CIO-DIO48 48 TTL Level I/O & CIO-DIO48H 48 High Drive DIO
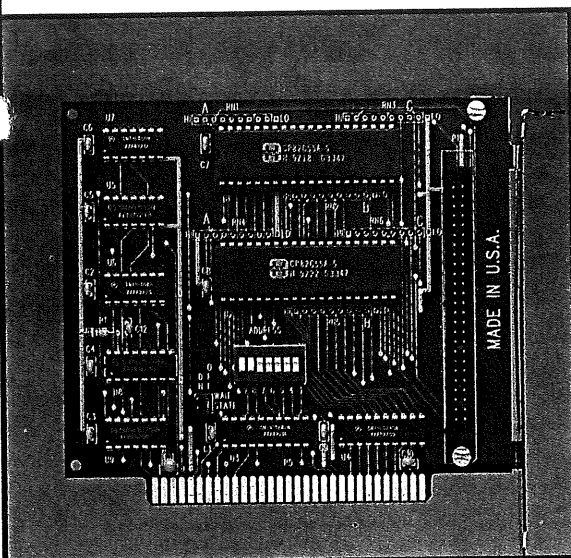
FEATURES
One 50 pin connector carries all 48 digital I/O lines plus power

Control 48 devices or sense 48 contact closures from a single 1/2 size card in your PC. The CIO-DIO48 employs two 8255 parallel peripheral interface chips which are programmable in three modes; simple byte input or output or strobed I/O. The 8255 is simple to program.

The CIO-DIO48H adds high drive and is fully 8255 mode 0 compliant. Software written for any DIO board employing 8255 chips or 8255 type registers will run without modification. High drive sources 15mA and sinks 64mA.

The CIO-DIO48 is one of a family of digital I/O boards which use the 50 pin connector. All the accessories, including screw terminal boards, electromechanical relay boards and solid state relay boards interface to the same connector, be it a 48, 96 or 192 point digital I/O board!
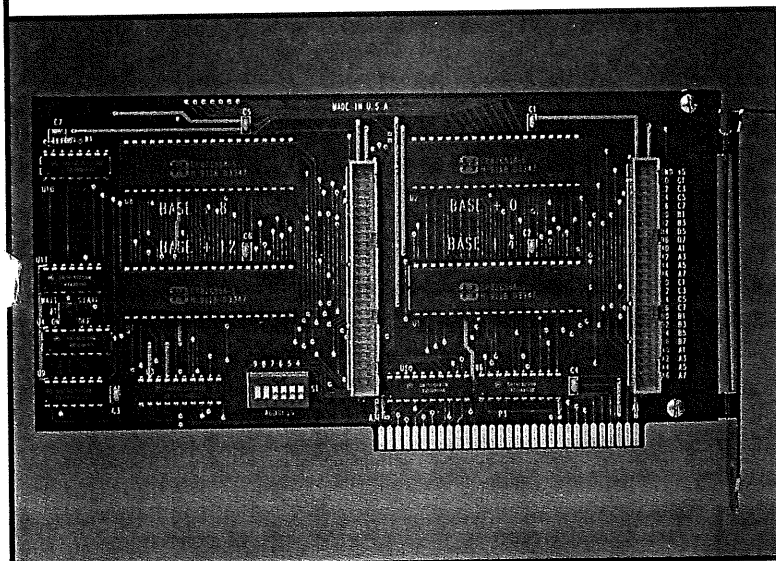
CIO-DIO96 - 96 TTL Level I/O

FEATURES
96 TTL Digital I/O Lines
Each 50 pin connector carries 48 I/O plus power

Sharing a standard connector pin-out with the CIO-DIO48 and CIO-DIO192, the CIO-DIO96 allows you to control 96 devices or sense contact closures from a single 2/3 size card in your personal computer.

Assemble a simple monitoring and alarm system. Control lights, motors, locks, heaters or virtually any device which can be turned on and off.

Use it with Control-CB, a complete software package for monitoring digital devices and graphing or logging events, or with Universal Library, a set of software drivers. The CIO-DIO96 is also easy to program directly from any language thats supports port I/O.
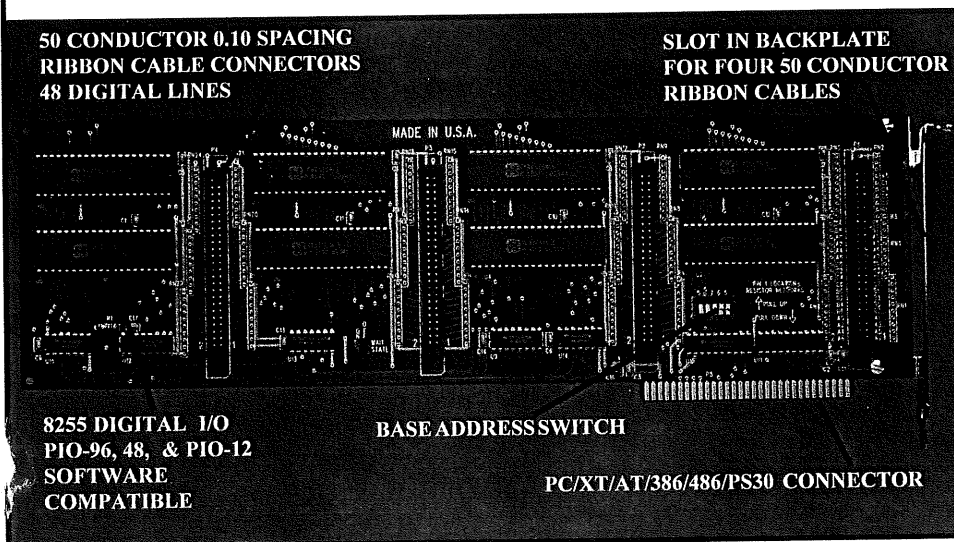
CIO-DIO192 - 192 TTL Level I/O

50 CONDUCTOR 0.10 SPACING
RIBBON CABLE CONNECTORS
48 DIGITAL LINES

SLOT IN BACKPLATE
FOR FOUR 50 CONDUCTOR
RIBBON CABLES

MADE IN U.S.A.

8255 DIGITAL I/O
PIO-96, 48, & PIO-12
SOFTWARE
COMPATIBLE

BASE ADDRESS SWITCH

PC/XT/AT/386/486/PS30 CONNECTOR

FEATURES
192 TTL Digital I/O Lines
Each 50 pin connector carries 48 I/O plus power

For very high density digital I/O problems, the CIO-DIO192 is the solution! Sharing a standard connector pin-out with the boards above, large numbers of electromechanical or solid state relays may be monitored and controlled from a single slot of your PC.

The CIO-DIO192 is easy to program and cable to (see diagrams to the right).

BASE ADDRESS SWITCH

To program and control the DIO board, the personal computer writes to and reads from the I/O address assigned to the DIO board. Each DIO board's address is set by selecting a base address via the base address switch.

The BASE address is set by switching inputs to a comparator. Each switch corresponds to one address line on the PC bus. Each switch represents one address weight and weights are added to determine a unique address.

Address 300H shown

SW	HEX
A9	200
A8	100
A7	80
A6	40
A5	20
A4	10
A3	8

9 8 7 6 5 4 3

↓ ↓ ↑ ↑ ↑ ↑ ↑
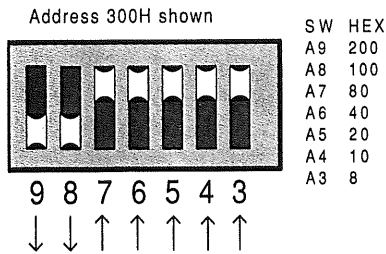
Each DIO board occupies several I/O addresses, all proceeding from the base address. The I/O register map shows how many addresses and their function for each board.

CABLING & CONNECTION

Cabling to the CIO-DIO48, 96 and 192 is via standard 50 pin, 0.10 inch spacing IDC type ribbon cable connectors. Each cable carries 48 digital I/O lines, +5 volts and ground. The DIO48 has one, the DIO96 has two and the DIO192 has four connectors

Cables are available in a variety of lengths. A screw terminal board, the CIO-TERM100, provides 100 standard 12 - 22 AWG screw terminals. The CIO-MINI50 provides 50 standard 12-22 AWG screw terminals. The CIO-SPADE50 provides terminals for 50 spade type connections.. The SSR-RACK24 mounts 24 solid state relays and the CIO-ERB24 mounts 24 electromechanical relays.
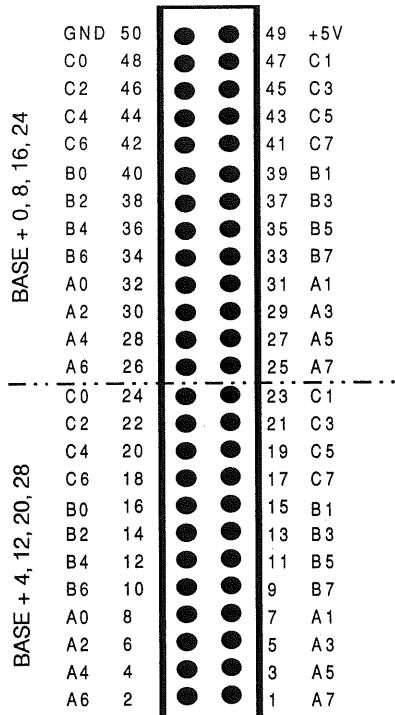
VIEW FROM COMPONENT SIDE OF BOARD

Each connector carries 48 digital I/O lines. One 8255 on pins 1-24 and one on pins 25-48.

Each 8255 has 24 I/O lines. The chip is configured as 3 ports. Two ports, A & B, are 8 bits wide. Port C may be an 8 bit port or two 4 bit ports.

Individual ports may be configured as Input or Output and are written to and read from as a unit.

The address numbers shown here correspond to the initial address of the chip associated with the connector, in boards which have multiple connectors.

```
              GND 50  ● ● 49  +5V
               C0 48  ● ● 47   C1
               C2 46  ● ● 45   C3
               C4 44  ● ● 43   C5
               C6 42  ● ● 41   C7
               B0 40  ● ● 39   B1
               B2 38  ● ● 37   B3
               B4 36  ● ● 35   B5
               B6 34  ● ● 33   B7
               A0 32  ● ● 31   A1
               A2 30  ● ● 29   A3
               A4 28  ● ● 27   A5
               A6 26  ● ● 25   A7
             - C0 24  ● ● 23   C1 -
               C2 22  ● ● 21   C3
               C4 20  ● ● 19   C5
               C6 18  ● ● 17   C7
               B0 16  ● ● 15   B1
               B2 14  ● ● 13   B3
               B4 12  ● ● 11   B5
               B6 10  ● ●  9   B7
               A0  8  ● ●  7   A1
               A2  6  ● ●  5   A3
               A4  4  ● ●  3   A5
               A6  2  ● ●  1   A7
```

BASE + 0, 8, 16, 24

BASE + 4, 12, 20, 28

I/O REGISTER MAP

The I/O registers of the CIO-DIO48 occupy 8 I/O locations in the PC's I/O address space. The first, or BASE, address is fixed by the base address switch.

BASE + 0	PORT A #1	BASE + 4	PORT A #2
BASE + 1	PORT B #1	BASE + 5	PORT B #2
BASE + 2	PORT C #1	BASE + 6	PORT C #2
BASE + 3	#1 CONTROL	BASE + 7	#2 CONTROL

The I/O registers of the CIO-DIO96 occupy an additional 8 I/O locations for a total of 16 I/O locations.

BASE + 8	PORT A #3	BASE + 12	PORT A #4
BASE + 9	PORT B #3	BASE + 13	PORT B #4
BASE + 10	PORT C #3	BASE + 14	PORT C #4
BASE + 11	#3 CONTROL	BASE + 15	#4 CONTROL

The CIO-DIO192 has an additional 16 registers - BASE + 16 through BASE + 31. A total of 32 I/O locations.

BASE + 16	PORT A #5	BASE + 20	PORT A #6
BASE + 17	PORT B #5	BASE + 21	PORT B #6
BASE + 18	PORT C #5	BASE + 22	PORT C #6
BASE + 19	#5 CONTROL	BASE + 23	#6 CONTROL
BASE + 24	PORT A #7	BASE + 28	PORT A #8
BASE + 25	PORT B #7	BASE + 29	PORT B #8
BASE + 26	PORT C #7	BASE + 30	PORT C #8
BASE + 27	#7 CONTROL	BASE + 31	#8 CONTROL

PROGRAMMING

The 8255 is easy to program. The following example is in BASIC but generalizes to all other languages.

```
BASE = &H300            'Set the base address of the 8255
OUT(BASE+3), &H92       'Set ports C to output, A&B input.
PORTA = INP(BASE + 0)   'Read data from port A
PORTB = INP(BASE + 1)   'Read data from port B
OUT(BASE+2), 1          'Write 1 to C. Bit 1 high, others low
```

Programming is via simple in and out statements. Ports of an 8255 may be independently programmed for input or output, and once set, individual bits may be set high or low.

82C55 DRIVE & HIGH DRIVE

The 82C55 can source or sink 2.5mA per I/O line. This is plenty of power for activating other chips, but not enough for LEDs or relays. High drive boards can source 15Ma and sink 64mA. Enough for LEDs and many relays, including SSRs

ORDERING GUIDE

48 Bit digital I/O board	CIO-DIO48
48 Bit digital I/O high drive.	CIO-DIO48H
96 Bit digital I/O board	CIO-DIO96
192 Bit digital I/O board	CIO-DIO192
Screw Terminal Boards	
4" X 4" 50, 12-22 AWG Screw Terminals	CIO-MINI50
16" X 4", 100, 12-22 AWG Screw Terminals	CIO-TERM100
16" X 4", 50 Spade Lug Terminals	CIO-SPADE50
17" X 4.5" 24 Solid State Relay Mounting Rack	SSR-RACK24
24 Electromechanical relay accessory.	CIO-ERB24
Cables	
2 foot, 50 conductor cable	C50FF-2
Custom length, 50 conductor cable	C50FF-##