MODEL 9400

400Vp-p Four Channel Signal Amplifier

- High voltage output to 400Vp-p (±200V)
- Output current to 50mA
- Full power bandwidth from DC to >500kHz
- Slew rate to 400V/μs
- Monitor Outputs for each channel
- Precise signal amplification for multiple applications
- Compatible with any of the Tabor waveform generators
- Special unipolar mode for MEMS engine drivers

Model 9400 was designed as a general purpose, wide band and high voltage amplifier however, with specific applications in mind. It has four channels built in a small case size to save space and cost but without compromising bandwidth and signal integrity.

Solve Common Problems

Model 9400 can output signals from -200V to +200V with continuous currents up to 50mA per channel. The output is driven from a 0.1W source and, with some degradation of its bandwidth, can drive capacitive loads up to 1nF, while maintaining its full amplitude range. Model 9400 has a rear-panel monitor output that divides the main output signal by 100 for applications that require monitoring of the output signal with low voltage sensors.

Modes of Operation

The 9400 has two modes of operation. The first is normal mode where each channel amplifies and outputs bipolar signals with a gain of x50. In this mode, the input signal is amplified and delivered to the output terminals without modification of its original properties, except its amplitude level. Using this mode of operation, each channel can be used separately to amplify a unique signal.

The second mode of operation is the unipolar mode where the signal is applied to one input, rectified, amplified and output through two separate outputs. Using this mode, the amplifier is converted to a one-input, two-output system, specifically designed to operate the up/down and right/left actuators of a typical MEMS micro engine, as well as for other applications requiring the precise conversion of bipolar to unipolar signals.

Target Applications

The amplifier case was designed to stack on top or below other Tabor products. It can also be mounted alongside a Tabor generator in a standard 19" rack. The waveform-amplifier combo is an ideal solution for virtually any high-voltage, wide bandwidth application.

Safety

Safety played a major role during the design of the Model 9400. The high voltage path to the amplifier circuit is blocked by a front panel mechanical switch and accidental application of high power to the UUT is prevented by a safety latch. The 9400 will output high voltage signals only after the safety latch has been lifted and the high voltage switch flipped to ON position. In emergency situations, one can hit the protective latch to immediately remove the high voltage power from the output terminals. As an additional visual safety feature, a red light glows on the front panel whenever the high voltage is turned on.

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40 Years Celebration

Specification

CONFIGURATION

Channels:

Single-ended:	4 separate inputs and 4 single-ended outputs, bipolar voltage span
Unipolar:	2 separate input, each having two output channels with 180° phase offset, unipolar voltage outputs

INPUT CHARACTERISTICS

Connectors:	Front panel BNCs
Impedance:	1MΩ
Coupling:	DC
Amplitude Level:	8Vp-p (±4V peaks)
Frequency Range:	
Full Power	DC to 500 kHz
Unipolar Mode	DC to 200kHz
Max. Output Current:	50mA per channel

OUTPUT CHARACTERISTICS

GENERAL

Connectors:	Front panel BNCs
Source Impedance:	0.1Ω
Load impedance:	Resistive, recommended for full power bandwidth spec, load resistance limited by the output current ; Capacitive, up to 100pF has minimal effect on bandwidth, 1nF reduces the full power bandwidth to 100kHz
Coupling:	DC
Protection:	Short-circuit, 10 seconds
Gain:	x50, fixed
Polarity:	Output normal; half wave rectified
Amplitude:	
Full Power	400Vp-p (±200V)
Unipolar Mode	0 to +200V

SQUARE WAVE CHARACTERISTICS

Transition Time:	<1µs
Aberrations:	<10%

SINE WAVE CHARACTERISTICS

Bandwidth:	-3dB
Small Signal	1.5MHz, at 20Vp-p
Large Signal	500kHz, at 400Vp-p
Accuracy:	(2% of full-scale amplitude range + 50mV), Square wave at 1kHz
THD:	
10 Hz to 50 kHz	<0.1%
50 kHz to 200 kHz	<0.8%

OUTPUT MONITOR CHARACTERISTICS

Connectors:	Rear panel BNCs
Source Impedance:	3kΩ
Load impedance:	1MΩ
Ratio:	100:1, ±10%

GENERAL

Voltage Range:	100V/115V/230V
Frequency Range:	47Hz to 63Hz
Power Consumption:	120W
Signal Ground:	Floated to the same level as the source, 250VDC max.
Dimensions:	
With Feet	315 x 102 x 395 mm (WxHxD)
Without Feet	315 x 88 x 395 mm (WxHxD)
Weight:	
Without Package	6.5kg
Shipping Weight	7.5kg
Temperature:	
Operating	0°C to 50°C
Storage	-40°C to 70°C
Humidity:	80% RH, non condensing
Safety:	CE Marked, IEC61010-1
Calibration:	1 years
Warranty [1]:	3 years standard

ORDERING INFORMATION

MODEL	DESCRIPTION
9400-50[*]	400Vp-p Four Channel Signal Amplifier

[*] Custom gain available upon request, however, bandwidth may change.

[1] Standard warranty in India is 1 year.