

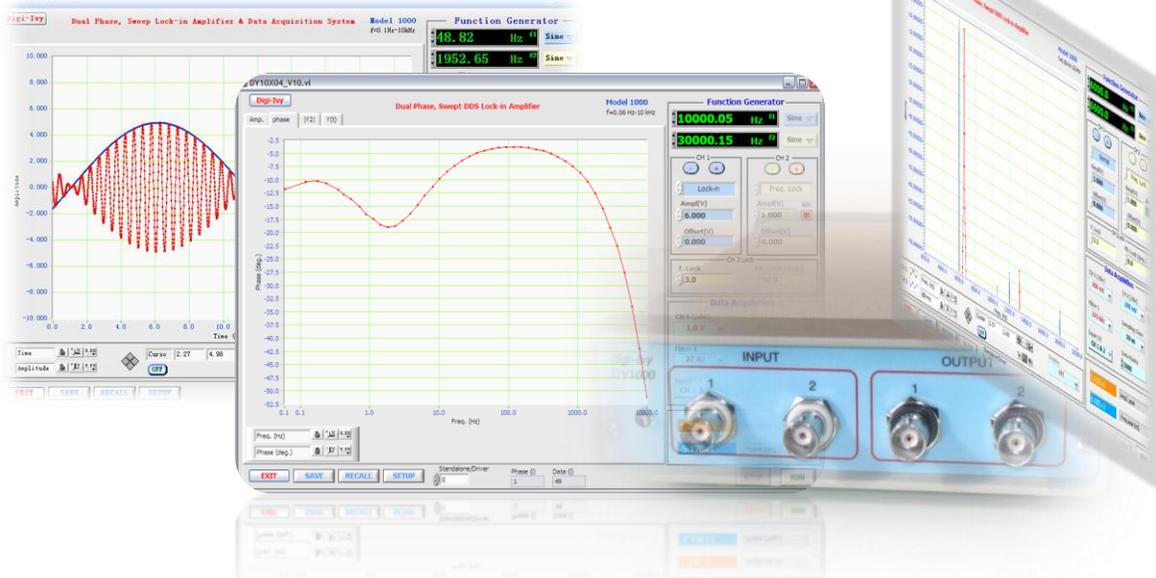


## DY1000 Sweep DDS Lock-In Amplifier

*Precision Instrument for Science, Education and Industry*

Lock-in amplifiers can be widely used in physics, chemistry, biology, and many other fields to detect very weak signals in the presence of a noisy background. However, in many cases, such usefulness could be limited by the complicated operation of conventional lock-in amplifiers. The DY1000 Sweep DDS Lock-In Amplifier by Digi-Ivy introduces a new and convenient way to operate lock-in amplifiers. Based on the modern semiconductor circuits and advanced software programming, a harmonious combination of universality in application and simplicity in operation has been achieved:

- **Fully automatic operation** The user inputs control parameters from an easy to use PC interface, then the instrument will conduct all of the measurement procedures, taking care of auto frequency sweep, auto gain control, synchronized data acquisition, data analysis and data display. The user will not only enjoy the unique simplified operation of the DY1000, but also, most importantly, acquire experimental data both accurately and quickly.
- **High accuracy** A dual-channel DDS (Direct Digital Synthesis) function generator which provides sine or triangle waves with 0.008Hz resolution and 50ppm drift has been used as a signal source. The analog input section contains DC-coupled low noise instrument amplifiers, variable gain stages and corresponding filters which provide precision signal pass for the measurement.
- **Low frequency** ( $f_{min} = 0.008\text{Hz}$ ) and **Harmonic** (1.0f, 2.0f, 3.0f...100.0f) detection.
- **Non integral harmonic** In addition to locking at the integral multiple frequencies of the reference signal, the DY1000 can also be used to lock at non-integral frequencies (such as 1.5f, 3.6f ...). As the only lock-in amplifier available with this capability, the DY1000 provides the possibility of being used in advanced research areas, for example, in studying the dynamic response of a nonlinear system.
- **Multiple applications** In addition to its use as a lock-in amplifier, the DY1000 can also be used as a (1) *dual-channel synchronized function generator*, (2) *variable-gain low-noise amplifier*, (3) *Variable-gain data acquisition system*, (4) *FFT analyzer*, and many other user-defined applications.
- **Lightweight** (1kg), compact (15 x 26 x 5 cm) design. USB connection.



# DY1000 Specifications

## **Lock-In Amplifier:**

Frequency Range:	0.008Hz to 10 kHz
Full-scale Input Range:	$\pm 500\mu\text{V}$ to $\pm 10\text{ V}$ in 14 steps
Harmonic detection:	1.0f, 2.0f...100.0f to 10 kHz (include non-integral number)
Low Pass Filter:	270 kHz, 2.7 kHz, 27 Hz, 0.27 Hz
Input Impedance:	1 M $\Omega$ // 20 pf (DC Coupling)

## **Function Generators:**

Number of Outputs:	2
Max output current:	$\pm 50\text{ mA}$
Waveforms:	Sine, Triangle and DC (50 $\Omega$ output impedance)
Frequency Range:	0.008Hz to 100 kHz* (DDS clock at 2.00 MHz)
Resolution:	0.008Hz
Stability:	50 ppm
Phase offset:	0 to 360 deg.
Resolution:	0.1 deg.
Amplitude:	0.02Vpp to 20 Vpp into Hi-Z
Resolution:	10 mV (Hi-Z)
Accuracy:	< 1% of full scale
Offset:	$\pm 8\text{ V}$ (Hi-Z)
Resolution:	10 mV
Accuracy:	< 1% of full scale
Modulation:	AM (CH2 only)
Source:	CH1/external
Frequency Sweep:	Linear or logarithmic*
Direction:	Up or down
Harmonic Distortion:	< -50 dB (at 10 kHz)

\*: CH2 frequency can be locked to CH1 during normal/sweep operation. See user manual for more information.

## **Data Acquisition**

Number of Inputs:	2 (differential inputs)
Full-scale Input Range (CH1):	$\pm 10\text{ V}$
Full-scale Input Range (CH2):	$\pm 500\mu\text{V}$ to $\pm 10\text{ V}$ in 14 steps
Sampling Rate:	1 Hz to 100 kHz in 16 steps
Maximum Data Points:	5 000 / CH (12-bit)

## **General**

Dimensions & Weight:	15 x 26 x 5 cm, 1kg
Power:	100-240 VAC, 0.5A, 47-63 Hz
Computer:	Requires user-provided PC running <i>Windows7/XP/Vista</i> , min 512 MB of RAM, and a screen resolution of 1024x768 or higher, one free USB port.

## **Applications**

- Auto Sweep Lock-in Amplifier
- Dual-channel Precision Sine/Triangle Waveform Generation
- Dual-channel variable-gain data acquisition system
- FFT Spectrum Analyzer
- Synchronized precision Lissajous figures
- Signal conditioning for sensor applications
- Impedance Analyzer
- Many other user-configurable applications

For more information, please send e-mail to: [info@digi-ivy.com](mailto:info@digi-ivy.com)  
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