

# 100-MHz 3-CH Oscilloscope with CRT Readout

- *One-Touch Auto Setup Sets V Sensitivity and Time Base*
- *Continuous On-Screen Readout of Frequency and V p-p or DC Level for CH1*
- *On-Screen Readout of H&V Scale Factors, Coupling, Uncal, INVert, ADD, MAG, X-Y and Delay Time*
- *Cursor Measurements of  $\Delta V$ ,  $\Delta T$ ,  $\Delta V\%$ ,  $\Delta T\%$ ,  $1/\Delta T$  (Frequency) and  $\theta$*
- *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 Despite Wide Amplitude Swings*
- *Dedicated TV-V and TV-H Sync Separators for Rock Solid Video Waveforms*
- *Variable Holdoff for Correct Display of Complex Wavetrains*
- *Single Sweep Operation*
- *X-Y Operation*



LS 8106

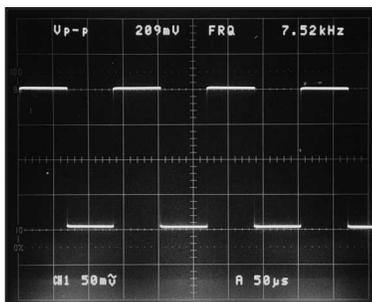
- *2% V Accuracy*
- *1 mV/div Sensitivity with 20-MHz Band Limit*
- *5 ns/div Sweep Speed with X10 Mag*
- *Signal Delay (All Channels) Ensures View of Trigger Edges*
- *CH1 Output Makes CH1 Amplifier Available as a High Gain Calibrated Preamp*
- *Z-Axis (Intensity Modulation)*

Top of the line in Leader's instruments, Model LS 8106 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.

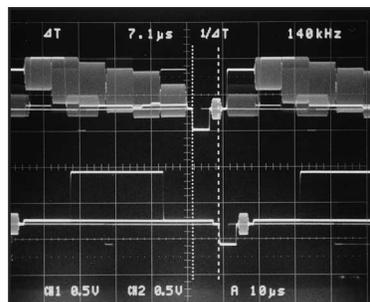
To aid in documentation, on-screen readouts register the status of V and timebase scale factors in use as well as

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 taken out of CAL preset to make a full cycle span 5 divisions.

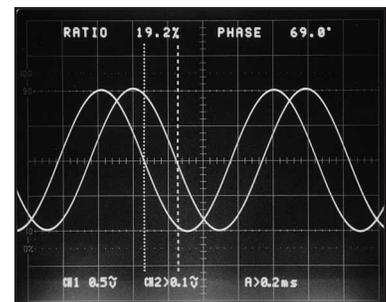
Other features include 3-channel operation with sync selected from all. A maximum of 8 traces can be shown (main and delayed timebases for CH1, CH2, CH3 and ADD (or subtract). For remaining operating features, see Model LS 8105 on the next page.



Continuous CH1 readout (top) of V p-p coupling) or V dc, frequency or period.



Time cursors checking CH1/CH2 delay.



Use of time cursors to measure phase shift.

# 100-MHz 3-CH Oscilloscopes

## KEY SPECIFICATIONS (Models LS 8106/LS 8105)

### CRT READOUT FUNCTION (LS 8106)

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 (LS 8106)

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 difference in degrees between the  $\Delta$  and REF cursors with a full scale of 5 div = 360°

### VERTICAL DEFLECTION

#### Bandwidth (-3 dB)

5 mV/div - 5 V/div, CH1/CH2  
dc coupled: dc to 100 MHz  
ac coupled: 5 Hz to 100 MHz  
1 mV/div - 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 - 5 V/div)  
17.5 ns (1 mV/div - 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

± 2%, 5 mV/div - 5 V/div  
± 5%, 1 mV/div - 2 mV/div

#### Accuracy, CH3

± 2%

#### Input Coupling

AC, GND, DC, CH1/CH2  
DC, CH3

#### Input Impedance

1 M $\Omega$  ± 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 per 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° 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

± 3%, ± 5% with X10 MAG on, ± 8% with X10 MAG, 50 ns/div to 0.5  $\mu$ s/div

#### Magnifier

X10 mag sets max sweep rate to 5 ns/div

#### Delay Time Jitter

1 part in 10,000

#### Delay Time

Numerically indicated on CRT (8106)

### MAIN TIME BASE TRIGGERING

#### Sources

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

#### Modes

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

#### Coupling

AC, HF-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-REF	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 ± 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 ± 10%  
50/60 Hz, 48 W (8106)  
43W (8105)

### PHYSICAL

#### Size (W x H x D)

12 x 6 x 15<sup>3/4</sup> in.  
300 x 150 x 400 mm

#### Weight

19.1 lbs., 8.7 kg

### SUPPLIED ACCESSORIES

2 Probes (LP-103C) (for LS 8106)  
(LP-102C) (for LS 8105)  
Adjusting Screwdriver  
1 Spare Fuse

### AVAILABLE ACCESSORIES

Probe Pouch (LP-2088)  
Rackmount Adapter (LR-2428I)  
Front Cover (LC-2136)  
Probe (LP-100C) (for LS 8105)