

ELECTRONIC COUNTERS

General Information

Modulation Domain Analysis: A New View of Complex Signals

As a pioneer of counter/timer technology, Hewlett-Packard recognized a need to expand traditional frequency and time measurement techniques. With modulation domain analyzers, HP offers a unique method for viewing complex signals that is both intuitive and insightful.

Oscilloscopes display amplitude (voltage) versus time: the time domain. Spectrum analyzers show amplitude versus frequency: the frequency domain. The HP 53310A, HP 5371A, HP 5372A, and HP 5373A bring a new dimension to frequency and time-interval analysis with views of the modulation domain:

- Frequency versus time
- Phase versus time
- Time interval versus time

Improved Measurement Analysis

A wide range of applications benefit from modulation domain analysis. Jitter measurements in digital communication systems, disk and tape drives, and mechanical systems are dramatically improved. Identify the sources of jitter — the first step in improving system performance.

Modulation domain analyzers simplify the study of step response for voltage-controlled oscillators (see Figure 1). They easily characterize the frequency-hopping performance of an agile transmitter. Chirp linearity and phase switching in radar systems are easily understood from displays of frequency or phase versus time.

For more examples of applications that benefit from modulation domain analysis, see the next section which covers the specific HP modulation domain analysis products.

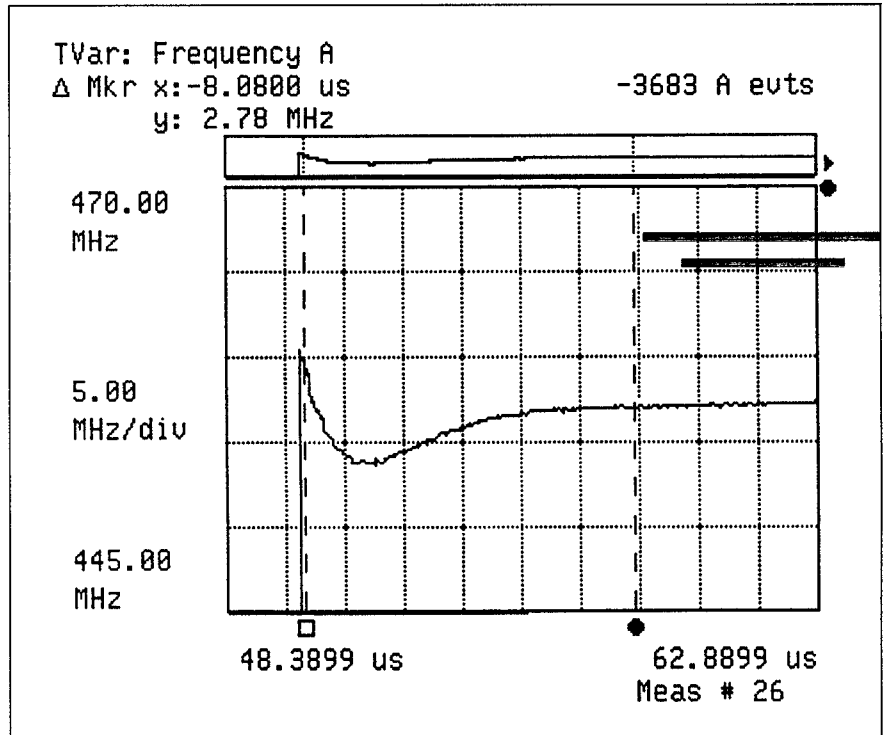


Figure 1. Modulation domain analyzers plot frequency versus time for a range of applications including the simplified, direct characterization of voltage-controlled oscillators. View the step response and analyze ringing and overshoot, settling time, and post-tuning drift.

Application Details

Discover new ways to view signals — new perspectives for solving elusive problems or fine-tuning product performance. Contact

your local sales office for a demonstration of an HP modulation domain analyzer, or request the application notes that describe this breakthrough measurement technique.

Modulation Domain Analyzer Selection Guide

Model	Frequency Range (Extension)	Single-Shot Freq. Res. (1s Gate)	Time-Interval Resolution (Single-Shot/Averaging)	Maximum Continuous Meas. Rate (Meas/s)	Memory Size	Output Meas/s	Analysis and Display	Page	Price
HP 5371A	500 MHz (18 GHz) ¹	10 digits	150 ps/1 ps	10×10 ⁶	1000	HP-IB: to 20,000	Frequency and time vs. time Software histogram Event timing graph Numeric display	189	\$24,500
HP 5372A	500 MHz (2 GHz) (18 GHz) ¹	10 digits	150 ps/1 ps	14×10 ⁶	8000	HP-IB: to 20,000 Fast Port: to 14×10 ⁶	As 5371A plus: Hardware histogram Frequency and time vs. time average Pre-triggering Time dev. (jitter) Phase deviation Window Margin Analysis	189	\$30,000
HP 5373A	500 MHz (2 GHz) (18 GHz) ¹	10 digits	150 ps/1 ps	14×10 ⁶	8000	HP-IB: to 20,000 FastPort: to 14×10 ⁶	As 5372A plus: Frequency, phase, and time vs. time Pulse carrier frequency Chirp deviation Pulse width, PRI, PRF Peak power, % AM	189	\$32,000
HP 53310A	200 MHz (2.5 GHz) (18 GHz) ¹	10 digits	200 ps	2.5×10 ⁶	8000 (32,000 w/Opt 001)	HP-IB: to 20,000	Frequency and time vs. time Autoscale (setup) Large display Jitter analysis Softkeys, menus Simple triggering	190	\$9,500

¹ Requires HP 5364A.