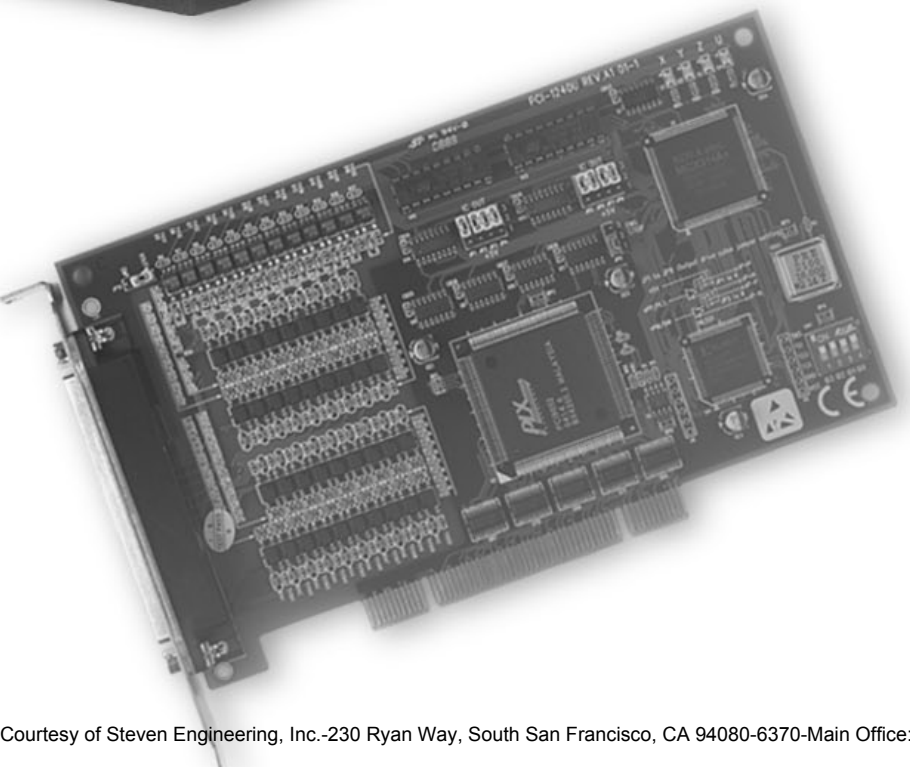
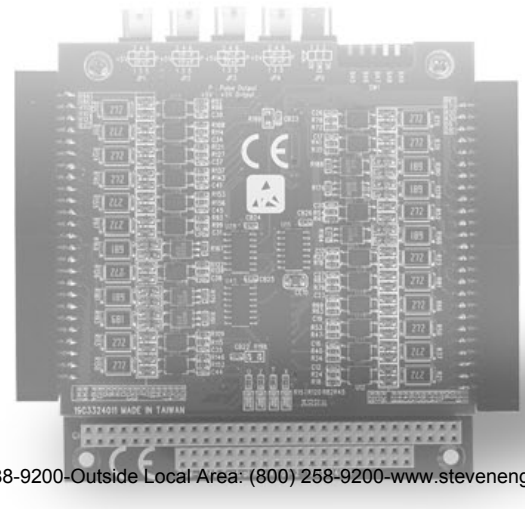
14 Motion Control I/O Modules





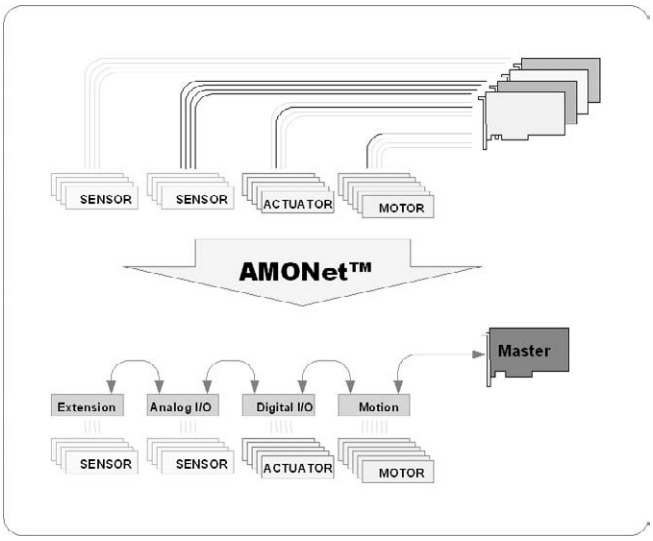
Overview

Complete Application-Ready Platforms for General Motion Control Tasks

Since the release of motion control cards in the 1990's, Advantech has been developing various types of motion control cards for users worldwide. Today, Advantech is still focused on providing the most robust, cost-effective and application-ready platforms for General Motion Control (GMC).

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.

Advantech motion control solutions have 3-axis, 4-axis and 6-axis inputs with pulse-type and voltage-pulse models and the AMONet series of distributed motion modules. Furthermore, these cards are supported by complete motion control libraries under Windows OS, which are widely applied in GMC 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.

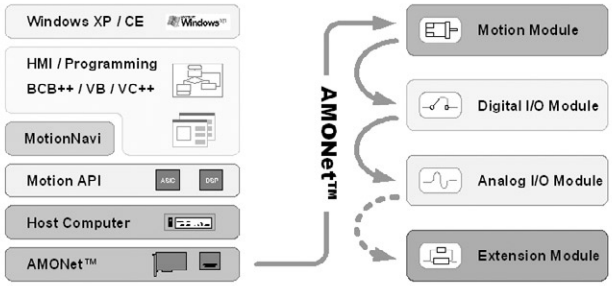
The first series of distributed motion control products from Advantech are called the AMONet RS-485 Series. AMONet RS-485 products are categorized as Master cards or Slave modules. While the Master card is kept in the host PC, the slave modules can be distributed so that they are next to motor drivers 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 64 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 low-cost Cat 5 network cable. In addition to saving wiring costs - debugging and maintenance is 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. Advantech is not content with the current selection though. There are already plans to release more AMONet products based on PCI, PC/104, and 1-axis motion slave modules as well as DI/O slave modules.



System Architecture

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 3-axis, 4-axis or 6-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, then Advantech can design one to your specifications. We are 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.

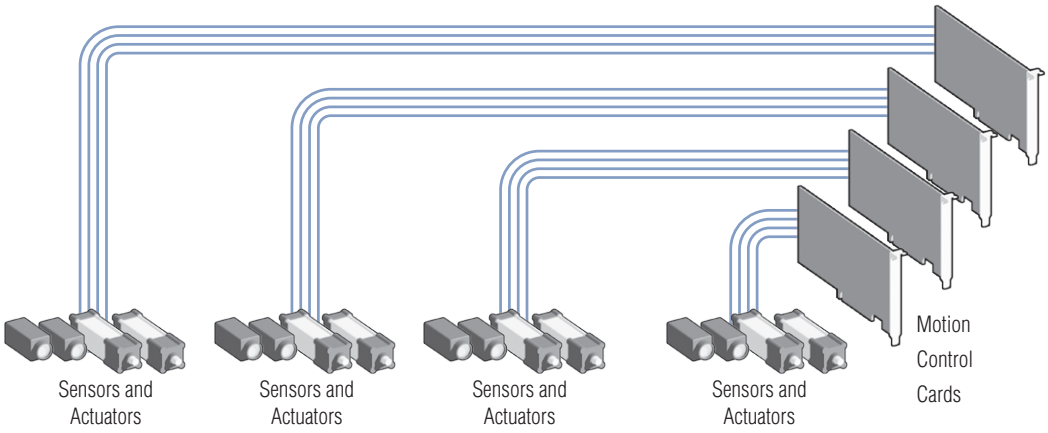
The Differences Between Centralized & Distributed Motion Control

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 on a programmable automation controller (PAC). 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 moreprocessing power, while it reduces overall wiring cost and system complexity.

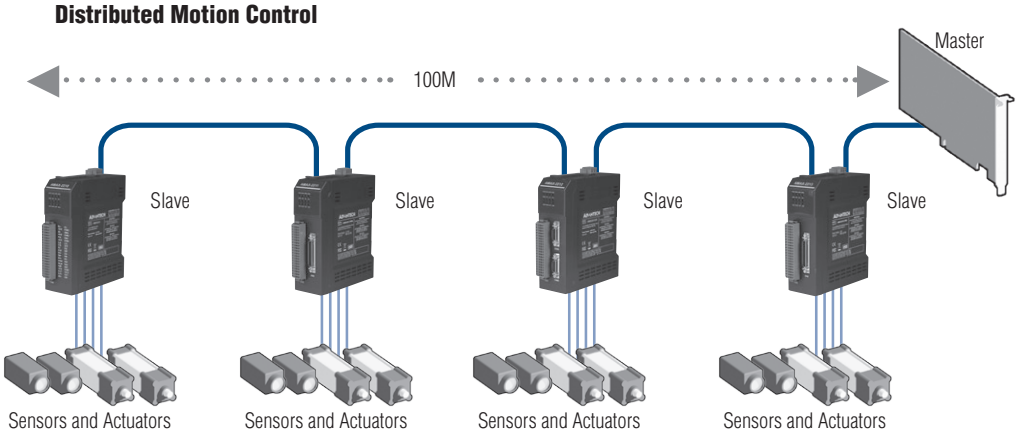
The Distributed Motion Control Products are categorized in two groups - Master Cards and Slave Modules. Communication between master and slave is based on a custom-engineered technology based on RS-485, which saves wires, transmits over long distances at high speeds, and have time-deterministic features.

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



Distributed Motion Control

Selection Guide

Centralized Motion Control Cards

Bus		PCI					ISA		
Category		Pulse type			Voltage type	Encoder card	Pulse type		Encoder card
Model		PCI-1240U	PCI-1242	PCI-1243U	PCI-1241	PCI-1784U	PCL-839+	PCM-3240	PCL-833
Axes	Number of Axes	4	4	4	4	-	3	4	-
	Linear Interpolation	✓	✓	-	✓	-	-	✓	-
	2-axis Circle Interpolation	✓	✓	-	✓	-	-	✓	-
	Helical Interpolation	-	✓	-	✓	-	-	-	-
Advanced Functions	Encoder Channels	4	5	-	5	4	-	4	3
	Limit Switch Input Channels	8	8	8	8	-	6	8	-
	Home Input Channels	4	4	4	4	-	3	4	-
	Emergency Stop Input Channels	1	1	1	1	-	-	1	-
	Slow Down Limit Switches	8	-	8	-	-	6	8	-
	General Purpose DI Channels	-	-	8	-	4	16	-	2
	Servo On Output Channels	4	4	-	4	-	-	4	-
	General Purpose DO Channels	4	-	8	-	4	16	4	-
	BoardID Switch	✓	-	✓	-	✓	-	✓	-
	Position Compare Event	✓	✓	-	✓	-	-	-	-
Dimensions (mm)		175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	185 x 100	96 x 90	185 x 100
Connectors		100-pin SCSI-II	68-pin SCSI-II	DB-62	68-pin SCSI-II	DB-37	1xDB-37 2 x 20-pin	2 x 50-pin IDC	1 x DB-25
Wiring Boards		ADAM-3952 ADAM-3952/J2S ADAM-3952/PMA	ADAM-3968	ADAM-3962 ADAM-3943	ADAM-3968	ADAM-3937	ADAM-3937 ADAM-3920	ADAM-3950 ADAM-3952 ADAM-3952/PMA ADAM-3952/J2S	ADAM-3925
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AMONet Distributed Motion Control Cards

Bus		PCI	PC/104+
Category		Remote Card	Remote Card
Model		PCI-1202U	PCM-3202P
Advanced Functions	General Purpose DI Channels	8	-
	General Purpose DO Channels	4	-
	Remote Motion	✓	✓
	Remote I/O	✓	✓
Dimensions (mm)		175 x 100	96 x 90
Connectors		2 x RJ45	4 x RJ45
Digital I/O Slave Modules		AMAX-2730 AMAX-2752 AMAX-2754 AMAX-2756	AMAX-2730 AMAX-2752 AMAX-2754 AMAX-2756
Motion Slave Modules		AMAX-2210 AMAX-2211/PMA AMAX-2212/J2S AMAX-2213/YS2 AMAX-2241/PMA AMAX-2242/J2S AMAX-2243/YS2	AMAX-2210 AMAX-2211/PMA AMAX-2212/J2S AMAX-2213/YS2 AMAX-2241/PMA AMAX-2242/J2S AMAX-2243/YS2
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AMAX-2050KW

GX2-400 Machine Control Box with AMONet™ Interface

NEW

Features

- Onboard AMD Geode™ GX2 processor, up to 256 MB onboard DDR
- 128 Kbyte battery backup RAM
- Supports AMONet™ series for remote motion control and data acquisition
- Two RS-232 and One RS-422/485 ports with automatic flow control
- One 10/100Base-T RJ-45 port and two USB ports
- Four programmable diagnostic LEDs, and one buzzer
- Design-in IP protection mechanism
- KW ready solution

Introduction

Advantech's AMAX-2050KW is a Pentium® III grade platform with an onboard AMONet controller, which is designed for embedded machine automation applications. It provides special mechanism to protect machine builder's IP, also the self diagnostic function. From the peripheral point of view, with one AMONet, master port AMAX-2050KW can control up to 2048 I/O points and 64 axes. Also, AMAX-2050KW offers one LAN and dual USB interfaces to fulfill user's various communication needs. In addition, it also offers two RS-232 and one RS-422/485 communication port with automatic flow control functionality. Therefore, the AMAX-2050KW is an ideal solution for data gateway applications.

AMAX-2050KW supports Windows CE .NET, which offers a pre-configured image with optimized onboard device drivers. MULTIPROG supports all IEC 61131-3 programming languages. Depending on the task to be handled, your experience and company standards, you may choose one of the five standardized programming languages. The use of MULTIPROG offers you many advantages. As all essential data can be displayed in MULTIPROG, frequent switching between different tools during PLC programming and commissioning is no longer necessary. Observers guarantee data consistence with other tools, thus the engineering effort for the programming of PLCs is reduced.

Specifications

General

- **Certifications** CE
- **Dimensions (W x H x D)** 47.6 x 156 x 125 mm
- **Power Consumption** 8 W (Typical), 15 W (Max.)
- **Power Supply Spec.** Min. 15 W (9 ~ 36 V_{DC}) (e.g +24 V @ 625 mA)
- **OS Support** Windows® CE .NET 5.0

System Hardware

- **CPU** AMD Geode GX2-400
- **Battery Backup RAM** 128 KB
- **Indicators** Power, CF, Alarm for RAM backup battery and 4 programmable diagnostic LEDs
- **Keyboard/Mouse** 1 x PS/2
- **Memory** 256MB DDR onboard
- **Storage** SSD: 1 x Internal (Master) & 1 x External (Slave) type I/II CompactFlash® slot
- **VGA** DB15 VGA connector
- **Watchdog Timer** Programmable

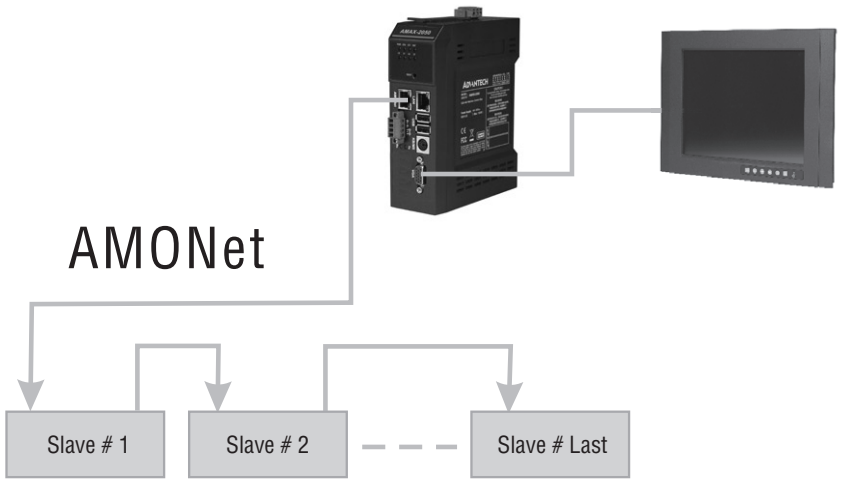
Communications

- **Serial Ports** 2 × RS-232, 1 x RS-422/485
  Automatic RS-485 data flow control
- **Serial Port Speed** RS-232: 50 ~ 115.2 kbps
  RS-422/485: 50 ~ 921.6 kbps (Max.)
- **LAN** 1 x 10/100 Base-T RJ-45 ports
- **USB Ports** 2 x USB, UHCI, Rev. 1.1 compliant
- **AMONet Rings** 1 x Isolated AMONet, connect up to 2048 DIO channels or 64 motion axes

Environment

- **Operating Humidity** 5 ~ 85% RH, non-condensing (refer to IEC 68-2-3)
- **Operating Temperature** 0 ~ 50° C

System Architecture



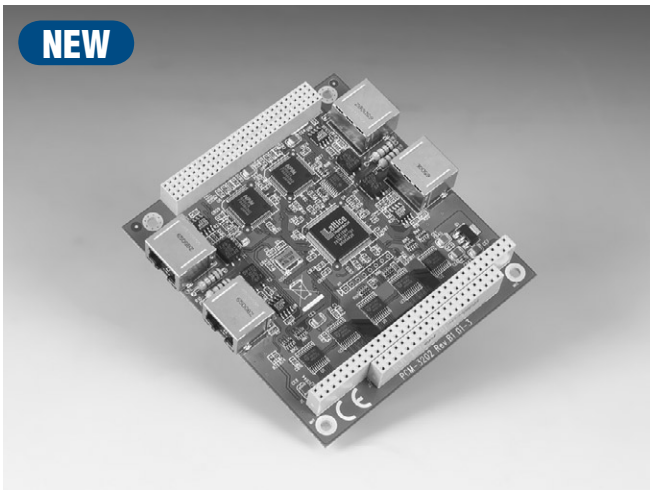
*Slave can be Motion or Digital I/O modules
**Last Slave module needs [Terminator] setting

Ordering Information

- **AMAX-2050KW** GX2-400 Machine Control Box with AMONet Interface
- **AMAX-2210** 1-axis AMONet RS-485 Motion Slave Module
- **AMAX-2211/PMA** 1-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2212/J2S** 1-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2213/YS2** 1-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **AMAX-2241/PMA** 4-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2242/J2S** 4-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2243/YS2** 4-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **AMAX-2752** 32-ch Isolated Digital Input Module
- **AMAX-2754** 32-ch Isolated Digital Output Module
- **AMAX-2756** 16/16-ch Isolated Digital Input/Output Module
- **AMAX-2730** 8/8-ch Isolated Digital Input/Output Module
- **AMAX-2710** 12-bit, 100kS/s, 16-ch Analog Input, 4-ch Analog Output Slave Module
- **PCL-10120M-2** SCSI 20-pin cable, 2 m (Optional for AMAX-2212/J2S)
- **PCL-10150M-2** SCSI 50-pin cable, 2 m (Optional for AMAX-2211/PMA and AMAX-2213/YS2)
- **MPROG-BAS33** KW Multiprog Softlogic Development Kit Basic Edition v3.3 for Windows NT/2000/XP (128-byte I/O)
- **MPROG-ADV33** KW Multiprog Softlogic Development Kit Advanced Edition v3.3 for Windows® NT/2000/XP (64k-byte I/O)

PCM-3202P

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



Features

- Max. 20 Mbps transfer rate
- Supports 2 independent AMONet™ RS-485 rings
- Supports up to 128 AMONet RS-485 slave modules
- Easy installation with RJ45 phone jack and LED diagnostics
- Max. 100 m (20 Mbps/32 slave modules) communication distance

Introduction

PCM-3202P is a PC/104+ interface card which supports two AMONet RS-485 master rings, and transfers data between host and slaves directly without any operations in between. Each ring can control up to 2048 I/O points, 64 axes, or a combination of I/O points and axes for motion control. The ring can support up to 20 Mbps transfer rate and a maximum communication distance of up to 100 meters.

The communication between master and slave is based on a customized RS-485 solution that saves wires, covers a long distance, supports high-speed communication and has time-deterministic features. The communication interface between master and host PC is accomplished by memory mapping. Various functions can be chosen on the slave modules, and standard industrial DIN-rail mounting design makes it easy to distribute them in the field. The master collects information from slave modules and publishes the information to its host PC.

Specifications

AMONet RS-485 Motion Control

- **AMONet RS-485 Rings** 2
- **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** 100 m @ 20 Mbps w/32 slave modules
- **Slave Module Support** Digital I/O, Motion Control, Analog I/O

General

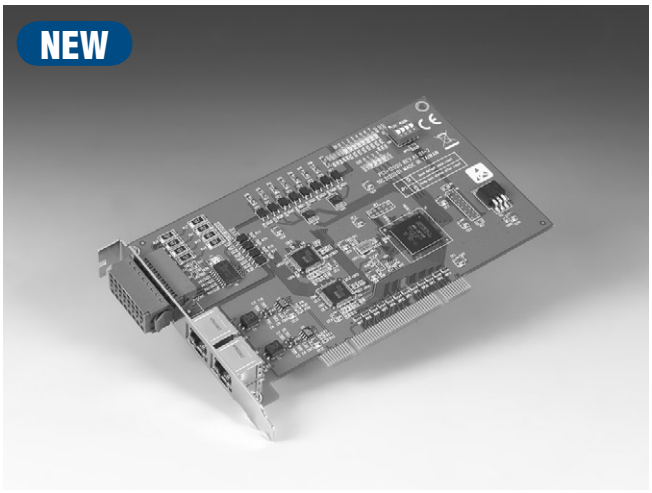
- **Bus Type** PC/104+
- **Certifications** CE
- **Connectors** RJ45 x 4
- **Dimensions** 96 x 90 mm (3.8" x 3.5")
- **Power Consumption** +5 V_{DC} @ 0.5 A typical
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)

Ordering Information

- **PCM-3202P** 4-port PC/104+ AMONet RS-485 Master Card
- **AMAX-2210** 1-axis AMONet RS-485 Motion Slave Module
- **AMAX-2211/PMA** 1-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2212/J2S** 1-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2213/YS2** 1-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **AMAX-2241/PMA** 4-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2242/J2S** 4-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2243/YS2** 4-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **AMAX-2752** 32-ch Isolated Digital Input Module
- **AMAX-2754** 32-ch Isolated Digital Output Module
- **AMAX-2756** 16/16-ch Isolated Digital Input/Output Module
- **AMAX-2730** 8/8-ch Isolated Digital Input/Output Module
- **AMAX-2710** 12-bit, 100kS/s, 16-ch Analog Input, 4-ch Analog Output Slave Module
- **PCL-10120M-2** SCSI 20-pin cable, 2 m (Optional for AMAX-3212/J2S)
- **PCL-10150M-2** SCSI 50-pin cable, 2 m (Optional for AMAX-3211/PMA and AMAX-3213/YS2)

PCI-1202U

2-port AMONet™ RS-485 Master Card



Features

- Max. 20 Mbps transfer rate
- 2 independent AMONet™ RS-485 Master Rings
- Max. 128 AMONet RS-485 slave modules supported
- Programmable digital input to notify events
- Easy installation with RJ45 phone jack and LED diagnostic

Introduction

PCI-1202U is a PCI interface card which supports two AMONet RS-485 master rings, and transfers data between host and slaves directly without any operations in between. Each ring can control up to 2048 I/O points, 64 axes, or a combination of I/O points and axes for motion control. The ring can support up to 20 Mbps transfer rate and a maximum communication distance of up to 100 meters.

The communication between master and slave is based on a customized RS-485 solution that saves wires, covers a long distance, supports high-speed communication and has time-deterministic features. The communication interface between master and host PC is accomplished by memory mapping. Various functions can be chosen on the slave modules, and standard industrial DIN-rail mounting design makes it easy to distribute them in the field. The master collects information from slave modules and publishes the information to its host PC.

Specifications

AMONet RS-485 Motion Control

- **AMONet RS-485 Rings** 2
- **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** 100 m @ 20 Mbps w/32 slave modules
- **Slave Module Support** Digital I/O, Motion Control, Analog I/O

Isolated Digital Input

- **Channels** 8
- **Input Voltage** Dry contact (but need External Vcc)
- **Isolation Protection** 2,500 V_{DC}
- **Input Resistance** 2.4 kΩ @ 0.5 W

Isolated Digital Output

- **Channels** 4
- **Output Type** Open collector
- **Isolation Protection** 2,500 V_{DC}
- **Output Voltage** 5 ~ 30 V_{DC}
- **Sink Current** 1 ch: Max. 1A
4 ch: Max. 1.1 (total)

General

- **Bus Type** PCI V2.2
- **Certifications** CE
- **Connectors** RJ45 x 2
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** +5 V_{DC} @ 0.5 A typical
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)

Ordering Information

- **PCI-1202U** 2-port AMONet RS-485 Master Card
- **AMAX-2210** 1-axis AMONet RS-485 Motion Slave Module
- **AMAX-2211/PMA** 1-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2212/J2S** 1 axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2213/YS2** 1-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **AMAX-2241/PMA** 4-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2242/J2S** 4-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2243/YS2** 4-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **AMAX-2752** 32-ch Isolated Digital Input Module
- **AMAX-2754** 32-ch Isolated Digital Output Module
- **AMAX-2756** 16/16-ch Isolated Digital Input/Output Module
- **AMAX-2730** 8/8-ch Isolated Digital Input/Output Module
- **AMAX-2710** 12-bit, 100kS/s, 16-ch Analog Input, 4-ch Analog Output Slave Module
- **PCL-10120M-2** SCSI 20-pin cable, 2 m (Optional for AMAX-2212/J2S)
- **PCL-10150M-2** SCSI 50-pin cable, 2 m (Optional for AMAX-2211/ PMA and AMAX-2213/YS2)

AMAX-2240 Series

4-axis AMONet™ RS-485 Motion Slave Modules

AMAX-2242/J2S

Features

- Max. 20 Mbps transfer rate
- Max. 6.5 Mhz, 4-Axes pulse output
- 28 bits counter for incremental encoder
- 2~4 axes Linear interpolation
- 2 axes 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

Introduction

AMAX-2240 series is used to increase the number of axes for an AMONet™ RS-485 distributed 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 SCSI-20P 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 Axes** 4
- **Interpolation** Linear or Circular
- **Max. Output Speed** 6.5 Mpps
- **Step Count Range** ± 134,217,728
- **Pulse Output Type** ±OUT/DIR, ±CW/CCW, ±A/B phase
- **Position Counter** ± 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** AB phase, CW/CCW
- **Counts per Enc. Cycle** x1, x2, x4 (AB phase only)
- **Input Range** Compatible with TIA/EIA-422 Differential Line Driver I = ±20 mA,VOD = ±2 V/min
- **Isolation Protection** 2,500 Vrms
- **Max. Input Frequency** 2 MHz @ 5 V

General

- **Bus Type** AMONet RS-485
- **Certifications** CE
- **Connectors** RJ45 x 2, SCSI-20P x 8
- **Dimensions (L x W x H)** 125 x 47.6 x 156 mm
- **Power Consumption** 5 W @ 24 V typical
- **Power Supply** Module: 18 ~ 30 V_{DC} External: 24 V_{DC} ± 10%
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **AMAX-2241/PMA** 4-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2242/J2S** 4-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2243/YS2** 4-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **PCL-10120M-2** SCSI 20-pin cable, 2 m

AMAX-2210 Series

1-axis AMONet™ RS-485 Motion Slave Modules

Features

- DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
- Max. 20 Mbps transfer rate
- Max. 6.5 Mhz, 1-Axis pulse output
- 28 bits counter for incremental encoder
- Programmable acceleration and deceleration time
- 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

Introduction

Products in the AMAX-2210 Series are used to increase the number of axes for an AMONet™. RS-485 distributed 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.

AMONet. RS-485 has driver specific motion slave modules to support a range of common motor vendors such as: Mitsubishi J2-Super series, Panasonic Minas A type, and Yaskawa Sigma-II. Please select the respective cable SCSI-20P or SCSI-50P and plug this cable into the motor driver and motion slave module.

AMONet. RS-485 also supports a general purpose motion slave module for general motor drivers, including step motor drivers. This general purpose motion slave module is designed with many detachable terminals to support easy wiring. Please refer to the related installation guides.

Specifications

Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo
- **Number of Axes** 1
- **Interpolation** None
- **Max. Output Speed** 6.5 Mpps
- **Step Count Range** ±134, 217, 728
- **Pulse Output Type** ±OUT/DIR, ±CW/CCW, ±A/B phase
- **Position Counter** ±134, 217, 728
- **Home Modes** 13
- **Velocity Profiles** T-curve, S-curve
- **Local I/O**

Machine Interfaces	EL+ x 1, EL- x 1, ORG x 1, SD x 1
Servo Driver Interfaces	ALM x 1, RDY x 1, SVON x 1, INP x 1, ERC x 1
Position Compare I/O	LTC x 1, CMP x 1
General Inputs	2
General Outputs	2

Encoder Interface

- **Input Type** Quadrature (AB phase), Up/Down
- **Counts per Enc. Cycle** x0, x1, x2, x4 (AB phase only)
- **Input Range** Compatible with TIA/EIA-422 Differential Line Driver I = ±20 mA,VOD = ±2 V/min
- **Isolation Protection** 2,500 Vrms
- **Max. Input Frequency** 2 MHz @ 5V

General

- **Bus Type** AMONet RS-485
- **Certifications** CE
- **Connectors** RJ45 x 2, SCSI-20P x 2 (AMAX-2212/J2S), SCSI-50P x 1 (AMAX-2211/PMA and AMAX-2213/YS2)
- **Dimensions (L x W x H)** 126 x 46 x 162 mm
- **LED Indicators** PWR, RUN, ERR, EMG, ORG, SD, EL-, EL+, SVON, BSY, INP, ALM
- **Power Consumption** 3 W @ 24 V typical
- **Power Supply** 10 ~ 30 V_{DC}
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **AMAX-2210** 1-axis AMONet RS-485 Motion Slave Module
- **AMAX-2211/PMA** 1-axis AMONet RS-485 Motion Slave Module for Panasonic Minas A
- **AMAX-2212/J2S** 1-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- **AMAX-2213/YS2** 1-axis AMONet RS-485 Motion Slave Module for Yaskawa Sigma-II
- **PCL-10120M-2** SCSI 20-pin cable, 2 m (Optional for AMAX-2212/J2S)
- **PCL-10150M-2** SCSI 50-pin cable, 2 m (Optional for AMAX-2211/PMA and AMAX-2213/YS2)

AMAX-2750 Series

32-ch Isolated Digital Input/Output Slave Modules

Features

- DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
- 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 DI, 32 DO or 16/16 DI/O)
- 2500 Vrms Isolation voltage

Introduction

The AMAX-2750 Series consists of digital slave modules for AMONet™ RS-485 that extend the digital I/O capacity. All the DIO 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 DI/O slave modules, 32In, 32Out, and 16In/16Out. 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 2048 IO channels in 1.04 ms.

Specifications

Isolated Digital Input

- **Channels** AMAX-2752: 32, AMAX-2756: 16
- **Input Type** Dry contact
- **Isolation Protection** 2,500 V_{RMS}
- **Opto-Isolator Response** 18 µs
- **Input Resistance** 1 kΩ @ 0.5 W

Isolated Digital Output

- **Channels** AMAX-2754: 32 (4 ports), AMAX-2756: 16 (2 ports)
- **Output Type** Sink (NPN) (open collector Darlington transistors)
- **Isolation Protection** 2,500 V_{RMS}
- **Output Voltage** 5 ~ 30 V_{DC}
- **Sink Current** 1CH: 500 mA (1 port)
  8CH: 150 mA (1 port)

General

- **Bus Type** AMONet RS-485
- **Certifications** CE
- **Connectors** 2 x RJ45, 2 x 40-pin wiring terminal
- **Dimensions (L x W x H)** 126 x 46 x 162 mm
- **Power Consumption** Typical: 1 W
- **Power Supply** 10 ~ 30 V_{DC}
- **Power Supply for DIO** 10 ~ 30 V_{DC} (Current< 2A)
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **AMAX-2752** 32-ch Isolated Digital Input Slave Module
- **AMAX-2754** 32-ch Isolated Digital Output Slave Module
- **AMAX-2756** 16/16-ch Isolated Digital Input/Output Slave Module

AMAX-2730

8/8-ch Isolated Digital Input/ Output Slave Module

Features

- DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
- 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)
- Highly integrated and compact size
- 2500 Vrms Isolation voltage

Introduction

AMAX-2730 is a digital slave module for AMONet™ RS-485 that extend the digital I/O capacity by 16 channels. (8 input, 8 output). All digital I/O slave 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 ensure a solid solution for machine builders.

AMAX-2730 is designed for the applications which with limited installation space. it integrates 8 DI, 8 DO, and on board terminal for direct wiring in a compact module. With it, 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.

Specifications

Isolated Digital Input

- **Channels** 8
- **Input Type** Dry contact
- **Isolation Protection** 2,500 V_{RMS}
- **Opto-Isolator Response** 18 µs
- **Input Resistance** 1 kΩ

Isolated Digital Output

- **Channels** 8
- **Output Type** Sink (NPN) (open collector Darlington transistors)
- **Isolation Protection** 2,500 V_{RMS}
- **Output Voltage** 5 ~ 30 V_{DC}
- **Sink Current** 1CH: 500 mA (1 port)
  8CH: 150 mA @ (duty 50%, 25° C) (1 port)

General

- **Bus Type** AMONet RS-485
- **Certifications** CE
- **Connectors** 2 x RJ45, 2 x 40-pin wiring terminal
- **Dimensions (L x W x H)** 126 x 46 x 162 mm
- **LED Indicators** I/O, power, error, run
- **Power Consumption** Typical: 1 W
- **Power Supply** 10 ~ 30 V_{DC}
- **Power Supply for DIO** 10 ~ 30 V_{DC} (Current<2A)
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **AMAX-2730** 8/8-ch Isolated Digital Input/Output Slave Module

AMAX-2710

12-bit, 100kS/s, 16-ch Analog Input, 4-ch Analog Output Slave Module

Features

- DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
- Max. 20 Mbps transfer rate
- 16-ch single-ended or 8-ch differential analog input
- Resolution:12-bit
- Maximum sampling rate: 100 kS/s
- Easy installation with RJ45 phone jack

Introduction

AMAX-2710 is an analog input/output slave module for AMONet™ RS-485 that adds analog I/O points to your system. Like other AMONet modules, these analog I/O slave modules are connected serially with a simple Cat.5 cable. This reduces wiring between driver and controller and is very suitable for integrated machine automation applications. High speed, scalability and cost-effectiveness ensure a solid solution for machine builders.

AMAX-2710 is designed for analog sensor applications like thermocouple, pressure sensors, or flow sensors. It integrates 16-ch AI, 4-ch AO, and wiring screw terminals in a module. With this slave module, 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.

Specifications

Analog Input

- **Channels** 16 single-ended or 8 differential
- **Resolution** 12 bits
- **Max. Sampling Rate** 100 kS/s
- **Overvoltage Protection** 30 V_{DC}
- **Input Range (V, software programmable)** Bipolar ±10 ±5 ±2.5 ±1.25
- **Current** 4 ~ 20 mA
- **Accuracy** 0.1%

Analog Output

- **Channels** 4
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range (V, software programmable)** Bipolar ±5, ±10
- **Current** 4 ~ 20 mA

General

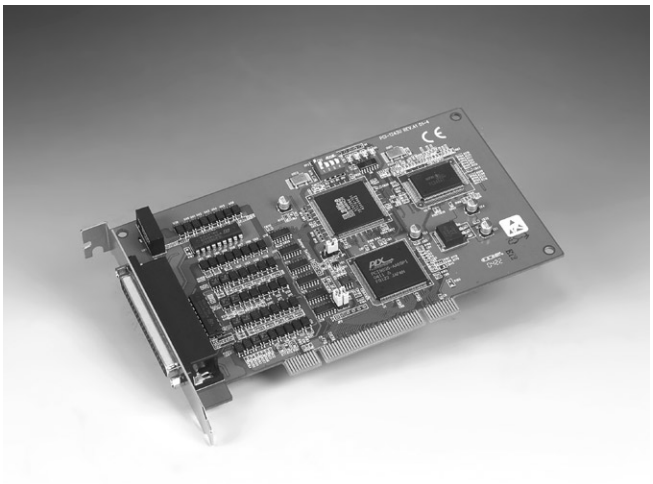
- **Bus Type** AMONet RS-485
- **Certifications** CE
- **Connectors** 2 x RJ45 and on board terminal for direct wiring
- **Power Consumption** Typical: 3 W
- **Power Supply** 10 ~ 30 V_{DC}
- **Power Supply for DIO** 10 ~ 30 V_{DC}
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **AMAX-2710** 12-bit, 100kS/s, 16-ch Analog Input, 4-ch Analog Output Slave Module

PCI-1243U

4-axis Low Cost Stepping Motor Control 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 Vrms system isolation
- BoardID™ switch

Introduction

PCI-1243U is a 4-axis intelligent stepping motor control card with universal PCI interface. The card's PCD-4541 motion controller can execute a variety of motion-control commands. For advanced applications, we supply a DLL so that programs can be created for the Microsoft® Windows® environment.

PCI-1243U is a cost-effective solution for PCI based motion control. Each axis can be controlled directly through the card's I/O registers. However, use of the card's high-level DLL driver is recommended. 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 Axes** 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 or S-curve acceleration/deceleration
- **Local I/O**
  - Machine 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_{RMS}
- **Opto-Isolator Response** 25μs
- **Input Resistance** 4.7 kΩ

Isolated Digital Output

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

General

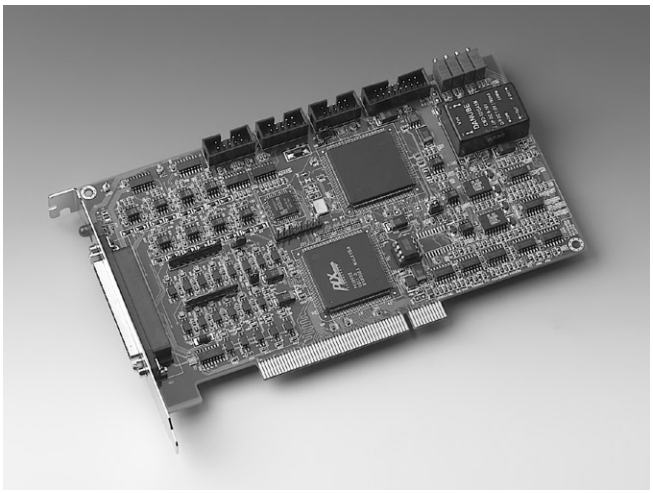
- **Bus Type** PCI V2.2
- **Certifications** CE
- **Connectors** 1 x DB-62 female
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 340 mA
Max: 5 V @ 500 mA mA
- **Storing Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140°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

Ordering Information

- **PCI-1243U** 4-axis Stepping Motor Control card
- **PCL-10162-1** DB-62 Cable Assembly, 1 M
- **PCL-10162-3** DB-62 Cable Assembly, 3 M
- **ADAM-3962** DB-62 wiring terminal with DIN-rail mounting
- **ADAM-3943** PCI-1243U wiring board with LED

PCI-1241

4-axis Voltage-type Servo Motor Control Card



FCC CE

Features

- PCI Bus interface
- 4-axis servo positioning control
- 5-ch encoder input
- 4-ch 16-bit D/A Converters
- 13 dedicated input and 5 dedicated output

Introduction

PCI-1241 uses an ASIC for 4-axis servo positioning and synchronized control with a DDA (Digital Differential Analyzer) to evenly move each axis. Closed-Loop control is implemented with P control, and -10 to +10 V signals are used for outputs to the speed type servo motor driver. It can be applied to multi-axis precision servo control, and it can also read back motor encoder values via its encoder input port to allow stepping motor control. In the control of each axis, there is a set of sensor input points, including: home points, plus limit points and minus limit points. Furthermore, there are inhibit signal output points, position ready output points and an emergency stop input point.

Specifications

V-Command Motion Control

- **Motor Driver Support** Voltage-type servo
- **Number of Axes** 4
- **Interpolation** 3-axis linear, 2-axis circular, helical
- **Voltage Output Range** ±10 V
- **Resolution** 16 bits
- **Channels** 4
- **Position Counter** ± 2, 146, 483, 647
- **Home Modes** 14
- **Velocity Profiles** T-curve, S-curve
- **Local I/O**
  Machine Interfaces: PEL x 4, MEL x 4, ORG x 4, EMG x 1
  Servo Driver Interfaces: SVON x 4, PRDY x 1
  Manual Pulse Generator Input: 1 set

Isolated Digital Input

- **Input Voltage** Logic 0: 1 V max.
  Logic 1: 18 V (30 V max.)
- **Isolation Protection** 2,500 V_{RMS}
- **Opto-Isolator Response** 50μs
- **Input Resistance** 5.4 kΩ @ 18 V

Isolated Digital Output

- **Output Type** Sink (NPN) (open collector Darlington transistors)
- **Isolation Protection** 2,500 V_{RMS}
- **Output Voltage** 5 ~ 40 V_{DC}
- **Sink Current** 100 mA max./channel; 500 mA max (Total).

Interface

- **Input Type** Quadrature (A/B phase) or Up/Down
- **Drive Type** Single-ended or differential
- **Counts per Enc. Cycle** 0x, 1x, 2x, 4x (AB phase only)
- **Input Range**
  Single Ended Configuration
  Logic 0 : 1 V max.
  Logic 1 : 5 V min. (5 V ±10% max.)
  Differential Configuration
  Logic 0 : -3 V max.
  Logic 1 : 3 V min. (±5 V max.)
- **Isolation Protection** 2,500 V_{DC}
- **Max. Input Frequency** 2 MHz

General

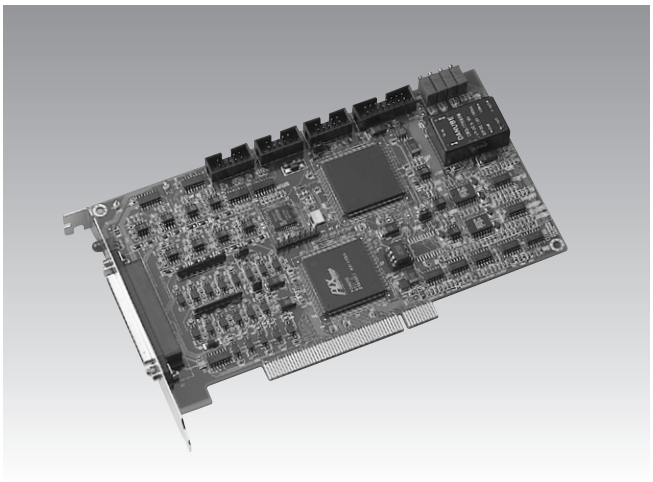
- **Bus Type** PCI V2.2
- **Certifications** CE, FCC class A
- **Connectors** 3 x 10-pin box head, 1 x 16-pin box head, 1 x SCSI 68-pin female
- **Dimensions** 174 x 107 mm (6.85" x 4.2")
- **Power Consumption** Typical: 5 V @ 850 mA
  Max: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **PCI-1241** 4-axis Voltage-type Servo Motor Control Card
- **PCL-10168** 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- **ADAM-3968** 68-pin SCSI-II Wiring Terminal Board for DIN-rail mounting

PCI-1242

4-axis Pulse-type Servo Motor Control Card



FCC CE

Features

- PCI bus interface
- Asynchronous 4-axis motion control
- Linear, helical interpolation functions
- 2/3-axis arc, circle interpolation functions
- Jog functions
- Continuous interpolation functions
- T/S-curve acceleration/decelerations
- Constant speed and over speed control
- In position and compensation functions
- Go home functions
- Position management and software limit switch functions
- Event trigger functions
- Up to 4 MPPS pulse output for each axis

Introduction

The PCI-1242 realizes 4-axis asynchronous control with a DDA (Digital Differential Analyzer) that ensures even movement of each axis. At pulse output control, it can also read back motor encoder values via its encoder input port. In the control of each axis, there is a set of sensor input points, including home points, plus limit points and minus limit points. Further, there are servo-on signal output points, position ready output point and an emergency stop input point. For advanced applications, we supply Windows® DLL drivers and user-friendly examples to decrease your programming load. Moreover, through a free bundled PCI-1242 motion utility, you can complete configuration and diagnosis easily.

Specifications

Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axes** 4 axes
- **Interpolation** 3-axis linear, 2-axis circular, Helical
- **Max. Output Speed** 4 Mpps
- **Step Count Range** ± 8,388,608
- **Pulse Output Type** Pulse/Direction, CW/CCW, A/B Phase
- **Position Counters** ± 2, 147, 483, 647
- **Home Modes** 14
- **Velocity Profiles** T/S-Curve, Acceleration/Deceleration
- **Local I/O**
  Machine Interfaces: PEL x 4, MEL x 4, ORG x 4, EMG x 1
  Servo Driver Interfaces: SVON x 4, PRDY x 1
  Manual Pulse: General Input: 1 set

Isolated Digital Input

- **Input Voltage** Logic 0 : 1 V max.
  Logic 1 : 18 V (30 V max.)
- **Isolation Protection** 2,500 V_{RMS}
- **Opto-Isolator Response** 50μs
- **Input Resistance** 5.4 kΩ @ 18 V

Isolated Digital Output

- **Output Type** Sink (NPN) (open collector Darlington transistors)
- **Isolation Protection** 2,500 V_{RMS}
- **Output Voltage** 5 ~ 40 V_{DC}
- **Sink Current** 100 mA max./channel; 500 mA max (Total)

Encoder Interface

- **Input Type** Quadrature (AB phase), or Up/Down
- **Drive Type** Single-ended or differential
- **Counts per Enc. Cycle** x0, x1, x2, x4 (A/B phase only)
- **Input Range**
  Single Ended Configuration
  Logic 0 : 1 V max.
  Logic 1 : 5 V min. (5 V ±10% max.)
  Differential Configuration
  Logic 0 : -3 V max.
  Logic 1 : 3 V min. (±5 V max.)
- **Isolation Protection** 2,500 V_{DC}
- **Max. Input Frequency** 2 MHz

General

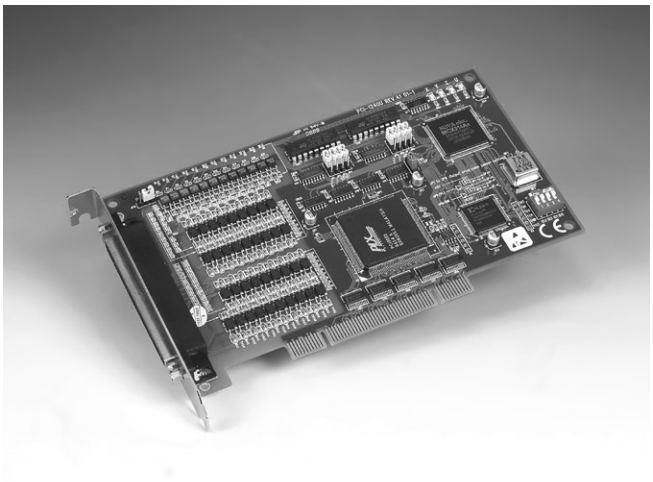
- **Bus Type** PCI V2.2
- **Certifications** CE, FCC class A
- **Connectors** 1 x 10-pin block head, 1 x 68-pin SCSI II femal
- **Dimensions** 175 x 107 mm (6.85" x 4.2")
- **Power Consumption** Typical: 5 V @ 850 mA, 12 V @ 600 mA
  Max: 5 V @ 1 A, 12 V @ 700 mA
- **Storing Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)

Ordering Information

- **PCI-1242** 4-axis Pulse-type Servo Motor Control Card
- **PCL-10168** 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- **ADAM-3968** 68-pin SCSI-II Wiring Terminal Board for DIN-rail mounting

PCI-1240U

4-axis Universal PCI Stepping/Pulse-type Servo Motor Control Card



Features

- Independent 4-axis motion control
- Hand wheel and jog function
- 2/3-axis linear interpolation function
- 2-axis circular interpolation function
- Continuous interpolation function
- Programmable T/S-curve acceleration/deceleration rate
- Up to 4 MPPS output for each axis
- Two pulse output types: CW/CCW or Pulse/Direction
- Up to 1 MHz encoder input for each axis
- Two encoder pulse input types: A/B phase or Up/Down
- Constant speed control
- Position management and software limit switch function
- BoardID™ switch

Introduction

Advantech introduces the PCI-1240U 4-axis Universal PCI (supports both 3.3 V and 5 V signal slot) stepping/pulse-type servo motor control card designed for general-purpose extreme motion applications. The PCI-1240U is a high-speed 4-axis motion control card for the PCI bus that simplifies stepping and pulse-type servo motor control, giving you added performance from your motors. The card's intelligent NOVA® MCX314-motion ASIC builds in a variety of motion control functions, such as 2/3-axis linear interpolation, 2-axis circular interpolation, T/S-curve acceleration/deceleration rate and more. In addition, the PCI-1240U performs these motion control functions without processor loading during driving. For advanced applications, Advantech supplies Windows® DLL drivers and user-friendly examples to decrease your programming load. Moreover, through a free bundled PCI-1240U motion utility, you can complete configuration and diagnosis easily.

Specifications

Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axes** 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** 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**
  - Machine 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 Inputs: 3
  - General Outputs: 4

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 ~ 25 V
- **Isolation Protection** 2,500 V_{DC}
- **Max. Input Frequency** 1 MHz

General

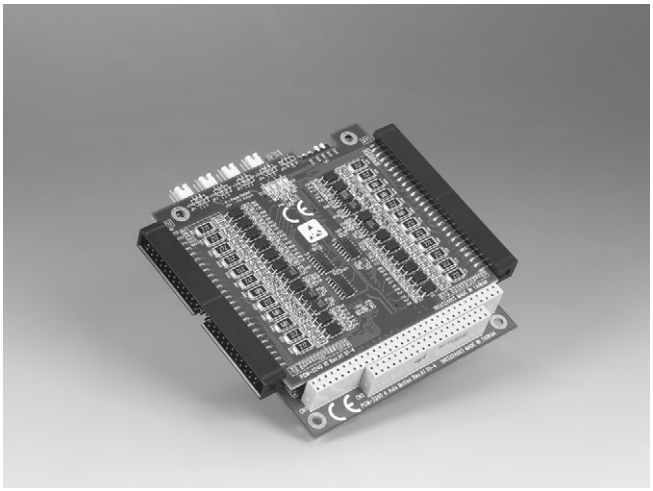
- **Bus Type** Universal PCI V2.2
- **Certifications** CE
- **Connectors** 1 x 100-pin SCSI-II female
- **Dimensions** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA
Max: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32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

Ordering Information

- **PCI-1240U** 4-axis universal PCI stepping/pulse-type servo motor control card
- **ADAM-3952** 50-pin SCSI-II wiring terminal for DIN-rail mounting
- **ADAM-39100** 100-pin SCSI-II wiring terminal, DIN-rail mounting
- **PCL-101100M-1** 100-pin SCSI cable, 1 m
- **PCL-101100M-3** 100-pin SCSI cable, 3 m
- **ADAM-3952/J2S** PCI-1240U Wiring Board for Mitsubishi J2S series
- **ADAM-3952/PMA** PCI-1240U Wiring Board for Panasonic Minas A series
- **PCL-10251-1** 100-pin SCSI to two 50-pin SCSI cable for PCI-1240U, 1 m
- **PCL-10251-3** 100-pin SCSI to two 50-pin SCSI cable for PCI-1240U, 3 m

PCM-3240

4-axis PC/104 Stepping/Pulse-type Servo Motor Control Card



Features

- PC/104 interface
- Independent 4-axis motion control
- Hand wheel and jog function
- 2/3-axis linear interpolation function
- 2-axis circular interpolation function
- Continuous interpolation function
- Programmable T/S-curve acceleration/deceleration rate
- Up to 4 MPPS pulse output for each axis
- Two pulse output types: CW/CCW or Pulse/Direction
- Up to 1 MHz encoder input for each axis
- Two encoder pulse input types: A/B phase or Up/Down
- Constant speed control
- Position management and software limit switch function
- BoardID™ switch

Introduction

PCM-3240 is a 4-axis stepping/pulse-type servo motor control card designed for general-purpose motion applications. PCM-3240 is a high-speed 4-axis motion control card for the PC/104 bus that simplifies stepping and pulse-type servo motor control, giving you added performance from your motors. The card's intelligent NOVA® MCX314-motion ASIC builds in a variety of motion control functions, such as 2/3-axis linear interpolation, 2- axis circular interpolation, T/S-curve acceleration/deceleration rate and more. In addition, the PCM-3240 performs these motion control functions without processor loading during driving. For advanced applications, we supply Windows® DLL drivers and user-friendly examples to decrease your programming load. Moreover, with a free bundled PCM-3240 motion utility, you can easily complete configuration and diagnosis.

Specifications

Pulse Type Motion Control

- **Motor Driver Support** Pulse-type servo/stepping
- **Number of Axes** 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** 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**
  - Machine 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 Inputs: 3
  - General Outputs: 4

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 ~ 25 V
- **Isolation Protection** 2,500 V_{DC}
- **Max. Input Frequency** 1 MHz

General

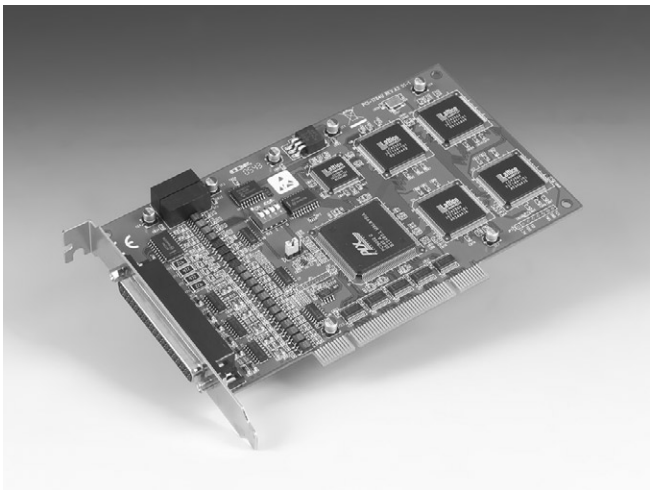
- **Bus Type** PC/104
- **Certifications** CE
- **Connectors** 2 x IDC 50-pin male
- **Dimensions** 96 x 91 mm
- **Power Consumption** Typical: 5 V @ 850 mA
Max: 5 V @ 1 A
- **Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 85° C (-4 ~ 185° F)

Ordering Information

- **PCM-3240** 4-axis stepping/pulse-type servo motor control card
- **PCL-10150-1.2** 50-pin flat cable, 1.2 m
- **ADAM-3950** 50-pin flat cable wiring terminal for DIN-rail mounting
- **PCL-12250-1** Two 50-pin flat cable to 100-pin SCSI connector, 1 m
- **ADAM-3952/J2S** PCM-3240 Wiring Board for Mitsubishi J2S series
- **ADAM-3952/PMA** PCM-3240 Wiring Board for Panasonic Minas A series
- **ADAM-39100** 100-pin SCSI-II wiring terminal for DIN-rail mounting
- **ADAM-3952** Wiring Terminal for DIN-rail mounting

PCI-1784U

4-axis Quadrature Encoder and Counter Card



Features

- Four 32-bit up/down counters
- Single ended or differential inputs
- Pulse/direction and up/down counter
- x1, x2, x4 counts for each encoder cycle
- Optically isolated up to 2,500 V_{DC}
- 4-stage digital filter with selectable sampling rate
- Onboard 8-bit timer with wide range time-base selector
- Multiple interrupt sources for precision application
- 4 isolated digital input
- 4 isolated digital output
- BoardID™ switch

Introduction

PCI-1784U is a 4-axis quadrature encoder and counter add-on card for PCI bus. The card includes four 32-bit quadruple AB phase encoder counters, 8-bit timer with multi range time-base selector and 4 isolated digital inputs as well as 4 isolated digital outputs. Its flexible interrupt sources are suitable for motor control and position monitoring.

Specifications

Encoder Input

- **Number of Axes** 4 (independent)
- **Resolution** 32-bit
- **Max. Quadrature Input** 1.0 MHz with digital filter
2.0 MHz without digital filter
- **Digital Filter** 4 stage
- **Drive Type** Single-ended or differential
- **Counter Modes** Quadrature, Up/Down, Count/Direction
- **Isolation Protection** 2,500 V_{DC}
- **Max. Input Pulse Freq.** x 1, x 2, x 4
- **Sample Clock Freq.** 8, 4, 2, or 1 MHz

Input Range

- **Single Ended Configuration**
Logic 0 : 0.8 V max.
Logic 1 : 2.8 V min. (12 V max.)
- **Differential Configuration**
Logic 0 : -0.2 V max.
Logic 1 : 0.2 V min. (±12 V max.)

Isolated Digital Input

- **Channels** 4
- **Input Voltage** Logic 0 : 3 V max.
Logic 1 : 10 V min. (30 V max.)
- **Interrupt Capable Ch.** DI0~DI3
- **Isolation Protection** 2,500 V_{DC}
- **Opto-Isolator Response** 25μs
- **Overvoltage Protection** 70 V_{DC}

Isolated Digital Output

- **Channels** 4
- **Compatibility** 5 V/TTL
- **Isolation Protection** 2,500 V_{DC}
- **Output Voltage** Logic 0: 0.8 V min.
Logic 1: 2.0 max.
- **Sink/Source Current** 50 mA max./channel
- **Opto-Isolator Response** 20 ms

Counter/Timer

- **Channels** 4
- **Resolution** 32 bits
- **Compatibility** 5 V/TTL
- **Max.Input Frequency** 8 MHz
- **Counter Modes** Quadrature, 2-pulse, Pulse/Direction
- **Interrupt Capable Ch.** Counter0 ~ Counter3
- **Digital Noise Filter** 4 stage

General

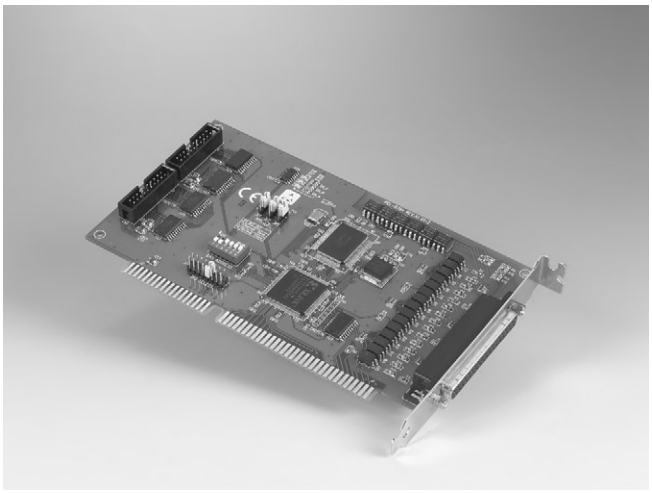
- **Bus Type** PCI V2.2
- **Connectors** 37-pin D-sub female
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: +5 V @ 200 mA
Max: +5 V @ 450 mA
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storage Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5~95% RH, non-condensing (refer to IEC 68-2-3)
- **Certifications** CE certified

Ordering Information

- **PCI-1784U** 4-axis Quadrature Encoder and Counter Card
- **PCL-10137H-1** High-speed DB-37 cable assembly, 1 m
- **PCL-10137H-3** High-speed DB-37 cable assembly, 3 m
- **ADAM-3937** DB-37 Wiring Terminal Board for DIN-rail mounting

PCL-839+

3-axis Stepping Motor Control Card



Features

- Independent, simultaneous control of three stepping motors
- Optically-isolated outputs
- Five isolated digital inputs per axis for limit switches
- Half-size PC add-on card
- Up to 200 kpps step rate
- 16 DI and 16 DO

Introduction

PCL-839+ three axis intelligent stepping motor control card turns your IBM-compatible PC into a 3-axis motion-control station. The card's one PCD-4541 intelligent controller chips can execute a variety of motion-control commands. For advanced applications, we supply function libraries which you can link to your C program.

Programming PCL-839+

You can control each axis directly through the card's I/O registers. but use of the card's high-level interpreter is recommended. This interpreter reads high-level commands from a text file to perform specific tasks. We also supply function libraries which you can call from your C program. The libraries come with 'Turbo C' source code which you can recompile if you want to access the libraries from other C compilers.

Specifications

Pulse Type Motion Control

- **Motor Driver Support** Stepping
- **Number of Axes** 3
- **Max. Output Speed** 200 kpps
- **Step Count Range** 0 ~ 16, 777, 215
- **Pulse Output Type** Pulse/Direction, CW/CCW
- **Velocity Profiles** T-Curve
- **Local I/O**
  - Machine Interfaces: PEL x 3, MEL x 3, ORG x 3, SLD x 6
  - General Inputs: 16 (5 V/TTL)
  - General Outputs: 16 (5 V/TTL)

General

- **Bus Type** ISA
- **Certifications** CE
- **Connectors** 1 x DB-37 (limit switches and pulse output)
  1 x 20-pin flat cable (DIO)
- **Dimensions** 185 x 100 mm (7.3" x 3.9")
- **Power Consumption** Max: 5 V @ 390 mA
- **Storing Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)

Ordering Information

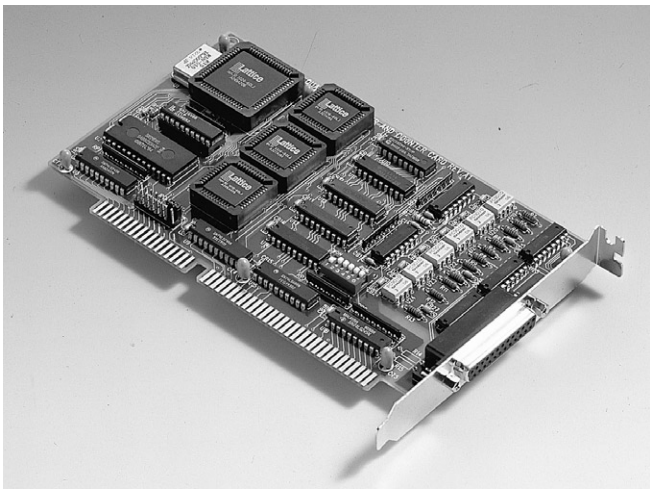
- **PCL-839+** 3-axis stepping motor control card
- **PCL-10137-1** DB-37 cable assembly, 1 m
- **PCL-10137-2** DB-37 cable assembly, 2 m
- **PCL-10137-3** DB-37 cable assembly, 3 m
- **ADAM-3937** DB-37 wiring terminal for DIN-rail mounting
- **ADAM-3920** 20-pin flat cable wiring terminal for DIN-rail mounting

Applications

- X-Y table control
- Rotary machine control
- Robotics control
- Precision position control using stepping motors

PCL-833

3-axis Quadrature Encoder and Counter Card



Features

- 1.0 MHz max. quadrature input rate
- Three 24-bit counters (can cascade up to 48 bits)
- Optically isolated up to 2,500 V_{RMS}
- 4-stage digital filter
- 2.4 MHz max. input pulse rate
- Pulse/direction and up/down counting
- Digital input with interrupt for each axis
- Programmable time-interval interrupt
- Half-size AT bus card

Introduction

PCL-833 is a 3-axis quadrature encoder and counter add-on card for the IBM PC/AT and compatibles (ISA bus). This card lets your PC perform position monitoring for motion control systems. Each input includes a decoding circuit for incremental quadrature encoding. Inputs accept either single-ended or differential signals. Quadrature input works with or without an index, allowing linear or rotary encoder feedback.

PCL-833 has three independent 24-bit counters. The maximum quadrature input rate is 1.0 MHz, and the maximum input rate in counter mode is 2.4 MHz. You can individually configure each counter for quadrature decoding, pulse/direction counting or up/down counting.

PCL-833 provides five digital input channels. Each channel accepts digital input as an index input for a rotary encoder or as a home sensor input for a linear encoder. The card can generate an interrupt to the system based on a signal from its digital inputs, overflow/underflow of its counters, or on a programmed time interval. It can repeatedly generate interrupts at any time interval you specify, from 0.1 msec. to 255 sec. These interrupts let you precisely monitor the speed of a control system.

Specifications

Encoder Interface

- **Input Type** Single-ended or differential
- **Counts per Encoder** x1, x2, x4 (S/W selectable)
  Cycle
- **Input Range** 12 V max.
- **Isolation Protection** 2,500 V_{RMS} (optical)
- **Max. Input Frequency** 2.4 MHz

Counter/Timer

- **Channels** 3
- **Resolution** 24 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 2.4 MHz
- **Counter Modes** 3 (quadrature, up/down, pulse/direction)
- **Interrupt Capable Ch.** Counter 0 ~ 2
- **Digital Noise Filter** 4 stage

Isolated Digital Input

- **Channels** 5 (Zin x 3 + DI0 + DI1)
- **Input Voltage** Logic 0: 1 V max.
  Logic 1: 5 V min. (12 V max.)
- **Interrupt Capable Ch.** DI0, DI1
- **Isolation Protection** 2,500 V_{RMS} (optical)

General

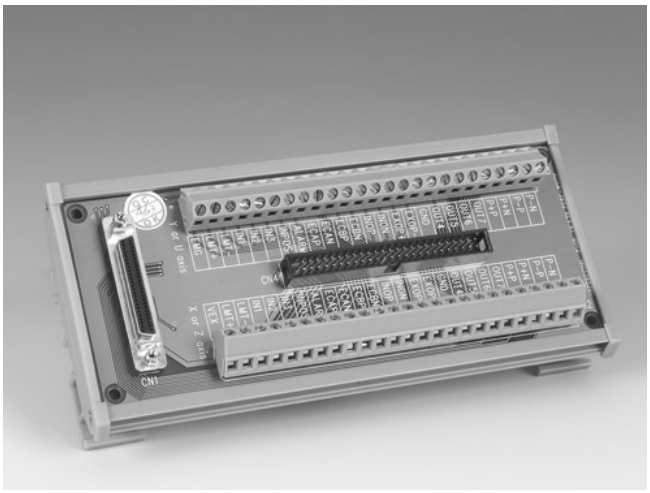
- **Bus Type** ISA
- **Certifications** CE
- **Connectors** 1 x DB-25 female
- **Dimensions** 185 x 100 mm (7.3" x 3.9")
- **Power Consumption** Typical: 5 V @ 700 mA, 12 V @ 15 mA
- **Storing Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-3)
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)

Ordering Information

- **PCL-833** 3-axis quadrature encoder and counter card
- **ADAM-3925** DB-25 wiring terminal for DIN-rail mounting
- **PCL-10125-1** DB-25 cable assembly, 1 m
- **PCL-10125-3** DB-25 cable assembly, 3 m

ADAM-3952 Series

PCI-1240U/PCM-3240 Wiring Terminals for DIN-rail Mounting



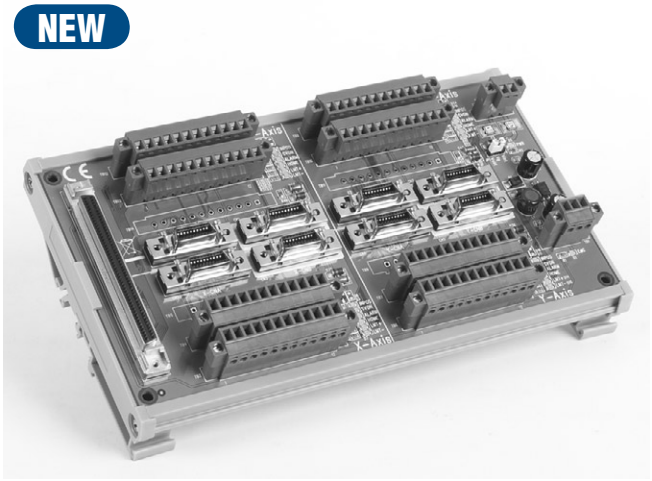
ADAM-3952

PCI-1240U/PCM-3240 50-Pin SCSI-II and IDC Wiring Terminal for DIN-rail Mounting

Features

- DIN-rail mounting wiring terminal for PCI-1240U/PCM-3240 applications
- Case 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-1240U and PCM-3240

NEW



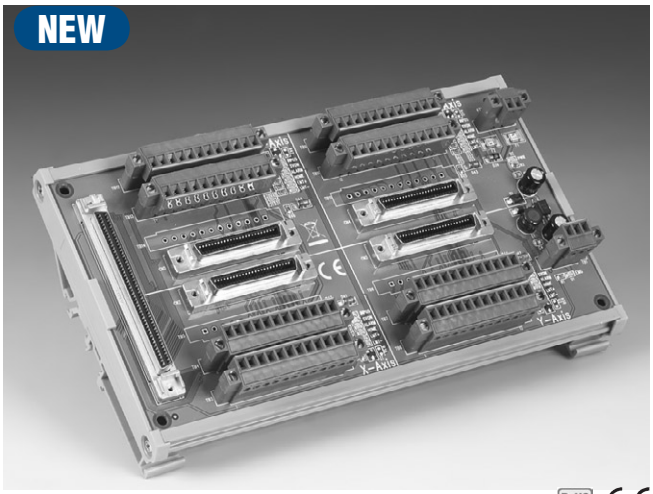
ADAM-3952/J2S

PCI-1240U/PCM-3240 Wiring Terminal for Mitsubishi MR-J2S

Features

- DIN-rail mounting wiring terminal for PCI-1240U/PCM-3240 connecting with Mitsubishi MR-J2S servo motor driver
- Case dimensions (W x L x H): 121 x 202 x 45 mm (4.76" x 7.95" x 1.77")
- One SCSI-100-pin connector to connect with PCI-1240U/PCM-3240
- Eight SCSI 20-pin connector to connect with Mitsubishi motor driver
- Optional cable PCL-101100M-1, PCL-101100M-3 and PCL-10120M-2

NEW



ADAM-3952/PMA

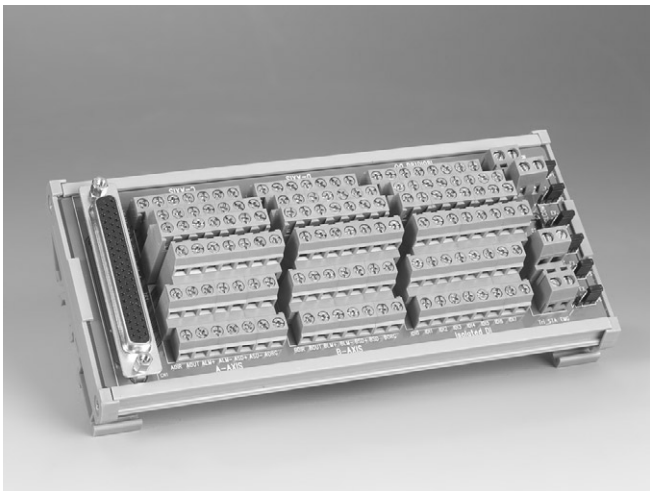
PCI-1240U/PCM-3240 Wiring Terminal for Panasonic Minas A

Features

- DIN-rail mounting wiring terminal for PCI-1240U/PCM-3240 connecting with Panasonic Minas A servo motor driver
- Case dimensions (W x L x H): 121 x 202 x 45 mm (4.76" x 7.95" x 1.77")
- One SCSI-100-pin connector to connect with PCI-1240U/PCM-3240
- Four SCSI 50-pin connector to connect with Panasonic motor driver
- Optional cable PCL-101100M-1, PCL-101100M-3 and PCL-10150M-2

ADAM-3900 Series

Wiring Terminals for DIN-rail Mounting



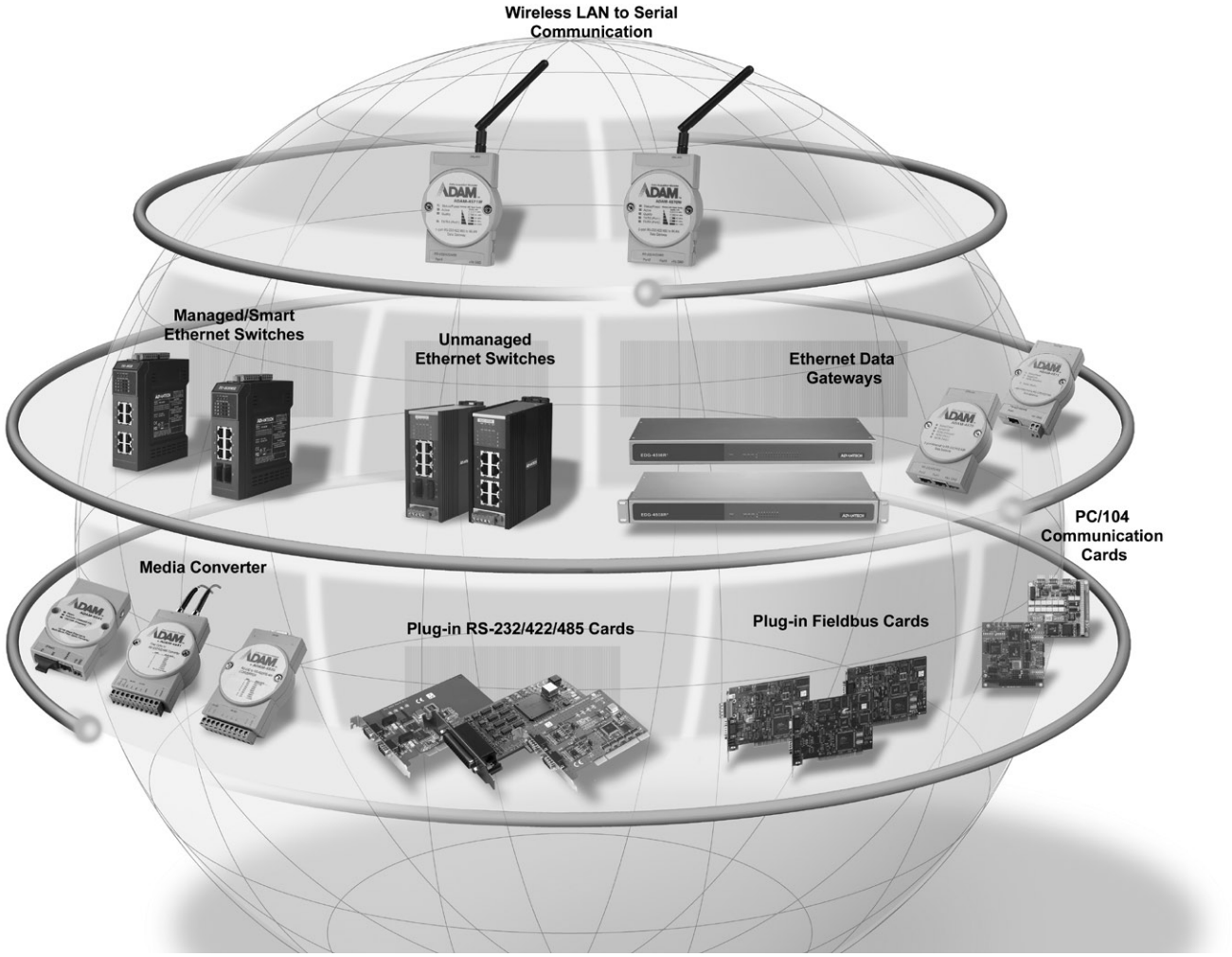
ADAM-3943

PCI-1243U Wiring Board with LED

Features

- DIN-rail mounting wiring terminal for PCI-1243U applications
- Case dimensions (W x L x H): 123 x 85 x 56 mm (4.8” x 3.3” x 2.2”)
- DB 62-pin female connector
- Tree-wire wiring for each channel

Link Your Devices to the eWorld with eConnectivity Solutions



Industrial Communication Solutions

Industrial Ethernet Switches

Advantech's Ethernet switches and hubs are designed especially for industrial environments with Ethernet networking needs, so you can expand your industrial network efficiently and cost-effectively. For example, the redundant dual power inputs ensure stable power supply, while surge protection for the power line and ESD protection for Ethernet ports make the Advantech switches more suitable for harsh environments. The unmanaged switches support networking standard IEEE802.3/ 802.3u, while smart switches featured several critical functions, like VLAN, QoS, Port Trunk and Port Mirroring. Advanced managed functions are ring redundancy for better reliability, and SNMP for security. In addition, fiber solution is also available for long distance and anti-noise application.

Media Converters

Advantech offers six types of media converters for various applications, including Ethernet to multi-mode fiber optic converters, Ethernet to single strand WDM fiber optic converters, fiber optic to RS-232/422/485 converters/repeaters, RS-422/485 repeaters, RS-232 to RS-422/485 converters and USB to RS-232/422/485 converters. Ethernet media converters are designed to convert Ethernet network (10/100Base-TX) to fiber-optic networks (100Base-FX). Fiber optic communication provides wide bandwidth and secures long-distance transmissions from electromagnetic interference. Serial Media Converters provide conversion between serial networks and other media. They can convert RS-232 signals to RS-422/485 signals, as well as wireless and fiber optic signals.

Serial to Ethernet/Wireless Data Gateways

Advantech offers wired and wireless devices to meet the needs of diverse industrial applications, including:

Ethernet/Wireless Data Gateways

Ethernet data gateways enable RS-232/422/485 serial devices to be connected to a host computer over an Ethernet network quickly and cost-effectively. No extra programming effort is required at the host computer, so software development costs can be saved. In addition, Advantech's newly serial to wireless LAN Data Gateways can be applied in mobile environments, and connect your serial devices to an Ethernet network or 802.11b wireless LAN easily.

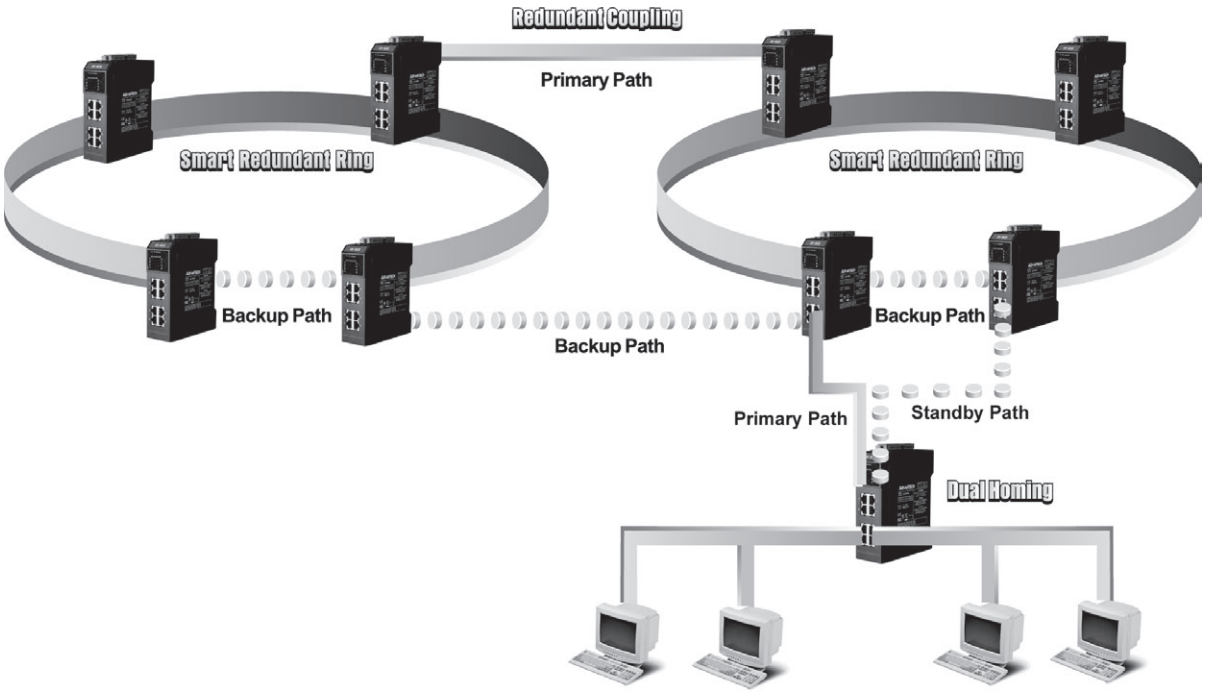
Modbus to Ethernet Data Gateways

Fully compliant with Modbus/TCP, Advantech's Modbus to Ethernet Data gateways are ideal for customers who are looking for an easy way to connect their existing devices or controllers running Modbus serial protocols (Modbus/ASCII or Modbus/RTU) to Ethernet networks.

Communication Card Solutions

Advantech serial communication cards accommodate multiple high performance peripherals for serial communications, such as field devices, modems, PCs and PLCs, using the RS-232, RS-422 and RS-485 serial communication protocols. Advantech PCI cards leverage the "Plug and Play" capability defined in the PCI 2.1/2.2 bus specification, and also come with a standard 16PCI954/16PCI952 UART containing a 128 byte FIFO. Optical isolation, surge and ESD protection are available to protect your system from damages and transient from lighting, electrostatic discharges and ground loops.

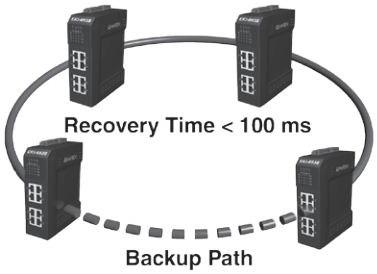
Non-Stop Communication within Advantech's Smart Redundant Ring



Three Redundant Ways to Maximize Communication Reliability

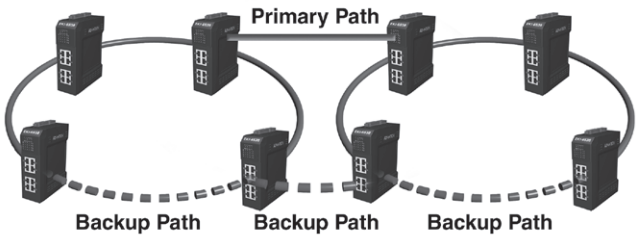
Smart Redundant Ring

EKI-6558 supports Smart Redundant Ring architecture, which allows one segment in the ring to be treated as a backup path. EKI-6558 will activate the backup path automatically and recover communications with deterministic recovery time in less than 100 ms if any Ethernet path with the ring fails. With the smart redundant ring function, EKI-6558 provides highly solid and reliable communications for your system.



Redundant Coupling

Redundant coupling is a flexible topology to connect several distributed rings together to act as one virtual ring. Communication between rings will recover itself automatically if any coupling path fails.



Dual Homing

EKI-6558 also supports another redundant way for you even your network is not setup as a ring. Dual homing means that the EKI-6558 is connected to a network with two independent connecting paths. The standby path is automatically activated when the primary path fails.