Optical Finesse µLIA-320

Dual-phase USB Lock-in Amplifier

The **µLIA-320** is a versatile, low-cost, dual-phase, high analog bandwidth, DDS-enabled lock-in amplifier with a native full-speed USB 2.0 interface. Powered by 32-bit ARM technology, this easy-to-use instrument is specifically designed for economical deployment in high-channel-count OEM applications. The **µLIA-320** can be operated by our intuitive *uLIA-Panel* application, or tied into a user-supplied program via the device driver toolkit--source code is provided. The lock-in is 100% RoHS compliant and is powered by a separate international power supply.

Features

• Dual-phase signal recovery to 400 kHz

• Native full-speed USB 2.0 compliant interface

• Continuous real-time streaming of demodulated (x, y) samples, or readings-on-demand

• Flexible 32-bit DDS-based reference channel can act as input or output; can recover signals conventional quadrature lock-in's cannot

• Analog monitor output enables standalone mode; software-selectable between four different signals

• Lightweight, miniature form-factor

• Separate international triple power supply

• RoHS compliant

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DEMODULATOR CHARACTERISTICS	
Signal input	• Bipolar voltage-only 0 to ±10V, 1 MΩ/10 nF input impedance, AC-coupled • 800 Hz to 410 kHz frequency range
AC gain	• 0 to 63 dB in discrete, calibrated 0-3-10 dB steps
AC overload	• Overload LED will illuminate for AC gains resulting in greater than ±10V_{peak} into demodulator stages
Reference input	• Logic-level TTL-compatible signal, 800 Hz to 410 kHz, arbitrary duty cycle. Input signal is opto-isolated for reference input configuration
Reference output	• Logic-level TTL-compatible signal, calibrated frequencies 800 Hz to 410 kHz, 50% duty cycle
Reference configuration	• Conventional 1F quadrature: X and Y channels held 90° apart, phase-adjustable with respect to reference input or output. Phase adjustable to 0.1°
Monitor output	• Bipolar analog output • Software-selectable between four internal signal sources: AC-coupled signal input, AC gain stage output, X DC output, or Y DC output • X or Y demodulator outputs may be substituted for X or Y DC outputs by internal jumper selection
Demodulator type	• High bandwidth analog multiplier (homodyne)
Demodulator lowpass filter	• 4th-order Butterworth, 160 Hz cutoff frequency
DC gain	• 6 to 66 dB, set parametrically by chosen DC Sensitivity setting
Sensitivity	• 10 µV to 2V sensitivity ranges, in discrete, calibrated 1-2-5-10 steps
DC overload	• Overload LED will illuminate for AC & DC gain combinations resulting in greater than ±10V into either X or Y analog-to-digital stages
Time constants	• Time constants implemented by real-time digital filtering of acquired samples • 1 ms to 50 ms in discrete steps
Gain accuracy	• ±0.5% typical end-to-end, ±1% maximum
A/D resolution	• Bipolar, 12 bits plus sign, referenced to 10.00 V

INTERFACE	
Host computer interface	• Full-speed USB 2.0 compliant, self-powered device; one interrupt and two bulk endpoints
Software	• *µLIA-Panel* application software (source code provided) permits instrument control and real-time acquisition of demodulated samples in (x, y) or (R, θ) formats • Host USB drivers for Windows 7, Vista and Windows XP (executable only; 64-bit Windows XP not supported. Windows XP installation requires Service Pack 2 or higher)
Device drivers	• uLIA_dd device-driver toolkit (source code provided) for application programming in Visual Studio

PHYSICAL	
Dimensions	• 5.5 in W *x* 7.5 in. L *x* 1.6 in H
Weight	• 1.4 lbs (µLIA-320); 2.9 lbs (µLIA-320 + power supply)
Chassis material	• Blue anodized aluminum, rubber bottom feet • Machined aluminum front & back panels, blue-anodized and laser etched
Front panel	• Power, Lock and Overload LEDs • 50-ohm BNC female bulkhead for Signal Input • 50-ohm BNC female bulkhead for Monitor Output
Back panel	• DIN-5 female receptacle for power input • ON/OFF power switch • Series B USB receptacle for USB to host computer • 50-ohm BNC female bulkhead for Reference Input/Output
RoHS and CE compliance	• 100% RoHS compliant; CE certification to FCC Class A emissions level upon special arrangement
Operating temperature	• 5 to 45° C
Power supply	• Separate, supplied with µLIA-320 • International +5V/+15V/-15V triple power supply, 42W, 100-240VAC 47-63Hz input, CE listed • DIN-5 male plug on 48 in cord
Warranty	• One year

In keeping with our commitment to continuous product improvement, these specifications are subject to change without notice.

Optical Finesse

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