

TW4801 DSP Lock-In Amplifier



Order Code

TW4801

Features:

- 50 mHz to 120 kHz frequency range
- Low-noise current and voltage inputs
- 1 nV to 1 V full-scale sensitivity
- Time constants from 10 μ s to 3 ks
- Up to 100 dB dynamic reserve
- Up to 100 dB CMRR
- 3.5 inch color TFT-LCD screen, Small size (259*320*102 mm)
- Support remote control, embedded a free LabVIEW program

Maxwellon TW4801 Small-size Digital Lock-in Amplifier provides an excellent performance within its bandwidth from 50 mHz to 120 kHz. With the high-speed 4-core architecture, high-precision ADC and excellent analog performance, TW4801 can easily detect the phase and the magnitude of weak signals overwhelmed by various large noise. The performance of TW4801 is as good as other lock-in amplifiers brands, even better in some certain parameters, such as measurement accuracy, operating bandwidth, which meets the needs of scientific research and industrial application well.

Specifications

Signal Channel	
Voltage Input Mode	Single-ended or Differential
Full-scale Sensitivity	1 nV to 1 V in a 1-2-5 sequence 1 fA to 1 μ A
Current Input	106 or 108 V/A
Impedance	<ul style="list-style-type: none"> • Voltage: 10 MΩ // 25 pF, AC or DC coupled • Current: 1 kΩ to virtual ground
C.M.R.R	> 100 dB to 10 kHz, decreasing by 6 dB/oct
Dynamic Reserve	> 100 dB
Gain Accuracy	0.2% typ, 1% max
Voltage Noise	9 nV/ \sqrt Hz at 997 Hz
Current Noise	<ul style="list-style-type: none"> • 0.13 pA/\sqrtHz at 97 Hz • 0.14 pA/\sqrtHz at 997 Hz
Line Filters	50/60 Hz and 100/120 Hz
Grounding	BNC shield can be grounded or floated via 10 k Ω to ground
Reference Channel	
Input	<ul style="list-style-type: none"> • Frequency range: 50 mHz to 120 kHz • Reference input: TTL or Sine

	<ul style="list-style-type: none"> • Input impedance: 1 MΩ//25 pF
Phase	<ul style="list-style-type: none"> • Resolution: 0.01$^{\circ}$ • Absolute phase error: < 1$^{\circ}$ • Relative phase error: < 0.01$^{\circ}$ • Phase noise: (Internal ref.) Synthesized, <0.0001$^{\circ}$rms at 1 kHz; (External ref.) 0.005$^{\circ}$rms at 1 kHz (100 ms time constant, 12 dB/oct) • Drift: <0.01$^{\circ}$/$^{\circ}$C below 10 kHz, <0.5$^{\circ}$/$^{\circ}$C above 10 kHz
Harmonic Detection	2F, 3F, ...nF to 120 kHz (n<32767)
Acquisition Time	<ul style="list-style-type: none"> • Internal ref.: instantaneous acquisition • External ref.: (2 cycles + 5 ms) or 40 ms, whichever is larger
Demodulator	
Stability	<ul style="list-style-type: none"> • Digital output: no zero drift on all setting • Display: no zero drift on all setting • Analog output: <5 ppm/$^{\circ}$C for all dynamic reserve settings
Harmonic Rejection	-90 dB
Time Constant	<ul style="list-style-type: none"> • 10 μs to 3 ks (<200 Hz) • 10 μs to 30 s (>200 Hz) (6, 12, 18, 24 dB/oct rolloff)
Synchronous Filters	Available below 20 Hz
Internal Oscillator	
Frequency	<ul style="list-style-type: none"> • Range: 50 mHz to 120 kHz • Accuracy: 2 ppm + 10 μHz • Resolution: 1 mHz
Distortion	<ul style="list-style-type: none"> • -80 dBc (f < 10 kHz) • -70 dBc (f > 10 kHz)
Amplitude	0.10 to 1 Vrms
Accuracy	1%
Stability	50 ppm/ $^{\circ}$ C
Output	Sine output on rear panel, and TTL sync output on rear panel
General Specification	
Interface	RS-232 and RS-232 to USB interface
CH1 and CH2 Outputs	<ul style="list-style-type: none"> • Function: output X, Y, R, θ • Output voltage: \pm5 V full scale, 30 mA max output current
Screen	3.5 inch, 320 \times 240 TFT
Display Quantities	4 channels of data to display X,Y,R, θ
Display Types	Numerical form
Power Requirement	<ul style="list-style-type: none"> • Voltage: 220 – 240 VAC, 100 – 120 VAC (optional) • Frequency: 50/60 Hz • Power: 20 W
Dimension	<ul style="list-style-type: none"> • 259 (W) \times 115 (H) \times 320 (D) mm (with feet) • 259 (W) \times 102 (H) \times 320 (D) mm (without feet)

Weight	3.2 kg
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Ordering Information

Part No.	Name	Description
TW4801	Digital Lock-in Amplifier	50 mHz to 120 kHz, 1 nV to 1 V full-scale sensitivity

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