advanced digital logic ™

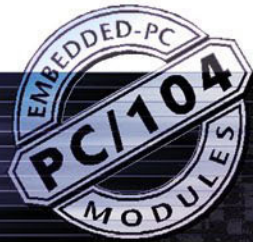## PC/104-Analog I/O Board

104-AIO16A

EMBEDDED-PC PC/104 MODULES

KEY FEATURES:

- 500kHz sampling rate supported by wide data bus
- 16 single-ended or 8 differential inputs
- 11 software/hardware selectable ranges
- Unique channel by channel programmable gain of 1, 2, 5, and 10
- 1024 sample data FIFO for A/D
- Auto calibration
- Two 12-bit D/A outputs and 16 digital I/O

FACTORY OPTIONS:

- FIFO up to 64K samples
- Programmable amplifier with gains of 1, 10, 100, and 1000
- +5VDC only operation
- 0 to 70°C and -40 to +85°C versions available

The 104-AIO16A is a high-speed, 16-bit resolution board which provides speeds up to 500kHz for 16 single-ended or eight true differential analog input channels. This multifunction board features an excel-lent price/performance value for precision PC/104-based data acquisition, control, or signal analysis of standalone environmen-tal test stations, compact production test equipment, portable testers, avionics and other applications.

The 104-AIO16A features 11 stan-dard analog input ranges and a filtered, extremely quiet front end. The module also offers on-board hardware oversampling for additional noise reduction. In addition to direct data transfers, the board's abil-ity to trigger the A/D in real time assures synchronized sampling that is unaffected by other computer operations—an essential requirement for signal, vibration and tran-sient analysis where high data rates must be sustained for short periods of time. The 500kHz sampling rate is supported by a 1024-sample FIFO (optional, 2, 4, 32, and 64K samples) for reducing processor over-head. Sixteen parallel bits of digital I/O and two 12-bit D/A outputs allow for a complete, high-performance data acquisition solution.
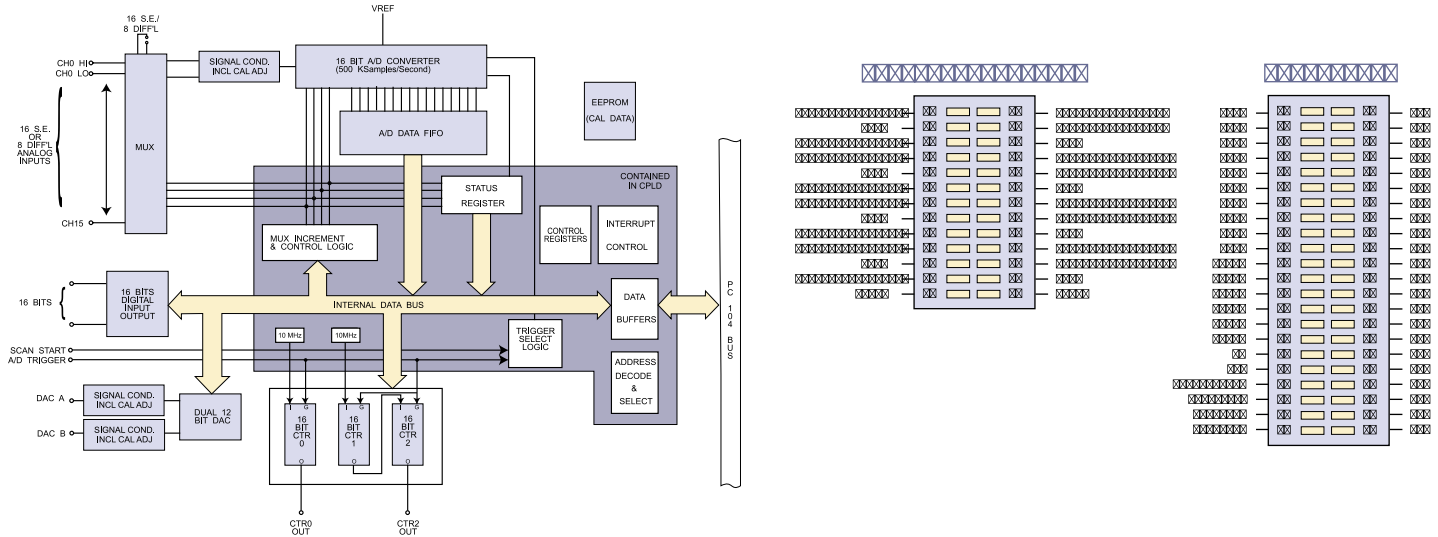
SOFTWARE

The 104-AIO16A is supported for use in most operating systems and includes a free DOS, Linux and Windows 95/98/Me/NT/ 2000/XP/2003 compatible software package. This contains sample programs and source code in "C" and Pascal for DOS, and Visual Basic, Delphi, C++ Builder, and Visual C++ for Windows. Also included is a graphical setup program in Windows. Linux support includes installation files and basic samples for programming from any user level via an open source kernel driver.

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Block Diagram & Pin Configuration

Specifications

A/ D

Inputs	16 single-ended or 8 differential
Resolution	16-bit resolution
Bipolar ranges	±0.5V, ±1V, ±2V, ±2.5V, ±5V, ±10V
Unipolar ranges	0-1V, 0-2V, 0-4V, 0-5V, 0-10V
Sampling rate	500kHz
Type	Successive approximation
Overvoltage protection	-37V to +52V
Nonlinearity	±4 LSB, monotonic
A/D FIFO	1024 16-bit wide samples (optional 2, 4, 32, and 64K)
Calibration	Offset and gain values stored in EEPROM
Trigger Source	Software selectable: external trigger, programmable timer, program command, A/D start, single scan start

D/ A

Outputs	2
Resolution	12-bit resolution
Ranges	0-5V, 0-10V
Relative accuracy	±2 LSB
Diff. Nonlinearity	±0.2 LSB
Settling time/Update rate	8μs/100kHz
Output current	5mA
Calibration	Gain values stored in EEPROM

Digital I/O

Number of I/O	16, programmable as inputs or outputs in groups of 8
Input voltage	Logic low: 0.0V min, 0.8V max; Logic high: 2.0V min, 5.0V max
Input current	±1μA max
Outputs	Logic low: 0.0V min, 0.55V max; Logic high: 2.4V min, 5.0V max
Output current	Logic low: 24mA max sink; Logic high: 24mA max source

Counter/Timers

Type	82C54
A/D Pacer clock	16 or 32-bit
Clock Frequency	10MHz

General

Power required (using optional DC/DC converter)	+5V at 190mA typ
Power required (using ±12V and +5V)	+12VDC - 25mA typical, -12VDC - 25mA typical, +5VDC - 65mA typical
Operating Temperature	0 to +70℃, optional -40 to +85℃
Storage Temperature	-50 to +120℃
Humidity	5% to 90% RH, non-condensing

Ordering Guide

104-AIO16A	16-bit, High-Speed, 16-channel A/D with 12-bit D/A