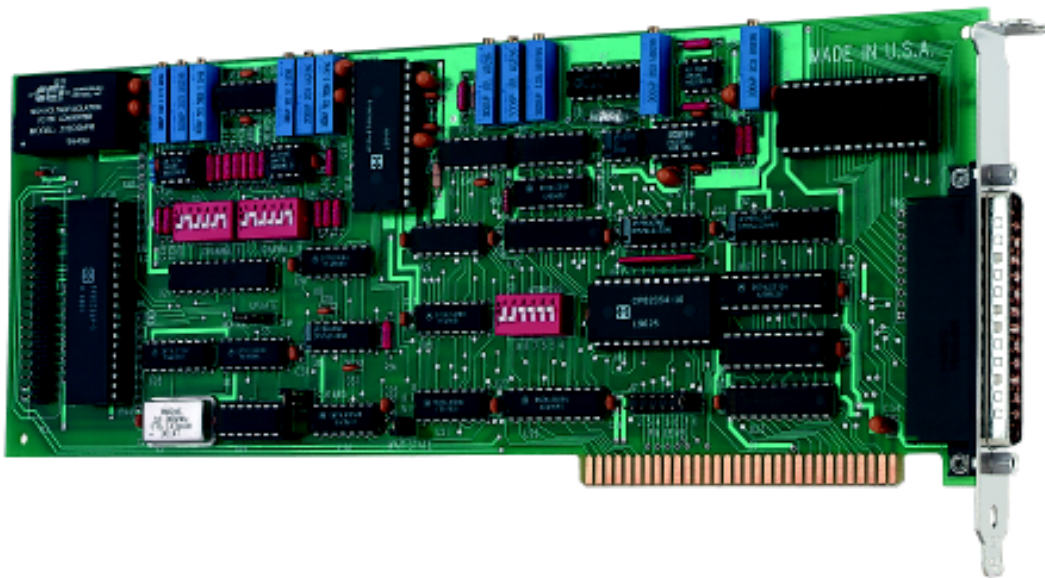


CIO-DAS08/AO

Medium Speed, 8 Channel Analog Input, 2 Analog Output, 3 Counters, 31 Digital I/O



DESCRIPTION

The CIO-DAS08/AO multifunction analog and digital I/O board is designed to be compatible with the DAS08 and DAS08PGA while adding two analog output channels. The CIO-DAS08/AO provides every popular laboratory I/O function on a single low cost board.

The CIO-DAS08/AO is supported by a broad range of software to allow programmed control in BASIC, C, and PASCAL. Many menu controlled data logging, analysis and control programs are available from a number of third party developers. In fact, any software designed for the popular DAS08 will work with the CIO-DAS08/AO.

The ComputerBoards CIO-DAS08/AO comes with an additional 24 bits of digital I/O which is lacking on other manufacturers versions of the DAS08AO.

8 ANALOG INPUTS

The analog signals of the CIO-DAS08/AO are brought on board by a standard 37 pin 'D' type connector directly to an analog multiplexor. The multiplexor provides 8 channels of differential input and is protected against 30 volts max.

A 2 uSec sample & hold captures the signal which is converted by a 574 A/D converter. The 12 bit A/D converter provides a resolution of 1/4096 parts of full scale. A programmable gain amplifier accepts bipolar and unipolar voltages in a number of ranges. Three different configurations of the programmable gain amp are available and are designated by the part number you order.

The CIO-DAS08/AOM has gains and responds to gain codes which are directly compatible to MetraByte's DAS-08/AO.

The CIO-DAS08/AOH (for *high* gains) has the same gain codes and ranges as the CIO-DAS08PGH. These are:

+/-10V, +/-5V, +/-1V, +/-0.5V, +/-0.1V, +/-0.05V, +/-0.01V, +/-0.005V
0-10V, 0-1V, 0-0.1V, 0-0.01V

The CIO-DAS08/AOL (for *low* gains) has the same gain codes and ranges as the CIO-DAS08PGL. These are:

+/-10V, +/-5V, +/-2.5V, +/-1.25V, +/-0.625V
0-10V, 0-5V, 0-2.5V, 0-1.25

2 ANALOG OUTPUTS

Two independent 12 bit analog outputs supply voltage in several bipolar and unipolar ranges. A bank of switches associated with each D/A select the output voltage range. D/A outputs are voltage only. For current output D/A, please see the CIO-DAC02 or CIO-DAC08I

Output ranges available are: +/-10V, +/-5V, +/-2.5, 0-10V, 0-5V, 0-2.5V.

20KHz A/D or D/A

Using the crystal controlled 8254 pacer clock circuit and either polled or interrupt service routines, input and output update rates of up to 20,000 samples per second may be achieved. The speed of data transfer is dependent on the method of triggering and data transfer, and the CPU speed as the table below illustrates. The rates shown below are typical of a PC with a 16MHz or faster 386 or 486 CPU.

METHOD

CONVERSION SPEED

	A/D	D/A
Polled/ Transfer to variable	2,000	2,000
Interrupt/ Variable or array	20,000	20,000

COUNTER/TIMER

An 8254 counter/timer chip on the CIO-DAS08/AO provides a means to generate pulses, count events, measure frequency and pace the analog to digital converter.

The 8254 chip has three 16 bit counters arranged as a CLK input, a Gate which allows or inhibits the CLK input and an OUT, the pulse rate of which is a function of the divisor and the mode of operation. Signals with a frequency of up to 10MHz and of any duty cycle may be connected to the CLK input. The only constraint is that the signal be between 0 and 5 volts and cross the 2.4V TTL threshold.

TRIGGERING

A Trigger is the event that begins an acquisition/transfer cycle. There are three ways to trigger a CIO-DAS08/AO; software, internal or external. There are two ways to transfer data from the CIO-DAS08/AO; program or interrupt service routine.

An internal trigger is useful for synchronizing samples to a known time base, such as the on board 8254 programmable divider and Crystal Oscillator signal. Using an external trigger allows you to synchronize samples to an external event.

CONTROL REGISTERS

The CIO-DAS08/AO is software compatible with the DAS08 because the I/O registers have identical functions on each board. I/O registers are the locations which the computer writes commands and data to and reads status and data from.

I/O ADDR.	FUNCTION R W	I/O ADDR.	FUNCTION R W
BASE + 0	A/D Low Byte Start 8 Bit A/D	BASE + 8	DAC0 Low Byte
BASE + 1	A/D High Byte Start 12 Bit A/D	BASE + 9	DAC0 High Byte
BASE + 2	Mux Settings Mux Scan Control	BASE + 10	DAC 1 Low Byte
BASE + 3	Gain & Range Control Status	BASE + 11	DAC 1 High Byte
BASE + 4	Read Counter 0 Load Counter 0	BASE + 12	Port A In Port A Out
BASE + 5	Read Counter 1 Load Counter 1	BASE + 13	Port B In Port B Out
BASE + 6	Read Counter 2 Load Counter 2	BASE + 14	Port C In Port C Out
BASE + 7	Not Used Counter Control	BASE + 15	NA 8255 Control

SPECIFICATIONS

ANALOG INPUT

A/D Resolution	12 Bits
Channels	8 Differential
Ranges	See Text
Conversion Speed	25uS
Linearity	+/-1 Bit
Zero Drift	20 ppm/Deg C
Gain Drift	35 ppm/Deg C
Input Impedance	>100Mohm

ANALOG OUTPUT

D/A Resolution	12 Bits
Channels	2
Ranges	See Text
Output Current	+/-5mA
Output Resistance	<0.1 Ohm

COUNTER/TIMER

Type	8254
Channels	3 Down Count
Counter Size	16 Bit
Max Input	10MHz
XTAL Osc.	1MHz

POWER CONSUMPTION

5V	750mA Typ
+/-12V	Not Used
+/-15V Supplied by DC/DC	

DIGITAL I/O

Out Only	4 Bits
In Only	3 Bits
Type	LSTTL
Out or In	24 Bits
Type	CMOS TTL
Source/Sink	2.5mA

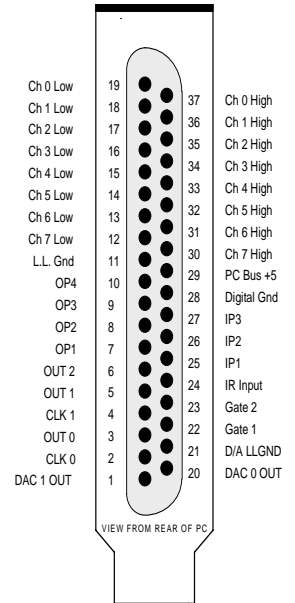
ENVIRONMENTAL

Operating Temp	0 to 50 Deg C
Storage Temp	-20 to 70 Deg C
Humidity	0-95% Non Cond.

CIO-DAS08-AO CONNECTOR

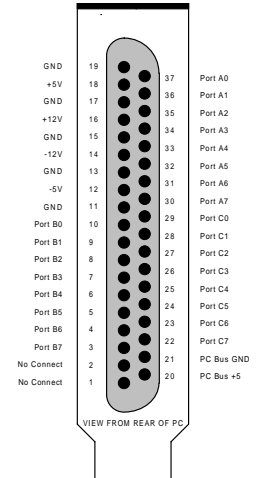
The connector pin assignment of the CIO-DAS08/AO are identical to those of the MetraByte DAS-08AO, which are quite similar to the CIO-DAS08 and CIO-DAS08PGA. Intentionally, members of the DAS-08 family of boards may be substituted without requiring changes to field wiring.

The Analog inputs may be fully differential (factory default) or referenced to ground through 10K resistors. A position for a 10K resistor SIP is supplied on the board.



24 DIGITAL I/O

The CIO-DAS08/AO provides 24 lines of bidirectional (82C55) digital I/O through a 40 pin header connector mounted on the rear of the board. The digital lines may be connected to directly or brought to the rear of the PC with a BP40-37. When brought to a 37 pin connector through the BP40-37, the connector pin-out is identical to that of a CIO-DIO24.



ORDERING GUIDE

CIO-DAS08AO multifunction A/D board.

Gains of 1, 10, 100, 1000

Gains of 1, 2, 4, 8

Gain codes identical to MetraByte DAS-08/AO

CIO-DAS08AOH

CIO-DAS08AOL

CIO-DAS08AOM

8 Position Isolation Module Rack for A/D Inputs

24 Position Solid State Relay Rack for 24 DIO

ISO-RACK08

SSR-RACK24

Analog Multiplexor, Thermocouple & CJC

32 Ch. Diff. Input, 2 Gains, up to 4 per CIO-DAS08.

16 Ch. Diff. Input, 1 Gain, up to 8 per CIO-DAS08.

CIO-EXP32

CIO-EXP16

Screw Terminal Boards

16" X 4" all signals from one 37 D plus proto area.

4" X 4" all signals from one 37 D connector.

16" X 4" all signals from one 37D, Spade Lug Terminals.

CIO-TERMINAL

CIO-MINI37

CIO-SPADE50

Cables

40 Pin Header to 37 Pin D with Backplate for 24 DIO

2 foot ribbon cable, 37 conductor, female connectors.

'N' foot ribbon cable, 37 conductor, female connectors.

5 foot shielded cable, female connectors, 37 cond.

10 foot shielded cable, female connectors, 37 cond.

BP40-37

C37FF-2

C37FF-##

C37FFS-5

C37FFS-10