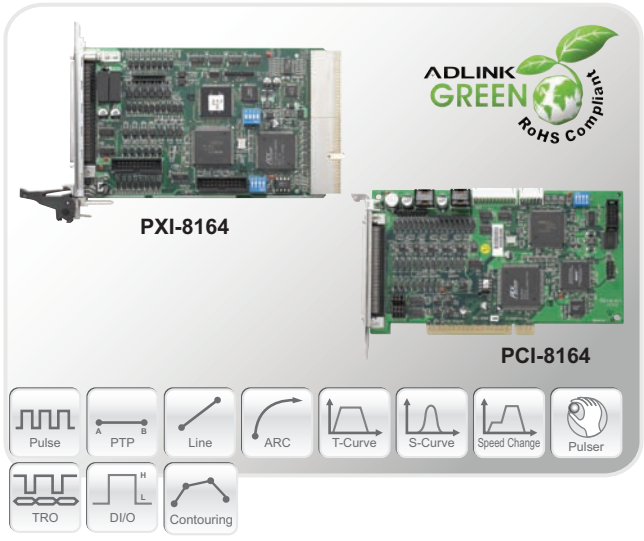
PCI-8164/PXI-8164

Advanced 4-axis Stepper & Servo Motion Control Cards with High-Speed Triggering



Features

- *PCI-8164: 32-bit PCI bus, Rev. 2.2, 33MHz*
- *Pulse output rate up to 6.55MHz*
- *Pulse output options: OUT/DIR, CW/CCW, AB Phase*
- *2~4 axes linear interpolation*
- *2 axes circular interpolation*
- *Multi-axis continuous interpolation*
- *Position/Speed change on-the-fly*
- *13 home return modes and auto home search*
- *Hardware position compare and trigger with auto-loading FIFO as buffer*
- *High speed position latch function*
- *Programmable acceleration and deceleration time*
- *Trapezoidal and S-curve velocity profiles*
- *28-bit up/down counter for incremental encoder*
- *Multi-axis, simultaneous start/stop*
- *Programmable interrupt sources*
- *Support up to 12 cards in one system (Only available for PCI-8164/PXI-8164)*
- *Hardware backlash compensator*
- *Softwares limit function*
- *Easy interface to any stepping motors, AC or DC servo, linear or rotary motors*
- *All digital inputs and outputs are 2500V_{RMS} isolated*
- *Manual pulser input interface*
- *More than 250 thread safe API functions*

Software Support

Windows® Platform

Available for Windows Vista32/XP/2000
VB/VC++/BCB/Delphi are recommended programming environment.
Various sample programs with source codes
Customized API functions are possible

RTX (Windows Real Time Extension)

RTX 5.x/6.x

MotionCreatorPro ™

MotionCreatorPro™ assists the motion system developer to debug any cabling problem, and solve the difficulty of system configuration before programming.

Linux Platform

Redhat 9, kernel 2.4.x	SUSE 10, kernel 2.6.13
Fedora Core 3, kernel 2.6.9	Fedora Core 5, kernel 2.6.15
Fedora Core 4, kernel 2.6.11	

Introduction

Advanced 4-axis Motion Controller

ADLINK PCI-8164/PXI-8164 is an advanced 4-axis motion control card. Compared with the PCI-8132/PCI-8134 series, PCI-8164/PXI-8164 offers better linear and circular interpolated move and continuous contouring performance-ideal for advanced pulse train motion control solutions and complicated motion and pick-and-place applications.

Velocity or Position Override

The PCI-8164/PXI-8164 provides powerful position or speed changing function while axis is moving. After motion begins, target of speed or position can be changed on the fly at the user's discretion.

Linear & Circular Interpolation

In multi-axis operation, the PCI-8164/PXI-8164 provides linear interpolation by any 2, any 3, or even all-4 axes. Besides any 2 axes can perform circular interpolation.

Continuous Contouring

The pre-register architecture of PCI-8164/PXI-8164 offers the feature to build the continuous interpolation function, ie, the 2nd motion may follow previous motion instantly without latency. Thus perfect velocity continuity can be established.

Hardware Position Compare and Trigger Output

The PCI-8164/PXI-8164 provides position compare and trigger functions. The CMP channel will output a trigger pulse when encoder counter reached the compared value preset by user. Comparison is done by hardware, and an on- board FIFO is implemented to automatically reload the comparing data. Thus, the trigger rate can reach 15KHz, while almost no CPU resource is needed.

Position Latch

The latch function is to capture the instant counter value of one certain axis when the latch signal activates. The LTC channel is used to receive the latch pulse. The latch function is implemented with hardware.

Automatic Backlash Compensation

Whenever direction change is occurred, the PCI-8164/PXI-8164 outputs backlash corrective pulses before sending commands. During interpolation mode, this function will be ineffective.

13 Home Return Modes

To fit into various mechanical design and operating restrictions, the PCI-8164/PXI-8164 provides 13 home moving modes for users to choose as their best convenience.

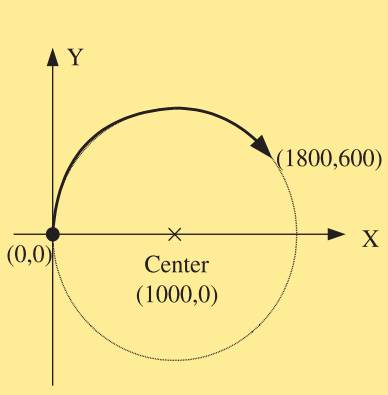
Simultaneously Start/Stop

By using software program or external input signal, the PCI-8164/PXI-8164 can perform simultaneously start/stop function on multi-axis in one card or multi-axis in multi-card. Also, the simultaneously stop function is selectable to be active when some axes are abnormally stopped.

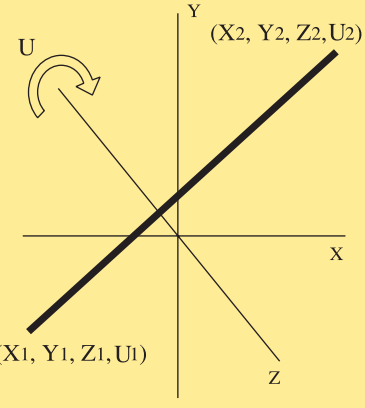
Applications

- *Semiconductor front & back end equipment*
- *TFT/LCD manufacturing equipment*
- *Electronic Assembly and Testing equipment*
- *Automatic Optical Inspection Equipment*
- *Flight/Vehicle Simulator in military and video game*
- *Dispenser Machinery*
- *Cutting or Carving Machinery*

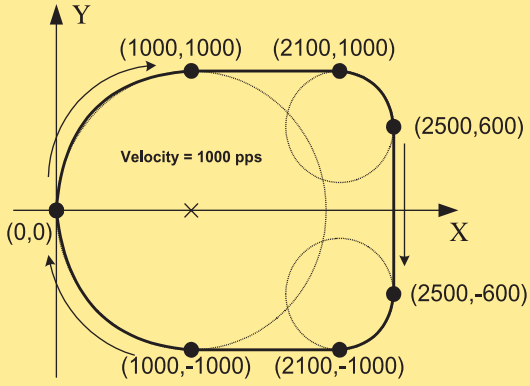
Various Interpolation Modes of PCI-8164/PXI-8164



Circular Interpolation



4 axes Linear Interpolation



Continuous Interpolation

Specifications

Motion

- Number of controllable axes: 4
- Pulse output rate: 0.01 pps to 6.5pps
- Max. Acceleration rate 245Mpps²
- Speed resolution: 16-bit
- Encoder input rate: 6.55MHz under 4xAB phase @ 1M cable
- Encoder counter resolution: 28-bit
- Positioning Range: -134, 217, 728 ~ +134, 217, 727 pulses (28-bit)
- Counters x 4 for each axis
- Comparators x 5 for each axis

Motion Interface I/O Signals

- Position latch input pin: LTC
- Position compare output pin: CMP (15Khz for continuou triggering)
- All I/O pins are differential and 2500V_{RMS} optically isolated
- Incremental encoder signals input pins: EA and EB
- Encoder index signal input: EZ
- Mechanical limit switch signal input pins: ±EL, SD and ORG
- Servomotor interface I/O pins: INP, ALM, ERC
- General DO pin: SVON
- General DI pin: RDY
- Pulser signal input: PA and PB
- Simultaneous Start/Stop Signal I/O Pins: STA and STP

General-Purposed I/O

- 6 TTL level digital output (PCI-8164 only)
- 4DI/4DO (PXI-8164 only)

Ordering Information

PCI-8164	Advanced PCI 4-axis stepper & servo motion control card with high-speed triggering
PXI-8164	Advanced PXI 4-axis stepper & servo motion control card with high-speed triggering
DIN-100S-01	Termination board for general purpose
DIN-814M0	Termination board for Mitsubishi MR-J2S-A servo amplifier
DIN-814M -J3A0	Termination board for Mitsubishi MR-J3-A amplifier
DIN-814PA0	Termination board for Panasonic MINAS A servo amplifier
DIN-814Y0	Termination board for Yaskawa Sigma II amplifier
DIN-814P-A40	Termination board for Panasonic MINAS A4 amplifier

Termination Board

- *DIN-100S-01: General Purpose*

DIN-100S-01

- *DIN-814M0: For Mitsubishi MR-J2S-A Servo amplifier*

DIN-814M0

- *DIN-814M-J3A0: For Mitsubishi MR-J3-A Amplifier*

DIN-814M-J3A0

- *DIN-814PA0: For Panasonic MINAS A Servo amplifier*

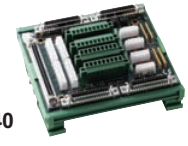
DIN-814PA0

- *DIN-814Y0: For Yaskawa Sigma II Amplifier*

DIN-814Y0

- *DIN-814P-A40: For Panasonic MINAS A4 Amplifier*

DIN-814P-A40



PCI-8164/PXI-8164 Pin Assignment of the 100-pin SCSI-type Connector

VPP	1	51	VPP
GND	2	52	GND
OUT1+	3	53	OUT3+
OUT1-	4	54	OUT3-
DIR1+	5	55	DIR3+
DIR1-	6	56	DIR3-
SVON1	7	57	SVON3
ERC1	8	58	ERC3
ALM1	9	59	ALM3
INP1	10	60	INP3
RDY1	11	61	RDY3
GND	12	62	GND
EA1+	13	63	EA3+
EA1-	14	64	EA3-
EB1+	15	65	EB3+
EB1-	16	66	EB3-
EZ1+	17	67	EZ3+
EZ1-	18	68	EZ3-
VPP	19	69	VPP
GND	20	70	GND
OUT2+	21	71	OUT4+
OUT2-	22	72	OUT4-
DIR2+	23	73	DIR4+
DIR2-	24	74	DIR4-
SVON2	25	75	SVON4
ERC2	26	76	ERC4
ALM2	27	77	ALM4
INP2	28	78	INP4
RDY2	29	79	RDY4
GND	30	80	GND
EA2+	31	81	EA4+
EA2-	32	82	EA4-
EB2+	33	83	EB4+
EB2-	34	84	EB4-
EZ2+	35	85	EZ4+
EZ2-	36	86	EZ4-
PEL1	37	87	PEL3
MEL1	38	88	MEL3
CMP1	39	89	LTC3
SD1	40	90	SD3
ORG1	41	91	ORG3
GND	42	92	GND
PEL2	43	93	PEL4
MEL2	44	94	MEL4
CMP2	45	95	LTC4
SD2	46	96	SD4
ORG2	47	97	ORG4
GND	48	98	GND
GND	49	99	E_24V
GND	50	100	E_24V