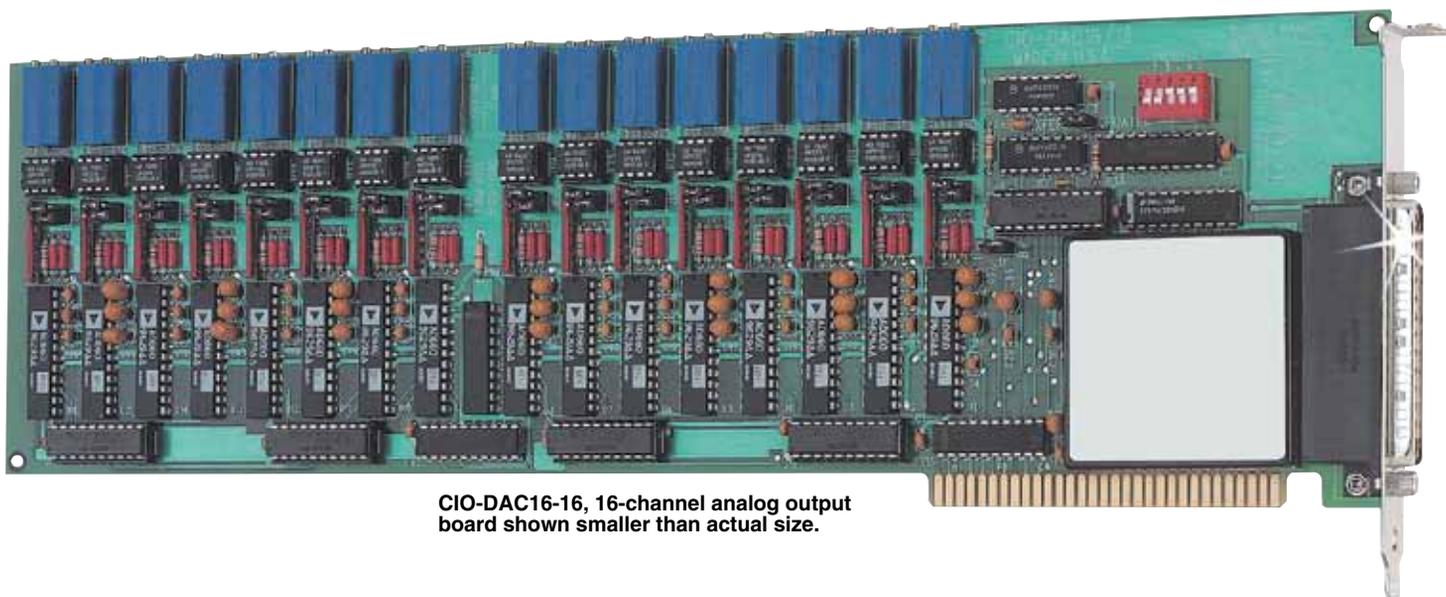


# 16-Channel Current or Voltage Analog Output Boards



CIO-DAC16-16, 16-channel analog output board shown smaller than actual size.

## CIO-DAC16 Series



- ✓ 16 D/A Channels
- ✓ Individual D/A per Channel
- ✓ 12-Bit or 16-Bit Resolution Models
- ✓ Includes Calibration and Test Software

The CIO-DAC16 analog output board provides 16 independent, 12-bit (one part in 4095) digital-to-analog converters with a number of voltage output range choices available, while the CIO-DAC16-16 provides 16 outputs at 16-bit resolution (one part in 65,536). If 4-20 mA current outputs are needed instead of voltage, then the CIO-DAC16-I can be used. All outputs are accessible via a 37-pin male D connector.

Installed in any IBM or compatible PC with an ISA bus, any CIO-DAC16 turns your personal computer into an analog station suitable for proportional valve control, 16 channel stimulus/

response experimentation, low-speed waveform generation or simple voltage driven control.

### Range Selection

The analog output range is switch selectable, and can be set individually for each channel. The CIO-DAC16 outputs can be set for  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, 0 to 10 V, 0 to 5 V and 0 to 2.5 V. For the CIO-DAC16-16, ranges can be set for  $\pm 10$  V,  $\pm 5$  V, 0 to 10 V and 0 to 5 V. Where 4 to 20 mA outputs are required, the CIO-DAC16-I can be used to supply up to 16 current outputs.

### Simultaneous Update

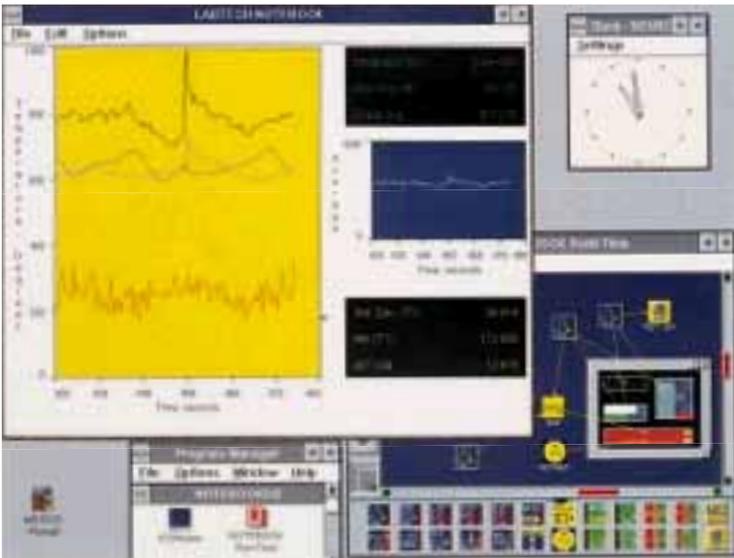
The CIO-DAC16 series output channels may be updated individually by writing new D/A data to the D/A chips. The D/A's are double buffered so the outputs are not changed until all 16 bits of the new output value are written to the D/A.

The entire 16 channels may also be set to update simultaneously. When set for simultaneous update,

the D/A data written to the D/A's has no effect on the output value until the board is commanded to update all simultaneous channels. At that instant, all channels are updated at once.

### Software Support

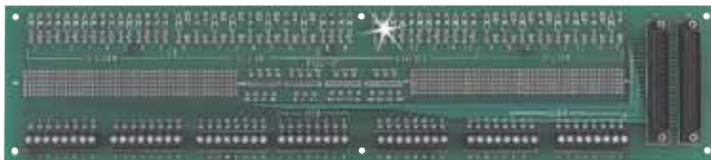
The CIO-DAC16 series is supplied with InstaCal software for calibration and testing. In addition, it is also supported by the optional Universal Library. The Universal Library is a set of I/O libraries and drivers for users who create their own custom programs. The Universal Library is compatible with most DOS and Windows (16-bit and 32-bit) based languages (DLL and VXD), and supports the entire CIO family of boards. The Library includes an extensive set of programming examples written in Visual Basic, C and Pascal for DOS, Windows 3.1, Windows 95 and Windows NT. An optional driver for LabVIEW is also available. Icon driven control programs such as Labtech Notebook, Labtech Control and DasyLab support the CIO-DAC16 series.



The CIO-DAC16, works with the optional Labtech Notebook software. See Section B for details.



CIO-MINI37, screw terminal panel shown smaller than actual size



CIO-TERMINAL, screw terminal panel shown smaller than actual size



InstaCal calibration and test software

## Specifications

D/A Channels: 16

### OUTPUT RANGES

**CIO-DAC16:**  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, 0 to 10 V, 0 to 5 V and 0 to 2.5 V

### CIO-DAC16-16:

$\pm 10$  V,  $\pm 5$  V, 0 to 10 V and 0 to 5 V

### CIO-DAC16-I: 4 to 20 mA

**Resolution:** 12-bit (1/4095) for CIO-DAC16 and CIO-DAC16-I; 16-bit (1/65,536) for CIO-DAC16-16

### Latches:

Double buffered/Sim update

### D/A Type:

Dual DAC, AD7237 for 12-bit boards, AD660BN for 16-bit boards

**Linearity:**  $\pm 1/2$  LSB max for CIO-DAC16 and CIO-DAC16-I;  $\pm 1$  LSB max for CIO-DAC16-16

**Load Current:**  $\pm 5$  mA max

**Short Circuit Current:** 40 mA max

**Output Resistance:**  $< 0.1 \Omega$

**Wait State:** 1 msec when enabled

### Settling Time:

5  $\mu$ s typical, 10  $\mu$ s max to 0.01% for CIO-DAC16 and CIO-DAC16-I;

6  $\mu$ s typical, 9  $\mu$ s max to 0.0008% for 10 V step for CIO-DAC16-16

## To Order

Model No.	Description
<b>CIO-DAC16</b>	16-channel, 12-bit voltage analog output board
<b>CIO-DAC16-I</b>	16-channel, 12-bit 4-20 ma analog output board
<b>CIO-DAC16-16</b>	16-channel, 16-bit voltage analog output board
<b>CIO-MINI37</b>	Screw terminal panel, 102 x 102 mm (4 x 4") for connecting inputs to CIO-DAS16-M1 boards (requires cable)
<b>CIO-TERMINAL</b>	Screw terminal panel, 406 x 102 mm (16 x 4") with prototype area (requires cable)
<b>CIO-SPADE50</b>	Spade lug terminal board, 406 x 102 mm (16 x 4") all signals from one 37D connector.
<b>ENC-MINI37</b>	Plastic enclosure for CIO-MINI37 panel
<b>C37FF-2</b>	2-foot, 37-pin ribbon cable
<b>C37FFS-5</b>	5-foot shielded cable, molded female connectors, 37-pin
<b>C37FFS-10</b>	10-foot shielded cable, molded female connectors, 37-pin
<b>UNIV-DRVR</b>	Universal Software Library (DOS, Windows 3.1, Windows 95, Windows 98 and Windows NT)
<b>CIO-LABVIEW-DRVR</b>	LabVIEW driver

*CIO-DAC16 series boards come with test/calibration software and operator's manual.*

*OMEGACARE<sup>SM</sup> extended warranty is available for models shown on this page. Ask your sales representative for full details when placing order.*

*Ordering Example: CIO-DAC16, C37FF-2 cable, CIO-MINI37 panel, ENC-MINI37 enclosure, OMEGACARE<sup>SM</sup> 1-year extended warranty for CIO-DAC16 (extends standard 3-year warranty to 4 years) and UNIV-DRVR Universal Library.*