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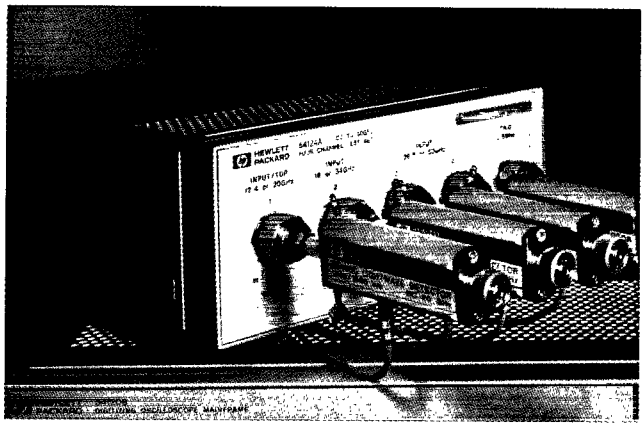
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TIME DOMAIN/COMMUNICATION ANALYZERS

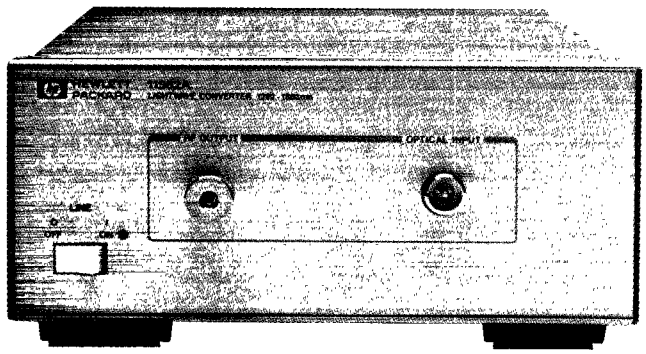
DC-Coupled Lightwave Converters

HP 11982A, 83440B/C/D

- DC-coupled optical-to-electrical converters
- Bandwidths from dc to 32 GHz
- Fast pulse response
- Low pulse aberrations
- High sensitivity
- Time- and frequency-domain measurements



HP 83440 Series



HP 11982A

DC-Coupled Optical Converters

Optical communication systems that incorporate time-domain instruments often require optical-to-electrical (O/E) converters in order to make optical pulse and wavelength measurements. Whether to use an unamplified or an amplified O/E converter depends on the measurement application. If signal power levels are high enough, a simple photodiode-only converter such as the HP 83440 offers well-behaved pulse response performance. To measure low power signals, an RF-amplified O/E converter such as the HP 11982A may be required.

In frequency-domain applications, O/E converters allow frequency-domain instruments such as network and spectrum analyzers to accept optical signals for basic lightwave measurements. Users can measure, quantify, and model modulation characteristics such as spectral purity, harmonic content, and noise spectral density.

HP 83440 Series Unamplified Lightwave Converters

The HP 83440 series offers a variety of bandwidth options for converting incoming modulated optical power or optical pulses into electrical current. Ideal for optical pulse parameter measurements, these fully integrated hermetic InGaAs photodetectors feature very low noise and pulse aberrations; fast, accurate O/E conversion; and a standard user interface compatible with most electrical instruments. The converters mount directly on test-instrument front panels. Simple internal structure ensures low signal distortion for improved output-signal fidelity, a novel optical launch ensures low optical reflection, and integral dc-bias regulation ensures stable frequency response performance.

The HP 83440 series can be used with high-speed digitizing oscilloscopes to accurately measure rise and fall time, overshoot, undershoot, ringing, peak power (pulse amplitude), pulse width, amplitude noise, and extinction ratio. The HP 83440 series also makes excellent mask measurements when sufficient optical power is available.

The HP 83440B Option 050 provides 50 Ω output required for use with external SDH Bessel-Thomson filters such as the HP 87441 family.

When using the HP 83440 with an ac-coupled instrument (except Option 050), a bias tee such as the HP 11612A or, alternatively, a 3 dB fixed attenuator on the output is required to provide a dc-bias return path.

HP 11982A Amplified Lightwave Converter

A wide-bandwidth, sensitive O/E converter for characterizing lightwave systems and components, the HP 11982A combines a PIN photodetector with a low-noise dc-coupled preamplifier to create a general-purpose front end. It covers wavelengths from 1200 to 1600 nm and bandwidths from dc to 15 GHz. With 300 V/W conversion gain and 0.05 percent input optical reflections, it significantly improves the sensitivity of the measurement system. The converter comes with a calibration chart of instrument-specific data for making corrected frequency response measurements.

The HP 11982A can be used with an electrical spectrum analyzer to display optical modulation power as a function of frequency. Intensity modulation, distortion, and laser intensity noise are also measured. The Option 001 memory card programs an HP 8590 E series spectrum analyzer with frequency response corrections and menus for easy, accurate lightwave measurements to 22 GHz. Using this converter with the HP 11980A interferometer, you can measure linewidth (with a gateable modulation source), chirp, and frequency modulation of single-line lasers.

Combine the HP 11982A with an HP 54120 series digitizing oscilloscope to make optical eye-pattern and impulse-response measurements. Use the results to verify optical and optoelectronic components and optical system level performance.

Specifications

	HP 83440B	HP 83440C	HP 83440D	HP 11982A
Wavelength	1000 to 1600 nm			1200 to 1600 nm
Bandwidth (optical)	6 GHz	20 GHz	32 GHz	dc to 15 GHz
FWHM* pulse width	74 ps	22 ps	14 ps	29.4 ps
Conversion gain				300 V/W, nominal
1300 nm	35 V/W	35 V/W	20 V/W	
1550 nm	32.5 V/W	32.5 V/W	15 V/W	
Noise equivalent power	<18 pW/$\sqrt{\text{Hz}}$			<30 pW/$\sqrt{\text{Hz}}$
Maximum operating optical power	2 mW peak			1.5 mW peak
Maximum safe Optical input power	10 mW peak			10 mW average
Input optical reflection	<0.05% (>33 dB)		<0.10% (>30 dB)	0.05%

*Full Width Half Maximum, the pulse width at one-half the maximum deflection

Ordering Information

HP 11982A Amplified Lightwave Converter
Opt 001 Frequency Response Correction/Menus
HP 83440B Unamplified Lightwave Converter
Opt 050 50 Ω Output for Use with SONET/SDH Filters
HP 83440C Unamplified Lightwave Converter
HP 83440D Unamplified Lightwave Converter
Connector Options (for all models)
Opt 011 Diamond HMS-10/HP
Opt 012 FC/PC
Opt 013 DIN 47256
Opt 014 ST
Opt 015 Biconic

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

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