



PGA-16

16-Channel Instrumentation Amplifier With Programmable Gain and AC/DC Coupling

- Instrumentation amplifier on each of 16 channels
- Software-selectable gains of 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 per channel
- Programmable AC or DC coupling
- Use several boards together for higher channel count
- Driver software for DOS, Windows 3.1/95/NT, LabVIEW, and HP VEE
- Menu-driven software with easy-to-use graphical interface



The PGA-16 is a 16-channel instrumentation amplifier with differential input, single-ended output, programmable AC or DC input coupling and pre-filter gain. The PGA-16 may be used as an input conditioner for any A/D converter or for our AAF-16 anti-alias filter card.

Each channel of the PGA-16 has its own instrumentation amplifier with differential inputs. Using the included software, you can configure each channel independently for a gain of 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, or 1000.

Performance on the PGA-16 is outstanding from DC to 200kHz, and a skew rate of 9V/microsec allows the card to handle large, fast signals.

Support Software

Alligator Technologies has developed both menu-driven and driver-level software for controlling key functions on the PGA-16.

Menu-Driven Software. WSETPGA16 for Windows 95/NT/3.1 and DOS uses a single setup screen with pop-up menus for selecting such key parameters as gain setting, AC or DC coupling and board address. Once selected, a combination of settings can be saved as a PGA-16 description file. Once saved, the settings stored in this file can be easily applied to other boards by selecting the file.

DOS and Windows Drivers. If you prefer to develop your own programs, the PGA-16 comes with DOS and Windows 95/NT/3.1 linkable libraries that provide high-level functions for configuring and controlling the PGA-16. Example

application programs are provided for popular compilers, including Visual C++, Visual Basic, and Pascal.

LabVIEW Driver. PGA-16.LLB provides a virtual instrument (VI) library that allows National Instruments' LabVIEW® graphical programming software to operate with the PGA-16. "Wiring" in the PGA-16's icon allows for direct control over the board's functions.

HP VEE Driver. WSETPGA16 for HP VEE provides both a 16- and 32-bit interface for the HP VEE visual programming environment. The PGA-16 UserObjects are powerful and easy to use, and provide the necessary tools to build an integrated data acquisition system under HP VEE.

Configuration

The PGA-16 plugs into the PC and is programmable through the ISA bus. For multi-channel systems and non-PC-based applications, the PGA-16 also plugs into the AT-SYS-1000, a turnkey system that provides cost-effective signal conditioning under control of a remote computer or as a stand-alone unit.

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Advantages of Pre-filter Gain

Many data acquisition boards provide multiple input ranges by using software-programmable gain amplifiers. While this kind of gain lets you change the input range, it also can present a new problem: amplification of electrical noise added by the measurement system to the signal.

If the gain is on the A/D board (**post-filter gain**), it amplifies not only the signal, but also any noise added by common measurement-system sources, such as the signal conditioner, the computer interconnections, or the A/D input circuit. On the other hand, if the gain is directly on the signal (**pre-filter gain**), only the signal is amplified. Pre-filter gain, which the PGA-16 provides, can make the low-level signal override the measurement-system noise, providing a dramatic improvement in signal-to-noise ratio. Post-filter gain cannot, since it amplifies the measurement-system noise along with the signal.

In addition, the A/D board post-filter gain usually multiplexes multiple channels into a single amplifier. The settling time of the amplifier can cause artificial signal errors unless delays are built into the sampling control. With the PGA-16, each channel has its own full-tile amplifier, eliminating this restriction

Signal Connection

Inputs from the signal sources connect to the PGA-16 via a 44-pin high-density D-sub connector, which extends out of the rear of the computer. If you are using an AAF-16 filter, you can connect PGA-16 outputs to AAF-16 inputs either externally via a 26-pin connector or internally via a 34-pin dual-row ribbon-cable connector.

For more information, contact Alligator Technologies or your local Alligator Distributor

Specifications

Input Characteristics

Input connection	Differential
Gain steps	0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, or 1000
Gain tolerance	±0.1%*
Common-mode rejection.....	86 dB typ @ gain = 1
Common-mode voltage	±12V max
Input voltage (at gain = 1).....	±10V
Input DC offset.....	±1.5 mV max, ±0.5 mV typ
Input protection	±70V DC or RMS continuous, power on or off; ±150V DC when programmed for AC coupling
Input impedance	4 MΩ differential (2 MΩ each side to analog ground)
Input bias current.....	±2 pA typ., ±100 pA max.
Input offset current.....	±1 pA typ., ±100 pA max.
Frequent range (-3dB):	
Gain 0.5 -5.....	DC to 1.2 MHz
Gain 10 - 100.....	DC to 600 kHz
Gain 200 - 1000.....	DC to 250 kHz
Amplifier slew rate	9 V/microsec typ
Output load	2KΩ min for full output, 1000 pF max

Environmental

Operating temperature.....	0° - 70°C
Storage temperature.....	-55° - 100°C
Relative humidity	Limited to 95% non-condensing

Physical

Dimensions	13.0" (W) x 4.5" (H)
I/O connectors	44-pin high-density D-sub (input) 26-pin high-density D-sub (external output) 34-pin dual-row 0.1" ribbon-cable connector output (internal output)

Operating Power

Maximum current requirements	
+12V	0.8A
+5V	30 mA

* Except gain = 0.5

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