

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, 5371A, 5372A, 5373A, E1725A and E1740A 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. 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.

Modulation Domain Analyzer Products

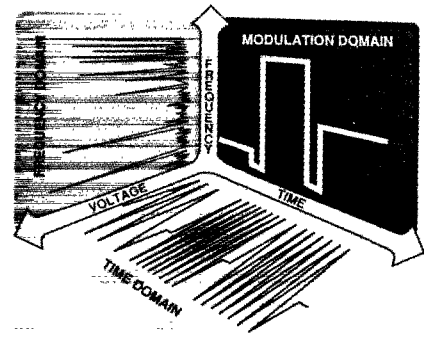
HP modulation domain analyzers provide a range of features and performance. Analysis features include views of frequency and phase versus time, with built-in statistics and histograms. HP-IB programmability lets you control these analyzers remotely, or use the front-panel measurement and display options for quick on-the-spot measurements.

The HP 53310A combines modulation domain analysis in a low-cost offering. Single-button functions and automated setup and measurement capabilities make the HP 53310A the easiest to operate of the modulation domain analyzers. The HP 53310A Option 031 includes features that further simplify the analysis steps for RF mobile communications designers.

For higher performance and greater functionality, the HP 5371A and HP 5372A extend the HP modulation domain analyzer family. Both instruments can sample frequency as fast as every 100 ns. The HP 5372A, a superset of the HP 5371A, offers expanded memory, faster measurements, hardware histograms, and FFT capabilities for improved performance and more sophisticated jitter spectrum analysis and phase noise studies.

The HP 5373A integrates the features and performance of the HP 5372A with built-in functions for pulsed signal analysis. These functions are especially suited for applications such as radar and EW signal characterization.

- HP 53310A: Affordable, easy-to-use modulation domain analyzer
- HP 5371A: General-purpose modulation domain analyzer
- HP 5372A: General-purpose analyzer with hardware histograms and FFT analysis (jitter spectrum)
- HP 5373A: Pulsed RF signal analysis for EW and radar applications



The Modulation Domain adds a third dimension of frequency vs. time.



New Products

HP's expertise with modulation domain analyzer technology has resulted in a family of time interval analyzer (TIA) products tuned for specific applications. Choose from preconfigured instruments, or design your own solution using the basic TIA module and selecting from a range of software offerings.

The HP E1725A TIA is based on the HP E1740A TIA module, a VXI card that can be plugged into a VXI cardcage. The on-card functionality includes basic arming and measurement control and a large 512K memory for storing results. Histograms are also executed in hardware on the HP E1740A for accelerated analysis operations.

The HP E1725A instruments combine the HP E1740A in a VXI cardcage with an embedded IBM-compatible PC. The PC's Microsoft®-Windows interface and optional HP software packages simplify measurements and offer powerful display and analysis capabilities for viewing and interpreting measurement results.

- HP E1740A: Two-slot VXI module
- HP E1725A: Highest-performance time interval analyzer with configurable personalities

Software Solutions

The HP E1725A can be tailored for specific TIA applications with the addition of optional software packages. The software can be purchased as options with the HP E1725A, or as standalone products for use with an existing HP E1740A configuration.

The current family of HP E174XA software products addresses the unique analysis requirements for the design and troubleshooting of data storage products, the integration of SONET/SDH technologies with existing telecommunications equipment, studying jitter in clock distribution networks and buffers, and solving jitter problems in token ring and other computer networking products.

- HP E1741A/E1747A: Data storage test
- HP E1742A: SONET/SDH tributary jitter analysis
- HP E1743A: Computer clock jitter analysis
- HP E1744A: Token Ring jitter analysis

Modulation Domain Analyzer Selection Guide

Model	Key selection criteria	Feature highlights
HP 53310A	Low-cost, easy-to-use	<ul style="list-style-type: none"> • Auto setup • RF transmitter characterization features • Fast histograms
HP 5371A	General purpose, 500 MHz analyzer	<ul style="list-style-type: none"> • Frequency and time versus time analysis • Histograms; statistics
HP 5372A	General purpose, 500 MHz analyzer (2 GHz optional)	<ul style="list-style-type: none"> • Frequency, phase, and time versus time • Fast histograms • FFT analysis (jitter spectrum, phase noise)
HP 5373A	Pulsed signal analysis	<ul style="list-style-type: none"> • EW and radar • Chirp linearity analysis • Function keys (PRF, PRI, % AM)
HP E1725A	Highest-performance analyzer	<ul style="list-style-type: none"> • 80 MHz sample rate • Microsoft® Windows user interface with custom analysis software
HP E1740A	2-slot VXI module	<ul style="list-style-type: none"> • High-performance histograms, window margin analysis, statistics • 512K on-card memory