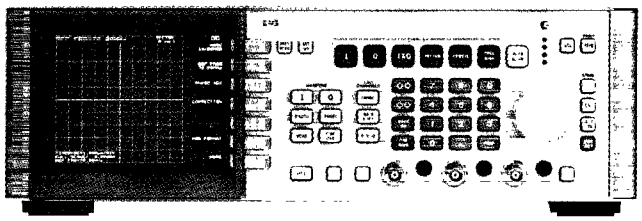
- Displays phase and amplitude modulation vs. time
- 350 MHz I, Q baseband signal analysis
- Markers for measuring phase, amplitude, and time
- 12-bit digitizing for HP-IB measurements



HP 8981B

DESIGNED FOR HP-IB SYSTEMS

HP 8981B Vector Modulation Analyzers

The HP 8981B vector modulation analyzer analyzes analog I and Q signals. Because it contains a calibrated demodulator it can also be connected to the IF of the modulator. This gives you the flexibility to examine changes in modulation down through the receiver chain and isolate faults quickly.

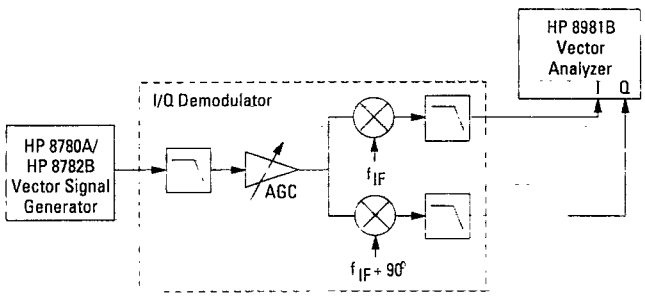
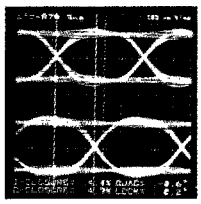
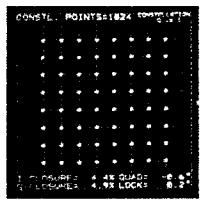


Fig. 1. I/Q demodulator measurement with HP 8981B

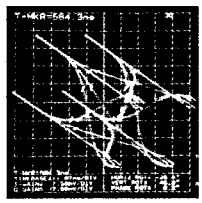
The HP 8981B vector modulation analyzer and HP 8780A/8782B vector signal generators can be used to adjust and troubleshoot I/Q modulators, demodulators, and I/Q modulated signals used in digital mobile radio, microwave radio, and the transmission of digital video. The analyzers can be connected to the I/Q outputs of a demodulator in a receiver, or to IF test points. Once connected, the HP 8981B vector modulation analyzer displays constellations, EYE diagrams, and vector diagrams of digital modulation formats such as QPSK, 16QAM, 64QAM, and 256QAM. The analyzer also makes statistical measures of system quality such as closure, lock angle error, and quadrature error. Through these "constellation analysis" techniques, transmission quality can be measured and monitored to detect degradations in the transmission link before link bit error rates reach unacceptable levels.



I & Q Display: Each I and Q channel is displayed vs. time on a separate grid, one above the other.



Constellation Display: Displays Q vs. I at the instant defined by the time marker.



3D Display: Useful for visual, or intuitive, analysis of Q vs. I vs. time waveforms. Signal can be rotated about any of 3 axes for optimal viewing.

- 50 to 200 MHz modulated IF input frequency range
- Other bands available to 1400 MHz
- Automatic internal/external demodulator calibration

Specifications

HP 8981B I/Q Mode Specifications

I and Q Channels

Bandwidth (−3dB): 350 MHz dc-coupled
DC vector accuracy using internal adc: ±1% of full scale
Input termination: 50 Ω or 75 Ω
Input coupling: Each channel independently: ac, dc, or ground

Power Requirements

Voltage: 100, 120, 220, 240 Vac, −10% to 10%; 48 to 66 Hz
Power: 245 W, 320 VA maximum

Size: 5¼-in rack height, one module width 23D HP System II cabinet
Weight: Net, approximately 20 kg (45 lb); shipping, approximately 24 kg (53 lb)

HP 8981B Demod Mode Specifications

Modulated IF input frequency range: <50 to 200 MHz
Modulated IF input level range: −5 to −20 dBm
Coherent reference input frequency range: 50 to 200 MHz
Coherent reference input level range: +10 to −20 dBm
Baseband bandwidth (3 dB): 100 MHz with external filters. Supplemental characteristic of 35 MHz with internal filters.
Corrected vector dc accuracy at 70 MHz: (typical from 50 to 200 MHz) <2% of full scale IF input

Supplemental Characteristics

Quadrature error: Corrected: < ±0.5°; uncorrected: < ±1°
I/Q gain imbalance (dc to 10 kHz): Corrected, < ±0.1 dB; uncorrected, < ±0.25 dB

Optional Demodulators

	Frequency range	RF BW	Calibrated modulation analysis	Calibrated I/Q outputs
HP 8981B	50 to 200 MHz	70 MHz	Yes	No
Opt H20	200 to 350 MHz	70 MHz	Yes	No
Opt H32	321.4 MHz	70 MHz	Yes	Yes
Opt H35	350 to 500 MHz	70 MHz	Yes	No
Opt H36	360 to 550 MHz	70 MHz	Yes	No
Opt H50	500 to 900 MHz	70 MHz	Yes	No
Opt H75	750 to 1250 MHz	70 MHz	Yes	No

Ordering Information

HP 8981B Vector Modulation Analyzer
HP 11748A Active Probe System

HP 11736B I/Q Tutor

The HP 11736B I/Q Tutor was written to train engineers, technicians, and engineering managers. I/Q Tutor consists of interactive training software and a user manual. It covers all the major blocks of a complete digital communications system, from the analog input through modulation, transmission, demodulation, and conversion, back into analog.

I/Q Tutor's presentation of fundamental principles followed by simulations and examples is a powerful learning tool. The user manual teaches fundamentals of phase and magnitude and employs laboratory exercises to help you explore the effects of real-world interactions of C/N ratios, data errors, multipath fades, filter factors, modulation types, and so forth.

Subjects covered include phase and magnitude, practical digital modulation techniques, BPSK, QPSK, 16QAM, Offset QPSK, and Offset 16QAM, multipath fading, high power amplifier nonlinearities, theory of I/Q modulation and demodulation, Nyquist filters, and some aspects of regulation.

Ordering Information

HP 11736B Runs on HP Vectra and most IBM PC-compatible computers (PC/XT/AT) with a monochrome or color graphics card.

To order, phone 1-800-227-8164.

For the most current prices and product information, contact your local Hewlett-Packard sales office—see page 691.