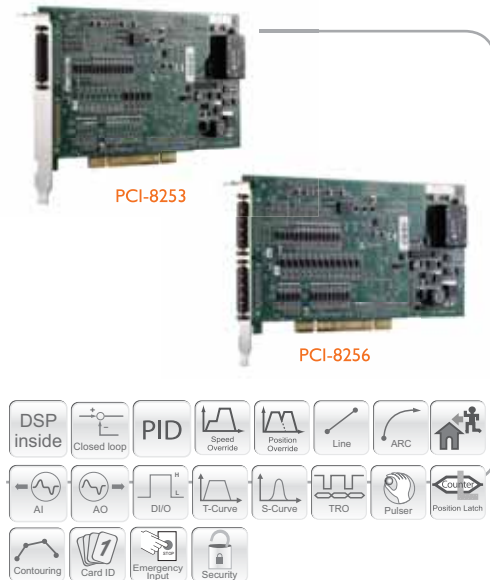


PCI-8253 / PCI-8256

DSP-based 3/6-axis Analog Motion Control Cards



Specifications

Analog Input / Output Channels	
Number of Channels	3 for PCI-8253; 6 for PCI-8256
Analog Output	±10 Volt with 16-bit D/A Converter
Analog Input	±10 Volt with 14-bit A/D Converter
Encoder Input Channels	
Number of Channels	3 for PCI-8253; 6 for PCI-8256
Max. Encoder Input Frequency	20 MHz under 4 x AB mode
Encoder Counter	6-CH, 32-bit
Pulse Command Type	AB phase and CW/CCW modes
Trigger Channels	
Number of High speed Channels	1 for PCI-8253; 2 for PCI-8256
Number of Low Speed Channels	1 for PCI-8253; 2 for PCI-8256
Maximum Trigger Pulse Frequency	1 MHz for high speed trigger; 25 KHz for low speed trigger
Trigger Pulse Width	0.3 μs to 300 ms
Motion I/O Interface Signals	
I/O Pins	Differential and 2500 VRMS, optically isolated
Incremental Encoder Signals Input Pin	EA and EB
Encoder Index Signal Input	EZ
Mechanical Limit Switch Signal Input Pins	±EL and ORG
Servomotor Interface I/O Pin	INP, ALM, ERC, SVON, RDY
Position Compare Output Pin	CMP
General Purpose I/O	
Digital Input	4-CH (PCI-8253) / 8-CH (PCI-8256) isolated digital input
Input Voltage	0 to 24 V
Input Resistance	2.4 KΩ @ 0.5 W
Digital Output	4-CH (PCI-8253) / 8-CH (PCI-8256) isolated digital output
Output Voltage	5 V (min.); 35 V (max.)
Output Type	NPN open collector Darlington transistors
Current Sink	90 mA
Analog Input (A/D)	
Resolution	14-bit
Input Channel	4 single-ended
Input Range	±10 V, bipolar
Conversion Time	8 μs
Sampling Rate	110 K samples/sec (Max.)
Accuracy	0.01% of FSR, ±1 LSB
General Specifications	
Connectors	68-pin SCSI-type connector
Operating Temperature	0°C to +55°C
Storage Temperature	+20°C to +80°C
Humidity	5% to 95%, non-condensing

Features

- 32-bit PCI bus, Rev. 2.2, 33 MHz
- On-board 250 MHz DSP
- 3/6 axes of ±10 volts analog command for controlling servo motors by differential command signal
- Maximum servo update rate is less than 300 μs for 6 axes
- Encoder feedback frequency up to 20 MHz
- Digital filter for encoder input to reduce noise disturbance
- 1/2 channel up to 1 MHz high speed trigger pulse output for PCI-8253/PCI-8256
- A/D inputs (3/6 channels, 14-bit, ±10 V)
- Manual pulse generator interface
- One dedicated emergency input pin
- High speed position latch function via ORG and Index signals
- On-board 512 kb flash ROM for motion kernel and non-volatile data – PID parameters
- Programmable interrupt source control to host PC
- General purpose I/O: 4 DI/4 DO for PCI-8253 and 8 DI/8 DO for PCI-8256
- Watch dog timer for safety control
- Support for up to 16 cards in one system
- Motion Functions
 - Jogging mode
 - Any 2-4 axes linear interpolation
 - Any 2 axes circular interpolation
 - Multi-axis synchronized motion
 - Trapezoidal, S-curve velocity profile
 - Position override & speed override in anytime
 - Programmable acceleration/deceleration
 - Variety of homing modes via signals
 - Linear and FIFO position comparison method for high speed trigger output
 - Filter: 2nd order Notch filter and 1 order low pass filter
 - Blend motion (LookAhead)
 - E-gear (Electronic gear)
 - Contouring function by point table description
 - Gantry mode
 - Ring counter (32-bit) for rotatory encoder input
 - Motion trajectory & PID parameters can be changed on-the-fly

Software Support

Windows® Platform

- Available for Windows Vista (32-bit)/XP/2000
- Recommended programming environments: Visual Basic, Visual C++, Borland C++ Builder, and Delphi



1

Software & Utilities

2

DAQ

3

PXI

4

Modular Instruments

5

GPIB & Bus Expansion

6

PAC

7

Motion

8

Real-time Distributed I/O

9

Remote I/O

10

Communications

11

Vision

12

Fanless I/O Platforms

13

cPCI & Industrial Computers

14

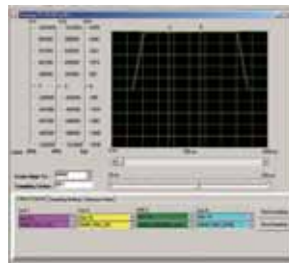
Accessories

MotionCreatorPro 2™

Powerful & Useful Utility Windows

MotionCreatorPro 2™ is a Windows-based application development software package included with the PCI-8253/PCI-8256. MotionCreatorPro 2™ is useful for debugging a motion control system during the design phase of a project. Anon-screen display lists all installed axes information and I/O signal status of the PCI-8253/PCI-8256. By using this utility, you can easily tune the axis parameter servo gain (PID plus feed forward gain) reducing the efforts on gain tuning. Furthermore, the sampling windows makes more accurate in motion data analysis, moreover, integrates with axis parameter and PID gain on-the-fly change, thus, the PCI-8253/PCI-8256 provides precise positioning control with less effort.

(See page I-23 for more information on MotionCreatorPro 2.)



- Board & Axis Configuration
- Oscilloscope
- PID Tuning Page
- Motion & I/O Manipulation Page
- Specific Applications Manipulation Pages
 - > Gantry
 - > 2D G-code Import
 - > Position Comparison Trigger Set Up

Ordering Information

PCI-8253

DSP-based 3-axis analog motion control card

PCI-8256

DSP-based 6-axis analog motion control card

Accessories

See section I4 for more information on Accessories.

Terminal Board

DIN-825-J3A0

Terminal board for Mitsubishi MR-J3S-A servo amplifiers

DIN-68S-01

Terminal board with 68-pin SCSI-II connector with DIN socket

Cabling

ACL-10568-I

68-pin SCSI-VHDCI cable (mating with AMP-787082-7), I M

Pin Assignment

SPI / SP2 (PCI-8253 & PCI-8256)

No.	Name	I/O	Function of Axis	No.	Name	I/O	Function of Axis
1	AOUT1+	O	Analog output (+),(1)	35	AOUT1-	O	Analog output (-),(1)
2	AOUT2+	O	Analog output (+),(2)	36	AOUT2-	O	Analog output (-),(2)
3	AOUT3+	O	Analog output (+),(3)	37	AOUT3-	O	Analog output (-),(3)
4	AGND	SG	Analog ground	38	AGND	SG	Analog ground
5	AIN1	I	Analog input, (1)	39	AGND	SG	Analog ground
6	AIN2	I	Analog input, (2)	40	Rsv.	-	Reserved
7	AIN3	I	Analog input, (3)	41	Rsv.	-	Reserved
8	EA1+	I	Encoder A-phase +,(1)	42	EA1-	I	Encoder A-phase -,(1)
9	EB1+	I	Encoder B-phase +,(1)	43	EB1-	I	Encoder B-phase -,(1)
10	EZ1+	I	Encoder Z-phase +,(1)	44	EZ1-	I	Encoder Z-phase -,(1)
11	ALM1	I	Servo alarm,(1)	45	ORG1	I	Home limit, (1)
12	SVON1	O	Servo-ON, (1)	46	PEL1	I	Positive limit, (1)
13	ZSP1	I	ZeroSpeed 1	47	MEL1	I	Negative limit, (1)
14	TRG1+	O	Trigger Output, +(1)	48	TRG1-	O	Trigger Output, -(1)
15	TRG2+	O	Trigger Output, +(2)	49	TRG2-	O	Trigger Output, -(2)
16	EA2+	I	Encoder A-phase +,(2)	50	EA2-	I	Encoder A-phase -,(2)
17	EB2+	I	Encoder B-phase +,(2)	51	EB2-	I	Encoder B-phase -,(2)
18	EZ2+	I	Encoder Z-phase +,(2)	52	EZ2-	I	Encoder Z-phase -,(2)
19	DOCOM	-	Digital output common	53	DICOM	-	Digital input common
20	ALM2	I	Servo alarm, (2)	54	ORG2	I	Home limit, (2)
21	SVON2	O	Servo-ON, (2)	55	PEL2	I	Positive limit, (2)
22	ZSP2	I	ZeroSpeed 2	56	MEL2	I	Negative limit, (2)
23	EA3+	I	Encoder A-phase +,(3)	57	EA3-	I	Encoder A-phase -,(3)
24	EB3+	I	Encoder B-phase +,(3)	58	EB3-	I	Encoder B-phase -,(3)
25	EZ3+	I	Encoder Z-phase +,(3)	59	EZ3-	I	Encoder Z-phase -,(3)
26	ALM3	I	Servo alarm,(3)	60	ORG3	I	Home limit, (3)
27	SVON3	O	Servo-ON, (3)	61	PEL3	I	Positive limit, (3)
28	ZSP3	I	ZeroSpeed 3	62	MEL3	I	Negative limit, (3)
29	DOCOM	-	Digital output common	63	IEMG	I	Emergency Stop
30	DOCOM	-	Digital output common	64	DICOM	-	Digital input common
31	EDO1	O	Digital Output, (1)	65	EDI1	I	Digital Input, (1)
32	EDO2	O	Digital Output, (2)	66	EDI2	I	Digital Input, (2)
33	EDO3	O	Digital Output, (3)	67	EDI3	I	Digital Input, (3)
34	EDO4	O	Digital Output, (4)	68	EDI4	I	Digital Input, (4)