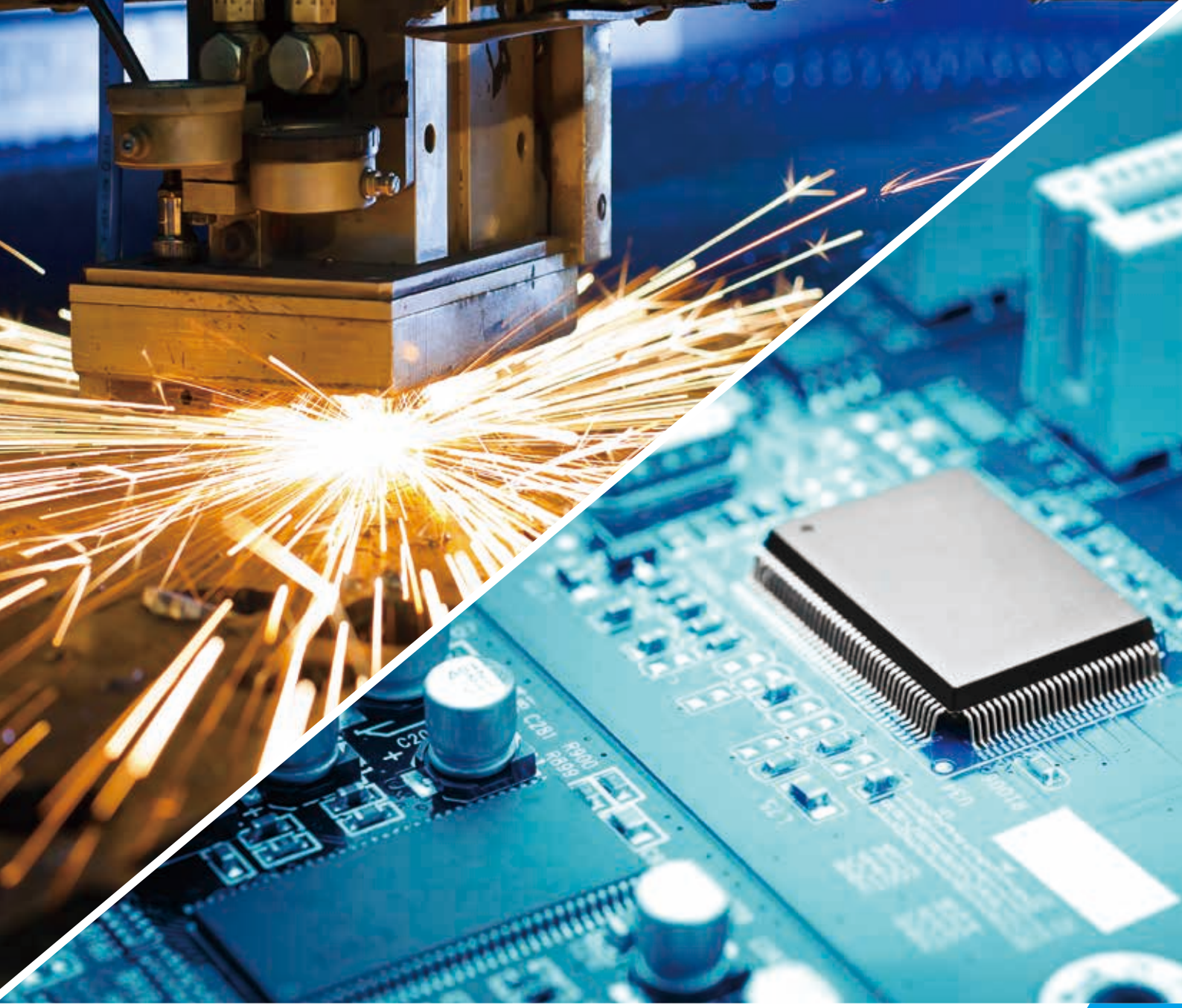

Automation for a Changing World

Delta Industrial PC-Based Motion Control Solution Motion Control Card Series

www.deltaww.com

DELTA

Smarter. Greener. Together.

High-Speed Communication Solution for Multi-Axis and Synchronous Motion Control

The Delta Industrial PC-Based Motion Control Solution features a one-wire protocol for unimpeded access, achieving easy wiring, high synchronization, and excellent motion control performance. With Delta's flexible dynamic-link library (DLL), it easily connects Delta's motion control cards to multiple control devices such as servo motors, linear motors, remote digital I/O modules, analog modules, and pulse I/O modules for real-time data exchanges and high-precision technical programming via the PCI / PCIe interface.

The solution is the best integrated motion control platform that effortlessly fulfills the need for multi-axis and synchronous motion control with enhanced stability, flexible extension capabilities and versatile operation for industry upgrades.

Four Major Features

- Supports DMCNET and EtherCAT communication motion control cards
- Connects to a variety of peripheral devices with standard Ethernet structure, such as servo motors, remote digital I/O and analog modules and stepping motors. direct drive DD motors and linear motors.
- Offers a high-security IC device for each motion control card for confidential programming protection
- Fieldbus verification and validation software provides easy configuration with relevant parameters of the fieldbus communication segment and hardware system, reducing programming cost and third-party software

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DMCNET System Configuration

Motion Control Cards

Motion Control Cards

PCI-DMC-A02

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PCI-DMC-B01

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PCI-DMC-B03

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PCI-DMC-F02

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Servo Systems

Servo Drives and Motors

ASDA-A3-F

ASDA-A2-F

ASDA-B3-F

ASDA-B2-F

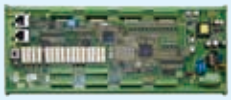
ASDA-M

** Please refer to the catalogues of Delta's servo drives and motors ASDA Series for detailed specifications

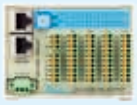
Digital Remote Modules

32 Digital Input Remote Module
ASD-DMC-RM32MN

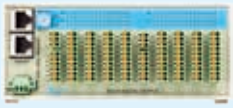
64 Digital Input Remote Module
ASD-DMC-RM64MN



Digital I/O Remote Module
HMC-RIO3232RT5



32 Digital Output Remote Module
ASD-DMC-RM32NT



64 Digital Output Remote Module
ASD-DMC-RM64NT

32 Digital I/O Remote Module
ASD-DMC-RM32PT

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Pulse Remote Module

4-Channel Pulse Remote Module
ASD-DMC-RM04PI

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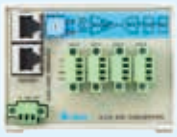
Analog Remote Modules

4-Channel Analog Output Remote Module
ASD-DMC-RM04DA



4-Channel Analog Input Remote Module
ASD-DMC-RM04AD

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Gateway Type Remote Modules

Gateway Type Remote Power Coupler
ASD-DMC-GA01

Gateway Type 1-Channel Pulse Remote Module
ASD-DMC-GE01PH

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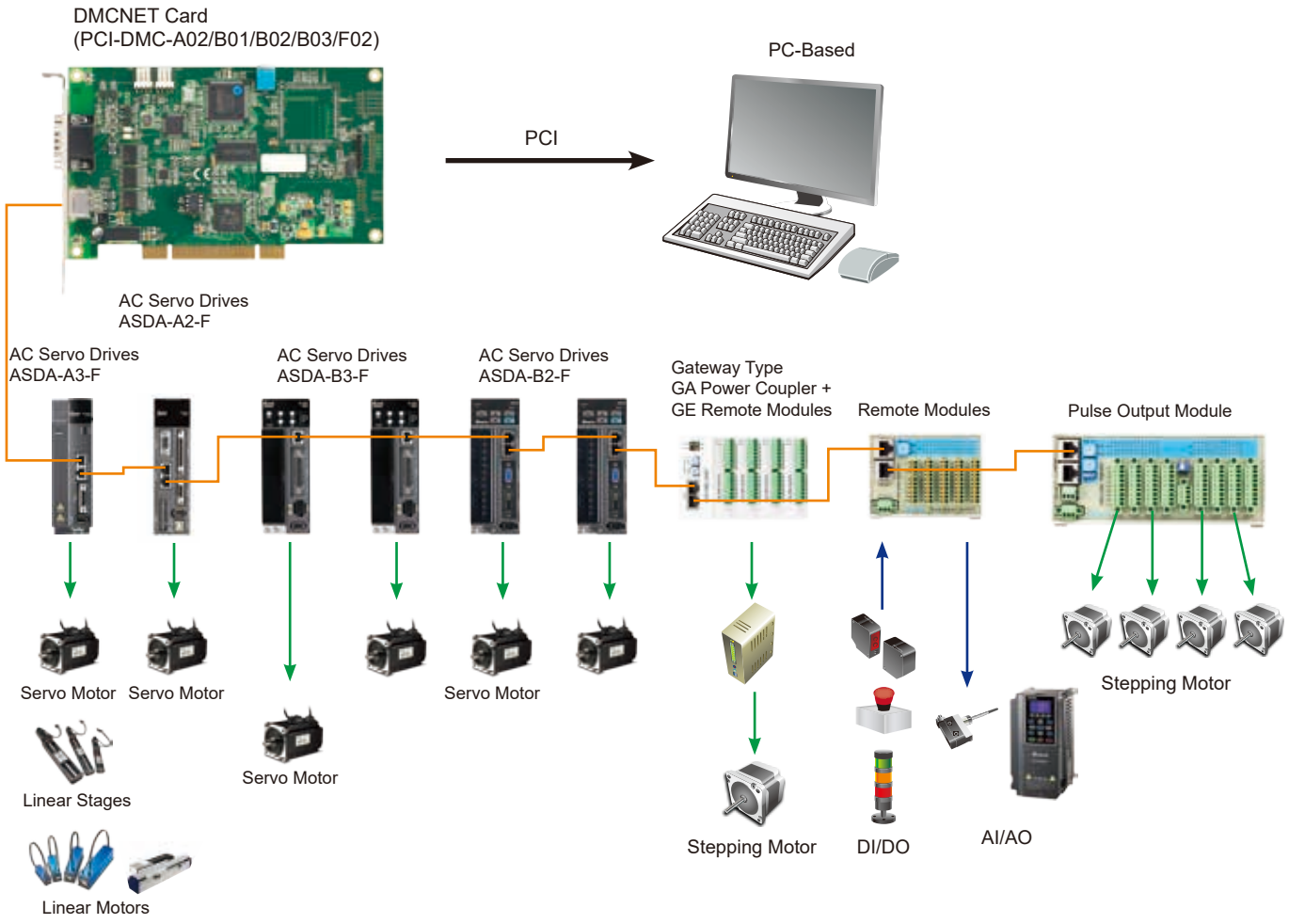
Delta's High-Speed Motion Control System - DMCNET Product Features

Delta's Motion Control NETwork (DMCNET) is a high speed, real-time communication system, capable of controlling up to 12 axes of servo system units within 1ms simultaneously: with 3-axis helical and linear interpolation in 4 groups, or 2-axis linear and arc interpolation in 6 groups. It supports 64-bit dual precision floating point, allowing high-precision system calculations and flexible operation, and also absolute commands, incremental commands and T-curve / S-curve velocity profiles for different uses. With built-in position, speed and torque control modes, and 35 homing modes, it is able to receive real-time servo information, parameters, or change control modes via communication command, offering fast communication and motion control for various applications.

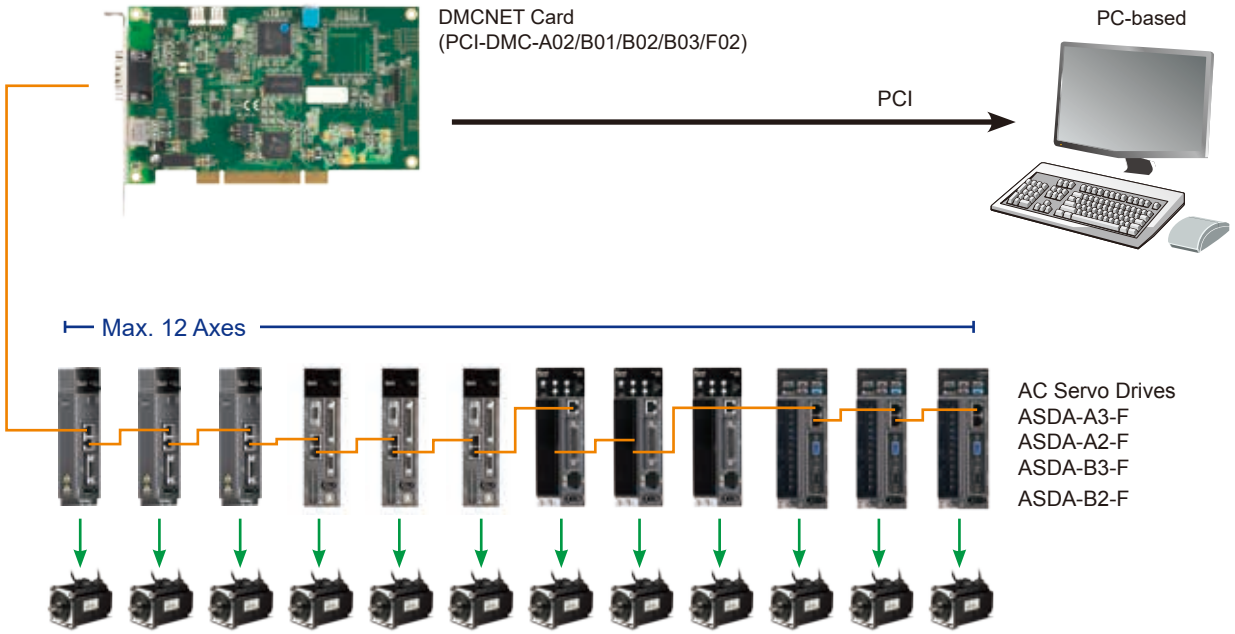
DMCNET Motion Control Structure

DMCNET is equipped with the high-speed and reliable one-wire DMCNET communication protocol for diverse motion control applications. Adapted depending on customer's needs, Delta's PCI motion control cards are available in three series: the 12-axis PCI-DMC-A02, 6-axis PCI-DMC-F02 with digital I/O interfaces and the PCI-DMC-B01 with pulse compare & capture functions. All series are able to connect to multiple servo systems, such as the high performance ASDA-A3-F & ASDA-A2-F Series and the standard ASDA-B3-F & ASDA-B2-F Series. It establishes a total motion control solution enabling lower system cost and superior performance to increase end-product value and competitiveness.



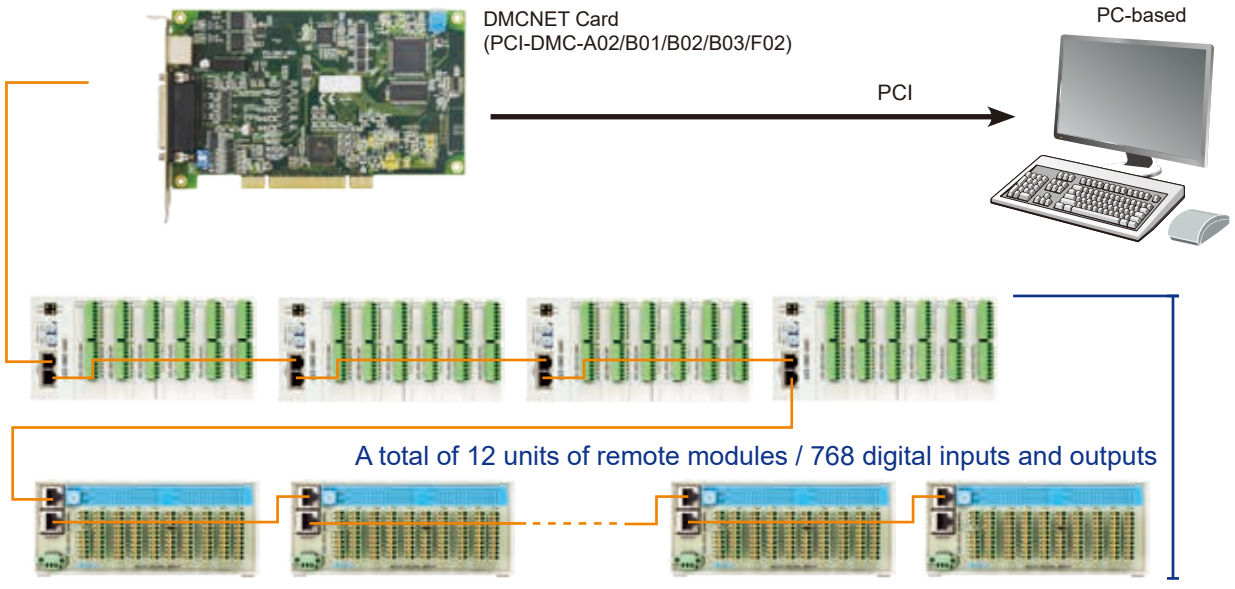
DMCNET Communication

The DMCNET is a motion control communication network that is able to control up to 12 servo drives or modules in serial connection on the same fieldbus, simplifying wiring as well as saving cost. With its fast and stable communication speed that deals with commands of the servo motors and modules within 1ms simultaneously, DMCNET offers an easy, fast and stable communication system solution that makes motion control easier.



DMCNET I/O Control Structure

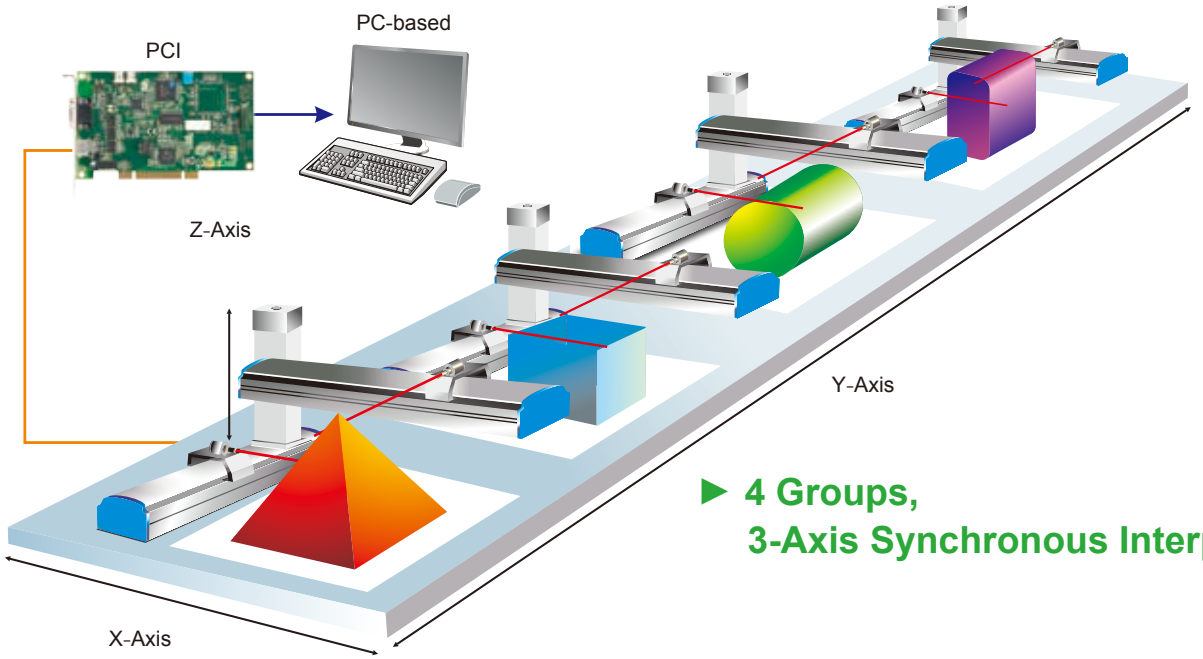
In a pure I/O control structure, DMCNET is capable of controlling up to 12 remote module units, which include a total of 768 digital inputs and outputs, offering customers a more flexible and effective solution.



Motion Control Functions

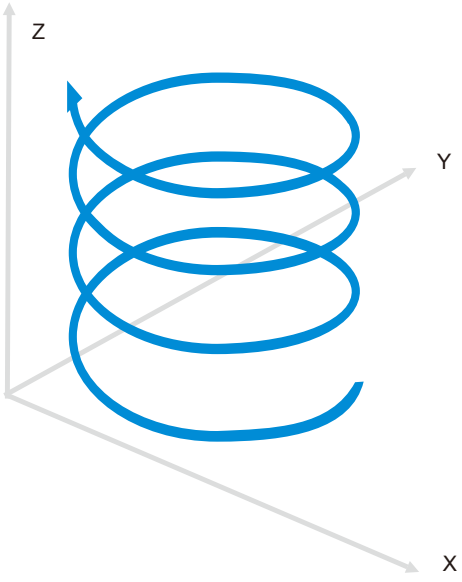
Multi-Group Synchronous Control

The DMCNET is capable of controlling 12 servo system units or 4 groups, 3-axis interpolation algorithms synchronously, realizing simultaneous 3-axis linear interpolation, 2-axis arc interpolation, 3-axis helical interpolation and continuous interpolation. It can also transfer the data of 12 servo motor units, or 768 digital inputs and outputs within 1ms simultaneously.

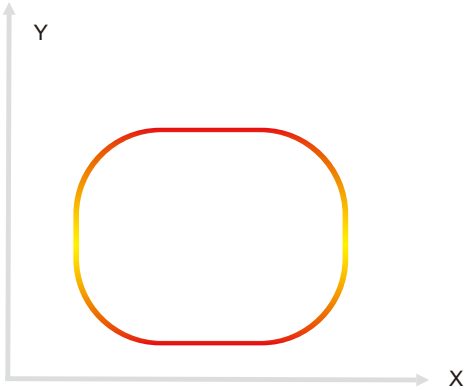


► 4 Groups,
3-Axis Synchronous Interpolation

► 3-Axis Interpolation



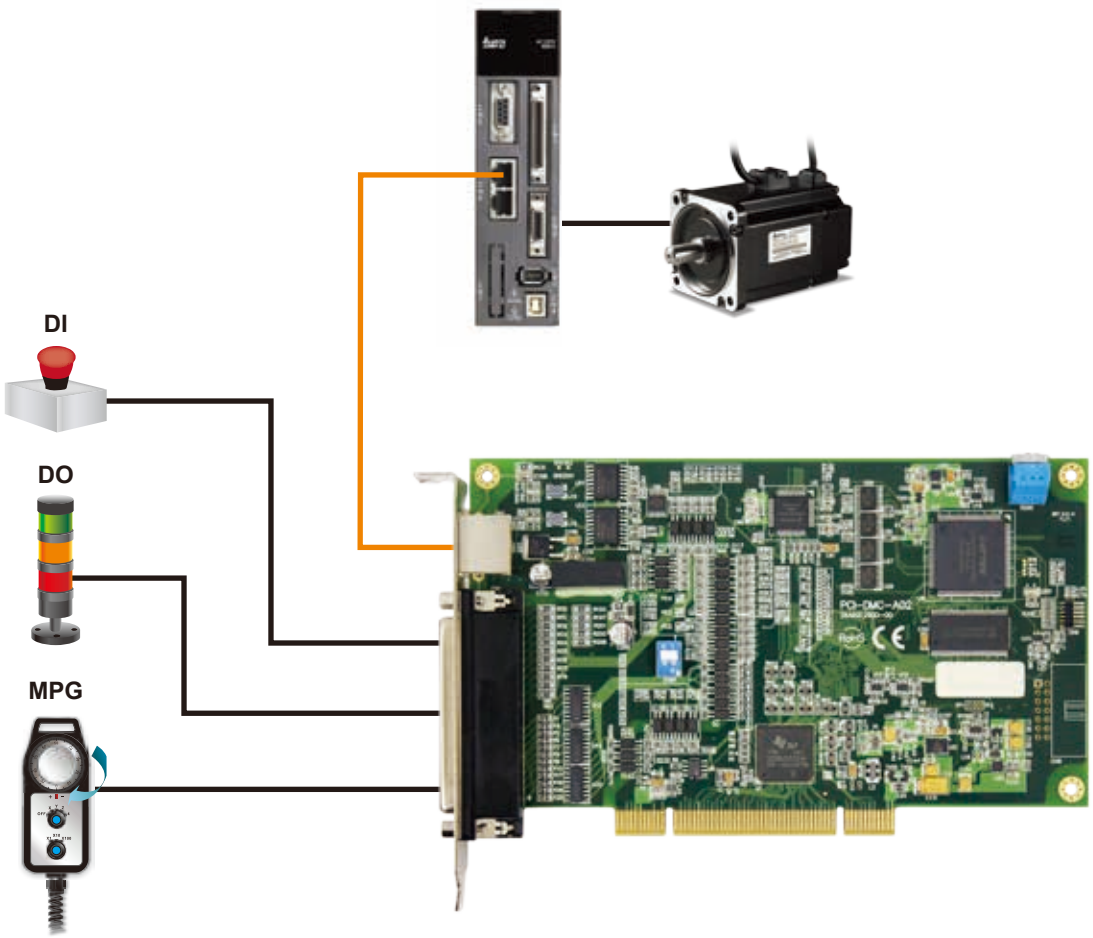
► 2-Axis Interpolation



Standard / Economical Motion Control Card
PCI-DMC-A02 / PCI-DMC-F02

Rapid Configuration and Easy Control with Digital I/O Interfaces

The PCI-DMC-A02 and PCI-DMC-F02 motion control cards are built-in with digital local I/O interfaces that are equipped with up to 32 digital inputs and 24 digital outputs. Without controlling through communication, the motion cards are able to rapidly capture and identify IO messages, enhancing the controlling efficiency of the system. For users who have fewer IO needs, this helps save cost with extended axes and rapid response (the PCI-DMC-F02 motion control card controls up to 6 axes). In addition, the motion cards can connect to a manual pulse generator (MPG) and conduct system adjustment directly, achieving real-time configuration and flexible operation.

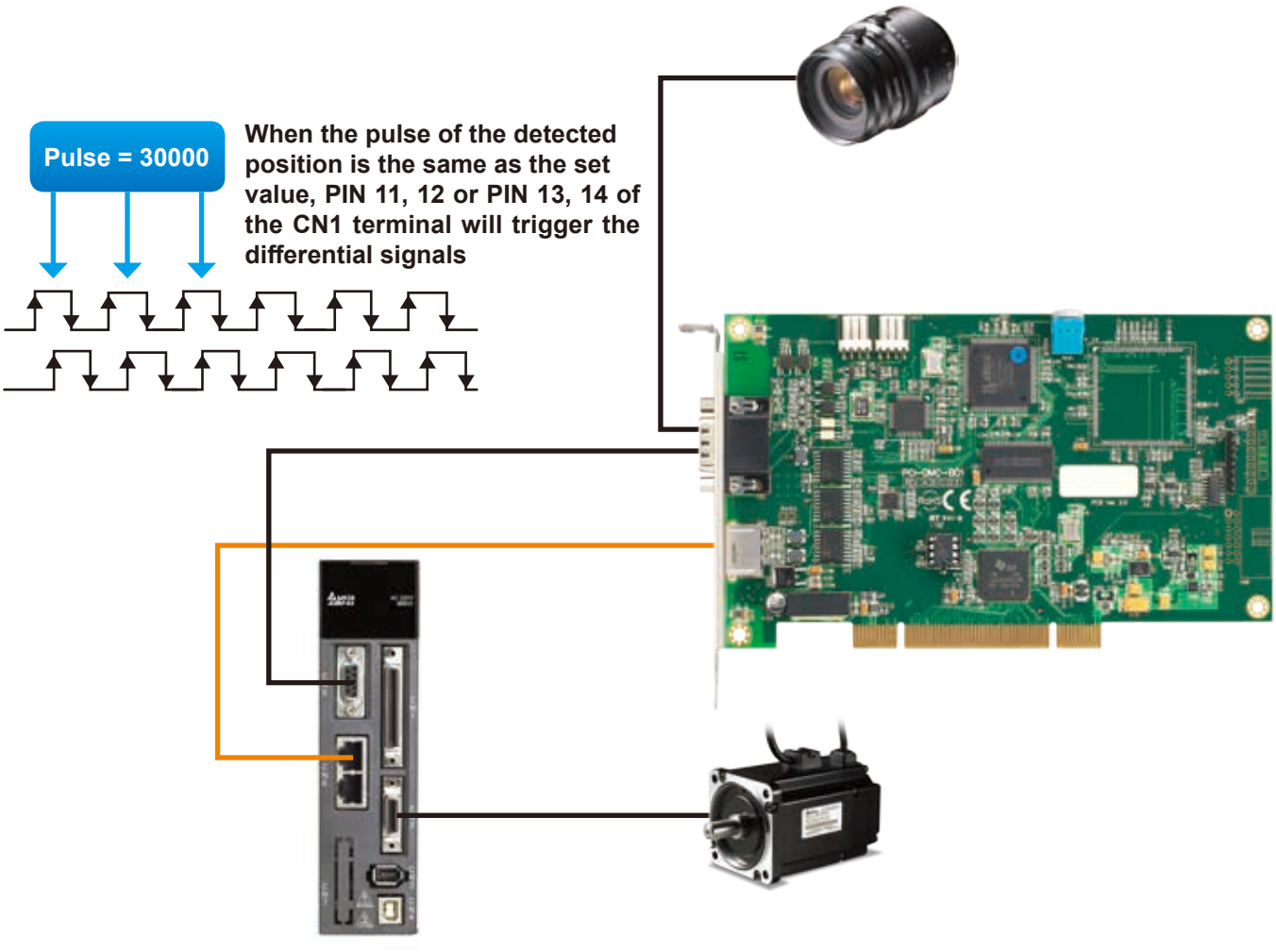


Advanced Motion Control Card
PCI-DMC-B01

Real-time Capture and Compare Functions

The capture function inputs a retrieve pulse to the control cards via an encoder and performs a pulse compare to remotely trigger the camera shutter and take pictures in equally spaced or unequally spaced pulse positions at a set time interval.

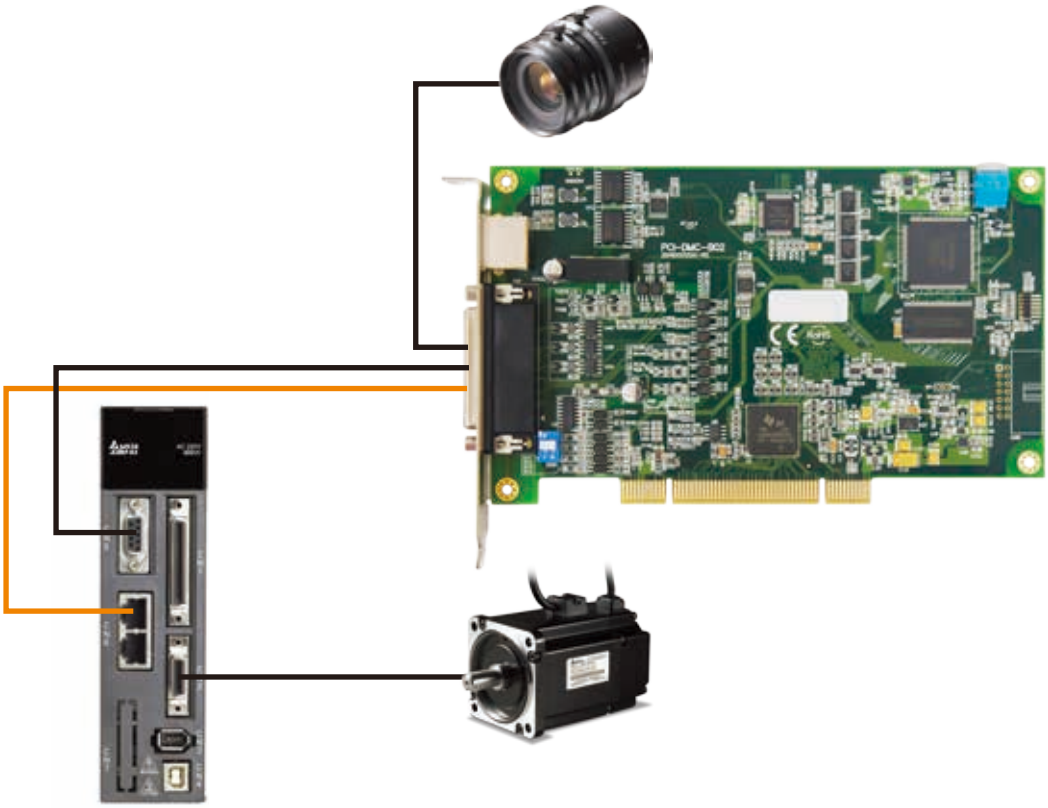
The PCI-DMC-B01 motion card provides 2 groups of real time pulse capture and 2 groups of compare functions.



Advanced Motion Control Card PCI-DMC-B02

Real-time Capture and 2D Compare Functions

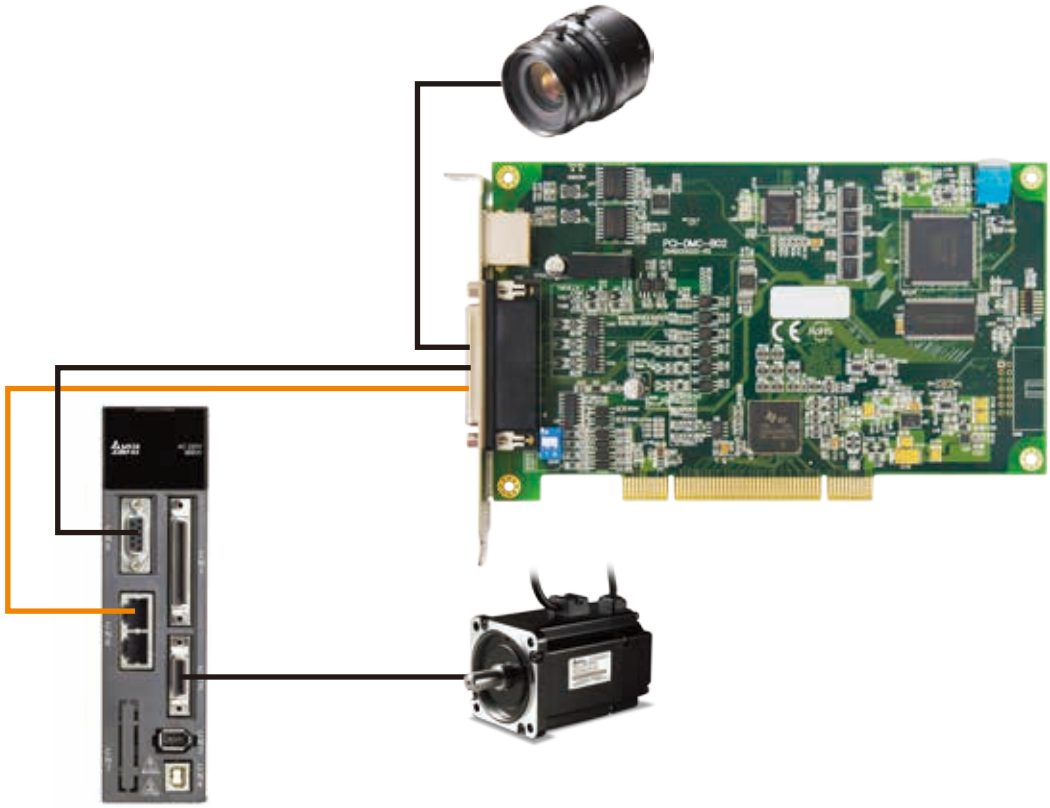
- The X and Y-axis path planning function can set the position and inputs the retrieve pulses of X and Y-axis to the control cards via an encoder. Users set 2D compare condition and speed to remotely trigger the camera shutter and take pictures.
- The PCI-DMC-B02 motion card provides 3 groups of real time pulse capture and 10 groups of compare functions.



Advanced Motion Control Card PCI-DMC-B03

Real-time Capture and Multiple Compare Functions

- The capture function inputs a retrieve pulse to the control cards via an encoder and performs a pulse compare to remotely trigger the camera shutter and take pictures in equally spaced or unequally spaced pulse positions at a set time interval.
- The PCI-DMC-B03 motion card provides 3 groups of real time pulse capture, 4 groups of equally spaced compare pulse triggers, and 6 groups of unequally spaced compare pulse triggers.



IPC Motion Platform (IMP 1.5)

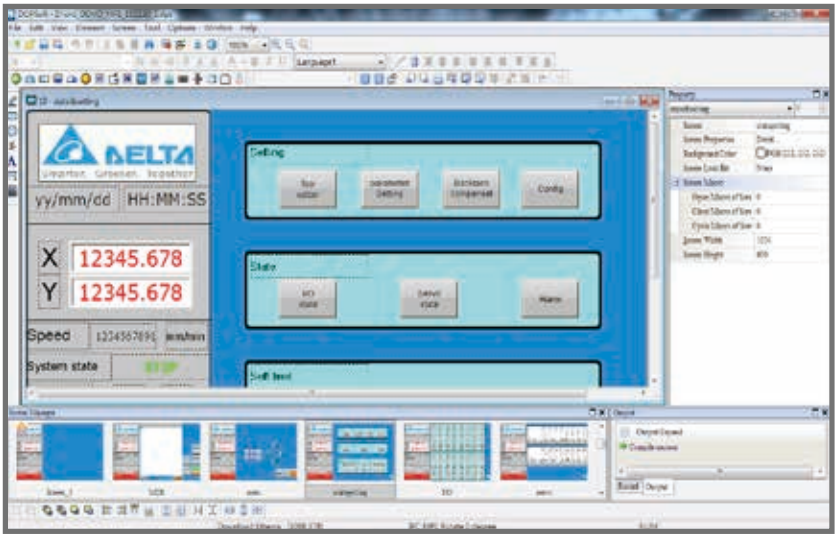
A Simple and Fast Setup Development Platform for Unsurpassed Motion Control

The IMP is a high-speed, flexible and scalable development platform which combines powerful motion control functions and integrates Delta's HMI editing and PLC logic programming software tools to achieve complex and precise motion control based on customers' requirements.

- **Powerful Motion Control Core:** Upgrades Delta's PAC and PC with a motion control card installed to become an advanced motion controller, which integrates functions of motion control, HMI, PLC and high-speed communication fieldbus in one unit.
- **Customized Platform for Secondary Development:** Combines with Delta's standard HMI editor DOPSoft and PLC editor WPLSoft in one customer-driven platform, the platform makes complex programming and development easy and time-saving without depending on technical support from the manufacturer.
- **Scalable Communication for Expandable Network:** Through PCI extension slots, three DMCNET communication networks with up to 36 stations can be established, which means 36 axes of servo motors can be controlled simultaneously without connecting to any remote modules.
- **Industry-Oriented Controller:** Soft Numeric Control (SNC) and Motion Program Macro (MPM) are provided for users to adjust and modify self-developed motion paths and commands according to changing application requirements.
- **Standard Communication Interfaces:** Support built-in standard Modbus and Modbus TCP gateways to enable more convenient data transmission and exchange between machines.

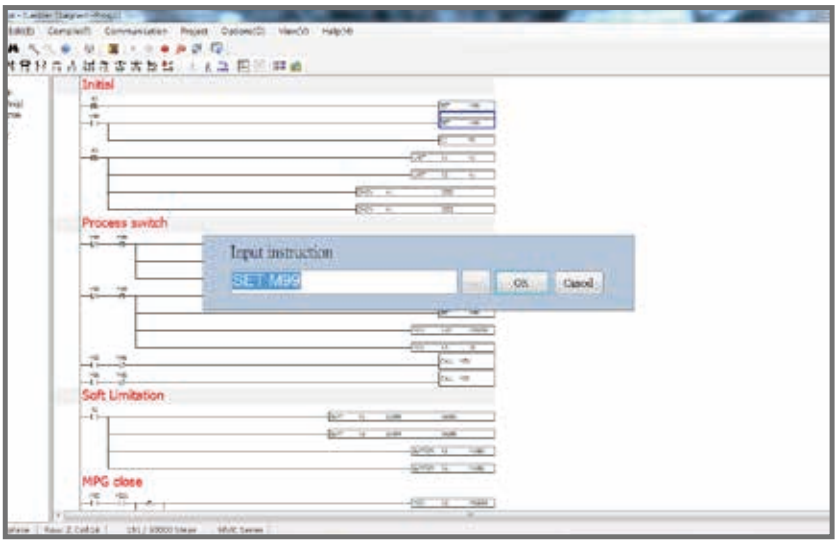
HMI Editor

After installing on a PC, even without C or C++ programming language, the HMI Editor DOPSoft 3.0 provides a simple path and quick downloading of customized user interfaces to Delta's PAC with the IMP for easy programming and system design. For specific industry applications, such as numerical control (NC), the IMP contains numerous example programs to provide a practical aid in real time for machine verification and evaluation.



PLC Editor

The IMP integrates Delta's PLC editor WPLSoft that offers users a ladder diagram editing environment to develop PLC programs for secondary development and to customize their applications. The PLC editor also accepts motion control commands and allows users to control servo systems and remote I/O modules to complete single-axis motions, multi-axis linear interpolation, arc interpolation, continuous speed and other motions, fulfilling the needs of users who are familiar with the PLC.



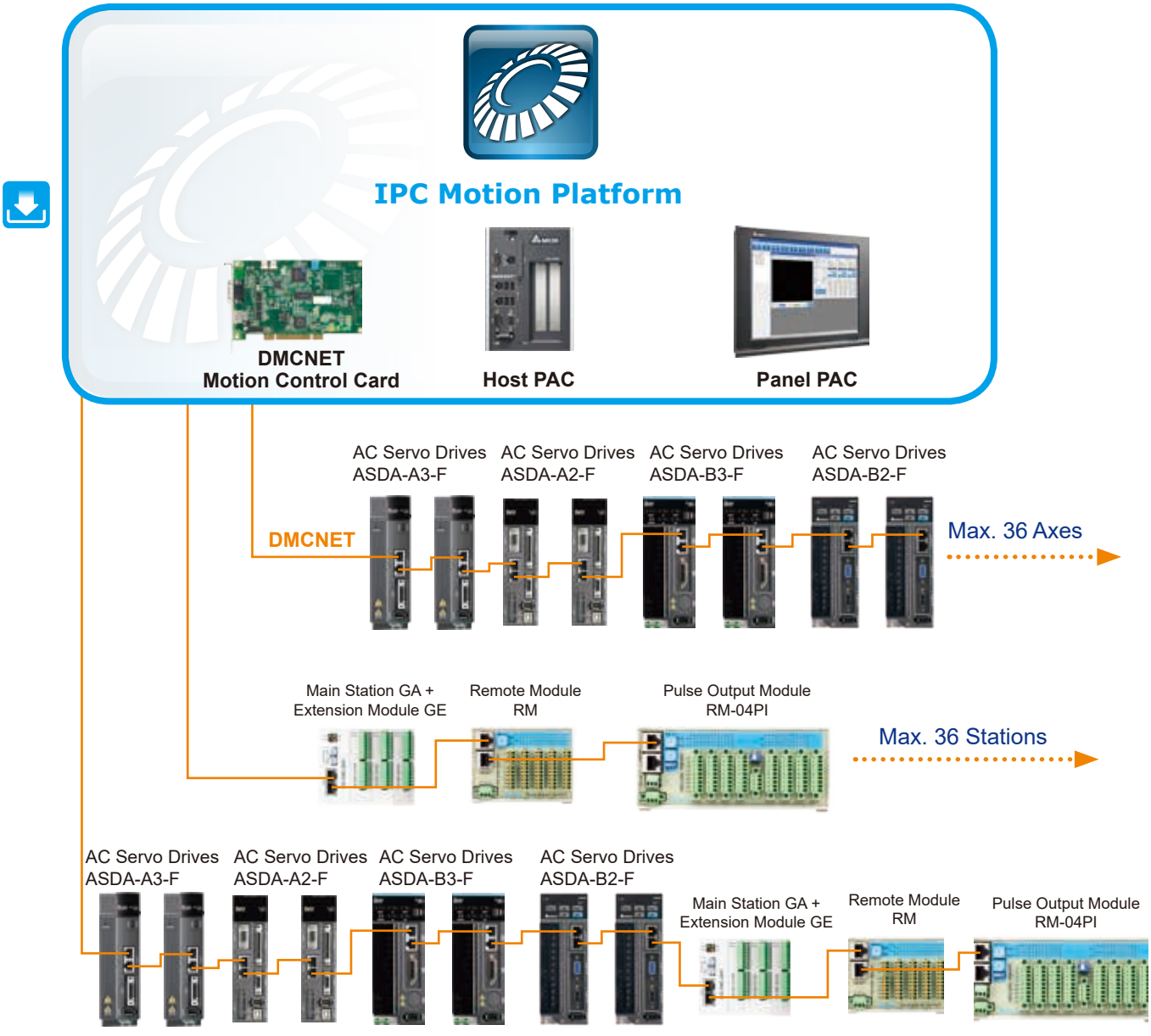
IMP System Configuration with DMCNET

VGA Display

IMP - Powerful Motion Control Kernel

The IMP is the kernel of the system, like the firmware of a motion controller, which runs on one of the processors of a multi-core PC or PAC with a plug-in motion control card. Without adding extra hardware, users can download HMI screens and PLC programs, edit user-defined graphical interfaces and execute programming logic control to run machine applications via software and VGA display only.

The IMP is a powerful motion control kernel and it simplifies connectivity and delivers more flexible functionality for the entire system. Not only is MODBUS communication equipped as standard, Soft Numeric Control (SNC) and Motion Program Macro (MPM) are also provided for users to change and calibrate motion paths and commands for different application requirements.



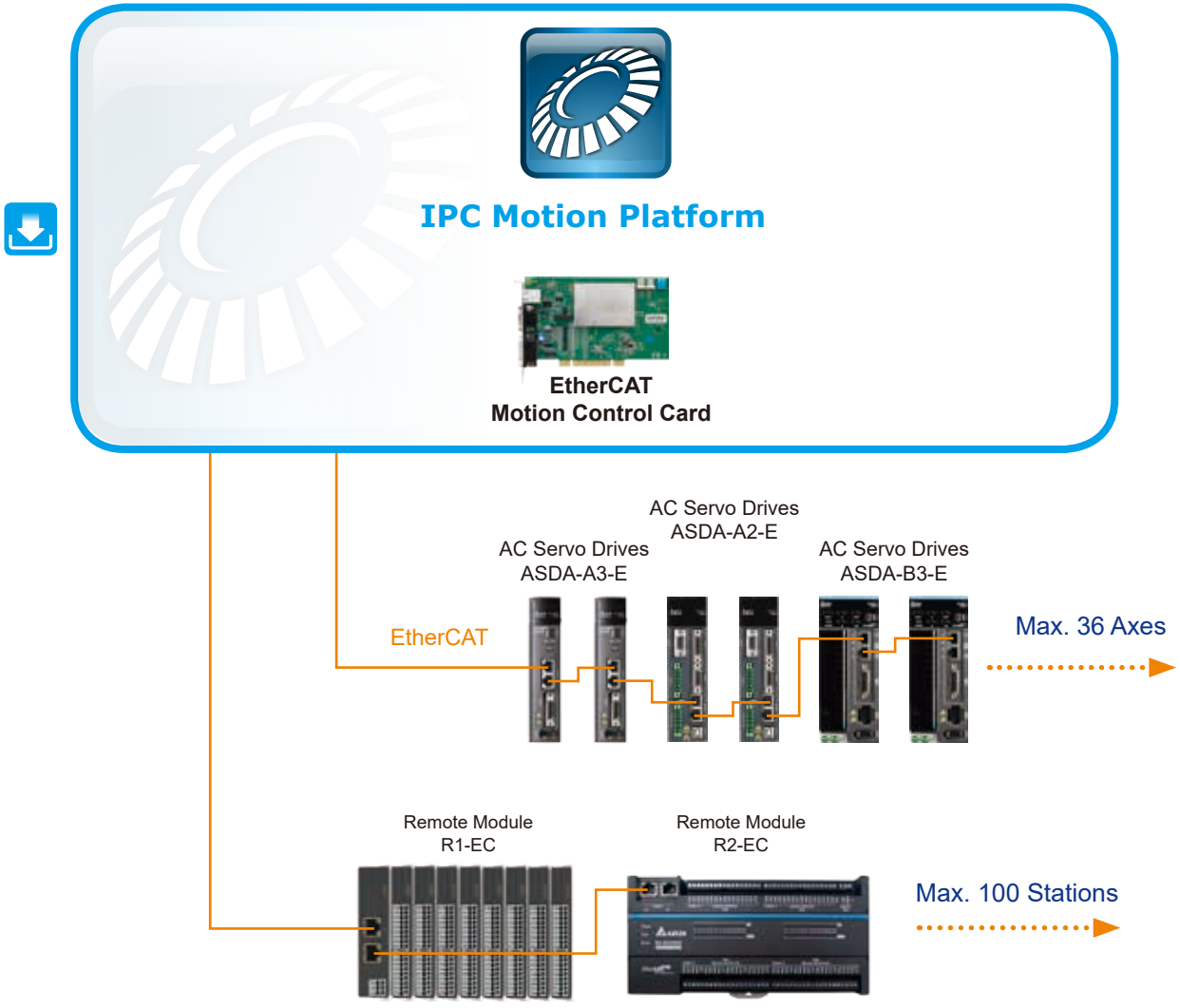
IMP System Configuration with EtherCAT

VGA Display

IMP - Powerful Motion Control Kernel

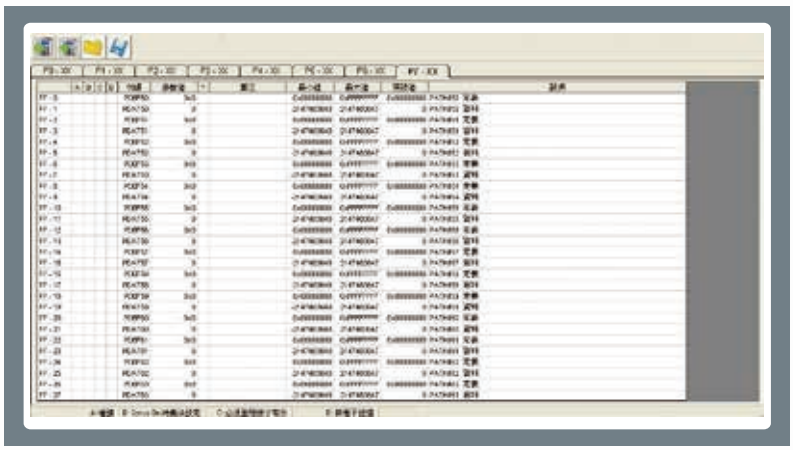
The IMP is the kernel of the system, like the firmware of a motion controller, which runs on one of the processors of a multi-core PC or PAC with a plug-in motion control card. Without adding extra hardware, users can download HMI screens and PLC programs, edit user-defined graphical interfaces and execute programming logic control to run machine applications via software and VGA display only.

The IMP is a powerful motion control kernel and it simplifies connectivity and delivers more flexible functionality for the entire system. Not only is MODBUS communication equipped as standard, Soft Numeric Control (SNC) and Motion Program Macro (MPM) are also provided for users to change and calibrate motion paths and commands for different application requirements.



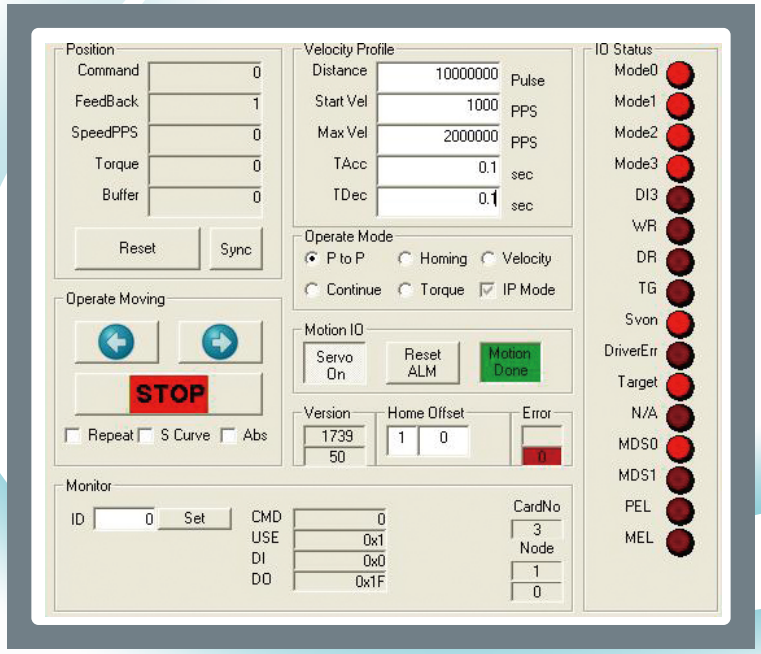
Fieldbus Verification and Validation - EzDMC Software

EzDMC Software provides simple editing functions for all the relevant parameters of the fieldbus communication and facilitates easy configuration of program development and the hardware system. Even first time users of Delta's DMCNET motion control cards can utilize the motion control card functions.



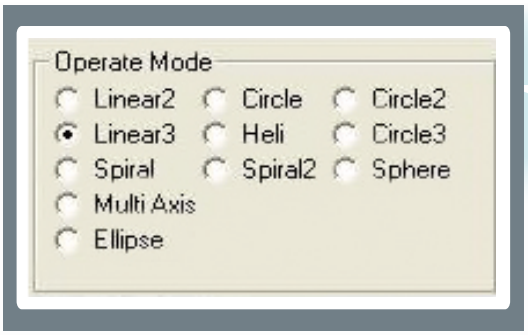
► User-Friendly Operator Interface

Helps users create and edit programs with clear images, easy-to-use parameter settings, and instruction disk for programming samples and function keys explanation



► Independent Control Unit

With the independent control unit, users can set up simple motions of the servo drives for flexible operation and management



► Multi-Axis Motion Control Modes

Offers a variety of sample programs and control modes (e.g. Linear 2, Linear 3, Heli, Circle, Circle 2 and Circle 3) for linear, arc and helical interpolation to supervise various multi-axis motions and execute programming for multi-axis motion control applications

► Real-time Response and Feedback

Monitoring and displaying the status of the connected servo drives is completed in a timely and efficient manner

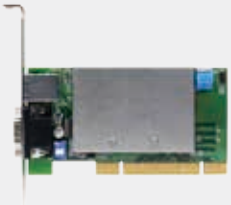
EtherCAT System Configuration

Motion Controllers

EtherCAT Motion Control Card

PAGE 31~40

PCIe-L221-B1D0



PCI-L221-P1D0

PCI-L221-F1D0

PCI-L221-B1D0

Servo Systems

AC Servo Drive

ASDA-A3-E

ASDA-A2-E

ASDA-B3-E

** Please refer to the catalogues of Delta's servo drives and motors ASDA Series for detailed specifications

Gateway Type Remote Modules

PAGE 51

Gateway Type E-Bus Remote Power Coupler

R1-EC5500D0

Pulse Remote Module

PAGE 52

1-Channel Pulse Remote Module

R1-EC5621D0

Digital Remote Modules

16 Digital Input Remote Module

R1-EC6002D0
R1-EC6022D0

16 Digital Output Remote Module

R1-EC7062D0
R1-EC70A2D0
R1-EC70E2D0
R1-EC70F2D0

Digital Input/Output Remote Module

R2-EC0902D0

PAGE 53~55

Analog Remote Modules

PAGE 56~57

4-Channel Analog Output Remote Module

R1-EC8124D0

4-Channel Analog Output Remote Module

R1-EC9144D0

Functional Remote Modules

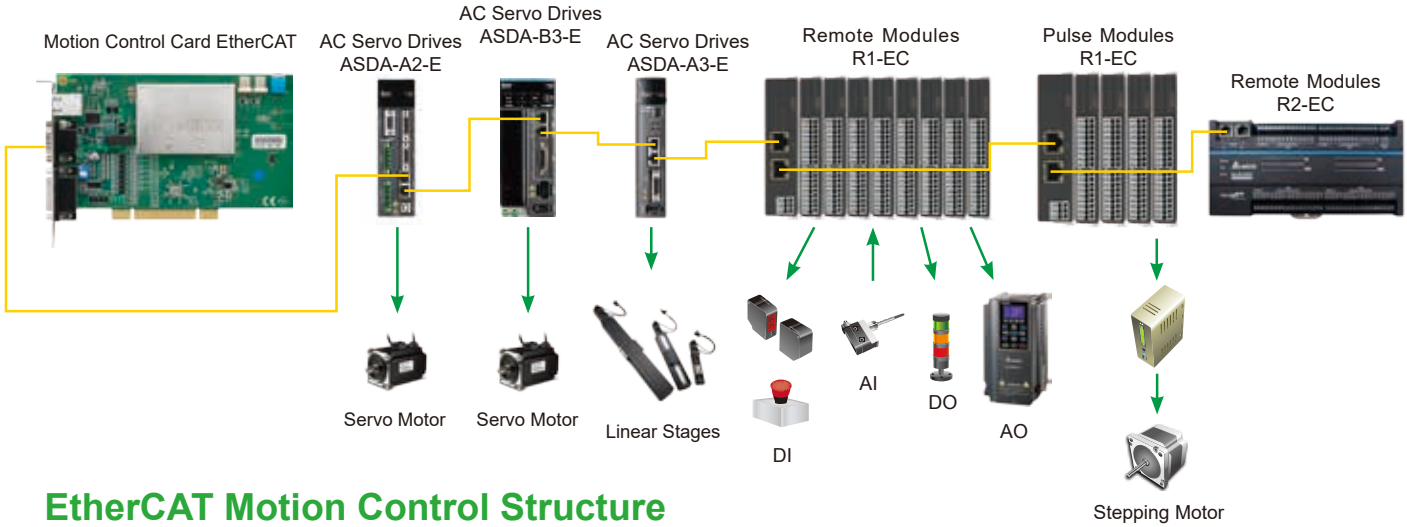
PAGE 58

For Manual Pulse Generator (MPG)

R1-EC5614D0

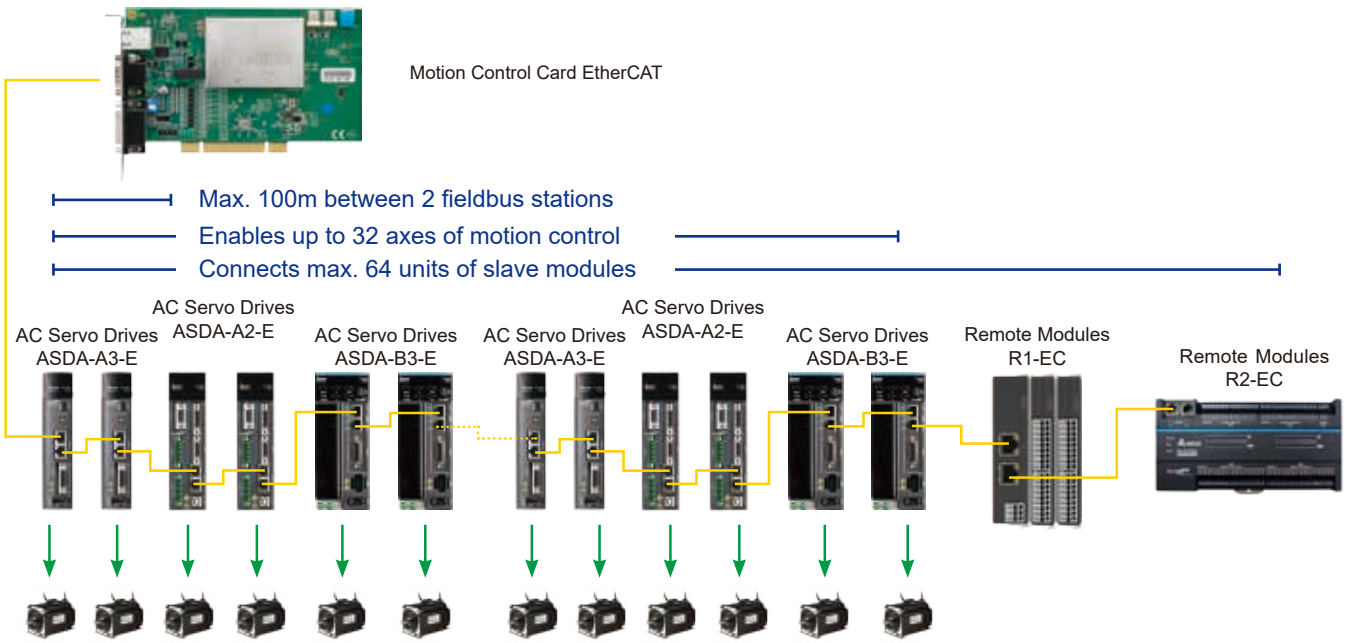
High-Speed Motion Control System - EtherCAT Product Features

Ethernet Central Automation Technology (EtherCAT) is an open Ethernet-based fieldbus system that provides high-efficiency and high-performance synchronization quality for automation control. With EtherCAT, Delta's EtherCAT motion control card PCI-L221-P1 achieves rapid and real-time multiple axes of motion control, and is capable of controlling up to 100 slave stations that enable a 64-axis motion control within 1ms cycle time. It also provides 35 homing modes, point-to-point position control, 2-axis interpolation, 3-axis interpolation, multi-axis synchronization, continuous motion, gantry control, speed control, torque control and more. In addition, the IEC61131 is one of the optional functions for programming flexibility and scalability.



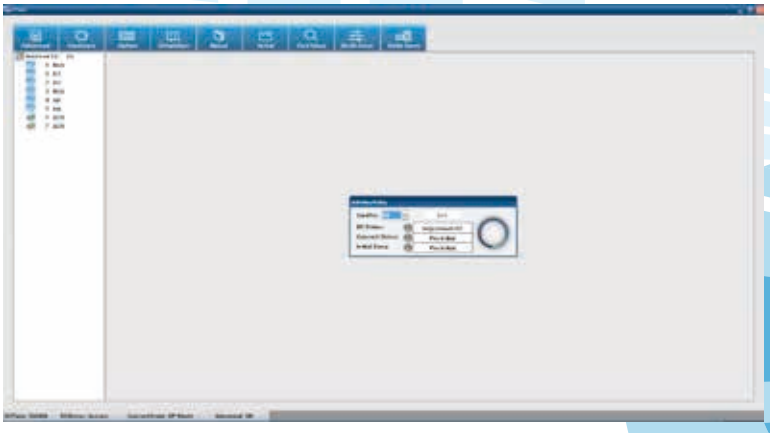
EtherCAT Motion Control Structure

Delta provides a high-speed motion control card PCI-L221-XXD0 with complete functions for EtherCAT masters. Supporting device descriptions in XML format (EtherCAT Slave Information - ESI), the PCI-L221-XXD0 also allows the system to quickly identify ESI files and offers the capability of real-time connection via EtherCAT for high level integration. It can adjust the communication cycle time between stations within 1ms ~ 0.5 ms according to customer needs.



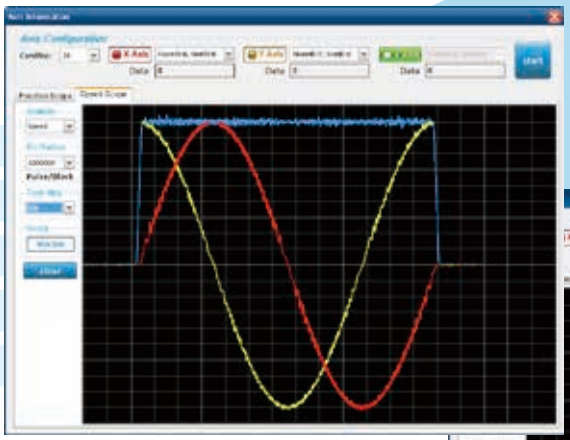
Fieldbus Verification and Validation - EcNavi Software

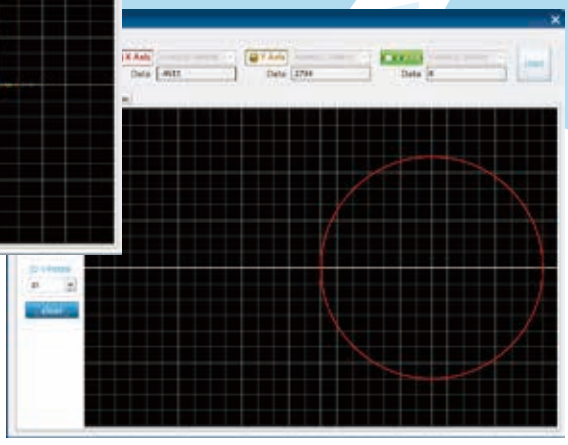
EcNavi development software is for configuring an EtherCAT network that includes an EtherCAT master controller and slave devices for data communication, functional identification, programming and debugging. For new users of Delta's EtherCAT motion control, the EcNavi helps them become familiar with the configuration of the system and to complete the function verification and validation in real time.



► Hardware Structure Search

Provides a search function for all slaves connected by EtherCAT to check hardware configuration and verify whether network communication is established successfully via software





► Speed Curve Tracing

Offers real-time tracing for speed curves of current motion commands to achieve better synchronization effects between multiple axes

► Independent Control Unit

Helps users avoid writing complex programs and immediately verifies all motion commands with the servo drives to meet application requirements

► Multi-Axis Motion Control Mode

Offers a variety of sample programs and control modes for EtherCAT devices (e.g. Linear 2, Linear 3, Heli, Circle, Circle 2 and Circle 3) to help users easily edit and complete development programs for multi-axis motion control applications

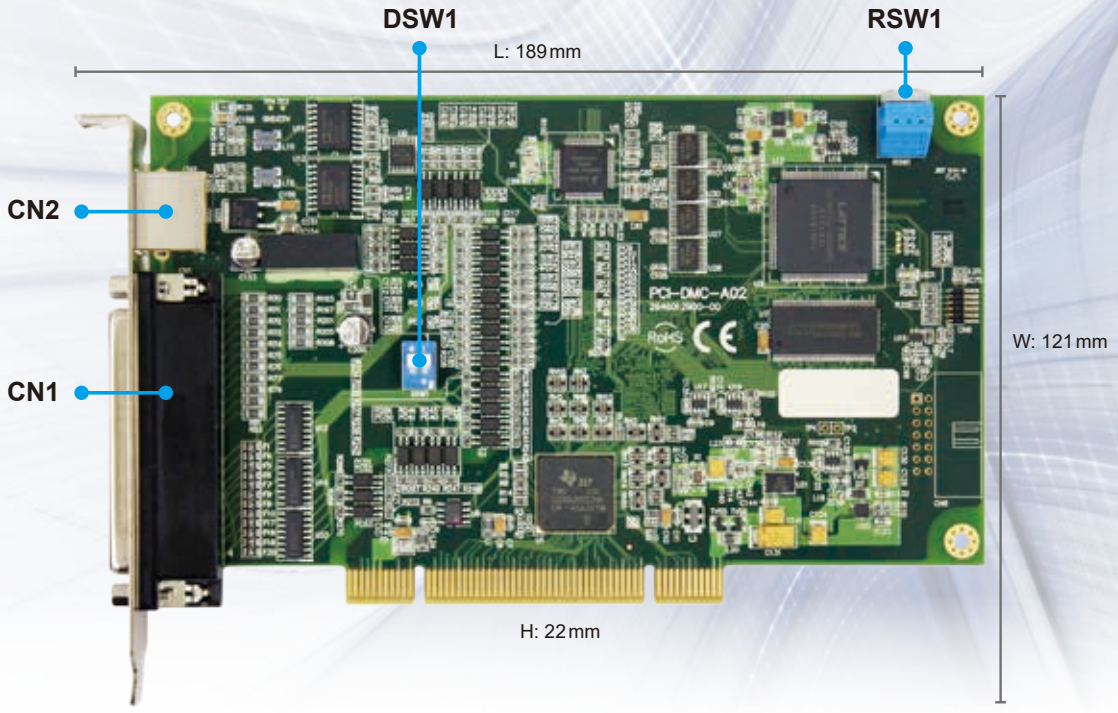
DMCNET Motion Control Card

- **Standard Type PCI-DMC-A02**

Specifications

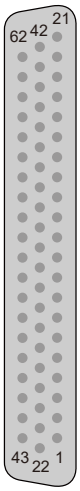
Model Name	PCI-DMC-A02
Supporting Module	Delta Servo Drive ASDA-A3-F / ASDA-A2-F / ASDA-B3-F / ASDA-B2-F Series
Homing Mode	35 types (Parameter Setting via DMCNET)
Velocity Profiles	T-curve, S-curve
Interpolation Mode	Linear, Arc, Helical and Continuous
Ring	1 Ring
Supporting Languages	VB, VC, BCB, Delphi, C#, VB.NET, Labview
Communication Cable	Category 5e STP Ethernet Cable (24AWG / 4Pairs)
Communication Distance	Max. 30 m (12 slave modules)
Communication Interface	Half duplex RS-485 with transformer isolation
PCI Specifications	ver.2.2, supports 32-bit, 3.3 V / 5 V_{DC} operation
Power Consumption	+5V DC at 1A typical
Environment	Operating Temperature: 0 °C ~ 50 °C ; Storage Temperature: -20 °C ~ 70 °C Humidity: 5 ~ 95% (non-condensing)
Maximum Axes	12
Maximum Number of Modules	12
Digital Input	32-CH isolated, SINK/SOURCE type, 24 V_{DC} (5mA / CH)
Digital Output	24-CH isolated, SINK type, 24 V_{DC} (100 mA / CH)
Noise Tolerance	Withstand (Peak) voltage: 1500V_{AC} (Primary-secondary); 1500V_{AC} (Primary-PE) ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV, Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 26 MHz ~ 1 GHz, 10 V/m

Exterior of the Motion Control Card



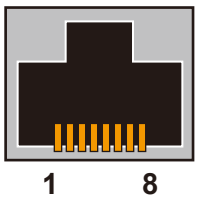
Title	Function
CN1	Digital Input / Output Connector
CN2	DMCNET Expansion Module Connection Port
RSW1	Card ID Number Configuration Switch
DSW1	Input / Output Signal SINK / SOURCE Device Switch

CN1: Digital Input / Output Connector



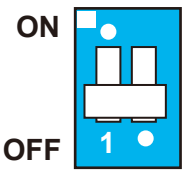
PIN	Description	PIN	Description	PIN	Description
1	IO Output Signal 7	22	IO Output Signal 16	43	IO Output Signal 23
2	IO Output Signal 6	23	IO Output Signal 15	44	IO Output Signal 22
3	IO Output Signal 5	24	IO Output Signal 14	45	IO Output Signal 21
4	IO Output Signal 4	25	IO Output Signal 13	46	IO Output Signal 20
5	IO Output Signal 3	26	IO Output Signal 12	47	IO Output Signal 19
6	IO Output Signal 2	27	IO Output Signal 11	48	IO Output Signal 18
7	IO Output Signal 1	28	IO Output Signal 10	49	IO Output Signal 17
8	IO Output Signal 0	29	IO Output Signal 9	50	$24V_{DC}$ Power
9	GND Signal	30	IO Output Signal 8	51	EGND Signal
10	GND Signal	31	GND Signal	52	IO Input Signal 31
11	IO Input Signal 10	32	GND Signal	53	IO Input Signal 30
12	IO Input Signal 9	33	IO Input Signal 20	54	IO Input Signal 29
13	IO Input Signal 8	34	IO Input Signal 19	55	IO Input Signal 28
14	IO Input Signal 7	35	IO Input Signal 18	56	IO Input Signal 27
15	IO Input Signal 6	36	IO Input Signal 17	57	IO Input Signal 26
16	IO Input Signal 5	37	IO Input Signal 16	58	IO Input Signal 25
17	IO Input Signal 4	38	IO Input Signal 15	59	IO Input Signal 24
18	IO Input Signal 3	39	IO Input Signal 14	60	IO Input Signal 23
19	IO Input Signal 2	40	IO Input Signal 13	61	IO Input Signal 22
20	IO Input Signal 1	41	IO Input Signal 12	62	IO Input Signal 21
21	IO Input Signal 0	42	IO Input Signal 11		

CN2: DMCNET Expansion Module Connection Port



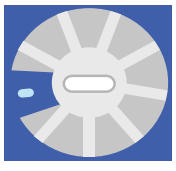
PIN	Label	Description
1	RS485T_1 (+)	1st RS485 Transmission Signal (+)
2	RS485T_1 (-)	1st RS485 Transmission Signal (-)
3	RS485T_2 (+)	2nd RS485 Transmission Signal (+)
6	RS485T_2 (-)	2nd RS485 Transmission Signal (-)
7	EGND	9V Ground Signal
8	EGND	9V Ground Signal

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (connects to PNP device)
OFF	SINK (connects to NPN device)

RSW1: Dial for Setting the Card ID Number



The number is set based on the value of the dial (between 0 ~ 15)

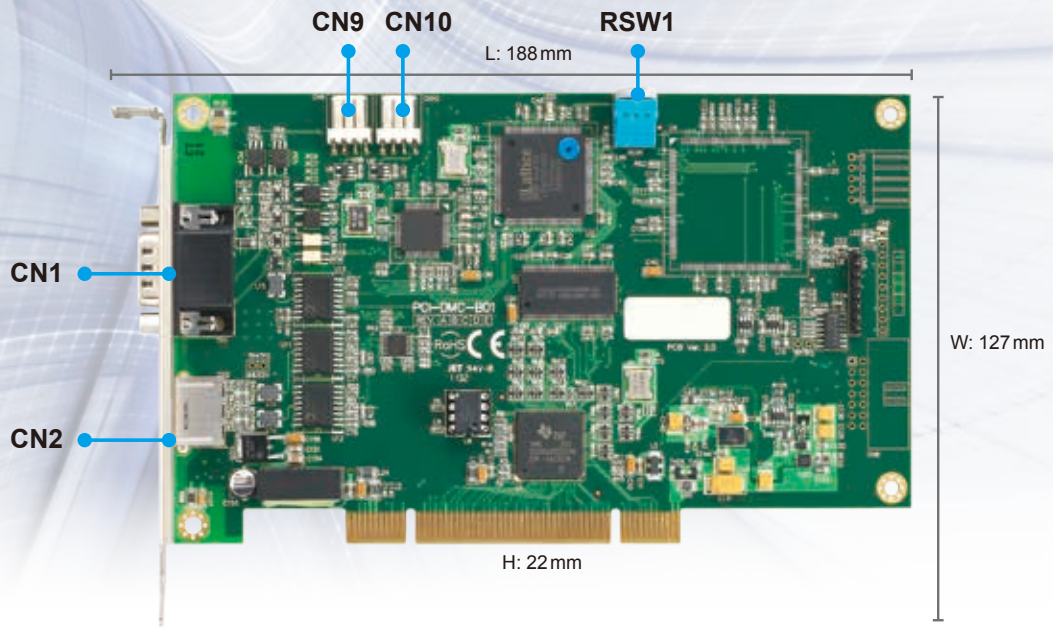
DMCNET Motion Control Card

• Advanced Type PCI-DMC-B01

Specifications

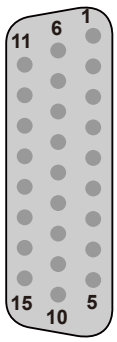
Model Name	PCI-DMC-B01
Supporting Module	Delta Servo Drive ASDA-A3-F / ASDA-A2-F / ASDA-B3-F / ASDA-B2-F Series
Homing Mode	35 types (Parameter Setting via DMCNET)
Velocity Profiles	T-curve, S-curve
Interpolation Mode	Linear, Arc, Helical and Continuous
Ring	1 Ring
Supporting Languages	VB, VC, BCB, Delphi, C#, VB.NET, Labview
Communication Cable	Category 5e STP Ethernet Cable (24 AWG / 4 Pairs)
Communication Distance	Max. 30 m (12 slave modules)
Communication Interface	Half duplex RS-485 with transformer isolation
PCI Specifications	ver.2.2, supports 32-bit, 3.3 V / 5 V_{DC} operation
Power Consumption	+5 V_{DC} at 0.5 A typical
Environment	Operating Temperature: 0 °C ~ 50 °C; Storage Temperature: -20 °C ~ 70 °C Humidity: 5 ~ 95% (Non-condensing)
Maximum Axes	12
Maximum Number of Modules	12
Digital Input	1-CH isolated, SINK/SOURCE type, 24VDC (5mA/CH)
Digital Output	1-CH isolated, SINK type, 24 V_{DC} (100mA/CH)
Encoder Input	2-CH isolated, EA± / EB±
Compare Signal Output	2-CH single-ended high speed compare, CMP, Max: 200K 2-CH differential table compare, CMP±, Max: 3.6K
Noise Tolerance	Withstand (Peak) Voltage: 1500 V_{AC} (Primary-secondary); 1500 V_{AC} (Primary-PE) ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV, Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 26 MHz ~ 1 GHz, 10 V/m

Exterior of the Motion Control Card



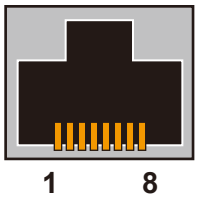
Title	Function
CN1	Connector (digital input/output, encoder & compare)
CN2	DMCNET Expansion Module Connection Port
CN9	Position compare signal output (channel 1, 3.3V)
CN10	Position compare signal output (channel 1, 3.3V)
RSW1	Card ID Number Configuration Switch

CN1: Digital Input / Output



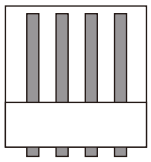
PIN	Label	Description	PIN	Label	Description
1	QA_1-	QA Signal 1 (-)	9	QB_2+	QB Signal 2 (+)
2	QB_1-	QB Signal 1 (-)	10	IO IN	IO Input Signal
3	QA_2-	QA Signal 2 (-)	11	CMP_1+(RS-422)	1st RS422 Differential Signal (+)
4	QB_2-	QB Signal 2 (-)	12	CMP_1- (RS-422)	1st RS422 Differential Signal (-)
5	External GND	GND Signal	13	CMP_2+(RS-422)	2nd RS422 Differential Signal (+)
6	QA_1+	QA Signal 1 (+)	14	CMP_2- (RS-422)	2nd RS422 Differential Signal (-)
7	QB_1+	QB Signal 1 (+)	15	IO OUT	IO Output signal
8	QA_2+	QA Signal 2 (+)			

CN2: DMCNET Expansion Module Connection Port



PIN	Label	Description
1	RS485T_1 (+)	1st RS485 transmission signal (+)
2	RS485T_1 (-)	1st RS485 transmission signal (-)
3	RS485T_2 (+)	2nd RS485 transmission signal (+)
6	RS485T_2 (-)	2nd RS485 transmission signal (-)
7	EGND	9V Ground Signal
8	EGND	9V Ground Signal

CN9: 3.3V Compare Output 1



PIN	Label	Description
1	CMP_OUT1(QEP1)	CMOS 3.3V to level comparison trigger signal output
2	GND	GND Signal
3	CMP_1+(LVDS)	LVDS Differential Signal (+)
6	CMP_1- (LVDS)	LVDS Differential Signal (-)

CN10: 3.3V Compare Output 2

PIN	Label	Description
1	CMP_OUT2(QEP2)	CMOS 3.3V to level comparison trigger signal output
2	GND	GND Signal
3	CMP_2+(LVDS)	LVDS Differential Signal (+)
6	CMP_2- (LVDS)	LVDS Differential Signal (-)

RSW1: Dial for Setting the Card ID Number

The number is set based on the value of the dial (between 0 ~ 15)

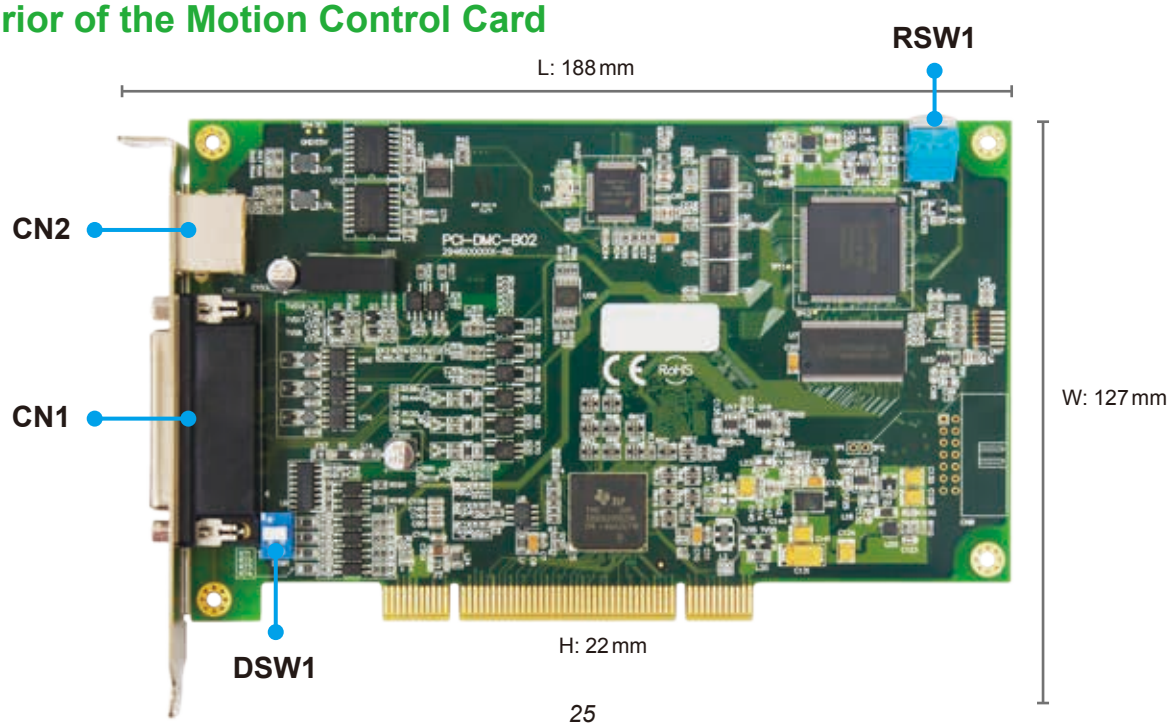
DMCNET Motion Control Card

• Advanced Type PCI-DMC-B02

Specifications

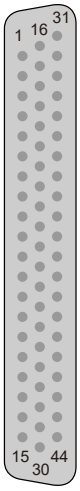
Model Name	PCI-DMC-B02
Supporting Module	Delta Servo Drive ASDA-A3-F / ASDA-A2-F / ASDA-B3-F / ASDA-B2-F Series
Homing Module	35 types (Parameter setting via DMCNET)
Velocity Profiles	T-curve, S-curve
Interpolation Mode	Linear, Arc, Helical and Continuous
Ring	1 Ring
Supporting Languages	VB, VC, BCB, Delphi, C#, VB.NET, Labview
Communication Cable	Category 5e STP Ethernet Cable (24 AWG / 4 Pairs)
Communication Distance	Max. 30m (12 slave modules)
Communication Interface	Half duplex RS-485 with transformer isolation
PCI Specifications	ver. 2.2; supports 32-bit, 3.3V / 5VDC operation
Power Consumption	+5 V_{DC} at 1A typical
Environment	Operating Temperature: 0°C ~ 50°C ; Storage Temperature: -20°C ~ 70°C
	Humidity: 5 ~ 95% RH(Non-condensing)
Maximum Axes	12
Maximum Number of Modules	12
Digital Input	8-CH isolated, SINK/SOURCE type, 24 V_{DC} (5mA/CH)
Digital Output	4-CH isolated, SINK, 24 V_{DC} (100mA/CH)
Encoder Input	3-CH isolated, EA± / EB±
Compare Signal Output	4-CH single-ended high-speed compare, CMP, Max: 40K 6-CH differential table compare, CMP±, Max: 40K
Noise Tolerance	Withstand (Peak) Voltage: 1500 V_{AC} (Primary-seconary); 1500 V_{AC} (Primary-PE) ESD (IEC 61131-2, IEC61000-4-2): 8KV Air Discharge EST (IEC 61131-2, IEC61000-4-4): Power Line: 2KV, Communication I/O: 1KV RS (IEC 61131-2, IEC61000-4-3): 26MHz ~ 1GHz, 10V/m

Exterior of the Motion Control Card



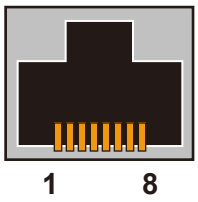
Title	Function
CN1	Connector (digital input/output, encoder & compare)
CN2	DMCNET Expansion Module Connection Port
RSW1	Card ID Number Configuration Switch
DSW1	Input / Output Signal SINK / SOURCE Device Switch

CN1: Digital Input / Output



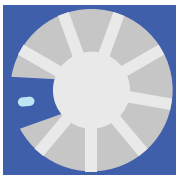
PIN	Description	PIN	Description	PIN	Description
1	QA_1-	16	QA_1+	0	IN_1
2	QB_1-	17	QB_1+	32	IN_2
3	QA_2-	18	QA_2+	33	IN_3
4	QB_2-	19	QB_2+	34	IN_4
5	QA_3-	20	QA_3+	35	IN_5
6	QB_3-	21	QB_3+	36	IN_6
7	CMP_1-	22	CMP_1+	37	IN_7
8	CMP_2-	23	CMP_2+	38	IN_8
9	CMP_3-	24	CMP_3+	39	OUT_1
10	CMP_4-	25	CMP_4+	40	OUT_2
11	CMP_5-	26	CMP_5+	41	OUT_3
12	CMP_6-	27	CMP_6+	42	OUT_4
13	CMP_7	28	CMP_8	43	E24V
14	CMP_9	29	CMP_10	44	E24V
15	EGND	30	EGND		

CN2: DMCNET Expansion Module Connection Port



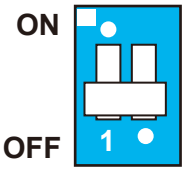
PIN	Label	Description
1	RS485T_1 (+)	1st RS485 Transmission Signal (+)
2	RS485T_1 (-)	1st RS485 Transmission Signal (-)
3	RS485T_2 (+)	2nd RS485 Transmission Signal (+)
6	RS485T_2 (-)	2nd RS485 Transmission Signal (-)
7	EGND	9V Ground Signal
8	EGND	9V Ground Signal

RSW1: Dial for Setting the Card ID Number



The number is set based on the value of the dial (between 0 ~ 15)

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (connects to PNP device)
OFF	SINK (connects to NPN device)

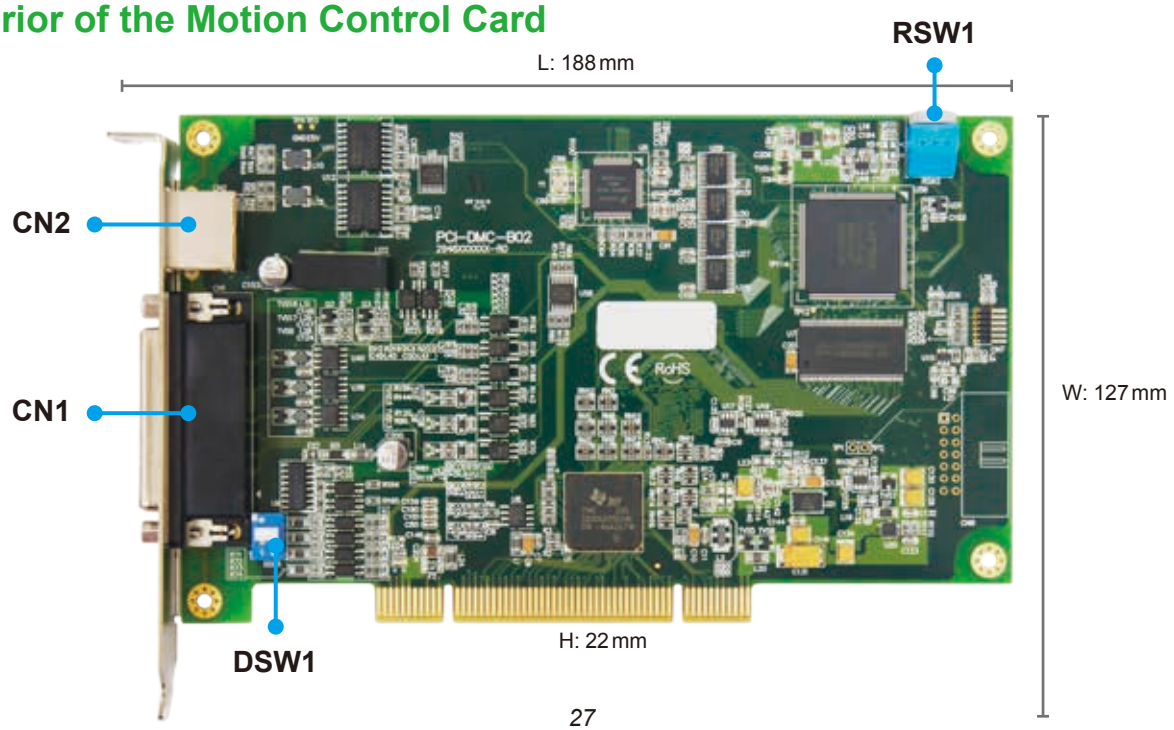
DMCNET Motion Control Card

- **Advanced Type PCI-DMC-B03**

Specifications

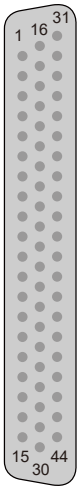
Model Name	PCI-DMC-B03
Supporting Module	Delta Servo Drive ASDA-A3-F / ASDA-A2-F / ASDA-B3-F / ASDA-B2-F Series
Homing Module	35 types (Parameter setting via DMCNET)
Velocity Profiles	T-curve, S-curve
Interpolation Mode	Linear, Arc, Helical and Continuous
Ring	1 Ring
Supporting Languages	VB, VC, BCB, Delphi, C#, VB.NET, Labview
Communication Cable	Category 5e STP Ethernet Cable (24 AWG / 4 Pairs)
Communication Distance	Max. 30m (12 slave modules)
Communication Interface	Half duplex RS-485 with transformer isolation
PCI Specifications	ver. 2.2; supports 32-bit, 3.3V / 5VDC operation
Power Consumption	+5 V_{DC} at 1A typical
Environment	Operating Temperature: 0 °C ~ 50 °C ; Storage Temperature: -20 °C ~ 70 °C
	Humidity: 5 ~ 95% RH (Non-condensing)
Maximum Axes	12
Maximum Number of Modules	12
Digital Input	8-CH isolated, SINK/SOURCE type, 24 V_{DC} (5mA/CH)
Digital Output	4-CH isolated, SINK, 24 V_{DC} (100mA/CH)
Encoder Input	3-CH isolated, EA± / EB±
Compare Signal Output	4-CH single-ended high-speed compare, CMP, Max: 100K 6-CH differential table compare, CMP±, Max: 3K
Noise Tolerance	Withstand (Peak) Voltage: 1500 V_{AC} (Primary-seconary); 1500 V_{AC} (Primary-PE) ESD (IEC 61131-2, IEC61000-4-2): 8 KV Air Discharge EST (IEC 61131-2, IEC61000-4-4): Power Line: 2 KV, Communication I/O: 1 KV RS (IEC 61131-2, IEC61000-4-3): 26 MHz ~ 1 GHz, 10 V/m

Exterior of the Motion Control Card



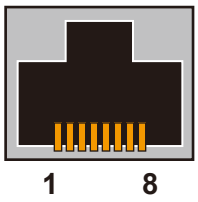
Title	Function
CN1	Connector (digital input/output, encoder & compare)
CN2	DMCNET Expansion Module Connection Port
RSW1	Card ID Number Configuration Switch
DSW1	Input / Output Signal SINK / SOURCE Device Switch

CN1: Digital Input / Output



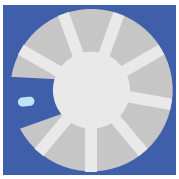
PIN	Description	PIN	Description	PIN	Description
1	QA_1-	16	QA_1+	0	IN_1
2	QB_1-	17	QB_1+	32	IN_2
3	QA_2-	18	QA_2+	33	IN_3
4	QB_2-	19	QB_2+	34	IN_4
5	QA_3-	20	QA_3+	35	IN_5
6	QB_3-	21	QB_3+	36	IN_6
7	CMP_1-	22	CMP_1+	37	IN_7
8	CMP_2-	23	CMP_2+	38	IN_8
9	CMP_3-	24	CMP_3+	39	OUT_1
10	CMP_4-	25	CMP_4+	40	OUT_2
11	CMP_5-	26	CMP_5+	41	OUT_3
12	CMP_6-	27	CMP_6+	42	OUT_4
13	CMP_7	28	CMP_8	43	E24V
14	CMP_9	29	CMP_10	44	E24V
15	EGND	30	EGND		

CN2: DMCNET Expansion Module Connection Port



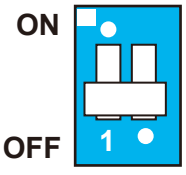
PIN	Label	Description
1	RS485T_1 (+)	1st RS485 Transmission Signal (+)
2	RS485T_1 (-)	1st RS485 Transmission Signal (-)
3	RS485T_2 (+)	2nd RS485 Transmission Signal (+)
6	RS485T_2 (-)	2nd RS485 Transmission Signal (-)
7	EGND	9V Ground Signal
8	EGND	9V Ground Signal

RSW1: Dial for Setting the Card ID Number



The number is set based on the value of the dial (between 0 ~ 15)

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (connects to PNP device)
OFF	SINK (connects to NPN device)

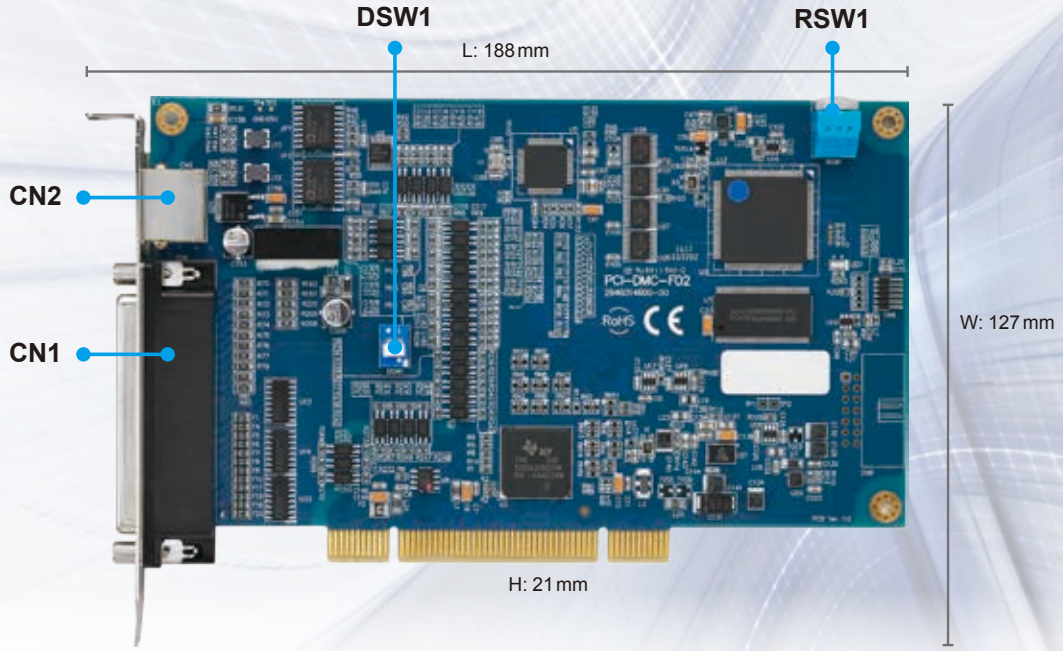
DMCNET Motion Control Card

- **Economical Type PCI-DMC-F02**

Specifications

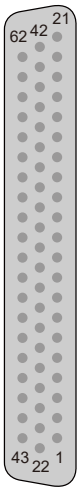
Model Name	PCI-DMC-F02
Supporting Module	Delta Servo Drive ASDA-A3-F / ASDA-A2-F / ASDA-B3-F / ASDA-B2-F Series
Homing Mode	35 types (Parameter Setting via DMCNET)
Velocity Profiles	T-curve, S-curve
Interpolation Mode	Linear, Arc, Helical and Continuous
Ring	1 Ring
Supporting Languages	VB, VC, BCB, Delphi, C#, VB.NET
Communication Cable	Category 5e STP Ethernet cable (24 AWG/4 Paris)
Communication Distance	Max. 30 m (12 slave modules)
Communication Interface	Half duplex RS-485 with transformer isolation
PCI Specifications	ver.2.2, supports 32-bit, 3.3 V / 5 V_{DC} operation
Power Consumption	+5 V_{DC} at 0.5A typical
Environment	Operating Temperature: 0 °C ~ 50 °C; Storage Temperature: -20 °C ~ 70 °C Humidity: 5 ~ 95% (Non-condensing)
Maximum Axes	6
Maximum Number of Modules	12
Digital Input	32-CH isolated, SINK/SOURCE type, 24 V_{DC} (5mA/CH)
Digital Output	24-CH isolated, SINK type, 24 V_{DC} (100mA/CH)
Noise Tolerance Threshold	Withstand (Peak) Voltage: 1500 V_{AC} (Primary-seconary); 1500 V_{AC} (Primary-PE) ESD (IEC 61131-2, IEC61000-4-2): 8 KV Air Discharge EST (IEC 61131-2, IEC61000-4-4): Power Line: 2 KV, Communication I/O: 1 KV RS (IEC 61131-2, IEC61000-4-3): 26 MHz ~ 1 GHz, 10 V/m

Exterior of the Motion Control Card



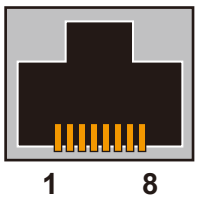
Title	Function
CN1	Digital Input / Output Connector
CN2	DMCNET Expansion Module Connection Port
RSW1	Card ID Number Configuration Switch
DSW1	Input / Output Signal SINK / SOURCE Device Switch

CN1: Digital Input / Output Connector



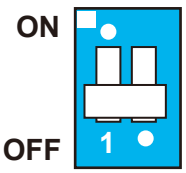
PIN	Description	PIN	Description	PIN	Description
1	IO Output Signal 7	22	IO Output Signal 16	43	IO Output Signal 23
2	IO Output Signal 6	23	IO Output Signal 15	44	IO Output Signal 22
3	IO Output Signal 5	24	IO Output Signal 14	45	IO Output Signal 21
4	IO Output Signal 4	25	IO Output Signal 13	46	IO Output Signal 20
5	IO Output Signal 3	26	IO Output Signal 12	47	IO Output Signal 19
6	IO Output Signal 2	27	IO Output Signal 11	48	IO Output Signal 18
7	IO Output Signal 1	28	IO Output Signal 10	49	IO Output Signal 17
8	IO Output Signal 0	29	IO Output Signal 9	50	$24V_{DC}$ Power
9	GND Signal	30	IO Output Signal 8	51	EGND Signal
10	GND Signal	31	GND Signal	52	IO Input Signal 31
11	IO Input Signal 10	32	GND Signal	53	IO Input Signal 30
12	IO Input Signal 9	33	IO Input Signal 20	54	IO Input Signal 29
13	IO Input Signal 8	34	IO Input Signal 19	55	IO Input Signal 28
14	IO Input Signal 7	35	IO Input Signal 18	56	IO Input Signal 27
15	IO Input Signal 6	36	IO Input Signal 17	57	IO Input Signal 26
16	IO Input Signal 5	37	IO Input Signal 16	58	IO Input Signal 25
17	IO Input Signal 4	38	IO Input Signal 15	59	IO Input Signal 24
18	IO Input Signal 3	39	IO Input Signal 14	60	IO Input Signal 23
19	IO Input Signal 2	40	IO Input Signal 13	61	IO Input Signal 22
20	IO Input Signal 1	41	IO Input Signal 12	62	IO Input Signal 21
21	IO Input Signal 0	42	IO Input Signal 11		

CN2: DMCNET Expansion Module Connection Port



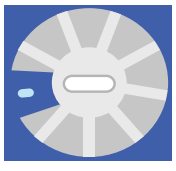
PIN	Label	Description
1	RS485T_1 (+)	1st RS485 Transmission Signal (+)
2	RS485T_1 (-)	1st RS485 Transmission Signal (-)
3	RS485T_2 (+)	2nd RS485 Transmission Signal (+)
6	RS485T_2 (-)	2nd RS485 Transmission Signal (-)
7	EGND	9V Ground Signal
8	EGND	9V Ground Signal

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (connects to PNP device)
OFF	SINK (connects to NPN device)

RSW1: Dial for Setting the Card ID Number



The number is set based on the value of the dial (between 0 ~ 15)

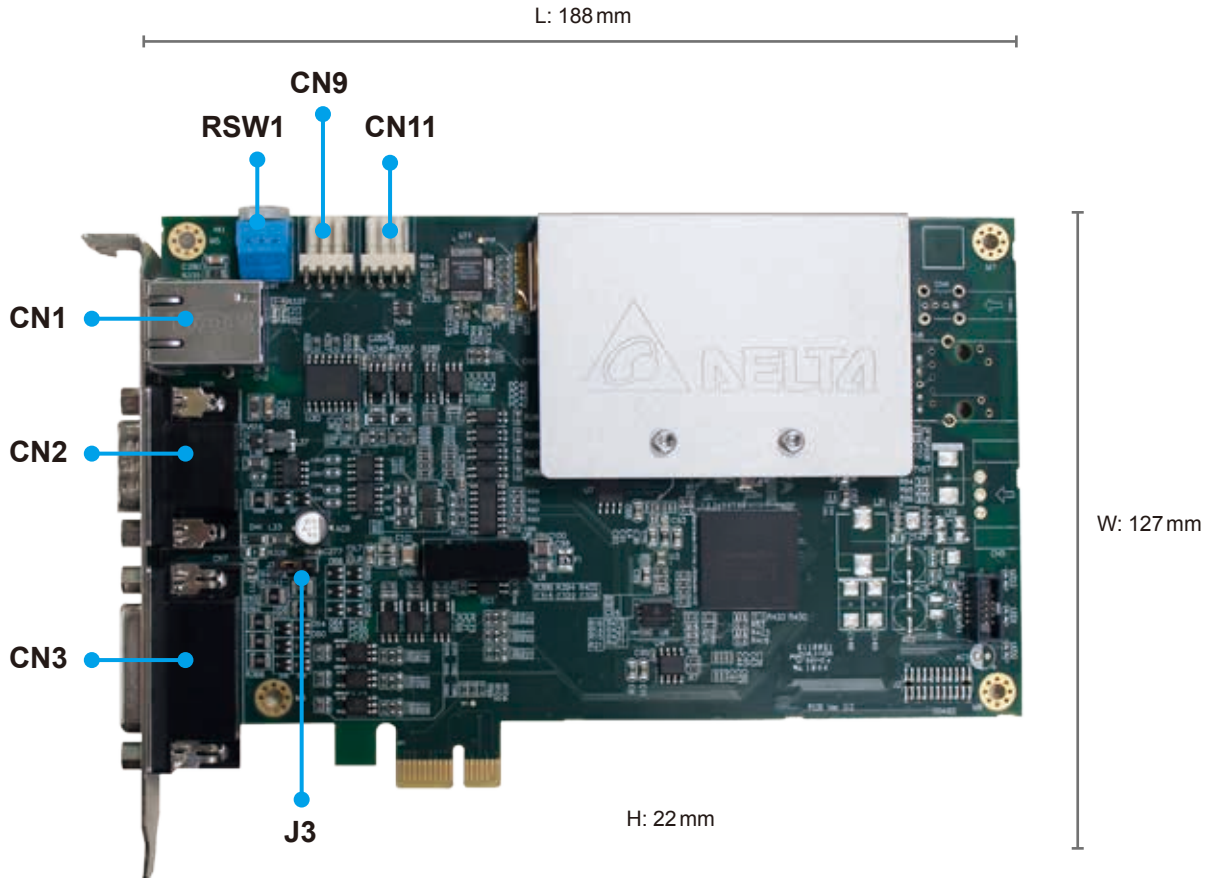
EtherCAT Motion Control Card

- **Advanced Type PCIe-L221-B1D0**

Specifications

Model Name	PCIe-L221-B1D0
Ring	1 Ring
Communication Interface	RJ-45
Communication Cable	CAT-5e
Communication Speed	100Mbps
Communication Distance	Max. 100m
Communication Hose and Slave Module	Max. 64
Motion Control Capability	Max. 32-axis synchronously
Digital Input	13-CH isolated, SINK/SOURCE type, 24V_{DC} (5mA/CH)
Digital Output	13-CH isolated, SINK, 24V_{DC} (100mA/CH)
Encoder Output	2-CH isolated, EA± / EB±
Compare Output	2-CH isolated, CMP±
Technical Indicators	PCI Spec. 2.2; supports 32-bit, 3.3/5V_{DC} operation
Power Consumption	+5V_{DC} at 1A typical
Operation Temperature	0°C ~ 50°C

Exterior of the Motion Control Card

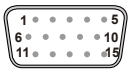


Title	Function	Title	Function
CN1	EtherCAT Expansion Module Connector	CN11	3.3V Compare Output (Channel 2 MOS)
CN2	Encoder & Compare Connector	RSW1	Card ID Number Setting Dial
CN3	Output / Input Signal Connector	J3	SINK / SOURCE Loop Switch
CN9	3.3V Compare Output (Channel 1 MOS)		

CN1: EtherCAT Expansion Module Connector

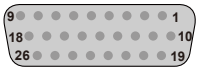
PIN	Label	Description
1	TX+	Transmitted Data +
2	TX-	Transmitted Data -
3	RX+	Received Data +
6	RX-	Received Data -
LED (right)	GREEN	Link/Activity

CN2: Encoder & Compare Connector



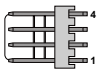
PIN	Label	Description	PIN	Label	Description
1	QA_1-	1st QA Signal (-)	9	QB_2+	2nd QB Signal (+)
2	QB_1-	1st QB Signal (-)	10	IO IN	IO Differential Signal
3	QA_2-	2nd QA Signal (-)	11	CMP_1+(RS-422)	1st RS422 Differential Signal (+)
4	QB_2-	2nd QB Signal (-)	12	CMP_1- (RS-422)	1st RS422 Differential Signal (-)
5	External GND	GND Signal	13	CMP_2+(RS-422)	2nd RS422 Differential Signal (+)
6	QA_1+	1st QA Signal (+)	14	CMP_2- (RS-422)	2nd RS422 Differential Signal (-)
7	QB_1+	1st QB Signal (+)	15	IO OUT	IO Output Signal
8	QA_2+	2nd QA Signal (+)			

CN3: Digital Input / Output Connector



PIN	Label	Description	PIN	Label	Description
1	IO IN 0	IO Input Signal	14	IO OUT 4	IO Output Signal
2	IO IN 1	IO Input Signal	15	IO OUT 5	IO Output Signal
3	IO IN 2	IO Input Signal	16	IO OUT 6	IO Output Signal
4	IO IN 3	IO Input Signal	17	IO OUT 7	IO Output Signal
5	IO IN 4	IO Input Signal	18	External GND	GND Signal
6	IO IN 5	IO Input Signal	19	IO IN 8	IO Input Signal
7	IO IN 6	IO Input Signal	20	IO IN 9	IO Input Signal
8	IO IN 7	IO Input Signal	21	IO IN 10	IO Input Signal
9	External GND	GND Signal	22	IO IN 11	IO Input Signal
10	IO OUT 0	IO Output Signal	23	IO OUT 8	IO Output Signal
11	IO OUT 1	IO Output Signal	24	IO OUT 9	IO Output Signal
12	IO OUT 2	IO Output Signal	25	IO OUT 10	IO Output Signal
13	IO OUT 3	IO Output Signal	26	IO OUT 11	IO Output Signal

CN9：3.3V Compare Output 1



PIN	Label	Description
1	CMP_OUT1(QEP1)	CMOS 3.3V Position Compare Signal Output
2	GND	GND Signal
3	CMP_+(LVDS)	LVDS Differential Signal (+)
4	CMP_1- (LVDS)	LVDS Differential Signal (-)

CN11：3.3V Compare Output 2

PIN	Label	Description
1	CMP_OUT2(QEP2)	CMOS 3.3V Position Compare Signal Output
2	GND	GNDSignal
3	CMP_2+(LVDS)	LVDS Differential Signal (+)
4	CMP_2- (LVDS)	LVDS Differential Signal (-)

J3：SINK / SOURCE Loop Switch

Label	Description
1	I24V (Internal 24V Voltage Connector)
2	ICOM (Common Input Signal Connector)
3	24V Grounding Signal

NPN mode: PIN1 & PIN2 short circuit (Default)
PNP mode: PIN2 & PIN3 short circuit

RSW1: Dial for Setting the Card ID Number

The number is set based on the value of the dial (between 0 ~ 15)

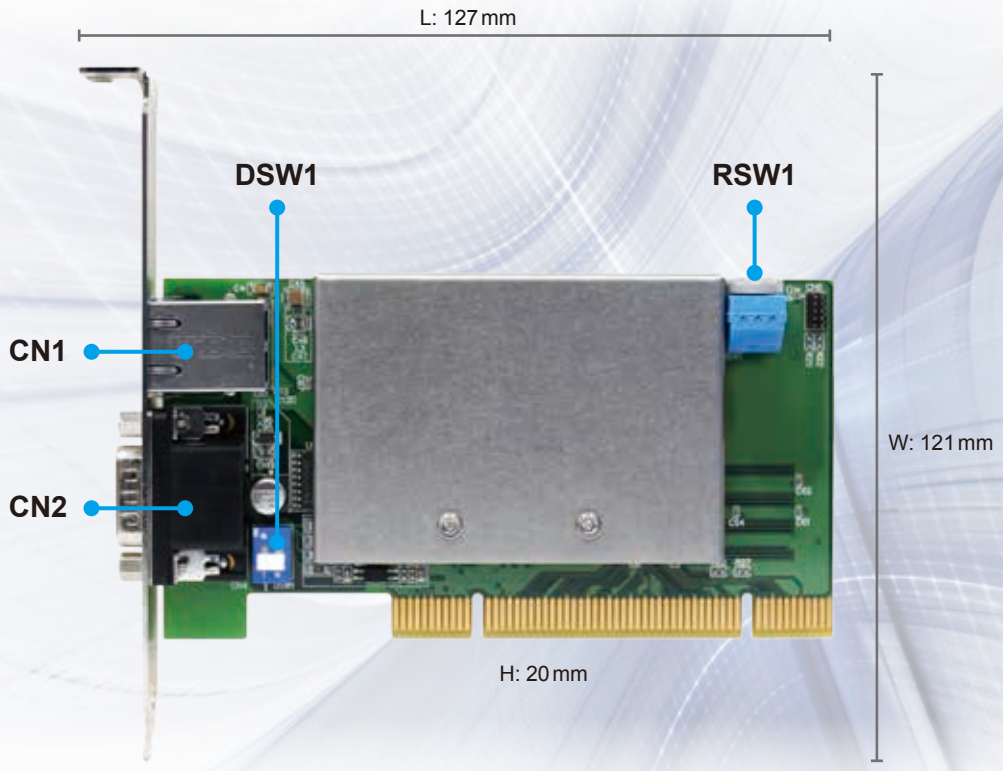
EtherCAT Motion Control Card

- **Standard Type PCI-L221-P1D0**

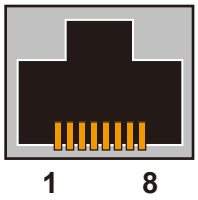
Specifications

Model Name	PCI-L221-P1D0
Ring	1 Ring
Communication	RJ-45
Communication Cable	CAT-5e
Communication Speed	100Mbps
Communication Distance	Max. 100m
Communication Host and Slave Module	Max. 64
Motion Control Capability	Max. 32-Axes Synchronously
Digital Input	8-CH isolated, SINK/SOURCE type, 24V_{DC} (5mA/CH)
Digital Output	4-CH isolated, SINK type, 24V_{DC} (100mA/CH)
Technical Indicators	PCI Spec. 2.2; supports 32-bit, 3.3/5V_{DC} operation
Power Consumption	+5 V_{DC} at 1A typical
Environment	0 °C ~ 50 °C

Exterior of the Motion Control Card

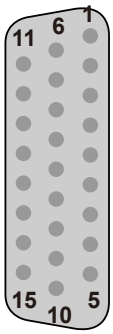


CN1: EtherCAT Connection Port



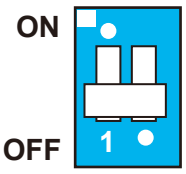
PIN	Label	Description
1	TX+	Transmission Signal (+)
2	TX-	Transmission Signal (-)
3	RX+	Transmission Signal (+)
6	RX-	Transmission Signal (-)

CN4: Digital Input / Output Connector



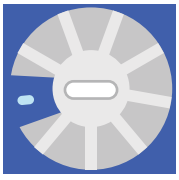
PIN	Label	Description	PIN	Label	Description
1	IO IN 0	IO Input Signal	9	IO IN 6	IO Input Signal
2	IO IN 1	IO Input Signal	10	IO IN 7	IO Input Signal
3	IO IN 2	IO Input Signal	11	External GND	GND Signal
4	IO IN 3	IO Input Signal	12	IO OUT 0	IO Output Signal
5	External GND	GND Signal	13	IO OUT 1	IO Output Signal
6	E24 V	24 V_{DC} Power	14	IO OUT 2	IO Output Signal
7	IO IN 4	IO Input Signal	15	IO OUT 3	IO Output Signal
8	IO IN 5	IO Input Signal			

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (Connects to PNP device)
OFF	SINK (Connects to NPN device)

RSW1: Dial for Setting the Card ID Number



The number is set based on the value of the dial (between 0 ~ 15)

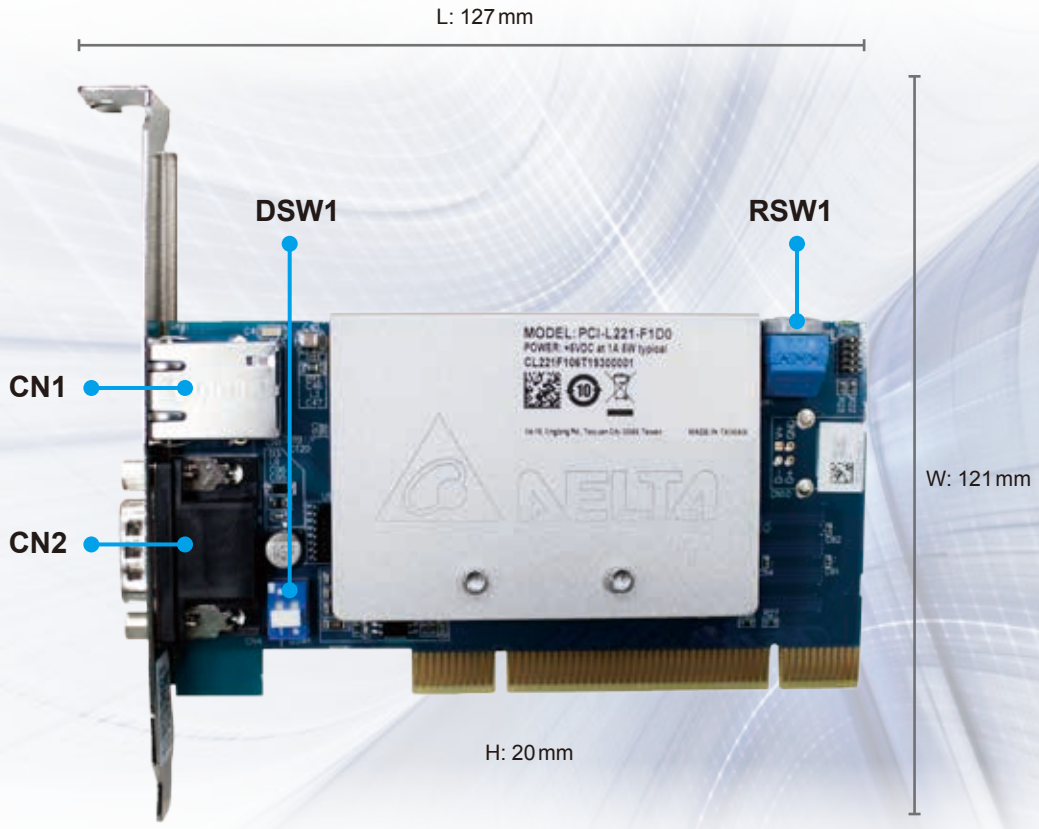
EtherCAT Economic Type Motion Control Card

- **Economic Type Motion Control Card PCI-L221-F1D0**

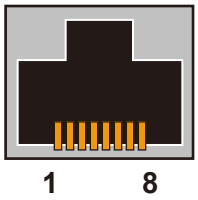
Specifications

Model Name	PCI-L221-P1D0
Ring	1 Ring
Communication	RJ-45
Communication Cable	CAT-5e
Communication Speed	100Mbps
Communication Distance	Max. 100m
Communication Host and Slave Module	Max. 64
Motion Control Capability	Max. 16-Axes Synchronously
Digital Input	8-CH isolated, SINK/SOURCE type, 24V_{DC} (5mA/CH)
Digital Output	4-CH isolated, SINK type, 24V_{DC} (100mA/CH)
Technical Indicators	PCI Spec. 2.2; supports 32-bit, 3.3/5V_{DC} operation
Power Consumption	+5V_{DC} at 1A typical
Environment	0 °C ~ 50 °C

Exterior of the Motion Control Card

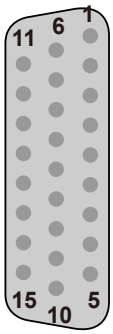


CN1: EtherCAT Connection Port



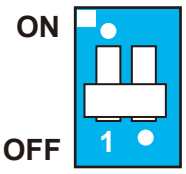
PIN	Label	Description
1	TX+	Transmission Signal (+)
2	TX-	Transmission Signal (-)
3	RX+	Transmission Signal (+)
6	RX-	Transmission Signal (-)

CN4: Digital Input / Output Connector



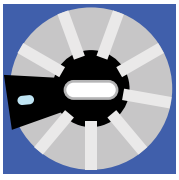
PIN	Label	Description	PIN	Label	Description
1	IO IN 0	IO Input Signal	9	IO IN 6	IO Input Signal
2	IO IN 1	IO Input Signal	10	IO IN 7	IO Input Signal
3	IO IN 2	IO Input Signal	11	External GND	GND Signal
4	IO IN 3	IO Input Signal	12	IO OUT 0	IO Output Signal
5	External GND	GND Signal	13	IO OUT 1	IO Output Signal
6	E24 V	24 V_{DC} Power	14	IO OUT 2	IO Output Signal
7	IO IN 4	IO Input Signal	15	IO OUT 3	IO Output Signal
8	IO IN 5	IO Input Signal			

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (Connects to PNP device)
OFF	SINK (Connects to NPN device)

RSW1: Dial for Setting the Card ID Number



The number is set based on the value of the dial (between 0 ~ 15)

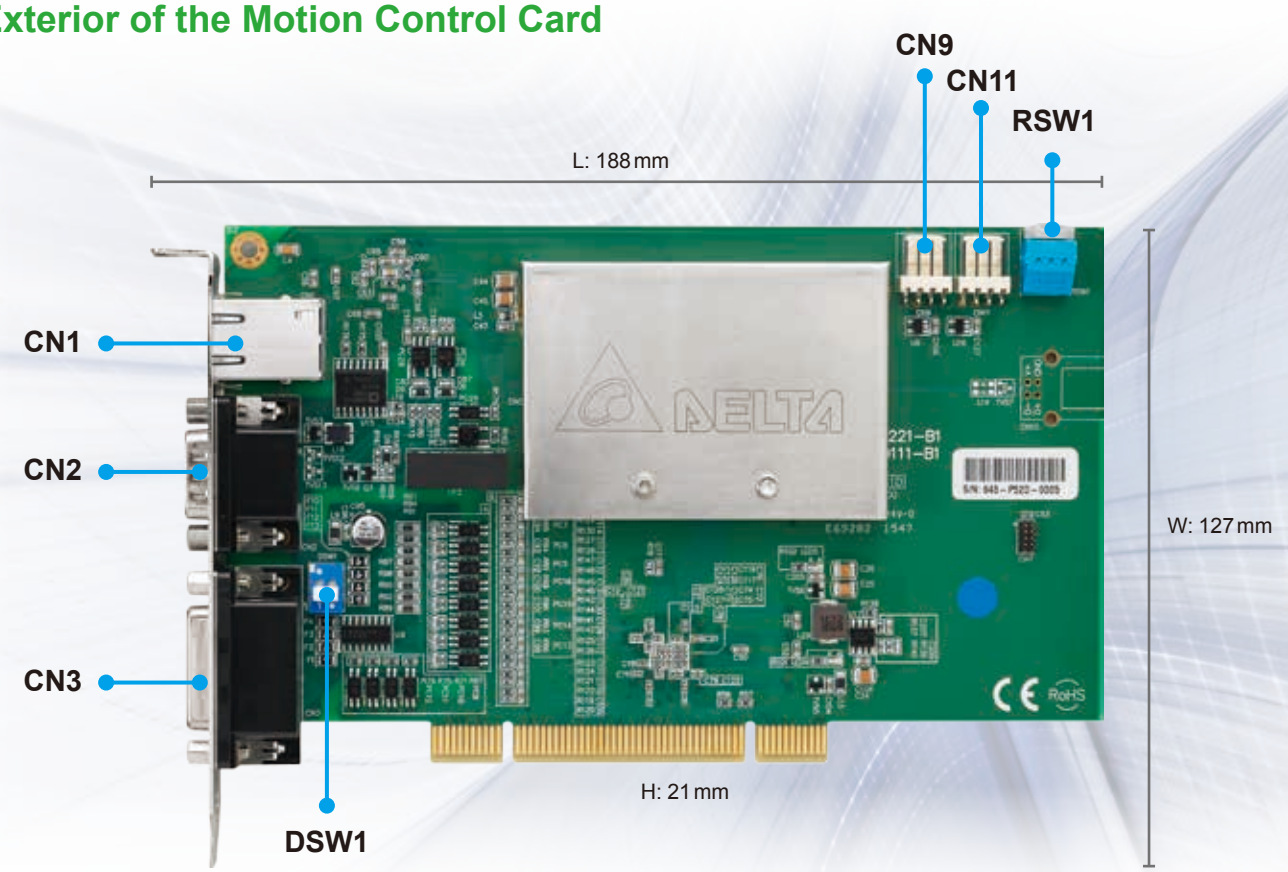
EtherCAT Motion Control Card

- **Advanced Type PCI-L221-B1D0**

Specifications

Model Name	PCI-L221-B1D0
Ring	1 Ring
Communication	RJ-45
Communication Cable	CAT-5e
Communication Speed	100Mbps
Communication Distance	Max. 100m
Communication Host and Slave Module	Max. 64
Motion Control Capability	Max. 32-Axes Synchronously
Digital Input	8-CH isolated, SINK/SOURCE type, 24V_{DC} (5mA/CH)
Digital Output	4-CH isolated, SINK type, 24V_{DC} (100mA/CH)
Encoder Input	2-CH isolated, EA± / EB±
Encoder Output	2-CH isolated, CMP±
Technical Indicators	PCI Spec. 2.2; supports 32-bit, 3.3/5V_{DC} operation
Power Consumption	+5V_{DC} at 1A typical
Environment	0°C ~ 50°C

Exterior of the Motion Control Card

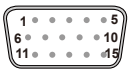


Title	Function	Title	Function
CN1	EtherCAT Expansion Module Connection Port	CN11	Position Compare Signal Output (Channel 2, 3.3V)
CN2	Encoder & Compare Connector	RSW1	Card ID Number Configuration Switch
CN3	Digital Input / Output Connector	DSW1	Input / Output Signal SINK / SOURCE Device Switch
CN9	Position Compare Signal Output (Channel 1, 3.3V)		

CN1: Expansion Module Connection Port

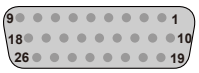
PIN	Label	Description
1	TX+	Transmitted Data +
2	TX-	Transmitted Data -
3	RX+	Received Data +
6	RX-	Received Data -
LED (right)	GREEN	Link/Activity

CNCN2: Encoder & Compare Connector



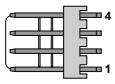
PIN	Label	Description	PIN	Label	Description
1	QA_1-	1st QA Signal (-)	9	QB_2+	2nd QB Signal (+)
2	QB_1-	1st QB Signal (-)	10	GPIO IN	GPIO Input Signal
3	QA_2-	2nd QA Signal (-)	11	CMP_1+(RS-422)	1st RS422 Differential Signal (+)
4	QB_2-	2nd QB Signal (-)	12	CMP_1- (RS-422)	1st RS422 Differential Signa (-)
5	External GND	GND Signal	13	CMP_2+(RS-422)	2nd RS422 Differential Signal (+)
6	QA_1+	1st QA Signal (+)	14	CMP_2- (RS-422)	2nd RS422 Differential Signal (-)
7	QB_1+	1st QB Signal (+)	15	IO OUT	IO Output Signal
8	QA_2+	2nd QA Signal (+)			

CN3: Digital Input / Output Connector



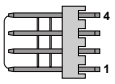
PIN	Label	Description	PIN	Label	Description
1	IO IN 0	IO Input Signal	14	IO OUT 4	IO Output Signal
2	IO IN 1	IO Input Signal	15	IO OUT 5	IO Output Signal
3	IO IN 2	IO Input Signal	16	IO OUT 6	IO Output Signal
4	IO IN 3	IO Input Signal	17	IO OUT 7	IO Output Signal
5	IO IN 4	IO Input Signal	18	External GND	GND Signal
6	IO IN 5	IO Input Signal	19	IO IN 8	IO Input Signal
7	IO IN 6	IO Input Signal	20	IO IN 9	IO Input Signal
8	IO IN 7	IO Input Signal	21	IO IN 10	IO Input Signal
9	External GND	GND Signal	22	IO IN 11	IO Input Signal
10	IO OUT 0	IO Output Signal	23	IO OUT 8	IO Output Signal
11	IO OUT 1	IO Output Signal	24	IO OUT 9	IO Output Signal
12	IO OUT 2	IO Output Signal	25	IO OUT 10	IO Output Signal
13	IO OUT 3	IO Output Signal	26	IO OUT 11	IO Output Signal

CN9: 3.3V Compare Output 1



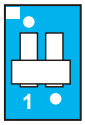
PIN	Label	Description
1	CMP_OUT1(QEP1)	Position Compare Signal Output (3.3V)
2	GND	GND Signal
3	CMP_+(LVDS)	LVDS Differential Signal (+)
4	CMP_1- (LVDS)	LVDS Differential Signal (-)

CN11: 3.3V Compare Output 2



PIN	Label	Description
1	CMP_OUT2(QEP2)	Position Compare Signal Output (3.3V)
2	GND	GND Signal
3	CMP_2+(LVDS)	LVDS Differential Signal (+)
4	CMP_2- (LVDS)	LVDS Differential Signal (-)

DSW1: SINK / SOURCE Loop Switch



Label	Description
ON	SOURCE (Connects to PNP device)
OFF	SINK (Connects to NPN device)

RSW1: Dial for Setting the Card ID Number

The number is set based on the value of the dial (between 0 ~ 15)

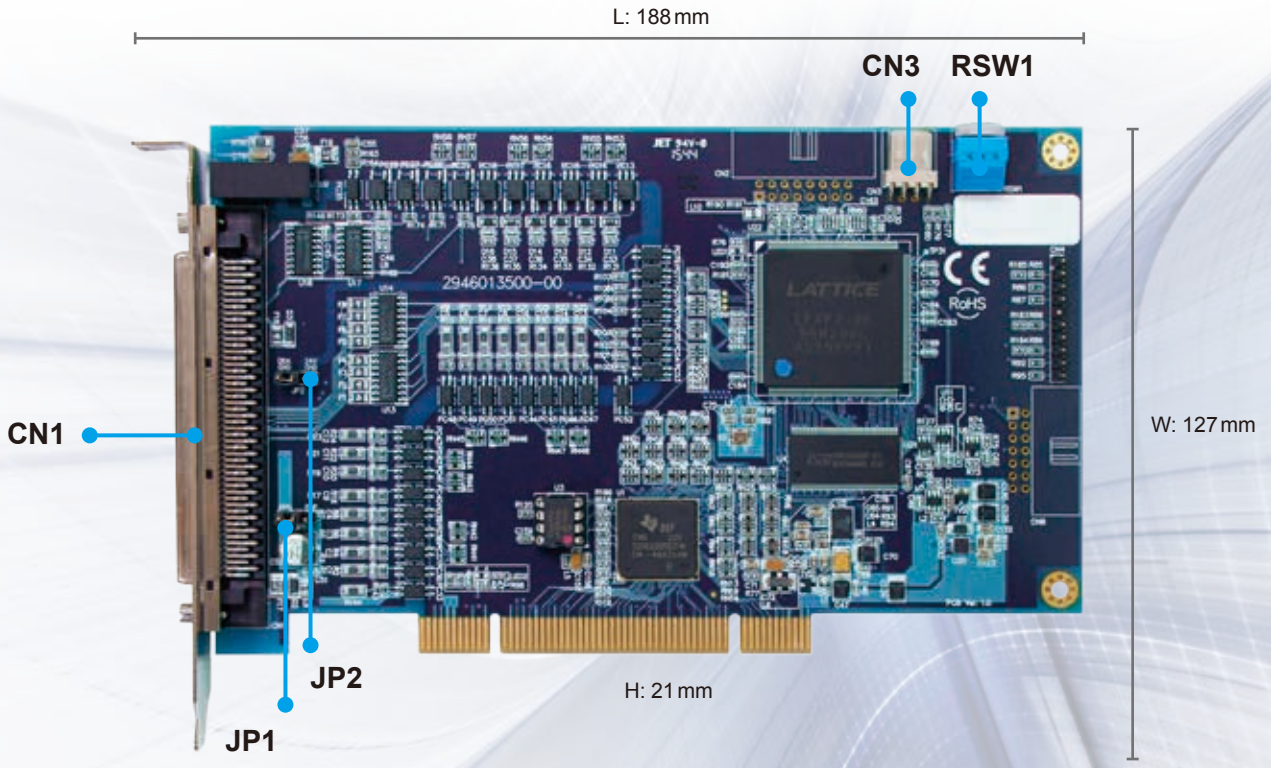
4-axis Pulse Motion Control Card

- **4-axis Pulse Type PCI-M324-F1D0**

Specifications

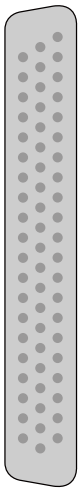
Model Name	PCI-M324-F1D0
Pulse Output Type	OUT/DIR, CW/CCW, AB phase
Pulse Output Speed	Max. 3.2Mpps
Range	32-bit (±2,147,483,648 pulses)
Homing Mode	35 types
Velocity Profile	T-curve, S-curve
Interpolation	Linear, circular, helix and continuous
Response Signal Counter	32-bit up/down x 4
Latch Output	LTC x 4
Compare Output	CMP x 2
Incremental Encoder Input	±EA x 4, ±EB x 4
Encoder Index Signal Input	±EZ x 4
Signal Input Connector	PEL x 4, MEL x 4, ORG x 4, SLD x 4
Servo Drive Input Connector	ALM x 4, SVON x 4, ALMC x 4, INP x 4, RDY x 4, ERC x 4
General Input Terminals	IN x 4
General Output Terminals	OUT x 4
Emergency Stop Input Terminals	EMG x 1
I/O PIN type	Optically isolated with 2.5KVrms on all pins
PCI Slot	PCI Spec. 2.2; supports 32-bit, 3.3/5V_{DC} operation
Power Consumption	+5V_{DC} at 0.5A typical
Operation Temperature	0 °C ~ 50 °C

Exterior of the Motion Control Card



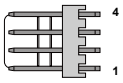
Title	Description
CN1	SCSI 100 pins, 4-axis Motion Control Input / Output Connector
CN3	Position Compare Signal Output
JP1	Jumper for Input Signal (NPN/PNP)
JP2	Jumper for Pulse Output I/O and External +24V Grounding Signal
RSW1	Card ID Number Configuration Switch

CN1: Input / Output Connector



PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	24V	26	ERC_2	51	24V	76	ERC_4
2	EGND	27	ALMC_2	52	EGND	77	ALMC_4
3	EMG	28	DO_2	53	EMG	78	DO_4
4	MEL_1	29	EA+_1	54	MEL_3	79	EA+_3
5	PEL_1	30	EA-_1	55	PEL_3	80	EA-_3
6	ORG_1	31	EB+_1	56	ORG_3	81	EB+_3
7	SLD_1	32	EB-_1	57	SLD_3	82	EB-_3
8	MEL_2	33	EZ+_1	58	MEL_4	83	EZ+_3
9	PEL_2	34	EZ-_1	59	PEL_4	84	EZ-_3
10	ORG_2	35	EA+_2	60	ORG_4	85	EA+_4
11	SLD_2	36	EA-_2	61	SLD_4	86	EA-_4
12	RDY_1	37	EB+_2	62	RDY_3	87	EB+_4
13	INP_1	38	EB-_2	63	INP_3	88	EB-_4
14	ALM_1	39	EZ+_2	64	ALM_3	89	EZ+_4
15	DI_1	40	EZ-_2	65	DI_3	90	EZ-_4
16	RDY_2	41	5V	66	RDY_4	91	5V
17	INP_2	42	DGND	67	INP_4	92	DGNO
18	ALM_2	43	DIR+_1	68	ALM_4	93	DIR+_3
19	DI_2	44	DIR-_1	69	DI_4	94	DIR-_3
20	EGND	45	OUT+_1	70	EGND	95	OUT+_3
21	SVON_1	46	OUT-_1	71	SVON_3	96	OUT-_3
22	ERC_1	47	DIR+_2	72	ERC_3	97	DIR+_4
23	ALMC_1	48	DIR-_2	73	ALM_3	98	DIR-_4
24	DO_1	49	OUT+_2	74	DO_3	99	OUT+_4
25	SVON_2	50	OUT-_2	75	SVON_4	100	OUT-_4

CN3: Position Compare Signal Output



PIN	Label	Description
1	3.3V CMP_OUT	CMOS 3.3VPosition Compare Signal Output
2	DGND	CMOS 3.3V Grounding Signal
3	DGND	CMOS 3.3V Grounding Signal
4	1.6(V) Vref	1.6V LVDS Voltage Reference

RSW1: Dial for Setting the Card ID Number

The number is set based on the value of the dial (between 0 ~ 15)

JP1: Jumper for Input Signal (NPN/PNP)

PIN	Label	Description
1	I24V	Internal +24V Voltage Connector
2	ICOM	Internal Input Signal Common Connector
3	EGND	24V Grounding Signal

JP2: Jumper for Pulse Output I/O and External +24V Grounding Signal

PIN	Label	Description
1	Not use	Reserved (Not In USe)
2	IGND	DDA Pulse Grounding Signal
3	EGND	24V Grounding Signal

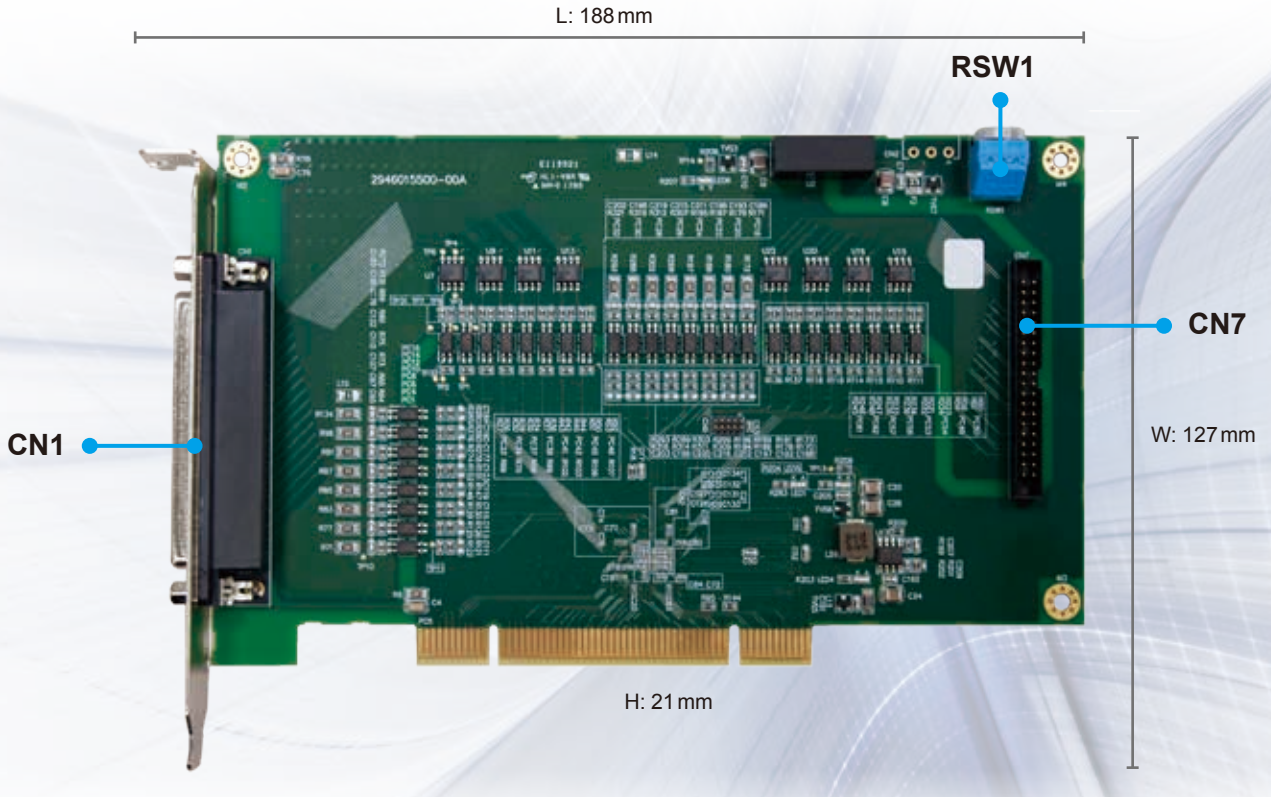
Standard Data Capture Card

- **Standard Type PCI-D122-XND0**

Specifications

Model Name		PCI-D122-XND0
Module Control	Function Mode	32 DI / 32 DO
	Additional Mode	MPG Function
	Input	32-CH Isolated
		Sink (NPN type) / Source (PNP type)
		24V@ 5mA
	Output	32-CH Isolated
		Sink (NPN type)
		24V@ 200mA
General	PCI Card Dimensions (With Bracket)	187.9 X 126.4 X 21.6 mm (W x H x D)
	PCI Specification	Ver2.2; supports 32-bit, 3.3V / $5V_{DC}$ Operation
	Power Consumption	$+5V_{DC}$ at 0.5A typical
	Surge Voltage Tolerance	$1500V_{AC}$ (Primary-secondary); $1500V_{AC}$ (Primary-PE)
	ESD	8KV Air Discharge
	EFT	Power Line-2KV
	RS	80MHz ~ 1GHz, 10V/M
	Operation Temperature	0 ºC ~ 50 ºC

Exterior of the Motion Control Card

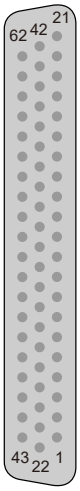


Title	Description
CN1	Input / Output Connector (CH0 ~ CH15)
CN7	Input / Output Connector (CH16 ~ CH31)
RSW1	Card ID Number Configuration Switch

RSW1: Dial for Setting the Card ID Number

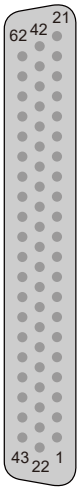
The number is set based on the value of the dial (between 0 ~ 15)

CN1: Input / Output Connector



PIN	Label	Description	PIN	Label	Description
1	N.C	Reserved	20	GND	GND Signal
2	IN_00 *	IO Input Signal	21	OUT_00	IO Output Signal
3	IN_01 *	IO Input Signal	22	OUT_01	IO Output Signal
4	IN_02 *	IO Input Signal	23	OUT_02	IO Output Signal
5	IN_03 *	IO Input Signal	24	OUT_03	IO Output Signal
6	IN_04 *	IO Input Signal	25	OUT_04	IO Output Signal
7	IN_05 *	IO Input Signal	26	OUT_05	IO Output Signal
8	IN_06 *	IO Input Signal	27	OUT_06	IO Output Signal
9	IN_07 *	IO Input Signal	28	OUT_07	IO Output Signal
10	IN_08 *	IO Input Signal	29	OUT_08	IO Output Signal
11	IN_09 *	IO Input Signal	30	OUT_09	IO Output Signal
12	IN_10 *	IO Input Signal	31	OUT_10	IO Output Signal
13	IN_11 *	IO Input Signal	32	OUT_11	IO Output Signal
14	IN_12 *	IO Input Signal	33	OUT_12	IO Output Signal
15	IN_13 *	IO Input Signal	34	OUT_13	IO Output Signal
16	IN_14 *	IO Input Signal	35	OUT_14	IO Output Signal
17	IN_15 *	IO Input Signal	36	OUT_15	IO Output Signal
18	COM_0	Common Input 0	37	N.C	Reserved
19	GND	GND Signal			

CN7: Input / Output Connector



PIN	Label	Description	PIN	Label	Description
1	N.C	Reserved	2	GND	GND Signal
3	IN_00 *	IO Input Signal	4	OUT_00	IO Output Signal
5	IN_01 *	IO Input Signal	6	OUT_01	IO Output Signal
7	IN_02 *	IO Input Signal	8	OUT_02	IO Output Signal
9	IN_03 *	IO Input Signal	10	OUT_03	IO Output Signal
11	IN_04 *	IO Input Signal	12	OUT_04	IO Output Signal
13	IN_05 *	IO Input Signal	14	OUT_05	IO Output Signal
15	IN_06 *	IO Input Signal	16	OUT_06	IO Output Signal
17	IN_07 *	IO Input Signal	18	OUT_07	IO Output Signal
19	IN_08 *	IO Input Signal	20	OUT_08	IO Output Signal
21	IN_09 *	IO Input Signal	22	OUT_09	IO Output Signal
23	IN_10 *	IO Input Signal	24	OUT_10	IO Output Signal
25	IN_11 *	IO Input Signal	26	OUT_11	IO Output Signal
27	IN_12 *	IO Input Signal	28	OUT_12	IO Output Signal
29	IN_13 *	IO Input Signal	30	OUT_13	IO Output Signal
31	IN_14 *	IO Input Signal	32	OUT_14	IO Output Signal
33	IN_15 *	IO Input Signal	34	OUT_15	IO Output Signal
35	COM_1	Common Input 1	36	N.C	Reserved
37	COM_1	Common Input 1	38	N.C	Reserved
39	N.C	Reserved	40	GND	GND Signal

DMCNET Remote Modules

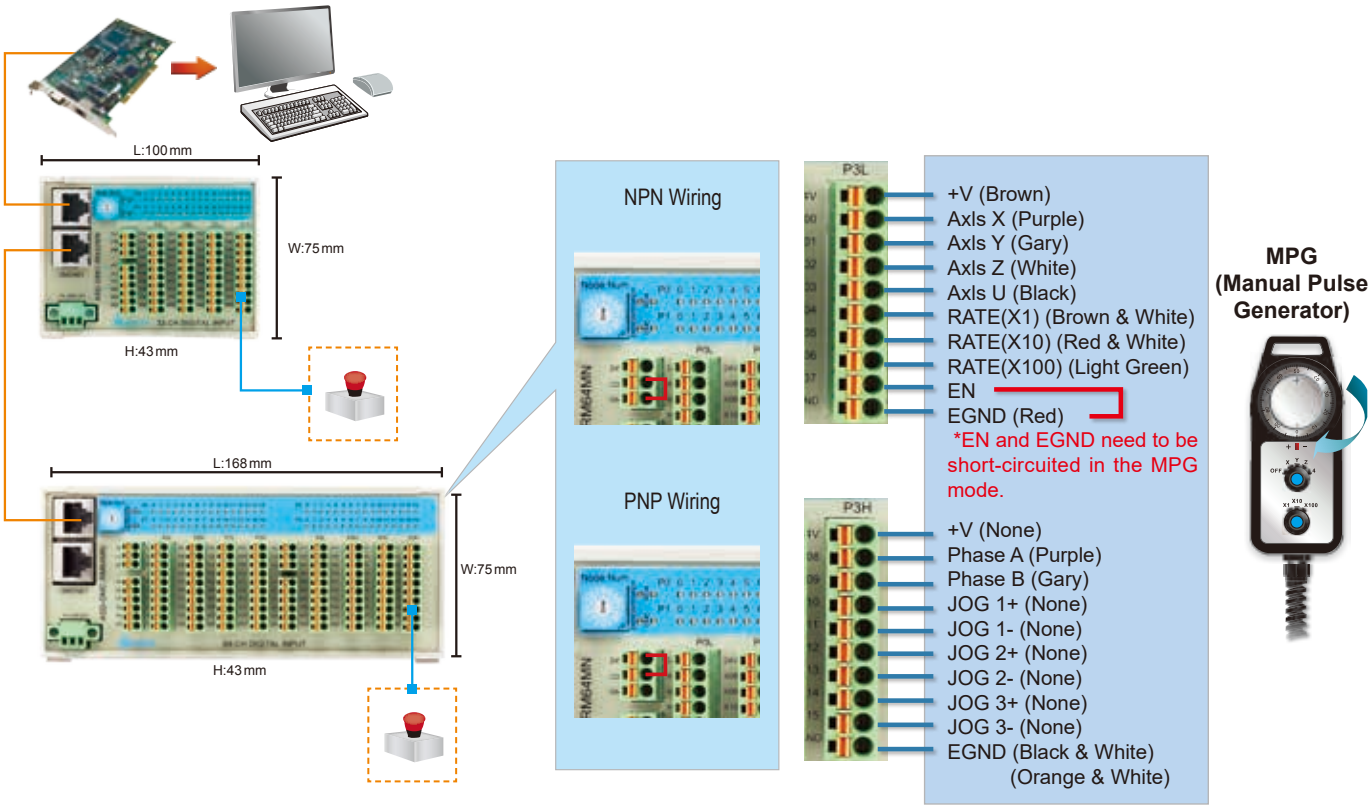
Digital Input Remote Modules

- **ASD-DMC-RM32MN (32 Digital Inputs)**
- **ASD-DMC-RM64MN (64 Digital Inputs)**
- **ASD-DMC-RM32PT (16 Digital Inputs / 16 Digital Outputs)**

Electrical Specifications

Model Name	RM32MN / RM64MN / RM32PT
Input Circuit Type	Single common port input
Input Signal Type	SINK / SOURCE
Input Signal Voltage	24 V_{DC} (5mA)
Response Time	0 to 3 ms, adjustable
Action Level (OFF > ON)	> 16.5 V_{DC}
Action Level (ON > OFF)	< 8 V_{DC}
Noise Tolerance Threshold	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV, Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m
Environment	Operating Temperature: 0 °C ~ 50 °C Storage Temperature: -20 °C ~ 70 °C

Installation & Wiring



***MPG can only be used for the terminals of P3H and P3L of ASD-DMC-RM64MN**

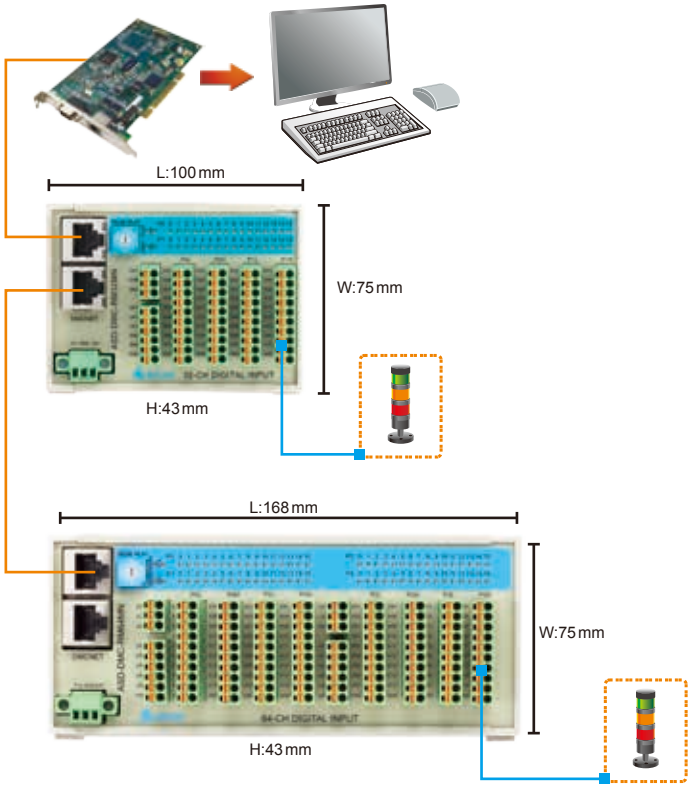
Digital Output Remote Modules

- **ASD-DMC-RM32NT (32 Digital Outputs)**
- **ASD-DMC-RM64NT (64 Digital Outputs)**
- **ASD-DMC-RM32PT (16 Digital Inputs / 16 Digital Outputs)**
  - Non-volatile memories can be managed through a software API
  - Load output: 0.1A / 1 Point

Electrical Specifications

Model Name	RM32NT / RM64NT / RM32PT
Output Circuit Type	Transistor
Output Signal Type	SINK
Current Specifications	0.1A/1 point
Voltage Specifications	24 V_{DC}
Maximum Switching (Operating) Frequency	1 KHz
Action Level (OFF > ON)	20 us
Action Level (ON > OFF)	30 us
Noise Tolerance Threshold	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV, Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m
Environment	Operating Temperature: 0 °C ~ 50 °C Storage Temperature: -20 °C ~ 70 °C

Installation & Wiring



DMCNET Remote Modules

• HMC-RIO3232RT5 (Digital I/O Remote Module)

- 16 points relay type output unit; max. loading: 2A / 1 Point with non-volatile memory function
- 16 points transistor type output unit; max. loading: 0.1A / 1 Point
- 32 points digital input unit – supports SINK and SOURCE modes

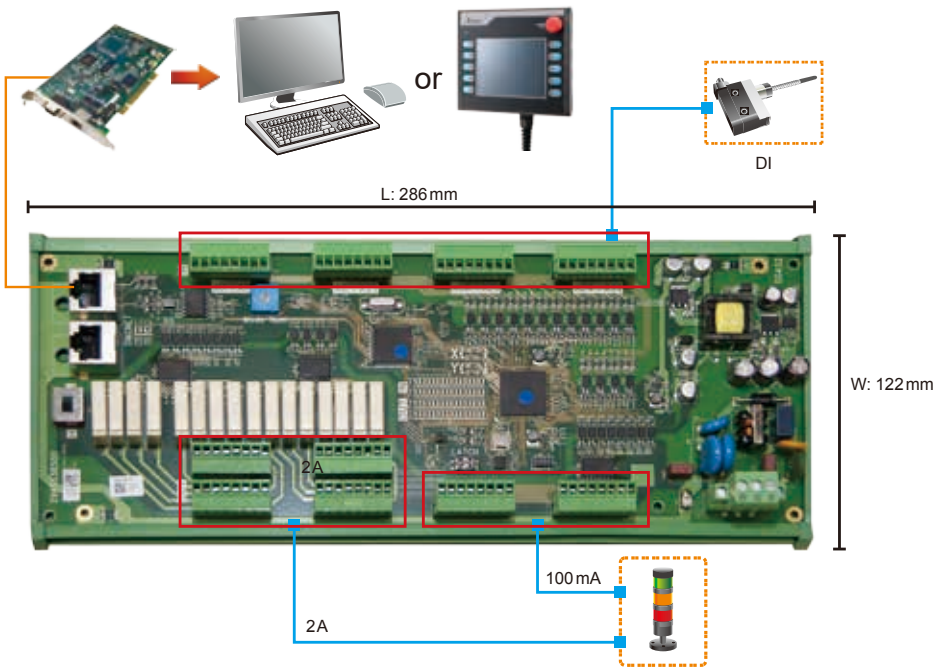
Electrical Specifications

Model Name	HMC-RIO3232RT5
Supply Voltage	24 VDC (-10% ~ +15%) / 50 mA
Power Consumption	1.2W
Noise Immunity	RS: Frequency: 80MHz ~ 1GHz, 1.4GHz ~ 2.0GHz, Test level 10V/m ESD: Contact discharge ±8KV Air discharge ±8KV EFT: ±2KV(Power port), ±2KV (I/O line), Surge: ±2KV (RIO power port)
Temperature	Operating: 0ºC ~ 55ºC (Temperature), 10 ~ 90% (Humidity) Storage: -20ºC ~ 60ºC (Temperature), 10 ~ 90% (Humidity)
Vibration	IEC 61131-2 compliant 5Hz ~ 8.3Hz = Continuous: 3.5 mm, 8.3Hz ~ 150Hz = Continuous: 1.0 g
Shock	IEC 60068-2-27 compliant 15g peak for 11 ms duration X, Y, Z directions for 6 times
Weight	Approx. 460g

Item	Input Port
Input Signal Type	SINK / SOURCE
Input Signal Voltage	24 V_{DC} (5 mA)
Input Impedance	4.7K ohm
Action Level	(OFF → ON) > 16.5 V_{DC} (ON → OFF) < 5 V_{DC}

Item	Output Port
Output Circuit Type	Transistor / Relay
Voltage Specifications	24 V_{DC} (-10% ~ +15%) / < 250 V_{AC} (Relay Only)
Current Specifications	100 mA / 1 Point (Transistor), 2A / 1 Point (Relay), Resistive Load
Maximum Switching (Operating) Frequency	8 k Hz (TR) / 1 Hz (RELAY)
Response Time	TR: (ON → OFF): 115 µs, (OFF → ON): 12 µs RELAY: (ON → OFF): 10 ms, (OFF → ON): 10 ms

Installation & Wiring



DMCNET Remote Modules

• ASD-DMC-RM04PI (4-Channel Pulse)

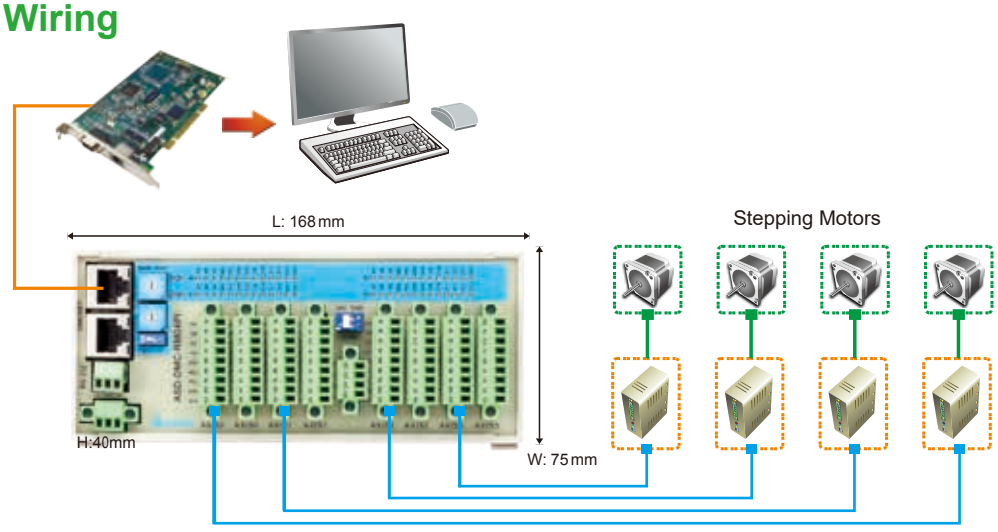
- 4 channels of 200 kHz pulse outputs (Pulse + Direction, CCW pulse + CW pulse, A phase + B phase)
- 4 channels of 200 kHz pulse inputs (CCW pulse + CW pulse, A phase + B phase)
- Digital Inputs x 8 / Digital Outputs x 8
- Built-in positive / negative limit and home for each channel
- In Mode 1, each RM04PI module occupies one node number only, and interpolation motion is carried out within one module.
  - 4 channels occupy 1 node number only
  - 4 channels occupy one PDO and SDO
  - Performs interpolation motion of 4 channels within one RM04PI module only
  - Transfers data in cyclical patterns
  - Motion commands set by parameters
  - Point-to-Point motion mode, motion position calculation is performed within one RM04PI module
- In Mode 2, each RM04PI module occupies node numbers 1~4, which correspond to 4 channels. The interpolation motion can be carried out among different modules.

Electrical Specifications

ASD-DMC-RM04PI	
Item	**Input (QA, QB, QZ, DI1, DI2)**
Circuit Type	Single
Signal Type	SINK
Power Supply Voltage	5 V_{DC}
Work Frequency	QA, QB, QZ: 200 kHz (5 mA / 1 point) DI1, DI2: 1 kHz (5 mA / 1 point)
Noise Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m
Operating/ Storage Environment	Operating: 0 °C ~ 50 °C (32 °F ~ 122 °F) Storage: -20 °C ~ 70 °C (-4 °F ~ 158 °F)

ASD-DMC-RM04PI		
Item	**Input (MEL, PEL, ORG, SLD)**	**Output (CW, CCW, DO1, DO2)**
Circuit Type	Single	Transistor
Signal Type	SINK / SOURCE	SINK
Power Supply Voltage	24 V_{DC} (5 mA)	5~24 V_{DC} (30 mA / 1 point)
Response Time/ Work Frequency	1 ms	CW, CCW : 200 kHz DO1, DO2 : 1 kHz
Active Level (OFF > ON)	> 16.5 V_{DC}	-
Active Level (ON > OFF)	< 8 V_{DC}	-
Noise Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m	
Operating/Storage Environment	Operating: 0 °C ~ 50 °C (32 °F ~ 122 °F) Storage: -20 °C ~ 70 °C (-4 °F ~ 158 °F)	

Installation & Wiring

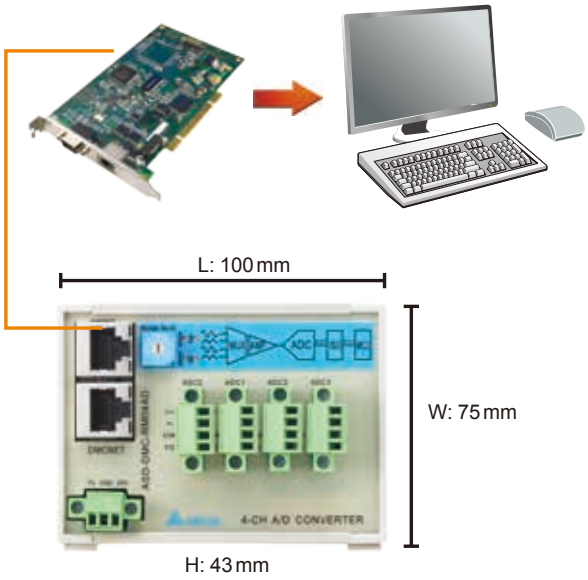


• ASD-DMC-RM04AD (4-Channel Analog Input)

Electrical Specifications

ASD-DMC-RM04AD	
Channel	4 Channels / module
Voltage Analog Input Range	-10 ~ 10 V / -5 ~ 5 V / 0 ~ 10 V / 0 ~ 5 V
Current Analog Input Range	0 ~ 24 mA
Digital Conversion Range	0 ~ 65535
Resolution	16 bits
Voltage Input Resistance	140 kΩ
Current Input Resistance	249 Ω
General Precision	Within ±0.5% (25 ºC, 77 ºF) at full scale Within ±1% (0 ~ 55 ºC, 32 ~ 131 ºF) at full scale
Response Time	Min. 1 ms / Max. 3 ms × the number of channels
Isolation	Internal circuit and analog output terminals are isolated with an optical coupler
Voltage Absolute Input Range	-15 ~ 15
Current Absolute Input Range	32 mA
Digital Data Format	16 significant bits
Sampling Mode	Five modes which the average number is two (2), four (4), eight (8), sixteen (16) and thirty-two (32) are available for selection

Installation & Wiring

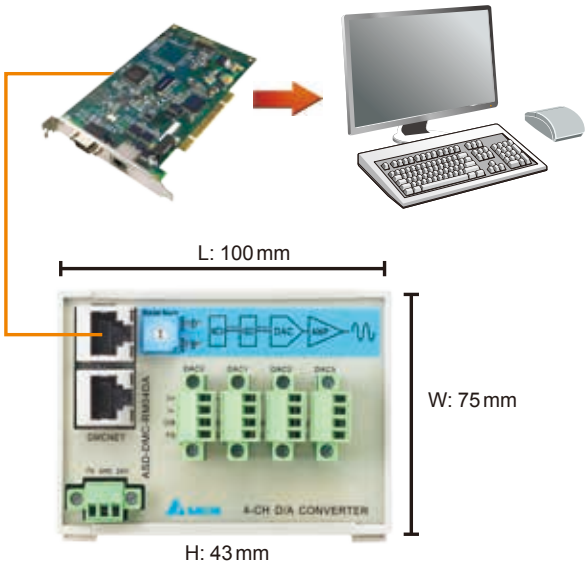


• ASD-DMC-RM04DA (4-Channel Analog Output)

Electrical Specifications

ASD-DMC-RM04DA	
Channel	4 Channels / module
Voltage Output Range	-10 ~ 10 V / -5 ~ 5 V / 0 ~ 10 V / 0 ~ 5 V
Current Output Range	0 ~ 24 mA / 0 ~ 20 mA / 4 ~ 20 mA
Excess Limit (Voltage)	10 %
Maximum Output Current (Voltage)	20 mA
Allowable Load Resistance (Current)	0 ~ 500 Ω
Digital Data Range	0 ~ 4096
Resolution	16 bits
DC Output Resistance	0.3 Ω
Response Time	1 ms
Digital Data Format	16 bits
Isolation	Internal circuit and analog output terminals are isolated with an optical coupler
Protection	Voltage output is protected by short circuit, but must be aware of long-lasting short circuit damaging the internal circuits

Installation & Wiring



Gateway Type Remote Power Coupler

Master Module - GA Series

- **ASD-DMC-GA01**

Front View
W: 37 mm

L: 90mm

H: 63 mm

- One GA01 can connect up to a maximum of 4 GE remote modules, of which there may be a maximum of four GE01PH modules.
- 64-point input / 64-point output can be set in one station (extra station for over 64).
- The EzDMC provides a software auto calculation function for calculating the numbers of start and end stations of ASD-DMC-GA01.

Switching Settings

ADDR1 & ADDR2

ADDR1		
PIN	**Function**	**Explanation**
1 ~ 12	Start Node Address	Start Station
ADDR1		
PIN	**Function**	**Explanation**
1 ~ 12	End Node Address	End Station

There is no communication when the value is set to 0 and 13 ~ 15.
When ADDR1 is set to 1 and ADDR2 is set to 2, it indicates that the remote modules have occupied two stations.

Gateway Type Digital I/O Remote Module

Slave Module - GE Series

- **Gateway Type 1-Channel Pulse Remote Module ASD-DMC-GE01PH**

Front View
W: 25 mm

L: 90 mm

H: 63 mm

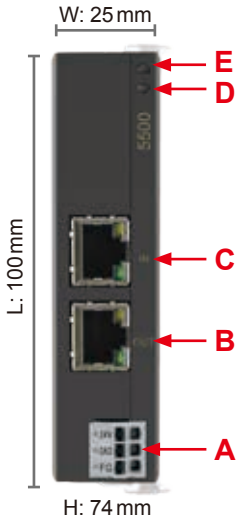
Electrical Specifications

ASD-DMC-GE01PH		
Item	**Input**	**Output**
Circuit Type	Single common port input	Transistor
Signal Type	SINK / SOURCE	SINK
Signal Voltage	24 V_{DC} (5 mA)	5 ~ 24 V_{DC} (30 mA/1 point)
Response Time	1 ms	
Maximum Input Pulse Frequency	QA+, QB+, QZ+, QA-, QB-, QZ-: 4 MHz (5 mA / 1 point)	CW, CCW: 4 MHz (30 mA / 1 point) SVON, RALM: 1 kHz (30 mA / 1 point)
Action Level (OFF → ON)	> 16.5 V_{DC}	-
Trigger Level (ON → OFF)	< 8 V_{DC}	-
Output Circuit Type	-	RS-422
Output Signal Type	-	Differential

EtherCAT Remote Modules

Gateway Type E-bus Remote Power Coupler

R1-EC5500D0

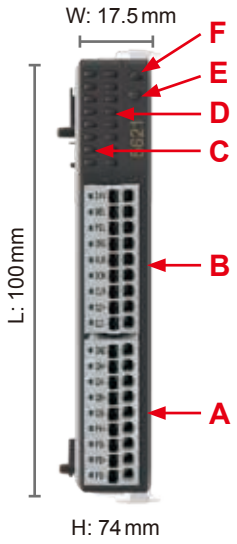


NO.	Description
A.	DC Power Input
B.	EtherCAT Output
C.	EtherCAT Input
D.	Status Indicator
E.	Power Indicator

Technical Data	R1-EC5500D0
Task Within EtherCAT System	Connect EtherCAT Slave module with 100 baseTX EtherCAT
Data Transfer Medium	Ethernet/EtherCAT cable (min. CAT 5), shielded
Distance Between Stations	100 m (100BASE-TX) between two slaves
Protocol	EtherCAT
Data Transfer Rates	100 Mbaud
Bus Interface	RJ 45 x 2
Input Voltage	24 V_{DC}
Input Current	50 mA + (E-bus total E-bus current)/4
Current Supply E-Bus	2A
Electrical Isolation	500 Vrms (Power contact / Supply voltage / Ethernet)
Vibration / Shock Resistance	EN 60068-2-6 / EN 60068-2-27 / 29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m
Operating Environment	Operating temperature: 0 °C ~ 50 °C Storage temperature: -20 °C ~ 70 °C
Weight	55 g
Protection Class	IP20
Mounting Type	DIN-rail

1-Channel Pulse Remote Module

R1-EC5621D0



NO.	Description	No.	Description
A.	IO Signal Port	D.	IO Signal Indicator
B.	IO Signal Port	E.	Status Indicator
C.	IO Signal Indicator	F.	Power Indicator

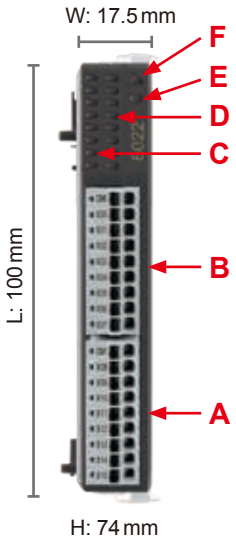
Input	Description	Input	Description
24V	24V Power	GND	External Ground
MEL	End Limit (-)	QA+	Encoder A Phase (+)
PEL	End Limit (+)	QA-	Encoder A Phase (-)
ORG	Home Signal	QB+	Encoder B Phase (+)
ALM	Servo Alarm	QB-	Encoder B Phase (-)
SON	Servo On	PA+	Pulse Signal (+)
CLR	Reset Servo Alarm	PA-	Pulse Signal (-)
QZ+	Encoder Z Phase (+)	PB+	Dir. Signal (+)
QZ-	Encoder Z Phase (-)	PB-	Dir. Signal (-)

Technical Data	R1-EC5621D0
Number of Outputs	1 channel (PA+, PA-, PB+, PB-)
Number of Inputs	1 channel (QA+, QA-, QB+, QB-. QZ+, QZ-)
Power Supply	E-bus
Signal Voltage	RS422 Level
Max. Output Current	RS422 specification
Base Frequency	1Hz ~ 4MHz
Numbers Of 24 V Input	4 (MEL, PEL, ORG, ALM)
Numbers Of 24 V Output	2 (CLR, SON)
Trigger Voltage (On > Off)	< 8 V_{DC}
Trigger Voltage (Off > On)	> 16.5 V_{DC}
Maximum Current of Each Output Port	30 mA
Current Consumption E-Bus	150 mA
Electrical Isolation	500 Vrms (E-bus / field potential)
Bit Width in The Process Image	32 byte in/out (1 x 16 byte data, 1 x 16 byte control/status)
Vibration / Shock Resistance	EN 60068-2-6 / EN 60068-2-27 / 29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3: 8 MHz ~ 1 GHz, 10 V/m
Operating Environment	Operating temperature: 0 °C ~ 50 °C ; Storage temperature: -20 °C ~ 70 °C
Weight	Approx. 60 g
Protection Class	IP20
Mounting Type	DIN-rail

EtherCAT Remote Modules

16 Digital Input Remote Module

R1-EC6002D0 / R1-EC6022D0



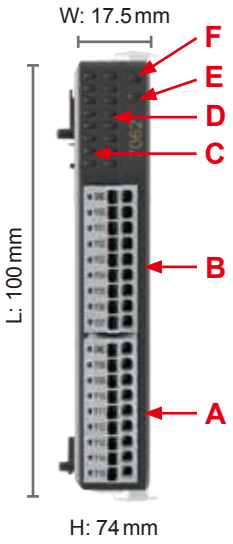
NO	Description	NO.	Description
A.	Port 1 Terminals	D.	Port 1 IO Signal X08~X15 (From the top)
B.	Port 0 Terminals	E.	Status Indicator
C.	Port 0 IO Signal X00~X07 (From the top)	F.	Power Indicator

Input	Description	Input	Description
CM0	Port 0 COM	CM1	Port1 COM
X00	Input 0	X08	Input 8
X01	Input 1	X09	Input 9
X02	Input 2	X10	Input 10
X03	Input 3	X11	Input 11
X04	Input 4	X12	Input 12
X05	Input 5	X13	Input 13
X06	Input 6	X14	Input 14
X07	Input 7	X15	Input 15

Technical Data	R1-EC6002D0	R1-EC6022D0
Connection Technology	single-ended	
Number of Inputs	16	
Nominal Voltage	24 V_{DC} ±10%	
Signal Type	SINK / SOURCE	
Trigger Voltage (On > Off)	< 8 V_{DC}	
Trigger Voltage (Off > On)	> 16.5 V_{DC}	
Input Filter	100µs	2ms
Input Current	3 mA at each port	
Current Consumption E-Bus	110 mA	
Electrical Isolation	500 Vrms (E-bus / field potential)	
Bit Width in The Process Image	16 inputs	
Vibration / Shock Resistance	EN 60068-2-6 / EN 60068-2-27 / 29	
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m	
Operating Environment	Operating temperature: 0 °C ~ 50 °C; Storage temperature: -20 °C ~ 70 °C	
Weight	55 g	
Protection Class	IP20	
Mounting Type	DIN-rail	

16-Channel Output Remote Module

R1-EC7062D0 / R1-EC70E2D0 / R1-EC70A2D0 / R1-EC70F2D0



NO.	Description	NO.	Description
A.	Port 1 Terminals	D.	Port 1 IO Signal Y08~Y15 (From the top)
B.	Port 0 Terminals	E.	Status Indicator
C.	Port 0 IO Signal Y00~Y07 (From the top)	F.	Power Indicator

Output	Description	Output	Description
GND *	Port 0 GND	GND	Port 1 GND
24V **	Port 0 24V Power Input		
Y00	Output 0	Y08	Output 8
Y01	Output 1	Y09	Output 9
Y02	Output 2	Y10	Output 10
Y03	Output 3	Y11	Output 11
Y04	Output 4	Y12	Output 12
Y05	Output 5	Y13	Output 13
Y06	Output 6	Y14	Output 14
Y07	Output 7	Y15	Output 15

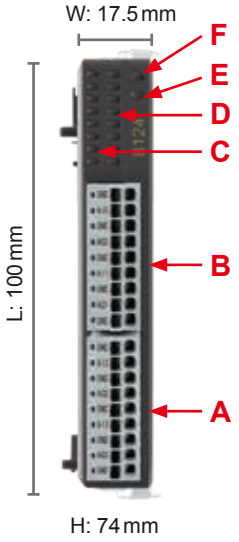
*R1-EC7062D0 / R1-EC70E2D0
**R1-EC70A2D0 / R1-EC70F2D0

Technical Data	R1-EC7062D0	R1-EC70E2D0	R1-EC70A2D0	R1-EC70F2D0
Connection Technology	MOSFET			
Signal Type	SINK		SOURCE	
Nominal Voltage	24 V_{DC}			
User-defined Output Disconnection	×	√	×	√
Output Current	0.5A (Max.)		0.25A (Max.)	
Current Consumption E-Bus	120mA	200mA		
Response Time / Frequency	1 KHz			
Trigger Time (Off > On)	140us		160us	
Trigger Time (On > Off)	150us		110us	
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 80 MHz ~ 1 GHz, 10 V/m			
Operating Environment	Operating temperature: 0 °C ~ 50 °C; Storage temperature: -20 °C ~ 70 °C			
Weight	Approx. 60 g			
Protection Class	IP20			
Mounting Type	DIN-rail			

EtherCAT Remote Modules

4-Channel Analog Input Remote Module

R1-EC8124D0



NO.	Description	NO.	Description
A.	CH3/CH4 Signal port	D.	CH3/CH4 Signal Indicator
B.	CH1/CH2 Signal port	E.	Status Indicator
C.	CH1/CH2 Signal Indicator	F.	Power Indicator

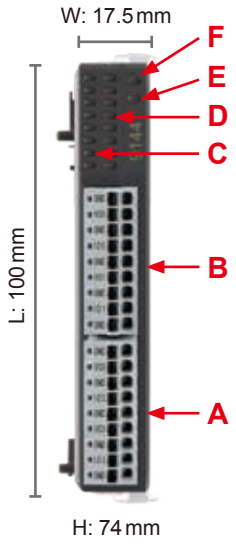
Input	Description	Input	Description
GND	Analog Ground	GND	Analog Ground
AI0	CH1 Voltage /Current Input	AI2	CH3 Voltage / Current Input
GND	Analog Ground	GND	Analog Ground
AG0	CH1 Current COM*	AG2	CH3 Current COM*
GND	Analog Ground	GND	Analog Ground
AI1	CH2 Voltage / Current Input	AI3	CH4 Voltage / Current Input
GND	Analog Ground	GND	Analog Ground
AG1	CH2 Current COM*	AG3	CH4 Current COM*
GND	Analog Ground	GND	Analog Ground

* In current mode: please connect current COM to GND; in voltage mode: please disconnect this COM

Technical Data	R1-EC8124D0
Number of Inputs	4 (single-ended)
Power Supply	via the E-bus
Signal Voltage	±10 V / ±5 V
Internal Resistance	> 1 MΩ
Input Filter Limit Frequency	1 KHz ~ 10 KHz
Resolution	16 bit
Over Sampling Rate	0 ~ 64
Conversion Time	2 us ~ 191 us (depends on Over Sampling Rate)
Measuring Error	< ±0.2 % (relative to full scale value)
Electrical Isolation	1000 Vrms (E-bus / signal voltage)
Current Consumption E-Bus	300 mA
Bit Width in The Process Image	input : 4 x 16 byte data, 4 x 16 byte control/status
Vibration / Shock Resistance	EN 60068-2-6 / EN 60068-2-27 / 29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, IEC 61000-4-3): 8 MHz ~ 1 GHz, 10 V/m
Operating Environment	Operating temperature: 0 °C ~ 50 °C ; storage temperature: -20 °C ~ 70 °C
Weight	Approx. 60 g (0.13 lbs)
Protection Class	IP20
Mounting Type	DIN-rail

4-Channel Analog Output Remote Module

R1-EC9144D0



NO.	Description	NO.	Description
A.	CH3/CH4 Signal port	D.	CH3/CH4Signal Indicator
B.	CH1/CH2 Signal port	E.	Status Indicator
C.	CH1/CH2 Signal Indicator	F.	Power Indicator

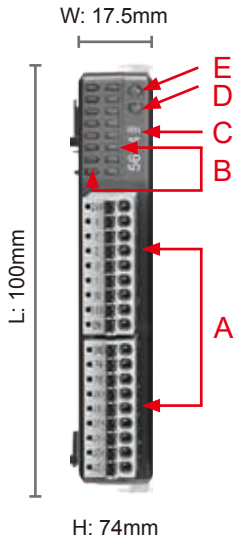
Output	Description	Output	Description
GND	Analog Ground	GND	Analog Ground
VO0	CH1 Voltage Output	VO2	CH3 Voltage Output
GND	Analog Ground	GND	Analog Ground
IO0	CH1 Current Output	IO2	CH3 Current Output
GND	Analog Ground	GND	Analog Ground
VO1	CH2 Voltage Output	VO3	CH4 Voltage Output
GND	Analog Ground	GND	Analog Ground
IO1	CH2 Current Output	IO3	CH4 Current Output
GND	Analog Ground	GND	Analog Ground

Technical Data	R1-EC9144D0
Number of Inputs	4 (single-ended)
Power Supply	via the E-bus
Signal Voltage Output	±10 V / ±5 V / 0 ~ 5 V / 0 ~ 10 V
Current Output	0 ~ 20 mA / 4 ~ 24 mA / 0 ~ 24 mA
Load	> 1 KΩ (short-circuit-proof)
Resolution	16 bit
Conversion Time	80us
Measuring Error	< ±0.2 % (relative to full scale value) Output Voltage < ±0.3 % (relative to full scale value) Current Output
Electrical Isolation	1000 Vrms (E-bus / signal voltage)
Current Consumption E-Bus	550 mA
Bit Width in The Process Image	Output: 4 x 16 byte, (4 x16-bit analog output)
Vibration/Shock Resistance	EN 60068-2-6 / EN 60068-2-27 / 29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 KV Communication I/O: 1 KV RS (IEC 61131-2, EC 61000-4-3): 8 MHz ~ 1 GHz, 10 V/m
Operating Environment	Operating temperature: 0 °C ~ 50 °C; Storage temperature: -20 °C ~ 70 °C
Weight	Approx. 60 g
Protection Class	IP20
Mounting Type	DIN-rail

EtherCAT Remote Modules

Manual Pulse Generator (MPG) Module

R1-EC5614D0



NO.	Description	NO.	Description
A.	IO Signal Port	D.	Status Indicator
B.	IO Signal Indicator	E.	Power Indicator
C.	Product No.		

Input	Description	Input	Description
GND	External Ground	24V	External Power Input
PA	MPG Pulse Phase A Input	X	X-axis Pulse Chosen Signal
PB	MPG Pulse Phase B Input	Y	Y-axis Pulse Chosen Signal
JX+	JOG X-axis Signal (+)	Z	Z-axis Pulse Chosen Signal
JX-	JOG X-axis Signal (-)	U	U-axis Pulse Chosen Signal
JY+	JOG Y-axis Signal (+)	1	Pulse magnification (x 1)
JY-	JOG Y-axis Signal (-)	10	Pulse magnification (x 10)
JZ+	JOG Z-axis Signal (+) / *W-axis	100	Pulse magnification (x 100)
JZ-	JOG Z-axis Signal (-) / *V-axis	EN	Motion / Setting Execution

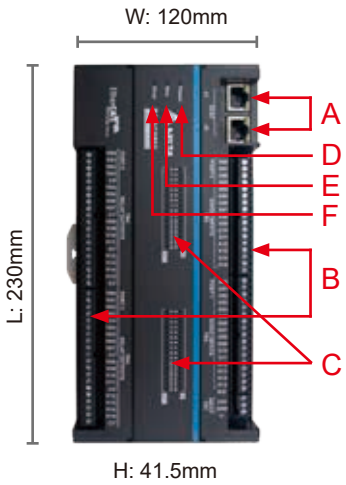
*Supports 6-axis MPG via software: JZ+ needs to connect to W-axis signal; JZ- needs to connect to V-axis signal

Technical Data	R1-EC5614
Control Axes	4 / 6 axes
Power Supply	via the E-bus
Pulse Magnification	x 1 / x 10 / x 100
JOG Input	3 / 2 sets
Sampling Rate	40KHz
FIFO Length	30 sets
Communication Time	125us - 3276800us
Trigger Time (ON > OFF)	< $8V_{DC}$
Trigger Time (OFF > ON)	> $16.5V_{DC}$
Current Consumption E-Bus	180mA
Electrical Isolation	500 Vrms (E-BUS / Signal Power)
Vibration / Shock Resistance	EN 60068-2-6 / EN 60068-2-27 / 29
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2) EFT (IEC 61131-2, IEC 61000-4-4) RS (IEC 61131-2, EC 61000-4-3)
Operating Environment	Operating temperature: 0 ºC ~ 50 ºC Storage temperature: -20 ºC ~ 70 ºC
Weight	Approx. 55 g
Protection Class	IP20
Safety Certification	CE
Mounting Type	DIN-rail

EtherCAT Remote Modules

Digital Input / Output Module

R2-EC0902D0



NO.	Description	NO.	Description
A.	EtherCAT DI/DO Terminals	D.	Power Indicator
B.	GPIO DI/DO Terminals	E.	Communication Indicator
C.	GPIO Status Indicator	F.	Alarm Indicator

DI/DO	Description	DI/DO	Description
X00 ⋮ X15	Port 0 Input 1 ⋮ Port 0 Input 16	24V	External Power Supply Input
N.C	Reserved	GND	External Power Ground
X00 ⋮ X15	Port 1 Input 1 ⋮ Port 1 Input 16	FG	Ground
S/S*	NPN / PNP Setting		
Y00 ⋮ Y15	Port 2 Input 1 ⋮ Port 2 Input 16		
Y00 ⋮ Y15	Port 3 Input 1 ⋮ Port 3 Input 16		

*1: S/S: NPN / PNP Setting, NPN = Vcc, PNP = GND

Technical Data	R2-EC0902D0	
Nominal Voltage	24 VDC -15% ~+20%	
Input Current	<1A	
Digital I/O	Digital Input	Digital Output
Insolation	Optical Coupler	Relay
Signal Type	Sink / Source	A (N.O) Dry Contact
I/O Terminals	32-CH	32-CH
Max. Operating Voltage / Current	$30V_{DC}$@8mA / Per CH	$30V_{DC}$ @ 2A / Per CH $250V_{AC}$ @ 2A / Per CH
Rated Input Voltage / Current	$24V_{DC}$ @ 5mA	-
Frequency	1 kHz	1 Hz
Response Time (Operation) (OFF > ON)	300us	10 ms
Response Time (Release) (ON > OFF)	300us	5 ms
Relay ON/OFF Times	-	Inductive: 20000 Times @$30V_{DC}$ 2A
		Resistive: 100000 Times @ $30V_{DC}$ 、$250V_{AC}$ 2A
Dimensions	230 x 120 x 41.5mm (W x H x D)	
Operating Environment	Operating Temperature: 0° C ~ 50° C (32° F ~ 122° F) ; Storage Temperature: -20° C ~ 70° C (-4° F ~ 158° F)	
Mounting Type	DIN-rail	
Vibration / Shock Resistance	Compliant with EN 60068-2-6 / EN 60068-2-27/29	
EMC Immunity	ESD (IEC 61131-2, IEC 61000-4-2) EFT (IEC 61131-2, IEC 61000-4-4) RS (IEC 61131-2, IEC 61000-4-3)	
Protection Rating	IP20	
Safety Certification	CE UL	

Ordering Information

Programmable Automation Controllers - Motion Control Host PAC

Model Name	CPU Type	Storage	Slot Interface	RAM	OS	Motion Protocol	Development Tool
MH1-A12D-A03DG	Atom E3845 Quad Core 1.91GHz	2 PCI	32GB CFast	4GB	Win 7 32bit	DMCNET	API
MH1-A12D-A03DM							IMP
MH1-A12D-A05DG			128GB SSD				API
MH1-C50D-A03DG	Core i5-3610ME Dual Core 2.7GHz	2 PCI	32GB Cfast	4GB	Win 7 32bit	DMCNET	API
MH1-C50D-A03DM							IMP
MH1-C50D-A33DH				8GB	Win 7 64bit		API
MH1-C50D-A04DG			64GB SSD	4GB	Win 7 32bit		API
MH1-C50D-C03DG		PCIe (x4+x1)	32GB CFast				API
MH1-C70D-A03DG	Core i7-3612QE Quad Core 2.1GHz	2 PCI	32GB CFast	4GB	Win 7 32bit	DMCNET	API
MH1-C70D-A03DM							IMP
MH1-C70D-A33DH				8GB	Win 7 64bit		API
MH1-C70D-C03DG		PCIe (x4+x1)		4GB	Win 7 32bit		API
MH1-C70D-C33DH					Win 7 64bit		API
MH1-A12N-A03DG	Atom E3845 Quad Core 1.91GHz	2 PCI	32GB CFast	4GB	Win 7 32bit	NA	NA
MH1-A12N-A05DG			128GB SSD				
MH1-C50N-A03DG	Core i5-3610ME Dual Core 2.7GHz	2 PCI	32GB CFast	4GB	Win 7 32bit	NA	NA
MH1-C50N-A05DG			128GB SSD				
MH1-C50N-C03DG		PCIe (x4+x1)	32GB CFast				
MH1-C50N-C33DH				8GB	Win 7 64bit		
MH1-C70N-A03DG	Core i7-3612QE Quad Core 2.1GHz	2 PCI	32GB CFast	4GB	Win 7 32bit	NA	NA
MH1-C70N-C03DG		PCIe (x4+x1)					
MH1-C70N-C33DH				8GB	Win 7 64bit		
MH2-P10N-N04DL	Celeron J1900 Quard Core 2.0GHz	NA	64GB SSD	4GB	Win 10 IoT 64bit	EtherCAT	API
MH2-P10N-N06DL			32GB SSD				

Programmable Automation Controllers - Motion Control Panel PC

Model Name	CPU Type	Monitor	Slot Interface	RAM	OS	Motion Protocol	Development Tool
MP1-P10D-150ADL	Celeron J1900 Quard Core 2.0GHz	15"	64GB CFast 128GB CFast	4GB	Win 10 IoT 64bit	DMCNET	API/IMP
MP1-P10D-150BDL							

Ordering Information

Motion Control Cards	
PCI-DMC-A02	DMCNET Standard Type Motion Control Card with Local I/O (32 DI / 24 DO)
PCI-DMC-B01	DMCNET Advanced Type Motion Control Card with 2 Groups of Pulse Compare
PCI-DMC-B02	DMCNET Advanced Motion Control Card + 2D Pulse Compare
PCI-DMC-B03	DMCNET Advanced Motion Control Card + 3 Sets of Pulse Compare & 10 Sets of DO
PCI-DMC-F02	DMCNET Economic Type Motion Control Card with Local I/O (32 DI / 24 DO)
PCIe-L221-B1D0	EtherCAT Advanced Motion Control Card + 2 Sets of Pulse Compare
PCI-L221-P1D0	EtherCAT Standard Type Motion Control Card
PCI-L221-F1D0	EtherCAT Economic Type Motion Control Card
PCI-L221-B1D0	EtherCAT Advanced Type Motion Control Card with 2 Groups of Pulse Compare
PCI-M324-F1D0	4-axis Pulse Motion Control Card
PCI-D122-XND0	32IN/32OUT Digital Signal Capture Card
DB-D1XX-01D0	Digital Signal Capture Slave Card

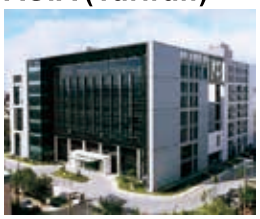
DMCNET Remote Modules	
ASD-DMC-RM32MN	32 Digital Input Remote Module (NPN / PNP)
ASD-DMC-RM64MN	64 Digital Input Remote Module (NPN / PNP) plus MPG Module
ASD-DMC-RM32NT	32 Digital Output Remote Module
ASD-DMC-RM64NT	64 Digital Output Remote Module
ASD-DMC-RM32PT	32 Digital I/O Remote Module with 16 DI (NPN / PNP) & 16 DO (Transistor Output)
ASD-DMC-RM04PI	4-Channel Pulse Remote Module (4 Channels of 200 kHz Pulse Outputs and Inputs)
ASD-DMC-RM04AD	4-Channel Analog Input Module
ASD-DMC-RM04DA	4-Channel Analog Output Module
HMC-RIO3232RT5	Digital I/O Remote Module with 32 DI (NPN / PNP), 16 DO (Relay Output) & 16 DO (Transistor Output)

Ordering Information

DMCNET Gateway Type Remote Modules	
ASD-DMC-GA01	DMCNET Gateway Type Remote Power Coupler
ASD-DMC-GE01PH	DMCNET Gateway Type Pulse Output Remote Module (1-Channel of 4M High-speed Pulse Interface)

EtherCAT Remote Modules	
R1-EC5500D0	E-BUS Remote Power Coupler
R1-EC5621D0	1-Channel Pulse Output Remote Module
R1-EC5614D0	MPG Extension Module
R1-EC6002D0	Digital Input Remote Module (NPN / PNP); response time < 0.1ms
R1-EC6022D0	Input Remote Module (NPN / PNP); response time 2ms
R1-EC7062D0	Digital Output Remote Module (NPN)
R1-EC70A2D0	Digital Output Remote Module (PNP)
R1-EC70E2D0	Digital Output Remote Module (NPN)
R1-EC70F2D0	Digital Output Remote Module (PNP)
R2-EC0902D0	Digital Input / Output Remote Module with Relay

ASIA (Taiwan)



Taoyuan
Technology Center
(Green Building)

Taoyuan Plant 1

Tainan Plant
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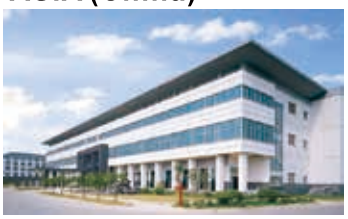
ASIA (China)



Wujiang Plant 3

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Tokyo Office

ASIA (India)

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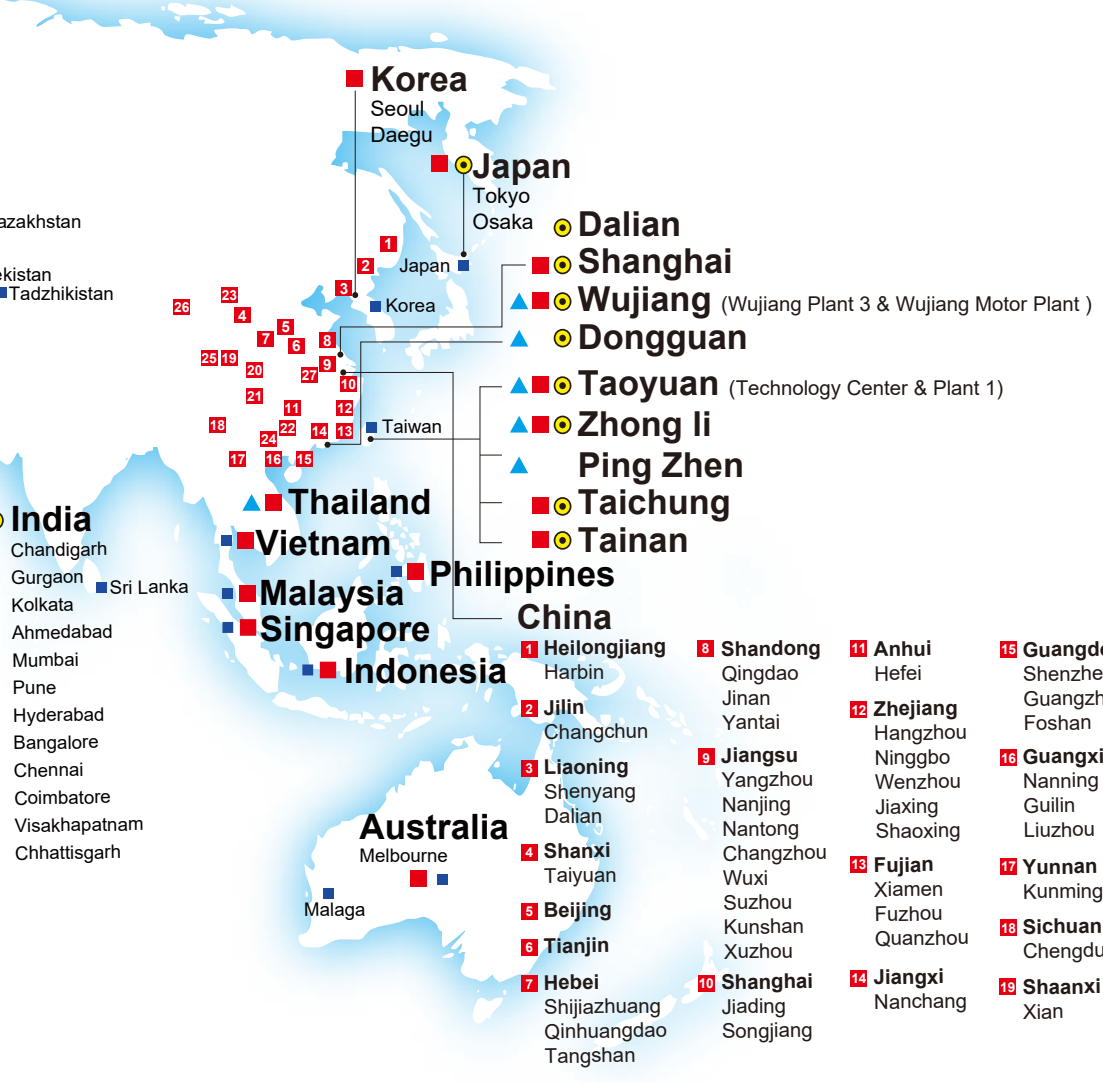
Amsterdam, the Netherlands

AMERICA

Research Triangle Park, U.S.A.

▲ 8 Factories ■ 117 Branch Offices ⊙ 13 R&D Centers ■ 915 Distributors



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Industrial Automation Headquarters

Delta Electronics, Inc.
Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

Asia

Delta Electronics (Shanghai) Co., Ltd.
No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: 86-21-6872-3988 / FAX: 86-21-6872-3996
Customer Service: 400-820-9595

Delta Electronics (Japan), Inc.
Tokyo Office
Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: 81-3-5733-1155 / FAX: 81-3-5733-1255

Delta Electronics (Korea), Inc.
Seoul Office
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

Delta Energy Systems (Singapore) Pte Ltd.
4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.
Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: 91-124-4874900 / FAX : 91-124-4874945

Delta Electronics (Thailand) PCL.
909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: 66-2709-2800 / FAX : 662-709-2827

Delta Electronics (Australia) Pty Ltd.
Unit 20-21/45 Normanby Rd., Notting Hill Vic 3168, Australia
TEL: 61-3-9543-3720

Americas

Delta Electronics (Americas) Ltd.
Raleigh Office
P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

Delta Electronics Brazil
São Paulo Sales Office
Rua Itapeva, 26 - 3°, andar Edificio Itapeva,
One - Bela Vista 01332-000 - São Paulo - SP - Brazil
TEL: 55-12-3932-2300 / FAX: 55-12-3932-237

Delta Electronics International Mexico S.A. de C.V.
Mexico Office
Gustavo Baz No. 309 Edificio E PB 103
Colonia La Loma, CP 54060
Tlalnepantla, Estado de México
TEL: 52-55-3603-9200

EMEA

Headquarters: Delta Electronics (Netherlands) B.V.
Sales: Sales.IA.EMEA@deltaww.com
Marketing: Marketing.IA.EMEA@deltaww.com
Technical Support: iatechnicalsupport@deltaww.com
Customer Support: Customer-Support@deltaww.com
Service: Service.IA.emea@deltaww.com
TEL: +31(0)40 800 3900

BENELUX: Delta Electronics (Netherlands) B.V.
De Witbogt 20, 5652 AG Eindhoven, The Netherlands
Mail: Sales.IA.Benelux@deltaww.com
TEL: +31(0)40 800 3900

DACH: Delta Electronics (Netherlands) B.V.
Coesterweg 45, D-59494 Soest, Germany
Mail: Sales.IA.DACH@deltaww.com
TEL: +49(0)2921 987 0

France: Delta Electronics (France) S.A.
ZI du bois Challand 2, 15 rue des Pyrénées,
Lisses, 91090 Evry Cedex, France
Mail: Sales.IA.FR@deltaww.com
TEL: +33(0)1 69 77 82 60

Iberia: Delta Electronics Solutions (Spain) S.L.U
Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
TEL: +34(0)91 223 74 20

Carrer Llacuna 166, 08018 Barcelona, Spain
Mail: Sales.IA.Iberia@deltaww.com

Italy: Delta Electronics (Italy) S.r.l.
Via Meda 2–22060 Novedrate(CO)
Piazza Grazioli 18 00186 Roma Italy
Mail: Sales.IA.Italy@deltaww.com
TEL: +39 039 8900365

Russia: Delta Energy System LLC
Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow Russia
Mail: Sales.IA.RU@deltaww.com
TEL: +7 495 644 3240

Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)
Şerifali Mah. Hendem Cad. Kule Sok. No:16-A
34775 Ümraniye – İstanbul
Mail: Sales.IA.Turkey@deltaww.com
TEL: + 90 216 499 9910

GCC: Delta Energy Systems AG (Dubai BR)
P.O. Box 185668, Gate 7, 3rd Floor, Hamarain Centre
Dubai, United Arab Emirates
Mail: Sales.IA.MEA@deltaww.com
TEL: +971(0)4 2690148

Egypt + North Africa: Delta Electronics
Unit 318, 3rd Floor, Trivium Business Complex, North 90 street,
New Cairo, Cairo, Egypt
Mail: Sales.IA.MEA@deltaww.com