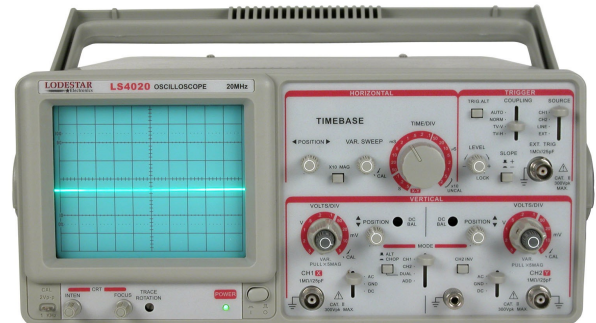


The model LS4020 is a dual-channel 20 MHz analog oscilloscope that is priced right for schools, home hobbyists, and cost-conscious business applications.



Features

- Clear, readable traces, even at high sweep speeds.
- Automatic triggering:
Trigger level lock makes manual triggering adjustments unnecessary.
- Alternate triggering:
Stable view of two waveforms of different frequencies.
- TV sync triggering:
The oscilloscope has a sync separator circuit for triggering of TV-V and TV-H signals.
- Channel 1 Output:
A 50 Ω terminated output of the channel 1 signal is available on the rear panel. It can be used for driving a frequency counter or other instruments.
- Z-Axis Input:
Intensity modulation capability permits time or frequency markers to be added. Trace blank with positive signal, TTL compatible.
- X-Y operation:
Set the switch to X-Y position to operate the instrument as a X-Y oscilloscope. CH1 is the horizontal deflection (X-axis) while CH2 provides vertical deflection (Y-axis).
- Virtual differential measurement:
Apply one signal to CH1 and the other signal to CH2. Invert the CH2 signal, then select ADD mode. Is also effective for removing 50/60 Hz hum.
- Built-in square wave source:
For probe compensation, a 1 kHz 2 Vp-p square wave is provided.

Specifications

Vertical Axis	Sensitivity	5 mV/DIV to 5 V/DIV, 10 calibrated steps
	Accuracy	< 3% (x5 MAG <5%)
	Attenuator	10 steps in 1-2-5 sequence. Vernier control provides full adjustments between steps
	Frequency bandwidth	DC – 20 MHz (x5 MAG DC – 7 MHz)
	Rise time	< 17.5 ns (x5 MAG < 50 ns)
	Input impedance	1 M Ω 25 pF
	Overshoot	< 5%
	DC balance shift	Adjustable from front panel
	Linearity	\leq 0.1 DIV amplitude change when waveform of 2 DIV at graticule is moved vertically
	Vertical modes	CH1: CH1, single trace CH2: CH2, single trace DUAL: CH1 and CH2 dual trace. ALT or CHOP selectable at any sweep rate ADD: Algebraic sum of CH1 and CH2
	Chop frequency	Approximately 250 kHz
	Input Coupling	AC, DC, GND
	Maximum input voltage	300 V DC + AC peak (AC frequency \leq 1 kHz)
	CH1 signal output	\geq 20mV/DIV into 50 Ω . Bandwidth is 50 Hz to 5 MHz minimum
CH2 INV BAL	Balanced point variation < 1 DIV (reference at center graticule)	

Sweep & Timebase	Sweep time	0.2 μ s - 0.5 s/DIV, 20 steps in 1-2-5 sequence
	Accuracy	3%
	Sweep magnification	x10
	x10 MAG sweep time accuracy	\pm 5% (20 ns - 50 ns are uncalibrated)
	Linearity	\pm 3%, (x10 MAG \pm 5%) (20 ns and 50 ns are uncalibrated)

Model LS4020

20 MHz Oscilloscope

Triggering	Triggering source	CH1,CH2, LINE, EXTERNAL, ALTERNATE.
	Coupling	AC 20 Hz to 20 MHz
	Slope	+ or -
	Sensitivity	20Hz - 2MHz: 1.0 DIV ALT: 2 DIV EXT: 200 mV 2MHz - 20MHz: 1.5 DIV ALT:3 DIV EXT:800 mV
	Triggering modes	AUTO, NORM, TV-V, TV-H
Ext. Trigger Input	Input impedance: 1 MΩ 25 pF Maximum input voltage: 300V DC+AC peak, (AC frequency ≤ 1 kHz)	

Calibration Voltage	Waveform	Positive-going square wave
	Frequency	Approximately 1 kHz
	Output voltage	2 Vp-p ±2%

CRT	Acceleration voltage	2 kV
	Effective screen size	8 x 10 DIV (1 DIV=10 mm or 0.39 in)
	Phosphor	P31
	Graticule	Internal
	Trace rotation	Adjustable from front panel

X-Y Mode	Sensitivity	Same as vertical axis. (X-axis: CH1 input signal; Y-axis: CH2 input signal.)
	Frequency bandwidth	DC to 500 kHz
	X-Y phase difference	≤ 3°, DC to 50 kHz

Power Requirements	AC 110 V/220 V ±10% selectable, 50/60 Hz, 35 W
Operating Environment	Indoor use Ambient temperature Within specified accuracy: 10 to 35 °C (50 to 95 °F), ≤ 85% RH Full operation: 0 to 45°C (32 to 104 °F), ≤ 85% RH Installation Category II Pollution degree 2
Storage Temperature & Humidity	-10 to 70 °C (14 to 158 °F), 70% RH maximum
Accessories	AC Line Cord Instruction manual Two Switchable X1/X10 Probes Spare fuse
Dimensions (W x H x D)	310 x 150 x 455 mm 12.2 x 5.9 x 17.9 inches
Weight	8 kg (17.6 pounds)

Z AXIS	Sensitivity	5 Vp-p (Positive-going signal decreases intensity)
	Frequency bandwidth	DC to 2 MHz
	Input resistance	Approx. 47 kΩ

Specifications subject to change without notice.