IA184 LOW-COST, HIGH-LINEARITY ISOLATION AMPLIFIER WITH EXTERNAL SYNC CAPABILITY

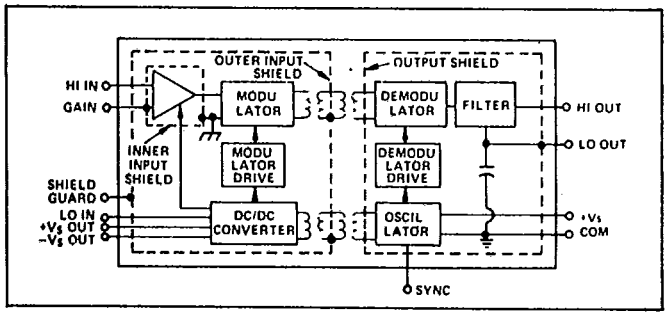
Fully Compatible with 10-Bit Data Acquisition Systems

FEATURES

- **UL Component Recognized (IA184)**
- **Provision for External Synchronization**
- **High Linearity: 0.025% Peak, Typical**
- **2500 V Input/Output Isolation**
- **126 dB Common-Mode Rejection**
- **1000:1 Programmable Gain**
- **Small Size: only 1.5" x 1.5" x 0.63"**

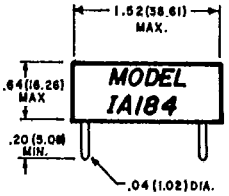
The Model IA184 Isolation Amplifier is an ultra-compact module offering high linearity, 2500-Volt input/output isolation, 126 dB common-mode rejection, externally programmable gain, a floating internal supply for powering an external transducer, and external synchronization of the internal oscillator used in obtaining the input isolation. Its 0.1% linearity assures compatibility with 10-bit data acquisition systems, and input voltage noise is held to 1μV, 10 Hz to 1 kHz, with 10 pA maximum current noise for the same range. The internal oscillator used to provide modulation and demodulation for input isolation can be synchronized with those of associated Model IA184 amplifiers by an external trigger, to prevent imposition of beat-frequency phenomena on the output signal. An independent ±15 VDC, ±15 mA supply in the input section, with the same voltage isolation as the input, can be used to power an external transducer or preamplifier.

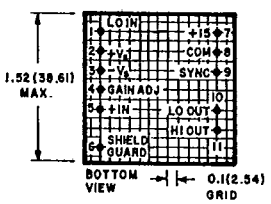
BLOCK DIAGRAM IA 184



CONNECTION NOTES:

1. Gain Adjustment Resistor (R_g) is connected between GAIN and LO-IN pins.
2. If no output-offset adjustment is required, connect LO-OUT to COMMON pin. Otherwise, consult factory.





CHARACTERISTICS

(Typical, @ 25°C, V_S = +15 VDC unless otherwise noted.)

	IA184
GAIN (Non-Inverting)	
Range (50kΩ Load)	1 to 1000V/V
Formula	Gain = $(1 + \frac{100k\Omega}{Rg})$
Deviation from Formula	±3%
vs. Temperature (0 to +70°C)	±0.015%/°C
Nonlinearity, G = 1V/V to 10V/V	@ ±5V, ±0.025% @ ±10V, ±0.1% @ ±10V, ±0.2% max.
INPUT VOLTAGE RATING	
Linear Differential Range, G = 1V/V	±10V min.
Max. Safe Differential Input	
Continuous	125V rms
Pulse, 10ms Duration, 1 pulse/10 sec	±600Vpk max.
Max. CMV, Inputs to Outputs	
AC, 60 Hz, 1 Minute duration	2500V rms
Pulse, 10ms duration, 1 pulse/10 sec	±2500Vpk max.
With 510kΩ in series with Guard	±5000Vpk max.
Continuous, AC or DC	±2500Vpk max.
CMR, Inputs to Outputs, 60 Hz, R_S<5kΩ	
Balanced Source Impedance	126dB
5KΩ Source Imbalance	120dB
CMR, Inputs to Guard, 60 Hz	
1kΩ Source Imbalance	80db
Max. Leakage Current, Inputs to Power	
Common @ 115 VAC, 60 Hz	1.2μA rms max.
INPUT IMPEDANCE	
Differential	10^{1}Ω‖3 pF
Overload	27kΩ
Common Mode	5 x 10^{10}Ω‖20 pF
INPUT BIAS CURRENT	
Initial, @ + 25°C	±2nA
vs. Temperature (0 to +70°C)	±0.01nA/°C
INPUT NOISE	
Voltage	
0.05 Hz to 10Hz	3μV
10Hz to 1kHz	1μV rms
Current	
0.05Hz to 100Hz	5pA p-p
10Hz to 1kHz	10pA rms
FREQUENCY RESPONSE	
Small Signal, −3dB G = 1V/V to 10V/V	1kHz
Full Power, 10V p-p Output	
Gain = 1V/V	500Hz
Gain = 10V/V	500Hz
Recovery Time, to ±100μV after application of ±600Vpk differential input pulse	50ms
OFFSET VOLTAGE, REFERRED TO INPUT	
Initial, @ +25°C	±(1 + 5/G)mV
vs. Temperature (0 to +70°C)	
Gain = 1V/V (μV/°C max.)	±65
Gain = 100V/V (μV/°C max.)	±15
At other Gains (μV/°C max.)	±(15 + 50/G)
vs. Supply Voltage	±(1 + 50/G)μV/V
RATED OUTPUT	
Voltage, 50kΩ Load	±10V min.
Output Impedance	1kΩ
Max. CMV, Output Common to Power Common, Peak AC or DC Continuous	±50V pk
ISOLATED POWER OUTPUTS	
Voltage, ±5 mA Load	±15 VDC
Accuracy	±5%
Current	±15 mA min.
Regulation, NL to FL	+0, −3%
Ripple, 100kHz Bandwidth	100m V p-p
POWER SUPPLY, SINGLE POLARITY	
Voltage, Rated Performance	+15VDC, ±.5V
Voltage, Operating	+ (8 to 15.5) VDC
Current, Quiescent	+20mA
Current, Full Load	50mA
External Sync Freq.	33 to 37 kHz, 5VDC @ 50% duty cycle
TEMPERATURE RANGE	
Rated Performance	0 to +70°C
Storage	−55°C to +85°C
CASE DIMENSIONS	1.5" x 1.5" x 0.62"
NOMINAL WEIGHT	1.3 ounces
MATING SOCKET	S134