

# Motion Control

<b>Motion Control Overview</b>		<b>1-2</b>
<b>SoftMotion Introduction</b>		<b>1-5</b>
<b>Common Motion API Introduction</b>		<b>1-12</b>
<b>Centralized Motion Control Solution Selection Guide</b>		<b>1-13</b>
<b>Distributed Motion Control Solution Selection Guide</b>		<b>1-14</b>
<b>Centralized Motion Control Solutions</b>		
<b>PEC-3240</b>	Intel Celeron M 1.0 GHz 4-axis Embedded Motion Controller with 32-ch Digital I/O	<b>1-15</b>
<b>PEC-3710</b>	AMD LX800 500 MHz Controller with 16-ch AI, 4-ch AO and 32-ch Isolated DI/O	<b>1-16</b>
<b>PCI-1220U</b>	2-axis Stepping and Servo Motor Control Universal PCI Card	<b>1-17</b>
<b>PCI-1240U</b>	4-axis Stepping and Servo Motor Control Universal PCI Card	
<b>PCM-3240</b>	4-axis Stepping and Servo Motor Control PC/104 Card	
<b>PCI-1243U</b>	4-axis Stepping Motor Control Universal PCI Card	<b>1-18</b>
<b>PCI-1245/1265 (New)</b>	DSP-based 4/6-axis Stepping and Servo Motor Control Universal PCI Card	<b>1-19</b>
<b>PCI-1245E (New)</b>	Economic DSP-based 4-axis Stepping and Servo Motor Control Universal PCI Card	<b>1-20</b>
<b>Distributed Motion Control Solutions</b>		
<b>PCI-1202U</b>	2-port AMONet RS-485 PCI Master Card	<b>1-21</b>
<b>PCM-3202P</b>	2-port AMONet RS-485 PC/104+ Master Card	
<b>AMAX-2240 Series</b>	4-axis AMONet Motion Slave Modules	<b>1-22</b>
<b>AMAX-2750SY Series</b>	32-ch Isolated Digital Input/Output Slave Modules	<b>1-23</b>
<b>Accessories</b>		
<b>Accessories</b>	DIN-rail Terminal Boards	<b>1-24</b>

To view all of Advantech's Motion Control Solutions, please visit [www.advantech.com/products](http://www.advantech.com/products).

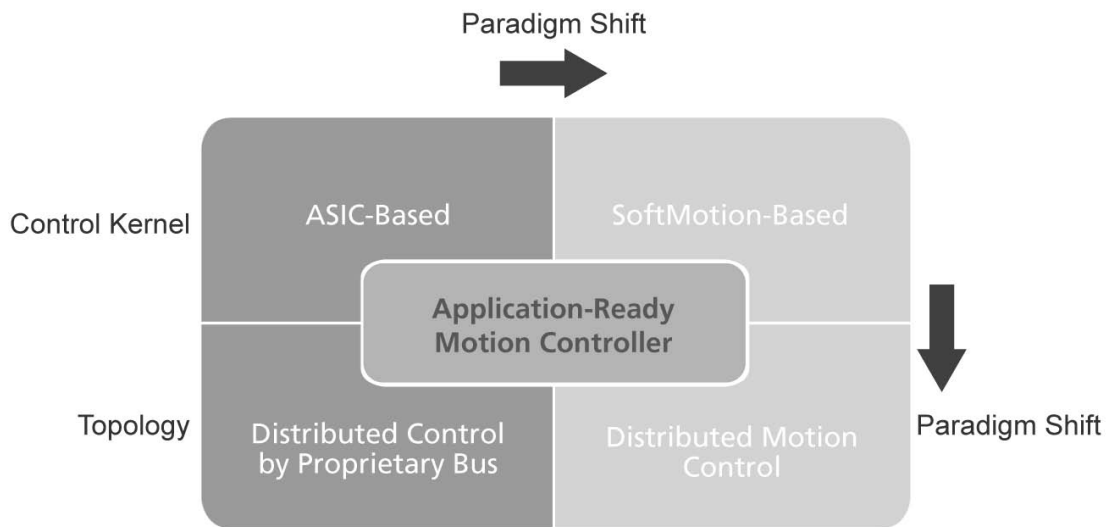


# Motion Control Overview

## Application-Oriented Motion Control Platforms to Fulfill a Variety of Control Requirements

Looking back over the past decades of PC-based motion control, ASIC-based & distributed control topologies through proprietary bus are quite common. However, the new emerging market for machine control comes with multiple-axis dependency, synchronization, and improved response times. These factors drive the paradigm shift from ASIC-based to SoftMotion-based and have more flexibility in design through suitable trajectories aligned with machines to meet the faster throughput, high performance and precision, and real-time Ethernet to give system integrators and machine builders help find the suitable solutions and reduce costs. Combining SoftMotion-based & Ethernet, this paradigm shift helps improve flexible trajectories, wiring-saving, and faster response times compared with past centralized topologies and reduce system implementation complexity.

Moreover, each quadrant of technology in the following diagram could be integrated into PC-based barebones to provide application-ready motion control platforms with off-the-shelf utilities and bountiful libraries for vertical market applications. For example, Advantech's PEC-3240 is a dispensing-oriented controller for the electronic industries.



**Application-ready Motion Control Platform Related Technology Chart**

### ASIC-based Motion Control

Since the 1990's, Advantech has been developing several motion control boards with ASIC-based technology. Based on the ASIC kernel, the boards are digital signal type and connected with servo drivers and motors to build a system. The pulse train speed and resolution will determine the control precision and response. Advantech's motion control team implemented application-ready libraries to fulfill the different machines in industry. The ASIC-based series boards are for GMC (General Motion Control) purposes to provide faster time-to-market with robust and cost-effective market adopters.

### Distributed Motion Control

As industrial Ethernet technology moves forward to increase response times and accurate time-deterministic precision, using real-time Ethernet is the future trend and benefits many machine builders with open standards. Distributed motion control can significantly reduce wiring efforts and cost in significant ways. In the past, fieldbus control was proprietary and had lower response times. Machine builders only have limited options in the market. However, open standard real-time Ethernet is the next generation. This technology will be also applied to a variety of Advantech platforms to offer application-ready motion control platforms with real-time Ethernet technology.

### SoftMotion-based Motion Control

In order to meet increasingly demands for complexity of trajectories, such as Gantry control & synchronization, and voltage signals for speed/torque control, Advantech's motion control team developed SoftMotion-based motion controllers and provides application-oriented & customization services. The SoftMotion technology is a control kernel executed by software which can run in DSP-based, RISC-based and X86-based CPUs with real-time extension. This technology gives flexibility in system implementation and the possibility to integrate third party real-time I/O control boards.

### Features and Benefits of Common Motion APIs

Most machine builders and system integrators face library integration headaches from different vendors and different boards. Moreover, re-programming applications are necessary when the motion control boards are changed or upgraded. Advantech's motion control team delivered the common motion API concept and developed the common motion library is to reduce time-consuming on this task and give faster time-to-market if any upgrading request exists. The common motion API concept is applied to all of Advantech's motion controllers.

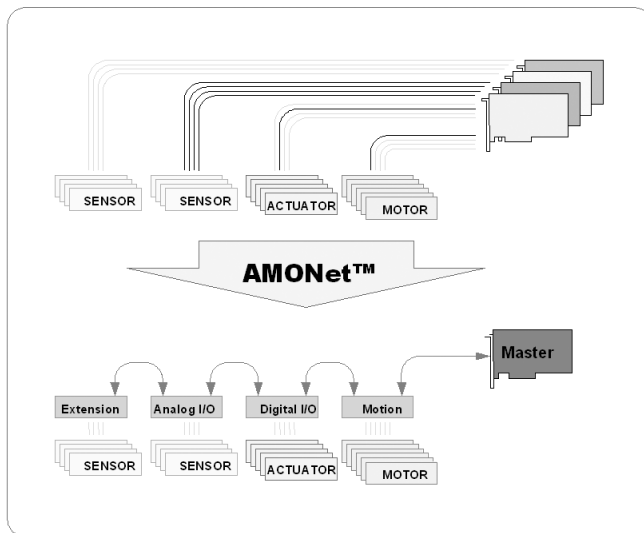
### Application-Ready Motion Control Platform

In any vertical specific application, machine builders and system integrators are looking for application-ready control platforms. The main reasons for this consideration are system integrity and system stability. Compared with plug-in motion controllers plus industrial PCs, the application-ready motion control platform provides a well-designed system with validation to guarantee stability. Furthermore, this concept can bring higher add-on value to system integrators and machine builders.

## Complete Application-Ready Platforms for General Motion Control Tasks

Advantech offers application-ready platforms that range from industrial workstations and industrial-grade CPUs, to motion control, encoder input and isolated I/O cards for general motion control (GMC) applications such as SMT/PCB, semiconductor and LCD manufacturing machinery. Advantech provides a full-range of industrial computing platforms that include high-brightness LCD displays, keypads, up to 20-slot backplanes and redundant power supplies for machine builders.

Nowadays general motion applications are divided into two functions - centralized and distributed motion control solutions. For centralized motion control, ASIC-based motion controllers are entry level that allow customers to easily build their own motion machines. As complicated and high performance applications are increasing, Advantech has recently developed SoftMotion control modules which are DSP-based to help customers do more tasks that ASIC-based motion modules can't do, such as gantry control, trajectory planning, electrical-CAM and so on. Furthermore, in order to enhance performance and stability, customized firmware in SoftMotion will be possible and can add secure protection for authorization. Advantech provides 2, 4, and 6 axis motion modules to fulfill the different motion applications.



Wire-Saving/Long-Distance

## AMONet - Advantech Distributed Motion Control Solutions

Motion control is growing in complexity as the number of axes in newly developed machines with motion control increases each year. Distance is also becoming an issue, as motors are located further and further away from the host computer. AMONet (Advantech Motion Network) was engineered to tackle the problems of increasing spending on wiring and maintenance of these complex motion control systems, and it also gets rid of distance limitations.

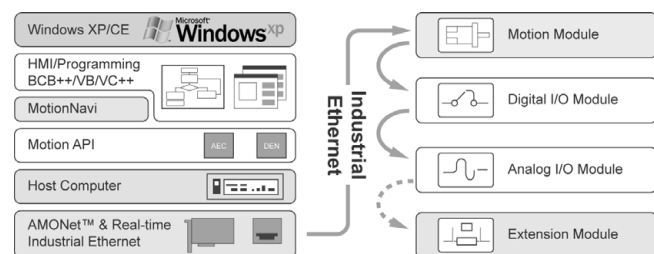
The first series of distributed motion control products from Advantech are called the AMONet RS-485 Series. AMONet RS-485 products are categorized as Master cards or Slave modules. While the Master card is kept in the host PC, the slave modules can be distributed so that they are next to motor drivers on the factory floor. The communication speed between the AMONet RS-485 slave modules can be up to 20 Mbps. This makes it possible to scan 2048 I/O points within 1.04 ms (or 1024 I/O points in 0.56 ms). Furthermore, an AMONet RS-485 master will update the I/O status automatically, and map data into local memory. Software running on the host PC can then read the status by simply reading the onboard memory, so no polling of slave modules is necessary.

Each port of a master card can control up to 2048 I/O connections or 256 motion axes, so future extensions are easily implemented. The distance between a master card and its slave modules can be up to 100 meters, and this distance is covered with a cost-effective Cat 5 network cable. In addition to saving wiring costs, debugging and maintenance are also simplified.

Another advantage of AMONet RS-485 is its compatibility with motor drivers from different vendors. Advantech provides specially designed wiring boards for popular motion drivers from vendors such as Panasonic, Mitsubishi and Yaskawa. This makes configuration easier, as pin-to-pin cables can be used. Having a selection of motor vendors can also be an advantage when sourcing of a certain motor is difficult.

Motion control and I/O functions with AMONet RS-485 use the same library. This unique feature saves time, as programmers do not need to study both a motion library and an I/O library. You can also connect to a manual pulse generator directly to adjust and calibrate the system without having to write programs first.

AMONet makes machine building with motion control easier. The savings made on wiring and programming effort, as well as the compatibility with a wide range of popular motors have already led to many requests for AMONet products.



System Architecture

1	Motion Control
2	Hazardous Location
3	Energy Automation
4	Building Automation Systems
5	Automation Software
6	Operator Panels
7	Automation Panel PCs
8	Industrial Monitors
9	Industrial Ethernet
10	Device Servers & Gateways
11	Serial Communication Cards
12	Embedded Auto. Computers
13	PACs
14	M2M I/O
15	Distributed Nano Controllers
16	RS-485 I/O
17	Ethernet I/O
18	DAQ Boards

# Motion Control Overview

## A Broad Array of Products for Centralized Motion Control

Advantech's full product offering can accommodate all your motion control needs. You can choose from 2-axis and 4-axis controllers, pulse-output or voltage-output, ISA-bus-based or PCI-bus-based, and standard PC-based or embedded in a system. The functions of the motion cards also vary, from high-end 3-axis circular interpolation cards to low-cost point-to-point motion devices. And if you cannot find a controller to meet your exact requirements for an embedded motion controller, Advantech is ready to build cost-effective controllers to meet your criteria, whether it be adding digital I/O channels or changing connector styles, or perhaps changing CPU grade. With all the inherent costs, time and risks involved, there's no reason why you should design your own controller when you can instead rely on the expertise, cost-efficiency, experience and proven reliability of Advantech.

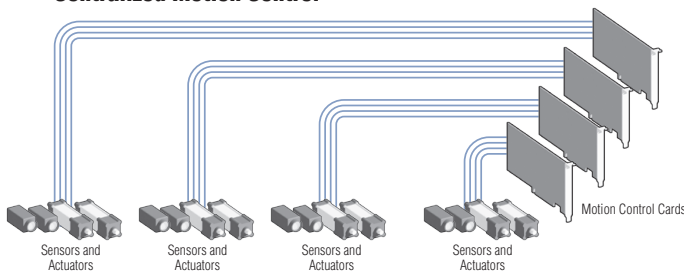
## The Differences Between Centralized & Distributed Motion Control

Machine control system architectures generally fall into two categories - centralized or distributed. In a centralized system, all control loops including logic, trajectory generation, and PID control, are executed on a single processor. In a distributed system, the trajectory generation and logic control executes in the central processor, but the PID control loop is executed in the intelligent slave module. A distributed approach gives more processing power, while it reduces overall wiring cost and system complexity.

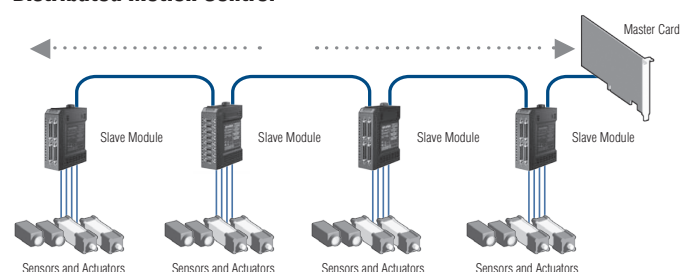
The Distributed Motion Control Products are categorized in two groups - Master Cards and Slave Modules. Communication between master and slave is based on a custom-engineered technology based on RS-485, which saves wires, transmits over long distances at high speeds, and has time-deterministic features.

The communication interface between master and host PC is based on memory mapping. Various functions can be chosen on the slave modules, and the industrial DIN-rail mountable design makes it easy to distribute them in the field. The master card collects information from slave modules and publishes the data to its host PC, and vice versa.

### Centralized Motion Control

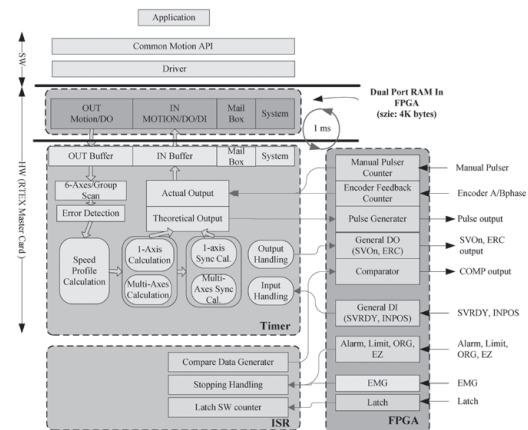


### Distributed Motion Control



## SoftMotion-based Motion Control

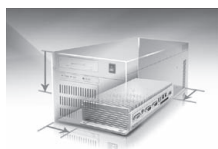
Advantech develops DSP-based SoftMotion control cards which enable the simplified utilization of complex motion manipulation involving JOG, PTP, linear and circular interpolation, multiple axes synchronized motion, and etc. For highly flexible programming features, it has the possibility to offer motion kernel customization. For high performance FPGA, high execution rate DSP, and Dual-Port RAM (DPM) technology, SoftMotion control cards can support faster encoding speeds, higher speed position comparison, and trigger pulse outputs over cards which use ASIC motion IC. SoftMotion controllers can provide programmable acceleration and deceleration to eliminate jerk and smooth velocity profile. For each axis, individual unlimited point tables can realize seamless continuous movements. These tables are also able to combine linear and arc segments. Based on the Common motion API—DSP & FPGA architectures, Advantech provides customers much easier programming environment and robust motion control.



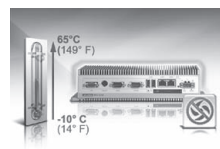
## Application-Ready Motion Control Platforms - PEC Series

Advantech provides embedded motion control platforms for embedded motion applications. PEC series is 1/8 the size compared with standard industrial computers, even with built-in motion control and digital I/O. Analog input functionalities, greatly saving space and development time. Fanless, no internal cables, and diskless mechanisms allow PEC series to operate under -10 ~ 65°C (14 ~ 149°F) without any heat issues. Due to its PC-based computing architecture integrated with motion control and digital I/O, PEC series can handle a wide range of devices under test (DUT), such as touch panel profiles very quickly, greatly reducing development time. Its small size allows it to fit into space-constrained applications and its anti-vibration capabilities allow PEC series to withstand vibration and noise interference during verification processes. To meet different demands for industrial automation, PEC series provides a variety of motion control functions, such as 2/3-axis linear, 2-axis circular interpolation, continuous interpolation, T/S-curve speed profile and software limits. PEC series features USB ports, COM (RS-232) ports, 10/100 Base-T LAN ports, and CompactFlash slots. These interfaces provide the capability to easily expand peripheral devices and modules.

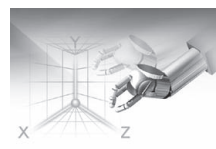
### Compact Size



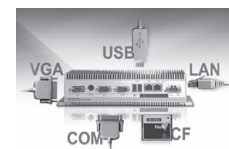
### Robust Design



### Advanced Motion Control



### Rich Interfaces



# SoftMotion Introduction

## Advantech's SoftMotion Introduction

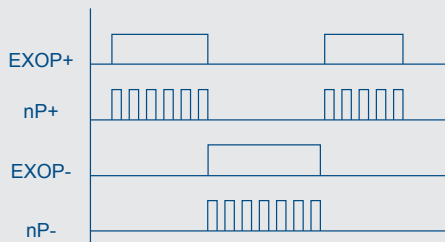
SoftMotion is Advantech's important core technology in the equipment automation field. Compared to ASIC motion control solutions, Advantech's Machine Automation Team independently developed its own SoftMotion control technology and uses the FPGA (Field Programmable Gate Array) and DSP (Digital Signal Processing) as the core-computing hardware platform. Because of SoftMotion, which is developed into the software architecture, excludes the inherent limitations of ASIC specifications Advantech is able to offer the expertise of professional motion control for our customers and provides custom firmware to optimize customer's devices control as well as to minimize their needs for programming. Through SoftMotion technology enhancements, Advantech offers critical technologies in EMA (Electronic Machine Automation) and TMA (Traditional Machine Automation) fields. Meanwhile, based on the three motion control architectures (centralized, distributed and embedded), Advantech's comprehensive product offering helps our customers to continuously progress their technologies, so as to create a win-win opportunity.

Supporting Advantech's PCI-1245/1265/1245E series, SoftMotion's features are described below:



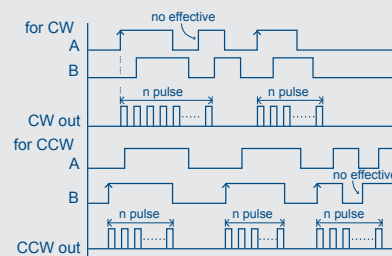
### JOG Move

Manually control the axis to directly move within a fixed (predefined) amount of position or continuously in the +/- direction along all axes via external signals; with this feature, users can manually control the movement while reducing CPU loading without consuming system resource.



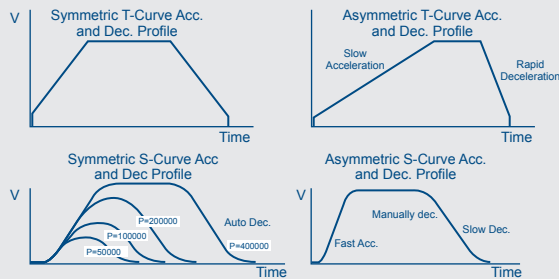
### Handwheel Move

Use a handwheel to control a motor to rotate positively or negatively; also, users can define parameters for or use external handwheels to control axial movement.



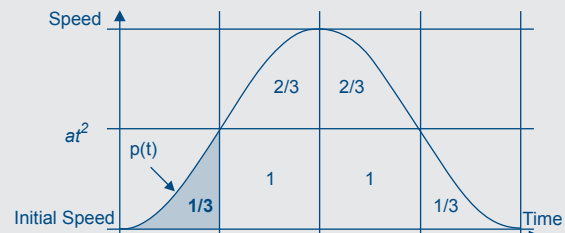
### Trapezoidal & S-Curve Profile

Users can issue commands to configure movement profiles (initial speed, acceleration, deceleration, maximum speed and acceleration onset rate (or called jerk which is for S—speed-curve movement)) and control a motor to move based on predefined speed curves such as the trapezoidal curve or S-curve (second degree curve).



### Programmable Acceleration and Deceleration

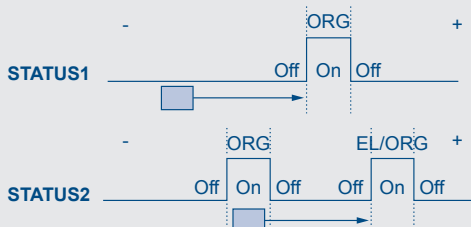
Programmable to define the rate of acceleration and deceleration and configure acceleration curve profile (the initial speed, maximum speed, acceleration, deceleration, Jerk) that best meets user needs. Acceleration and deceleration rates can be set independently to ensure the movement better & smooth!



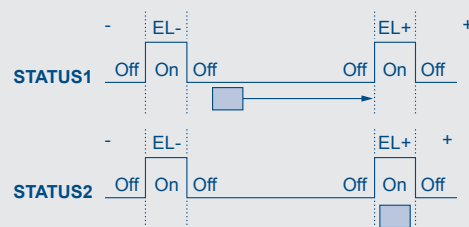
### Homing

SoftMotion supports more than 10 homing modes to fit into the mechanical design.

**MODE1\_Abs:** Limited to using ORG only, movement (direction) → ORG trigger → stop  
**Example:** Positive direction; ORG logic: trigger on a high voltage level

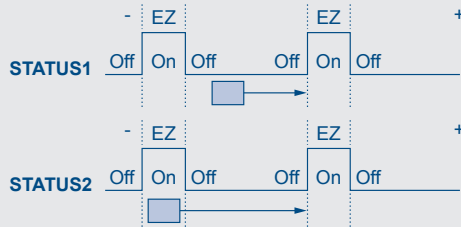


**MODE2\_Lmt:** Limited to using EL only, movement (direction) → EL trigger → stop  
**Example:** Positive direction; EL logic: trigger on high voltage level

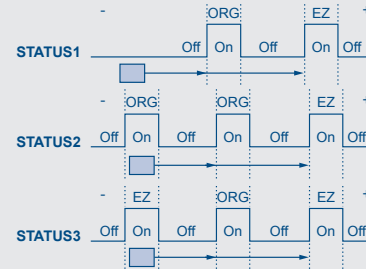


# SoftMotion Introduction

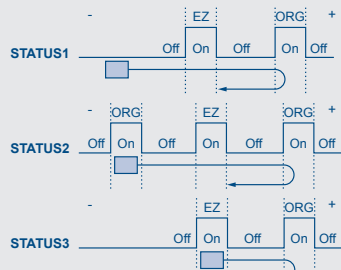
**MODE3\_Ref:** Limited to using EZ only, movement (direction) → EZ trigger → stop  
**Example:** Positive direction; EZ logic: trigger on high voltage level



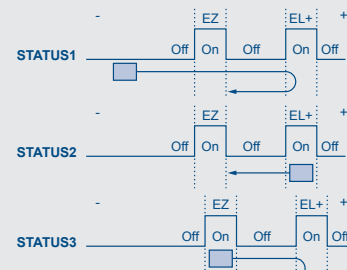
**MODE4\_Abs\_Ref:** ORG + EZ, movement (direction) → ORG trigger → stop → movement (direction) → EZ trigger → stop  
**Example:** Positive direction; ORG logic: trigger on high voltage level; EZ logic: trigger on high voltage level



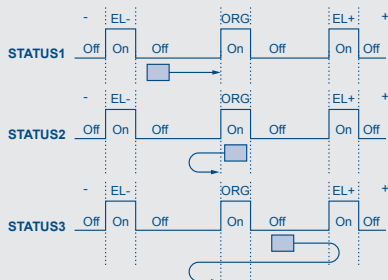
**MODE5\_Abs\_NegRef:** ORG + negative EZ, movement (direction) → ORG trigger → stop → movement (negative direction) → EZ trigger → stop  
**Example:** Positive direction; ORG logic: trigger on high voltage level; EZ logic: trigger on high voltage level



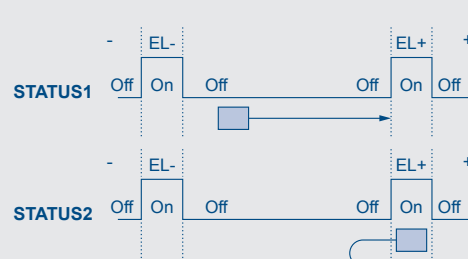
**MODE6\_Lmt\_Ref:** EL + negative EZ, movement (direction) → EL trigger → stop → movement (negative direction) → EZ trigger → stop  
**Example:** Positive direction; EL logic: trigger on high voltage level; EZ logic: trigger on high voltage level



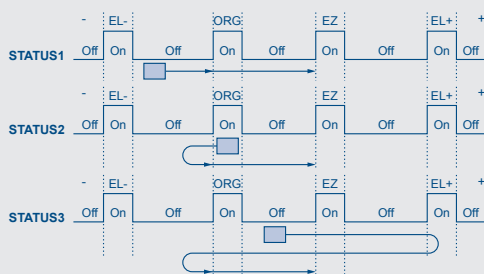
**MODE7\_AbsSearch:** limited to searching ORG only, movement (direction) → ORG → stop  
**Example:** Positive direction; EL logic: trigger on high voltage level  
 EL logic: trigger on high voltage level



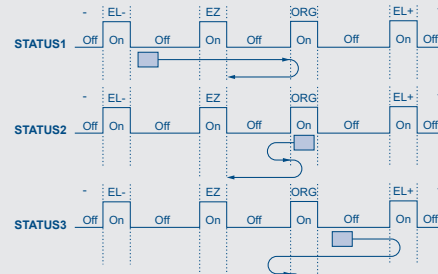
**MODE8\_LmtSearch:** Limited to searching EL only, movement (direction) → EZ search → stop  
**Example:** Positive direction; EL logic: trigger on high voltage level



**MODE9\_AbsSearch\_Ref:** Search ORG+EZ only, movement (direction) → ORG search → stop  
 movement (direction) → EZ trigger → stop  
**Example:** Positive direction; ORG logic: trigger on high voltage level;  
 EL logic: trigger on high voltage level

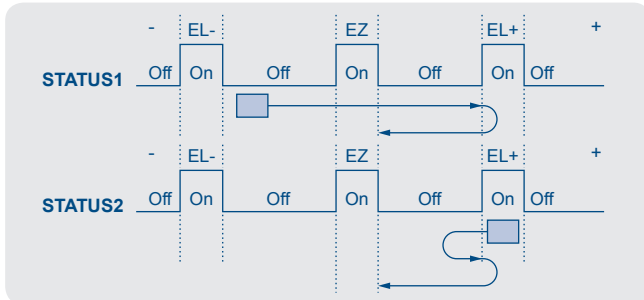


**MODE10\_AbsSearch\_NegRef:** Search ORG+ negative EZ, movement (direction) → ORG search → stop  
 stop → movement (direction) → EZ trigger → stop  
**Example:** Positive direction; ORG logic: trigger on high voltage level;  
 EL logic: trigger on high voltage level; EZ logic: trigger on high voltage level



**MODE11\_LmtSearch\_Ref:** Search EL+ negative EZ, movement (direction) → EL search → stop → movement (negative direction) → EZ trigger → stop

**Example:** Positive direction; EL logic: trigger on high voltage level;  
EZ logic: trigger on high voltage level



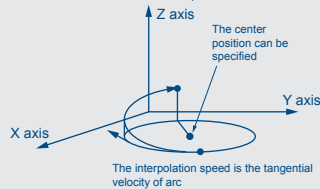
## Helical / Spiral Interpolation

Helical / spiral movement by interpolation defined by

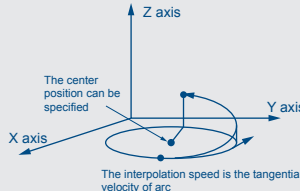
- (1) center position
- (2) terminal point on the circular route or points along the circular route
- (3) terminal point on the circular route and Z axis movement.

To perform interpolation up to 2+1 axes for helical / spiral movement.

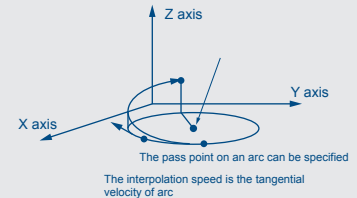
3-axis spiral interpolation (Center point specification/  
CW direction/Z-axis movement)



3-axis spiral interpolation (Center point specification/  
CCW direction/Z-axis movement)



3-axis spiral interpolation (Pass point specification/  
Z-axis movement)

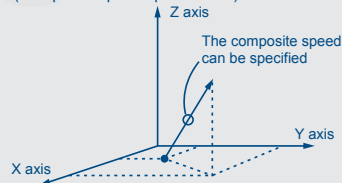


## Multi-axis (Group) Motion

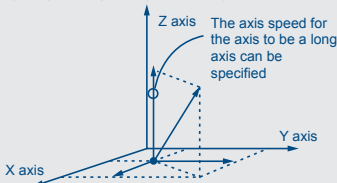
- Group settings: up to 3 group settings
- Linear interpolation: up to 6 axes
- Speed override is available

### 3-axis Linear Interpolation

3-axis linear interpolation  
(Composite speed specification)

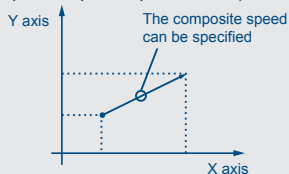


3-axis linear interpolation  
(Composite speed specification)

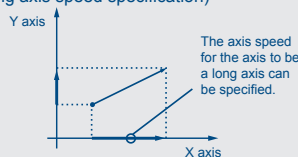


### 2-axis Linear Interpolation

2-axis linear interpolation  
(Composite speed specification)



2-axis linear interpolation  
(Long axis speed specification)



1

Motion Control

2

Hazardous Location

3

Energy Automation

4

Building Automation  
Systems

5

Automation Software

6

Operator Panels

7

Automation Panel PCs

8

Industrial Monitors

9

Industrial Ethernet

10

Device Servers &  
Gateways

11

Serial Communication  
Cards

12

Embedded Auto.  
Computers

13

PACs

14

M2M I/O

15

Distributed Nano  
Controllers

16

RS-485 I/O

17

Ethernet I/O

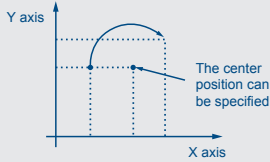
18

DAQ Boards

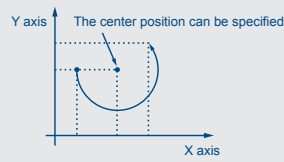
# SoftMotion Introduction

## 2-axis Circular Interpolation

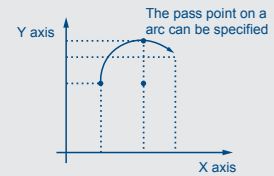
2-axis circular interpolation  
(Center point specification/CW direction)



2-axis circular interpolation  
(Center point specification/CCW direction)

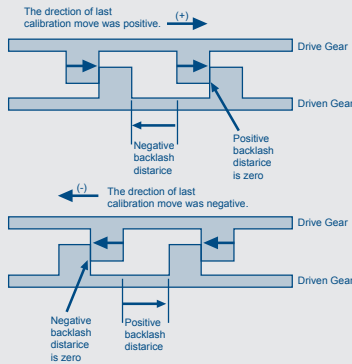


2-axis circular interpolation  
(Pass point point specification)



### Backlash Compensation

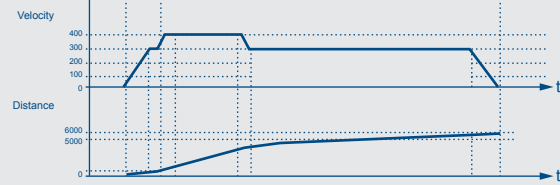
In order to enhance ball screw repeatability precision, special algorithms and commands can be adopted to eliminate these errors and offset their inherited weakness in mechanism design.



### Superimposed Move

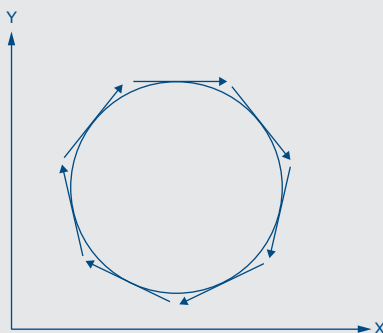
Change the current state of motion by superimposing new commands onto existing movement. E.g. the expected position and speed are 5,000 and 300. The state of motion is changed by superimposing position 1,000 and speed 100.

#### Motion



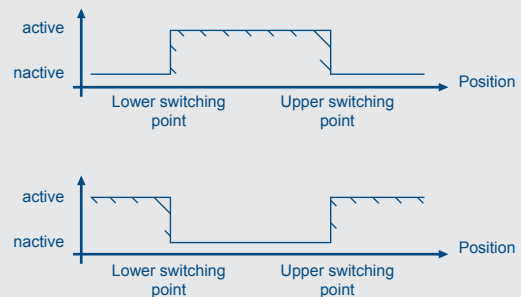
### Tangential Following

The knife control of cutting machine is typical application. For Z axis movement, a motor follows the X-Y movement and curve. As shown below, the tangential direction of the circular movement for the Z axis on this X-Y dimension will be adjusted instantly to ensure that the radius between its movement and the circular trace stays at 90 degrees.



### Position Window Output

The digital output voltage level within a certain position window can be controlled by using commands.



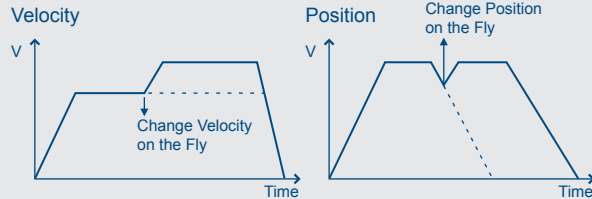
# SoftMotion Introduction



## Position / Velocity Override

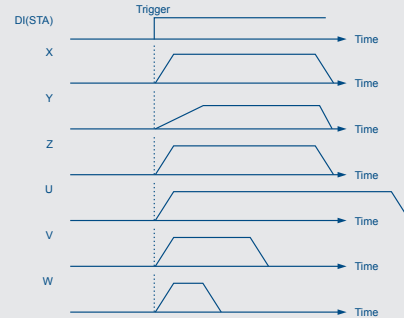
Under certain conditions, users can use commands to set up and change the position of a terminal point and movement speed to fulfill certain purposes. The terminal points and movement speed can still be changed on the fly.

### Position / Velocity Override



## Simultaneously Start/Stop

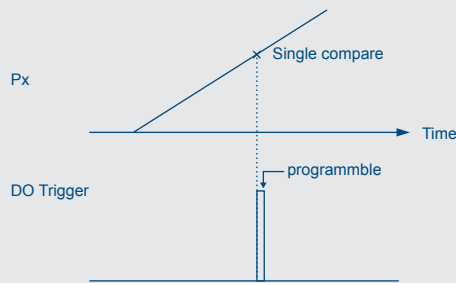
Simultaneously start/stop can be achieved by issuing commands to configure settings to trigger multiple axes and multiple cards from external signal sources. Software control via commands is also supported.



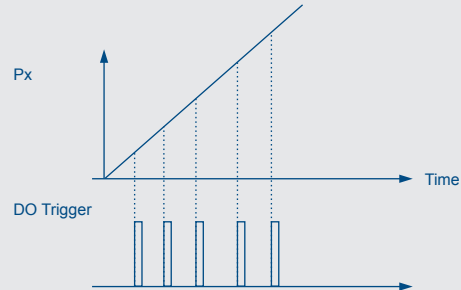
## Trigger Function

- Single compare & trigger: trigger on a single position.
- Table compare & trigger: multi position triggers during fixed intervals or variable intervals can be achieved via commands.
- Linear compare & trigger: triggers on any position within 2D or 3D space can be achieved via commands.
- Compare and toggle trigger: as shown in the bottom right figure, we can set to invert DO after triggers of a certain position – ex. high voltage level at the first point after triggers for DO, low voltage level at the second point after triggers for DO, and high voltage level again at the third position and ends with a low voltage level at the fourth point.

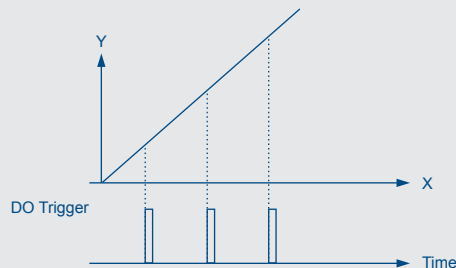
### Single Compare & Trigger



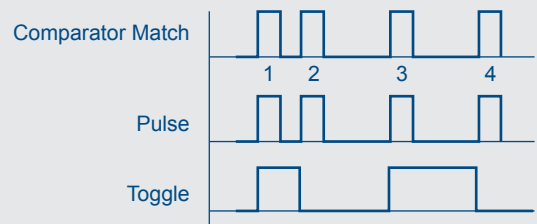
### Table Compare & Trigger



### Linear Compare & Trigger

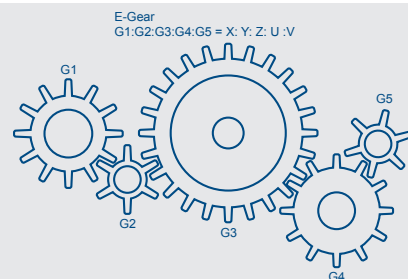


### Compare and Toggle Trigger



## E-Gear

Multi-axial and absolutely synchronized controls can be achieved through SoftMotion algorithms and parameter configurations. With E-Gear, users can enforce configurations and controls over master and slave gears through their relationship. This not only simplifies the mechanism designs, but also saves mechanism space and enforces absolute and synchronized controls.



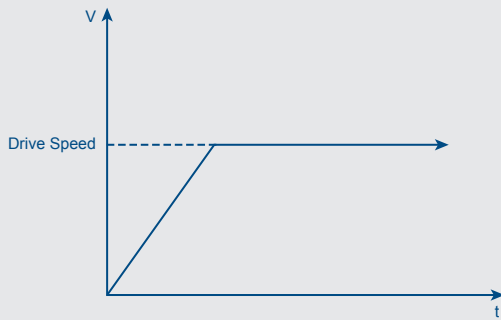
- 1 Motion Control
- 2 Hazardous Location
- 3 Energy Automation
- 4 Building Automation Systems
- 5 Automation Software
- 6 Operator Panels
- 7 Automation Panel PCs
- 8 Industrial Monitors
- 9 Industrial Ethernet
- 10 Device Servers & Gateways
- 11 Serial Communication Cards
- 12 Embedded Auto. Computers
- 13 PACs
- 14 M2M I/O
- 15 Distributed Nano Controllers
- 16 RS-485 I/O
- 17 Ethernet I/O
- 18 DAQ Boards

# SoftMotion Introduction



## Velocity Motion

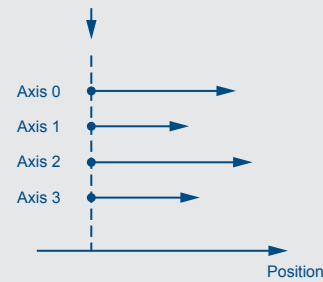
Via commands, users can control motors to operate continuously under a defined speed.



## Multi-Axis Point to Point Motion

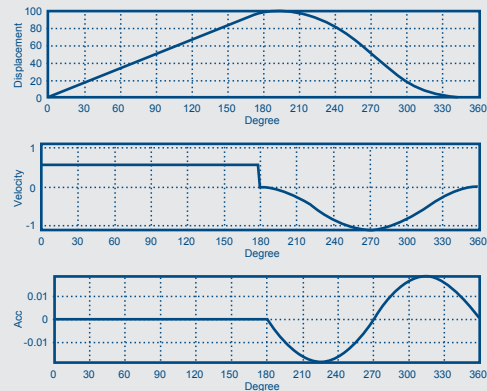
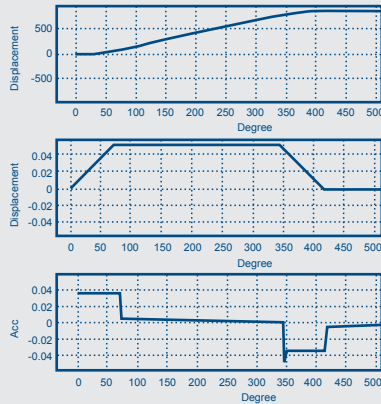
Entering terminal points of axis with relative and absolute positions, users can configure the motor to arrive at the final position configured. With this feature, users can activate multi-axial control and simultaneous start/stop on the same or different cards.

Simultaneous Start



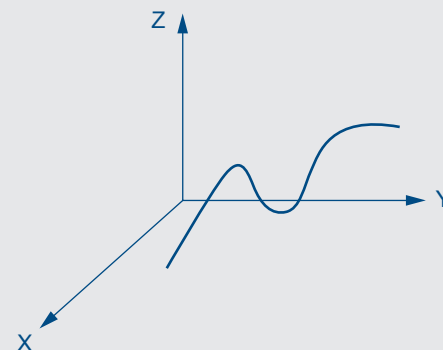
## E-Cam

The relationship of relative movement between master (shaft axis) and slave (follower axis) axes can be established from following tables and it can simulate moves of the cam and provide multiple movement models based on the relationship.



## Path Table Motion

- Supports up to 3 describing path table tables and each table can be up to 10,000 points
- Supports linear and circular interpolation commands
- Supports start/stop motion list as descriptive commands for movement control
- Supports Pause/ Resume commands
- Supports Auto Blending
- Supports Z axis following movement



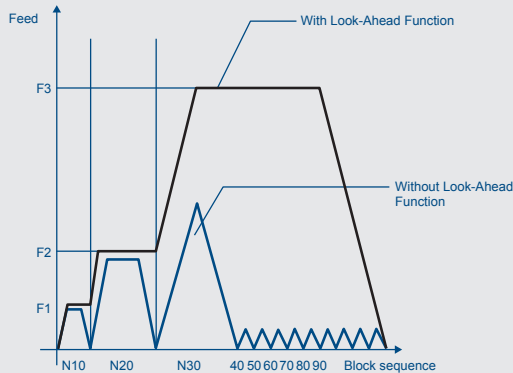
# SoftMotion Introduction

- 1 Motion Control
- 2 Hazardous Location
- 3 Energy Automation
- 4 Building Automation Systems
- 5 Automation Software
- 6 Operator Panels
- 7 Automation Panel PCs
- 8 Industrial Monitors
- 9 Industrial Ethernet
- 10 Device Servers & Gateways
- 11 Serial Communication Cards
- 12 Embedded Auto. Computers
- 13 PACs
- 14 M2M I/O
- 15 Distributed Nano Controllers
- 16 RS-485 I/O
- 17 Ethernet I/O
- 18 DAQ Boards



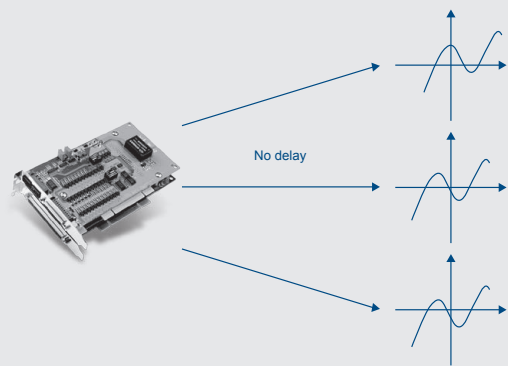
## Look Ahead

By configuring customized parameter profiles (e.g. feed speed and acceleration) users can use the forward looking preprocessing module to enforce movement control and continuous small segmented linear-wise trajectories processing procedures.



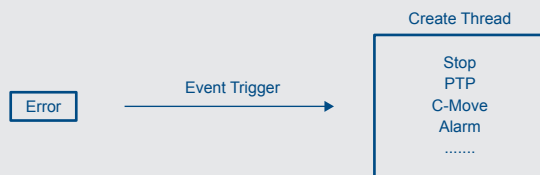
## Up to 3 Groups of Vectors Moving

With SoftMotion algorithms designed to enhance DSP and FPGA interaction, users can use the system to perform interpolated movement: to simplify the design of machines for mechanism designers.



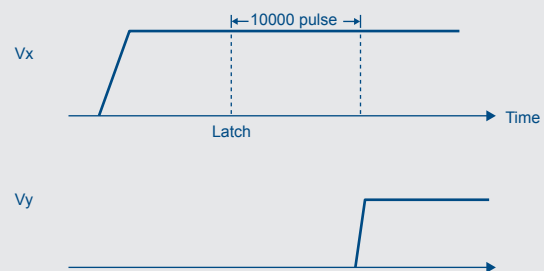
## Event Interrupt

Instantly notify users with event interruption alerts when specified event occur. So, users can activate contingency procedures based on event condition.



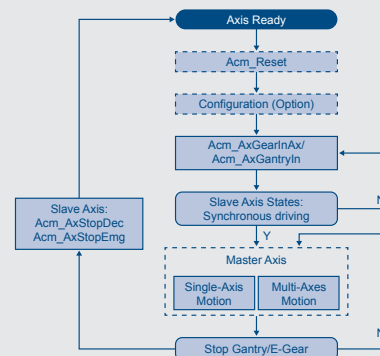
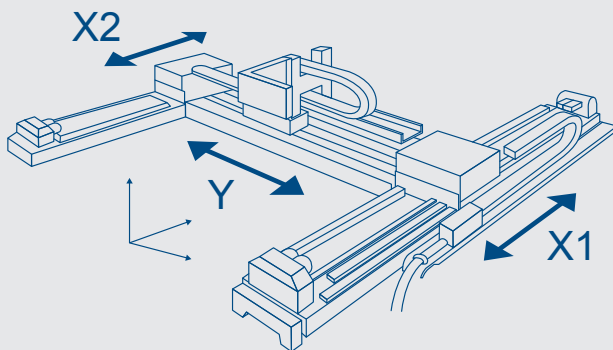
## Position Latch

Record down the theoretical and actual motor positions when corresponding sensors are triggered.



## Gantry Control

Ensure that the error deviation of absolute mutual parallel axes positions during active sessions remain within the predefined range via special algorithms to achieve gantry controls.

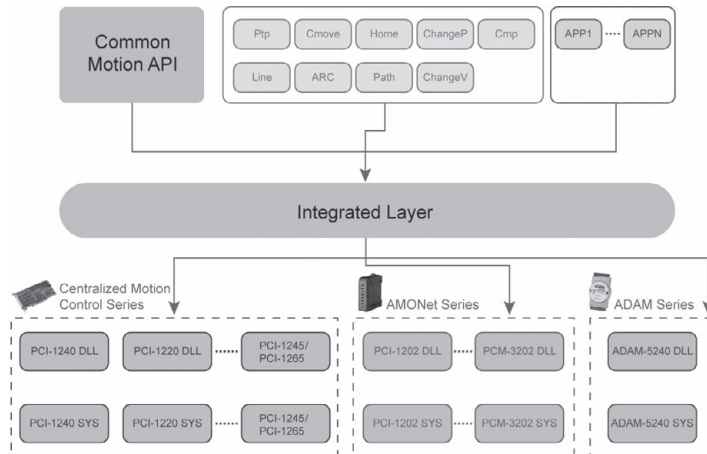


# Common Motion API Introduction

## Architecture and Features of Common Motion API

### Advantech's New Generation Motion Control Software

System integrators often encounter difficulties when an engineer may not be familiar with the different syntaxes during the integration of various motion control cards. And what bothers them the most is that when the system has to be upgraded, the problems often occur with rewriting the program as well as increasing the development time. To reduce these difficulties, Advantech has introduced a unified interface - Common Motion API- which provides a single syntax and interface, regardless of the types of motion control card the integrator chooses to use. The design can proceed under a single syntax interface to save development time and speed up the time to market. The ACM (Advantech Common Motion) architecture defines a single interface which consists of three types of operation objects, including Device, Axis and Group and each object has its own Property, Method and State.



### Features of Common Motion API

- Provides complete debugging tool utility
  - Hardware wiring testing
  - Software functional testing
  - Condition & status monitoring
- Provides the dedicated APIs for different applications
- Simplifies API calls process
- Improves the integration
- Supports scalable hardware
  - Supports the existing hardware and future hardware development, such as PCI-1245/1265

Through the above advantages and the lower learning threshold, integrators can significantly reduce development time and follow-up maintenance work!

## 5 Compositions in Common Motion API

### 1. Easy-understanding Naming Rule

#### Property

- FT\_XXX: Feature Property
- CFG\_XXX: Configuration Property
- PAR\_XXX: Parameter Property

#### Method

- Acm\_DevXXX(): Use 'Device' as a control unit
- Acm\_AxXXX(): Use 'Axis' as a control unit
- Acm\_GpXXX(): Use 'Group' as a control unit

#### Event

- EVT\_DevXXX
- EVT\_AxXXX
- EVT\_GpXXX

### 2. Object-oriented Interface

#### 3 Categories of Property

- Feature Property
- Configuration Property
- Parameter Property

#### 3 Categories of Method

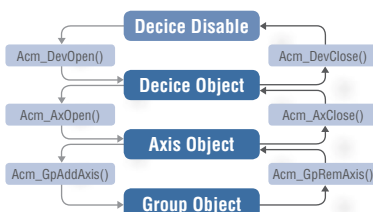
- Use 'Device' as a control unit
- Use 'Axis' as a control unit
- Use 'Group' as a control unit

#### 3 Categories of Event

- EVT\_DevXXX
- EVT\_AxXXX
- EVT\_GpXXX

### 3. Clear Motion Control Unit

- Single-axis: Axis Object
- Multi-axis: Group Object
- DI/O, AI/O: Device Object



### 4. Simple Integer Type

- U/I/F stands for different types of integers and the following numbers stand for bits.

New Type	Windows Data Type	Description
U8	UCHAR	8-bit unsigned integer
U16	USHORT	16-bit unsigned integer
U32	ULONG	32-bit unsigned integer
U64	ULONGLONG	64-bit unsigned integer
I8	CHAR	8-bit signed integer
I16	SHORT	16-bit signed integer
I32	INT	32-bit signed integer
I64	LONGLONG	64-bit signed integer
F32	FLAOT	32-bit Floating point variable
F64	DOUBLE	64-bit Floating point variable

- Example: U32 Acm\_AxMoveRel (U32 AxisHandle, PF64 Distance)

### 5. Detailed Error Classification

No	Error Code	Classification	Description
1	0	Success	Set up successfully
2	0x01000001~0x01000fff	Warning	The parameter is incorrect but do not affect performance
3	0x80000xxx	Function Error	Cannot execute because the parameter is incorrect
4	0x80001xxx	Communication Error	Cannot execute because of communication errors
5	0x80002xxx	Motion Error	Cannot execute because of motion errors
6	0x80003xxx	DAQ Error	Cannot execute because of data acquisition errors

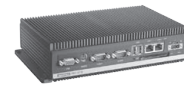
# Centralized Motion Control Solution Selection Guide

## Centralized Motion Control Solutions



Category		Motion Control							Encoder	
Bus		PC/104	PCI					ISA	PCI	ISA
Model		PCM-3240	PCI-1220U	PCI-1240U	PCI-1243U	PCI-1245 PCI-1265	PCI-1245E	PCL-839+	PCI-1784U	PCL-833
Axis	Number of Axis	4	2	4	4	4/6	4	3	-	-
	Linear Interpolation	✓	✓	✓	-	✓	✓	-	-	-
	2-axis Circle Interpolation	✓	✓	✓	-	✓	-	-	-	-
	2-axis Circle Interpolation	✓	✓	✓	-	✓	-	-	-	-
Advanced Functions	Encoder Channels	4	2	4	-	4/6	4	-	4	3
	Limit Switch Input Channels	8	4	8	8	8/12	8	6	-	-
	Home Input Channels	4	2	4	4	4/6	4	3	-	-
	Emergency Stop Input Channels	1	1	1	1	1	1	-	-	-
	Slow Down Limit Switches	8	4	8	-	8/12	8	6	-	-
	General Purpose DI Channels	12	6	12	8	16/32	16	16	4	2
	Servo On Output Channels	4	2	4	-	4/6	4	-	-	-
	General Purpose DO Channels	16	8	16	8	16/32	16	16	4	-
	Analog Input Channels	-	-	-	-	-/2	-	-	-	-
	BoardID Switch	✓	✓	✓	✓	✓	✓	-	✓	-
	Position Compare Event	✓	✓	✓	-	✓	-	-	-	-
	Position Latch	-	-	-	-	✓	-	-	-	-
	Dimensions (mm)	96 x 90	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	185 x 100	185 x 100	185 x 100
Connector		2 x 50-pin IDC	50-pin SCSI	100-pin SCSI	DB62	100-pin SCSI 50-pin SCSI 20-pin IDC	100-pin SCSI	1 x DB37 2 x 20-pin	DB37	1 x DB25
Wiring Boards		ADAM-3950 ADAM-3952	ADAM-3952 ADAM-3955	ADAM-3952 ADAM-3955	ADAM-3962	ADAM-3952 ADAM-3955	ADAM-3952 ADAM-3955	ADAM-3937 ADAM-3920	ADAM-3937	ADAM-3925
Page		1-17	1-17	1-17	1-18	1-19	1-20	online	online	online

## Embedded Motion Controller and Integrated I/O Controller



Model		PEC-3240	PEC-3710
CPU		Celeron M 1.0 GHz CPU	AMD LX800 500Hz CPU
Onboard RAM		512 MB DDR SDRAM	512 MB DDR SDRAM
Operating Systems		Windows XP Embedded	Windows CE, Windows XP
Motion Axis	Number of Axis	4	-
	Linear Interpolation	✓	-
	2-axis Circle Interpolation	✓	-
	General Inputs	12 (IN0 ~ 2 of each axis)	-
	General Outputs	16 (OUT4 ~ 7 of each axis)	-
Analog Input Channel		-	16 single-ended/ 8 differential
Analog Output Channel		-	4
Isolated Digital Input Channel		16	16
Isolated Digital Output Channel		16	16
Isolated Counter Channel		-	1
Page		1-15	1-16

# Distributed Motion Control Solution Selection Guide

## AMONet Motion Master Cards



Model		PCI-1202U	PCM-3202P
Bus		PCI	PC/104+
Advanced Functions	General Purpose DI Channels	8	-
	General Purpose DO Channels	4	-
	Remote Motion	✓	✓
	Remote I/O	✓	✓
Dimensions (L x H)		175 x 100 mm	96 x 90 mm
Connectors		2 x RJ45	4 x 10-pin box header
Digital I/O Slave Modules		AMAX-2752SY, AMAX-2754SY, AMAX-2756SY	
Motion Slave Modules		AMAX-2241/PMA, AMAX-2242/J2S, AMAX-2243/YS2	
Page		1-21	1-21

## AMONet Motion Slave Modules



Model		AMAX-2241/PMA	AMAX-2242/J2S	AMAX-2243/YS2
Axis	Number of Axis	4	4	4
	Linear Interpolation	✓	✓	✓
	2-axis Circle Interpolation	✓	✓	✓
Advanced Functions	Encoder Channels	4	4	4
	Limit Switch Input Channels	8	8	8
	Home Input Channels	4	4	4
	Emergency Stop Input Channels	1	1	1
	Slow Down Limit Switches	8	8	8
	Servo On Output Channels	4	4	4
	Board ID Switch	✓	✓	✓
	Position Compare Event	✓	✓	✓
	Position Latch	✓	✓	✓
	Power Consumption	5 W @ 24 V typical		
Dimensions (L x W x H)		125 x 47.6 x 151 mm	125 x 47.6 x 151 mm	125 x 47.6 x 151 mm
Page		1-22	1-22	1-22

## Isolated Digital I/O Slave Modules



Model	AMAX-2752SY	AMAX-2754SY	AMAX-2756SY
Isolated Digital Input Channels	32	-	16
Isolated Digital Output Channels	-	32	16
Typical Power Consumption	1.2 W	1.2 W	1.2 W
Maximum Power Consumption	5 W	5 W	5 W
Dimensions (L x W x H)	125 x 47.6 x 151 mm	125 x 47.6 x 151 mm	125 x 47.6 x 151 mm
Page	1-23	1-23	1-23

# PEC-3240

## Intel® Celeron® M 1.0 GHz 4-axis Embedded Motion Controller with 32-ch Digital I/O



### Features

- Onboard Celeron® M 1.0 GHz CPU
- 2 x RS-232 ports
- Two 10/100Base-T RJ45 ports
- 2 x USB ports (one with lockable cable mechanism)
- Independent 4-axis motion control
- 32-ch isolated Digital I/O (16-ch inputs and 16-ch outputs)
- 2/3-axis linear, 2-axis circular interpolation function
- Continuous interpolation
- Up to 4 Mpps output; up to 1 MHz encoder input
- Two pulse output types: CW/CCW or pulse/direction
- Two encoder pulse input types: A/B or CW/CCW

### Introduction

PEC-3240 is a standalone embedded motion controller that provides 4-axis motion and 32 isolated digital inputs/outputs. This controller also supports serial communication ports and several other networking interfaces. The Windows XP Embedded OS offers a pre-configured image with optimized onboard device drivers. You can seamlessly integrate your applications into Windows XP Embedded and speed up your system development with this application ready controller.

### Specifications

#### General

- **Certifications** CE, FCC Class A
- **Dimensions (W x D x H)** 255 x 152 x 59 mm (10" x 6.0" x 2.3")
- **Power Consumption** 24 W (Typical)
- **Power Requirements** 10 ~ 30 V<sub>DC</sub> (e.g 24 V @ 2 A) (Min. 48 W), AT
- **Weight** 2.4 kg (Typical)
- **OS Support** Windows XP Embedded, Windows 2000/XP

#### System Hardware

- **CPU** Celeron M 1.0 GHz
- **Memory** 512 MB DDR SDRAM
- **Indicators** LEDs for Power, IDE and LAN (Active, Status)
- **Keyboard/Mouse** 1 x PS/2
- **Storage** SSD: 2 x internal type I/II CompactFlash® slot

#### I/O Interface

- **Serial Ports** 2 x RS-232 with DB9 connectors
- **Serial Port Speed** 50 ~ 115.2 kbps
- **LAN** 2 x 10/100Base-T RJ45 ports
- **USB Ports** 2 x USB, EHCI, Rev. 2.0 compliant

#### Pulse Type Motion Control

- **Number of Axis** 4
- **Interpolation** 2-axis linear, 3-axis linear, 2-axis circular
- **Max. Output Speed** 4 Mpps
- **Step Count Range** ±2, 147, 483, 646
- **Pulse Output Type** CW/CCW or pulse/direction
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O** PEL x 4, MEL x 4, ORG x 4, ALM x 4, INP x 4, CMP x 4
- **General Inputs** 12 (IN0 ~ 2 of each axis)
- **General Outputs** 16 (OUT4 ~ 7 of each axis)

#### Encoder Interface

- **Input Type** Quadrature (x1, x2, x4 A/B phase) or CW/CCW
- **Input Range** 5 ~ 25 V
- **Isolation Protection** 1,000 V<sub>DC</sub>
- **Max. Input Frequency** 1 MHz

#### Isolated Digital Input

- **Channels** 16
- **Input Voltage** Logic 0: 2 V max.; Logic 1: 5 V min. (24 V max.)
- **Isolation Protection** 1,000 V<sub>DC</sub>

#### Isolated Digital Output

- **Channels** 16
- **Output Type** Sink Type (NPN)
- **Output Voltage** 5~40 V max.
- **Sink Current** 200 mA max. per channel
- **Isolation Protection** 1,000 V<sub>DC</sub>

#### Environment

- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** -10 ~ 65°C (14 ~ 149°F) @ 5 ~ 85% RH
- **Storage Temperature** -20 ~ 80°C (-4 ~ 176°F)
- **Shock Protection** IEC 68 2-27
- **Vibration Protection** CompactFlash: 50 G @ wall mount, half sine, 11 ms  
IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.)  
CompactFlash: 2 Grms @ 5 ~ 500 Hz

### Ordering Information

- **PEC-3240-AE** Celeron M 1 GHz 4-axis Motion Controller w/ DIO

#### Accessories

- **PCL-10251-1E** 100-pin SCSI to Two 50-pin SCSI Cable, 1m
- **PCL-10251-2E** 100-pin SCSI to Two 50-pin SCSI Cable, 2m
- **PCL-10251-3E** 100-pin SCSI to Two 50-pin SCSI Cable, 3m
- **PCL-10125-1E** DB25 Cable, 1m
- **PCL-10125-3E** DB25 Cable, 3m
- **ADAM-3955-AE** 50-pin DIN-rail SCSI 2-axis Motion Wiring Board
- **ADAM-3952-AE** 50-pin DIN-rail SCSI and Box Header Board
- **ADAM-3925-AE** DB25 DIN-rail Wiring Board

1

Motion Control

2

Hazardous Location

3

Energy Automation

4

Building Automation Systems

5

Automation Software

6

Operator Panels

7

Automation Panel PCs

8

Industrial Monitors

9

Industrial Ethernet

10

Device Servers & Gateways

11

Serial Communication Cards

12

Embedded Auto. Computers

13

PACs

14

M2M I/O

15

Distributed Nano Controllers

16

RS-485 I/O

17

Ethernet I/O

18

DAQ Boards

# PEC-3710

**AMD LX800 500 MHz Controller  
with 16-ch AI, 4-ch AO  
and 32-ch Isolated DI/O**



## Features

- Onboard AMD LX800 500 MHz CPU
- 2 x RS-232 ports
- Two 10/100Base-T RJ45 ports
- 2 x USB ports (one with lockable cable mechanism)
- 16-ch single-ended or 8-ch differential or a combination of Analog Input
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Onboard FIFO memory (4,096 samples)
- 4-ch 12-bit Analog Output
- 16-ch Isolated Digital Input
- 16-ch Isolated Digital Output
- 1-ch Isolated Counter

## Introduction

PEC-3710 is a standalone automation controller that provides 16-ch analog input, 4-ch analog output, 16-ch isolated digital input and 16-ch isolated digital output. This controller also supports serial communication ports and several other networking interfaces. You can seamlessly integrate your applications into PEC-3710 and speed up your system development with this application ready controller.

## Specifications

### General

- Dimensions (W x D x H)** 255 x 152 x 59 mm (10" x 6.0" x 2.3")
- Power Consumption** 24 W (Typical)
- Power Requirements** 10 ~ 30 V<sub>DC</sub> (e.g 24 V @ 2 A) (Min. 48 W), AT
- Weight** 2.4 kg (Typical)
- OS Support** Windows CE, Windows XP

### System Hardware

- CPU** AMD LX800 500 MHz
- Memory** 512 MB DDR SDRAM
- Indicators** LEDs for Power, IDE and LAN (Active, Status)
- Keyboard/Mouse** 1 x PS/2
- Storage** 2 x type I/II CompactFlash® slot (one internal)

### Environment

- Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- Operating Temperature** -10 ~ 60°C (14 ~ 140°F) @ 5 ~ 85% RH
- Storage Temperature** -20 ~ 80°C (-4 ~ 176°F)

### I/O Interface

- Serial Ports** 2 x RS-232 with DB9 connectors
- LAN** 2 x 10/100Base-T RJ45 ports
- USB Ports** 2 x USB, EHCl, Rev. 2.0 compliant

### Analog Input

- Channels** 16 single-ended/ 8 differential
- Resolution** 12 bits
- Max. Sampling Rate** 100 kS/s
- FIFO Size** 4,096 samples
- Overvoltage Protection** 30 Vp-p
- Input Impedance** 1 GΩ
- Input Range** (V, software programmable)

Unipolar	N/A	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Accuracy (% of FSR ±1LSB)	0.1	0.1	0.2	0.2	0.4

### Analog Output

- Channels** 4
- Resolution** 12 bits
- Output Range** (Software programmable)  
Unipolar (V) 0 ~ 5, 0 ~ 10  
Bipolar (V) ±5, ±10  
Current Loop (mA) 0 ~ 20, 4 ~ 20
- Driving Capability** 5 mA
- Accuracy** Relative: ±1 LSB; Differential  
Non-Linearity: ±1 LSB (monotonic)
- Excitation Voltage** 48 V (max.)

### Isolated Digital Input

- Channels** 16
- Input Voltage** Logic 0: 2 V max.  
Logic 1: 5 V min. (30V max.)
- Isolation Protection** 1,000 V<sub>DC</sub>

### Isolated Digital Output

- Channels** 16
- Output Type** Sink Type (NPN)
- Output Voltage** 5~40 V<sub>DC</sub>
- Sink Current** 300 mA max. per channel
- Isolation Protection** 1,000 V<sub>DC</sub>

### Isolated Counter

- Channels** 1
- Resolution** 16 bits
- Input Voltage:** Logic 0: 2 V max.  
Logic 1: 5 V min. (30 V max.)
- Isolation Protection:** 1,000 V<sub>DC</sub>
- Max. Input Frequency** 1 MHz

## Ordering Information

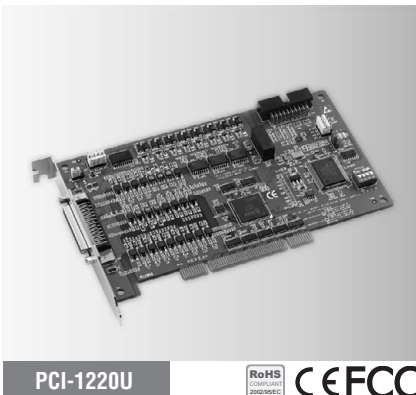
- PEC-3710-AE** AMD LX800 500 MHz Controller w/ AI/O and DI/O

### Accessories

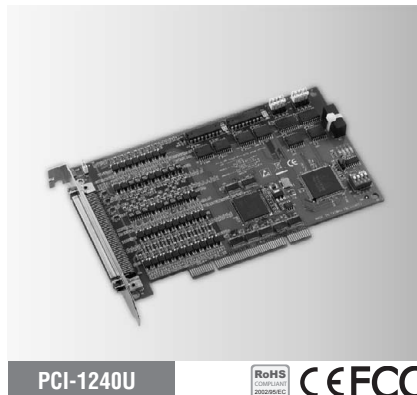
- PCL-10137-1E** DB37 Cable, 1m
- PCL-10125-1E** DB25 Cable, 1m
- ADAM-3925-AE** DB25 DIN-rail Wiring Board
- ADAM-3937-BE** DB37 DIN-rail Wiring Board

# PCI-1220U PCI-1240U PCM-3240

## 2-axis Stepping and Servo Motor Control Universal PCI Card 4-axis Stepping and Servo Motor Control Universal PCI Card 4-axis Stepping and Servo Motor Control PC/104 Card



PCI-1220U



PCI-1240U



PCM-3240



### Specifications

#### Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axis** 2
- **Interpolation** 2-axis linear, 2-axis circular
- **Max. Output Speed** 4 Mpps
- **Step Count Range**  $\pm 2,147,483,646$  (32 bits)
- **Pulse Output Type** Pulse/direction (1-pulse, 1-direction type) or CW/CCW (2-pulse type)
- **Position Counters** Range of command and actual position
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O Interfaces** PEL x 2, MEL x 2, ORG x 2  
Servo Driver Interfaces: ALM x 2, INP x 2  
Position Compare I/O: CMP x 2  
General Input: 6 (X\_IN0 ~ 2, Y\_IN0~2)  
General Output: 8 (X\_OUT4 ~ 7, Y\_OUT4~3)

#### Encoder Interface

- **Input Type** Quadrature (A/B phase) or up/down
- **Counts /Enc. Cycle** x1, x2, x4 (A/B phase only)
- **Input Range** 0 ~ 2 V<sub>DC</sub> for low; 5 ~ 30 V<sub>DC</sub> for high
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Max. Input Freq.** 1 MHz

#### General

- **Bus Type** Universal PCI V2.2
- **Certifications** CE, FCC Class A
- **Connectors** 1 x 50-pin SCSI female connector
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mAMax.: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temp.** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temp.** -20 ~ 85°C (-4 ~ 185°F)

### Ordering Information

- **PCI-1220U-AE** 2-axis Stepping and Servo Motor Control Universal PCI Card

### Specifications

#### Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axis** 4
- **Interpolation** 2-axis linear, 3-axis linear, 2-axis circular
- **Max. Output Speed** 4 Mpps
- **Step Count Range**  $\pm 2,147,483,646$  (32-bit)
- **Pulse Output Type** Pulse/direction (1-pulse, 1-direction type) or CW/CCW (2-pulse type)
- **Position Counters** Range of command and actual position
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O Interfaces** PEL x 4, MEL x 4, ORG x 4  
Servo Driver Interfaces: ALM x 4, INP x 4  
Position Compare I/O: CMP x 4  
General Input: 12 (IN0 ~ 2 of each axis)  
General Output: 16 (OUT4 ~ 7 of each axis)

#### Encoder Interface

- **Input Type** Quadrature (A/B phase) or up/down
- **Counts /Enc. Cycle** x1, x2, x4 (A/B phase only)
- **Input Range** 5 ~ 25 V
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Max. Input Freq.** 1 MHz

#### General

- **Bus Type** Universal PCI V2.2
- **Certifications** CE, FCC Class A
- **Connectors** 1 x 100-pin SCSI female connector
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mAMax.: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temp.** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temp.** -20 ~ 85°C (-4 ~ 185°F)

### Ordering Information

- **PCI-1240U-B2E** 4-axis Stepping and Servo Motor Control Universal PCI Card

### Specifications

#### Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axis** 4
- **Interpolation** 2-axis linear, 3-axis linear, 2-axis circular
- **Max. Output Speed** 4 Mpps
- **Step Count Range**  $\pm 2,147,483,646$  (32-bit)
- **Pulse Output Type** Pulse/direction (1-pulse, 1-direction type), or CW/CCW (2-pulse type)
- **Position Counters** Range of command, range of actual position
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O Interfaces** PEL x 4, MEL x 4, ORG x 4  
Servo Driver Interfaces: ALM x 4, RDY x 4, SVON x 4, INP x 4  
Position Compare I/O: CMP x 4  
General Input: 12  
General Output: 16

#### Encoder Interface

- **Input Type** Quadrature (A/B phase or up/down)
- **Counts /Enc. Cycle** x1, x2, x4 (A/B phase only)
- **Input Range** 5 ~ 25 V
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Max. Input Freq.** 1 MHz

#### General

- **Bus Type** PC/104
- **Certifications** CE, FCC Class A
- **Connectors** 2 x IDC 50-pin male connector
- **Dimensions (L x H)** 96 x 90 mm (3.8" x 3.5")
- **Power Consumption** Typical: 5 V @ 850 mAMax.: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temp.** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temp.** -20 ~ 85°C (-4 ~ 185°F)

### Ordering Information

- **PCM-3240-AE** 4-axis Stepping and Servo Motor Control PC/104 Card

1

Motion Control

2

Hazardous Location

3

Energy Automation

4

Building Automation Systems

5

Automation Software

6

Operator Panels

7

Automation Panel PCs

8

Industrial Monitors

9

Industrial Ethernet

10

Device Servers & Gateways

11

Serial Communication Cards

12

Embedded Auto. Computers

13

PACs

14

M2M I/O

15

Distributed Nano Controllers

16

RS-485 I/O

17

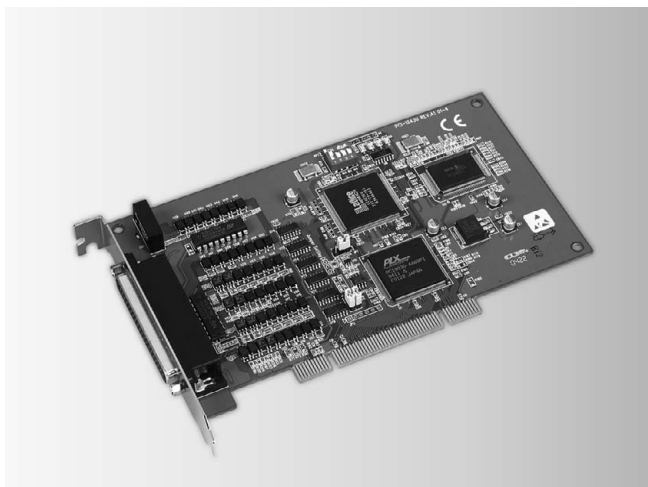
Ethernet I/O

18

DAQ Boards

# PCI-1243U

## 4-axis Stepping Motor Control Universal PCI Card



### Features

- 4 axis stepping motor control
- PCI universal bus
- Up to 400 k pulse output rate
- T-Curve acceleration/deceleration
- Pulse/Dir and CW/CCW pulse output mode
- Up 24-bit step count
- Opto-Isolated Digital input and output
- Up to 1,500 V<sub>RMS</sub> system isolation
- BoardID switch

### Introduction

PCI-1243U is a 4-axis stepping motor control card with universal PCI interface. Each axis can be controlled directly through the card's I/O registers. This board is economic solution for stepping motor which provides 4 channels pulse train, T/S speed profile, on-the-fly velocity change and so on. The board is supplied with DLL library for Windows programmer to write the program. With the DLL driver, you can easily link to VC++®, Visual Basic® or BCB.

### Specifications

#### Pulse Type Motion Control

- **Motor Driver Support** Stepping
- **Number of Axis** 4
- **Max. Output Speed** 400 kpps
- **Step Count Range** 0 ~ 16, 777, 215
- **Pulse Output Type** Pulse/Direction, CW/CCW
- **Position Counters** ±16, 777, 215
- **Home Modes** 4
- **Velocity Profiles** T-Curve or S-Curve acceleration/deceleration
- **Local I/O Interfaces** PEL x 4, NEL x 4, ORG x 4, SLD x 4, EMG x 1 General Inputs: 8 General Outputs: 8

#### Isolated Digital Input

- **Channels** 8
- **Input Voltage** Logic 0: 1 V  
Logic 1: 12 V (24 V max.)
- **Isolation Protection** 3,750 V<sub>RMS</sub>
- **Opto-Isolator Response** 25 µs
- **Input Resistance** 4.7 kΩ

#### Isolated Digital Output

- **Channels** 8
- **Output Type** Sink (NPN)
- **Isolation Protection** 3,750 V<sub>RMS</sub>
- **Output Voltage** 5 ~ 30 V<sub>DC</sub>
- **Sink Current** 200 mA max./channel; 1.1 A max. total
- **Opto-Isolator Response** 25 µs

#### General

- **Bus Type** PCI V2.2
- **Certifications** CE, FCC Class A
- **Connectors** 1 x DB-62 female
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 340 mA Max: 5 V @ 500 mA
- **Storing Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60°C (32 ~ 140°F)
- **Storing Temperature** -20 ~ 80°C (-4 ~ 170°F)

### Ordering Information

- **PCI-1243U-AE** 4-axis Stepping Motor Control Card

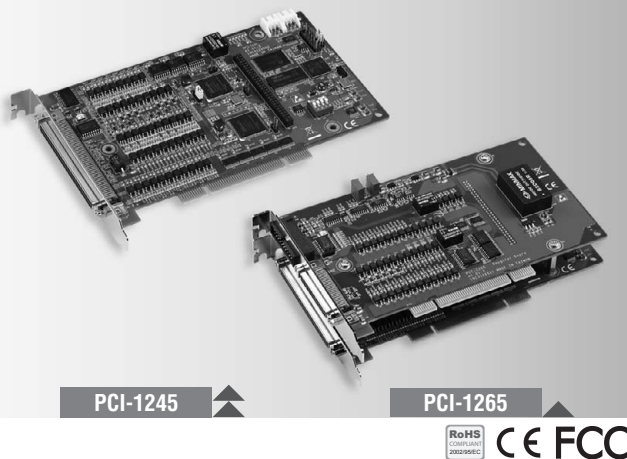
#### Accessories

- **PCL-10162-1E** DB-62 Cable Assembly, 1 M
- **PCL-10162-3E** DB-62 Cable Assembly, 3 M
- **ADAM-3962-AE** DB-62 wiring terminal with DIN-rail mounting

# PCI-1245/1265

**DSP-based 4/6-axis  
Stepping and Servo Motor  
Control Universal PCI Card**

**NEW**



PCI-1245

PCI-1265



## Introduction

PCI-1245/1265 is a 4/6-axis universal PCI (supporting both 3.3 V and 5 V signal slot) stepping/pulse-type servo motor control card designed for applications which need to control interpolation, synchronization among multiple axes, continuous contouring and high speed triggering to integrated machine vision solution. PCI-1245/1265 utilizes the high-performance DSP and FPGA to calculate the motion trajectories, synchronization timing control for multiple axes and input/output handling to offer functionality, such as up to 4-axis linear interpolation for PCI-1245 and up to 6-axis linear interpolation for PCI-1265, 2-axis circular interpolation, helical interpolation, T/S-curve acceleration/deceleration rate and so on. In addition, Advantech supplies a Common Motion API library, graphical utility and user-friendly examples to decrease programming load, helping users complete configuration and diagnosis easily.

## Specifications

### Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axis** PCI-1245: 4  
PCI-1265: 6
- **Interpolation** 2 to 6-axis linear, 2-axis circular, X-Y plane with Z thread helical interpolation
- **Max. Output Speed** 5 Mbps
- **Step Count Range**  $\pm 2, 147, 483, 646$
- **Pulse Output Type** Pulse/direction (1-pulse, 1-direction type) or CW/CCW (2-pulse type)
- **Position Counters** Range of command and actual position
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O**
  - Machine Interfaces: LMT+, LMT-, ORG
  - Servo Driver Interfaces: ALM, INP
  - Position Compare I/O: TrigP
  - General Digital I/O: PCI-1245: 16-ch DI, 16-ch DO (RDY/LTC pin can be switchable to general-purpose input and CAM-DO/TrigP/SVN/ERC pin to general-purpose output)  
PCI-1265: 32-ch DI, 32-ch DO (RDY/LTC pin can be switchable to general-purpose input and CAM-DO/TrigP/SVN/ERC pin to general-purpose output)
- **Analog Input:** 2 (PCI-1265 only)

### Encoder Interface

- **Input Type** Quadrature (A/B phase) or up/down
- **Counts per Enc. Cycle** x1, x2, x4 (A/B phase only)
- **Input Range** 5 ~ 15 V
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Max. Input Frequency** 10 MHz under 4xAB mode

## Features

- Encoder input is 10 MHz for 4xAB mode, 2.5 MHz for CW/CCW mode
- Pulse output up to 5 Mpps
- Memory buffer (10K points) for trajectory planning which is designed in DSP
- Supports E-Gear, and helical interpolation
- Supports E-CAM providing 256 points to describe the CAM profiles which buffers located in DSP
- Hardware emergency input
- Watchdog timer
- Position latch via ORG & index signal
- Position compare triggering up to 100 KHz, and memory buffer is up to 100 K points in DSP
- Programmable interrupt
- Supports gantry mode by semi-closed loop pulse train control
- RDY/LTC-dedicated input channels & SVN/TrigP/CAM-DO/ERC-dedicated output channels are switchable for general input and output purposes

### General

- **Bus Type** Universal PCI V2.2
- **Connectors** PCI-1245: 1 x 100-pin SCSI female connector  
PCI-1265: 1 x 100-pin SCSI female connector & 1 x 50-pin SCSI female connector
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA  
Max.: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temperature** -20 ~ 85°C (-4 ~ 185°F)

## Ordering Information

- **PCI-1245-AE** 4-axis Stepping/Servo Control Universal PCI Card
- **PCI-1265-AE** 6-axis Stepping/Servo Control Universal PCI Card

### Accessories

- **ADAM-3955-AE** 50-pin DIN-rail SCSI 2-axis Motion Wiring Board
- **ADAM-3952-AE** 50-pin DIN-rail SCSI and Box Header Board
- **ADAM-39100-AE** 100-pin DIN-rail SCSI Wiring Board
- **PCL-101100M-3E** 100-pin SCSI Cable, 3 m
- **PCL-10251-1E** 100-pin SCSI to Two 50-pin SCSI Cable, 1 m
- **PCL-10251-2E** 100-pin SCSI to Two 50-pin SCSI Cable, 2 m
- **PCL-10251-3E** 100-pin SCSI to Two 50-pin SCSI Cable, 3 m
- **PCL-10153PA5-2E** 50-pin Cable from ADAM-3955 to Panasonic A4 and A5 Servo, 2 m
- **PCL-10153YS5-2E** 50-pin Cable from ADAM-3955 to Yaskawa Sigma V Servo, 2 m
- **PCL-10153MJ3-2E** 50-pin Cable from ADAM-3955 to Mitsubishi J3 Servo, 2 m

**1**

Motion Control

**2**

Hazardous Location

**3**

Energy Automation

**4**

Building Automation Systems

**5**

Automation Software

**6**

Operator Panels

**7**

Automation Panel PCs

**8**

Industrial Monitors

**9**

Industrial Ethernet

**10**

Device Servers & Gateways

**11**

Serial Communication Cards

**12**

Embedded Auto. Computers

**13**

PACs

**14**

M2M I/O

**15**

Distributed Nano Controllers

**16**

RS-485 I/O

**17**

Ethernet I/O

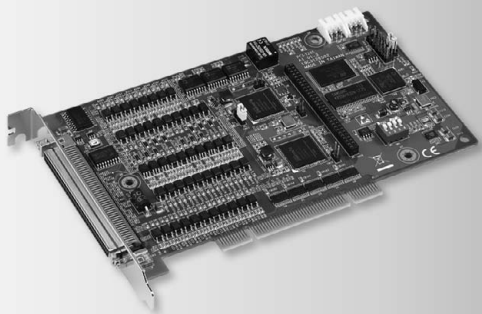
**18**

DAQ Boards

# PCI-1245E

## Economic DSP-based 4-axis Stepping and Servo Motor Control Universal PCI Card

NEW



RoHS  
COMPLIANT  
2002/95/EC

CE FCC

### Features

- Encoder input is 10 MHz for 4xAB mode, 2.5 MHz for CW/CCW mode
- Pulse output up to 5 Mpps
- Memory buffer for trajectory planning (circular trajectory and auto blending are not supported)
- Supports E-Gear
- Hardware emergency input
- Watchdog timer
- Position latch via ORG & index signal
- Programmable interrupt
- RDY/LTC-dedicated input channels & SVN/TrigP/CAM-DO/ERC-dedicated

### Introduction

PCI-1245E is a 4-axis economic universal PCI (supporting both 3.3 V and 5 V signal slot) stepping/pulse-type servo motor control card designed for entry-level applications which need to control linear interpolation, electronic gear, continuous contouring (circular trajectories and auto blending are excluded). PCI-1245E utilizes the high-performance DSP and FPGA to calculate the motion trajectories, synchronization timing control for multiple axes and input/output handling to offer functionality, such as 2 to 4-axis linear interpolation, E-Gear, T/S-curve acceleration/deceleration rate, speed override, 11 home modes and so on. In addition, Advantech supplies a Common Motion API library, graphical utility and user-friendly examples to decrease programming load, helping users complete configuration and diagnosis easily.

### Specifications

#### Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axis** 4
- **Interpolation** 2 axis linear
- **Max. Output Speed** 5 Mbps
- **Step Count Range**  $\pm 2, 147, 483, 646$
- **Pulse Output Type** Pulse/direction (1-pulse, 1-direction type) or CW/CCW (2-pulse type)
- **Position Counters** Range of command and actual position
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O**
  - Machine Interfaces: LMT+, LMT-, ORG
  - Servo Driver Interfaces: ALM, INP
  - General Digital I/O: 16-ch DI, 16-ch DO (RDY/LTC pin can be switchable to general-purpose input and CAM-DO/TrigP/SVN/ERC pin to general-purpose output)

#### Encoder Interface

- **Input Type** Quadrature (A/B phase) or up/down
- **Counts per Enc. Cycle** x1, x2, x4 (A/B phase only)
- **Input Range** 5 ~ 15 V
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Max. Input Frequency** 10 MHz under 4xAB mode

#### General

- **Bus Type** Universal PCI V2.2
- **Connectors** 1 x 100-pin SCSI female connector
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA  
Max.: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temperature** -20 ~ 85°C (-4 ~ 185°F)

### Ordering Information

- **PCI-1245E-AE** Economic 4-axis Stepping/Servo Control Universal PCI Card

#### Accessories

- **ADAM-3955-AE** 50-pin DIN-rail SCSI 2-axis Motion Wiring Board
- **ADAM-3952-AE** 50-pin DIN-rail SCSI and Box Header Board
- **ADAM-39100-AE** 100-pin DIN-rail SCSI Wiring Board
- **PCL-101100M-3E** 100-pin SCSI Cable, 3 m
- **PCL-10251-1E** 100-pin SCSI to Two 50-pin SCSI Cable, 1 m
- **PCL-10251-2E** 100-pin SCSI to Two 50-pin SCSI Cable, 2 m
- **PCL-10251-3E** 100-pin SCSI to Two 50-pin SCSI Cable, 3 m
- **PCL-10153PA5-2E** 50-pin Cable from ADAM-3955 to Panasonic A4 and A5 Servo, 2 m
- **PCL-10153YS5-2E** 50-pin Cable from ADAM-3955 to Yaskawa Sigma V Servo, 2 m
- **PCL-10153MJ3-2E** 50-pin Cable from ADAM-3955 to Mitsubishi J3 Servo, 2 m

# PCI-1202U PCM-3202P

2-port AMONet RS-485 PCI Master Card

2-port AMONet RS-485 PC/104+ Master Card



PCI-1202U



## Specifications

### AMONet RS-485 Motion Control

- **AMONet RS-485** 2 rings
- **Interface** Half duplex RS-485
- **Cable Type** CAT5 UTP/STP Ethernet cable and above
- **Surge Protection** 10 kV
- **Transmission Speeds** 2.5, 5, 10, and 20 Mbps
- **Data Flow Control** Automatic
- **Communication Distance (Max.)** 100 m @ 20 Mbps w/32 slave modules  
100 m @ 10 Mbps w/64 slave modules
- **Slave Module** Digital I/O, Motion Control, Analog I/O

### Isolated Digital Input

- **Channels** 8
- **Input Voltage** Dry contact (need external voltage source)
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Input Resistance** 2.4 kW @ 0.5 W

### Isolated Digital Output

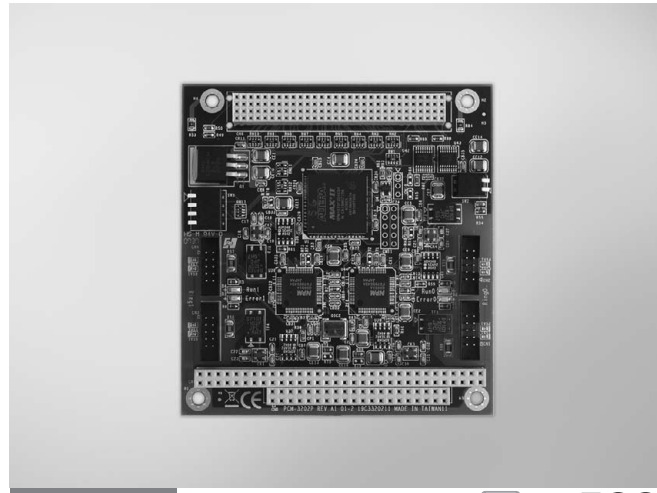
- **Channels** 4
- **Output Type** Open collector
- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Output Voltage** 10 ~ 30 V<sub>DC</sub>
- **Sink Current** 1 ch: Max. 0.5 A  
4 ch: Max. 1.1 A (total)

### General

- **Bus Type** Universal PCI V2.2
- **Certifications** CE, FCC Class A
- **Connectors** 2 x RJ45
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** 5 V<sub>DC</sub> @ 0.5 A typical
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temp.** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temp.** -20 ~ 85°C (-4 ~ 185°F)

## Ordering Information

- **PCI-1202U-AE** 2-port AMONet RS-485 PCI Master Card



PCM-3202P



## Specifications

### AMONet RS-485 Motion Control

- **AMONet RS-485** 2 rings
- **Interface** Half duplex RS-485
- **Cable Type** CAT5 UTP/STP Ethernet cable
- **Surge Protection** 10 kV
- **Transmission Speeds** 2.5, 5, 10, and 20 Mbps
- **Data Flow Control** Automatic
- **Communication Distance (Max.)** 100 m @ 20 Mbps w/32 slave modules
- **Slave Module** Digital I/O, Motion Control, Analog I/O

### General

- **Bus Type** PC/104+
- **Certifications** CE, FCC Class A
- **Connectors** 4 x 10-pin box header
- **Dimensions (L x H)** 96 x 90 mm (3.8" x 3.5")
- **Power Consumption** +5 V<sub>DC</sub> @ 0.5 A typical
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temp.** 0 ~ 60°C (32 ~ 140°F)
- **Storing Temp.** -20 ~ 85°C (-4 ~ 185°F)

## Ordering Information

- **PCM-3202P-AE** 2-port PC/104+ AMONet RS-485 Master Card

1

Motion Control

2

Hazardous Location

3

Energy Automation

4

Building Automation Systems

5

Automation Software

6

Operator Panels

7

Automation Panel PCs

8

Industrial Monitors

9

Industrial Ethernet

10

Device Servers & Gateways

11

Serial Communication Cards

12

Embedded Auto. Computers

13

PACs

14

M2M I/O

15

Distributed Nano Controllers

16

RS-485 I/O

17

Ethernet I/O

18

DAQ Boards

# AMAX-2240 Series

4-axis AMONet Motion Slave Modules



## Features

- Max. 20 Mbps transfer rate
- Max. 6.5 MHz, 4-axis pulse output
- 28 bits counter for incremental encoder
- 2 ~ 4-axis linear interpolation
- 2-axis circular interpolation
- T-Curve and S-Curve velocity profiles support
- Change speed on-the-fly
- Easy installation with RJ45 phone jack and LED diagnostic
- Easy installation for servo or stepping motor driver
- Suitable for DIN-rail mounting

## Introduction

AMAX-2240 series is used to increase the number of axes for an AMONet RS-485 decentralized motion control network. These extension slave modules connect serially by a simple and affordable Cat.5 LAN cable, reducing the wiring between driver and controller. This is very suitable for highly integrated machine automation applications. Please select cable 20-pin SCSI and plug this cable into the motor driver and motion slave module.

## Specifications

### Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo
- **Number of Axis** 4
- **Interpolation** Linear and circular
- **Max. Output Speed** 6.5 Mpps
- **Step Count Range**  $\pm 134, 217, 728$
- **Pulse Output Type** OUT/DIR, CW/CCW, A/B phase
- **Position Counter**  $\pm 134, 217, 728$
- **Home Modes** 13
- **Velocity Profiles** T-Curve, S-Curve
- **Local I/O**
  - Machine Interfaces: EL+ x 4, EL- x 4, ORG x 4, SD x 4
  - Servo Driver Interfaces: ALM x 4, RDY x 4, SVON x 4, INP x 4, ERC x 4
  - Position Compare I/O: LTC x 4, CMP x 4

### Encoder Interface

- **Input Type** A/B phase, CW/CCW
- **Counts per Enc. Cycle** x1, x2, x4 (AB phase only)
- **Input Range** Compatible with TIA/EIA-422 differential line driver  
I :  $\pm 20$  mA, VOD :  $\pm 2$  V/min
- **Isolation Protection** 2,500 V<sub>RMS</sub>
- **Max. Input Frequency** 2 MHz @ 5 V

### General

- **Bus Type** AMONet RS-485
- **Certifications** CE, FCC Class A
- **Connectors** 2 x RJ45 and 8 x 20-pin SCSI (AMAX-2242/J2S)  
4 x 50-pin SCSI (AMAX-2241/PMA and AMAX-2243/YS2)
- **Dimensions (L x W x H)** 125 x 47.6 x 151 mm (4.9" x 1.8" x 5.9")
- **Power Consumption** 5 W @ 24 V typical
- **Power Input** 24 V<sub>DC</sub> within 200 mV ripple
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60°C (32 ~ 140°F)

## Ordering Information

- **AMAX-2241/PMA-AE** 4-axis AMONet Motion Module for Panasonic Minas A
- **AMAX-2242/J2S-AE** 4-axis AMONet Motion Module for Mitsubishi MR-J2S
- **AMAX-2243/YS2-AE** 4-axis AMONet Motion Module for Yaskawa Sigma-II

### Accessories

- **PCL-10220M-2E** 20-pin SCSI Cable, 2 m
- **PCL-10150M-2E** 50-pin SCSI Cable, 2 m
- **ADAM-3940-AE** 40-pin Wiring Board with LED

# AMAX-2750SY Series

## 32-ch Isolated Digital Input/Output Slave Modules



### Features

- Max. 20 Mbps transfer rate
- Onboard terminal for direct wiring
- Easy installation with RJ45 phone jack and LED diagnostic
- LED indicator for each IO channel (switch by SW4)
- Selection of I/O-channel configuration (32-ch DI, 32-ch DO or 16/16-ch Digital I/O)
- 2,500 V<sub>RMS</sub> Isolation voltage
- Suitable for DIN-rail mounting

### Introduction

The AMAX-2750SY series consists of digital slave modules for AMONet RS-485 that extend the digital I/O capacity. All the digital I/O slave extension modules are connected serially with a simple Cat.5 cable. This reduces wiring between driver and controller and is very suitable for highly integrated machine automation applications. High speed, scalability and cost-effectiveness ensures a solid solution for machine builders. There are 3 main types of digital I/O slave modules, 32-ch digital input, 32-ch digital output, and 16/16-ch digital input/output. With these slave modules, you can connect actuators/sensors directly with minimum hassle. You can access I/O points nearby or 100 meters away using simple and low-cost wiring, and the high speed of AMONet RS-485 makes it possible to scan 2,048 I/O channels in 1.04 ms.

### Specifications

#### Isolated Digital Input

- **Channels** AMAX-2752SY: 32 (4 ports)  
AMAX-2756SY: 16 (2 ports)
- **Input Type** Dry contact
- **Isolation Protection** 2,500 V<sub>RMS</sub>
- **Opto-Isolator Response** 18  $\mu$ s
- **Input Resistance** 1 k $\Omega$  @ 0.5 W

#### Isolated Digital Output

- **Channels** AMAX-2754SY: 32 (4 ports)  
AMAX-2756SY: 16 (2 ports)
- **Output Type** Sink (NPN) (open collector Darlington transistors)
- **Isolation Protection** 2,500 V<sub>RMS</sub>
- **Output Voltage** 10 ~ 30 V<sub>DC</sub>
- **Sink Current** 150 mA/ea. for multiple-channel usage,  
total 1.1 A max. (1 port)

#### General

- **Bus Type** AMONet RS-485
- **Certifications** CE, FCC Class A
- **Connectors** 2 x RJ45 and 2 x 40-pin wiring board
- **Dimensions (L x W x H)** 125 x 47.6 x 151 mm (4.9" x 1.8" x 5.9")
- **Power Consumption** AMAX-2752SY: 1.2 W typical, 5 W max.  
AMAX-2754SY: 1.2 W typical, 5 W max.  
AMAX-2756SY: 1.2 W typical, 5 W max.
- **Power Input** 24 V<sub>DC</sub> within 200 mA ripple
- **Power Supply for DIO** 10 ~ 30 V<sub>DC</sub> (Current < 2A)
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60°C (32 ~ 140°F)

### Ordering Information

- **AMAX-2752SY-AE** 32-ch Isolated Digital Input AMONet Module
- **AMAX-2754SY-AE** 32-ch Isolated Digital Output AMONet Module
- **AMAX-2756SY-AE** 16/16-ch Isolated Digital I/O AMONet Module

**1**

Motion Control

**2**

Hazardous Location

**3**

Energy Automation

**4**

Building Automation Systems

**5**

Automation Software

**6**

Operator Panels

**7**

Automation Panel PCs

**8**

Industrial Monitors

**9**

Industrial Ethernet

**10**

Device Servers &amp; Gateways

**11**

Serial Communication Cards

**12**

Embedded Auto. Computers

**13**

PACs

**14**

M2M I/O

**15**

Distributed Nano Controllers

**16**

RS-485 I/O

**17**

Ethernet I/O

**18**

DAQ Boards

# Accessories

## DIN-rail Terminal Boards



### ADAM-3940

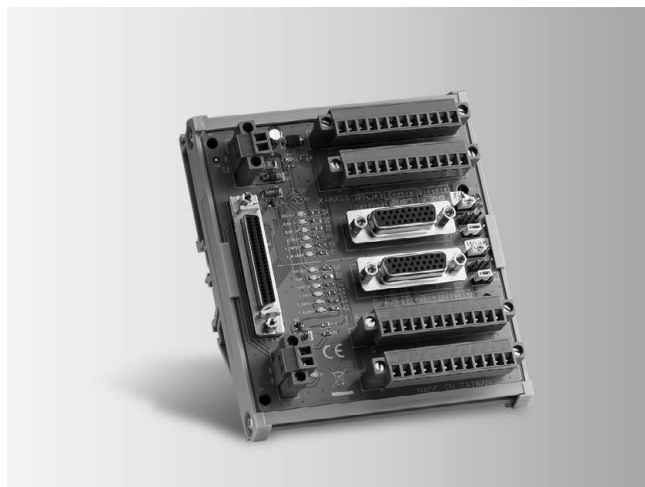
40-pin Wiring Board with LED

#### Features

- DIN-rail wiring board
- Dimensions (W x L x H): 160 x 50 x 43 mm (6.3" x 2" x 1.7")
- 40-pin box header connector
- LED indicators

#### To Be Used With

AMAX-2241, AMAX-2242, AMAX-2243



### ADAM-3955

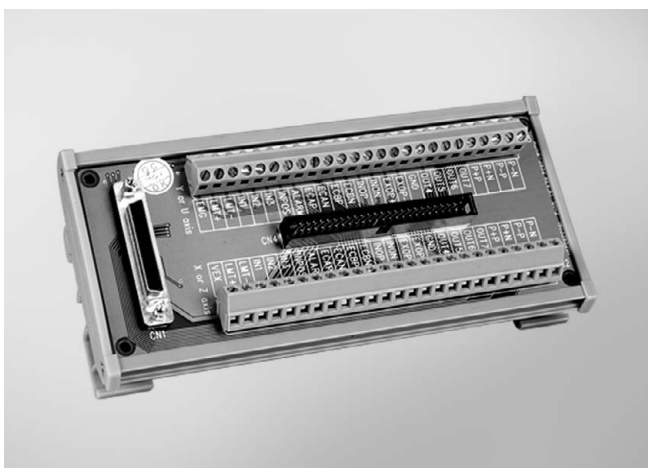
50-pin SCSI DIN-rail Motion Wiring Board

#### Features

- DIN-rail wiring board
- Dimensions (W x L x H): 103 x 120 x 45 mm (4.12" x 4.8" x 1.8")
- DB-26 and connector
- LED indicators

#### To Be Used With

PCI-1220U, PCI-1240U, PCI-1245, PCI-1265, PCM-3240, PEC-3240



### ADAM-3952

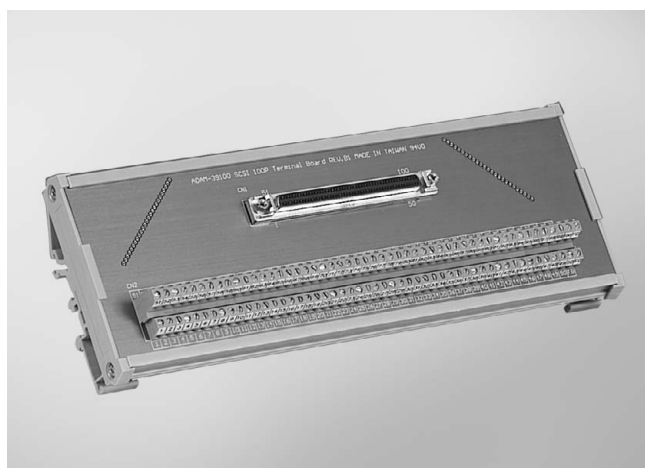
50-pin SCSI and IDC DIN-rail Wiring Board

#### Features

- DIN-rail wiring board
- Dimensions (W x L x H): 77.5 x 179.5 x 41.5 mm (3.1" x 7.1" x 1.6")
- 50-pin SCSI and IDC connectors

#### To Be Used With

PCI-1220U, PCI-1240U, PCI-1245, PCI-1245E, PCI-1265, PCM-3240



### ADAM-39100

100-pin DIN-rail SCSI Wiring Board

#### Features

- Low cost universal DIN-rail mounting screw terminal module for industrial applications with 100-pin SCSI female connector
- Dimensions (W x L x H): 80 x 230 x 42 mm (3.14" x 9.05" x 1.65")

#### To Be Used With

PCI-1240U