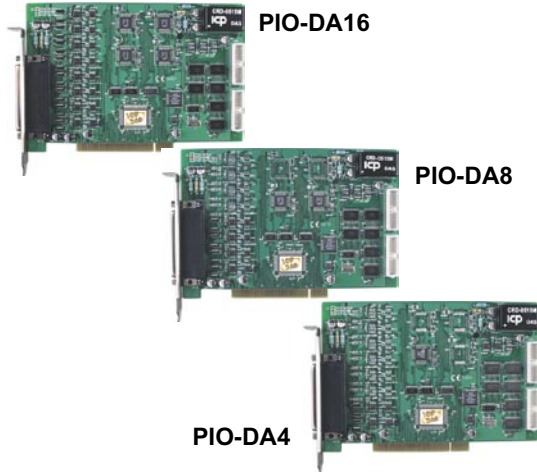


## PCI Analog Output Board

# PIO-DA16/DA8/DA4 Series

16/8/4-channel 14-bit analog output board



### Features

- 32-bit +5V PCI bus, Plug & Play
- 16/8/4-channel, 14-bit analog output
- Unipolar or bipolar outputs available from each converter
- Voltage/current outputs for individual D/A converter
- Output type and output range can be software programmable
- 4~20 mA or 0~20 mA current sink to ground for each converter
- Two pacer timers interrupt source
- Double-buffered D/A latches
- Software calibration
- 16-channel DI, 16-channel DO

### Functional Description

The PIO-DA16/DA8/DA4 are multi-channel D/A boards with the PCI bus for IBM or compatible PC. The PIO-DA16/DA8/DA4 offers 16/8/4-channels double-buffered analog output. The output range may be configured in different ranges:  $\pm 10V$ ,  $\pm 5V$ , 0~10V, 0~5V voltage output, or 4~20 mA, 0~20 mA sink current loop.

The innovative design improves several drawbacks of the conventional D/A boards. For example:

1. Jumperless and without Trim pot.
2. The calibration is performed under software control and eliminating manual Trim pot adjustments. The calibration data is stored in EEPROM.
3. Each channel can be selected as voltage or current output.
4. High channel count output can be implemented in half size.

### Applications

- Programmable voltage source
- Programmable current sink
- Harsh environment operation
- Process control

### Specifications

#### Analog Output

- D/A converter: Quad 14-bit MDAC
- Number of channels: 4/8/16 independent
- Resolution: 14-bit
- Type: double-buffered, multiplying
- Integral linearity: 0.006% FSR; typical
- Differential linearity: 0.006 % FSR (typical)

#### Voltage Output Range

- Unipolar: 0~5V or 0~10V
- Bipolar:  $\pm 10V$  or  $\pm 5V$
- Current drive:  $\pm 5$  mA (PIO-DA16/DA8/DA4)  
 $\pm 40$  mA (PIO-DA4H)
- Absolute accuracy: 0.01% FSR (typical)

#### Current Output Range

- 0~20 mA or 4~20 mA
- Absolute accuracy: 0.1% FSR (typical)
- Excitation voltage range: + 7 V to +40 V

#### Stability

- Offset temperature coefficient:  $\pm 50 \mu V / ^\circ C$
- Gain temperature coefficient:  $\pm 10 \text{ppm} / ^\circ C$

#### Digital I/O

- 16 TTL-level input
- Input low  $V_{IL} = 0.8V$  max;  $I_{IL} = -0.4$  mA max
- Input high  $V_{IH} = 2.0V$  min;  $I_{IH} = 20 \mu A$  max
- 16 TTL-level output
- Output low  $V_{OL} = 0.5V$  max; @ $I_{OL} = 8$  mA max
- Output high  $V_{OH} = 2.7V$  min; @ $I_{OH} = 0.4$  mA max

#### General Specifications

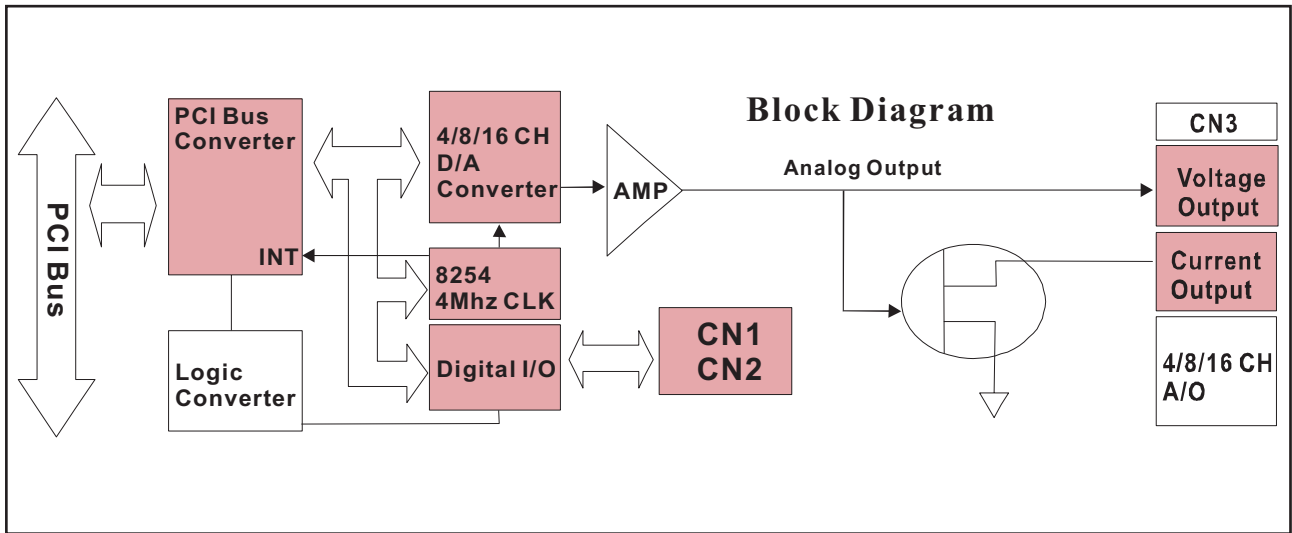
- I/O connector: one 37-pin D-sub female  
two 20-pin ribbon male
- Power requirements:

Device	+5V	+12V	-12V
PIO-DA16	1400 mA	16 mA	16 mA
PIO-DA8	800 mA	8 mA	8 mA
PIO-DA4	600 mA	4 mA	6 mA

- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90 % non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 179 mm x 122 mm

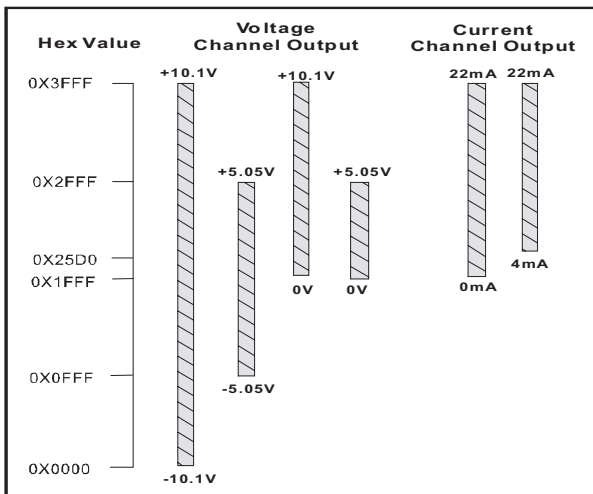
# PIO-DA16/DA8/DA4 Series

16/8/4-channel 14-bit analog output boards



2 PCI Bus I/O Boards

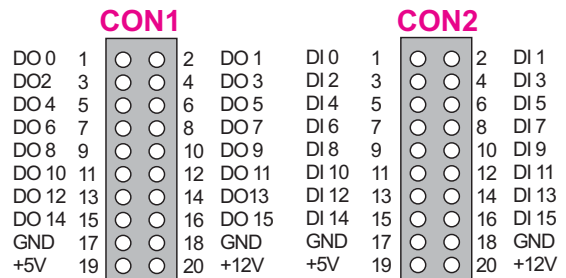
## Output Range & Resolution



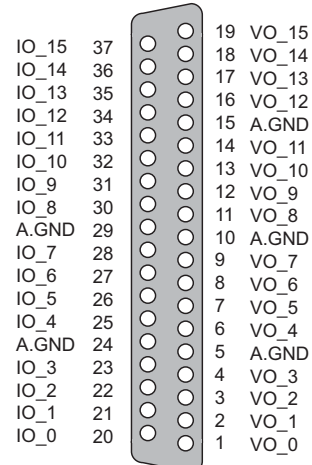
The resolution of each is given as follows

Configuration	Equivalent bit	Resolution
-10V~+10V	14-bit	1.22 mV
0V~+10V	13-bit	1.22 mV
-5V~+5V	13-bit	1.22 mV
0V~+5V	12-bit	1.22 mV
0mA~20mA	13-bit	2.70 μ A
4mA~20mA	13-bit	2.70 μ A

## Pin Assignment



## CON3



## Ordering Information

### Standard

- PIO-DA4:** 4-channel 14-bit analog output board
- PIO-DA4/S:** PIO-DA4 with DN-37
- PIO-DA8:** 8-channel 14-bit analog output board
- PIO-DA8/S:** PIO-DA8 with DN-37
- PIO-DA16:** 16-channel 14-bit analog output board
- PIO-DA16/S:** PIO-DA16 with DN-37

### Optional

- DN-37:** DIN-rail mounting terminal board
- DB-37:** Directly connection terminal board
- DB-16P:** 16-channel opto-isolated digital input board
- DB-16R:** 16-channel relay output board
- DN-20:** DIN-rail mounting terminal board
- ADP-20/PCI:** 20-pin extender