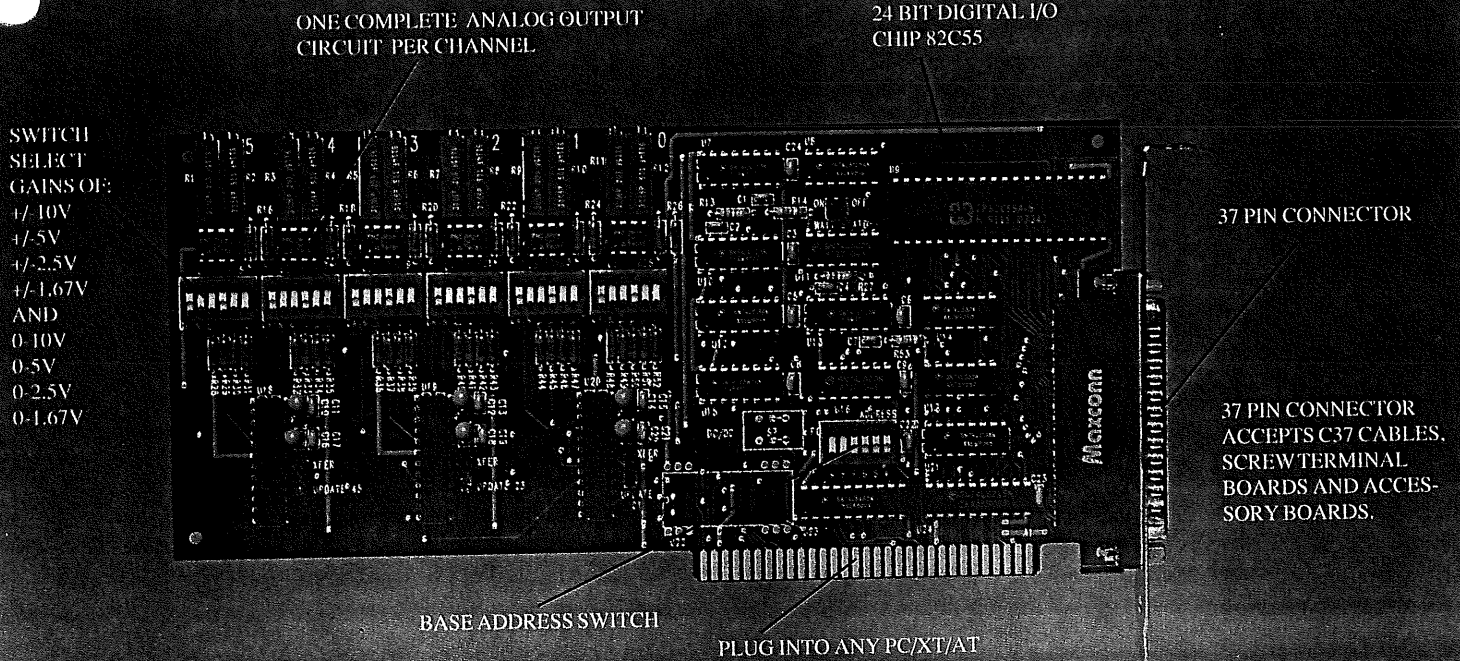# CIO-DDA06/16 & CIO-DDA06/12

6 Channel, 16 Bit or 12 Bit Resolution, Analog Output, 24 Digital I/O

ONE COMPLETE ANALOG OUTPUT CIRCUIT PER CHANNEL

24 BIT DIGITAL I/O CHIP 82C55

SWITCH SELECT GAINS OF:
+/-10V
+/-5V
+/-2.5V
+/-1.67V
AND
0-10V
0-5V
0-2.5V
0-1.67V

37 PIN CONNECTOR

37 PIN CONNECTOR ACCEPTS C37 CABLES, SCREW TERMINAL BOARDS AND ACCESSORY BOARDS.

BASE ADDRESS SWITCH

PLUG INTO ANY PC/XT/AT

DESCRIPTION

The CIO-DDA06 analog output and digital I/O board is available th either 16 bit (1 part in 65,535) or 12 bit (1 part in 4,095) resolution.

Installed in any IBM PC/XT/AT/PS30 or compatible computer the CIO-DDA06 turns your personal computer into a analog and digital control station suitable for proportional valve control, high voltage AC and DC contact monitoring and on/off control. The CIO-DDA06 is two boards in one; a 24 bit digital input/output board that

is CIO-DIO24 compatible and a 6 channel analog output board. The 37 pin D connector's 24 digital I/O pins are assigned identically to the CIO-DIO24. The analog outputs occupy the remaining pins. This means that accessories such as the SSR-RACK24 just plug right in!

The CIO-DDA06 is supplied with a complete user's manual, calibration software and is supported by language drivers Universal Driver, CTOOLS and TTOOLS as well as Control-CB and Labtech Notebook.

CIO-DDA06 BLOCK DIAGRAM

CIO-DDA06 CONNECTOR

Call for Friendly Technical Assistance - (508) 261-1123
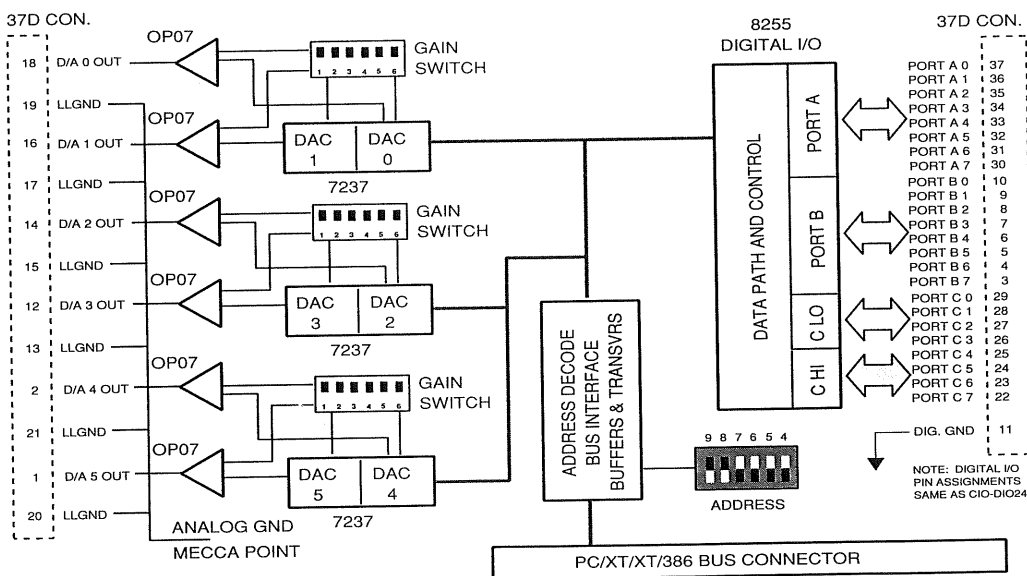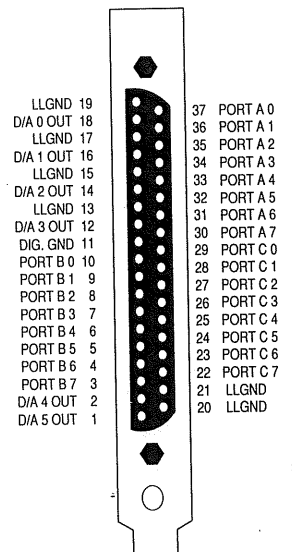
RANGE SELECTION

The analog output range is fully switch selectable. The CIO-DDA06/12, 12 bit range may vary from as much as bipolar +/-10V to as little as unipolar 0-1.67V. Resolution may vary from 4.88mV/bit to as little as 408uV/bit.

The CIO-DDA06/16, 16 bit range may vary from +/-10V (300uV/Bit) to +/-2.5 (67uV/Bit). The advantage of the 16 bit CIO-DDA06/16 is greater resolution over a wider dynamic range. In other words, in the +/-10V range you can make a measurement 16 more accurate with a 16 bit board.

The CIO-DDA06 provides different stages of gain/range to allow you to bracket more closely the signal you wish to simulate, or to match the range exactly to the proportional device you wish to control.

SOFTWARE SUPPORT

The CIO-DDA06 is supplied with software for calibration and test. In addition, the Universal Driver, CTOOLS and TTOOLS provide high level language support for :

> Single Channel Analog Out
> Simultaneous Update of Multiple Analog Outputs
> Digital Configuration & Control
> Digital Bit Read/Write
> Digital Port Byte Read/Write

Menu driven control programs such as Control-CB, Labtech Notebook and Labtech Control support the CIO-DDA06

SIGNAL CONDITIONING & ACCESSORIES

Solid State Relays provide over 4,000 Volts isolation and allow the CIO-DDA06 to sense or control high-voltage AC and DC voltages. The solid state relays mount on the SSR-RACK24 (pictured below) which interfaces directly to the CIO-DDA06.

A complete line of screw terminal boards and cables support both the analog output and digital I/O signals. Screw terminal boards accept 12-22 AWG wire and are constructed of high quality black FR4 with durable jaw-type screw terminals.
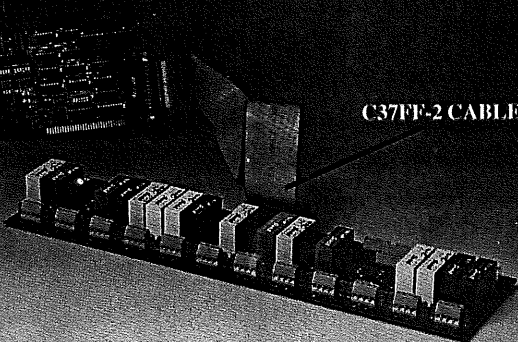

CIO-MINI37
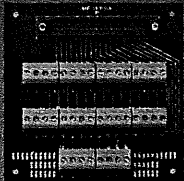
C37FFS-5 CABLE
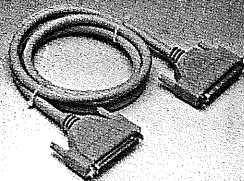
C37FF-2 CABLE
SSR-RACK24 with CIO-DDA06

I/O & CONTROL REGISTER MAP

The CIO-DDA06/12 and CIO-DDA06/16 are 100% software compatible 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.

ADDRESS	FUNCTION	ADDRESS	FUNCTION
Base	D/A0 LSB	Base + 8	D/A4 LSB
Base + 1	D/A0 MSB	Base + 9	D/A4 MSB
Base + 2	D/A1 LSB	Base + 10	D/A5 LSB
Base + 3	D/A1 MSB	Base + 11	D/A5 MSB
Base + 4	D/A2 LSB	Base + 12	PORT A Out/ In
Base + 5	D/A2 MSB	Base + 13	PORT B Out/ In
Base + 6	D/A3 LSB	Base + 14	PORT C Out/ In
Base + 7	D/A3 MSB	Base + 15	8255 Control

BASE ADDRESS SWITCH

The CIO-DDA06 occupies 16 consecutive I/O addresses. The first, or Base Address, is set by a bank of switches in a DIP switch on the board. It is possible to set the base address of the CIO-DDA06 anywhere within the range 0 to 3FF Hex. Because of this flexibility, multiple CIO-DDA06 boards, or other I/O boards, may be used in the same PC.

BASE ADDRESS SWITCH
SETTINGS SHOWN - 300 HEX, 768 DECIMAL

```
        9 8 7 6 5 4    SW  DEC  HEX
                        9   512  200
UP                      8   256  100
                        7   128   80
                        6    64   40
DN                      5    32   20
                        4    16   10
        ↓ ↓ ↑ ↑ ↑ ↑
```

SPECIFICATIONS

Channels	6 Voltage Output
Resolution	CIO-DDA06/12, 12 Bit, 1 part in 4,095
	CIO-DDA06/16, 16 Bit 1 part in 65,535
D/A Type	Dual DAC, AD7237 (12 Bit), DAC725 (16 Bit)
Latches	Double buffered/Sim. Update
Linearity	+/- 1/2 Bit (12 Bit), +/-0.006% FS (16 Bit)
Monotonicity	+/- 1/2 Bit (12 Bit), 14 Bit over Temp Range(16 Bit)
Temperature drift	1ppM Typ., 3ppM Max @ 0V
	15ppm Typ., 30ppM max @ FS
Load Current	+/-5mA Max
Short Circuit Current	40mA Max
Output Resistance	<0.1 ohm
Settling Time + FS 0.01%	3uS Typical, 5uS Max (12 Bit), 8uS (16 Bit)
Settling Time -FS 0.01%	5uS Typical, 10uS
OUTPUT RANGES	
CIO-DDA06/12	+/-10, +/-5, +/-2.5, +/-1.67 Bipolar Volts
	0-10, 0-5, 0-2.5, 0-1.67 Unipolar Volts
CIO-DDA06/16	+/-10, +/-5, +/-2.5 Bipolar Volts
	0-10, 0-5 Unipolar Volts
DIGITAL I/O	
I/O Ports	2 Eight Bit, 2 Four Bit
Total Bits	24
Output High	2.4V Min @ 2.5mA
Output Low	0.5V Max @ 2.5 mA
Input High	2.0V Min, 7.0V Max
Input Low	-0.5V Min, 0.8V Max

ORDERING GUIDE

6 Channel, 16 Bit, D/A, Digital I/O	CIO-DDA06/16
6 Channel, 12 Bit, D/A, 24 Digital I/O	CIO-DDA06/12
24 Channel Solid State Relay Rack	SSR-RACK24
8 Channel Solid State Relay Rack	SSR-RACK08

Screw Terminal Boards

16" X 4" all signals from one 37 D plus proto area & circuitry.	CIO-TERMINAL
4" X 4" all signals from one 37 D connector.	CIO-MINI37
16" X 4" all signals from one 37D, Spade Lug Terminals.	CIO-SPADE50

Cables

2 foot ribbon cable, 37 conductor, female connectors.	C37FF-2
'N' foot ribbon cable, 37 conductor, female connectors.	C37FF-N
5 foot shielded cable, molded female connectors, 37 cond.	C37FFS-5
10 foot shielded cable, molded female connectors, 37 cond.	C37FFS-10