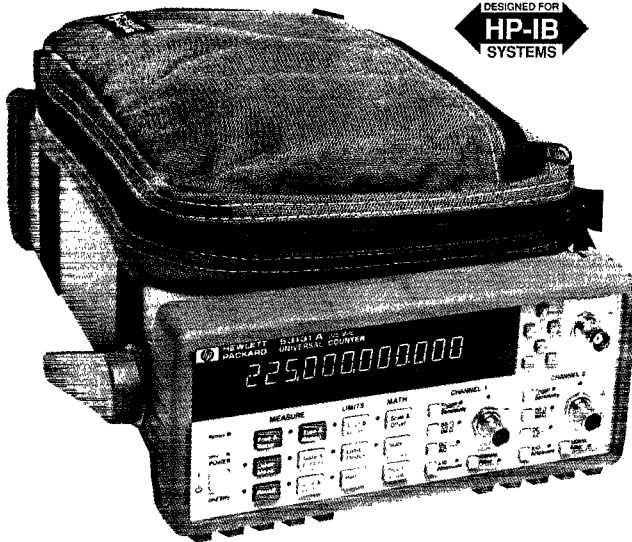


# ELECTRONIC COUNTERS

## High-Performance Universal Counters

HP 53131A

- Two-channel frequency and time interval measurements to 225 MHz (3 GHz optional)
- Time-interval resolution of 500 ps
- Frequency resolution of 10 digits per second
- Single-key setup recall
- High measurement throughput
- Standard HP-IB and talk-only RS-232



HP 53131A: High-performance bench and ATE counter

### HP 53131A Universal Counter

#### Within Budget, Without Compromise

The HP 53131A Universal Counter offers exceptional price and performance in a rugged, lightweight, half-rack package. The features and performance of these counters address the needs of most applications at prices that won't break the budget. You can't find this combination of ease of use, a complete set of measurements, extensive analysis capabilities, and high measurement and computer transfer speeds in any other universal counter family. This counter offers solutions in application areas from benchtop troubleshooting and manufacturing test all the way to high-speed, high-resolution ATE. It's Hewlett-Packard's highest performance universal counter.

#### High Technology Counting Techniques

The HP 53131A uses a sophisticated technique that provides frequency resolution of 10 digits per second. This performance exceeds that found in many more expensive counters, and ensures highly accurate results in a minimum amount of time. This technique provides time interval resolution of 500 ps for a single acquisition, and averaging can reduce this to tens of picoseconds.

#### Features to Make Your Job Easier

The HP 53131A makes your complete counting task easier. You'll find all the functions you expect in a universal counter, such as frequency, frequency ratio, time interval, and period. Additional measurement features include phase, totalize, peak voltage, rise time, and more.

The HP 53131A also provides features not often found in low-cost counters. Statistical analysis measures and tracks mean, minimum, maximum, and standard deviation of measured data, and you can use limit calculations to achieve results that fall within limits you define.

#### Limit Test and Analog Display Mode

The HP 53131A provides limit testing for the first time in a universal counter. Limit testing allows the user to set upper and lower limits for any measurement. When a measurement fails the limit condition, the counter logs the failure, notifies the operator, and can then continue or stop measuring.

Analog display mode carries limit test one step further. In analog display mode, limits are shown on the counter's display as two vertically aligned dots, and the measurement result is shown as a star. This format makes it easy for users to determine the results of a pass/fail measurement.



Analog display mode showing user-entered limit indicators (:). The position of the asterisk indicates each measurement relative to the limit indicators.

#### Extended Frequency Range

The HP 53131A is available with an optional Channel 3 to provide frequency measurements up to 3 GHz. This extra range lets you use the HP 53131A in mobile communications and other RF test environments.

#### Standard HP-IB and RS-232

The HP 53131A includes a standard HP-IB interface, along with talk-only RS-232. The HP 53131A uses Standard Commands for Programmable Instruments (SCPI) protocol, ensuring more uniform programming and compatibility across measurement systems. The talk-only RS-232 interface allows simple usage with terminals and printers.

#### HP 53131A Abridged Measurement Specifications and Characteristics

All measurements specified over the full signal ranges of Channels 1 and 2. For full specifications, call your HP representative.

#### Channel 1 & 2 Inputs

##### Frequency Range

**dc coupled:** dc to 225 MHz

**ac coupled:** 1 MHz to 225 MHz (50 Ω)  
30 Hz to 225 MHz (1 M Ω)

##### Voltage Range and Sensitivity (Sinusoid)

**dc to 100 MHz:** 20 mV rms to ±5 Vac + dc

**100 MHz to 200 MHz:** 30 mV rms to ±5 Vac + dc

**200 MHz to 225 MHz:** 40 mV rms to ±5 Vac + dc  
(75 mV rms with optional rear connectors)

**Trigger:** Rising or falling edge; level set by percent of signal level or by absolute voltage

**Gating and Arming:** Auto; manual (defined by gate time or digits of resolution required); external; delay

#### Standard Timebase

**Temperature:** <math>5 \times 10^{-4}</math>, 0° to 50° C

**Aging:** <math>3 \times 10^{-7}</math> per month

#### Measurements

##### Frequency

**Channel 1 and 2 range:** .1 Hz to 225 MHz

**Channel 3 range:** 100 MHz to 3 GHz

**Trigger:** Defaults to 50% of the peak-to-peak signal

##### Time Interval: 1 to 2

**Results range:** -1 ns to 10 s

**LSD:** 500 ps (can be improved by averaging with the math functions)

##### Pulse Width Channel 1

**Pulse selection:** Positive or negative

**Trigger:** Defaults to 50% of the peak-to-peak signal

**Results range:** 5 ns to 10 s

**LSD:** 500 ps

##### Rise/Fall Time Channel 1

**Edge selection:** Positive or negative

**Trigger:** Defaults to 10% and 90% of the peak-to-peak signal

**Results range:** 15 ns to 105 s

**LSD:** 500 ps