

Four-Channel High-Voltage WideBand Amplifier

MODEL 9400

- Four independent channels
- Small case size
- Monitor Outputs for each channel
- Precise signal amplification for multiple applications
- Full power bandwidth from DC to >500 kHz
- -200 to +200 V (400 Vp-p) with up to 50 mA output current
- Compatible with any of the Tabor arbitrary waveform generators
- Special unipolar mode for MEMS engine drivers



Description

The 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.

Four Channels

Each channel can output signals from -200 to +200 V with continuous currents up to 50 mA. The output is driven from a 0.1Ω source and, with some degradation of its bandwidth, can drive capacitive loads up to 1 nF, while maintaining its full amplitude range. Each channel 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

There are 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 two-input, four-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.

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 Model 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.



TABOR ELECTRONICS Ltd.

www.taborelec.com

The measure of perfection

Specification Four-Channel High-Voltage WideBand Amplifier

Model 9400



CONFIGURATION

Amplifier Channels:

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

INPUT CHARACTERISTICS

- Connectors:** BNC
- Impedance:** 1MΩ
- Coupling:** DC
- Amplitude Level:** 8 Vp-p (-4 to +4 V peaks)
- Frequency Range:**
- Full power DC to > 500 kHz
 - Unipolar mode DC to > 200kHz

OUTPUT CHARACTERISTICS

GENERAL

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

SQUARE WAVE CHARACTERISTICS

- Transition Time: <1μs
- Aberrations: <10%

SINE WAVE CHARACTERISTICS

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

OUTPUT MONITOR CHARACTERISTICS

- Connectors:** BNC (rear panel)
- Source Impedance:** 3 kΩ
- Load impedance:** 1 MΩ
- Ratio:** 100:1, ±10%

ENVIRONMENTAL

- Operating Temperature:** 0°C - 40°C, RH 80% (non-condensing)
- Storage Temperature:** -30°C to 80°C

GENERAL

- Physical Size:** 2U, half-rack size
- Power Requirements:** 100V/115V/230V, 47-63 Hz, <150 VA; <120W
- Weight:** Approximately 14 lbs (6.5 kg)
- EMC Certification:** CE marked
- Reliability:** MTBF per MIL-HDBK-217E, 25°C, Ground Benign
- Safety:** Designed to meet IEC EN61010-1, UL 3111-1
- Workmanship Std:** Conforms to IPC-A-610D
- Warranty:** 3 years standard; Extended warranty available upon request

ORDERING INFORMATION

Four-Channel High-Voltage WideBand Amplifier,

MODEL	9400-50 (*)
--------------	--------------------

(*) Custom gain available upon request, however, bandwidth may change.



TABOR ELECTRONICS Ltd.

www.taborelec.com

The measure of perfection