

**Frequency Ratio**

**Results range:**  $10^{-10}$  to  $10^1$   
**'Auto' Gate Time:** 100 ms  
**LSD:**  $1 / (\text{Ch 2 Frequency} \times \text{Gate Time})$

**Phase 1 to 2**

**Results range:**  $-180^\circ$  to  $+360^\circ$

**Duty Cycle 1**

**Results range:** 0 to 1

**Totalize 1**

**Results range:** 0 to  $10^1$   
**LSD:** 1 count of input signal  
**Resolution:**  $\pm 1$  count

**Peak Volts Channel 1 or 2**

**Input signal:**  $> 100$  Hz and  $> 100$  mV p-p or dc  
**Results range:** 100 mV p-p to  $\pm 5.1$  V  
**Resolution:** 10 mV  
**Accuracy:** 20 mV + 1% of V peak  
 Use of the input attenuator multiplies all voltage specs (input range, results range, resolution, and accuracy) by a factor of 10.

**Analysis:** Limit testing, math (scaling and offset), statistics (minimum, maximum, mean, std deviation)

**Measurement Throughput (HP-IB, ASCII):** Maximum 200 meas/s

**Option 001 (Medium Stability Timebase)**

**Temperature:**  $< 2 \times 10^{-7}$ ,  $0^\circ$  to  $50^\circ$  C  
**Aging:**  $< 4 \times 10^{-8}$  per day  
**Turn-on:** Within  $< 2 \times 10^{-7}$  of final value in 10 minutes

**Option 010 (High Stability Timebase)**

**Temperature:**  $< 7 \times 10^{-9}$ ,  $0^\circ$  to  $50^\circ$  C  
**Aging:**  $< 5 \times 10^{-10}$  per day  
**Turn-on:** Within  $< 1 \times 10^{-8}$  of final value in 10 minutes

**Option 030 (3 GHz Channel)**

**Frequency Range:** 100 MHz to 3 GHz  
**Coupling:** ac  
**Power Range and Sensitivity (Sinusoid)**  
 100 MHz to 2.7 GHz:  $-27$  dBm to  $+19$  dBm  
 2.7 GHz to 3 GHz:  $-21$  dBm to  $+13$  dBm  
**Damage Level:** 5 V rms

**General Information**

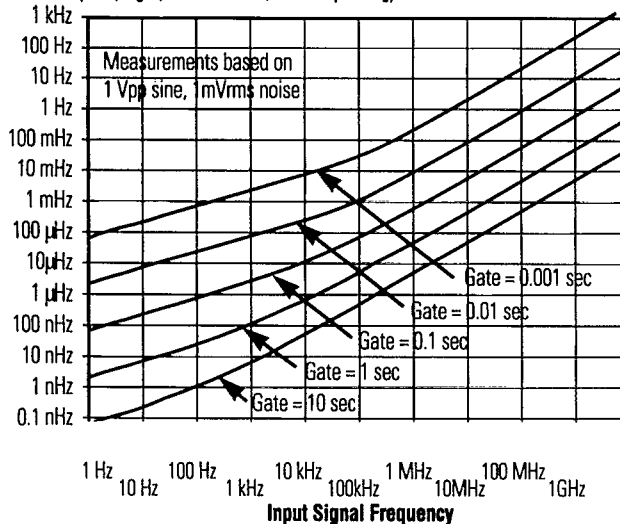
**Save and Recall:** Up to 20 complete front panel setups  
**Rack Dimensions:** 88.5 mm H  $\times$  212.6 mm W  $\times$  348.3 mm D  
**Weight:** 3.5 kg maximum  
**Warranty:** 3 years  
**Power Supply:** 88 to 135 Vac or 176 to 269 Vac, automatically selected; 45 to 66 Hz  
**Power Requirements:** 170 VA maximum; 30 W typical  
**Operating Environment:**  $0^\circ$  C to  $55^\circ$  C  
**Storage Environment:**  $-40^\circ$  C to  $71^\circ$  C  
**Remote Interface:** HP-IB (IEEE 488.1-1987, IEEE 488.2-1987)  
**HP-IB Interface Capabilities:** SH1, AH1, T5, TE0, L4, LE0, SRI, RLI, PP0, DC1, DT1, CO, E2  
**Remote Programming Lang.:** SCPI-1992 (Standard Commands for Programmable Instruments)

**Ordering Information**

<b>HP 53131A</b> Universal Counter	<b>Price</b>	
Counter comes with standard crystal timebase, power cord, operating and programming manuals.	\$1,675	D
<b>Opt 001</b> Medium Stability Timebase	\$600	D
<b>Opt 010</b> High Stability Oven Timebase	\$900	D
<b>Opt 030</b> 3 GHz Channel 3	\$800	
<b>Opt 060</b> Rear Input Terminals	\$150	
<b>Opt 1CM</b> Rack Mount Kit	\$51	
<b>HP 34161A</b> Accessory Pouch	\$38	

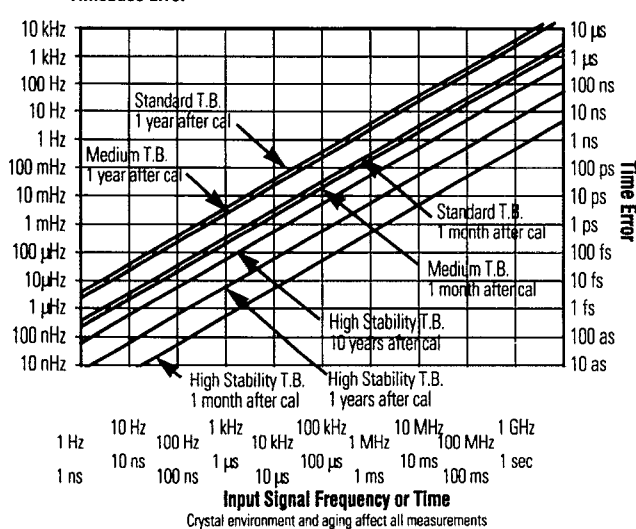
The following graphs provide a quick way to estimate resolution for the measurement you wish to make by assuming negligible values for other error sources. Typically, frequency resolution error and timebase error are the largest components of error in a frequency or period measurement, while timebase and trigger errors are most significant in a time interval measurement. Remember: other error factors may affect your measurement. For full specifications, please see your HP representative.

**Frequency Resolution Error**  
 (Time, Digits, or External-Start/Timed-Stop Arming)



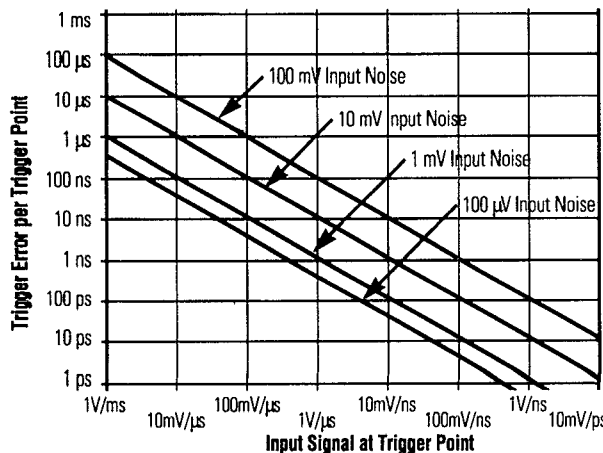
Note: Noise on the input signal and internal uncertainties will affect frequency measurements

**Timebase Error**



Crystal environment and aging affect all measurements

**Input Noise Trigger Error**



Note: Noise on the input signal affects both the start and stop points of all time interval measurements