SIGNALOC™ 2100

HINDS INSTRUMENTS

SIGNAL PROCESSING | PRODUCT BULLETIN

TECHNOLOGY FOR POLARIZATION MEASUREMENT

A lock-in amplifier (LIA) is commonly used with the photoelastic modulator (PEM) in highly sensitive measurements of polarization properties. Now, a research grade LIA is available that is customized to the needs of the typical PEM measurement and available in a high value package. This means that the highest sensitivity for measuring polarization properties can be achieved by using a PEM with an affordable but research grade lock-in amplifier.

Signaloc Model 2100 is a new, AC and DC dual-phase analog signal recovery instrument consisting of proprietary Hinds Instruments lock-in amplifier circuitry and control display software. Tailored for use with PEMs, each Signaloc is calibrated for use at a single user-defined frequency. The unit is designed to optimize the detection of signals at both the first and second harmonics (1F and 2F) of a PEM.

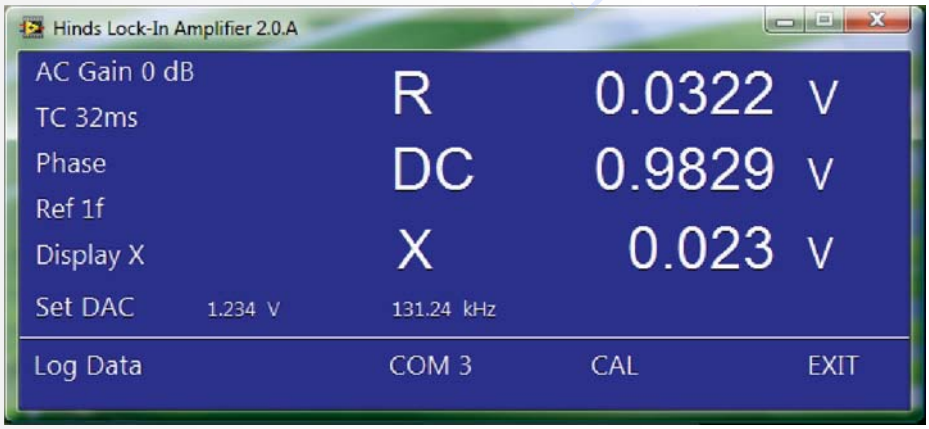
Information from the lock-in amplifier is sent to a computer via RS-232 where it is displayed on a monitor and available for immediate, real-time analysis by the user's program. The user can control various settings of the lock-in amplifier using the software program that is provided. The unit measures and displays the AC magnitude of the signal in Volts RMS, the DC magnitude of the signal in Volts, and the frequency of the reference signal in kHz. In addition, the user can display one of the following signal parameters:

1. Phase angle of AC component in degrees with respect to reference signal input
2. X component of AC signal in Volts RMS
3. Y component of AC signal in Volts RMS

Operation of Signaloc control software, which runs on the user's computer, is intuitive and allows the user to quickly tailor the display and data logging functions to the particular settings desired. The user can select the optimum Gain and Time Constant values for a specific measurement and can select/de-select the Auto Phase function. In addition, the user can initiate a device self-calibration.

Data can be logged either by specifying a time window or by specifying the number of data points desired.

The Signaloc Model 2100 Lock-in Amplifier includes the compact LIA module, a 24 DC power supply, Hinds Instruments control software, and the User Manual.



PEMlabs

SPECIFICATIONS		
Signal Channel	Modes	Single-ended
	Grounding	BNC shield to ground
	Impedance	1 MΩ / 10 pF
	Frequency Response	40 Hz to 250 kHz
	Maximum Input	2.5 Vpp
	Full-scale Sensitivity	4 µV
	Gain	0, 3, 6, 9, 12, 15 db (selectable)
	Gain Accuracy	+/- 1% for ≥ 1 mV
		+/- 5% for < 1 mV
	Phase Accuracy	+/- 1° for ≥ 1 mV
	DC Accuracy	+/- 2 mV max
	Voltage Noise	2 µV / √Hz
	CMRR	> 60 dB
Signal Channel Filters	High-Pass Filter (- 3 dB)	40 Hz
	Low-Pass Filter (- 3 dB)	250 kHz
	Frequency Accuracy	+/- 5%
Reference Channel	Frequency Range	20 kHz - 250 kHz*
	Frequency Accuracy	+/- 0.1% max
	Reference Input	TTL or CMOS
	Input Impedance	10 MΩ, 50 pF
	Phase Resolution	0.01%
	Orthogonality	90° +/- 0.088°
	Acquisition Time	5 ms

*Note: *Signaloc Model 2100* is a dual-phase, analog lock-in amplifier operating at a single frequency. Each unit is calibrated at time of manufacture for use at one user-specifed frequency.

Hinds Instruments, Inc / 7245 NW Evergreen Pkwy / Hillsboro, OR 97124 / USA
T: 503.690.2000 / F: 503.690.3000 / sales@hindsinstruments.com / www.hindsinstruments.com