

eLockIn204/2 Specifications



1 MHz Digital Lockin Amplifier / Sine Generator

Features

- **Real 4-channel** lockin amplifier
- **Dual** harmonic & **dual** input
- **5 nV/Hz^{0.5}** input noise @ 100 kHz
- 14-bit 40 Mega samples per second
- graphical display vs. time and frequency
- 14-bit sine wave generation from 0.1 mV_{rms} to 7 V_{rms}
- **Synchronous filtering** over full frequency range
- 0.01 Hz to **1 MHz**, 135 dB dynamic reserve
- spectra acquisition up to **2 MHz**
- data width: 64/96-bit, results: float
- remote control via TCP/IP, internal web-server
- free DLL, windows driver and remote program

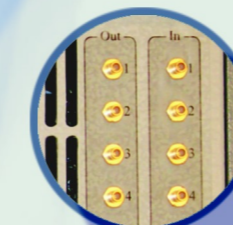
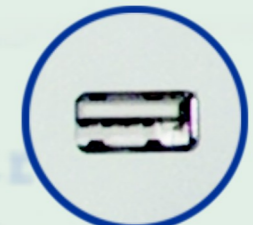
TCP/IP remote control



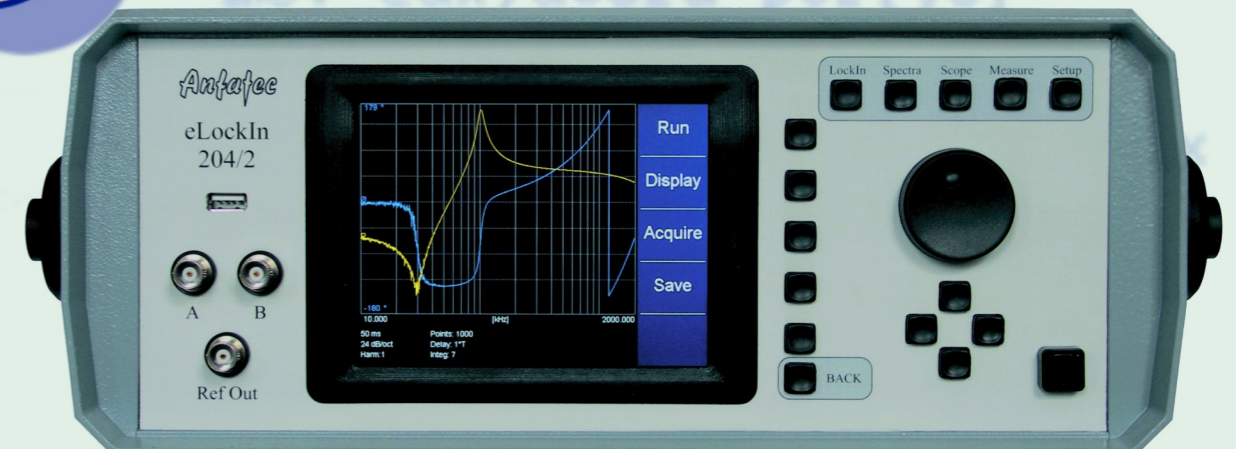
Internal PLL & Trigger Out



USB data storage



24-bit 156 kHz
Auxiliary Inputs &
Auxiliary Outputs



www.anfatec.com

GENERAL PARAMETER			
Functions	Lockin Amplifier		
	Spectrum Acquisition		
	Oscilloscope		
Remote Control	Ethernet		
Special Features	Dual Harmonic Dual Input Synchron Mode up to 1 MHz		
Display	Color TFT - 16.51 cm (6.5")		
LOCKIN AMPLIFIER SPECIFICATION			
General	Number of Phases	4 simultaneously acquired phases	
	Dynamic Reserve	max. 135 dB	
	Input Noise	< 5 nV _{rms} /Hz ^{0.5} @ 100kHz	
	Time Constants	0.1 ms ... 1 ks	
	Full Scale Sensitivity	10 nV ... 10 V in 1-2-5 sequence	
	Phase Resolution	0.0001°	
Signal Input	Type	single-ended (A) dual input (A&B) differential (A-B)	
	Connector	BNC	
	Coupling	DC or AC (f _{-3dB} = 2 Hz)	
	Damage Threshold	+/- 12 V (in ON state) +/- 2 V (in OFF state)	
	Full Scale Input Ranges	High dynamic: ± 3.6 V _{rms} Normal: ± 360 mV _{rms} Low noise: ± 35 mV _{rms}	
	Time Constants	0.1 ms to 1 ks in 1-2-5 steps	
	Synchron filter	1 to 200 periods in 1-2-5 steps	
	Filter Characteristic	Butterworth	
	Gain Deviations	< 1 % between Dynamic Ranges	
	Gain accuracy @ 20 °C	± (0.0004 % of range + 0.5 % measurement)	
	Impedance	~ 1 MΩ 10 pF	
	Input Noise τ = 1 ms 50 Ω @ 100 kHz	high dynamic: < 300 nV _{rms} /Hz ^{0.5} normal dynamic: < 30 nV _{rms} /Hz ^{0.5} low noise: 5 nV _{rms} /Hz ^{0.5}	
	Reference Output	Internal Oscillator	10 mHz .. > 1 MHz
		Frequency Resolution	3 mHz
Frequency Accuracy		+/- 50 ppm from 0 °C to 70 °C	
Reference Output Voltage		< 0.1 mV _{rms} ... 7 V _{rms}	
Output Noise		@ U _{out} = 1 mV _{rms} , τ = 1 ms, 100 kHz < 230 nV _{rms} /Hz ^{0.5}	
Reference Input	Frequency	0.1 Hz .. 1 MHz	
	Amplitude	TTL or sine signal > 100 mV _{rms}	
	PLL Locking Time	< (100 ms+ 10 Cycle)	
	Phase Error	< 4 deg @ f = 1 kHz	
	Impedance	TTL: 1 MΩ small sine signals: 1 MΩ large sine signals: 1 kΩ	

SPECTRUM ACQUISITION SPECIFICATION		
General	Displayed channels	4
	Frequency range	0.1 Hz to 2 MHz
	Modes	Logarithmic, linear
	Acquisition	Single spectra Integrated spectra Continuous spectra
Channels	1 st Lockin	RA, PhiA, XA, YA
	Auxiliary IN	AD1 to AD8
	Internal data	f, Uac, In
	Auxiliary OUT	DA5 to DA8
Special Features	2 nd Lockin	RB, PhiB, XB, YB for "A&B" input Rn, Phin, Xn, Yn for "A" & "A-B" input
	Mathematical	Noise
	Measurement	Single point positions & Q-factors
	Storage	Reference channel
OSCILLOSCOPE		
General	Data Channels	4
	Sampling rate	39.062 kHz
	Time scaling	20 μs to 5 s per division
Channels	1 st Lockin	RA, PhiA, XA, YA
	Auxiliary IN	AD1 to AD8
	Internal data	f, Uac, In
	Auxiliary OUT	DA5 to DA8
Special Features	2 nd Lockin	RB, PhiB, XB, YB for "A&B" input Rn, Phin, Xn, Yn for "A" & "A-B" input
	Mathematical	Noise
	Special Features	Ring buffer
OUTPUTS & AUXILIARY CHANNELS		
Outputs	Number of Available Channels	4
	Output Range	± 10 V
	Sampling Rate	156 kHz
Auxiliary A/D Input	Data	User-selectable out of all channels (see oscilloscope)
	Number of Available Channels	8
	Input Range	± 10 V
Auxiliary D/A Output	Sampling Rate	39.062 kHz
	Resolution	24 Bit
	Number of Available Channels	4
	Output Range	± 10 V
Auxiliary D/A Output	Sampling Rate	156 kHz
	Resolution	24 Bit
DATA STORAGE		
Internal Hard drive	32 MByte	
External drive	USB-Stick	
Editing function	Clear data, Copy data to USB	
Storage type	ASCII data, numbered	
GENERAL		
Power supply	110/230 V	
Power cord frequency	50/60 Hz	
Dimensions	0.16 (H) x 0.84 (W) x 0.34 (D) m (handle in backward position)	
Weight	6 kg	
Warranty	2 years	
Includes	Manual & Certificate USB stick, SMB-BNC cables Low noise BNC cable power cord	
Optional	I/U-converters	



Anfatec Instruments AG
Melanchthonstr. 28
08606 Oelsnitz
Germany

Note: Specifications are subject to change without notice due to design improvement