

## LA314/LA314H 400 MHz/470 MHz

With four channels and wide 470 MHz bandwidth, these leading-edge analog oscilloscopes offer the highest level of performance available today.

Analog oscilloscopes offer unique benefits in solving specific measurement problems. The analog display provides important clues on relative frequency content of signals mixed together or the occurrence of low rep-rate events on repetitive signals. The LA314's meshless CRT effectively displays these "grey scaling" and "persistence" effects; and the LA314's ultra fast display update rate lets you see how the waveforms behave in real time.

The standard multipurpose trigger, wide input offset range, comprehensive cursors and counter make the LA314s truly universal oscilloscopes.



### Main Features

- 4 Channels
- Up to 500ps/div Time Resolution
- High-Speed Auto Setup
- Cursor Measurements
- Event and Burst Trigger Modes
- Full TV Trigger with clamping
- Save and Recall Panel settings
- Frequency Counter
- High-Input Offset Range
- High Intensity CRT
- Power for FET Probes

### Specifications

#### **DC - 470 MHz, 4-CH, 10 traces**

Four channels up to 470 MHz are available, with CH1 and CH2 boasting the widest frequency range with highest sensitivity (2mV/div). The fastest sweep speed is 500 ps/div.

#### **Input offset function**

Suitable for the observation of small signals superimposed on large signals. The DC input offset function features an offset equivalent to  $\pm 500$  div. max, which can be applied to CH1 or CH2.

## Counter measurement function

Built-in 5 digit counter for frequencies up to 470 MHz.

**Save/Recall up to 256 panel settings** Just turn the FUNCTION knob to recall panel setups. Stores up to 256 settings in memory.

## Power for FET Probe

Dedicated power supplies for 2 FET probes. Controls DC offset voltage of each probe as well.

## TV/HDTV Synchronization

TV triggering is available for NTSC, PAL, (SECAM) and HDTV. Field (EVEN, ODD, BOTH) and line select functions are included.

## TV Clamp Function

Easy observation of TV video signals with fluctuating average voltage. Back porch level of composite signals is fixed to ground level for display.

## Typical Applications

- Video, especially VCRs and TVs.
- Data recording, finding servo anomalies, glitches and intermittent phenomena in the disk-drive head- signals.
- Eye patterns (for DVDs) in optical disk measurements.
- Wide-bandwidth noise measurements on magneto optical disks.
- Radar/Lidar burst measurements.
- Eye pattern measurements on ATM 155 Mbps signals.

## Display

**CRT:** 6-inch rectangular, internal graticule (8 x 10 div) meshless CRT  
**Accelerating voltage:** Approximately 20 kV

## Vertical Deflection System

**Mode:** CH1, CH2, CH3, CH4, ADD (CH1 + CH2), ALT, CHOP  
**Channel 1, 2 Sensitivity:** 2 mV/div - 5 V/div  $\pm 2\%$ , 11 step (1-2-5)  
**Fine Adjuster:** 2 mV/div - 12.5 V/div continuously variable

### Bandwidth (-3dB):

#### Model LA314H

470 MHz (5 mV/div - 50 mV/div)

440 MHz (2 mV/div, 100 mV/div - 5 V/div)

#### Model LA314

400 MHz (2 mV/div - 5 V/div)

**BW limiter:** 20 MHz and 100 MHz selectable

**VSWR:** Less than 1.35:1 over DC - 400 MHz (with 50 ohm input)

### Rise time:

#### Model LA314H

Approx. 745 ps @ 20 mV/div

**Model LA314**

Approx. 875 ps

**Input coupling:** AC, DC, GND

**Input RC:** Hi-Z input: 1 Mohm  $\pm 1.5\%$ //16 pf  $\pm 2$ pf, Lo-Z input: 50 ohm  $\pm 1\%$ .

**Maximum input voltage:** 1 Mohm

**input:**  $\pm 400$  V max., 50 ohm input: 5 V RMS

**Polarity switching:** CH2 only

**Probe sensors:** 1:1, 1:10, 1:100 detection possible

**Offset voltage variable range:**

Offset voltage / Vertical axis range

$\pm 1$  V / 2mV/div - 50 mV/div

$\pm 10$  V / 0.1 V/div - 0.5 V/div

$\pm 100$  V / 1 V/div - 5 V/div

**Channel 3, 4 Sensitivity:** 100 mV, 500 mV/div

**Accuracy:**  $\pm 3\%$  (+10°C - +35°C)

**Bandwidth (-3dB):** 400 MHz

**Rise time:** Approx. 875 ps

(bandwidth x rise time = 0.35)

**Input coupling:** AC, DC

**Input RC:** Direct: 1 Mohm  $\pm 1.5\%$ // 16 pF+3pF,

when using the probe (SS-082R): 10 Mohm  $\pm 2\%$ //13pF  $\pm 2$ pF

**Maximum input voltage:**  $\pm 400$  V max

**Probe sensors:** 1:1, 1:10, 1:100 detection possible

## Triggering

### A Triggering

**Sources:** CH1, CH2, CH3, CH4

**Coupling:** AC, DC, HF-REJ, LF-REJ

**Polarity:**  $\pm$

**TV sync - Line selection:**

NTSC: 1 - 525H

PAL (SECAM): 1 - 625H

HDTV: 1 - 1125H

### B Triggering

**Sources:** CH1, CH2, CH3, CH4, LINE

**Coupling:** AC, DC, HF-REJ, LF-REJ

**Polarity:**  $\pm$

**Event Delay:**

**Count:** Setting range: 1 - 65535 maximum count freq.: 50 MHz

**Burst:** Time setting range: 0.15  $\mu$ s - 9.99s

**Auto setup:** Input channels: CH1, CH2, Freq. range: 50 Hz - 100 MHz

## Horizontal Deflection System

### Horizontal Display A, ALT, B, X-Y

#### A sweep

**Mode:** AUTO, NORM, SINGLE

Sweep time: 5 ns/div - 500 ms/div  $\pm 2\%$ , 25-step (1-2-5), Fastest sweep time: 500 ps/div, Fine adjuster: 5 ns/div - 1.5 s/div

#### B sweep

**Delay:**

**Triggered delay:** CH1, CH2, CH3, CH4

**Continuous delay:** B delayed by A

**Sweep time:** 5 ns/div - 20 ms/div  $\pm 2\%$ , 21 step (1, 2, 5)

**Delay time range:** 0.2 div - 10.2 div;

**Accuracy:** + (setting value x 0.005) + (sweeptime x 0.1) -55 ns

**Magnifier (MAG):** 10 times

**Accuracy:**  $\pm 5\%$  (+10°C - +35°C)

X-Y Operation

**X axis:** CH1

**Y axis:** CH1, CH2, CH3, CH4, ADD

**Accuracy:**  $\pm 2\%$  (+10°C - +35°C)

## CH2 Out

**Output voltage:** 20 mV/div  $\pm 30\%$

**Frequency output:** DC - 200 MHz  
(50 ohm load)

**Output resistance:** 50 ohm  $\pm 20\%$

## Utilities

### Save/Recall Function

**Number of panel setups:** 256 max

**Comments:** 12 characters max

### Modulation (Z-axis)

**Minimum modulation voltage:** 0.5 Vp-p

**Polarity:** Positive (dark)/negative (bright)

**Frequency range:** DC - 5 MHz

**Max. input voltage:** 40 V

### Calibrator

**Waveform:** Square

**Repetitive frequency:** 1 kHz

**Accuracy:**  $\pm 0.1\%$

**Output voltage:** 0.6 V

**Accuracy:**  $\pm 1\%$

### Power for FET probes

**Voltage:** 2 each +12 V outlets for 2 FET probes, offset control available

## Counter

**Display digits:** 5 digits shown at all times

**Accuracy:**  $\pm 0.01\%$

**Frequency measurement range:** 2 Hz - 400 MHz

## Cursor Measurement

**Voltage axis:** 2

**Time axis:** 2

**Time difference:**  $\Delta T$

**Voltage difference:**  $\Delta V$

$\Delta T$  &  $\Delta V$  can be simultaneously measured

## Power

**Voltage range:** AC 90 V - 250 V

**Frequency range:** 48 Hz - 440 Hz

**Power consumption:** 120 VA max

## Dimensions and Weight

Approx. 320W x 160H x 420L mm

**Weight:** approx. 8.5 kg (19.8 lbs)