AAF-16

Programmable 16-Channel Low-Pass Filter Card Series for PC/AT (ISA) Data Acquisition Systems

Features

- 16 single-ended low-pass filter channels
- Cutoff frequency ranges between 2 Hz and 200 kHz
- 8-pole Bessel, Butterworth, Cauer, high-speed Cauer, or high-speed linear phase filters (not selectable through software, specify different type per 4-channel group)
- ±10V input and output
- Automatic DC offset compensation
- Synchronized sampling-clock output to eliminate the need for post-filter
- Driver software for Windows 3.1/95/NT, DOS and LabVIEW 3..x/4.x
- Graphical menu-driven software
- Completely remote controlled from a host computer via RS-232 interface when used as a part of AT-SYS-1000 system

Options

- Instrumental amplifier card with differential input
  - Software-programmable gains of 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, and 1,000
  - Programmable AC/DC coupling
- Analog pre-filters for clock-aliasing protection
- Post-filters for waveform reconstruction if A/D is unsynchronized

Benefits

- Eliminates input signal errors caused by aliasing and high-frequency noise
- Reduces acquisition storage requirements and analysis time
- Helps to ensure accurate signal sampling

* Differential with optional PGA-16 input amplifier card

AAF-16 Low-Pass Filter Card for PC/AT ISA Data Acquisition Systems

The AAF-16 is a 16-channel low-pass filter card series for PC/AT (ISA) data acquisition systems. Each channel uses any one of five 8-pole filter types with a rolloff of up to 120 dB octave and a variable cutoff frequency range between 2 Hz and 200 kHz. The cutoff frequency can be set using 2 on-board programmable sources or 2 external sources, allowing for 4-different cutoffs on each AAF-16. Each channel can be individually bypassed, routing the input signal directly to the A/D

Pre- and post-filters on the optional PPF add-on module as well as the standard built-in pacer clock allow the AAF-16 to offer superior specifications that meet the maximum performance needed by high-resolution A/D converters. When used with the PPF, the switched-capacitor AAF-16 becomes a hybrid filter that offers the advantages of programmability, tunability and low cost while matching the performance of traditional, continuos time active filters.

Configuration

The AAF-16 plugs into the PC and is programmable through the ISA bus via menu-driven or driver software. For large channel count and non-PC based systems, the AAF-16 also fits in an external chassis that houses multiple boards and is packaged in a rugged cased convenient for bench-top or rack-mount applications.

When used as part of the AT-SYS-1000 filter/amplifier system, the AAF-16 is completely remote controlled from a host computer via a serial interface.

Alligator Technologies

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	Cutoff Frequency Range (Programmable Mode Selection)	Passband Gain (to 85% of fc)	Stopband Rejection	Attenuation Slope	Total Wideband Noise	Phase Match
Bessel	Mode A: 2 Hz - 33 kHz * (150:1)					
	Mode B: 2 Hz - 67 kHz (75:1)	**	84dB Typ.	45dB/octave Typ.	120μVRMS Typ.	1.2° Typ.
Butterworth	Mode A: 2 Hz - 50 kHz (100:1)					
	Mode B: 2 Hz - 100 kHz (50:1)	0dB + 0.15 - 0.5dB	90dB Typ.	48dB/octave Typ.	160μVRMS Typ.	1.2° Typ.
Cauer	Mode A: 2 Hz - 50 kHz (100:1)	0dB ± 0.4dB	75dB Typ.	120dB/octave Typ.	330μVRMS Typ.	2.5° Typ.
High-Speed	Mode A: 2 Hz - 50 kHz (100:1)					
Cauer	Mode B: 2 Hz - 100 kHz (50:1)	0dB + 0.1 - 0.5 dB	90dB Typ.	90dB/octave Typ.	260μVRMS Typ.	1.0° Typ.
High-Speed	Mode A: 2 Hz - 100 kHz (50:1)					
Linear Phase	Mode B: 2 Hz - 200 kHz (25:1)	***	75dB Typ.	55dB/octave Typ.	350μVRMS Typ.	1.7° Typ.

* To 47 kHz below 55°C with external clock.

** Bessel passband performance: Group delay inversely proportional to cutoff-frequency setting. Value approximately ½ cycle of fc, passband variation <1%; amplitude 3 dB down at fc.

*** High-speed linear phase passband performance: Group delay inversely proportional to cutoff-frequency setting. Value approximately one cycle of fc; passband variation < 2% max., 1% typ.; amplitude 3dB down at fc.

Support Software

The AAF-16 is supplied with Windows 3.1/95/NT and DOS menu-driven and driver software for controlling key functions. The easy to use menu-driven software eliminates the need for programming while making all relevant calculations as parameters are changed. The drivers provide a library of subroutines that are compatible with high-level programming languages such as Visual Basic, Visual C++, C and Pascal. A driver for LabVIEW® 3.x/4.x is also available.

Option

PPF Pre- and Post-Filtering Module

The PPF is an add-on module that plugs into the AAF-16 and provides 8 channels per module of pre- and/or post-filtering. It features a 2-pole Butterworth filter with fixed frequencies at any point in the entire spectrum of the AAF-16's frequency selection.

PGA-16 Programmable Gain Card

The PGA_16 is a separate 16-channel instrumentation amplifier card designed to provide differential inputs, programmable AC or DC coupling, and pre-filter gain to the AAF-16. Each channel can programmed independently for a gain of 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, or 1000.

Accessories

A variety of cable accessories have been developed for connecting the AAF-16 to any A/D board and to any system. These accessories include BNC boxes, 16 to 64 inputs, Screw Terminal Assemblies, and custom cables.

Specification

Input Characteristics

Connection	Single-ended*
Input impedance	2 MΩ
Input voltage range	±10V
Input protection	120VRMS AC, 250V for 5 seconds

Output Characteristics

Low-frequency gain	Factory adjustment 0 ± 0.015 dB max
Output resistance	10Ω
Voltage range	±10V
Minimum load resistance for full output swing	2000Ω
Maximum load current	2.5 mA min

General

Operating power (ISA bus)	
+12V	500mA
-12V	450mA
+5V	100mA
Operating temperature	0°C to 70°C
Dimensions	13.0" (W) x 4.5" (H)
I/O connectors	Separate 26-pin high-density D-sub

* Differential with optional PGA-16 input amplifier card

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

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