**KEY FEATURES:**

- 250kHz sampling rate
- 16 single-ended or 8 differential inputs
- 11 software/hardware selectable ranges
- Unique channel by channel programmable gain of 1, 2, 5, and 10
- 2K sample data FIFO for A/D
- Auto calibration
- Two 12-bit D/A outputs and 16 digital I/O

FACTORY OPTIONS:

- FIFO up to 32K 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-AIO16-16E is an economical 16-bit resolution board which provides speeds up to 250kHz for 16 single-ended or 8 true differential analog input channels. This multifunction board features an excellent price/performance value for precision PC/104-based data acquisition, control, or signal analysis of standalone environmental test stations, compact production test equipment, portable testers, avionics and other applications.

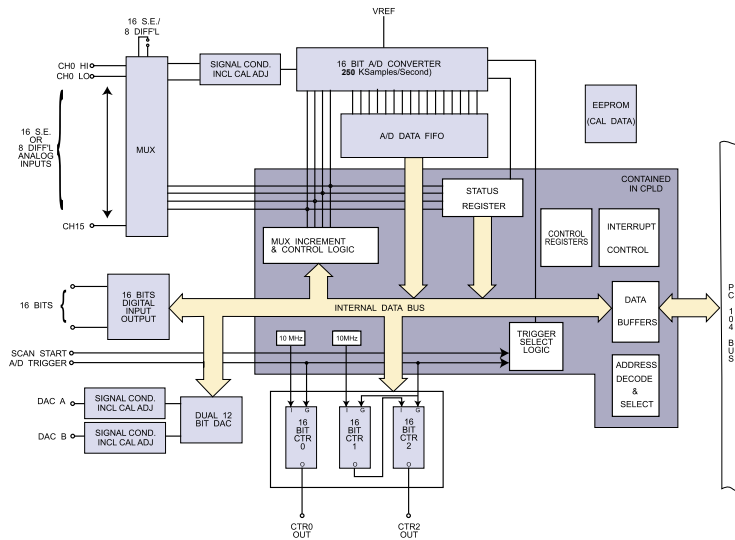
The 104-AIO16-16E features 11 standard analog input ranges and a filtered, extremely quiet front end. The module also offers on-board hardware oversampling for additional noise reduction. In addition to direct data transfers, the board's ability to trigger the A/D in real time assures synchronized sampling that is unaffected by other computer operations—an essential requirement for signal, vibration and transient analysis where high data rates must be sustained for short periods of time. The 250kHz sampling rate is supported by a 2K-sample data FIFO (optional, up to 32K samples) for reducing processor overhead. 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-AIO16-16E 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.

Block Diagram & Pin Configuration



ANALOG I/O HEADER

AIN0+ / AIN0 S.E.	01	02	AIN0- / AIN8 S.E.
AGND	03	04	AIN1- / AIN9 S.E.
AIN1+ / AIN1 S.E.	05	06	AGND
AIN2+ / AIN2 S.E.	07	08	AIN2- / AIN10 S.E.
AGND	09	10	AIN3- / AIN11 S.E.
AIN3+ / AIN3 S.E.	11	12	AGND
AIN4+ / AIN4 S.E.	13	14	AIN4- / AIN12 S.E.
AGND	15	16	AIN5- / AIN13 S.E.
AIN5+ / AIN5 S.E.	17	18	AGND
AIN6+ / AIN6 S.E.	19	20	AIN6- / AIN14 S.E.
AGND	21	22	AIN7- / AIN15 S.E.
AIN7+ / AIN7 S.E.	23	24	AGND
AOUT0	25	26	AOUT1

I/O HEADER

DIO0	01	02	GND
DIO1	03	04	GND
DIO2	05	06	GND
DIO3	07	08	GND
DIO4	09	10	GND
DIO5	11	12	GND
DIO6	13	14	GND
DIO7	15	16	GND
DIO8	17	18	GND
DIO9	19	20	GND
DIO10	21	22	GND
DIO11	23	24	GND
DIO12	25	26	GND
DIO13	27	28	GND
DIO14	29	30	GND
DIO15	31	32	GND
RESERVED	33	34	GND
GND	35	36	SCAN ENABLE
GND	37	38	SCAN START
RESERVED	39	40	CTR 2 OUT

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	Sampling rate: 250kHz
Type	Successive approximation
Overvoltage protection	-37 to +52V
Nonlinearity	±4 LSB, monotonic
A/D FIFO	2K samples, optional 4 and 32K
Calibration	Offset and gain values stored in EEPROM
Trigger Source	Software selectable: external trigger, programmable timer, program command, A/D start, single scan start

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

D/A

Outputs	2
Resolution	12-bit resolution
Ranges	0-5V, 0-10V
Relative accuracy	±0.5 LSB
Diff. Nonlinearity	±0.5 LSB
Settling time/Update rate	16µs/10kHz
Output current	5mA
Calibration	Gain values stored in EEPROM

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°C, optional -40 to +85°C
Storage Temperature	-50 to +120°C
Humidity	5% to 90% RH, non-condensing

Ordering Guide

104-AI016-16E	16-bit, 16-channel A/D with 12-bit D/A
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