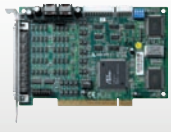
Motion Control Products

Pulse Train Type Motion Control Solution Selection Guide

Model Name	PCI				
					
	PCI-8174	PCI-8158	PCI-8154	PCI-8164	PCI-8102
Controllable Axes	4	8	4	4	2
Support Motor	Stepper / Servo				
Pulse Output Rate (Max)	6.55Mpps				
Encoder Input Frequency (Max)	6.55MHz@1M				
Encoder Counter (28-bit)	4	8	4	4	4
Ring Counter Support	√				
Speed Profile	T/S curve (Non-symmetric acceleration/ deceleration setting are supported)				
Linear Interpolation	Any 2-4 of 4 Axes				
Circular Interpolation	Any 2 Axes				
Helical Interpolation	√			-	
Position Compare & Triggering	√ (Controlled by DSP, up to 2MHz)	√ (With DB-8150, up to 2MHz)		√ (up to 15KHz)	√ (up to 1KHz)
Home Mode	13 (Include Auto Homing)				
Continuous Contouring	√				
Dedicated Moiton I/O	+/-EL/ORG/SVON/INP/ALM/RDY for each axis				
DIO Channels	4DI / 4DO	8DI / 8DO	4DI / 4DO	6 TTL DO	16DI / 16DO
Card Index Switch	√ (0 to 15)			-	√ (0 to 15)
Hardware EMG Stop Input	√			-	-
Backlash Compensation	√			√	-
Synchronous Action(*)	√			-	-
Page No.	4-5	4-7	4-7	4-11	4-13

(*) Please refer to user manual.

PCI			PXI	Model Name
				
PCI-8132	PCI-8134	PCI-8144	PXI-8164	
2	4	4	4	Controllable Axes
Stepper / Servo		Stepper Only	Stepper / Servo	Support Motor
2.4Mpps			6.55Mpps	Pulse Output Rate (Max)
2.4MHz@3M		-	6.55MHz@1M	Encoder Input Frequency (Max)
2	4	-	4	Encoder Counter (28-bit)
-	-	-	√	Ring Counter Support
T/S curve (Non-symmetric acceleration/ deceleration setting are supported)				Speed Profile
2 Axes		-	Any 2-4 of 4 Axes	Linear Interpolation
-		-	2 Axes	Circular Interpolation
-		-	-	Helical Interpolation
√ (Up to 1KHz)	-	-	-	Position Compare & Triggering
3	3 (Hardware)+ 5 (Software)	1	13 (Include Auto Homing)	Home Mode
-	-	-	√	Continuous Contouring
+/-EL/ORG/SVON/INP/ALM/RDY for each axis				Dedicated Moiton I/O
16DI / 16DO	-	8DI / 8DO	4DI / 4DO	DIO Channels
-	-	-	-	Card Index Switch
-	-	√	-	Hardware EMG Stop Input
-	-	-	√	Backlash Compensation
-	-	-	√	Synchronous Action(*)
4-15	4-17	4-19	4-11	Page No.

Motion Control Products

Selection Guide - SSCNET Series Motion Control Solution

PCI-8392


PCI-8366+


PCI-8372+


cPCI-8312H

	SSCNET III		SSCNET II		
Model Name	**PCI-8392**	**PCI-8392H**	**PCI-8366+**	**PCI-8372+**	**cPCI-8312H**
Controllable Axes	16	16	6	12	12
Comminication Protocol	SSCNET III (Cycle Time: 0.888 ms for 16 axes, 0.444 for 8 axes)		SSCNET II (Cycle Time: 0.888 ms)		
Speed Profile	T/S Curve	T/S Curve	T/S Curve		
2D Linear Interpolation	Any 2 Axes	Any 2 Axes	Any 2 Axes		
3D Linear Interpolation	Any 3 Axes	Any 3 Axes	Any 3 Axes		
2D Circular Interpolation	Up to 4D linear interpolation	-	Any 2 Axes		
Position Compare	-	-	2CH/Axis		
Trigger Output Channels	-	-	2 (Via DO Channel, Up to 1KHz)		
Continuous Triggering	-	-	√		
Continuous Interpolation	-	-	√		
Contour Smoothing	-	-	√		
Dedicated Motion I/O	PEL/MEL/ORG are on Mitsubishi J3B servos (CN3). All signal information will be monitored by SSCNET III protocol		PEL/MEL/ORG for every axis		
DI/O Channels	-	Via HSL bus, up to 2016 points	2 DI / 2 DO	2 DI / 2 DO	2 DO
Programmable I/O	-	-	√	√	√
External Encoder Counter	-	-	3 (32-bit)	3 (32-bit)	2 (32-bit)
Analog Input Channel	-	-	-	-	2
Analog Output Channel	-	-	2	2	2
Pulse Output Interface	-	-	-	-	√
Pulse Output Channel	-	-	-	-	2
HSL inside	-	√ (MKY36)	-	-	√ (MKY33)
HSL Network Port	-	1	-	-	2
Page No.	4-23	4-23	4-27	4-27	4-25

Note:

1. *PCI-8366+ has two dedicated digital input channels. However, PEL/MEL/ORG of axis 7 to 12 can be also utilized as digital input channels, for a total of 20 digital input channels.*
2. *If PEL/MEL/ORG are not used in your application, they can be assigned as digital input channels by function call. For details, please refer to the SSCNET manual.*

Selection Guide –Auxiliary Encoder Board Solution


PCI-8136


PCI-8124

Form Factor	**PCI**	**PCI**
Model Name	PCI-8136	PCI-8124
Pulse Output Rate (Max.)	500 kHz	500 kHz
Position Compare	6[1]	6[1]
DI/O Channels	19DI / 7DO	19DI / 7DO
Encoder Counter	6 (32-bit)	6 (32-bit)
Analog I/O	6AI / 6AO	6AI / 6AO
Cable	ACL-102100	ACL-50P
Terminal Board	DIN-100S-01	DIN-50S
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Note: *1. PCI-8136 offers an interrupt signal to let users check the position compare event.*

Motion Control Products

ADLINK offers a powerful, cost-effective, and easy-to-use motion control solution for customers with a platform ready for many industrial applications, such as semiconductor/LCD equipment manufacturers, electrical assembly manufacturers, or packaging applications. Machine manufacturers will benefit from precise positioning and advanced motion control technology.
ADLINK PC-based motion control solutions provide; including pulse train, DSP-based analog, and the SSCNET (Servo System Control Network) series. Our motion control solutions deliver accurate and high performance motion for target objects. Our position comparing and trigger output capabilities match the performance of high-end frame grabbers in carrying out on-the-fly image inspection or line scanning. Distributed motion control solutions are also available. ADLINK motion control solutions provide user-friendly and ready-to-use function library for use under DOS, Windows®, and Linux. Our superior technical support team is always ready to assist you.

Develop System
- MotionCreatorPro™ inside
- Motion parameter assignment for testing
- Debug the system

Run Time Software Support
- Single Axis Motion
- Linear/Circular Interpolated Motion
- Position Compare & Trigger Output
- Sync. Operation, etc.

Hardware Platform
- Pulse Train Type
- DSP-based Analog Type
- SSCNET Series
- Multi-channel Encoder Board
- CompactPCI Solution
- PXI Solution

Feature Overview

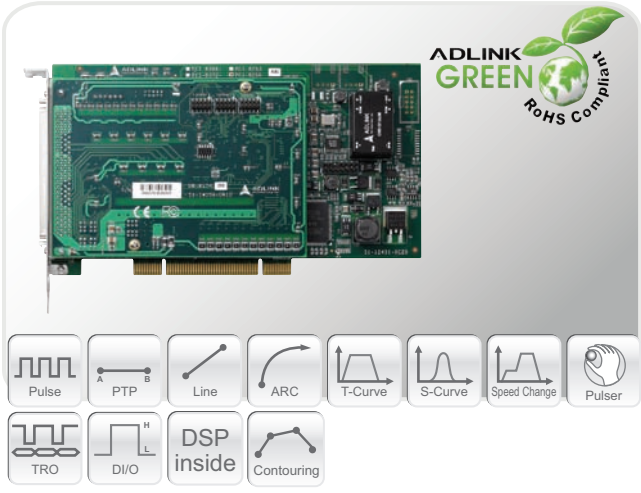
Pulse Train *Pulse train motion cards generate high-frequency digital signals to control servo motors and steppers, matching the performance and precise position of high-performance servo amplifiers.*	Pulse
SSCNET III *SSCNET is a serial connection protocol proposed by Mitsubishi. The SSCNET III protocol has real-time response and absolute synchronization. With this technology, a single board can connect to up to 16 axes. The cycle time is 0.444ms.*	SSCNET III
SSCNET II *SSCNET is a serial connection protocol proposed by Mitsubishi. The SSCNET II protocol has real-time response and absolute synchronization. With this technology, a single board can connect to up to 12 axes. The cycle time is 0.888ms.*	SSCNET II
PTP Motion *Move one axis from position A to position B (Point-to-point motion).*	PTP
Linear Interpolation *Move two or multiple coordinated axes to perform line piece motion.*	Line
Circular Interpolation *Move two coordinated axes to perform arc and circular piece motion.*	ARC
T-Curve/S-Curve Velocity Profile *Users can use T-curve or S-curve for speed profiles. S-curve velocity typically has smoother performance.*	T-Curve S-Curve
Change Speed On-the-fly *Change the rotation speed on-the-fly while the axis is running.*	Speed Change
DSP *DSP, or Digital Signal Processing, allows for time-critical motion control, multiple axes synchronization, and standalone control in a variety of applications.*	DSP inside
Contouring *Some motion controllers can provide hardware-based contouring control in order to provide a variety of trajectories controls for smooth motion.*	Contouring
Card ID *Card identification to support multiple cards in one system.*	Card ID

Manual Pulser Input Interface *Some motion control solutions provide the interface that connects manual pulser input devices, which can be used to move the axis.*	Pulser
Position Compare & Trigger Output (TRO) *By sending several position compare points to the buffer with this feature, the digital signal would be triggered upon reaching each compare position. The high frequency trigger pulse can signal line scan frame grabbers.*	TRO
Closed-Loop Control *Motion control cards can accept feedback signals to perform closed-loop control. Users can tune the control loop gain to get the better positioning or velocity control.*	Closed loop
Absolute Synchronization *Most of the time a pulse train type motion control solution does not provide this feature. However, SSCNet motion controllers entitle users to enjoy this feature, which is especially vital for complicated motion patterns requiring absolute synchronization of multiple axes.*	Sync
Digital I/O Capacities *Digital input and output channels are provided for users.*	DI/O
Analog Output Channel *Some products offer analog output channels for voltage signal.*	AO
Analog Input *Some boards offer analog input channels for voltage signals.*	AI
HSL *HSL is a High Speed Link bus designed specifically for distributed real-time I/O control and motion systems.*	HSL Support
Emergency Input *Emergency Input is typically used to immediately stop a moving stage when an emergency occurs. This is typically implemented by an external button to open the circuit and stop the controller from sending commands to servo/stepper motors*	Emergency Input
Security *This function offers hardware security protection for software developed by the system integrator.*	Security

PCI-8174

DSP Firmware ODM by ADLINK is possible

Advanced DSP-based 4-axis Stepper & Servo Motion Control Card



Features

- *TI TMS320C6711 200MHz DSP on-board*
- *DSP firmware customizable*
- *Time-critical motion and standalone control*
- *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*
- *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*
- *Supports up to 12 cards in one system*
- *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*
- *Security protection for user's program*
- *Manual pulser input interface*

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

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 DSP-based 4-axis Motion Controller

The ADLINK PCI-8174 offers an on-board DSP with motion ASIC to easily allow implementation of time-critical motion sequences. The DSP will execute the sequence via the motion ASIC without consuming CPU resources, making it ideal for interrupt control and synchronization among multiple axes. All processes are executed in the hardware layer, so the PCI-8174 operates as a standalone controller.

Motion Control Feature

The PCI-8174 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-8174 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-8174 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-8174 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 without time delay problem.

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-8174 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-8174 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-8174 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*

Specifications

Motion

- Number of controllable axes: 4
- Pulse output rate: 0.01pps to 6.5 Mpps
- Max. Acceleration rate 245 $Mpps^2$
- Speed resolution: 16-bit
- Encoder input rate: 6.55MHz under 4 x AB 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
- Position clear input pin: CLR
- Position change input pin: PCS
- Emergency Stop input pin : EMG
- 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, RDY, SVON
- Pulser signal input: PA and PB
- Simultaneous Start/Stop Signal I/O Pins: STA and STP

General-Purposed I/O

- 4 channel open collector DO
- 4 channel Isolated DI (LTC/CLR/PCS/SD/EMG)

Ordering Information

PCI-8174	Advanced DSP-based 4-axis stepper & servo motion control card
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 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

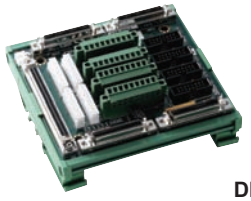
• *DIN-100S-01: General Purpose*

DIN-100S-01

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

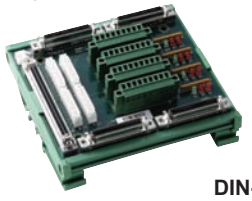
DIN-814M0

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



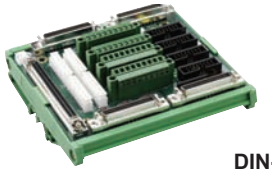
DIN-814M-J3A0

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



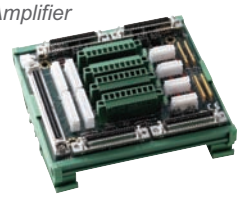
DIN-814PA0

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



DIN-814Y0

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



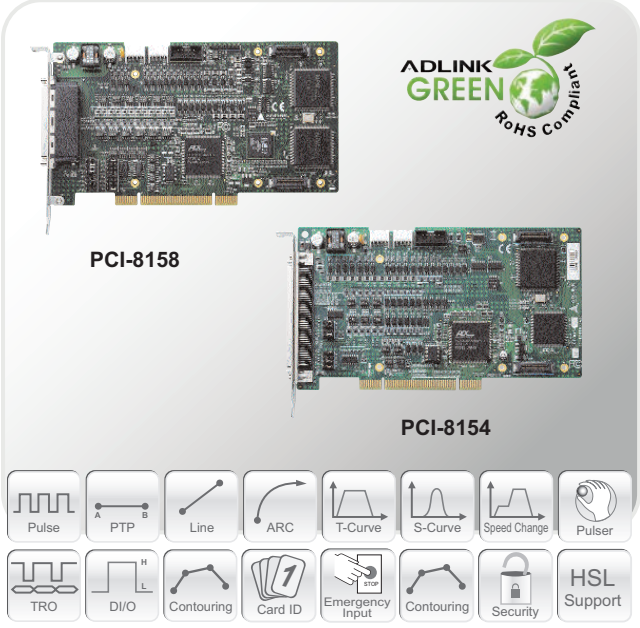
DIN-814P-A40

PCI-8174 Pin Assignment of the 100-pin SCSI-type Connector

VPP	1	51	VPP
EGND	2	52	EGND
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
EGND	12	62	EGND
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	EGND
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
EGND	30	80	EGND
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
GDI0	39	89	GDI2
DO0	40	90	DO3
ORG1	41	91	ORG3
GND	42	92	EGND
PEL2	43	93	PEL4
MEL2	44	94	MEL4
GDI1	45	95	GDI3
DO1	46	96	DO4
ORG2	47	97	ORG4
EGND	48	98	GND
EGND	49	99	E_24V
EGND	50	100	E_24V

PCI-8158/PCI-8154

Advanced 8/4 -axis Stepper & Servo Motion Control Card with Modular Design



Features

- 3 axes helical interpolation
- Hardware-controlled position compare and trigger (with DB-8150, up to 1MHz)
- ECAM (Electronic CAM) Control (with DB-8152)
- One HSL network support (with DB-8151)
- One Motionnet master support (with DB-8153)
- 32-bit PCI bus, Rev. 2.2, 33MHz
- High density (200-pin) 8-axis motion controller
- 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
- 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
- Supports up to 12 cards in one system
- Hardware backlash compensator
- Softwares limit function
- Hardware emergency input
- Security protection for user's program
- 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 100 thread safe API functions

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
- Packaging industry (with DB-8152)
- Timber industry (with DB-8152)
- Materials Handling technology (with DB-8152)
- Printing machine technology (with DB-8152)

Introduction

Advanced 8-axis Motion Controller

ADLINK PCI-8158 is an advanced 8-axis motion control card. Compared with the PCI-8132/PCI-8134 series, PCI-8158 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. With DB accessories, users can extend the functionality to high-speed triggering, distributed I/O control or ECAM control.

Velocity or Position Override

The PCI-8158/PCI-8154 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-8158/PCI-8154 provides linear interpolation by any 2, any 3, or even all-4 axes. Any 2 axes can perform circular interpolation. Besides, linear/linear or circular/circular interpolated moves can be executed at the same time.

Continuous Contouring

The pre-register architecture of PCI-8158/PCI-8154 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 (with DB-8150)

The PCI-8158/PCI-8154 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 SDRAM can store amount of comparing point (2 million points, up to 1MHz).

One HSL Network Support (with DB-8151)

With DB-8151 accessories, users can extend the functionality to one HSL network and control I/O from remote site. Details please refer to Chapter 6.

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-8158/PCI-8154 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-8158/PCI-8154 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-8158/PCI-8154 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.

Hardware Emergency Input

The PCI-8158/PCI-8154 provides hardware emergency control with the cable wiring. When the emergency button is pressed, it triggers this function and the motion controller will cease sending pulses. This function is ideal protection for system designers.

Security Protection

The PCI-8158/PCI-8154 offers hardware security protection for system designers' software.

Specifications

Motion

Number of controllable axes: 8
Pulse output rate: 0.01pps to 6.5Mpps
Max. acceleration rate 245Mpps^2
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
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, RDY, SVON
General DO pin: DO x 8 for DO/CMP
General DI pin: GDI x 8 for DI/LTC/PCS/SD/CLR/EMG
Pulser signal input: PA and PB
Simultaneous Start/Stop Signal I/O Pins: STA and STP

Software Support

Windows® Platform

Available for Windows Vista32/XP/2000
VB/VC++/BCB/Delphi/VB.NET 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	

Ordering Information

PCI-8158	Advanced 8-axis stepping & servo motion control card
PCI-8154	Advanced 4-axis stepping & servo motion control card
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
Cable	ACL-102100

Termination Board

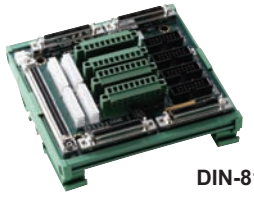
- *DIN-100S-01: General Purpose*

DIN-100S-01

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

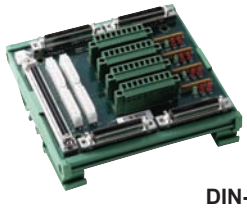
DIN-814M0

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



DIN-814M-J3A0

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

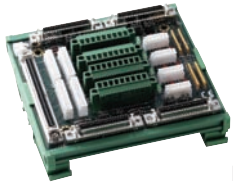


DIN-814PA0

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

DIN-814Y0

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



DIN-814P-A40

PCI-8158/PCI-8154 Pin Assignment of 100-pin mini SCSI type Connector

VDD	1	51	VDD
EXGND	2	52	EXGND
OUT0+	3	53	OUT2+
OUT0-	4	54	OUT2-
DIR0+	5	55	DIR2+
DIR0-	6	56	DIR2-
SVON0	7	57	SVON2
ERC0	8	58	ERC2
ALM0	9	59	ALM2
INP0	10	60	INP2
RDY0	11	61	RDY2
EXGND	12	62	EXGND
EA0+	13	63	EA2+
EA0-	14	64	EA2-
EB0+	15	65	EB2+
EB0-	16	66	EB2-
EZ0+	17	67	EZ2+
EZ0-	18	68	EZ2-
VDD	19	69	VDD
EXGND	20	70	EXGND
OUT1+	21	71	OUT3+
OUT1-	22	72	OUT3-
DIR1+	23	73	DIR3+
DIR1-	24	74	DIR3-
SVON1	25	75	SVON3
ERC1	26	76	ERC3
ALM1	27	77	ALM3
INP1	28	78	INP3
RDY1	29	79	RDY3
EXGND	30	80	EXGND
EA1+	31	81	EA3+
EB1-	32	82	EA3-
EB1+	33	83	EB3+
EB1-	34	84	EB3-
EZ1+	35	85	EZ3+
EZ1-	36	86	EZ3-
PEL0	37	87	PEL2
MEL0	38	88	MEL2
GDI0	39	89	GDI2
DO0	40	90	DO2
ORG0	41	91	ORG2
EXGND	42	92	EXGND
PEL1	43	93	PEL3
MEL1	44	94	MEL3
GDI1	45	95	GDI3
DO1	46	96	DO3
ORG1	47	97	ORG3
EXGND	48	98	EXGND
EXGND	49	99	E_24V
EXGND	50	100	E_24V

DB-8150

High-speed Trigger Board

Features

- *High performance 125MHz FPGA inside*
- *On-board SDRAM for comparing point table (1M points for each channel)*
- *Simultaneously 8 channel TTL compatible differential output*
- *One general-purpose digital output channel , up to 20mA*
- *Two general-purpose digital input channel, 100MHz response time*
- *Two high speed digital input channel*
- *One 32-bit comparator for position comparing*
- *Trigger output pulse polarity and pulse width adjustable*
- *Two 32-bit position counters by two encoder signals EA/EB input from carrier board*
- *Two encoder signals EA/EB input from daughter board*
- *Counter clear signal from by EZ input from carrier board*
- *Support trigger output toggle mode*
- *Equal and window condition comparison available*
- *Linear function and point table mode for continuous trigger output*
- *Counter latched by digital input pins*

Specifications

Counter

FPGA on-board to process the trigger function without consuming CPU	
Trigger Speed	Up to 1MHz
Trigger Points	2M * 32-bit
Dimension	96.42 (L) x 62 (W) mm
Operating Temperature	0 to 60˚C
Storage Temperature	-20 to +80˚C
Power Consumption	+3.3V @250mA typical, +5V @100mA typical

Connections

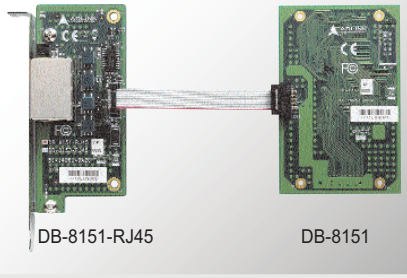
No.	Name Function (Axis)	No.	Name Function (Axis)
1	CMP0+ Compare output+	14	CMP0- Compare output-
2	CMP1+ Compare output+	15	CMP1- Compare output-
3	CMP2+ Compare output+	16	CMP2- Compare output-
4	CMP3+ Compare output+	17	CMP3- Compare output-
5	CMP4+ Compare output+	18	CMP4- Compare output-
6	CMP5+ Compare output+	19	CMP5- Compare output-
7	CMP6+ Compare output+	20	CMP6- Compare output-
8	CMP7+ Compare output+	21	CMP7- Compare output-
9	EGND Ext. Ground	22	EGND Ext. Ground
10	DOOpen collectoroutput	23	DO_COMOutput COM
11	EXGND Ext. Ground	24	EXGND Ext. Ground
12	DI_0 Digital Input Ch_0	25	DI_1 Digital Input Ch_1
13	N/A Empty	26	N/A Empty

Ordering Information

DB-8150	High-speed trigger board

DB-8151

Single HSL Master Controller Daughter Board



Features

- *Programmable timer interrupt*
- *RJ-45 phone jack for easy installation (with DB-8151-RJ45)*
- *Attached with PCI-815x can save PCI slots and take advantage of 4 to 8-axis control and distributed I/O together*
- *Software selectable transmission speed and mode*
- *Supports HSL-HUB3/ HSL-Repeater*
- *DI data transmission interrupt*

Specifications

Counter

Master controller ASIC	
Build-in 32KB RAM	
Full duplex, RS-485 with transformer isolation	
Transmission speed	3/6/12Mbps
Dimension	96.42 (L) x 62 (W) mm
Operating Temperature	0˚ to 60˚C
Storage Temperature	-20 to +80˚C
Power Consumption	+3.3V @250mA typical, +5V @100mA typical

Connections

PIN NO.	PIN OUT
PIN 1	+5V
PIN 2	FG
PIN 3	DG
PIN 4	LED Signal
PIN 5	RXD1
PIN 6	TXD
PIN 7	RXD2
PIN 8	TXE
PIN 9	DG
PIN 10	FG

CN3 is the major connector of DB-8151.

Connections

PIN NO.	PIN OUT
PIN 1	NC
PIN 2	NC
PIN 3	RX+
PIN 4	TX-
PIN 5	TX+
PIN 6	RX-
PIN 7	NC
PIN 8	NC

RJ1 is the RJ45 connector of DB-8151-RJ45.

Ordering Information

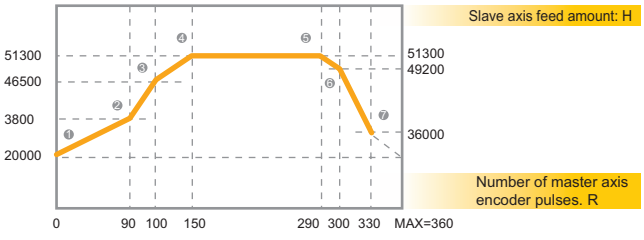
DB-8151	Single HSL master controller daughter board
DB-8151-RJ45	Bracket with RJ-45 phone jack for DB-8151

DB-8152

Electronic CAM Slave Motion Solution Daughter Board

Features

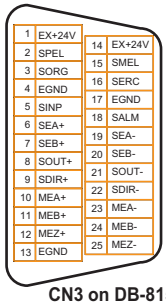
- *Up to 1MHz from encoder signals of the master axis*
- *Support OUT/DIR and CW/CCW pulse output mode*
- *Support 4 x AB phase and CW/CCW pulse input mode*
- *Programmable Interrupt*
- *CAM table setting by API function*



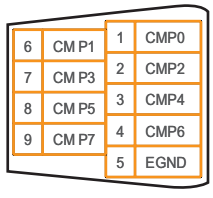
Specifications

Counter

D-Sub 9 and 25 bracket required when using the DB-8152	
D-Sub 25 for master encoder and slave encoder, pulse out and DIO with isolation	
D-Sub 9 for CMP output with 2 high speed and 6 general speed	
Dimension	6.42 (L) x 62 (W) mm
Operating Temperature	0 to 60˚C
Storage Temperature	-20 to +80˚C
Power Consumption	+3.3V @200 mA typical, +5V @100 mA typical



CN3 on DB-8152 Bracket



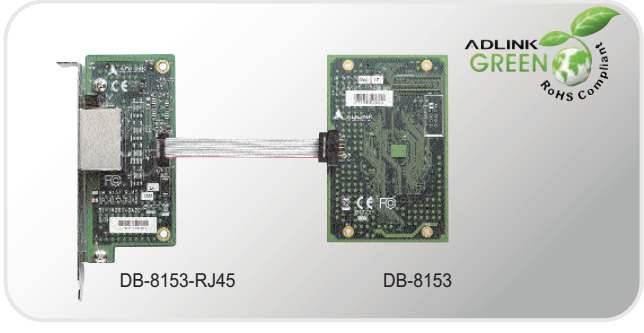
CN4 on DB-8152 Bracket

Ordering Information

DB-8152	Electronic CAM slave motion solution daughter board

DB-8153

Single Motionnet Master Controller Daughter Board



Features

- *RJ-45 phone jack for easy installation (with DB-8153-RJ45)*
- *Attached with PCI-815x can save PCI slots and take advantage of distributed motion controller and on-bard motion controller together*
- *Software selectable transmission speed*

Ordering Information

DB-8151	Single HSL master controller daughter board
DB-8151-RJ45	Bracket with RJ-45 phone jack for DB-8151

Specifications

Counter

Motionnet Master controller ASIC	
Half duplex, RS-485 with transformer isolation	
Transmission speed	2.5/5/10/20 Mbps (Default: 20Mbps)
Dimension	96.42 (L) x 62 (W) mm
Operating Temperature	0 to 60˚C
Storage Temperature	-20 to +80˚C
Power Consumption	+3.3V @250 mA typical, +5V @100 mA typical

Connections

CN3 is the major connector of DB-8151.

PIN NO.	PIN OUT
PIN 1	+5V
PIN 2	FG
PIN 3	DG
PIN 4	LED Signal
PIN 5	RXD1
PIN 6	TXD
PIN 7	RXD2
PIN 8	TXE
PIN 9	DG
PIN 10	FG

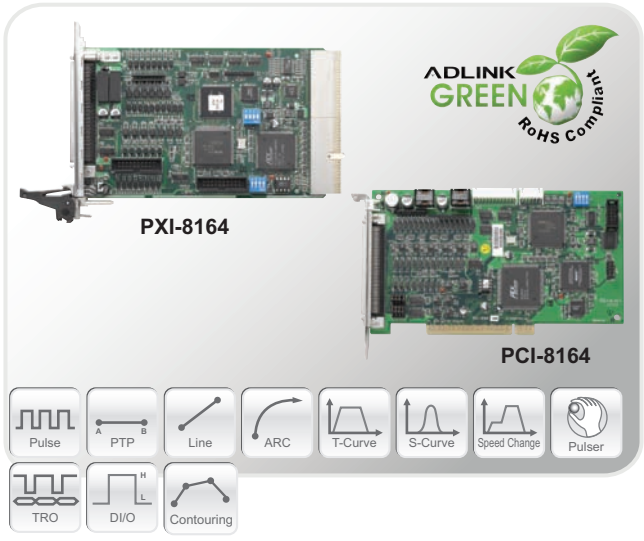
Connections

RJ1 is the DB-8153-RJ45 RJ45 connector.

PIN NO.	PIN OUT
PIN 1	NC
PIN 2	NC
PIN 3	NC
PIN 4	Data-
PIN 5	Data+
PIN 6	NC
PIN 7	NC
PIN 8	NC

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.

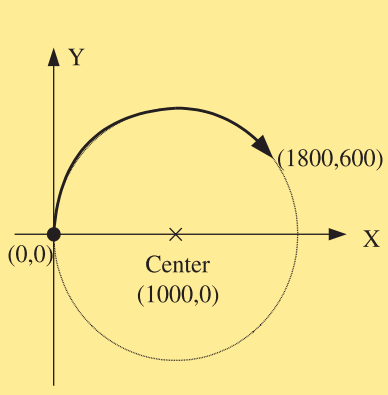
Simultaneously Start/Stop

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.

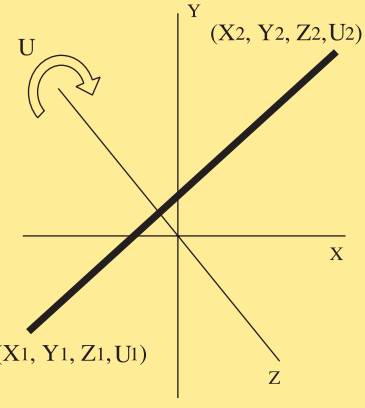
Applications

- *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*

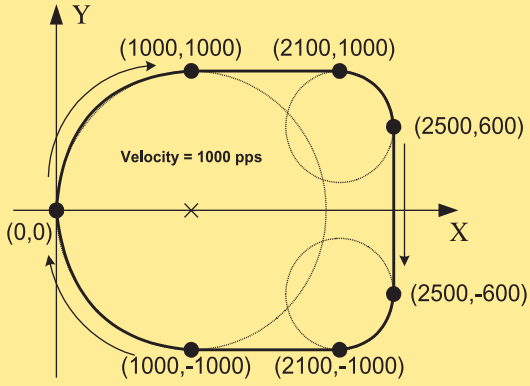
Various Interpolation Modes of PCI-8164/PXI-8164



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*

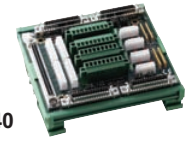
DIN-814PA0

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

DIN-814Y0

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

DIN-814P-A40

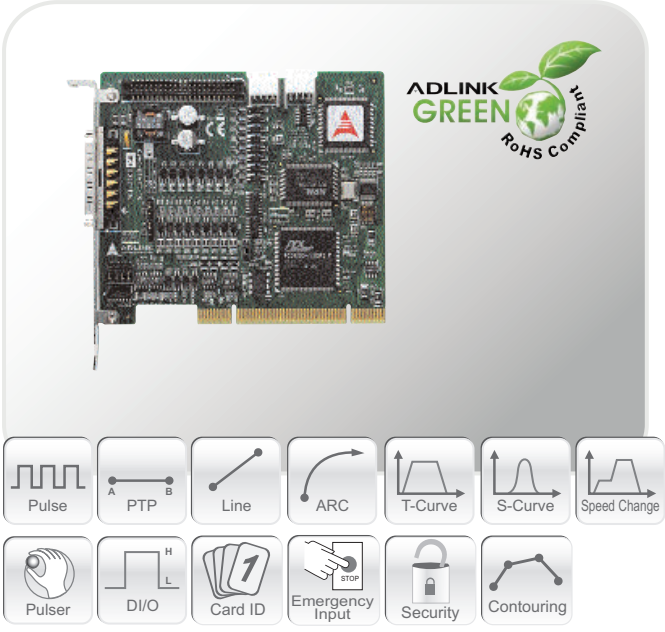


PCI-8164/PXI-8164 Pin Assignment of the 100-pin SCSI-type Connector

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

PCI-8102

Advanced 2-axis Stepper & Servo Motion Control Card



Features

- *32-bit PCI bus, Rev. 2.2, 33MHz*
- *Pulse output rate up to 6.55MHz*
- *Pulse output options: OUT/DIR, CW/CCW*
- *2-axis linear/circular interpolation*
- *Continuous interpolation*
- *Position/speed change on-the-fly*
- *13 home return modes and auto home search*
- *Hardware position compare*
- *High speed position latch function*
- *Programmable acceleration and deceleration time*
- *Trapezoidal and S-curve velocity profiles*
- *Multi-axis, simultaneous start/stop*
- *Programmable interrupt sources*
- *Supports up to 12 cards in one system*
- *Hardware backlash compensator*
- *Softwares limit function*
- *On-board GPIO 16IN/16OUT (P2 Connector)*
- *Card index switch setting*
- *Hardware emergency input*
- *Security protection for user's program*
- *Easy interface to any stepping motors, AC or DC servo, linear or rotary motors which have pulse train input mode*
- *All digital inputs and outputs are 2500V_{RMS} isolated*
- *Manual pulser input interface*
- *More than 100 thread safe API functions*

Ordering Information

PCI-8102	Advanced 2-axis stepper & servo motion control card
DIN-68M-J3A0	Termination board for Mitsubishi MR-J3-A servo amplifier with 68-pin SCSI-II connector
DIN-68M-J2A0	Termination board for Mitsubishi MR-J2S servo amplifier with 68-pin SCSI-II connector
DIN-68Y-SGII0	Termination board for Yaskawa Sigma II servo amplifier with 68-pin SCSI-II connector
DIN-68P-A40	Termination board for Panasonic MINAS A4 servo amplifier with 68-pin SCSI-II connector

Introduction

Advanced 2-axis Motion Controller

ADLINK PCI-8102 is an advanced 2-axis motion control card. Compared with the PCI-8132/PCI-8134 series, PCI-8102 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-8102 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 program.

Linear & Circular Interpolation

The PCI-8102 provides 2-axis linear/circular interpolation.

Continuous Contouring

The pre-register architecture of PCI-8102 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.

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-8102 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-8102 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-8102 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.

Hardware Emergency Input

The PCI-8102 provides hardware emergency control with the cable wiring. When the emergency button is pressed, it triggers this function and the motion controller will cease sending pulses. This function is ideal protection for system designers.

Security Protection

PCI-8102 offers hardware security protection for system designers' software.

Specifications

Motion

- Number of controllable axes: 2
- Pulse output rate: 0.01pps to 6.5Mpps
- Max. Acceleration rate 245Mpps^2
- Speed resolution: 16-bit
- Encoder input rate: 6.55MHz under 4 x AB 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
- 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, SVON, RDY
- General DO pin: DO x 16 (P2 Connector)
- General DI pin: DI x 16 (P2 Connector)
- Pulser signal input: PA and PB
- Simultaneous Start/Stop Signal I/O Pins: STA and STP

Software Support

Windows® Platform

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

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 5, kernel 2.6.15
- Fedora Core 3, kernel 2.6.9
- Fedora Core 4, kernel 2.6.11

Pin Assignment of 68-pin SCSI type Connector

VPP	1	35	VPP
EXGND	2	36	EXGND
OUT0+	3	37	OUT1+
OUT0-	4	38	OUT1-
DIR0+	5	39	DIR1+
DIR0-	6	40	DIR1-
SVON0 41	7	41	SVON1
ERC0	8	42	ERC1
ALM0	9	43	ALM1
INP0	10	44	INP1
RDY0	11	45	RDY1
EA0+	12	46	EA1+
EA0-	13	47	EA1-
EB0+	14	48	EB1+
EB0-	15	49	EB1-
EZ0+	16	50	EZ1+
EZ0-	17	51	EZ1-
VPP	18	52	VPP
N/C	19	53	EXGND
PEL0	20	54	PEL1
MEL0	21	55	MEL1
EXGND	22	56	EXGND
LTC/SD/PCS0/ CLR0	23	57	LTC/SD/PCS1/ CLR1
ORG0	24	58	ORG1
N/C	25	59	EXGND
PA+_ISO	26	60	EMG
PA-_ISO	27	61	DIN0
PB+_ISO	28	62	DIN1
PB-_ISO	29	63	DIN2
CMP0	30	64	DIN3
CMP1	31	65	DOUT0
EXGND	32	66	DOUT1
EXGND	33	67	EXGND
EX+24V	34	68	EX+24V

Pin Assignment of BOX HEAD Connector

EXGND	1	23	DO0
EXGND	2	24	DO1
DIN0	3	25	DO2
DIN1	4	26	DO3
DIN2	5	27	EXGND
DIN3	6	28	EXGND
DIN4	7	29	DO4
DIN5	8	30	DO5
VDD	9	31	DO6
EXGND	10	32	DO7
DIN6	11	33	DO8
DIN7	12	34	DO9
DIN8	13	35	EXGND
DIN9	14	36	VDD
DIN10	15	37	DO10
DIN11	16	38	DO11
EXGND	17	39	DO12
EXGND	18	40	DO13
DIN12	19	41	DO14
DIN13	20	42	DO15
DIN14	21	43	EXGND
DIN15	22	44	EXGND

PCI-8132

Entry-level 2-axis Stepper & Servo Motion Control Card with 32-CH GPIO

Features

- 32-bit PCI bus, Rev2.2, 33MHz
- Pulse output rate up to 2.4MHz
- Pulse output options: OUT/DIR, CW/CCW
- 2 axes linear interpolation
- Programmable acceleration and deceleration time
- Trapezoidal and S-curve velocity profiles
- Easy interface to any stepping motors, AC or DC servo, linear or rotary motors which have pulse train input mode
- 28-bit up/down counter for incremental encoder
- All digital inputs and outputs are 2500V_{RMS} isolated
- Change speed on-the-fly
- Multi-axis, simultaneous start/stop
- Dedicated I/O interface for PEL, MEL, ORG, EZ, INP, ERC, ALM
- Programmable interrupt sources
- Manual pulser input interface
- Supports up to 12 cards in one system
- Hardware position compare and trigger pulse output
- 16-CH general purpose input/16-CH general purpose output
- 3 home return modes
- More than 100 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

LabVIEW® VIs

The motion VIs of PCI-8132 for LabVIEW is available.

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

PCI Interface

ADLINK PCI-8132 is a 2-axis motion control card based on PCI bus. The PCI interface provides plug-and-play feature that is the key to easy maintenance. The maximum number of cards in one system is 12 cards with capability of controlling 24 motors.

Motion Control Principle

The PCI-8132 can generate high frequency pulse train. The frequency of the pulse train controls the motor speed; the number of pulse controls the motor position. The differential input/output signals reduce noise interference. The command output options, including DIR/OUT mode and CW/CCW mode, provide an easy access to various stepper or servo amplifier.

Velocity Profile

The PCI-8132 offers versatile trajectory planning ability. The acceleration and deceleration time are programmable. The S-curve helps to avoid mechanism vibration. The hardware linear interpolation between two axes is powerful to reduce software computation effort.

Operation Modes

Various operation modes are available, such as continuous velocity motion, absolute move, relative move, manual pulser mode, simultaneous move, change speed on the fly, linear interpolation, and home return.

Encoder Interface

Incremental encoder interface is used for position feedback. The encoder counters provides the position information to correct the position error generated by inaccurate mechanical transmissions. The differential-type encoder feedback avoids noise interference. The 28-bit counters cover the position range for most applications.

Mechanism Interface

The pre-defined limit switch sensors on table are widely used to protect the mechanism. The dedicated I/O interface for end-limit, slow-down point, and origin is very useful for system integration.

Servo Amplifier Interface & GPIO

Some servo motor drivers provide interfacing signals such as in-position (INP), alarm (ALM), error counter clear (ERC), servo ready signals. These signal interfaces are supported.

Pulser Interface

The handle-wheel pulser is widely used in machine applications, such as NC machine. Four pulser interfaces are available through the CN3 connector (10-pin).

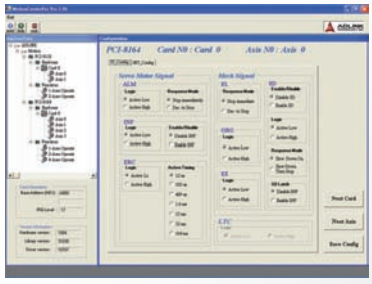
Interrupt Events

Many hardware status can be used as interrupt events, such as limit switch, alarm, moving home ready, one movement finished, and so on.

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

Control Axis Setting By Tree Directory



Speed Profile Preview

Multiple Axes Access within One Window

MotionCreatorPro™

Specifications

Motion

- Number of controllable axes: 2
- Max. number of cards in one system: 12
- 0.03pps to 2.4Mpps programmable DIR/OUT, CW/CCW pulse command output
- Max. acceleration rate: 91Mpps^2
- Speed resolution: 16-bit
- One 28-bit counter for encoder input of each axis
- Positioning range: -134,217,728 to +134,217,727 (28-bit)
- Encoder input frequency: 2.4MHz @ 3M cable

Motion Interface I/O Signals

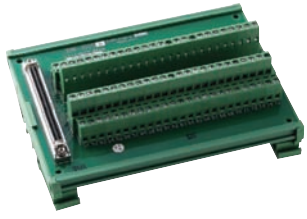
- All I/O pins are 2500V$_{RMS}$ optically isolated
- Incremental encoder signals input pins: DIR/OUT, EA/EB
- Encoder index signal input: EZ
- Mechanical Limit/Switch signal input pins: ±EL, ±SD and ORG
- Servomotor Interface I/O pins: INP, ALM, ERC
- General DO pin: SVON
- General DI pin: RDY
- Pulser signal input: PA and PB
- Simultaneous signal I/O pins: STA and STP
- Position compare output pin: CMP (1 KHz for continous triggering)

General-Purposed I/O

- 16-CH input & 16-CH output

Termination Board

• *DIN-100S-01: General Purpose*



DIN-100S-01

• *DIN-812M0: For Mitsubish MR-J2S-A Servo Amplifier*

DIN-812M0

Ordering Information

PCI-8132	Entry-level 2-axis stepper & servo motion control card with GPIO
DIN-812M0	Termination board for Mitsubishi MR-J2S-A servo amplifier
DIN-100S-01	Termination board for general purpose
Cable	ACL-102100

PCI-8132 Pin Assignment of the 100-pin SCSI-type Connector

VPP+5V	1	51	DO COM+
EXGND	2	52	EXGND
OUT 1+	3	53	DO0
OUT 1-	4	54	DO1
DIR 1+	5	55	DO2
DIR 1-	6	56	DO3
SVON1	7	57	DO4
ERC1	8	58	DO5
ALM1	9	59	DO6
INP1	10	60	DO7
RDY1	11	61	DO8
EXGND	12	62	DO9
EA1+	13	63	DO10
EA1-	14	64	DO11
EB1+	15	65	DO12
EB1-	16	66	DO13
EZ1+	17	67	DO14
EZ1-	18	68	DO15
VPP+5V	19	69	EXGND
EXGND	20	70	EXGND
OUT 2+	21	71	DI COM+
OUT 2-	22	72	DI COM-
DIR 2+	23	73	DI0
DIR 2-	24	74	DI1
SVON2	25	75	DI2
ERC2	26	76	DI3
ALM2	27	77	DI4
INP2	28	78	DI5
RDY2	29	79	DI6
EXGND	30	80	DI7
EA2+	31	81	DI8
EA2-	32	82	DI9
EB2+	33	83	DI10
EB2-	34	84	DI11
EZ2+	35	85	DI12
EZ2-	36	86	DI13
PEL1	37	87	DI14
MEL1	38	88	DI15
PSD1	39	89	EXGND
MSD1	40	90	EXGND
ORG1	41	91	PA+
EXGND	42	92	PA-
PEL2	43	93	PB+
MEL2	44	94	PB-
PSD2	45	95	EXGND
MSD2	46	96	CMP1
ORG2	47	97	CMP2
EXGND	48	98	EXGND
EXGND	49	99	VPP+24V
EXGND	50	100	VPP+24V

PCI-8134

Entry-level 4-axis Stepper & Servo Motion Control Card

Features

- 32-bit PCI bus, Rev. 2.2, 33MHz
- Pulse output rate up to 2.4MHz
- Pulse output options: OUT/DIR, CW/CCW
- 2 axes linear interpolation
- Programmable acceleration and deceleration time
- Trapezoidal and S-curve velocity profiles
- Easy interface to any stepping motors, AC or DC servo, linear or rotary motors
- 28-bit up/down counter for incremental encoder
- All digital inputs and outputs are 2500V_{RMS} isolated
- Change speed on-the-fly
- Multi-axis, simultaneous start/stop
- Dedicated I/O interface for PEL, MEL, ORG, EZ, INP, ERC, ALM
- Programmable interrupt sources
- Manual pulser input interface
- Supports up to 12 cards in one system
- 3 ASIC-based home return modes and 9 software-based home return modes
- More than 75 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

LabVIEW® VIs

The motion VIs of PCI-8134 for LabVIEW is available.

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

PCI Interface

ADLINK PCI-8134 is a 4-axis motion control card based on PCI bus. The PCI interface provides plug-and-play feature that is the key to easy maintenance. The maximum number of cards in one system is 12 cards with capability of controlling 48 motors.

Motion Control Principle

The PCI-8134 can generate high frequency pulse train. The frequency of the pulse train controls the motor speed; the number of pulse controls the motor position. The differential input/output signals reduce noise interference. The command output options, including DIR/OUT mode and CW/CCW mode, provide an easy access to various stepper or servo motor drivers.

Velocity Profile

The PCI-8134 offers versatile trajectory planning ability. The acceleration and deceleration time are programmable. The S-curve helps to avoid mechanism vibration. The hardware linear interpolation between two axes is powerful to reduce software computation effort.

Operation Modes

Various operation modes are available, such as continuous velocity motion, absolute move, relative move, manual pulser mode, simultaneous move, change speed on the fly, linear interpolation, and home return.

Encoder Interface

Incremental encoder interface is used for position feedback. The encoder counters provides the position information to correct the position error generated by inaccurate mechanical transmissions. The differential-type encoder feedback avoids noise interference. The 28-bit counters cover the position range for most applications.

Mechanism Interface

The pre-defined limit switch sensors on table are widely used to protect the mechanism. The dedicated I/O interface for end-limit, slow-down point, and origin is very useful for system integration.

Servo Drive Interface & GPIO

Some servo motor drivers provide interfacing signals such as in-position (INP), alarm (ALM), error counter clear (ERC), servo ready signals. These signal interfaces are supported.

Pulser Interface

The handle-wheel pulser is widely used in machine applications, such as NC machine. Four pulser interfaces are available through the CN3 connector (10-pin).

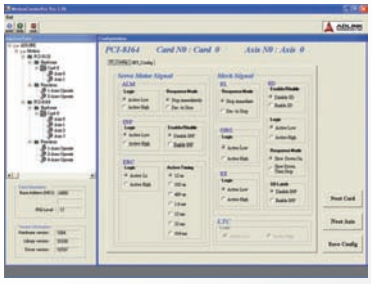
Interrupt Events

Many hardware status can be used as interrupt events, such as limit switch, alarm, moving home ready, one movement finished, and so on.

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

Control Axis Setting By Tree Directory



Speed Profile Preview

Multiple Axes Access within One Window

MotionCreatorPro™

Specifications

Motion

- Number of controllable axes: 4
- Max. number of cards in one system: 12
- 0.03 pps to 2.4 Mpps programmable DIR/OUT, CW/CCW pulse command output
- Max. acceleration rate: 91 MPPS^2
- Speed resolution: 16-bit
- One 28-bit counter for encoder input of each axis
- Positioning range: -134,217,728 to +134,217,727 (28-bit)
- Encoder input frequency: 2.4MHz @ 3M cable

Motion Interface I/O Signals

- All I/O pins are 2500V$_{RMS}$ optically isolated
- Incremental encoder signals input pins: DIR/OUT, EA/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 signal I/O pins: STA and STP

Ordering Information

PCI-8134	Entry-level 4-axis stepper & servo motion control card
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 with 1M cable
DIN-814Y0	Termination board for Yaskawa Sigma II amplifier
DIN-814P-A40	Termination board for Panasonic MINAS A4 amplifier
Cable	ACL-102100

Termination Board

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

DIN-100S-01

- *DIN-814M0: For Mitsubish 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-8134 Pin Assignment of the 100-pin SCSI-type Connector

EX+5V	1	51	EX+5V
EXGND	2	52	EXGND
OUT 1+	3	53	OUT 3+
OUT 1-	4	54	OUT 3-
DIR 1+	5	55	DIR 3+
DIR 1-	6	56	DIR 3-
SVON1	7	57	SVON3
ERC1	8	58	ERC3
ALM1	9	59	ALM3
INP1	10	60	INP3
RDY1	11	61	RDY3
EXGND	12	62	EXGND
EA1+	13	63	EA3+
EA1-	14	64	EA3-
EB1+	15	65	EB3+
EB1-	16	66	EB3-
EZ1+	17	67	EZ3+
EZ1-	18	68	EZ3-
EX+5V	19	69	EX+5V
EXGND	20	70	EXGND
OUT 2+	21	71	OUT 4+
OUT 2-	22	72	OUT 4-
DIR 2+	23	73	DIR 4+
DIR 2-	24	74	DIR 4-
SVON2	25	75	SVON4
ERC2	26	76	ERC4
ALM2	27	77	ALM4
INP2	28	78	INP4
RDY2	29	79	RDY4
EXGND	30	80	EXGND
EA2+	31	81	EA4+
EA2-	32	82	EA4-
EB2+	33	83	EB4+
EB2-	34	84	EB4-
EZ2+	35	85	EZ4+
EZ2-	36	86	EZ4-
+EL1	37	87	EL3+
+EL1	38	88	EL3-
+SD1	39	89	SD3+
-SD1	40	90	SD3-
ORG1	41	91	ORG3
EXGND	42	92	EXGND
+EL2	43	93	EL4+
+EL2	44	94	EL4-
+SD2	45	95	SD4+
-SD2	46	96	SD4-
ORG2	47	97	ORG4
EXGND	48	98	EXGND
EXGND	49	99	EX+24V
EXGND	50	100	EX+24V

cPCI-8168

Advanced 6U CompactPCI 8-axis Motion Control Card with One HSL Network Inside

Features

- *32-bit CompactPCI, PICMG 2.0 Rev 2.1*
- *6U ComactPCI Form factor*
- *Pulse output rate up to 6.5MHz*
- *Pulse output options: OUT/DIR, CW/CCW, AB Phase*
- *2~4 axes linear interpolation*
- *2 axes circular interpolation*
- *Multi-axis continuous interpolation*
- *Programmable acceleration and deceleration time*
- *Trapezoidal and S-curve velocity profiles*
- *Easy interface to any stepping motors, AC or DC servo, linear or rotary motors*
- *28-bit up/down counter for incremental encoder of each axis*
- *All digital input or output signals are 2500V$_{DC}$ isolated*
- *Change speed/position on-the-fly*
- *Simultaneously start/stop on multiple axes*
- *Supports up to 6 cards in one system (48 axes)*
- *High speed position compare and trigger output*
- *4 single-ended 16-bit DA outputs*
- *4 single-ended 12-bit AD inputs*
- *High speed remote I/O interface: scan 1000 points/ ms*
- *Programmable interrupt source*
- *13 home return modes including auto searching*
- *More than 400 thread safe API functions*

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*

Ordering Information

cPCI-8168	CompactPCI 8-axis motion control card
DIN-68S-01	Termination board with 68-pin SCSI-II connector with DIN socket
DIN-68M-J3A0	Termination board for Mitsubishi MR-J3-A
DIN-68M-J2A0	Termination board for Mitsubishi MR-J2S servo amplifier with 68-pin SCSI-II connector
DIN-68Y-SGII0	Termination board for Yaskawa Sigma II servo amplifier with 68-pin SCSI-II connector
DIN-68P-A40	Termination board for Panasonic MINAS A4 servo amplifier with 68-pin SCSI-II connector
Cable	ACL-10568-1

Introduction

6U CompactPCI Interface

The cPCI-8168 is an 8-axis motion control cards based on CompactPCI bus. The CompactPCI interface provides plug-and-play feature that is the key to easy maintenance. The maximum number of cards in one system is 6 cards with capability of controlling 48 motors.

Motion Control Principle

The cPCI-8168 can generate high frequency pulse train. The frequency of the pulse train controls the motor speed; the number of pulse controls the motor position. The differential input/output signals reduce noise interference. The command output options, including DIR/OUT mode and CW/CCW mode, provide an easy access to various stepper or servo motor drivers.

Support HSL network

One HSL network port is inside. It is easy for users to realize centralized motion control and distributed I/O control with one board.

Velocity Profile

The motion control ASIC performs versatile trajectory planning ability. The acceleration and deceleration time are programmable. The S-curve helps to avoid mechanism vibration. The hardware linear interpolation between two axes is powerful to reduce software computation effort.

Operation Modes

Various operation modes are available, such as continuous motion, absolute move, relative move, simultaneous move, change speed on the fly, linear interpolation, and home return.

Encoder Interface

Incremental encoder interface is used for position feedback. The encoder counters provides the position information to correct the position error generated by inaccurate mechanical transmissions. The differential-type encoder feedback avoids noise interference. The 28-bit counters cover the position range for most applications.

Mechanism Interface

The pre-defined limit switch sensors on table are widely used to protect the mechanism. The dedicated I/O interface for end-limit and origin is very useful for system integration.

Servo Drive Interface & GPIO

Some servo motor drivers provide interfacing signals such as in-position (INP), alarm (ALM), error counter clear (ERC), servo ready signals. These signal interfaces are supported. General-purposed digital input/output for each axis is provided.

Interrupt Events

Many hardware status can be used as interrupt events, such as limit switch, alarm, moving home ready, one movement finished, and so on.

Analog Inputs, Analog Outputs

Data Acquisition functions are widely used in system integration for machine automation. 4 analog inputs and 4 analog outputs channels are provided.

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

MotionCreator ™

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

Specifications

Motion

Number of axes: 8 axes	
Pulse output rate: 0.01pps to 6.5Mpps	
Max. Acceleration rate: 245Mpps^2	
Speed resolution: 16-bit	
Encoder input rate: 6.55MHz under 4 x AB phase @ 1M cable	
Encoder counter resolution: 28-bit	
Positioning range: -134, 217, 728 to +134, 217, 727 pulses (28-bit)	
Counters x 4 for each axis	
Comparators x 5 for each axis	

Motion Interface I/O Signals

Isolation Protection	All I/O pins are differential and 2500VRMS optically isolated
Incremental Encoder Signals Input Pins	EA and EB
Encoder Index Signal Input	EZ
Mechanica Limit Switch Signal Input Pins	±EL and ORG
Servomotor Interface I/O Pins	INP, ALM, ERC, SVON, RDY
Position Compare Output Pin	CMP

General Purpose I/O

Digital Input	8 channel isolated digital input
Input Voltage	0 to 24V
Input Resistance	2.4KΩ @ 0.5W
Digital Output	8 channel isolated Digital outputs
Output Voltage	Min. 5V
	Max. 35V
Output Types	NPN open collector Darlington transistors
Current Sink	90mA

Analog Input (A/D)

Converter and Resolution	12-bit LTC1402
Input Channels	4 Single-Ended
Input Range	±10V; Bipolar
Conversion Time	8µs
Sampling Rate	Max. 110K samples/ sec
Output Voltage	Min. 5 V
	Max. 35 V
Over Voltage Protection	Continuous ±35V
Accuracy	0.01% of FSR ±1 LSB

Analog Output (D/A)

Converter and Resolution	16-bit; AD1866R
Output Channels	4 Single-Ended
Output Range	±10V; Bipolar
Settling Time	2µs (-10 V to + 10 V)

High Speed Link (HSL) Port

Connector	RJ45
Cable	Shield 100 Base/TX Ethernet cable
Wiring Distance	200 meters
	Multi-drop full duplex RS-485 with transformer isolation scheme
Transmission Speed	6Mbps
I/O Refreshing Rate	30.4 µs sec per slave ID
Maximum Slave Index	Control maximum 63 slave I/O index

LED display

Motion chipset busy display
HSL communications error

cPCI-8168 Pin Assignment of the 68-pin VHDCI Connector

VPP	1	35	VPP
IGND	2	36	IGND
OUT1+	3	37	OUT2+
OUT1-	4	38	OUT2-
DIR1+	5	39	DIR2+
DIR1-	6	40	DIR2-
SVON1	7	41	SVON2
ERC1	8	42	ERC2
ALM1	9	43	ALM2
INP1	10	44	INP2
RDY1	11	45	RDY2
EA1+	12	46	EA2+
EA1-	13	47	EA2-
EB1+	14	48	EB2+
EB1-	15	49	EB2-
EZ1+	16	50	EZ2+
EZ1-	17	51	EZ2-
VPP	18	52	VPP
IGND	19	53	IGND
PEL1	20	54	PEL2
MEL1	21	55	MEL2
IGND	22	56	IGND
IGND	23	57	IGND
ORG1	24	58	ORG2
AGND	25	59	AGND
AIN1	26	60	AIN2
AGND	27	61	AGND
AOUT1	28	62	AOUT2
DI_COM	29	63	DI_COM
DIN1	30	64	DIN2
DOUT1	31	65	DOUT2
IGND	32	66	IGND
IGND	33	67	IGND
E_24V	34	68	E_24V

PCI-8144

4-axis Stepper Motion Control Card

Features

- *32-bit PCI bus, Rev. 2.2, 33MHz*
- *Card index switch selection*
- *Pulse output rate up 2.4 Mpps for stepper motor control*
- *Pulse output options: CW/CCW*
- *Speed change on-the-fly*
- *Home return mode with slow down & ORG signal*
- *Programmable acceleration and deceleration time*
- *Trapezoidal and S-curve velocity profile*
- *Simultaneously start/stop with external signal control (STA/STP)*
- *Programmable interrupt control*
- *Support up to 12 cards in one system*
- *Security protection for user's program*
- *General purpose isolated I/O: 8 DI and 8 DO*
- *Emergency Stop Input via STP pin*
- *All digital I/O are 2500Vrms isolated*
- *More than 30 thread safe API functions*
- *2-phase stepping motor excitation (Options for users)*

Software Support

Windows® Platform

Available for Windows Vista32/XP/2000

VB/VC++/BCB/Delphi/VB.NET are recommended programming environment.

Various sample programs with source codes

Customized API functions are possible

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	

Ordering Information

PCI-8144	4-axis stepper motion control card
DIN-68S-01	Termination board for SCSI connector
Cable	ACL-10569-1

Introduction

4-axis Stepper Motion Controller

The ADLINK PCI-8144 is a pulse train motion controller ideal for stepper motor control. This controller provides T/S curve control, on-the-fly speed change, non-symmetric acceleration and deceleration profile control, and simultaneous start/stop functions. This controller also offers card index settings for multiple cards in one IPC system and a hardware security function to prevent unauthorized use of in-house developed applications.

Velocity Override

The PCI-8144 offers powerful speed change functions that can be executed while the axis is moving. After motion begins, the target speed can be changed as needed according to the application.

Simultaneously Start/Stop

By using either a software function or external input signal, the PCI-8144 can perform simultaneously starts and stops on multiple axes in a one-card configuration, or multiple axes in a multiple-card application. The simultaneously stop function can be selectively active when an axis (or axes) stops abnormally.

Hardware Emergency Input

The PCI-8144 provides hardware emergency control via the wiring. When the emergency button is pressed, a hardware emergency function is triggered and the motion controller will cease sending pulses.

Application Security

PCI-8144 offers hardware security protection for in-house developed applications to prevent unauthorized use and copying.

Specifications

Motion

- Number of channels: 4
- Pulse output rate: 0.5pps to 2.4Mpps
- Max. acceleration rate: 737Mpps2
- Speed resolution: 16-bit

I/O Signals

- I/O signals are optically isolated with 2500V_{RMS} isolation voltage
- End limit signal pin: PEL and MEL
- Slow down signal pin: PSD and MSD
- Home sensor: ORG
- GPIO: 8 DI and 8 DO

General Specifications

- Connectors: 68-pin SCSI-type connector
- Operating temperature: 0˚C to 50˚C
- Storage temperature: -20˚C to +80˚C
- Humidity: 5 - 85%, non-condensing

Power Consumption

- Power supply (input): +24 V_{DC} ±5%
- External power supply (output): +5V_{DC} ±5%, 100mA (max)

Pin Assignment

VDD	1	35	VDD
EGND	2	36	EGND
CW+	3	37	CW+
CW-	4	38	CW-
CCW+	5	39	CCW+
CCW-	6	40	CCW-
PEL0	7	41	PEL2
MEL0	8	42	MEL2
PSD0	9	43	PSD2
MSD0	10	44	MSD2
ORG0	11	45	ORG2
EGND	12	46	EGND
CW+	13	47	CW+
CW-	14	48	CW-
CCW+	15	49	CCW+
CCW-	16	50	CCW-
PEL1	17	51	PEL3
MEL1	18	52	MEL3
PSD1	19	53	PSD3
MSD1	20	54	MSD3
ORG1	21	55	ORG3
STP/EMG	22	56	STA
DIN0	23	57	DOUT0
DIN1	24	58	DOUT1
DIN2	25	59	DOUT2
DIN3	26	60	DOUT3
DIN4	27	61	DOUT4
DIN5	28	62	DOUT5
DIN6	29	63	DOUT6
DIN7	30	64	DOUT7
VDD	31	65	DO_COM
VDD	32	66	DO_COM
EGND	33	67	EGND
EX+24V	34	68	EX+24V

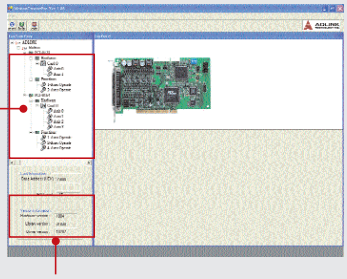
MotionCreatorPro™

Universal User Interface Utility for ADLINK Pulse Train Motion Controller

ADLINK MotionCreatorPro is a new utility that can graphically display the speed profile to familiarize users with motion control manipulation. This universal user interface for all ADLINK pulse train motion controllers provides single axis, multiplaxes, and interpolation simulation. By previewing the speed profile, users can check and adjust the speed profile setting simultaneously.

Universal User Interface for ADLINK Pulse Train Motion Controllers

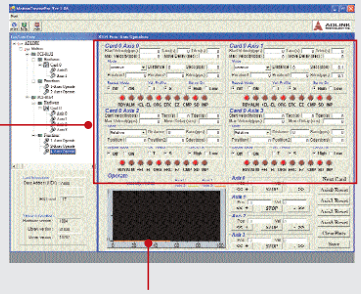
All ADLINK pulse train motion controllers and simulation functions are shown here.



Easy to understand hardware & software version

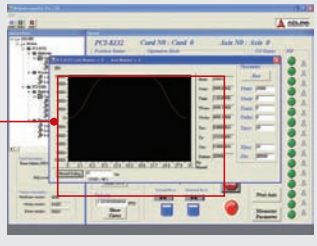
Multiple Axes Simulation within One Window

Up to 4 axes can be simulated at once



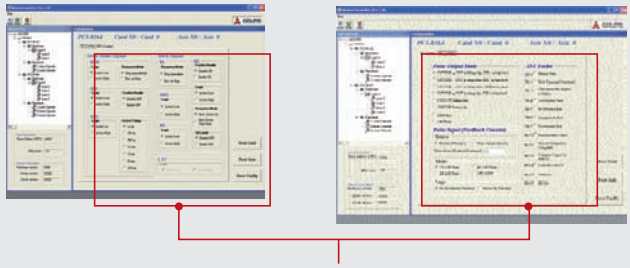
Running speed profile can be monitored instantaneously

Universal User Interface for ADLINK Pulse Train Motion Controllers



Speed profile can be previewed. Users can check and adjust the speed parameters simultaneously

Motion Parameters Settings can be Saved and Reused in Users' Program

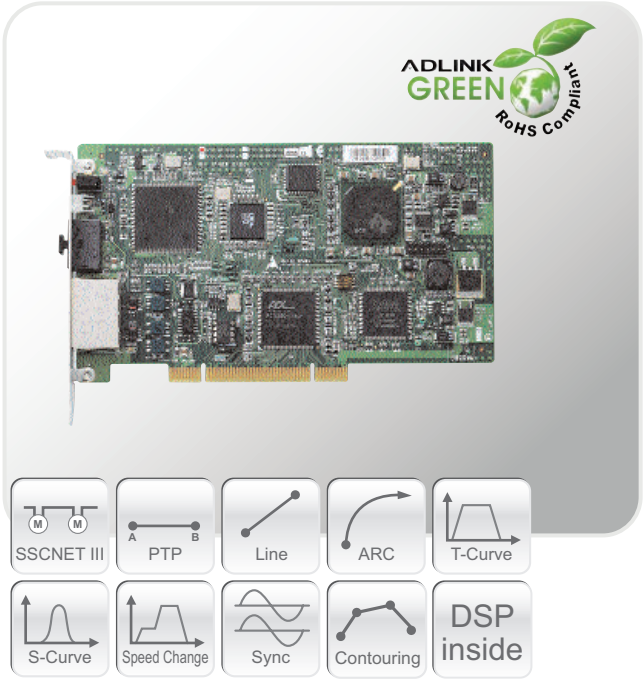


Press "Save Config" button to save the configuration setting of the motion control parameters.

PCI-8392/PCI-8392H

New

SSCNET III 16-axis Motion Controller



Introduction

ADLINK PCI-8392/PCI-8392H is an advanced SSCNETIII 16-axis motion controller based on PCI bus. The PCI bus features plug-and-play function and maximum installation is up to 12 cards in one system. PCI-8392 and PCI-8392H offer the following advantages:

Advantages

- *Easy wiring and time-deterministic servo update*
- *Command synchronization*
- *Easy maintenance*
- *Meet maximum motor speed and maximum encoder resolution (18-bit) simultaneously*
- *Parameter setting and tuning by software*
- *Absolute encoder support*

Extra advantages for PCI-8392H users

- *One card to simultaneously meet the servo network and distributed I/O configuration*
- *High cost/performance: Users can benefit from combining SSCNET III and HSL into one card and save the PCI slot, PC system size and cost.*
- *Distributed I/Os are up to 2016 points and refreshed within 1ms*
- *Reduce controller size. (No more need large backplane to install multiple cards)*

Board Features

- ***32-bit PCI bus, Rev 2.2, 33MHz***
- ***Servo Interface: SSCNET 3 protocol***
- ***Controllable axes up to 16 axes***
- ***High speed network communication bus up to 50Mbps***
- ***Servo update rate: 0.444ms for 8 axes, 0.888ms for 16 axes***
- ***On-board DSP: TI TMS320C6711 250MHz to process the synchronization (RTOS is not needed)***
- ***Fiber cable connection ensure the best communication quality***
- ***Easy and reduced wiring up to 20/50 meters between servo drivers (POF/HPCF fiber cable)***
- ***32-bit position command resolution***

Function Features

- ***Function Features***
- ***No command frequency limitation***
- ***Runtime data logging for debug and machine monitoring***
- ***On-line servo tuning and full servo parameter management***
- ***High speed servo information sampling***
- ***Excellent performance in axis synchronous control***
- ***Programmable acceleration rate for T/S-curve profile***
- ***Up to 4 axes linear interpolation positioning***
- ***Up to 3 axes circular interpolation positioning***
- ***Velocity moving function***
- ***Jogging function***
- ***Absolute positioning system***
- ***Speed override and position override function***
- ***Auto home returning function***
- ***Programmable interrupt events***
- ***Security protection for user's program***
- ***Board ID switch selection from 0 to 15***
- ***Watch dog timer for safety***
- ***External emergency input pin (Jumper selection)***
- ***One HSL bus is available for PCI-8392H***
- ***Supports up to 16 boards in one system***
- ***Free MotionCreator software for system setup and servo parameters management***

Specifications

Motion Control

Cycle time: 0.888 ms for 16 axes, 0.444 ms for 8 axes
Maximum number of controllable axes: Up to 16
Maximum number of cards in one system: 12
Connection: Via FB1 with fiber

Emgergency Control (EMG1)

Normal close
PCI-8392/PCI-8392H stops motion control (all connected servos) if the EMG1 signal is activated.

LED Indicator (LED1)

Red & green light to indicate the communication status of SSCNET III and HSL bus

Board ID Selection

DIP switch selection
ID is available from 0 to 15

HSL bus

Only available for PCI-8392H version
For HSL bus, please refer to chapter 6 High Speed Link

General Specifications

Operating temperature: 0˚C to 50˚C
Storage temperature: -20˚C to +80˚C
Humidity: 5 - 85%, non-condensing

New Version, Faster Processing Speed

Mitsubishi J3-B Servo Features

- *High resolution encoder of Mitsubishi J3 servo motor up to 18-bit (262,144 pulse/rev)*
- *PEL/MEL/ORG on Mitsubishi J3-B servo drive to save the wiring from motion controller*

Software Support

Windows® Platform

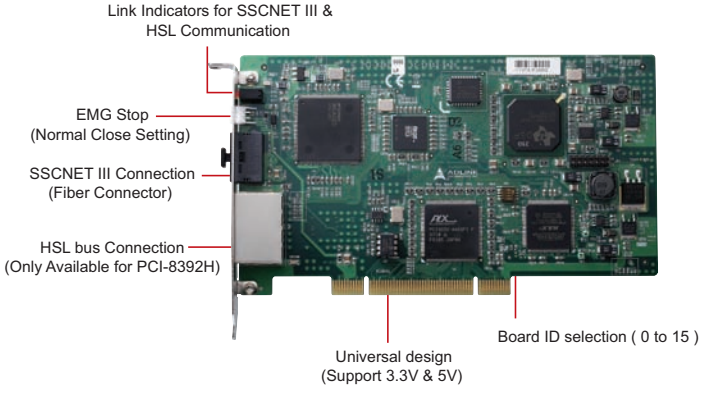
Available for Windows Vista32/XP/2000

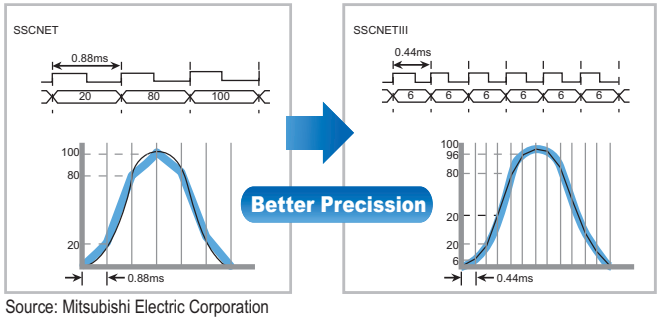
VB/VC++/BCB/Delphi are recommended programming environment.

Ordering Information

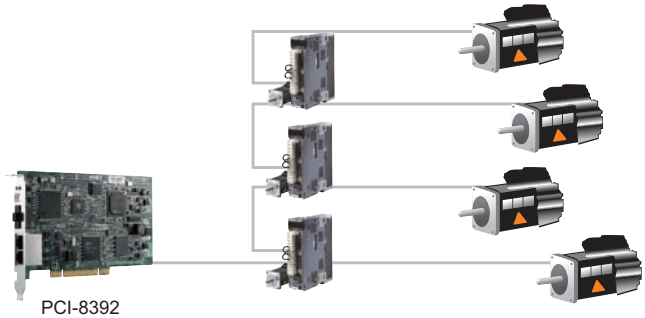
PCI-8392	SSCNET III Motion Controller
PCI-8392H	SSCNET III Motion Controller with one HSL bus

PCI-8392/PCI-8392H Profile



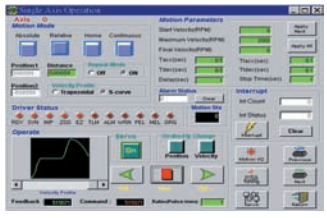


Source: Mitsubishi Electric Corporation



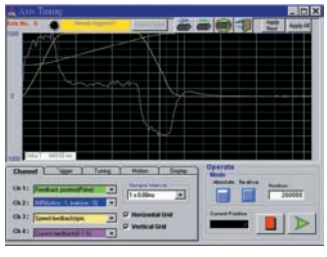
PCI-8392

MotionCreator™

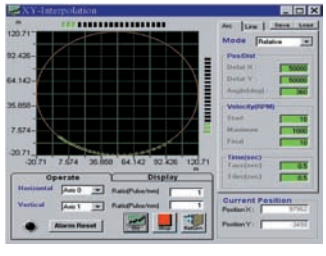


Single Axis Operation

Servo Driver Parameters



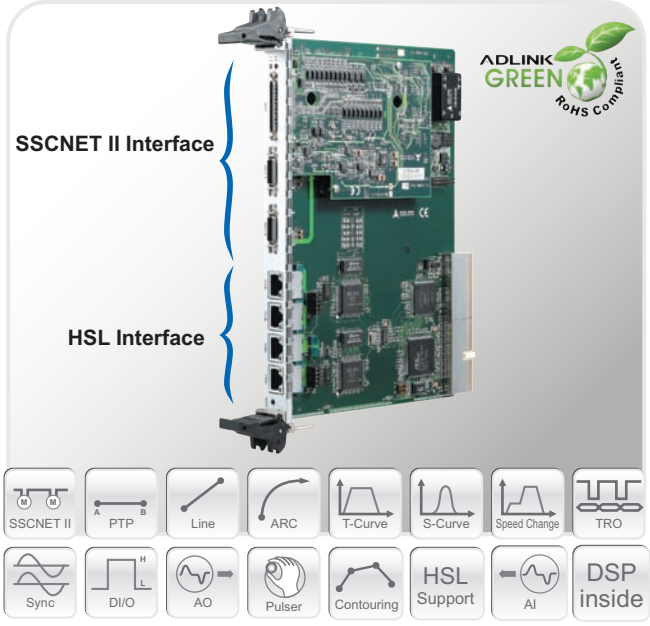
Servo Tuning



XY Move Operation

cPCI-8312H

Advanced 6U CompactPCI SSCNET II 12-axis Motion Control Card with HSL Network



Introduction

Serial-Connection Multi-Axis Motion Controller

ADLINK cPCI-8312H is a 12-axis motion control card based on CompactPCI bus. They contain two main features: SSCNET II motion control and HSL network control. SSCNET II motion control allows users to connect Mitsubishi servo motors to realize high performance and to benefit from absolute synchronization mechanism.

HSL network control also allows users to take advantage of the high-speed, real-time, and distributed connection while building up the entire application. These two main features can meet users' requirement in motion and distributed I/O control simultaneously. The CompactPCI interface offers plug-and-play feature that is key to easy maintenance. The maximum number of cards in one system is 12 cards, offering users the following advantages:

Advantages of SSCNET II

- Easy-wiring and real-time motion control
- Command synchronization
- Easy maintenance
- High resolution/High Speed
- 32-bit command resolution
- Up to 30 meters control distance
- Parameter setting and tuning by software
- Absolute position command control

Advantage of HSL

- High Speed communication and remote data exchange
- Real-time scanning
- Easy wiring
- Huge Number of I/O points
- Easy and flexible I/O expansion
- Remote motion control available, connecting up to 60 axes in one HSL network port

Motion Control Principle

*The motion command is accomplished by the host PC and the DSP on cPCI-8312H. DSP accomplished the synchronization between users' program control and SSCNET update cycle. Motion profiles are split into several frames and trans-ferred to the DSP via DPRAM. According to these frames, DSP calculates the absolute position of all axes in one control cycle and send each position to the individual driver via the *SSCNET II at the same cycle. The cPCI-8312H can also collect data from the servo driver via the SSCNET II at the same cycle including servo parameter, position, speed, torque etc. The cycle time is 0.888ms which is defined in *SSCNET II protocol.*

Operation Modes

Single axis motion; Linear interpolation; Circular interpolation mode; mult-axis simulta-neous start motion; contour motion; change speed/position on-the-fly; and home return modes.

Mechanism Interface

Dedicated limit switch and origin input points for each axis.

General Purpose I/O

2 isolated digital output channels.

Pulse Train Interface

This board offers users 2 pulse train output channels for users to connect pulse train type servomotors. The maximum frequency is 4.16MHz.

Interrupt Events

The hardware interrupts are transformed into softrware events or signals. An event driven applications under multi-tasking OS can be realized by this way.

Analog Inputs and Outputs

These are two modes for analog: Direct +/- 10 volts output with 16-bit resolution and velocity command monitoring. 2 analog inputs are also available for this board.

Servo Amplifier/Motor Support

ADLINK cPCI-8312H is designed for SSCNET II series servo amplifier/motor including MR-J2S-B and MR-J2M-B.

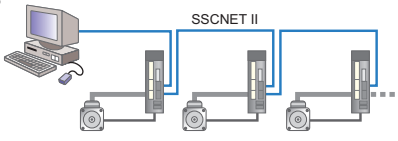
Features

SSCNET II Part

- *32-bit CompactPCI, PICMG 2.0 Rev. 2.1*
- *Servo Interface: *SSCNET II protocol*
- *On-board DSP: TI TMS320C6711 200 MHz*
- *Maximum control axes: 12*
- *32-bit position command resolution*
- *On-line servo tuning and data monitoring*
- *Easy wiring up to 30 meters*
- *2 isolated DO channels*
- *2 Analog input and 2 analog output channels*
- *2 pulse train output channels support, connecting pulse train type servo amplifiers*
- *2 external encoder/linear scale interface*
- *Multiple axes linear interpolation*
- *Any 2 axes circular interpolation*
- *Contour following motion*
- *On-the-fly velocity change*
- *Programmable interrupt sources*
- *Easy-to-use function library*
- *MotionCreatorPro utility for machine setup*
- *Sequence Motion Control for speed profile timing chart between axes*
- *Absolute encoder access*

HSL Part

- *Dual independent network operation*
- *One network port with 2 separate connectors*
- *Max. 300mx2 communication distance at 3 Mbps*
- *Jumper selectable transmission rate: 3/6/12 Mbps*
- *Jumper selectable transmission mode: full/half duplex*
- *on-board memory*
- *Programmable timer interrupt*
- *RJ45 phone jack for easy installation*
- *More than 400 thread safe API functions*



Applications

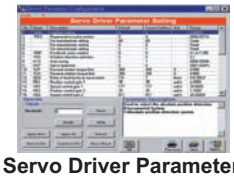
- ***Semiconductor front & back end equipment***
- ***TFT/LCD manufacturing equipment***
- ***Electronic Assembly and Testing equipment***
- ***Automatic Optical Inspection Equipment***
- ***Flight/Vehicle Simulator in military and video game***
- ***Dispenser Machinery***
- ***Cutting or Carving Machinery***

For HSL introduction, please refer to chapter 6.

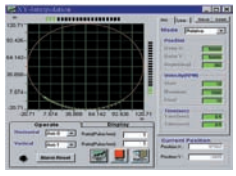
SSCNET II: Servo System Control Network defined by Mitsubishi Electric Co.

MotionCreator™

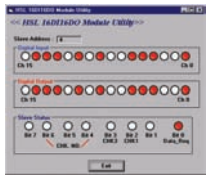

Single Axis Operation


Servo Driver Parameters


Servo Tuning


XY Move Operation


HSL Master Utility


HSL Module Utility

Specifications

Motion Control

- Cycle time: 0.888ms
- Number of controllable axes: 12
- Max. number of cards in one system: 12
- Encoder feedback: 3-CH, 32-bit, Up/Down counter up to 5MHz

Motion Interface I/O Signals

- External encoder signals input pins: EA and EB
- Encoder index signal input: EZ
- Mechanical limit seitch and origin signal input pins: ±EL and ORG

General-Purposed I/O

- 2 channels open collector output
- Sink current: 4mA
- Bandwidth 10KHz

Analog Input (AI):

- Resolution: 16-bit
- Programmable input range: ±10V, ±5V, ±2.5V
- Auto calibration
- Sampling rate: 250ks/sec

Analog Output (D/A):

- Resolution: 16-bit
- Output channels: 2 single-ended channels
- Output range: ±10V, Bipolar
- Setting time: 10μs
- Output driving ±5mA

Pulse Train Output:

- OUT/DIR, CW/CCW AB phase selectable
- Max. output frequency: 4.16 MHz
- Isolated voltage: 500V_{RMS}

Software Support

Windows® Platform

- Available for Windows Vista32/XP/2000
- VB/VC++/BCB/Delphi are recommended programming environment.

MotionCreator ™

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

Ordering Information

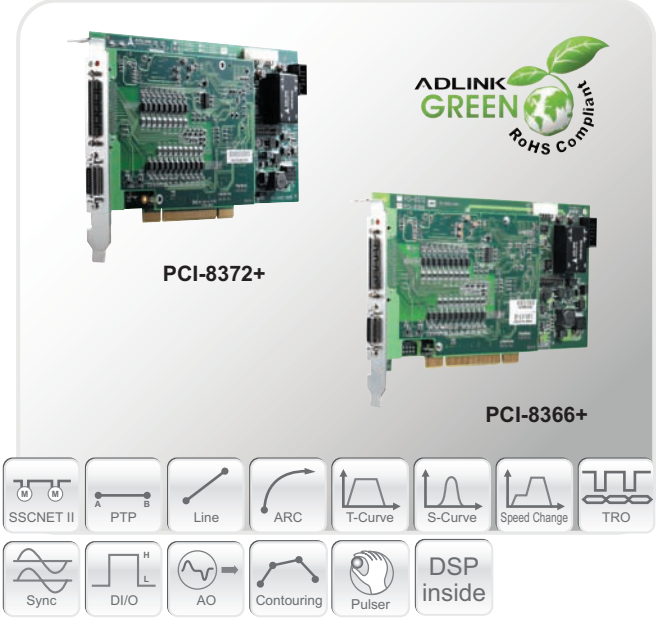
cPCI-8312H	6U CompactPCI SSCNETII 12-axis motion control card with HSL network
DIN-68S-01	Termination Board for CN5

SP1 Pin assignment

DO_COM	1	35	DO1
PEL1	2	36	DO2
MEL1	3	37	PEL2
ORG1	4	38	MEL2
PEL3	5	39	ORG2
MEL3	6	40	PEL4
ORG3	7	41	MEL4
PEL5	8	42	ORG4
MEL5	9	43	PEL6
ORG5	10	44	MEL6
IPT_COM/EMG_COM	11	45	ORG6
EA1+	12	46	EA2+
EA1-	13	47	EA2-
EB1+	14	48	EB2+
EB1-	15	49	EB2-
EZ1+	16	50	EZ2+
EZ1-	17	51	EZ2-
PEL7	18	52	PEL8
MEL7	19	53	MEL8
ORG7	20	54	ORG8
PEL9	21	55	PEL10
MEL9	22	56	MEL10
ORG9	23	57	ORG10
PEL11	24	58	PEL12
MEL11	25	59	MEL12
ORG11	26	60	ORG12
IPT_COM/EMG_COM	27	61	EMG
P_GND	28	62	AD1
OUT1+	29	63	DIR1+
OUT1-	30	64	AD2
OUT2+	31	65	DIR1-
OUT2-	32	66	DA1
DIR2+	33	67	DA2
DIR2-	34	68	A_COM

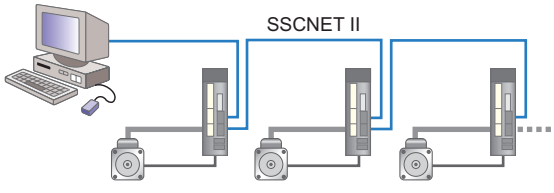
PCI-8372+/PCI-8366+

DSP-based SSCNET II 12/6-axis Motion Control Cards



Features

- 32-bit PCI bus, Rev 2.2, 33MHz
- Servo Interface: *SSCNET II protocol
- On-board DSP: TI TMS320C6711 200MHz
- Maximum control axes: 12/6 for PCI-8372+/8366+
- 32-bit position command resolution
- On-line servo tuning and data monitoring
- Easy wiring up to 30 meters for servo drivers connection
- 2 Isolated DI/DO
- 3 external encoder/linear scale interface
- Multiple axes linear interpolation
- Any 2 axes circular interpolation
- Contour following motion with smoothing function
- On-the-fly velocity change
- Programmable interrupt sources
- Hardware synchronization between multiple cards
- Easy-to-use function library
- MotionCreator™ utility for Mitsubishi servo motor setup
- More than 250 thread safe API functions
- Sequence motion control for speed profile timing chart between axes
- Absolute encoder access
- 2-CH 16-bit analog output



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

Introduction

Serial-connection Multi-Axis Motion Controller

ADLINK PCI-8372+/PCI-8366+ is a 12/6-axis motion control cards based on PCI bus. The PCI interface provides plug-and-play feature that is the key to easy maintenance. The maximum number of cards in one system is up to 12 cards, offering users the following advantages.

Advantages

- *Easy-wiring and time-deterministic*
- *Command synchronization*
- *Easy-maintenance*
- *Maximum motor speed can be achieved under maximum motor resolution (17-bit)*
- *32-bit command resolution*
- *Connecting distance up to 30 meters*
- *Parameter setting and tuning by software*
- *Absolute encoder control (ABS position) control*

Motion Control Principle

*The motion command is accomplished by the host PC and the DSP on PCI-8372+/PCI-8366+. DSP accomplished the synchronization between users' program control and SSCNET update cycle. Motion profiles are split into several frames and trans-ferred to the DSP via DPRAM. According to these frames, DSP calculates the absolute position of all axes in one control cycle and send each position to the individual driver via the *SSCNET II at the same cycle. The PCI-8372+/66+ can also collect data from the servo driver via the *SSCNET II at the same cycle including servo parameter, position, speed, torque etc. The cycle time is 0.888ms which is defined in *SSCNET II protocol.*

Operation Modes

Single axis motion; Linear interpolation; Circular interpolation mode; mult-axis simulta-neous start motion; contour motion; change speed on the fly; and home return modes.

Mechanism Interface

Dedicated limit switch and origin input points for each axis.

General Purpose I/O

2 Isolated DI, 2 open collector output DO are included to provide general purpose I/O.

Interrupt Events

The hardware interrupts are transformed into softrware events or signals. An event driven applications under multi-tasking OS can be realized by this way.

Analog outputs

These are two modes for analog: Direct 16 bits +/-10 volts output, velocity command monitoring.

Hardware Synchronization

The PCI-8372+/PCI-8366+ can be synchronized via the CN4 connector between every card.

Servo Amplifier/Motor Support

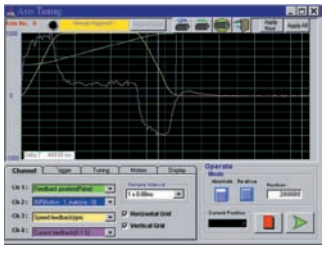
*ADLINK PCI-8372+/PCI-8366+ is designed for *SSCNET II series servo amplifier/motor including MR-J2S-B and MR-J2M-B.*

SSCNET II
Servo System Control Network proposed by Mitsubishi Electric Co.

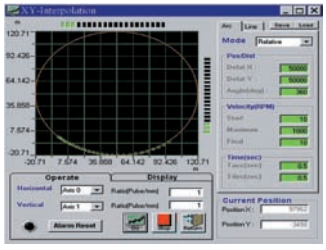
MotionCreator™

Single Axis Operation

Servo Driver Parameters



Servo Tuning



XY Move Operation

Specifications

Motion Control

Cycle time: 0.888ms

Number of controllable axes: 12/6 axes for PCI-8372+/PCI-8366+

Max. number of cards in one system: 12

Encoder feedback: 3-CH, 32-bit, up/down counter up to 5MHz

Motion Interface I/O Signals

External encoder signals input pins: EA and EB

Encoder index signal input: EZ

Mechanical limit seitch and origin signal input pins: ±EL and ORG

General-Purposed I/O

2 channels isolated digital inputs

- Input volotage: 0 to 24 V
- Input resistance: 2.4KΩ @0.5W
- 2 channal open collector output
- Sink current: 4mA
- Bandwidth 10KHz

Analog Output (D/A):

Resolution: 16 bits

Output channels: 2 Single-Ended channels

Output range: ±10V, Bipolar

Setting Time: 10μs

Output driving: ±5mA

Software Support

Windows® Platform

Available for Windows Vista32/XP/2000

VB/VC++/BCB/Delphi are recommended programming environment.

MotionCreator ™

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

Termination Board

- *Termination board for CN5*

DIN-68S-01

Ordering Information

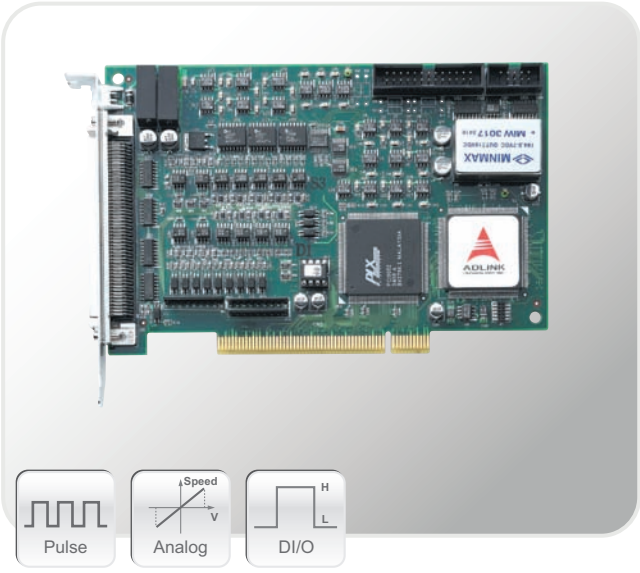
PCI-8372+	PCI Bus SSCNETII 12 axes motion control card
PCI-8366+	PCI Bus SSCNETII 6 axes motion control card
DIN-68S-01	Termination board for CN5

CN5 Pin Assignment

A.COM	1	35	DA1
PEL1	2	36	DA2
MEL1	3	37	PEL2
ORG1	4	38	MEL2
PEL3	5	39	ORG2
MEL3	6	40	PEL4
ORG3	7	41	MEL4
PEL5	8	42	ORG4
MEL5	9	43	PEL6
ORG5	10	44	MEL6
IPT_COM	11	45	ORG6
EA1+	12	46	EA2+
EA1-	13	47	EA2-
EB1+	14	48	EB2+
EB1-	15	49	EB2-
EZ1+	16	50	EZ2+
EZ1-	17	51	EZ2-
PEL7	18	52	PEL8
MEL7	19	53	MEL8
ORG7	20	54	ORG8
PEL9	21	55	PEL10
MEL9	22	56	MEL10
ORG9	23	57	ORG10
PEL11	24	58	PEL12
MEL11	25	59	MEL12
ORG11	26	60	ORG12
IPT_COM	27	61	IPT_COM
DO_COM	28	62	D11
EA3+	29	63	D12
EA3-	30	64	EMG
EB3+	31	65	EMG_COM
EB3-	32	66	DO1
EX3+	33	67	DO2
EZ3-	34	68	DO_COM

PCI-8136

6-CH Quadrature Encoder and Multi-Function I/O Card



Features

- 32-bit PCI bus, plug & play
- 6-CH 32-bit industrial counter for 3 kinds of differential pulse trains
  - A/B phase
  - CW/CCW
  - Pulse/Direction
- 6-CH differential pulse generators up to 500KHz
- 6-CH 32-bit position compare with interrupt function
- 6-CH 16-bit +/- 10V analog output
- 6-CH 12-bit 133KHz analog single-ended input
- 19-CH opto-isolated DI, 7-CH open collector DO
- Digital I/Os and counters are 2500V_{DC} opto-isolated
- One 24-bit programmable timer with interrupt
- Auto-calibration for analog I/O
- More than 50 thread safe API functions

Introduction

The PCI-8136 is a high performance industrial counter and Multi-I/O card. What makes it special is the ADPIO function, which is the abbreviation of Analog/Digital/Pulse Input/Output.

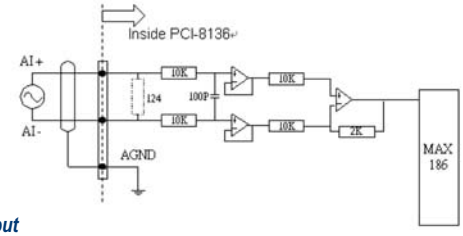
- *Analog Input: 6 channels*
- *Analog Output: 6 channels*
- *Digital Input: 19 channels*
- *Digital Output: 7 channels*
- *Pulse Input (Industrial Counter): 6 channels*
- *Pulse Output (Pulse Generator): 6 channels*

Besides, the PCI-8136 provides some useful functions for industrial applications.

- *One 24-bit programmable interrupt timer with 33MHz base clock*
- *Position compare: 6 channels*

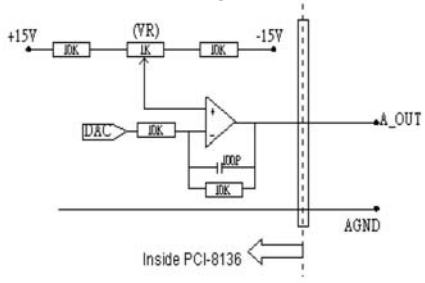
Analog Input

The PCI-8136 provides 6 12-bit A/D converter channels. The analog source is selectable for each channel to be ±10VDC (Default) or 0 to 20 mA by soldering a 124Ω DIP resistance which is shipped with PCI-8136.



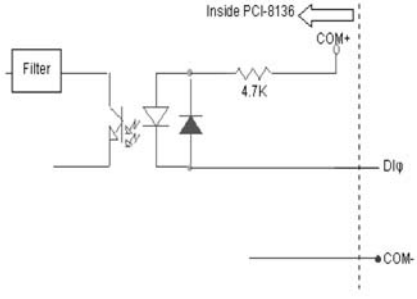
Analog Output

The PCI-8136 provides 6 16-bit digital-to-analog converter channels. The output voltage ranged from -10V to +10V. The Analog outputs are all single ended with common ground "AGND".



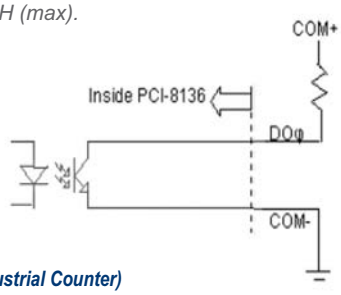
Digital Input

The PCI-8136 provides 19 digital inputs with 2500 V_{RMS} isolation. The system recognizes a logical "1" when no current goes from COM+ to DIO and, Logical "0" is returned when current goes from COM+ to DIO. The max current passing trough DIO must be less than 20mA.



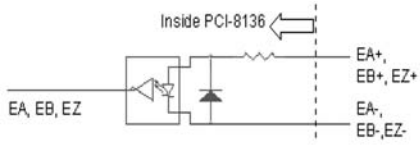
Digital Output

The PCI-8136 provides 7 open collector outputs with 2500 V_{RMS} isolation. The maximum output switching frequency is 10KHz, and the continuous output supply current is subject to 500mA/ (total), 100mA/CH (typical) ,and 268mA/CH (max).



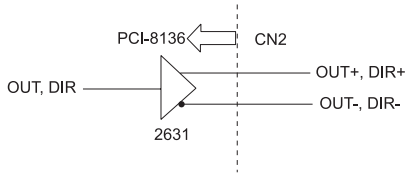
Pulse Input (Industrial Counter)

The PCI-8136 provides 6 differential pulse inputs with 2500 V_{RMS} isolation. The pulse mode is software programmable to be AB- phase, CW/CCW, or Pulse/Direction, and the counter speed goes up to 2MHz.



Pulse Output (Pulse Generator)

The PCI-8136 provides 6 differential pulse output channels. The pulse mode is software programmable to be Pulse/Direction, CW/CCW, or AB-phase, and the output frequency goes up to 500KHz.



Specifications

General Specifications

Connectors	100-pin SCSI-type connector
	DB25 female connector
	DB9 male connector
Operating Temperature	0°C to 50°C
Storage Temperature	-20°C to +80°C
Humidity	5 to 85%, non-condensing
Power Consumption	Slot power supply (input): to ±5%, 900 mA (max.)
	External power supply (input): + 5VDC, ±5%, 500mA (max.)
	External power supply (output): +5VDC, ±5%, 500mA, max.
	Dimension: 164mm (L) x 98.4mm (H)

Pulse Input (Industrial Counter)

6 differential input channels
32-bit counter for AB-phase, CW/CCW, Pulse/Direction
2500VDC optical isolation Max. counter speed: 3MHz

Pulse Output (Pulse Generator)

6 output channels with differential Drivers
Pulse command type: CW/CCW, Pulse /Direction, A/B Phase
Max. pulse rate: 500KHz

Analog Input

Channel Numbers	6 differential/single-end input channels
Input Range	Voltage: ±10V
	Current: 0~20 mA
	12-bit ADC with 1-bit non-linearity
Input Impedance	440KΩ (Voltage)
Approx	120Ω (Current)
Sampling Rate	133 KHz multiplexing

Analog Output

Channel Numbers	6 output channels
Output Range	bipolar ±10V
	16-bit DAC resolution, 14-bit accuracy guarantee
Settling Time	2μs

Digital Output

Channel Numbers	7 Output channels
Output Type	open collector
Sink Current	100mA/CH (typical)
	268mA/CH (max.)
	500mA/total
Isolated Voltage	2500VRMS
Throughput	10KHz (0.1ms)

Timer

One programmable timer interrupt	
Base Clock	33MHz by PCI bus
Timer Range	24-bit

Software Support

Windows® Platform

Available for Windows Vista32/XP/2000
VB/VC++/BCB/Delphi are recommended programming environment.

Linux Platform

Fedora Core 3, kernel 2.6.9
Fedora Core 4, kernel 2.6.11

Termination Board

- *Termination board for general purpose*

DIN-100S-01

Ordering Information

PCI-8136	6-CH quadrature encoder and multi-function I/O card
DIN-100S-01	Termination board for general purpose

CN1 Pin Assignment

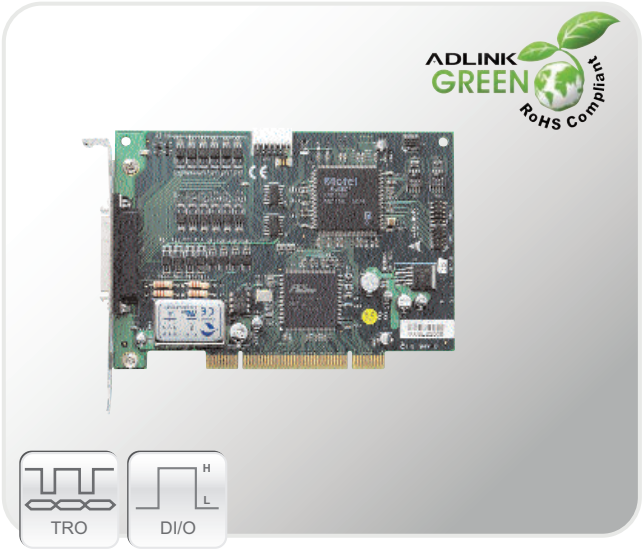
AGND	1	51	AGND
DAC1	2	52	DAC2
DAC2	3	53	DAC4
DAC3	4	54	DAC6
VCC+5v	5	55	EXGND
EX+24v	6	56	EXGND
EX+24v	7	57	(DI18)ALM
EX+24v	8	58	(DO6)P_RDY
ORG1(DI0)	9	59	(DI1)ORG2
PEL1(DI6)	10	60	(DI8)PEL2
MEL1(DI7)	11	61	(DI9)MEL2
SVON1(DO0)	12	62	(DO1)SVON2
ORG3(DI2)	13	63	(DI3)ORG4
PEL3(DI10)	14	64	(DI12)PEL4
MEL3(DI11)	15	65	(DI13)MEL4
SVON3(DO2)	16	66	(DO3)SVON4
ORG5(DI4)	17	67	(DI5)ORG6
PEL5(DI14)	18	68	(DI16)PEL6
MEL5(DI15)	19	69	(DI17)MEL6
SVON5(DO4)	20	70	(DO5)SVON6
EA1+	21	71	EA2+
EA1-	22	72	EA2-
EB1+	23	73	EB2+
EB1-	24	74	EB2-
EZ1+	25	75	EZ2+
EZ1-	26	76	EZ2-
EA3+	27	77	EA4+
EA3-	28	78	EA4-
EB3+	29	79	EB4+
EB3-	30	80	EB4-
EZ3+	31	81	EZ4+
EZ3-	32	82	EZ4-
EA5+	33	83	EA6+
EA5-	34	84	EA6-
EB5+	35	85	EB6+
EB5-	36	86	EB6-
EZ5+	37	87	EZ6+
EZ5-	38	88	EZ6-
OUT1+	39	89	OUT2+
OUT1-	40	90	OUT2-
DIR1+	41	91	DIR2+
DIR1-	42	92	DIR2-
OUT3+	43	93	OUT4+
OUT3-	44	94	OUT4-
DIR3+	45	95	DIR4+
DIR3-	46	96	DIR4-
OUT5+	47	97	OUT6+
OUT5-	48	98	OUT6-
DIR5+	49	99	DIR6+
DIR5-	50	100	DIR6-

CN3 Pin Assignment

G2SIOCLK/	1	14	G2SIOCLK
G2SCS0	2	15	G2SCS0/
G2S2MD/	3	16	G2S2MD/
G2S2SD/	4	17	G2S2SD/
AGND	5	18	DAC1
DAC2	6	19	DAC2
ADC1-	7	20	ADC1+
ADC2-	8	21	ADC2+
ADC3-	9	22	ADC3+
ADC4-	10	23	ADC4+
ADC5-	11	24	ADC5+
ADC6-	12	25	ADC6+
AGND	13		

PCI-8124

Advanced 4-CH Encoder Card with High-peed Triggering Function



Features

- *32-bit PCI bus, Rev. 2.2, 33MHz*
- *Support both PCI-X (3.3V) and PCI (5V) slot*
- *Card index switch selection*
- *Four 32-bit quadrature encoder input and trigger output channels*
- *Trigger output up to 5MHz*
- *Encoder input up to 10MHz*
- *Trigger pulse up to 3.7ms*
- *Encoder input frequency: Up to 5MHz*
- *Trigger output frequency: Up to 1MHz*
- *Encoder input interface: OUT/DIR, CW/CCW, and 1x, 2x, 4x A/B phase*
- *Input / Output circuit source can be selectable: TTL/ Open Collector (with isolation)*
- *Four 32-bit comparators where source can be configurable*
- *Internal high-speed FIFO for 4 32-bit comparators as data reload buffer*
- *Each channel can store 1023K points (32-bit)*
- *Trigger pulse width is software programmable from 0.1 £gs to 3.2765ms*
- *Each trigger output channel is selected from all comparators, manual trigger commands, EZ signal and timers by demands*
- *4 comparators for comparing encoder counter and FIFO data*
- *10 comparators for comparing encoder counter and linear data*
- *Each encoder counter source is selected from encoder input pins or timers*
- *Comparator data is updated by next FIFO data or linear data when encoder counter is compared and trigger is outputted*
- *14 comparators can select one of 4 trigger output channels individually*
- *4 channel TTL output pins for general purpose output or trigger output*
- *4 channel TTL input pins for general purpose or timer start signal*
- *4 channel high speed latch input pins for counters*
- *EZ and Latch input pins can be used for general purpose input*
- *Latch input logic is selectable by rising or falling edge*
- *Encoder counter clear via EZ input pin as zero operation by rising or falling edge*
- *Programmable interrupt sources from linear data finished, triggered, FIFO empty/full/low, latched, TTL input on.*
- *Switch setting for trigger output default level while power on*
- *Trigger output pin logic programmable*

Software Support

Windows® Platform

Available for Windows Vista32/XP/2000

VB/VC++/BCB/Delphi are recommended programming environment.

Ordering Information

PCI-8124	Advanced 4-CH encoder card with high-speed triggering function
DIN-50S	Termination board with 50-pin SCSI-II connector with DIN socket

Specifications

Counter

Number of Channels	4
Maximum Trigger Pulse Frequency	5MHz
Encoder Counter	4, 32-bit
Comparator	4, 32-bit
FIFO Capacity	1023 points/channel
Maximum Encoder Input Frequency	10MHz
Trigger Pulse width	0.1µs to 3.2765ms

I/O Signals

Partial I/O Signals	optically isolated with 2500VRMS isolation voltage
Partial I/O Signals	TTL type
Encoder Signals Input Pins	EA and EB
Encoder Index Signal Input Pin	EZ
Position latch Input Pin	LTC
Trigger Pulse Output Pin	TRG, 5 volt pulse output reference to ground

General Specifications

Connectors	50-pin SCSI-type connector
Operating Temperature	0˚C to 50˚C
Storage Temperature	-20˚C to +80˚C
Humidity	5 to 85%, non-condensing

Power Consumption

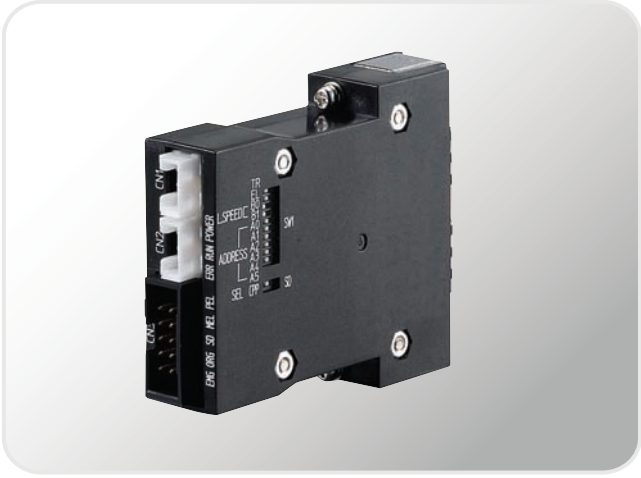
Slot Power Supply (input)	900mA (max.) ±5%, 900mA(max)
External Power Supply (output)	+5VDC ±5%, 500mA(max)

Pin Assignment

INCOM1	1	26	INCOM3
LTC1	2	27	LTC3
INCOM2	3	28	INCOM4
LTC2	4	29	LTC4
OUTCOM1	5	30	OUTCOM3
TRG1	6	31	TRG3
OUTCOM2	7	32	OUTCOM4
TRG2	8	33	TRG4
EA1+	9	34	EA3+
EA1-	10	35	EA3-
EB1+	11	36	EB3+
EB1-	12	37	EB3-
EZ1+	13	38	EZ3+
EZ1-	14	39	EZ3-
EA2+	15	40	EA4+
EA2-	16	41	EA4-
EB2+	17	42	EB4+
EB2-	18	43	EB4-
EZ2+	19	44	EZ4+
EZ2-	20	45	EZ4-
TTL-IN1	21	46	TTL-IN3
TTL-IN2	22	47	TTL-IN4
TTL-OUT1	23	48	TTL-OUT3
TTL-OUT2	24	49	TTL-OUT4
DGND	25	50	DGND

MNET-J3/MNET-S23/MNET-MIA

Motionnet Distributed Single-axis Motion Control Module



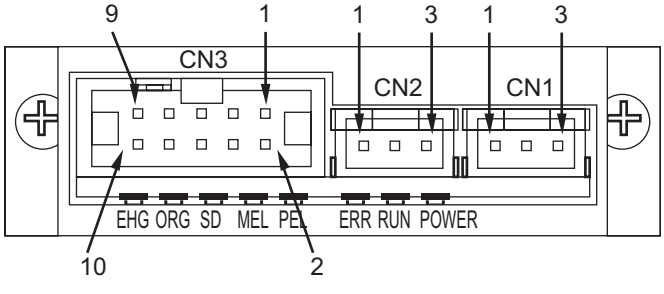
Features

- *Compact & single-axis connection*
- *One Motionnet master can connect up to 64 axes*
- *Support Mitsubishi J3, Panasonic MINAS A, and Yaskwa Sigma II and V series*
- *The distributed distance up to 100m with CAT-5 cable*
- *The scanning cycle time up to 0.97 ms when 64 axes are connected at 20 Mbps*
- *Point-to-point application can be easily completed with multiple single-axis module*
- *Supports linear/ S-curve acceleration and deceleration*

Specifications

Counter	
Required Power	24 VDC ±10%, 110 mA (Typ.)
Power Indicator	Displays the status of the 3.3 VDC internal control power using a red LED.
Operating Temperature Range	0 to 40˚C
Operating Ambient Humidity	80% RH or less (Non-condensing through the 10˚C to 40˚C range)
Measures for Environmental Problem	Complies with the EU RoHS requirement
Vibration Proof	Complies with JIS C0040
Weight Approximately	50 g
Dimensions	52.4 x 16.3 x 69.5 mm (W x H x D)

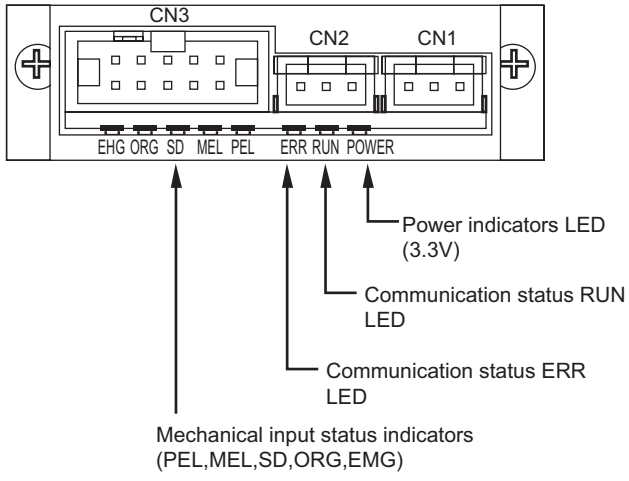
Connection



CN1/CN2 Pin Assignment			
No	Signal name	Function	Signal direction
1	RS485+	Serial communicationdata+	I/O
2	RS485-	Serial communication data-	I/O
3	FG	Frame ground	-

CN3 Pin Assignment			
No	Signal name	Function	Signal direction
1	PEL	Positive end limit	I
2	MEL	Negative end limit	I
3	SD/CPP	Slowdown input / comparator output (+)	I/O
4	ORG	Zero position input	I
5	EMGI	Emergency stop input	I
6	CPN	Comparator output (-)	O
7	24V	24VDC Power source	I
8	GND	Ground	I
9	GND	Ground	I
10	FG	Frame ground	-

LED Indicator



Ordering Information

MNET-J3	Motionnet Distributed Single-Axis Motion Control Module for MitsubishiJ3-A
MNET-S23	Motionnet Distributed Single-Axis Motion Control Module for Yaskawa Sigma II, III and V
MNET-MIA	Motionnet Distributed Single-Axis Motion Control Module for Panasonic MINAS A4

HSL-4XMO-CG-N/-P, HSL-4XMO-CD-N/-P

4-axis Pulse Train Motion Control Module

General Features

- *HSL communication protocol*
- *Transmission speed selectable: 3/6/12Mbps*
- *Support for Half / Full Duplex Mode*
- *On-board DSP*
- *4-axis pulse train Output channels*
- *Up to 60 axes on a single HSL Network*
- *Motion point table management*
- *Motion script download (G-Code-Like Language)*

Notes:
1. HSL-4XMO-CG-N/-P provides general-purpose interface for connection. Users can easily connect steppers, linear motors, and other pulse train type amplifiers.
2. HSL-4XMO-CD-N/-P provides D-sun interface for connection. Users can easily connect servo motors with a transfer cable.

Motion Control Features

- *Pulse train frequency up to 6.55MHz*
- *Point-to-point motion*
- *On-the-fly speed/position change*
- *13 home return modes*
- *4 axes high-speed position counter latches*
- *Dedicated motion I/O: EL, ORG, INP, RDY, SVON, ERC, and ALM*
- *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*
- *High speed position latch function*
- *Programmable acceleration and deceleration time*
- *Trapezoidal and S-curve velocity profiles*
- *28-bit up/down counter for incremental encoder*
- *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 2500 V_{RMS} isolated*
- *Point table management up to 2000 sets*

**For HSL introduction, please refer to chapter 6.*

Specifications

Slave ID consumption	4
Number of controllable axes	4
Maximum number of HSL-4XMO in single HSL network	15
Position range (28 bit)	Pulse output is programmable to be OUT/DIR or CW/CCW 28-bit up/down counter for encoder feedback signal -134217728 to +134217728 pulse
General-purpose input type	NPN/ PNP jumper selectable
General-purpose input voltage	ON: 6.5V to 24V OFF: 0 to 3V
General-purpose output	N for NPN sinking type output P for PNP sourcing type output
General-purpose output current	±90mA (Max.)
Power Supply	$22V_{DC}$ to $26V_{DC}$
Power Consumption	8W
CE Certification	Ready

Introduction

4-Axis Pulse Train Control Module

ADLINK HSL-4XMO-CG-N and HSL-4XMO-CD-N are 4-axis pulse train motion control modules based on HSL bus. Compared with traditional PCI boards, distribution solution can let users benefit from wire-saving, space-saving, and cost-effective advantages. One HSL bus can support up to 60 axes pulse train motion control.
Besides, HSL-4XMO offers point table management which can save the moving points into the module and make movement without consuming CPU resource.

Velocity or Position Override

The HSL-4XMO 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 HSL-4XMO 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 HSL-4XMO 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 HSL-4XMO 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 while almost no CPU resource is needed.

Automatic Backlash Compensation

Whenever direction change is occurred, the HSL-4XMO 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 HSL-4XMO provides 13 home moving modes for users to choose as their best convenience.

Cable Accessories

MR-J2HBUS M

- Controller to amp. bus cable
- Available for 2M, 5M

MR-J2HBUS M(CAN)

- Controller to amp. bus cable
- Available for 2M, 5M

MR-JCCBL M

- Encoder cable (for KFS series)
- Available for 2M, 5M

MR-JHSCBL M

- Encoder cable (for SFS series)
- Available for 2M, 5M

SSCNET Y Cable

- PCI-8372+ controller to amplifier bus cable
- Available for 2M, 5M, 10M

ACL-50P M

- Controller to amplifier bus cable, 50-pin to 50-pin
- Available for 1M, 2M, 3M
- Suitable for Panasonic A4 servo and Yaskawa Sigma II, III and V servo

ACL-50P M-OPEN

- Controller to amplifier bus cable, 50pin to open wire
- Available for 2M, 3M
- Suitable for Panasonic A4 servo and Yaskawa Sigma II, III and V servo

SCSI-VHDCI 100P Cable

- SCSI-VHDCI 100-pin cable
- Available for 2M, 3M

HSL-4XMO-DM Cable

- For HSL-4XMO-CD-N/ -P
- For Mitsubishi MR-J2S-A servo amplifiers

HSL-4XMO-DP Cable

- For Panasonic MINAS A4 servo amplifier with brake control
- For HSL-4XMO-CD-N/ -P

ACL-10568-1

- SCSI-VHDCI 68-pin cable
- Available for 1M, 2M, 1.8M, 3M, 5M

ACL-10569-1

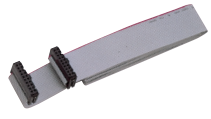
- 68-pin SCSI cable
- Available for 1M, 2M, 3M

ACL-102100

- 100-pin SCSI-II cable
- Available for 0.5M to 10M

ACL-10120-1

- 20-pin flat cable
- Available for 1M



ACL-10250

- 50-pin SCSI-II cable
- Available for 1M, 2M, 1.5M, 4M, 6M

ACL-10137-1MM

- 37-pin D-sub male-male cable
- Available for 1M

ACL-10232

- DB-9 RS-232 male-female cable
- Available for 5M

ACL-10337

- Two 20-pin header to DB-37 PC back panel

ASS PCI-8134

- +24V power core for motion card

CB-MLPT-S1M

- Mini LPT to single open cable
- Available for 1M

RJ45-DB9M

- Flat cable connection between DB-8151 and DB-8151-RJ45
- Flat cable connection between DB-8153 and DB-8153-RJ45

MA-J3BUS M

- Mini LPT to single open cable, SSCNET III fiber cable
- Available for 0.15M, 0.3M, 0.5M, 3M, 5M

DIN Rail Screw Termination Boards

Compitable Termination Boards for Motion Control Cards

	Product Name											
	PCI-8174	PCI-8158	PCI-8154	PCI-8164	PCI-8102	PCI-8132	PCI-8134	PXI-8164	cPCI-8168	cPCI-8312H	PCI-8372+	PCI-8366+
DIN without cable												
DIN-100S-01	●	●	●	●		●	●	●				
DIN-68S-01									●	●	●	●
DIN-68M-J2A0					●				●			
DIN-68M-J3A0					●				●			
DIN-68Y-SGII0					●				●			
DIN-68P-A40					●				●			
DIN-812M0						●						
DIN-814M0	●	●	●	●			●	●				
DIN-814M-J3A0	●	●	●	●			●	●				
DIN-814Y0	●	●	●	●			●	●				
DIN-814PA0	●	●	●	●			●	●				
DIN-814P-A40	●	●	●	●			●	●				
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For Mitsubishi Servo Terminal Boards

DIN-812M0

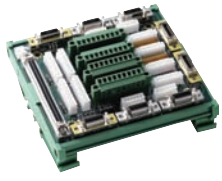
Termination Board for Mitsubishi MR-J2S-A servo amplifiers with 100-pin SCSI connector

- *Compatible with Mitsubishi MR-J2S-A servo amplifier*
- *Dimensions: 123 x 107 x 44 mm (W x L x H)*

Mating cables:

- *ACL-102100*
- *SCSI-VHDCI 100P Cable*

DIN-814M0



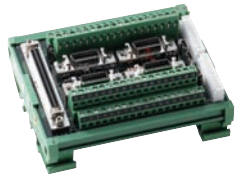
Termination board for Mitsubishi MR-J2S-A servo amplifiers

- *Compatible with Mitsubishi MR-J2S-A servo amplifiers*
- *Dimensions: 123 x 107 x 44 mm (W x L x H)*

Mating cables:

- *ACL-102100*
- *SCSI-VHDCI 100P Cable*

DIN-68M-J2A0



Termination board for Mitsubishi MR-J2A servo amplifiers

- *Compatible with Mitsubishi MR-J2A servo amplifiers*
- *Dimensions: 103 x 83 x 43 mm (W x L x H)*

Mating cables:

- *ACL-10568-1*
- *ACL-10569-1*

DIN-814M-J3A0

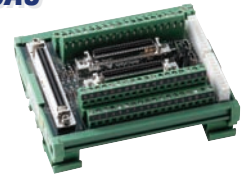
Termination board for Mitsubishi MR-J3-A servo amplifiers

- *Compatible with Mitsubishi MR-J3-A servo amplifiers*
- *Dimensions: 123 x 107 x 44 mm (W x L x H)*

Mating cables:

- *ACL-102100*
- *SCSI-VHDCI 100P Cable*

DIN-68M-J3A0



Termination board for Mitsubishi MR-J3-A servo amplifiers

- *Compatible with Mitsubishi MR-J3-A servo amplifiers*
- *Dimensions: 103 x 83 x 43 mm (W x L x H)*

Mating cables:

- *ACL-10568-1*
- *ACL-10569-1*

DIN Rail Screw Termination Boards

For Yaskawa Servo Terminal Boards

DIN-814Y0

Termination board for Yaskawa Sigma-II servo amplifiers

- *Compatible with Yaskawa Sigma-II servo amplifiers*
- *Dimensions: 123 x 107 x 44 mm (W x L x H)*

Mating cables:

- *ACL-102100*
- *SCSI-VHDCI 100P Cable*

DIN-68Y-SGII0

Termination board for Yaskawa SIGMA-II servo amplifiers

- *Compatible with Yaskawa Sigma-II servo amplifiers*
- *Dimensions: 103 x 83 x 43 mm (W x L x H)*

Mating cables:

- *ACL-10568-1*
- *ACL-10569-1*

For Panasonic Servo Terminal Boards

DIN-814P-A40

Termination board for Panasonic MINAS A4 servo amplifiers

- *Compatible with Panasonic MINAS A4 servo amplifiers*
- *Dimensions: 123 x 107 x 44 mm (W x L x H)*

Mating cables:

- *ACL-102100*
- *SCSI-VHDCI 100P Cable*

DIN-68P-A40

TTermination board for Panasonic MINAS A4 servo amplifiers

- *Compatible with Panasonic MINAS A4 servo amplifiers*
- *Supports 500k & 2Mpps pulse frequency input options*
- *Dimensions: 103 x 83 x 43 mm (W x L x H)*

Mating cables:

- *ACL-10568-1*
- *ACL-10569-1*

DIN-814PA0

Termination board for Panasonic MINAS A servo amplifiers

- *Compatible with Panasonic MINAS A servo amplifiers*
- *Dimensions: 123 x 107 x 44 mm (W x L x H)*

Mating cables:

- *ACL-102100*
- *SCSI-VHDCI 100P Cable*

For General Wiring Terminal Boards

DIN-100S-01

Termination board with 100-pin SCSI-connector with DIN socket

- *General purpose termination board for 100-pin SCSI-II cable*
- *On-board connector type: female 100-pin*
- *Dimensions: 157 x 112 x 51 mm (W x L x H)*

DIN-68S-01

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

- *General purpose termination board for 68-pin SCSI-II cable*
- *Dimensions: 103 x 83 x 43 mm (W x L x H)*

Others

DIN-50S-01

Termination board with 50-pin SCSI-II connector with DIN socket

- *General purpose termination board for 50-pin SCSI -II cable*
- *On-board connector type is female 50-pin*
- *Plastic cover for protection of wiring*
- *Dimensions: 124 x 77 x 50 mm (W x L x H)*

DIN-37D-01

Termination board with one 37-pin D-sub connector and DIN-rail mounting

- *General purpose termination board for D-sub 37-pin cable*
- *On-board connector type: 37-pin D-sub female*
- *Dimensions: 113 x 85 x 52 mm (W x L x H)*

DIN-20P-01

Termination board with one 20-pin ribbon connector and DIN-rail mounting

- *DIN-rail mounting General purpose termination board for 20-pin ribbon cable*
- *Dimensions: 68 x 85 x 55 mm (W x L x H)*