Specifications

Appendix A

Measurement Modes

XY %	X-channel and Y-channel PSD outputs expressed as a percentage of the present full-scale sensitivity setting
XY V	X-channel and Y-channel PSD outputs expressed directly in terms of voltage at input to signal channel
R θ	Vector magnitude of input signal in volts and phase angle in degrees
NOISE	Noise in a bandwidth defined by the output filter time constant and slope controls and centered at the reference frequency expressed as a percentage of the present full-scale sensitivity setting
Harmonic	Fundamental (F) or 2F modes

Displays & Indicators

Two, 3½ -digit liquid crystal displays, analog center-zero panel meter and back-lit LED indicators show the settings of all the main instrument controls and outputs.

Signal Channel

Voltage Inputs

Modes	A only or Differential (A-B)
Full-scale Sensitivity	100 nV to 3 V rms in a 1-3-10 sequence
Impedance	100 MΩ // 30 pF
Maximum Input	± 100 V DC; 30 V AC pk-pk without damage, 10 V AC pk-pk without saturation
Voltage Noise	5 nV/√Hz at 1 kHz typ
CMRR	> 100 dB at 1 kHz degrading by 6 dB/octave
Frequency Response	0.5 Hz to 120 kHz
Grounding	BNC shields can be grounded or floated via 1 kΩ to ground

Current Input

Mode	10^6 V/A or 10^8 V/A
Full-scale Sensitivity	
10^8 V/A	10 fA to 30 nA in a 1-3-10 sequence
10^6 V/A	10 fA to 3 μA in a 1-3-10 sequence
Frequency Response	
10^8 V/A	-3 dB at 330 Hz
10^6 V/A	-3 dB at 60 kHz
Impedance	
10^8 V/A	< 2.5 kΩ at 100 Hz
10^6 V/A	< 250 Ω at 1 kHz

Maximum Input	15 mA continuous, 1 A momentary without damage. 10 μA AC pk-pk without saturation on 10^6 V/A; 100 nA AC pk-pk without saturation on 10^8 V/A
Noise	
10^8 V/A	13 fA/√Hz at 500 Hz
10^6 V/A	130 fA/√Hz at 1 kHz
Grounding	BNC shield can be grounded or floated via 1 kΩ to ground
Line Notch Filter	> 34dB attenuation @ ±1% of 50 or 60 Hz and/or 100 or 120 Hz
Dynamic Reserve	130 dB max
Gain Accuracy	
Flat Mode	1% typical
Bandpass Mode	2% typical
Gain Stability	200ppm/°C typical

Reference Channel

TTL Input (rear panel)	
Frequency Range	0.5 Hz to 120 kHz
Analog Input (front panel)	
Impedance	1 MΩ // 30 pF
Frequency Range	0.5 Hz to 120 kHz
Level	
Sinusoidal Input	1.0 V rms**
Squarewave Input	100 mV rms**
	**Note: Lower levels can be used with the analog input at the expense of increased phase errors.
Maximum input voltage	5.0 V rms
Phase	
Set Resolution	0.1° or 0.005° increments
Accuracy	±1° typical
Noise	0.005°rms at 100 ms TC, 12 dB/octave
Orthogonality	
Above 5Hz	90° ±0.5°
0.5Hz - 5Hz	90° ±5° max
Drift (Flat Mode)	< 0.05°/°C
Lock Acquisition Time	2 cycles + 100 ms

Demodulator

Description	Switching type demodulators operating in either square wave or Walsh function modes.

Output Zero Stability

High Dynamic Reserve	500 ppm/°C
Normal	50 ppm/°C
High Stability	5 ppm/°C

Harmonic Rejection

Low-Pass	>80dB at 1 kHz
Bandpass	>60dB at 1 kHz

Time Constants

Main outputs	1 ms to 3 ks in a 1-3-10 sequence
Roll-off	6 and 12 dB/octave
P.S.D. Monitor Outputs	100 µs nominal, X-output only
Roll-off	6 dB/octave only

Offset Auto and Manual on X and/or Y: ±150 % FS

Oscillator

Frequency

Range	0.5 Hz to 120 kHz
Setting Resolution	better than 1%
Absolute Accuracy	±2%

Distortion (THD) 0.5%

Amplitude

Range	
Front panel	1 mV to 1.999 V
Computer Control	1 mV to 2.000 V and 5.000 V
Setting Resolution	
1 mV to 500 mV	1 mV
501 mV to 2 V	4 mV
Accuracy	
0.001 Hz to 60 kHz	±0.3 %
60 kHz to 250 kHz	±0.5 %
Stability	50 ppm/°C

Output

Impedance	900 Ω

Auxiliary Inputs

AUX ADC INPUT CH1 - CH4

Maximum Input	±15 V
Resolution	1 mV
Input Impedance	1 MΩ // 30 pF
Sample Rate	
CH1 only	200 Hz max.
CH1 - CH4	50 Hz max.

Trigger Mode	Internal or External
Trigger input	TTL compatible

Outputs

CH1, CH2 Analog Outputs

Function	X, Y, R, θ, Noise, Ratio and Log Ratio.
Amplitude	±15 V (±10.0 V = ± full scale)
Impedance	1 kΩ

Signal Monitor

Amplitude	±10 V max
Impedance	1 kΩ

Aux D/A Output

Maximum Output	±15 V
Resolution	1 mV
Output Impedance	< 150 Ω

Reference Output

Waveform	0 to 5 V square wave
Impedance	TTL compatible

Power - Low Voltage ±15 V at 100 mA rear panel DIN connector for powering ***SIGNAL RECOVERY*** preamplifiers

Interfaces

RS232 and GPIB (IEEE-488). All settings can be adjusted from the front-panel

General

Power Requirements

Voltage	110/120/220/240 VAC
Frequency	50/60 Hz
Power	< 130 VA

Dimensions

Width	440 mm (17.25")
Depth	89 mm (16.5 ")
Height	
With feet	105 mm (4.1 ")
Without feet	89 mm (3.5 ")

Weight 9.1 kg (20 lbs)

All specifications subject to change without notification