel Oscilloscope with CRT Readout



LS 8106A

- 2% V Accuracy
- 1 mV/div Sensitivity with 20 MHz Band Limit
- 5 ns/div Sweep Speed with X10 Mag
- Signal Delay (All Channels Ensures View of Trigger Edges)
- CH1 Output Makes CH1 Amplifier Available as a High Gain Calibrated Preamp
- Z-Axis (Intensity)
- One-Touch Auto Setup Sets V Sensitivity and Time Base

Top of the line in Leader's instruments, Model LS8106A offers speed and operating shortcuts found in very few modern scopes. Examples include Auto Setup in which a single touch automatically sets both V sensitivity and timebase for instant, optimum waveform display. Another great convenience is a continuous on-screen readout of the operator's choice of frequency or period and V p-p or DC level for signals handled in CH1. Solid state switching in the vertical attenuators also eliminates switching noise and ensures long-term reliability.

To aid in documentation, on-screen readouts register the status of V and timebase scale factors in the use as well as

- Continuous On-Screen Readout of Frequency and V p-p or DC Level
- On-Screen Readout of H & V Scale Factors, Coupling, Uncal, INVert, ADD, MAG, X-Y and Delay Time
- Cursor Measurements of  $\Delta V$ ,  $\Delta T$ ,  $\Delta V\%$ ,  $\Delta T\%$ ,  $1/\Delta T$  and  $\phi$
- Hybrid IC Attenuator Eliminates Switching Noise and Enhances Long-Term Reliability
- 100 MHz Bandwidth
- Calibrated Delayed Sweep  
Alternate Sweep - Shows Main and Delayed Waveforms Simultaneously
- 3 Channel, 8 Trace Operation  
CH1, CH2, CH3, CH1  $\pm$  CH2 Main and Delayed
- 400 V (dc + ac peak) Input Withstand (CH1 and CH2)
- FIXED Trigger Mode Ensures Stable Triggering
- Dedicated TV-V and TV-H Sync Separators
- Variable Holdoff for Correct Display of Complex Wavetrains
- Single Sweep Operation
- One Touch X-Y Operation
- CH3 0.1 V and 0.5V/div Sensitivity Meets TTL, CMOS and ECL Needs
- Conforms to International EMIO, EMS and Safety Standards

coupling, uncal warning, INVert, ADD, use of MAG, X-Y operation and delay time. These readouts are augmented by precision cursors to make quick work of measuring voltage and time for parts of the waveform as well as frequency, % of presets for both voltage level and time. For example, the latter reads out phase angle in degrees when the timebase is take out of CAL preset to make a full cycle span 5 divisions.

Other features include 3-channel operation with sync selected from all. A maximum of 8 traces can be shown (main and delayed timebases for CH1, CH2, CH3 and ADD, or subtract).

# 100-MHz 3-Channel Oscilloscope with CRT Readout

## key specifications LS8106A

### CRT READOUT FUNCTION

CH1 frequency or period + V p-p  
(ac coupling) or DC level (dc coupling)

Setting Conditions

Vertical

Scale factors for CH1, CH2, and CH3

Corrects X10 probe

Input Coupling V-UNCAL, INVert, ADD

Horizontal

A & B TIME BASE scale factors includes

MAG conversion, H-UNCAL, MAG X10,

delay time (when cursors not used), X-Y

### CURSOR MEASUREMENTS

2 cursors (vertical or horizontal)

Voltage Difference ( $\Delta V$ )

Voltage between  $\Delta$  and REF cursors

Voltage Difference ( $\Delta V\%$ )

Voltage difference in % between  $\Delta$

and REF cursors with a full scale of

5 div = 100%

Time Difference ( $\Delta T$ )

Time interval between the  $\Delta$  and REF

cursors

Time Difference Ratio ( $\Delta T\%$ )

The time ratio in % between the  $\Delta$  and

REF cursors with a full scale of

5 div = 100%

Frequency ( $1/\Delta T$ )

Frequency between  $\Delta$  and REF cursors

Phase Difference

Indicates the in degrees between the

$\Delta$  and REF cursors with a full scale of

5 div =  $360^\circ$

### VERTICAL DEFLECTION

Bandwidth (-3dB)

5 mV/div to 5 V/div, CH1/CH2

dc coupled: dc to 100 MHz

ac coupled: 5 Hz to 50 MHz

1 mV/div to 2 mV/div

dc coupled: dc to 20 MHz

ac coupled: 5 Hz to 20 MHz

0.1 V/div, CH3

dc coupled: dc to 100 MHz

Rise Time (All Channels)

3.5 ns (5 mV/div to 5 V/div)

17 ns (1 mV/div to 2 mV/div)

Signal Delay (All Channels)

Displays fast trigger edges

Deflection Coefficients (CH1/CH2)

1 mV/div to 5 V/div in 12 calibrated

steps, 1-2-5 sequence (20 MHz bandwidth

at 1 mV/div and 2 mV/div settings)

Deflection Coefficient (CH3)

0.1 V/div

Accuracy (CH1/CH2)

$\pm 2\%$  5 mV/div to 5 V/div

$\pm 5\%$  1 mV/div to 2 mV/div

Accuracy (CH3)

$\pm 2\%$

Input Coupling

AC, GND, DC, CH1/CH2

DC, CH3

Input Impedance

1 M $\Omega$   $\pm 2\%$ , 23 pF, approx.

Maximum Input

400 V (dc plus ac peak), CH1/CH2

50 V (dc plus ac peak), CH3

Display Modes

CH1, CH2, ALternate, CHOP, ADD,

subtract (CH2 invert)

CH3, CH1/CH2/CH3, add (8 trace)

Chop Frequency

250 kHz

Output

CH1 output on rear panel, 50 mV/div of

CRT deflection into 50  $\Omega$

100 Hz - 100 MHz

### EXTERNAL HORIZONTAL DEFLECTION

(X-Y MODE)

X-Axis

Via CH2 vertical amplifier

Y-Axis

CH1

Sensitivity

Same as CH1/CH2

Input Impedance

Same as CH1/CH2

X-Axis Bandwidth (-3 dB)

dc: dc to 1 MHz

ac: 5 Hz to 1 MHz

Phase Shift

$< 3^\circ$  at 100 kHz

### INTERNAL HORIZONTAL DEFLECTION

Display Modes

Main time base, main time base intensified

by delayed time base, Main and delayed

alternate time base, delayed time base,

delayed time base triggered

Main Time Base

50 ns/div to 0.5 s/div in 22 steps,

1-2-5 sequence

Delayed Time Base

50 ns/div to 50 ms/div in 19 steps,

1-2-5 sequence

Accuracy

$\pm 3\%$ ,  $\pm 5\%$  with X10 MAG on,  $\pm 8\%$

with X10 MAG, 50 ns/div to 0.5  $\mu$ s/div

Magnifier

X10 mag sets max sweep rate to 5 ns/div

Delayed Time Jitter

1 part in 10,000

### MAIN TIME BASE TRIGGERING

Sources

CH1, CH2, CH3, VERT (alternate), Line

Modes

AUTO, NORMal, FIX (p-p), SINGLE

Coupling

AC, HR, REject, DC, TV-V, TV-H

Slope

+ or - (also applies to video polarity)

Sensitivity

	Freq. Range	Sensitivity
NORM	dc - 50 MHz	1 div
	dc - 100 MHz	1.5 div
AUTO	40 Hz - 50 MHz	1 div
	40 Hz - 100 MHz	1.5 div
FIX	40 Hz - 50 MHz	1.5 div
	40 Hz - 100 MHz	2 div
AC	At 10 Hz or lower, the minimum trigger amplitude increases	
HF-RF	At 10 Hz or lower and 30 kHz or higher, the minimum trigger amplitude increases	
TV-V, TV-H	1.5 div	

Relative Holdoff

Permits stable triggering on complex

and long wave trains

### DELAYED TIME BASE TRIGGERING

Modes

Immediate

Delayed time base begins immediately

after delay

Triggered

Delayed time base begins on the first

trigger after delay

### Z-AXIS (INTENSITY) MODULATION

Input Level

TTL compatible (blanked at TTL high)

Maximum Input

42 V (dc plus ac peak)

Input Impedance

10 k $\Omega$  approx.

Bandwidth

dc - 5 MHz

### INTERNAL CALIBRATION

Output

1.0 V p-p  $\pm 3\%$

Waveform

Squarewave, 1 kHz nominal

### CRT DISPLAY

Graticule

Internal, illuminated 8 x 10 div

Accelerating Potential

12 kV/2 kV (PDA)

Focus

Front panel FOCUS and ASTIGmatism

Trace Alignment

Front Panel trace rotation control

### POWER REQUIREMENTS

100, 120, 220, 240 V ac  $\pm 10\%$

50/60 Hz, 48 W

### PHYSICAL

Size (W x H x D)

12 x 6 x 15<sup>3</sup>/<sub>4</sub> in.

300 x 150 x 400 mm

Weight

19.1 lbs., 8.7 kg

### SUPPLIED ACCESSORIES

2 Probes (LP-103C)

Adjusting Screwdriver

1 Spare Fuse

### AVAILABLE ACCESSORIES

Probe Pouch (LP-2088)

Rackmount Adapter (LR-2428I)

Front Cover (LC-2136)