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clarke-hess
COMMUNICATION RESEARCH CORP.
manufacturer of precision test and measurement equipment

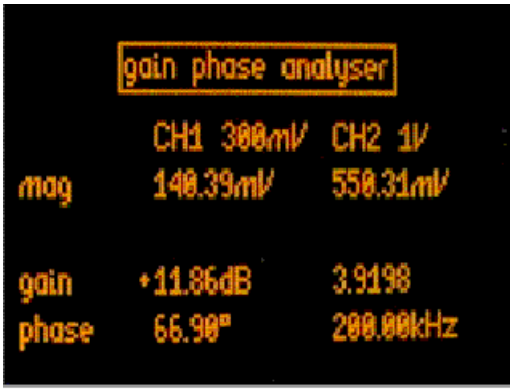
OTHER PRODUCTS

Multi-function Gain-Phase Analyzer (Frequency Response Analyzer) Model 2505



Standard Configurations

- Gain phase analyzer
- Frequency response analyzer
- Phase Angle Voltmeter (PAV)
- Fast dual channel wide-band voltmeter
- Phase meter
- Complex impedance bridge
- Spectrum / Harmonic analyzer
- Wide-band power analyzer
- Dual channel sampling oscilloscope



Features

- Isolated / floating inputs, dc-2MHz
- Auto rejection of noise and harmonics
- Internal Function Generator
- 0.1mV to 500V range
- Alarm on any measurement
- RS232 and printer port, IEEE-488 option

Display

- High resolution vacuum fluorescent display
- Outputs presented as tables or graphs
- Magnification for large clear results

Typical applications

- Testing of closed loop feedback systems
- Synchro, resolver, RVDT and LVDT test
- Inductor / transformer testing
- Incoming inspection of components

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- Complex impedance measurement
- Core loss measurements
- Ultrasonic power measurements
- Power line carrier signal measurements
- Multi-function testing in University labs

Description

The Model 2505 is a multi-function instrument which is ideal for users that must make a large variety of sophisticated measurements. A single package, contains a Gain Phase Analyzer (Frequency Response Analyzer), Phase Angle Voltmeter with a null detector, Function Generator, Pulse Generator, Spectrum Analyzer, Digital Sampling Oscilloscope, Wattmeter, Phase Meter and Complex Impedance Bridge. These internal instruments cover the frequency range from dc (10mHz for the ac instruments) to more than 2MHz.

Each of these internal instruments may be used independently or in an internally correlated fashion. By selecting the internal Function Generator and the two Voltmeters, the user can obtain dual gain-phase data for two outputs of any network he is testing. This is particularly useful for making Bode plots to check the stability of networks having feedback. These plots can be displayed in several formats using the oscilloscope capability of the Model 2505. Because of the floating inputs, the measurements can be made across network components with neither side connected to ground.

In its Phase Angle Voltmeter (PAV) mode, the Model 2505 presents, on a single display, the total rms, the in-phase and quadrature components, the phase angle and the fundamental magnitude. An additional display provides the ratios of the various parameters. An internal null meter provides the user with the ability to make precision ratio adjustments. The specifications in this mode are superior to the specifications of all competing PAVs regardless of their cost. In addition, unlike traditional PAVs, the Model 2505 has the advantage of a built-in signal generator. All of these features make the Model 2505 ideal for synchro, resolver, RVDT and LVDT testing.

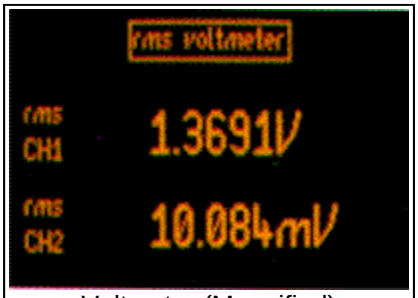
The Spectrum Analyzer feature can be used to observe the harmonic content of complex, periodic input signals. This proves to be especially useful for examining current waveforms to ensure that they do not exceed the requirements placed on harmonics.

As a true rms Wattmeter, the Model 2505 is ideally suited to measure core loss, input power to ultrasonic transducers, power consumed by switching power supplies, and many other devices operating at higher frequencies. It also performs exceptionally well with measurements at 50Hz or 60Hz.

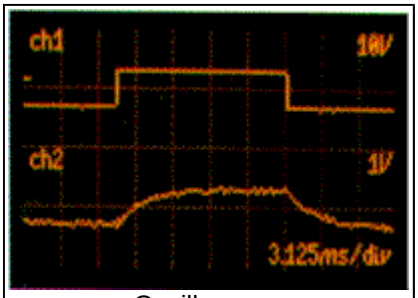
The Complex Impedance Bridge function permits the user to measure Resistance, Inductance and Capacitance at frequencies from dc (Resistance only) to 2MHz. Secondary functions such as Q (quality factor), D (dissipation factor), and ESR (equivalent series resistance) can also be measured over the same frequency range.

Data are presented on an orange, vacuum luminescent display either in tabular form or in a swept graphical form, e.g., an amplitude vs. frequency plot for a linear network. The tabular form comprises a list of the frequencies with their corresponding amplitudes. A zoom function permits the user to enlarge items of interest on the display.

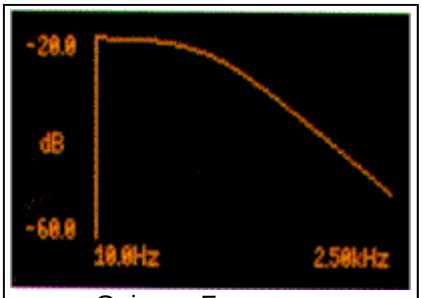
Typical Displays



Voltmeter (Magnified)



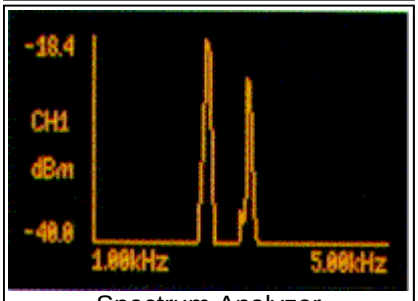
Oscilloscope



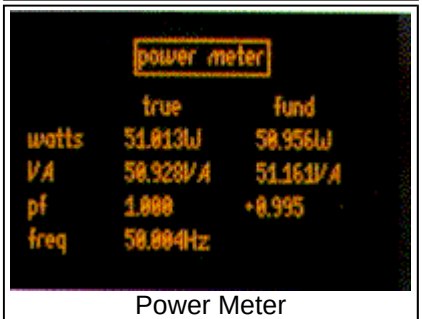
Gain vs. Frequency



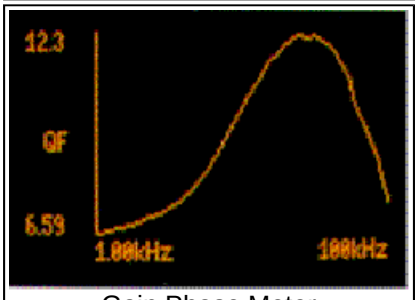
Selective Level Meter



Spectrum Analyzer



Power Meter



Gain Phase Meter



Impedance Bridge



Transformer Analyzer

Specifications

CH1 & CH2 Voltmeters

Channels / display	2 isolated / 5 digits
Measurement	Rms, ac, dc, peak, cf, surge
Frequency	Dc to 2MHz
Coupling	Ac or ac+dc
Max input	±500V peak ±500V peak from earth
Input ranges	500V 300V, 100V, 30V, 10V, 3V, 1V, 300mV, 100mV, 30mV,10 mV
Ranging control	Full auto, up only, or manual
Input impedance	1 M // 30pF (excluding. Leads)
Accuracy (ac) All + 0.4mV	0.1 % range < 1 kHz 0.3% range < 10kHz 1 % range < 50kHz + 0.004% rdg per kHz to 2MHz
Accuracy (dc)	0.2% range + 2mV
CMRR	>55dB @ 10V 1 MHz >110dB @ 100V 1 kHz
Time constant	0.2s, 1.5s or 12s

Phase Meter

Frequency	10mHz to 2MHz*
Measurement	DFT analysis
Phase accuracy	0.02° < 100Hz 0.05° < 1 kHz 0.25° < 10kHz + 0.005° per kHz

Gain phase analyzer (Frequency response analyzer)

Frequency range	10mHz to 2MHz*
Modes	Gain, angle, real, imaginary
Accuracy	±0.02dB

LCR meter

Frequency range	10mHz to 2MHz*
Measurement	DFT analysis
Functions	L, C, R (ac), R (dc), Z, Q, tanð, Ø, series or parallel
Ranges	10pF to 1F 100nH to 1000H 100mΩ to 10MΩ
Accuracy	0.3% < 1 kHz, 0.75% < 10kHz 2.5% < 50kHz, 12.5% < 1 MHz

Transformer analyzer

Inductance L	100nH to 1000H Series / Parallel
Quality factor Q	0.001 to 2000
Leakage inductance	100nH to 1000H
Inductance match	1:5000 to 5000:1
Turns ratio (voltage)	1:70000 to 70000:1
Turns ratio (Inductance)	1:2000 to 2000:1
Winding polarity / phasing	Pass/fail or ±indication
Dc R & winding continuity	20mΩ to 100kΩ
Inter winding phase angle	0° to 360° or ±180°
Impedance test	10mΩ to 100MΩ
Insertion / return loss	-100dB to 100dB
Frequency response	10Hz to 2MHz
Longitudinal balance	0dB to 100dB
Inter winding capacitance	10pF to 1F
Inter winding capacitance match	1:5000 to 5000:1

Distortion THD	0.1 % to 100%

Signal generator

Waveforms	sine, triangle, square, sawtooth, dc only
Frequency	10mHz to 2.4MHz (sine); 10mHz to 1MHz (other)
Accuracy	Frequency ±0.05%; Amplitude ±5% (to 100kHz)
Output impedance	50Ω
Output voltage	10mV to 10V peak
Offset	0V to 10V

Pulse generator

Frequency	10mHz to 2.4MHz
Pulse width	200ns to 10s (50ns resolution)
Rise and fall time	selectable 50ns (5V) to 1s

Phase Angle Voltmeter PAV (Vector Voltmeter)

Measurement	Total rms, in-phase and quadrature components, phase angle, fundamental magnitude, and ratio with null meter capability.
Range	10mHz to 1MHz
Accuracy	See voltmeter/phase meter specifications

Low frequency DSO / waveform display

Channels	2
Time-base	20us to 5s per division
Roll mode	Time-base >1s/div
Pretrigger	None, 25%, 50%, 75%
Sample rate	800k sample/sec

Power meter

Measurements	W, VA, power factor, V, A total, fundamental, integrated
Current and Voltage accuracy	±0.1 % reading
Power accuracy (power factor >0.7)	±(0.3% rng + 0.3% rdg), f < 1kHz; ±(0.7% mg +0.3% rdg), f < 10kHz; ±(2% mg +0.5% rdg), f < 50kHz; ±(2% rng + 5% rdg), f < 1MHz

Selective level meter

Frequency range	10Hz to 2MHz
Scan	single, dual, or sweep
Selectivity (-3dB)	3Hz, 24Hz, or 100Hz

General

Display	160 x 80 dot graphic electroluminescent
Size	Approximately 30 x 15 x 25 cm (Upright unit)
Temperature range	Operating: 0° to 40°C Within specification: 23° ±5°C
Weight	Approximately 5kg
Power supply	115 V rms ±10%, 60Hz, 30VA max.
Warranty	1 year

Ordering information

Model number	2505	rack mount unit, 2U high, specify front or rear connections
Included:	Input probes, BNC output cable, RS232, RS232 cable; power cord, manual, Certificate of Calibration	
Option IEEE	IEEE-488 interface	
Option 01-A	Active LCR Test Head Includes Kelvin clips	
Option 01-P	Passive LCR Test Head Includes Kelvin clips	
Option 03A	Injection transformer (for gain-phase measurements)	
Option 04	Amplifier, 20Vp-p at 1 A	

*20mHz to 1 MHz if not using generator

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