

# Selection Guide

## ISA bus isolated data acquisition board

Model No.		ISO-AD32H/L	ISO-813	ISO-LDH/L	ISO-DA8	ISO-DA16
Bus		ISA				
Analog Input Channels		32 S.E. 16 DIF	32 S.E.	1	-	-
Strain Gauge Input		-	-	1	-	-
Analog Input Resolution		12-bit			-	-
Analog Input Range (V)	Bipolar Low Gain	10,±5,±2.5, 1.25,±0.625	±10,±5,±2.5, 1.25, 0.625, ±0.3125	-	-	-
	Bipolar High Gain	±10,±5,±1, ±0.5,±0.1 0.05,±0.01,±0.005	-	-	-	-
	Unipolar Low Gain	0~10,0~5,0~2.5, 0~1.25	0~10,0~5,0~2.5, 0~1.25,0~0.625	0~10,0~5,0~2.5 0~1.25	-	-
	Unipolar High Gain	0~10,0~1,0~0.1, 0~0.01	-	0~10,0~1, 0~0.1,0.01	-	-
Analog Output	Channels	-	-	-	8	16
	Resolution	-	-	-	14-bit	
	Range (V)	-	-	-	±10,±5, 0~5,0~10	
	Range (mA)	-	-	-	0~20,4~20	
On-Board FIFO		1K bytes	-	1K bytes	-	-
Sampling rate		ISO-AD32H: 125KHz ISO-AD32L: 200KHz	10KHz	20KHz	-	-
Digital I/O Channels		-	-	8 isolated input 7 isolated O.C. output 8 TTL Output	16 TTL Input 16 TTL Output	16 TTL Input 16 TTL Output
Channel Scan		Yes	-	-	-	-
Isolation		500VDC	3,000VDC	500VDC	2,500VDC	2,500VDC
Dimensions (mm)		173 x 122	174 x 122	190 x 122	182 x 122	
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### Isolated Digital I/O, Relay Output Board Selection Guide

Model NO.	ISO-P32C32	ISO-C64	ISO-P64	ISO-730	P8R8DIO	P16R16DIO
Bus	ISA					
Isolated Input Channels	32	-	64	16	8	16
Input Range	5~30V	-	5~30V	5~30V	5~24V	5~24V
Input Isolation	3,750V	3,750V	3,750V	2,500V	5,000V	5,000V
Isolated Output Channels	32	64	-	16	8	16
Driving Capacity	Open-collector 100 mA sink	Open-collector 100 mA sink		Open-collector 100 mA sink 200 mA max.	Relay 125VAC@0.5A 30VDC@1A	
Non-isolated DI/O	-	-	-	16DI 16DO	-	-
Other Function	Built-in DC/DC	On Board Fuse , LED	Built-in DC/DC	Built-in DC/DC	4 Form C relay 4 Form A relay	8 Form C relay 8 Form A relay
Connectors	1 x 40-pin 1 x DB-37			4 x 20-pin 1 x DB-37	1 x DB-37	1 x 40-pin 1 x DB-37
Daughter Board	DB-37,DN-37,DB-8125			DB-37,DN-37, DB-8125,DB-8025	DB-37,DN-37,DB-8125	
Dimensions (mm)	163 x 115			172 x 124	157 x 105	175 x 121
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# ISO-AD32

**32-channel 12-bit 200KS/s isolated analog input board****Features**

- 32 single-ended or 16 differential input channels
- 500VDC photo-isolation protection
- 12-bit resolution
- Maximum 200KHz sampling rate
- Built-in 1K bytes FIFOs
- Single-ended or differential input selectable
- Auto channel scan / gain scan
- Command set programming
- Gap-free A/D conversion

**Functional Description**

The ISO-AD32H/L (H for high gain; L for low gain) is a bus-type isolated 12-bit A/D board for PC/AT compatible computers. The isolation inputs can operate up to 500Vrms of common-mode voltage. The ISO-AD32H/L features a 200KHz 12-bit analog-to-digital converter, on board 1 K bytes FIFO buffer, 32 single-ended or 16 differential analog input channels. The analog input allows auto-channel /gain scan. This board supports gap-free A/D conversion at 200KHz sampling rates for single channel or 100KHz sampling rates for channel scanning.

The "Hands-Off" design permits all board parameters (channel selection, gain, input type, operating mode) to be performed in software. Once installed, user will never have to worry again.

The innovative design improve several drawbacks of the conventional isolated A/D card. Such as:

1. The speed is faster; up to 200KHz
2. The sampling rate can be programmable
3. On board FIFOs buffer support gap-free A/D conversion and work well under DOS and Windows environment
4. High channel count input can be implemented in half size board.

**Applications**

- Data acquisition
- Waveform analysis
- Harsh environment operation
- Signal isolation

**Specifications****Analog Input**

- Number of channels: 32 single-ended/16 differential
- Resolution: 12-bit
- ADC conversion rate: 200KS/s max
- Input impedance: 10,000M $\Omega$  || 6pF
- Over voltage protection:  $\pm 35V$
- Accuracy: 0.01% of reading  $\pm 1$  bit
- Linearity:  $\pm 1$  bit
- On chip sample & hold
- Zero drift:  $\pm 25$ ppm/  $^{\circ}C$  of F.S. max

**ISO-AD32H Input Range**

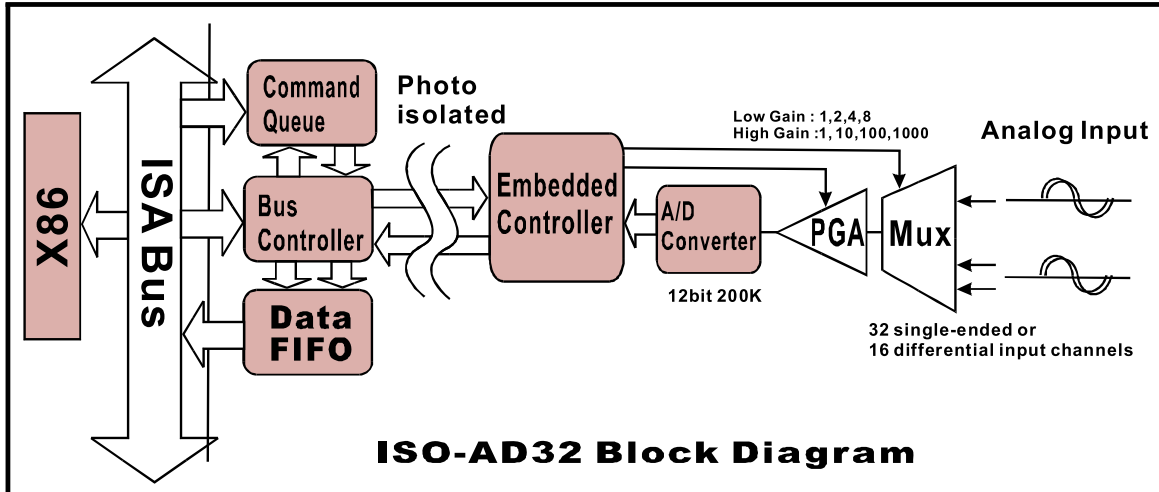
Gain	Bipolar(V)	Unipolar(V)	Sampling Rate (Max.)
0.5	$\pm 10$	X	125KS/s
1	$\pm 5$	0~10	125KS/s
5	$\pm 1$	X	80KS/s
10	$\pm 0.5$	0~1	80KS/s
50	$\pm 0.1$	X	10KS/s
100	$\pm 0.05$	0~0.1	10KS/s
500	$\pm 0.01$	X	1KS/s
1000	$\pm 0.005$	0~0.01	1KS/s

**ISO-AD32L Input Range**

Gain	Bipolar(V)	Unipolar(V)	Sampling Rate (Max.)
0.5	$\pm 10$	X	200KS/s
1	$\pm 5$	0~10	200KS/s
2	$\pm 2.5$	0~5	200KS/s
4	$\pm 1.25$	0~2.5	200KS/s
8	$\pm 0.625$	0~1.25	200KS/s

# ISO-AD32

32-channel 12-bit 200KS/s isolated analog input board



## General Specifications

- I/O connector: one 37-pin D-Sub female
- Power requirements: +5V @ 850 mA
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 173 mm x 122 mm

## Pin Assignment

D.GND	37	19	Ext Trg
A.GND	36	18	+5V
AI 31	35	17	A.COM
AI 30	34	16	AI 15
AI 29	33	15	AI 14
AI 28	32	14	AI 13
AI 27	31	13	AI 12
AI 26	30	12	AI 11
AI 25	29	11	AI 10
AI 24	28	10	AI 9
AI 23	27	9	AI 8
AI 22	26	8	AI 7
AI 21	25	7	AI 6
AI 20	24	6	AI 5
AI 19	23	5	AI 4
AI 18	22	4	AI 3
AI 17	21	3	AI 2
AI 16	20	2	AI 1
		1	AI 0

## Ordering Information

### Standard

**ISO-AD32H:** 32-channel 12-bit 125KS/s high gain isolated analog input board

**ISO-AD32H/S:** ISO-AD32H with DN-37

**ISO-AD32L:** 32-channel 12-bit 200KS/s low gain isolated analog input board

**ISO-AD32L/S:** ISO-AD32H with DN-37

### Optional

**DN-37:** 2x37-pin connector DIN-rail mounting terminal board

**DB-1825:** General screw terminal board

**DB-37:** 37-pin D-sub directly connector terminal board

# ISO-LDH/L

Isolated strain gauge type Load Cell input board



## Features

- 500 VDC photo-isolation protection
- One strain gauge input channel
- One analog input channel
- Built-in 1K bytes FIFOs
- Excitation voltage for Load Cell: 12V, 50 mA
- Maximum gain up to 40,000
- Programmable 12-bit resolution DC offset voltage
- Second order low-pass filter build-in
- Direct connection to strain gauge type Load Cell
- 8-channel 12-24V isolated digital input
- 7-channel isolated open-collector digital output
- Programmable 8-bit LED indicator
- Command set programming

## Functional Description

The ISO-LD series is a bus-isolated Load Cell input board. The isolation inputs can operate with up to 500Vrms of common-mode voltage. The ISO-LD series features a 12-bit analog-to-digital converters, on board 1 K bytes FIFO buffer, one Load Cell signal input channel, one analog input channel, 8-channel 12-24V isolated digital inputs, 7-channel isolated open-collector digital outputs, one programmable 8-bit LED indicator to indicate the magnitude of strain gauge input signal. The ISO-LD series board is suitable for static force measurement and dynamic force analysis. Because there are on-board excitation voltage, high-gain amplifier, user don't have to buy any excitation voltage and signal conditioning module.

The board also has some special features, such as:

1. 12-bit programmable offset voltage. Therefore the user can cancel the DC bias and amplify the AC signal
2. The isolated structure eliminate the ground loop noise and protect your computer
3. On board 1K FIFOs buffer support gap-free A/D conversion under DOS and Windows environment
4. Except the Load Cell input channel, there are a lot digital I/O and one analog input channel. The user can use ISO-LD to implement a measurement and analysis system.

## Applications

- Strain Gauge type Load Cell measurement
- Dynamic force on-line monitoring system
- Dynamic pressure measurement

## Specifications

### Analog Input

- Number of channels: 1 Load Cell input channel & 1 analog input channel
- Resolution: 12-bit
- ADC conversion rate: 20 KS/s max
- Input Impedance: 10,000M $\Omega$  || 6pF
- Bias Current:  $\pm 3$  nA max
- Input offset current:  $\pm 2$  nA max
- CMRR: 90 dB min
- Recommended warm-up time: 10 minutes
- On chip sample & hold

### ISO-LDH Input Range

- Analog input range: 0~10V, 0~1V, 0~0.1V, 0~0.01V
- Strain Gauge input range: 0~37.5 mV

Gain	Input range(mV)
400	0~37.5
4,000	0~15
40,000	0~12.75

### ISO-LDL Input Range

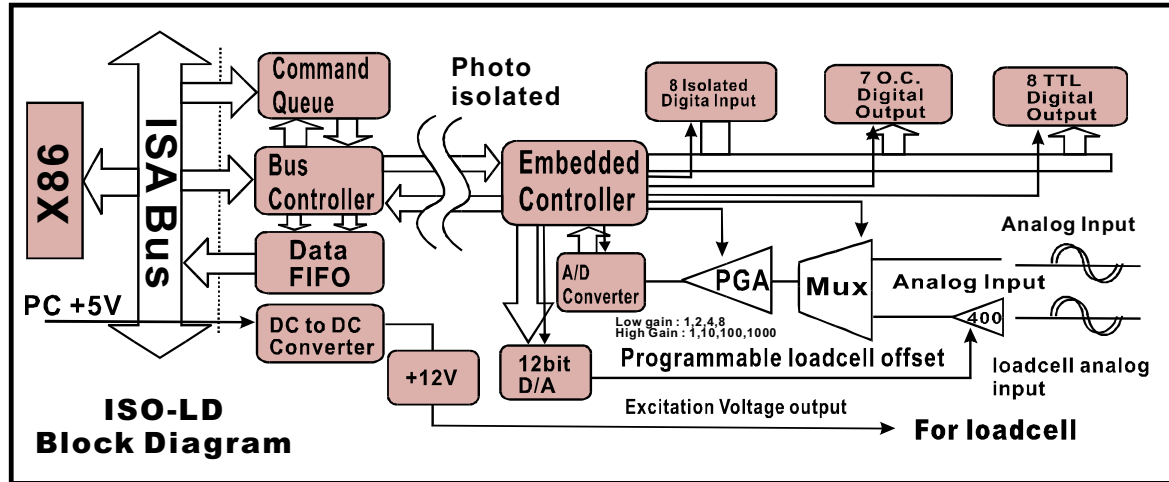
- Analog input range: 0~10V, 0~5V, 0~2.5V, 0~1.25V
- Strain Gauge input range: 0~37.5 mV

Gain	Input range(mV)
400	0~37.5
8,00	0~25
1,600	0~18.75
3,200	0~15.625

- Load Cell offset voltage adjustment: 0~ -5V, 12-bit

# ISO-LDH/LDL

Isolated strain gauge type Load Cell input board



## Digital I/O

- 8 photo-isolated 12~24V digital input
- 7 isolated open-collector digital output (NPN type)
- Sink current: 100 mA
- 8 TTL/LED output

## General Specifications

- I/O connector:
  - one 9-pin D-Sub female
  - one 25-pin D-Sub female
  - one 10-pin ribbon male
- Power requirements: +5V @ 400 mA
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 182 mm x 122 mm

## Ordering Information

### Standard

- ISO-LDH:** 12-bit high-gain Load Cell input board
- ISO-LDH/S:** ISO-LDH with DN-25
- ISO-LDL:** 12-bit low-gain Load Cell input board
- ISO-LDL/S:** ISO-LDL with DN-25

### Optional

- DN-25:** DIN-rail mounting terminal board
- S-50:** S-type Load Cell

## Pin Assignment

### CN1

Exec+	1	6	GND
Vin 1+	2	7	Vin 1-
3 N.C.	3	8	Vin 0
4 N.C.	4	9	N.C.
5 N.C.	5		

### CN2

DI 0+	1	14	DI 0-
DI 1+	2	15	DI 1-
DI 2+	3	16	DI 2-
DI.COM	4	17	DI 3-
DI 4-	5	18	DI 5-
DI 6-	6	19	DI 7-
DO.COM	7	20	DO.GND
DO 0	8	21	DO 1
DO 2	9	22	DO 3
DO 4	10	23	DO 5
DO 6	11	24	+12VDC
+12VDC	12	25	GND
GND	13		

### CN3

LED 1	1	2	LED 2
LED 3	3	4	LED 4
LED 5	5	6	LED 6
LED 7	7	8	LED 8
N.C.	9	10	+5V

# ISO-813

## 32-channel 12-bit 10KS/s isolated analog input board



### Features

- 32 single-ended analog input channels
- 12-bit A/D converter ( ADS 774 or equivalent)
- 3,000VDC photo-isolation protection
- Analog input range
  - Bipolar : +/- 10V, +/- 5V, +/-2.5V, +/-1.25V, +/-0.625V, +/-0.3125V
  - Unipolar: 0-10V, 0-5V, 0-2.5V, 0-1.25V, 0-0.625V
- Programmable gain control: 1, 2, 4, 8, 16
- Built-in 3000V DC/DC converter
- A/D trigger mode: software trigger
- A/D data transfer mode : polling

### Functional Description

The ISO-813 is a bus-isolated 12-bit A/D board for PC/AT compatible computers. Its isolation range is increased to 3000 V that extend the application field to real industry application. It is backward compatible to 813 families. When compared with PCL-813 or ACL-8113, the ISO-813 adds x16 Programmable Gain Control range . On-board FPGA increase the stability of this board. It is the most cost effective isolated A/D board in the world. If the user need high sampling rate, differential input and FIFOs-on-board isolated A/D card, please refer to our ISO-AD32.

### Applications

- Data acquisition
- Harsh environment operation
- Signal isolation

### Specifications

#### Analog Input

- Number of channels: 32 single-ended
- Resolution: 12-bit
- ADC conversion rate: 10KS/s max
- Input impedance: 10M $\Omega$
- Over voltage protection:  $\pm 35V$
- Accuracy: 0.01% of reading  $\pm 1$  bit
- Linearity:  $\pm 1$  bit
- On chip sample & hold
- Zero drift:  $\pm 25ppm/^\circ C$  of FS max

### General Specifications

- I/O connector: one 37-pin D-Sub female
- Power requirements: +5V @ 850 mA max
- Operating temperature: 0 ~ 60 $^\circ C$
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70 $^\circ C$
- Dimensions: 174 mm x 122 mm

### Pin Assignment

AI_31	37	19	A.GND
AI_29	36	18	AI_30
AI_27	35	17	AI_28
AI_25	34	16	AI_26
AI_23	33	15	AI_24
AI_21	32	14	AI_22
AI_19	31	13	AI_20
AI_17	30	12	AI_18
A.GND	29	11	AI_16
A.GND	28	10	A.GND
AI_15	27	9	A.GND
AI_13	26	8	AI_14
AI_11	25	7	AI_12
AI_9	24	6	AI_10
AI_7	23	5	AI_8
AI_5	22	4	AI_6
AI_3	21	3	AI_4
AI_1	20	2	AI_2
		1	AI_0

### Ordering Information

#### Standard

**ISO-813:** 32-channel 12-bit 10KS/s isolated analog input board

**ISO-813/S:** ISO-813 with DB-8325

#### Optional

**DB-8325:** Daughter board with signal conditioning circuitry

**DB-37:** Directly connection terminal board

**DN-37:** DIN-rail mounting terminal board



# ISO-DA8/DA16

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



ISO-DA8



ISO-DA16

## Features

- 2500VDC photo-isolation protection
- 8/16-channel, 14-bit analog output
- Unipolar or bipolar outputs available from each converter
- Voltage/Current output from each converter
- Output type and output range can be software programmable
- 4~20 mA or 0~20 mA current sink to ground from each converter
- Double-buffered D/A latches
- Command set programming
- Software Calibration
- 16-channel DI, 16-channel DO

## Functional Description

The ISO-DA8/16 is a bus isolated 14-bit D/A card for PC/AT compatible computers. The optical isolation of the ISO-DA8/16 can operate with up to 2500Vrms of common-mode. The ISO-DA8/16 offers 8/16 channel double-buffered analog outputs. The output range can be configured in different ranges:  $\pm 10V$ ,  $\pm 5V$ ,  $0\sim 10V$ ,  $0\sim 5V$  voltage output or 4 to 20 mA or 0 to 20 mA sinkcurrent.

The innovative design improve several drawbacks of the conventional isolated D/A card. For example :

1. Jumperless and trimless
2. The power-on value of analog output can be pre-defined by the user and stored in the on-board EEPROM
3. The calibration is performed under software control, thus eliminating manual trim-pot adjustments. The calibration data is stored in EEPROM. Easy recalibration ensures the accuracy of the board
4. Every channel can be selected as voltage or current output
5. 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
- Channels: 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:  $0\sim 5V$  or  $0\sim 10V$
- Bipolar:  $\pm 10V$  or  $\pm 5V$
- Current drive:  $\pm 5$  mA
- Absolute accuracy: 0.01% FSR (typical)
- Power on state: programmable

### Current Output Range

- $0\sim 20$  mA or  $4\sim 20$  mA
- Absolute Accuracy: 0.1% FSR (typical)
- Excitation voltage range:  $+7V \sim +40V$
- Power on state: programmable

### Digital I/O

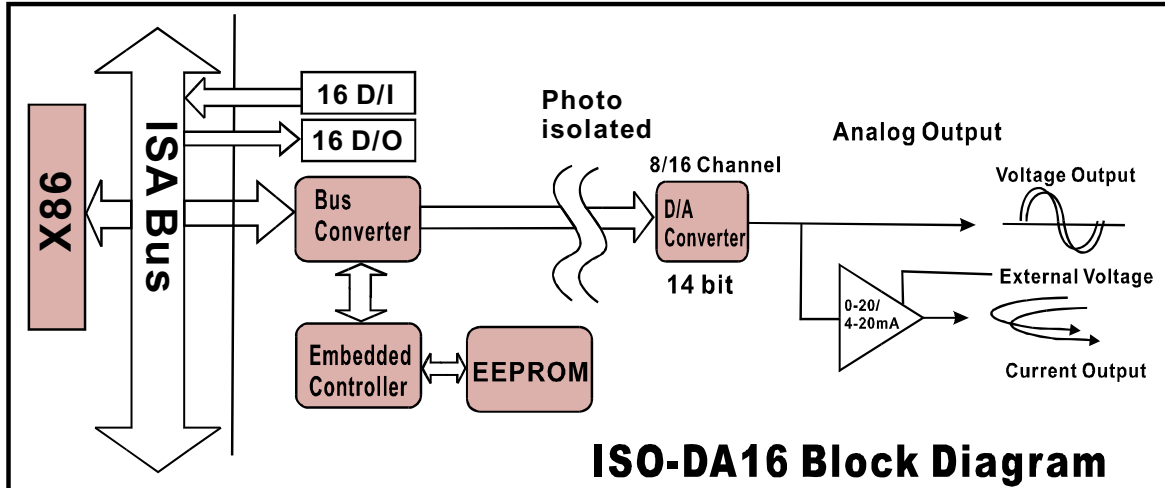
- 16 TTL-level input
- Input low  $V_{IL} = 0.8V$  max;  $I_{IL} = -0.4$  mA max
- Input high  $V_{IH} = 2.0V$  min;  $I_{IH} = 20 \mu A$  max
- 16 TTL-level output
- Output low  $V_{OL} = 0.5V$  max;  $@I_{OL} = 8$  mA max
- Output high  $V_{OH} = 2.7V$  min;  $@I_{OH} = 0.4$  mA max

### Stability

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

# ISO-DA8/DA16

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



## General Specifications

- I/O connector:
  - one 37-pin D-Sub female
  - two 20-pin ribbon male
- Power requirements:
  - ISO-DA8: +5VDC @ 800 mA max
  - ISO-DA16: +5VDC @ 1400 mA max
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 182 mm x 122 mm

## Pin Assignment

CN1				CN2			
DI0	1	DI1	2	DI0	1	DI1	2
DI2	3	DI3	4	DI2	3	DI3	4
DI4	5	DI5	6	DI4	5	DI5	6
DI6	7	DI7	8	DI6	7	DI7	8
DI8	9	DI9	10	DI8	9	DI9	10
DI10	11	DI11	12	DI10	11	DI11	12
DI12	13	DI13	14	DI12	13	DI13	14
DI14	15	DI15	16	DI14	15	DI15	16
GND	17	GND	18	GND	17	GND	18
+5V	19	+12V	20	+5V	19	+12V	20

## CN3

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

## Ordering Information

### Standard

**ISO-DA8:** 8-channel 14-bit isolated analog output board

**ISO-DA8/S:** ISO-DA8 with DN-37

**SO-DA16:** 16-channel 14-bit isolated analog output board

**ISO-DA16/S:** ISO-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



# ISO-P32C32/P64/C64

64-channel isolated DI/O board



ISO-P32C32

## Functional Description

The ISO-P32C32/P64/C64 provide 64 optically isolated digital input and/or output channel, arranged into four isolated banks. Each input channel use a photo-coupler input which allows either internal isolated power supply or external power selected by jumper. Each digital output offers a Darlington transistor and integral suppression diode for inductive load. The power supply of the input port may use the external power or the power from the PC side using DC/DC converter. The power supply of the output port should use the external power. This interface board is easily installed in any PC/AT. The board interface to field logic signals, eliminating ground loop problems and isolating the host computer from damaging voltages. The ISO-P32C32/P64/C64 has one 37-pin D-Sub connector and one 40-pin male header. The 40-pin to DB-37 flat-cable is used to fixed with the case. The user can connect the digital signal through the second D-Sub connector.

## Applications

- Factory Automation
- Product Test
- Laboratory Automation

## Specifications

### Isolated Digital Input

- Number of channels: 32 (ISO-P32C32)  
64 (ISO-C64)
- Type: Isolated open-collector (NPN type)
- Sink current: 100 mA per channel
- External voltage: 30V max
- Response time: 30KHz max

## Features

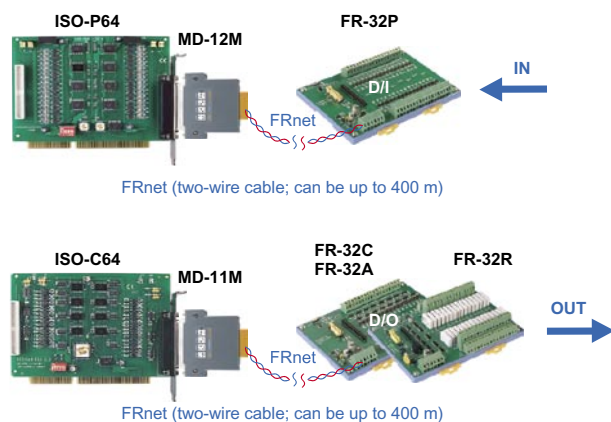
- 32-channel isolated digital input & 32-channel isolated digital output (ISO-P32C32)
- 64-channel isolated digital input (ISO-P64)
- 64-channel isolated digital output (ISO-C64)
- Sink current up to 100 mA on each isolated output
- Four isolated bank, 3000VDC isolation voltage
- DC/DC converter build-in (ISO-P32C32 & ISO-P64)
- Two interrupt source: channel 0 and channel 15 (ISO-P32C32)

### Isolated Digital Input

- Number of channels: 32 (ISO-P32C32)  
64 (ISO-P64)
- Type: Isolated current input
- Isolation voltage:  
3750V (using external power)  
3000V (using internal power)
- Input voltage: 5V to 30V
- Input impedance: 3K $\Omega$ ; 1/4W
- Response time: 4KHz max

### General Specifications

- I/O connector:  
one 37-pin D-Sub female & one 40-pin header
- Power requirements:  
+5V @ 600 mA (ISO-P32C32)  
+5V @ 400 mA (ISO-P64)  
+5V @ 800 mA (ISO-C64)
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 163 mm x 115 mm



Please refer to page 8-7 MagicWire and FR I/O for detail information

ISA Bus I/O Boards

ISA Isolated DIO Board

# ISO-P32C32/P64/C64

64-channel isolated DI/O board



ISO-P64



ISO-C64

## Pin Assignment

### ISO-P32C32

GND_DO (-)	1		20	GND_DO (-)
DI_0	2	○	21	DO_0
DI_1	3	○	22	DO_1
DI_2	4	○	23	DO_2
DI_3	5	○	24	DO_3
DI_4	6	○	25	DO_4
DI_5	7	○	26	DO_5
DI_6	8	○	27	DO_6
DI_7	9	○	28	DO_7
DI_8	10	○	29	DO_8
DI_9	11	○	30	DO_9
DI_10	12	○	31	DO_10
DI_11	13	○	32	DO_11
DI_12	14	○	33	DO_12
DI_13	15	○	34	DO_13
DI_14	16	○	35	DO_14
DI_15	17	○	36	DO_15
EXT_Power_DI (+)	18	○	37	EXT_Power_DO (+)
GND_DI (-)	19	○		

### ISO-C64

GND_1 (-)	1		20	GND_2 (-)
DO_0	2	○	21	DO_16
DO_1	3	○	22	DO_17
DO_2	4	○	23	DO_18
DO_3	5	○	24	DO_19
DO_4	6	○	25	DO_20
DO_5	7	○	26	DO_21
DO_6	8	○	27	DO_22
DO_7	9	○	28	DO_23
DO_8	10	○	29	DO_24
DO_9	11	○	30	DO_25
DO_10	12	○	31	DO_26
DO_11	13	○	32	DO_27
DO_12	14	○	33	DO_28
DO_13	15	○	34	DO_29
DO_14	16	○	35	DO_30
DO_15	17	○	36	DO_31
EXT_Power_1 (+)	18	○	37	EXT_Power_2 (+)
N.C.	19	○		

### ISO-P64

GND_1	1	○	20	GND_2
DI_0	2	○	21	DI_16
DI_1	3	○	22	DI_17
DI_2	4	○	23	DI_18
DI_3	5	○	24	DI_19
DI_4	6	○	25	DI_20
DI_5	7	○	26	DI_21
DI_6	8	○	27	DI_22
DI_7	9	○	28	DI_23
DI_8	10	○	29	DI_24
DI_9	11	○	30	DI_25
DI_10	12	○	31	DI_26
DI_11	13	○	32	DI_27
DI_12	14	○	33	DI_28
DI_13	15	○	34	DI_29
DI_14	16	○	35	DI_30
DI_15	17	○	36	DI_31
EXT_Power_1	18	○	37	EXT_Power_2
N.C.	19	○		

## Ordering Information

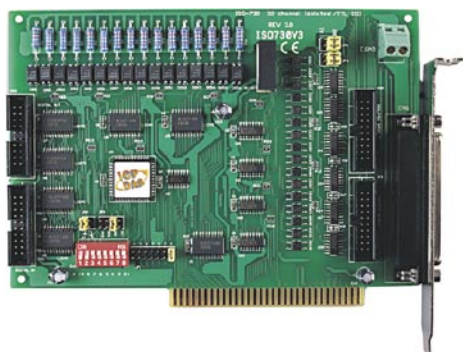
### Standard

- ISO-P32C32:** 32-channel isolated digital input and 32-channel isolated open-collector output board
- ISO-P64:** 64-channel isolated digital input board
- ISO-C64:** 64-channel isolated digital output board

### Optional

- DN-37:** 2x37-pin connector DIN-rail mounting terminal board
- DB-37:** 37-pin D-sub directly connector terminal board
- DB-16P16R:** 16-channel of input terminal and 16-channel of relay output daughter board (For ISO-P32C32)
- DB-32R:** 32-channel of relay output daughter board (For ISO-C64)

### 32-channel isolated DI/O & 32-channel TTL DI/O board



## 3-11

## ISA Relay Output Board

# P8R8DIO/P16R16DIO

8/16-channel isolated digital input & 8/16-channel relay output board



P8R8DIO



P16R16DIO

### Functional Description

The P8R8DIO is an 8-channel isolated digital input and 8 channel relay output interface board designed for control and sensing applications. This board is easily installed in any PC/AT/XT or compatible computer. The P8R8DIO can be used in various applications including load switching, external switching, contact closure and others. The P16R16DIO has one 37-pin D-Sub female and one 40-pin header. It can replace two P8R8DIO.

### Applications

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

### Specifications

#### Relay Output

- Relay output channels: 8(P8R8DIO); 16(P16R16DIO)
- Contact rating: 125VAC@0.5A ; 30VDC@1A
- Output type: channel 0~3 and 8~11: SPDT(Form C)  
channel 4~7 and 12~15: SPST(Form A)
- Breakdown voltage: 1KV
- Operating time: 5ms
- Release time: 5ms
- Expected life > 100, 000 times (Electrical at 30V/1A)

#### Isolated Digital Input

- Number of channels: 8 (P8R8DIO);16(P16R16DIO)
- Type: non-polarized OPTO-Isolated
- Input voltage: AC/DC 5-24V (AC: 50 -1 K Hz)
- Input impedance: 1.2 K $\Omega$
- Response time: 20  $\mu$ S (without filter)  
2.2 mS (with filter)
- Isolation voltage: 500V Channel-Channel & Channel-Ground

### Features

- 8/16-channel electromagnetic relay output
- 8/16-channel optically isolated digital input
- AC/DC signal input
- AC signal input with filter
- On-board LED indication for relay status

### General Specifications

- I/O connector:  
one 37-pin D-sub female (P8R8DIO)  
one 37-pin D-sub female & one of 40-pin header (P16R16DIO)
- Power requirements: (max)

Device	+5V	+12V
P8R8DIO	120 mA	180 mA
P16R16DIO	200 mA	260 mA

- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 145 mm x 105 mm (P8R8DIO)  
175 mm x 121 mm (P16R16DIO)

### Pin Assignment

NO_0	1	20	NO_3
COM_0	2	21	COM_3
NC_0	3	22	NC_3
NO_1	4	23	NO_4
COM_1	5	24	COM_4
NC_1	6	25	NO_5
NO_2	7	26	COM_5
COM_2	8	27	NO_6
NC_2	9	28	COM_6
NO_7	10	29	GND
COM_7	11	30	DIL_0
DIH_0	12	31	DIL_1
DIH_1	13	32	DIL_2
DIH_2	14	33	DIL_3
DIH_3	15	34	DIL_4
DIH_4	16	35	DIL_5
DIH_5	17	36	DIL_6
DIH_6	18	37	DIL_7
DIH_7	19		

### Ordering Information

#### Standard

**P8R8DIO:** 8-channel isolated digital input 8-channel relay output board

**P16R16DIO:** 16-channel isolated digital input 16-channel relay output board

#### Optional

**DN-37:** Two 37-pin connector DIN-rail mounting terminal board

**DB-37:** 37-pin D-sub directly connector terminal board

# Selection Guide

## ISA bus Non-isolated data acquisition board

Model No.		A-826PG	A-822PG	A-823PG	A-821PG	A-812PG	A-8111	A-626/628
Bus		ISA						
Analog Input Channels		16 S.E. 8 DIF.				16 S.E.	8 S.E.	-
Analog Input Resolution		16-bit	12-bit					-
Analog Input Range (V)	Bipolar Low Gain	$\pm 10, \pm 5, \pm 2.5, \pm 1.25$	$\pm 10, \pm 5, \pm 2.5, \pm 1.25, \pm 0.625$		$\pm 5, \pm 2.5, \pm 1.25, \pm 0.625$	$\pm 10, \pm 5, \pm 2.5, \pm 1.25, \pm 0.625, \pm 0.3125$	$\pm 5, \pm 2.5, \pm 1.25, \pm 0.625, \pm 0.3125$	-
	Bipolar High Gain	-	$\pm 10, \pm 5, \pm 1, \pm 0.5, \pm 0.1, \pm 0.05, \pm 0.01, \pm 0.005$		$\pm 5, \pm 0.5, \pm 0.05, \pm 0.005$	-	-	-
	Unipolar Low Gain	-	10, 0~5, 0~2.5, 0~1.25		-	-	-	-
	Unipolar High Gain	-	0~10, 0~1, 0~0.1, 0~0.01		-	-	-	-
Analog Output	Channels	2	2	2	1	2	1	6/8
	Resolution	12-bit						
	Range (V)	0~5 0~10	0~5 0~10	0~5, 0~10 $\pm 5, \pm 10$	0~5 0~10	0~5 0~10	0~5 0~10	0~5, 0~10 $\pm 5, \pm 10$
	Range (mA)	-	-	-	-	-	-	4-20 mA
Sampling rate		100KHz	125KHz	125KHz	45KHz	62.5KHz	30KHz	-
Digital I/O Channels		16 Input 16 Output	16 Input 16 Output	16 Input 16 Output	16 Input 16 Output	16 Input 16 Output	16 Input 16 Output	16 Input 16 Output
Dimensions (mm)		170 x 122	170 x 122		170 x 122	163 x 124	157 x 106	184 x 123 (A-626) 198 x 123 (A-628)
Page		3-14	3-16		3-18	3-20	3-21	3-22

## ISA Bus Digital I/O, Counter/Timer Board Selection Guide

ModelNo.	DIO-24	DIO-48	DIO-64	DIO-96	DIO-144	TMC-10
Bus	ISA					
Digital I/O Channels	24 Bi-direction	48 Bi-direction	32 DI 32 DO	96 Bi-direction	144 Bi-direction	-
Driving Capacity	24 mA sink 15 mA source	24 mA sink 15 mA source	24 mA sink 15 mA source	24 mA sink 15 mA source	24 mA sink 15 mA source	24 mA sink 15 mA source
Timer/Counter	-	1 x 16-bit 1 x 32-bit	3 x 16-bit(DIO-64/3) 6 x 16-bit(DIO-64/6)	-	-	8 x 16-bit 2 x 32-bit
Connector	1 x 50-pin OPTO-22	2 x 50-pin OPTO-22	5 x 20-pin	4 x 50-pin OPTO-22	6 x 50-pin OPTO-22	1 x DB-37
Dimensions (mm)	107 x 106	182 x 110	93 x 135	182 x 110		121 x 106
Page	3-24		3-26	3-27		3-28



# A-826PG

16-channel 16-bit 100KS/s multi-function board



## Functional Description

The A-826PG is a multi-function, 16-bit high resolution Analog and Digital I/O board for the PC/AT compatible computers. The A-826PG offers 16-channel single-ended or 8-channel differential analog input, plus two channels of analog output with 12-bit resolution. In addition, the A-826PG has 16-channel digital input, 16-channel digital output and one timer/counter channel. The A-826PG uses a B.B. ADS 7805 high performance 16-bit A/D converter. It provides maximum sampling rate up to 100 K samples/s and software programmable gains. DMA operation is jumper-selectable for levels 1 or 3. Interrupts are jumper-selectable between 3 and 15.

## Applications

- Signal analysis
- Industrial automation
- Laboratory automation
- Sensor interface FFT & frequency analysis
- Transient analysis
- Production test
- Process control

## Specifications

### Analog Input

- Number of channels: 16 single-ended or 8 differential
- Resolution: 16-bit
- Conversion time: 8  $\mu$ s
- Maximum ADC conversion rate: 100KS/s
- Input impedance: 10,000 M $\Omega$  || 6pF
- Over voltage protection:  $\pm$ 35V
- Integral linearity error:  $\pm$ 3 LSB max
- On chip sample & hold
- Accuracy: 0.01% of reading  $\pm$ 1 bit
- Zero drift:  $\pm$ 15ppm/  $^{\circ}$ C of F.S. max

## Features

- 16-bit high resolution
- 100KS/s sampling rate(Max.)
- 16 single-ended or 8 differential analog inputs
- A/D trigger mode: software trigger, pacer trigger, external trigger and event trigger
- A/D data transfer modes: polling, interrupt, DMA
- Software programmable gain: 1,2,4,8
- Bipolar analog input
- 2-channel of 12-bit D/A voltage output
- 16 digital inputs & 16 digital outputs
- General purpose programmable 16-bit counter/timer

## A-826PG Input Range

Gain	Bipolar(V)	Sampling Rate(Max.)
1	$\pm$ 10V	100KS/s
2	$\pm$ 5V	100KS/s
4	$\pm$ 2.5V	100KS/s
8	$\pm$ 1.25V	100KS/s

## Analog Output

- Number of channels: 2 independent
- Type: 12-bit double buffered
- Linearity: 0.006% FS
- Output range: 0~5V, 0~10V or 0~Ext Ref
- External reference: +10V or -10V max
- Output driving:  $\pm$ 5 mA
- Settling time: 0.6  $\mu$ s to 0.01% for full scale step

## 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

## Timer/Counter

- Number of channels: 1
- Resolution: 16-bit
- Compatibility: 5V/TTL
- Internal clock: 2MHz
- External clock: up to 10 MHz
- A/D pacer: cascaded 32-bit counter
- Programmable internal timer: 0.0047Hz~0.5MNz



## 16-channel 16-bit 100KS/s multi-function board



- CN1**

**CN2**

**CN3**

## Ordering Information

**A-826PG:** 16-channel 16-bit 100KS/s multi-function board

**A-826PG/S:**A-826PG with DB-8225

### Optional

- 3-15

# A-823PG/822PG

16-channel 12-bit 125KS/s multi-function boards



A-823PG



A-822PG

## Functional Description

The A-823PGH/L and A-822PGH/L (H for high gain; L for low gain) are 12-bit multifunction analog and digital I/O boards for the PC/AT compatible computer. The A-823PG/A-822PG offers 16-channel single-ended or 8-channel differential analog inputs, plus two channels of analog output with 12-bit resolution. In addition, The A-823PG/A-822PG has 16-channel digital input, 16-channel digital output, and one channel timer/counter. Its sampling rate can reach 125K samples/second. The DMA operation is jumper-selectable for levels 1 or 3. Interrupts are jumper-selectable between 3 and 15. The A-823PG provides unipolar and bipolar D/A output, while the A-822PG provides only unipolar D/A output.

## Applications

- Signal analysis
- Industrial automation
- Laboratory automation
- FFT & frequency analysis
- Transient analysis
- Production test
- Process control

## Specifications

### Analog Input

- Number of channels: 16 single-ended or 8 differential
- Resolution: 12-bit
- Conversion time: 8  $\mu$ s
- Maximum ADC conversion rate: 125KS/s
- Input impedance: 10,000 M $\Omega$  || 6pF
- Over voltage protection:  $\pm$ 35V
- A/D converter:  $\pm$ 1LSB max INL

## Features

- 12-bit A/D converter
- 125 KS/s sampling rates(Max.)
- 16 single-ended or 8 differential analog inputs
- A/D Trigger modes: Software Trigger, Pacer Trigger, External Trigger and Event Trigger
- A/D data transfer modes: polling, interrupt, DMA
- Software programmable gain:  
PGH: 0.5, 1, 5, 10, 50, 100, 500, 1000  
PGL: 0.5, 1, 2, 4, 8
- Bipolar and unipolar analog input
- Two 12-bit D/A Voltage output channels
- 16 digital inputs & 16 digital outputs
- 1-channel general purpose programmable 16-bit counter/timer

- On chip sample & hold
- Accuracy: 0.01% of reading  $\pm$  1 bit
- Zero drift:  $\pm$ 25ppm/  $^{\circ}$ C of FS max

### PGH Input Range

Gain	Bipolar(V)	Unipolar(V)	Sampling Rate(Max.)
0.5	$\pm$ 10	X	125KS/s
1	$\pm$ 5	0~10	125KS/s
5	$\pm$ 1	X	80KS/s
10	$\pm$ 0.5	0~1	80KS/s
50	$\pm$ 0.1	X	10KS/s
100	$\pm$ 0.05	0~0.1	10KS/s
500	$\pm$ 0.01	X	1KS/s
1000	$\pm$ 0.005	0~0.01	1KS/s

### PGL Input Range

Gain	Bipolar(V)	Unipolar(V)	Sampling Rate(Max.)
0.5	$\pm$ 10	X	125KS/s
1	$\pm$ 5	0~10	125KS/s
2	$\pm$ 2.5	0~5	125KS/s
4	$\pm$ 1.25	0~2.5	125KS/s
8	$\pm$ 0.625	0~1.25	125KS/s

### 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

# A-823PG/822PG

## 16-channel 12-bit 125KS/s multi-function boards

### Analog Output

- Number of channels: 2 independent
- Type: 12-bit double buffered
- Linearity: 0.006% FS
- Output range:
  - Unipolar: 0~5V, 0~10V, 0~Ext Ref (A-822PG/823PG)
  - Bipolar:  $\pm 5V$ ,  $\pm 10V$ ,  $\pm \text{Ext Ref}$  (A-823PG)
- External reference: +10V or -10V max
- Output Driving:  $\pm 5$  mA
- Settling time: 0.6  $\mu$ s to 0.01% for full scale step

### Counter/Timer

- Number of channels: 1
- Resolution: 16-bit
- Compatibility: 5V/TTL
- Internal clock: 2MHz
- External clock: up to 10 MHz
- A/D Pacer: 16-bit counter (A-823PG)  
cascaded 32-bit counter (A-822PG)
- Programmable internal timer:
  - 61Hz~1MHz (A-823PG)
  - 0.0047Hz~0.5MHz (A-822PG)

### General Specifications

- I/O connector: one 37-pin D-Sub female  
two 20-pin ribbon male
- Power requirements: +5V @ 960 mA max
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 170 mm x 122 mm

### Pin Assignment

#### CN1

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

#### CN2

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

#### CN3

Ext Counter	37		19	+5V OUT
N.C.	36		18	N.C.
COUT1	35		17	Ext Trig
CGATE1	34		16	COUT0
CGATE0	33		15	D.GND
D/A OUT1	32		14	A.GND
D/A Ref 0	31		13	+12V OUT
D/A OUT0	30		12	D/A Ref 1
A.GND	29		11	int Ref Out
A.GND	28		10	A.GND
AI15	27		09	A.GND
AI14	26		08	AI 7
AI13	25		07	AI 6
AI12	24		06	AI 5
AI11	23		05	AI 4
AI10	22		04	AI 3
AI 9	21		03	AI 2
AI 8	20		02	AI 1
			01	AI 0

### Ordering Information

#### Standard

- A-823PGH:** 16-channel 12-bit 125KS/s high gain multi-function board with 2x12-bit bipolar/unipolar analog output
- A-823PGH/S:** A-823PGH with DB-8225
- A-823PGL:** 16-channel 12-bit 125KS/s low gain multi-function board with 2x12-bit bipolar/unipolar analog output
- A-823PGL/S:** A-823PGL with DB-8225
- A-822PGH:** 16-channel 12-bit 125KS/s high gain multi-function board with 2x12-bit unipolar analog output
- A-822PGH/S:** A-822PGH with DB-8225
- A-822PGL:** 16-channel 12-bit 125KS/s low gain multi-function board with 2x12-bit unipolar analog output
- A-822PGL/S:** A-822PGL with DB-8225

#### Optional

- DB-8225:** Screw terminal board with CJC
- DB-889D:** 16-channel multiplexer and signal conditioning board
- DN-37:** 2x37-pin connector DIN-rail mounting terminal board
- DB-37:** 37-pin D-sub directly connector terminal board
- DN-20:** 2x20-pin header DIN-rail terminal board
- DB-16P:** 16-channel isolated D/I board
- DB-16R:** 16-channel relay board
- ADP-20/PCI:** 20-pin extender

# A-821PG

**16-channel 12-bit 45KS/s multi-function board****A-821PGH****A-821PGL**

## Functional Description

The A-821PGH/L (H for high gain; L for low gain) are 12-bit multi-function analog and digital I/O boards for the PC/ AT compatible computer. The A-821PGH/A-821PGL offers 16-channel single-ended or 8-channel differential analog input, one channel analog output with 12-bit resolution, 16-channel digital input, 16-channel digital output. It has a maximum sampling rate of 45K samples/s.

## Applications

- Laboratory automation
- Sensor interface
- Production test

## Specifications

### Analog Input

- Number of channels: 16 single-ended or 8 differential
- Resolution: 12-bit
- ADC conversion rate: 45KS/s max
- Input impedance: 10,000 M $\Omega$  || 6pF
- Over voltage protection:  $\pm 35V$
- Accuracy: 0.01% of reading  $\pm 1$  bit
- Zero drift:  $\pm 25ppm/^\circ C$  of F.S. max

### PGL Input Range

Gain	Bipolar(V)	Sampling Rate(Max.)
1	$\pm 5V$	45KS/s
2	$\pm 2.5V$	45KS/s
4	$\pm 1.25V$	45KS/s
8	$\pm 0.625V$	45KS/s

## Features

- 12-bit A/D converter
- 45KS/s sampling rate(Max.)
- 16 single-ended or 8 differential analog inputs
- A/D Trigger modes: Software Trigger, Pacer Trigger
- A/D data transfer modes: polling, interrupt
- Software programmable gain: 1, 10, 100, 1000 (A-821PGH); 1, 2, 4, 8 (A-821PGL)
- Bipolar analog input
- One 12-bit analog output channel
- Interrupt handling
- 16 digital inputs & 16 digital outputs

### PGH Input Range

Gain	Bipolar(V)	Sampling Rate(Max.)
1	$\pm 5V$	45KS/s
10	$\pm 0.5V$	45KS/s
100	$\pm 0.05V$	10KS/s
1000	$\pm 0.005V$	1KS/s

### Analog Output

- Number of channels: 1 independent
- Type: 12-bit double-buffered (AD-7948)
- Linearity:  $\pm 1/2$ -bit
- Output range: 0~5V, 0~10V
- Output Driving:  $\pm 5$  mA
- Settling time: 0.6  $\mu s$  to 0.01% for full scale step

### Digital I/O

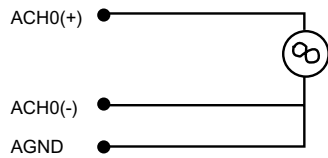
- 16 TTL-level input
- Input low  $V_{IL} = 0.8V$  max;  $I_{IL} = -0.4$  mA max
- Input high  $V_{IH} = 2.0V$  min;  $I_{IH} = 20 \mu A$  max
- 16 TTL-level output
- Output low  $V_{OL} = 0.5V$  max; @ $I_{OL} = 8$  mA max
- Output high  $V_{OH} = 2.7V$  min; @ $I_{OH} = 0.4$  mA max

### Counter/Timer

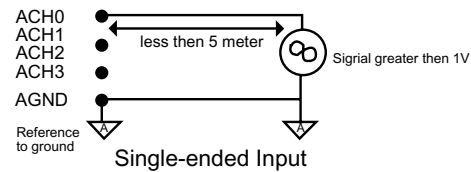
- Number of channels: 1
- Resolution: 16-bit
- Compatibility: 5V/TTL
- Internal clock: 2MHz
- External clock: up to 10 MHz
- A/D pacer: cascaded 32-bit counter
- Programmable internal timer: 0.0047Hz~0.5MNz

# A-821PG

## 16-channel 12-bit 45KS/s multi-function board



Differential Input



Single-ended Input

### Single-ended & Differential Input

The A82X series provides 16-channel single-ended or 8-channel differential analog input. Single-ended inputs are all referenced to a common ground point. They are typically used when the input signal are greater than 1 volt, the lead wires from the signal source to the analog input hardware are short (less than 5 meter), and all input signals share a common ground reference. If above criteria do not meet, you should use differential inputs.

The common-mode noise can be canceled, when the input is configured in differential mode.

### General Specifications

- I/O connector: one 37-pin D-Sub female  
two 20-pin ribbon male

- Power requirements:

Device	+5V	+12V	-12V
A-821PG	320 mA	60 mA	30 mA

- 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

**A-821PGH:** 16-channel, 12-bit 45KS/s high gain multi-function board

**A-821PGH/S:** A-821PGH with DB-8225

**A-821PGL:** 16-channel, 12-bit 45KS/s low gain multi-function board

**A-821PGL/S:** A-821PGL with DB-8225

**A-821PGL/DNA:** A-821PGHL without D/A

#### Optional

**DB-8225:** Screw terminal board with CJC

**DB-889D:** 16-channel multiplexer and signal conditioning board

**DN-37:** 2x37-pin connector DIN-rail mounting terminal board

**DB-37:** 37-pin D-sub directly connector terminal board

**DN-20:** 2x20-pin header DIN-rail terminal board

**DB-16P:** 16-channel isolated D/I board

**DB-16R:** 16-channel relay board

**ADP-20/PCI:** 20-pin extender

### Pin Assignment

#### CN1

N.C.	37	19	+5V OUT
N.C.	36	18	N.C.
N.C.	35	17	N.C.
N.C.	34	16	N.C.
N.C.	33	15	N.C.
N.C.	32	14	A.GND
N.C.	31	13	+12V
D/A OUT	30	12	N.C.
A.GND	29	11	N.C.
A.GND	28	10	A.GND
AI15	27	09	A.GND
AI14	26	08	AI 7
AI13	25	07	AI 6
AI12	24	06	AI 5
AI11	23	05	AI 4
AI10	22	04	AI 3
AI 9	21	03	AI 2
AI 8	20	02	AI 1
		01	AI 0

#### CN2

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

#### CN3

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



## ISA Multi-Function Board

# A-812PG

## 16-channel 12-bit 62.5KS/s Multi-Function board



### Functional Description

The A-812PG is a 12-bit multifunction analog and digital I/O board for the PC/AT compatible computer. The A-812PG offers 16-channel single-ended analog input and plus 2-channel analog output with 12-bit resolution. In addition, the A-812PG has 16-channel digital input, 16-channel digital output, and one timer/counter channel. The max. sampling rate of A-812PG is 62.5K samples/s. It is completely compatible to PCL-812PG.

### Applications

- Laboratory automation
- Sensor interface

### Specifications

#### Analog Input

- Number of channels: 16 single-ended
- Resolution: 12-bit
- ADC conversion rate: 62.5KS/s max
- Input impedance:  $10,000M\Omega // 6pF$
- Over voltage protection:  $\pm 35V$
- Accuracy: 0.01% of reading,  $\pm 1$  bit
- Linearity:  $\pm 1$  bit
- On chip sample & hold
- Zero drift :  $\pm 25ppm/^{\circ}C$  of FS max
- Input Range :  
 $\pm 10V, \pm 5V, \pm 2.5V, \pm 1.25V, \pm 0.625V, \pm 0.3125V$

#### Analog Output

- Number of channels: 2 independent
- Type: 12-bit double-buffered (AD-7541)
- Linearity:  $\pm 1/2$  bit
- Output range: 0~5V, 0~10V, 0~Ext Ref
- External reference: +10V or -10V max
- Output driving:  $\pm 5$  mA
- Settling time: 0.6  $\mu s$  to 0.01% for full scale step

### Features

- 12-bit A/D converter
- 62.5KS/s sampling rate(Max.)
- 16 single-ended analog inputs
- Software programmable gain: 1,2,4,8,16
- Bipolar analog input
- A/D Trigger modes : Software trigger, Pacer trigger, external trigger
- A/D data transfer modes : polling, interrupt DMA
- 16 digital inputs & 16 digital outputs
- Bipolar analog input
- Two 12-bit D/A voltage output
- One general purpose programmable timer/ counter

### Digital I/O

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

### Timer/Counter

- Number of channels: 1
- Resolution: 16-bit
- Compatibility: 5V/TTL
- Internal clock: 2MHz
- External clock: up to 10 MHz
- A/D pacer: cascaded 32-bit counter
- Programmable internal timer: 0.0047Hz~0.5MNz

### General Specifications

- I/O connector: five 20-pin ribbon male
- Power requirements: +5V @ 500 mA typical
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 163 mm x 124 mm

### Ordering Information

#### Standard

**A-812PG:** 16-channel 12-bit 62.5 KS/s multi-function board

#### Optional

- DB-8025:** General screw terminal board
- DB-8125:** General screw terminal board
- DB-16P:** 16-channel isolated digital input board
- DB-16R:** 16-channel SPDT relay board
- DN-20:** DIN-rail mounting terminal board
- ADP-20:** 20-pin extender



# A-8111

## 8-channel, 12-bit, 30KS/s Multi-Function board



### Features

- 12-bit A/D converter
- 30 KS/s sampling rate(Max.)
- 8 single-ended analog inputs
- A/D trigger modes: software trigger, pacer trigger
- A/D data transfer modes: polling, interrupt
- Software programmable gain: 1,2,4,8
- Bipolar analog input
- One 12-bit analog output
- 16 digital inputs & 16 digital outputs

### Functional Description

The A-8111 is 12-bit multifunction analog and digital I/O board for the PC/AT compatible computer. The A-8111 provides 8-channel single-ended analog input, 1-channel analog output with 12-bit resolution, 16-channel digital input, 16-channel digital output. The sampling rate of A-8111 is 30K samples/s. It is completely compatible to PCL-711B and ACL-9111.

### Applications

- Laboratory automation
- Sensor interface
- Production test

### Specifications

#### Analog Input

- Number of channels: 8 single-ended
- Resolution: 12-bit
- ADC conversion rate: 30KS/s max
- Input impedance: 10M $\Omega$  || 6pF
- Over voltage protection:  $\pm 35V$
- Accuracy: 0.01% of reading
- Linearity:  $\pm 1$  bit
- On chip sample & hold
- Zero drift:  $\pm 25ppm/^{\circ}C$  of FS max
- Input range:  
 $\pm 5V, \pm 2.5V, \pm 1.25V, \pm 0.625V, \pm 0.3125V$

#### Analog Output

- Number of channels: 1 independent
- Type: 12 bit double buffered (AD-7948)
- Linearity:  $\pm 1/2$  bit
- Output range: 0~5V, 0~10V
- Output driving:  $\pm 5$  mA
- Settling time: 0.6  $\mu$ s to 0.01% for full scale step

### 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; @IOL = 8 mA max
- Output high  $V_{OH} = 2.7V$  min; @IOH = 0.4 mA max

### Timer/Counter

- A/D pacer: cascaded 32-bit counter
- Programmable internal timer: 0.0047Hz~0.5MNz
- Interrupt channel: 2,3,4,5,6,7 software selectable

### General Specifications

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

Device	+5V	+12V	-12V
A-8111	320 mA	60 mA	30 mA

- Operating temperature: 0 ~ 60 $^{\circ}C$
- Operating humidity: 0 ~ 90%, non-condensing
- Storage temperature: -20 ~ 70 $^{\circ}C$
- Dimensions: 157 mm x 106 mm

### Ordering Information

#### Standard

**A-8111:** 8-channel 12-bit multi-function board

#### Optional

**DB-8125:** Screw terminal board  
**DN-37:** DIN-rail mounting terminal board  
**DB-37:** Directly connection terminal board  
**DB-16P:** 16-channel isolated digital input board  
**DB-16R:** 16-channel SPDT relay board  
**DN-20:** DIN-rail mounting terminal board  
**ADP-20:** 20-pin extender

# A-626/A-628

**6 & 8-channel 12-bit analog output board****A-626****A-628**

## Functional Description

The A-626 and A-628 are 12-bit analog output boards with 16-channel digital input and 16-channel digital output. The A-626 and A-628 boards support both current and voltage output. The output channels can be jumper-selectable for different voltage range  $\pm 10V$ ,  $\pm 5V$ ,  $0\sim 5V$ ,  $0\sim 10V$ . It can also sink  $4\sim 20$  mA current loop when connected to an external voltage source. On-board BB Ref-01 chip is used for solving the thermo-drifting problem of the reference voltage. A-626 is much better than other products on the market for long period operation. On-board lattice FPGA increases the stability.

## Applications

- Servo control
- Programmable voltage source
- Programmable current sink
- Product testing

## Specifications

### Analog Output

- Number of channels: 6 (A-626); 8 (A-628)
- Resolution: 12-bit
- Type: AD 7541 or equivalent
- Differential linearity:  $\pm 1/2$  LSB max over temperature
- Settling time: less than  $65 \mu s$
- Temperature drift:  $5 \text{ ppm} / ^\circ\text{C}$  max
- Relative accuracy:  $\pm 1$  LSB max
- Voltage output range:  $0\sim 5V$ ,  $0\sim 10V$ ,  $\pm 5V$ ,  $\pm 10V$
- Output driving capability: 5 mA max
- Current output range:  $4\sim 20$  mA
- Current loop exciting voltage:  $8V \sim 35V$
- Reference voltage: Internal  $-5V$  or  $-10V$   
External  $+10V$  or  $-10V$  max

## Features

- 6 or 8 analog output channels
- 12-bit resolution
- $0\sim 5V$ ,  $0\sim 10V$ ,  $\pm 5V$ ,  $\pm 10V$  output ranges
- $4\sim 20$  mA current loop capability, sink to ground
- On-board reference  $-5V$ ,  $-10V$
- External reference  $\pm 10V$  (max.) AC or DC
- IRQ level from IRQ 3-IRQ 15
- 16-channel digital input and 16-channel digital output

- 16 TTL-level input
- Input low  $V_{IL} = 0.8 V_{max}$ ;  $I_{IL} = -0.4$  mA max
- Input high  $V_{IH} = 2.0 V_{min}$ ;  $I_{IH} = 20 \mu A$  max
- 16 TTL-level Output
- Output low  $V_{OL} = 0.5 V_{max}$ ;  $@I_{OL} = 8$  mA max
- Output high  $V_{OH} = 2.7 V_{min}$ ;  $@I_{OH} = -400 \mu A$  max

## General Specifications

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

Power	Typical A-626/A-628	Maximal A-626/A-628
+5V	450/500 mA	900/1100 mA
+12V	50/60 mA	110/130 mA
-12V	14/15 mA	90/105 mA

- Operating temperature:  $0 \sim 60^\circ\text{C}$
- Operating humidity:  $0 \sim 90\%$  non-condensing
- Storage temperature:  $-20 \sim 70^\circ\text{C}$
- Dimensions:  $184 \text{ mm} \times 123 \text{ mm}$  (A-626);  
 $198 \text{ mm} \times 123 \text{ mm}$  (A-628)

## Ordering Information

### Standard

- A-626:** 6-channel 12-bit analog output board  
**A-626/S:** A-626 with DN-37  
**A-628:** 8-channel 12-bit analog output board  
**A-628/S:** A-628 with DN-37

### Optional

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

# Pin Assignment

A-812PG/A-8111/A-626/A-628

## Pin Assignment

### A-812PG

CN1				CN2					
AI 0	1	○	2	A.GND	AI 10	1	○	2	A.GND
AI 1	3	○	4	A.GND	AI 11	3	○	4	A.GND
AI 2	5	○	6	A.GND	AI 12	5	○	6	A.GND
AI 3	7	○	8	A.GND	AI 13	7	○	8	A.GND
AI 4	9	○	10	A.GND	AI 14	9	○	10	A.GND
AI 5	11	○	12	A.GND	AI 15	11	○	12	A.GND
AI 6	13	○	14	A.GND	AO 0	13	○	14	A.GND
AI 7	15	○	16	A.GND	AO 1	15	○	16	A.GND
AI 8	17	○	18	A.GND	AO 0 EXT REF	17	○	18	A.GND
AI 9	19	○	20	A.GND	AO 1 EXT REF	19	○	20	A.GND

CN4				CN5					
DI 0	1	○	2	DI 1	DO 0	1	○	2	DO 1
DI 2	3	○	4	DI 3	DO 2	3	○	4	DO 3
DI 4	5	○	6	DI 5	DO 4	5	○	6	DO 5
DI 6	7	○	8	DI 7	DO 6	7	○	8	DO 7
DI 8	9	○	10	DI 9	DO 8	9	○	10	DO 9
DI 10	11	○	12	DI 11	DO 10	11	○	12	DO 11
DI 12	13	○	14	DI 13	DO 12	13	○	14	DO 13
DI 14	15	○	16	DI 15	DO 14	15	○	16	DO 15
D.GND	17	○	18	D.GND	D.GND	17	○	18	D.GND
+5V	19	○	20	+12V	+5V	19	○	20	+12V

CN3					
External Trigger	1	○	○	2	N.C.
DRDY	3	○	○	4	N.C.
Internal CLK 2MHz	5	○	○	6	Counter 1&2 Gate
N.C.	7	○	○	8	External CLK
N.C.	9	○	○	10	Counter 0 Out
N.C.	11	○	○	12	Counter 0 Gate
N.C.	13	○	○	14	Counter 1 Out
N.C.	15	○	○	16	N.C.
D.GND	17	○	○	18	Digital Ground
PC's+5V	19	○	○	20	N.C.

### A-8111

CN1				
N.C.	37	○	19	+5V OUT
N.C.	36	○	18	N.C.
N.C.	35	○	17	N.C.
N.C.	34	○	16	N.C.
N.C.	33	○	15	N.C.
N.C.	32	○	14	A.GND
N.C.	31	○	13	N.C.
N.C.	30	○	12	N.C.
D/A OUT	29	○	11	N.C.
A.GND	28	○	10	A.GND
A.GND	27	○	09	A.GND
A.GND	26	○	08	AI 7
A.GND	25	○	07	AI 6
A.GND	24	○	06	AI 5
A.GND	23	○	05	AI 4
A.GND	22	○	04	AI 3
A.GND	21	○	03	AI 2
A.GND	20	○	02	AI 1
		○	01	AI 0

CN2				CN3					
DI 0	1	○	2	DI 1	DO 0	1	○	2	DO 1
DI 2	3	○	4	DI 3	DO 2	3	○	4	DO 3
DI 4	5	○	6	DI 5	DO 4	5	○	6	DO 5
DI 6	7	○	8	DI 7	DO 6	7	○	8	DO 7
DI 8	9	○	10	DI 9	DO 8	9	○	10	DO 9
DI 10	11	○	12	DI 11	DO 10	11	○	12	DO 11
DI 12	13	○	14	DI 13	DO 12	13	○	14	DO 13
DI 14	15	○	16	DI 15	DO 14	15	○	16	DO 15
D.GND	17	○	18	D.GND	D.GND	17	○	18	D.GND
+5V	19	○	20	+12V	+5V	19	○	20	+12V

### A-626 6-channel analog output

A.GND	37	○	19	+5V OUT
A.GND	36	○	18	D.GND
A.GND	35	○	17	Ext trg
N.C.	34	○	16	A.GND
N.C.	33	○	15	CH3 I.OUT
N.C.	32	○	14	CH3 Ext ref
A.GND	31	○	13	CH3 V.OUT
N.C.	30	○	12	A.GND
N.C.	29	○	11	CH2 I.OUT
N.C.	28	○	10	CH2 Ext ref
A.GND	27	○	09	CH2 V.OUT
CH5 I.OUT	26	○	08	A.GND
CH5 Ext ref	25	○	07	CH1 I.OUT
CH5 V.OUT	24	○	06	CH1 Ext ref
A.GND	23	○	05	CH1 V.OUT
CH4 I.OUT	22	○	04	A.GND
CH4 Ext ref	21	○	03	CH0 I.OUT
CH4 V.OUT	20	○	02	CH0 Ext ref
		○	01	CH0 V.OUT

### A-628 8-channel analog output

A.GND	37	○	19	+5V OUT
A.GND	36	○	18	D.GND
A.GND	35	○	17	Ext trg
N.C.	34	○	16	A.GND
CH7 I.OUT	33	○	15	CH3 I.OUT
CH7 Ext ref	32	○	14	CH3 Ext ref
CH7 V.OUT	31	○	13	CH3 V.OUT
A.GND	30	○	12	A.GND
CH6 I.OUT	29	○	11	CH2 I.OUT
CH6 Ext ref	28	○	10	CH2 Ext ref
A.GND	27	○	09	CH2 V.OUT
CH5 I.OUT	26	○	08	A.GND
CH5 Ext ref	25	○	07	CH1 I.OUT
CH5 V.OUT	24	○	06	CH1 Ext ref
A.GND	23	○	05	CH1 V.OUT
CH4 I.OUT	22	○	04	A.GND
CH4 Ext ref	21	○	03	CH0 I.OUT
CH4 V.OUT	20	○	02	CH0 Ext ref
		○	01	CH0 V.OUT

### A-626/A-628 DIO

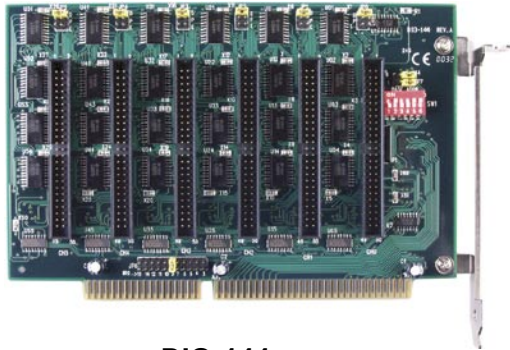
DI0	1	○	2	DI1
DI2	3	○	4	DI3
DI4	5	○	6	DI5
DI6	7	○	8	DI7
DI8	9	○	10	DI9
DI10	11	○	12	DI11
DI12	13	○	14	DI13
DI14	15	○	16	DI15
D.GND	17	○	18	D.GND
+5V	19	○	20	+12V

DO0	1	○	2	DO1
DO2	3	○	4	DO3
DO4	5	○	6	DO5
DO6	7	○	8	DO7
DO8	9	○	10	DO9
DO10	11	○	12	DO11
DO12	13	○	14	DO13
DO14	15	○	16	DO15
D.GND	17	○	18	D.GND
+5V	19	○	20	+12V

# DIO-144/96/48/24

144/96/48/24-bit OPTO-22 compatible DIO board



DIO-144

## Functional Description

The DIO-144/96/48/24 are high density parallel digital I/O Board with 144/96/48/24 bi-direction I/O channels. The header connectors are fully compatible with industry OPTO-22 standard. The DIO-144/96/48/24 emulate mode 0 of the industry standard 8255 programmable peripheral interface (PPI) chips. Each PPI offers three 8-bit ports, Port A, Port B and Port C. The Port C is divided into 2 nibble-wide (4-bit) ports. All groups are configured as inputs upon power-up or reset.

The DIO-48 has one 8254 Timer/Counter chip, one 16-bit counter accept event signal (P2C0) and it will generate trigger signal of interrupt. The other 32-bit counter is used to generate pacer time trigger of interrupt. The clock source is 32.768KHz, 2MHz, 4MHz or 8MHz.

## Applications

- Test automation
- Digital I/O control
- Alarm monitoring
- Factory Automation
- Product Test

## Features

- 144/96/48/24 digital TTL/DTL I/O channels
- All I/O lines are buffered on the board
- Emulate 6/4/2/1 industry standard 8255 PPI Mode 0
- Direct interface with OPTO-22 compatible I/O modules
- High output driving capability
- Programmable interrupt source
- On-board 8254 timer/counter chip (DIO-48)
- Interrupt source: timer, event, direct trigger (DIO-48)

## Specifications

### Logic inputs and outputs

- Input logic high voltage: 2.0V min / 5.0V max
- Input logic low voltage: -0.5V min / 0.8V max
- Input load current: -0.45 mA min / +70  $\mu$  A
- Output sink current: +24 mA max
- Output source current: -15 mA
- All outputs and inputs are TTL compatible
- Programmable interrupt source:
  - P2C0, P5C0, P8C0, P11C0, P14C0, P17C0 (DIO-144)
  - P2C0, P5C0, P8C0, P11C0 (DIO-96)
  - P2C3, P2C7, P5C3, P5C7 (DIO-48)
  - P2C0 (DIO-24)

### General Specifications

- I/O connector: six 50-pin ribbon male (DIO-144)  
four 50-pin ribbon male (DIO-96)  
two 50-pin ribbon male (DIO-48)  
one 50-pin ribbon male (DIO-24)

- Power requirements:

Device	DIO-144	DIO-96	DIO-48	DIO-24
+5V	2680 mA	1860 mA	880 mA	580 mA

- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 80°C
- Dimensions:
  - 182 mm x 110 mm (DIO-144, DIO-96, DIO-48)
  - 107 mm x 106 mm (DIO-24)

# DIO-144/96/48/24

144/96/48/24-bit OPTO-22 compatible DIO board



DIO-96



DIO-48



DIO-24

## Pin Assignment

GND	50	○ ○	49	V <sub>cc</sub>
GND	48	○ ○	47	PA_0
GND	46	○ ○	45	PA_1
GND	44	○ ○	43	PA_2
GND	42	○ ○	41	PA_3
GND	40	○ ○	39	PA_4
GND	38	○ ○	37	PA_5
GND	36	○ ○	35	PA_6
GND	34	○ ○	33	PA_7
GND	32	○ ○	31	PB_0
GND	30	○ ○	29	PB_1
GND	28	○ ○	27	PB_2
GND	26	○ ○	25	PB_3
GND	24	○ ○	23	PB_4
GND	22	○ ○	21	PB_5
GND	20	○ ○	19	PB_6
GND	18	○ ○	17	PB_7
GND	16	○ ○	15	PC_0
GND	14	○ ○	13	PC_1
GND	12	○ ○	11	PC_2
GND	10	○ ○	9	PC_3
GND	8	○ ○	7	PC_4
GND	6	○ ○	5	PC_5
GND	4	○ ○	3	PC_6
GND	2	○ ○	1	PC_7

## Ordering Information

### Standard

- DIO-24:** 24-bit OPTO-22 DIO board  
**DIO-48:** 48-bit OPTO-22 DIO board  
**DIO-96:** 96-bit OPTO-22 DIO board  
**DIO-144:** 144-bit OPTO-22 DIO board

### Optional

- DB-24P:** 24-channel OPTO-isolated input terminal board  
**DB-24R:** 24-channel relay terminal board  
**DB-24PR:** 24-channel power relay terminal board  
**DB-24C:** 24-channel open-collector output board  
**DB-24OD:** 24-channel open-drain output board  
**DB-24POR:** 24-channel PhotoMos relay board  
**DB-24SSR:** 24-channel solid state relay board  
**DB-16P8R:** 16-channel OPTO-isolated digital input & 8-channel relay output board  
**DN-50:** DIN-rail mounting terminal board  
**ADP-37:** 50-pin OPTO-22 ports to DB-37 adaptor  
**ADP-50:** 50-pin extender



# DIO-64

**32 digital input & 32 digital output with timer/counter board**

## Features

- 32-channel digital input
- 32-channel digital output
- Buffered output for higher driving capability
- 3 independent programmable 16-bit down counters
- Four clock sources: 2M, 1M, 500K, 250KHz
- Three frequency divider: 100, 10, 1
- One 16-bit counter, one 32-bit timer with a 4 MHz for interface function
- Interrupt source: timer, event, direct trigger
- Breadboard area for add-on circuit

## Functional Description

The DIO-64 provides 32-channel digital input, 32-channel digital output and 6-channel counter/timer. The DIO-64 consists of two 16-bit input ports and two 16-bit output ports. The user can use the DB-16P to connect the input ports (CN2, CN4) for isolation purpose, or use DB-16R to interface to the output ports (CN1, CN3) for relay control. The first 8254 chip is used as general-purpose timer/counter, such as frequency measurement, event counting and pulse generation. The second 8254 chip is used to generate interrupt trigger signal. The Counter 3 accept event signal and it will generate trigger signal for interrupt. The counter 4 and counter 5 are cascaded together. The clock source is 4MHz. It is used to generate pacer timer trigger for interrupt.

## Applications

- Factory automation
- Product test
- Relay control

## Specifications

### Logic inputs and outputs

- All outputs and inputs are TTL Compatible
- Input logic high voltage: 2.0V min / 5.0V max
- Input logic low voltage: -0.5V min / 0.8V max
- Input load current: -0.45 mA min / +70  $\mu$  A
- Output sink current: +64 mA max
- Output source current: -15 mA

### General Specifications

- I/O Connector: five 20-pin ribbon male
- Power requirements: +5V @ 500 mA typical
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 80°C
- Dimensions: 93 mm x 135 mm

## Pin Assignment

### CN1/CN3

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

### CN2/CN4

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

### CN5

CLK2	1	○	○	2	CLK1
OUT2	3	○	○	4	OUT1
GATE2	5	○	○	6	GATE1
CLK3	7	○	○	8	CLK0
OUT3	9	○	○	10	OUT0
GATE3	11	○	○	12	GATE0
GATE4	13	○	○	14	CLK4
X	15	○	○	16	OUT4
GND	17	○	○	18	GND
+5V	19	○	○	20	X

## Ordering Information

### Standard

- DIO-64/3:** 64 digital I/O with three timer/counter board  
**DIO-64/6:** 64 digital I/O with six timer/counter board

### Optional

- DB-16P:** 16-channel OPTO-isolated input board  
**DB-16R:** 16-channel relay terminal board  
**DB-24PR:** 24-channel power relay board  
**DB-24POR:** 24-channel PhotoMos relay board  
**DB-24C:** 24-channel open-collector output board  
**DB-24OD:** 24-channel open-drain output board  
**DB-8025:** General screw terminal board  
**DN-20:** DIN-rail mounting terminal board  
**ADP-20:** 20-pin extender



# TMC-10

## 10-channel timer/counter board



### Features

- On-board four 8254 timer/counter chips
- Eight independent 16-bit timer/counter
- Eight external clock inputs
- Eight external gate control signals
- Two cascaded 32-bit timer/counter
- 11 interrupt levels, jumper-selectable
- Programmable Interrupt sources: COUT6, COUT9, COUT12 or external
- Two internal clock sources: 8M/1.6M, 0.8M/80K
- 8-bit general purpose digital output

### Functional Description

The TMC-10 is a general-purpose timer/counter and digital I/O board. It provides eight 16-bit timer/counter channels, two cascaded 32-bit timer/counter channels, 8-channel digital output, and two internal clock sources (8M/1.6M; 0.8M/80K) which are jumper-selectable. The external clock input pin and gate control pin may be used as general-purpose TTL-level DI. Four 8254 chips provide various powerful timer/counter function modes to match the industrial and laboratory applications.

### Applications

- Event Counting
- Wave Generator
- Frequency Measurement
- Pulse Width Measurement
- Time-delay generation
- Watchdog Timer
- Industrial Automation

### Specifications

#### Logic inputs and outputs

- Input logic high voltage: 2.0V min / 5.0V max
- Input logic low voltage: -0.5V min / 0.8V max
- Input load current: -0.45 mA min / +70  $\mu$  A
- Output sink current: +24 mA max
- Output source current: -15 mA
- All outputs and inputs are TTL Compatible

### General Specifications

- I/O connector: one 37-pin D-Sub female
- Power requirements: +5V @ 500 mA typical
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 80°C
- Dimensions: 121 mm x 106 mm

### Pin Assignment

GND	1	○	20	GND
CLK1/DI0	2	○	21	GATE1/DI4
COUT 1	3	○	22	GATE2/DI5
CLK2/DI1	4	○	23	COUT 2
CLK3/DI2	5	○	24	GATE3/DI6
COUT 3	6	○	25	GATE4/DI7
CLK4/DI3	7	○	26	COUT 4
CLK7/DI8	8	○	27	GATE7/DI12
COUT 7	9	○	28	GATE8/DI13
CLK8/DI9	10	○	29	COUT 8
CLK9/DI10	11	○	30	GATE9/DI14
COUT 9	12	○	31	GATE10/DI5
CLK10/DI11	13	○	32	COUT 10
COUT 6	14	○	33	COUT 12
DO_0	15	○	34	DO_1
DO_2	16	○	35	DO_3
DO_4	17	○	36	DO_5
DO_6	18	○	37	DO_7
+5V	19	○		

### Ordering Information

#### Standard

**TMC-10:** 10-channel timer/counter board

#### Optional

**DN-37:** Two 37-pin connector DIN-rail mounting terminal board

**DB-37:** 37-pin D-sub directly connector terminal board