Selection Guide

PCI bus analog output board

PCI Bus DA Board			PISO-DA2	PIO-DA4	PIO-DA8	PIO-DA16
Analog Output	Output Channel		2	4	8	16
	Resolution		12-bit	14-bit	14-bit	14-bit
	Output Range	Voltage	-10~10V, -5~+5V 0~+5V, 0~+10V			
		Current		0~20 mA, 4~20 mA		
	Power on value can be pre-set		N	N	N	N
	Voltage output and Current output can be switched without re-calibration		Y	Y	Y	Y
	Need trim pot for calibration		N	N	N	N
	Channel to Channel Isolation		Y	N	N	N
Isolation			3,750 VDC	-	-	-
Digital Output Channel (TTL Level)			N	16	16	16
Digital Input Channel (TTL Level)			N	16	16	16
Dimensions (mm)			170 x 122	179 x 122	179 x 122	179 x 122
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PISO-DA2

2-channel 12-bit isolated analog output board

Features

- 32-bit +5V PCI Bus, Plug & Play
- Two independent 12-bit channels of analog output
- 3750 VDC isolation protection
- 3000 VDC isolation DC/DC converter build-in
- Software calibration
- The calibration data is fully stored in EEPROM
- Two pacer timers interrupt source
- The voltage or current output can be set to arbitrary values or reset to zero when the power is on

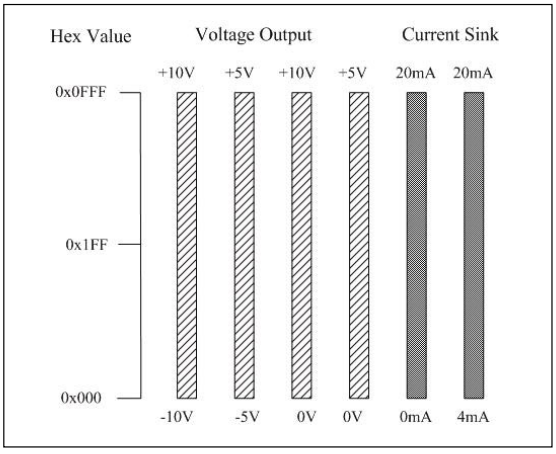
Functional Description

The PISO-DA2 is a PCI bus analog output board with two isolated 12-bit output channels for IBM personal computer and compatibility. The output range can be configured as voltage output by one of the different ranges: ±10V, ±5V, 0~10V, 0~5V, or current output using loop sink by the range: 0~20 mA or 4~20 mA. Besides, output channel is isolated from each other and the isolation range can reach the voltage more than 3000 VDC. The maximum conversion rate of the analog output is 10KS/s. It is the most cost-effective isolated D/A board for the PCI bus interface.

Applications

- Factory Automation
- Product Test
- Laboratory Automation
- Security Control

Output Range Resolution



Specifications

- D/A converter with resolution: 12-bit
- Conversion rate: 10KS/s max
- Voltage output range: Bipolar: ±10V, ±5V
  Unipolar: 0~10V, 0~5V
- External load register: 1KΩ min
- Reference voltage: Internal: -5V and -10V
  External: DC ±10V max
- Current output: 0~20 mA, 4~20 mA
- Current loop excitation voltage: +8V~+36V
- External load register: 400 Ω max
- Converter: AD7541 or equivalent
- Accuracy: 0.015% of reading FSR (Full Scale Range)
  Linearity: ±1/2 LSB

General Specifications

- I/O connector: two 9-pin D-Sub female
- Power requirement: 5V @ 2.5A
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 170 mm x 122 mm

Ordering Information

Standard

PISO-DA2: Isolated 12-bit analog output board
PISO-DA2/S: PISO-DA2 with DB-8425

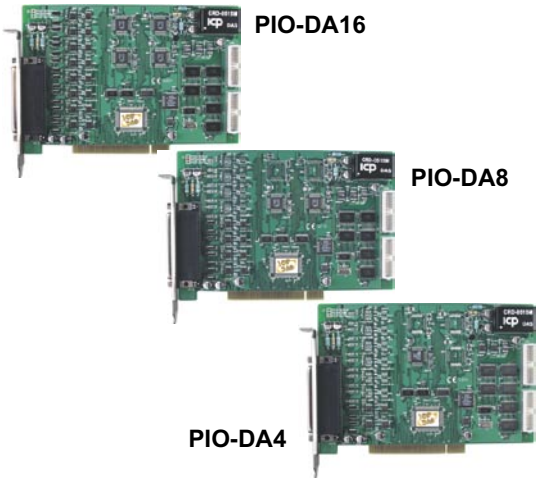
Optional

DB-8425: Screw terminal board for PISO-DA2
DN-09-02: DIN-rail mounting terminal board for PISO-DA2

PCI Analog Output Board

PIO-DA16/DA8/DA4 Series

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



PIO-DA16

PIO-DA8

PIO-DA4

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: ±10V, ±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: ±10V or ±5V
- Current drive: ±5 mA (PIO-DA16/DA8/DA4)
  ±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: ±50 μV /°C
- Gain temperature coefficient: ±10ppm/°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 μA 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

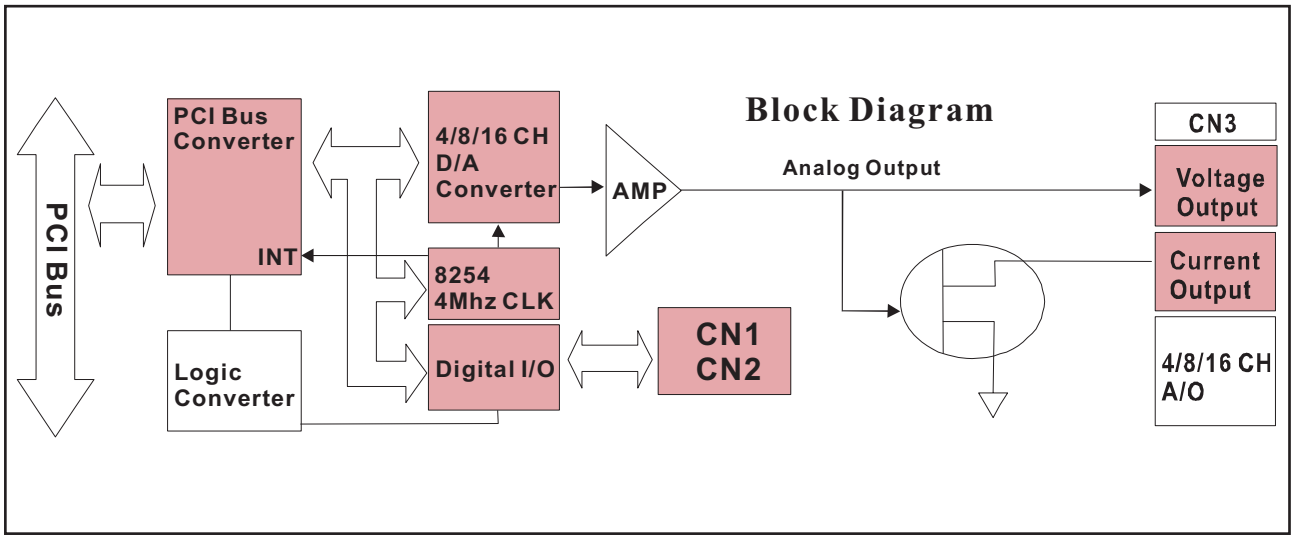
- I/O connector: one 37-pin D-sub female
  two 20-pin ribbon male
- Power requirements:

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

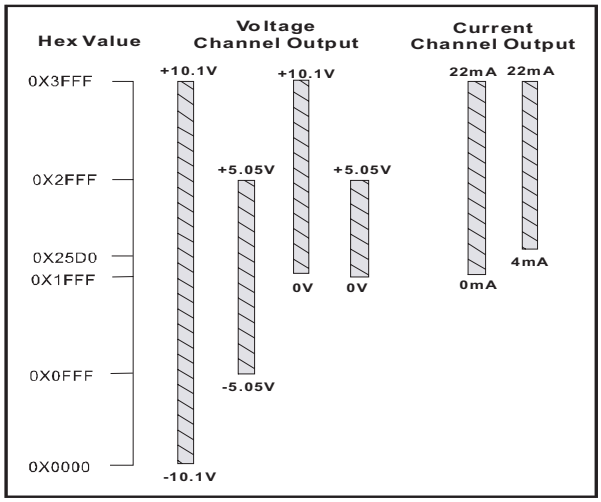
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90 % non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 179 mm x 122 mm

PIO-DA16/DA8/DA4 Series

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



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 μA
4mA~20mA	13-bit	2.70 μA

Pin Assignment

CON1

DO 0	1	2	DO 1	DI 0	1	2	DI 1
DO2	3	4	DO 3	DI 2	3	4	DI 3
DO 4	5	6	DO 5	DI 4	5	6	DI 5
DO 6	7	8	DO 7	DI 6	7	8	DI 7
DO 8	9	10	DO 9	DI 8	9	10	DI 9
DO 10	11	12	DO 11	DI 10	11	12	DI 11
DO 12	13	14	DO13	DI 12	13	14	DI 13
DO 14	15	16	DO 15	DI 14	15	16	DI 15
GND	17	18	GND	GND	17	18	GND
+5V	19	20	+12V	+5V	19	20	+12V

CON2

CON3

IO_15	37	19	VO_15
IO_14	36	18	VO_14
IO_13	35	17	VO_13
IO_12	34	16	VO_12
IO_11	33	15	A.GND
IO_10	32	14	VO_11
IO_9	31	13	VO_10
IO_8	30	12	VO_9
A.GND	29	11	VO_8
IO_7	28	10	A.GND
IO_6	27	9	VO_7
IO_5	26	8	VO_6
IO_4	25	7	VO_5
A.GND	24	6	VO_4
IO_3	23	5	A.GND
IO_2	22	4	VO_3
IO_1	21	3	VO_2
IO_0	20	2	VO_1
		1	VO_0

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