

CIO-DAS1402/16

VERY LOW COST - High Speed 16 Channel 16 Bit Analog Input, 8 DIO, 3CTRS



ANALOG INPUT - DAS-1600 STYLE

The CIO-DAS1402/16 multifunction analog and digital I/O board is 100% compatible with the DAS-1600 analog input. It is smaller and, acquires data faster, and consumes less power. Designed for applications where price is a factor and only analog input is desired, the CIO-DAS1402/16 provides:

- * Data acquisition at 100KHz with existing DAS-16 software.
- * Programmable gain.
- * Burst Mode
- * Smaller footprint, fewer components.
- * Consumes only 5V from PC.
- * OEM Power engine for analog data acquisition.

DAS1600 COMPATIBILITY

ComputerBoards designed the CIO-DAS1400 to be register and connector compatible with the new DAS-1600 family. Currently ComputerBoards offers 3 different configurations of DAS-1600 and virtually every data acquisition software package supports the DAS-1600 register set.

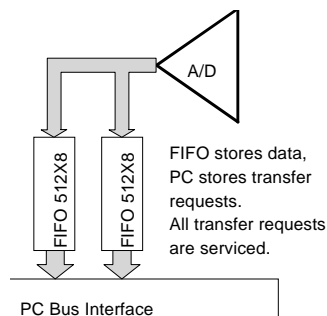
If you have applications designed for the DAS-16 and are ready to propagate those either within your facility or as a commercial product, these smaller, less expensive DAS16s may be just what you need. As the diagram shows, connector compatibility is assured.



Great with HP VEE

FIFO Buffer = Windows Ready

The FIFO Buffer collects the results of A/D conversions and stores them until the personal computer CPU is able to transfer the data into PC memory. A FIFO buffer allows the PC to store up the A/D transfer requests, then service the requests in batches. Under Windows, many demanding resources employ block transfers. Your A/D board should work in concert rather than conflict with your high performance PC.



The best part about the FIFO buffer is transparency; software you have written for the KM DAS-1400 or CIO-DAS16 will run a CIO-DAS1402/16 at higher speed without modification. And you won't miss a sample.

SIXTEEN BIT RESOLUTION & COMPATIBLE

The CIO-DAS1402/16 provides a full 16 bits of A/D resolution (1 part in 65,536). In addition, it is fully compatible with the CIO-DAS1402/12 (KM DAS-1402), including burst mode and gain codes. Because it is a natural extension of the DAS-16 family architecture, the CIO-DAS1402/16 is also register compatible with the KM DAS-HRES.

The only difference between a the 12 and 16 bit board is one register; the A/D least significant byte. Shown here is the LSB register for both a 12 and 16 bit board. The lower nibble, used for 12-15 on a 16 bit board are used for channel tags on a 12 bit board.

12 Bit Board A/D LSB

D7 D6 D5 D4 D3 D2 D1 D0
A8 A9 A10 LSb CH3 CH2 CH1 CH0

16 Bit Board A/D LSB

D7 D6 D5 D4 D3 D2 D1 D0
A8 A9 A10 A11 A12 A13 A14 LSb

ANALOG INPUTS

The analog input section of the CIO-DAS1402/16 has been designed for flexibility and accuracy in a number of configurations and ranges. The analog signals are brought on board by a standard 37 pin D connector directly to two multiplexors. The two multiplexors may be configured as 16 channels of single ended input or 8 channels of differential input. Differential inputs can reject noise and ground loops (common mode voltages) but require a 3 wire hookup as opposed to 2.

Signals are amplified by a programmable gain amplifier prior to conversion by the A/D converter.

An integral sample & hold captures the signal which is then converted by the A/D converter. The 16 bit A/D converter provides a resolution of 1/65,536 parts of full scale. The speed of data gathering is dependent on the method of triggering and data transfer, as the table below illustrates.

A/D CONVERSION SPEED	PC 4.77 MHz	386/20MHz
Polled/ Transfer to variable	320	2,200
Interrupt/ Variable or array	4,000	20,000
D.M.A.	100,000	100,000

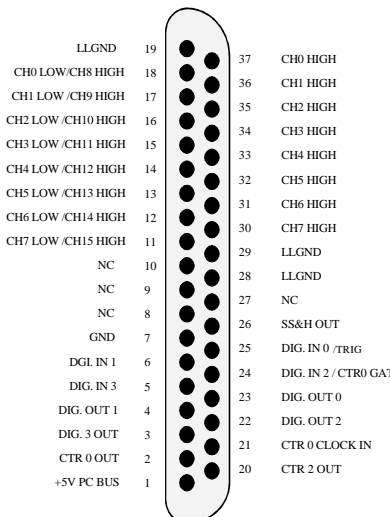
I/O & CONTROL REGISTER MAP -

The CIO-DAS1402/16 and MetraByte DAS-1400 are 100% software compatible because the I/O register have identical functions on each board. I/O registers are the locations to which the computer writes commands, and from which status and data are read.

I/O ADDR.	FUNCTION	I/O ADDR.	FUNCTION
BASE + 0	A/D Low Byte	BASE + 8	A/D Status
BASE + 1	A/D High Byte	BASE + 9	Control Settings
BASE + 2	Mux Settings	BASE + 10	NA
BASE + 3	Digital 4 In	BASE + 11	Gain & Range
BASE + 4	Not Used: These 4 registers are the DAS-16 D/A control registers, and are not used so that existing DAS-16 software will be compatible.	BASE + 12	Counter 0
BASE + 5		BASE + 13	Counter 1
BASE + 6		BASE + 14	Counter 2
BASE + 7		BASE + 15	Counter Control

SIGNAL CONNECTOR

The 37 pin D connector on the CIO-DAS1402/16 is identical to that of the CIO-DAS1600.



Of course, the pins which carry analog output signals on the CIO-DAS16 are no-connect (NC) on the CIO-DAS1402/16 boards. These pins are left floating rather than tied to ground or some other signal. That way an existing cable with a signal on it is not a problem.

Because of Computer Boards' strict adherence to standards, accessory boards, cables and all of your existing hook-ups are compatible with the CIO-DAS16 connector

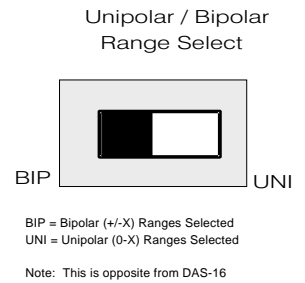
GAIN & RANGE SELECTION

Gain and range selection on the CIO-DAS1402/16 is accomplished by a combination of bipolar/unipolar switch and a programmable gain amplifier. The ranges available are:

BOARD	Prog. Gain CODE	Bipolar RANGE	Unipolar RANGE
CIO-DAS1402/16	0	+/- 10V	0- 10V
	1	+/- 5V	0- 5V
	2	+/- 2.5V	0- 2.5V
	3	+/- 1.25V	0- 1.25V

The bipolar/unipolar switch must be set.

The CIO-DAS1402/16 is not made available in a 1401 version because of the gains of 100 and 1000. A 16 bit converter at a gain of 100 resolves each bit to 1.5uV. At that low level we determined the signal to noise made the measurement meaningless. For those with special range requirements, please call the factory to explore other options or custom configurations.



BURST MODE

The CIO-DAS1402/16 may optionally be triggered in 'burst mode' in order to minimize channel to channel skew when acquiring data from multiple channels. For a complete discussion of Burst Mode, please turn to the CIO-DAS1600 data sheet. The CIO-DAS1402/16 is a cut down, analog input only version of the CIO-DAS1602/16. As such, all CIO-DAS1602/16 analog input functions are supported. The burst mode is among those.

A/D SPECIFICATIONS

Analog to Digital Resolution	16 bit, 1 part in 65,536
Channels	16 SE or 8 Differential
A/D Type	Successive Approx.
Conversion Time	10uS
Throughput	100KHz
Accuracy	0.0015% +/- 1.5LSB
Integral Linearity	+/- 1.5LSB
No missing codes over temp. range.	
Maximum Overvoltage	+/- 35V Continuous
Input Leakage Current	250 nA Max @ 25°C
Gain Drift	+/- 7 ppm/Deg C Max
Zero Drift	+/- 2 ppm/Deg C Max

GAIN & RANGE

CIO-DAS1402/16	0-10V, 0-5V, 0-2.5V, 0-1.25V +/-10V, +/-5V, +/-2.5V, +/-1.25V
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