

Safety Precautions

- Important Notes on exporting this product or equipment containing this product;
If the end-user or application of this product is related to military affairs or weapons, its export may be controlled by "Foreign Exchange and Foreign Trade Control Law" of Japan where export license will be required before product can be exported from Japan.
- This product is designed and manufactured for use in General Purpose Industrial Equipment and it is not intended to be used in equipment or system that may cause personal injury or death.
- All servicing such as installation, wiring, operation, maintenance and etc., should be performed by qualified personnel only.
- Tighten mounting screws with an adequate torque by taking into consideration strength of the screws and the characteristics of material to which the product will be mounted. Over tightening can damage the screw and/or material; under tightening can result in loosening.
*Example: apply 2.7 N·m – 3.3 N·m torque when tightening steel screw (M5) to steel surface.
- Install safety equipment to prevent serious accidents or loss that is expected in case of failure of this product.
- Consult us before using this product under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a lesser air contamination.
- We have been making the best effort to ensure the highest quality of our products, however, some applications with exceptionally large external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Please be careful when using the product in an environment with high concentrations of sulfur or sulfuric gases, as sulfuration can lead to disconnection from the chip resistor or a poor contact connection.
- Do not input a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may lead to damage of the internal parts, causing smoke and/or fire and other troubles.
- The user is responsible for matching between machine and components in terms of configuration, dimensions, life expectancy, characteristics, when installing the machine or changing specification of the machine. The user is also responsible for complying with applicable laws and regulations.
- Manufacturer's warranty will be invalid if the product has been used outside its stated specifications.
- Component parts are subject to minor change to improve performance.
- Read and observe the instruction manual to ensure correct use of the product.

Repair

Consult to the dealer from whom you have purchased this product for details of repair work.
When the product is incorporated to the machine you have purchased, consult to the machine manufacturer or its dealer.

URL

Technical information of this product (Operating Instructions, CAD data, Inquiries) can be downloaded from the following web site.
< industrial.panasonic.com/ac/e/ >

Contact :



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ISO9001
Certificate
division



ISO14001
Certificate
division

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The contents of this catalog apply
to the products as of November 2017.

Panasonic



AC Servo
Network
Linear and Direct
Drive Control

2017/11
Catalog

Collaboration

Network, Linear & Direct Drive Motor Control System

www.motiontech.com.au

Servo motor that brings out potential of the machine.

“Realtime Express” model

A6N series



- Com. period min. 0.0625 ms
- Standard Ethernet cable*1 using

EtherCAT communication type

A6B series



- CiA 402 protocol is available
- Standard Ethernet cable*1 using

Linear and DD motor control type

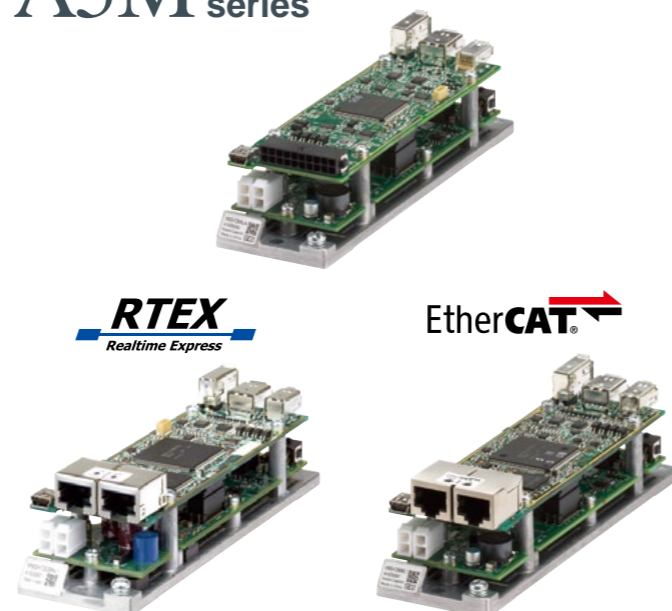
A6L series



- Position, Speed, Thrust control and Block operation
- Drastically reduced setup time by automatic setup

Ultra compact DC Servo

A5M series



- Line-up: DC24 V/48 V and up to 30 W rotary motor and linear
- Control Line-up: Pulse train, RTEX and EtherCAT

[Partner product] (Quality of partner product is guaranteed by the manufacturer and distributor.)

RTEX (Applicable product : A6N / A6NL / A5MN series)

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*1 Shielded twisted pair cable (CAT5e or higher)

Ultra High-Speed Network Servo MINAS A6N series



Realtime Express (RTEX)

Ultimate Real-time performance

- Com. period min. **0.0625 ms**
- Com. speed **100 Mbps** Full-duplex
- Velocity response **3200 Hz**

Max 16000 times/s

Functionality to meet various needs

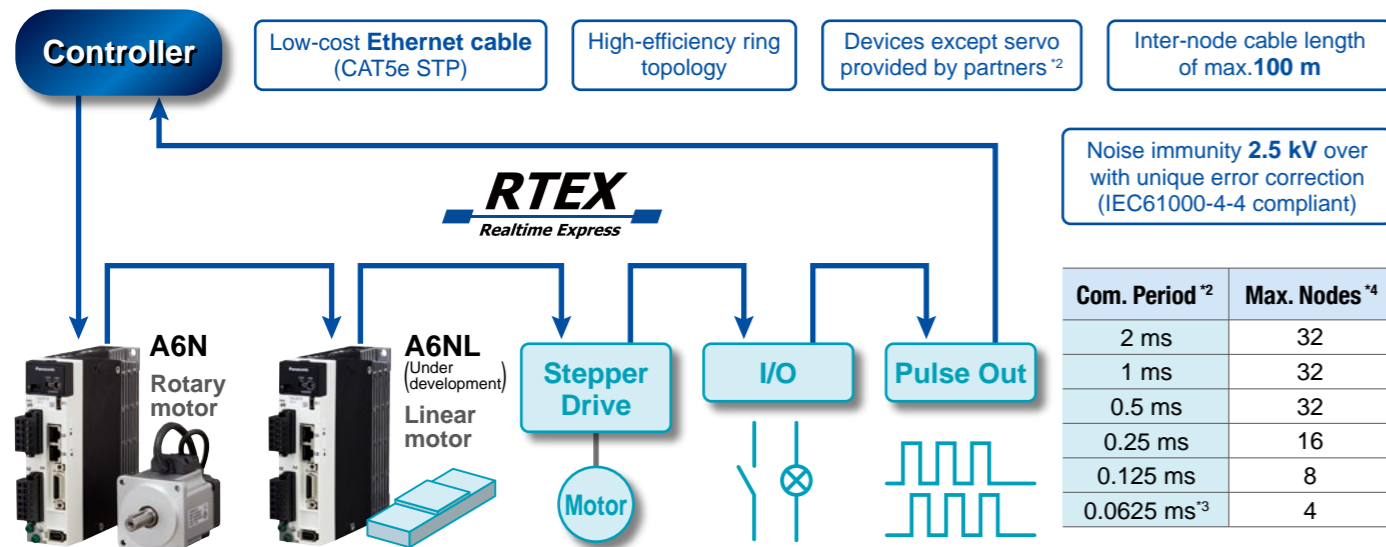
- Precise position latch & comparing
- Infinitely rotatable absolute encoder
- IEC safety I/F model available *1

Simple network

- High-performance & Low-cost
- Isochronous established by ASIC
- Easy device development

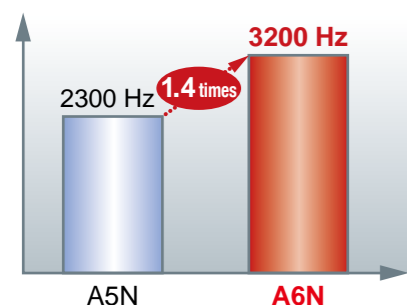


[Typical system configuration]

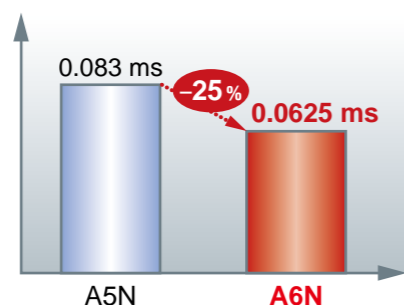


*1: Multi-functional type F. IEC61800-5-2 STO, IEC61508 SIL3. *2: The communication period and connection of slave devices depend on the controller specification. *3: For communication period 0.0625 ms, command update period is 0.125 ms only. *4: Slave nodes.

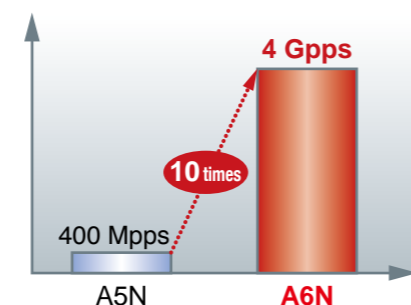
• Speed response frequency



• Minimum communication period



• Maximum pulse frequency



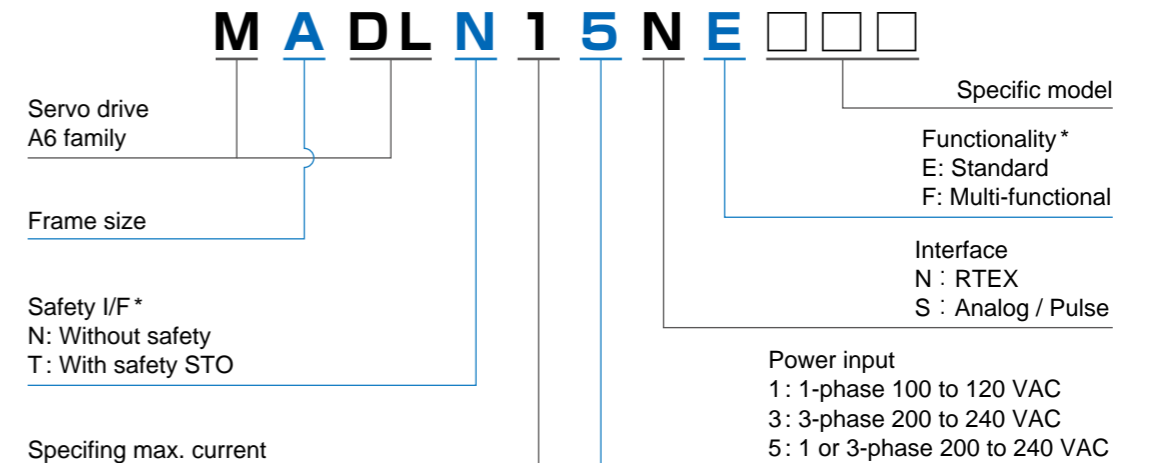
* Max. frequency is 8 Mpps when A/B phase feedback scale is used.

Drive list

Drive power supply	Frame size	Motor rated output											
		50 W	100 W	200 W	400 W	750 W	1 kW	1.5 kW	2 kW	3 kW	4 kW to 5 kW		
1-phase 100 to 120 VAC	Model No.	MADLN 01NE	MADLN 11NE	MBDLN 21NE	MCDLN 31NE								
	Frame size	A	A	B	C								
1 or 3-phase 200 to 240 VAC	Model No.	MADLN 05NE	MADLN 15NE	MBDLN 25NE	MCDLN 35NE	MDDLN 45NE	MDDLN 55NE						
	Frame size	A	A	B	C	D	D						
3-phase 200 to 240 VAC	Model No.									MEDLN 83NE	MFDLN A3NE	MFDLN B3NE	
	Frame size									E	F	F	

- The above table shows a drive model number (Type E) in typical combination.
- Since some motors are not suitable for the model number listed above, confirm the valid combination by the A6 family catalog.

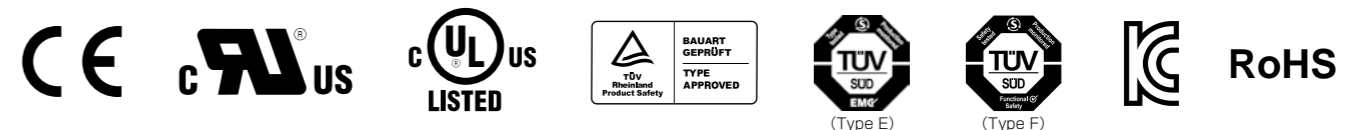
Model nomenclature



* The combination has the following limitation. The standard type E is without safety I/F, and the multi-functional type F is with safety I/F.

	Standard Type E	Multi-functional Type F
Safety STO	—	○
Full-closed control	—	○

Compliance



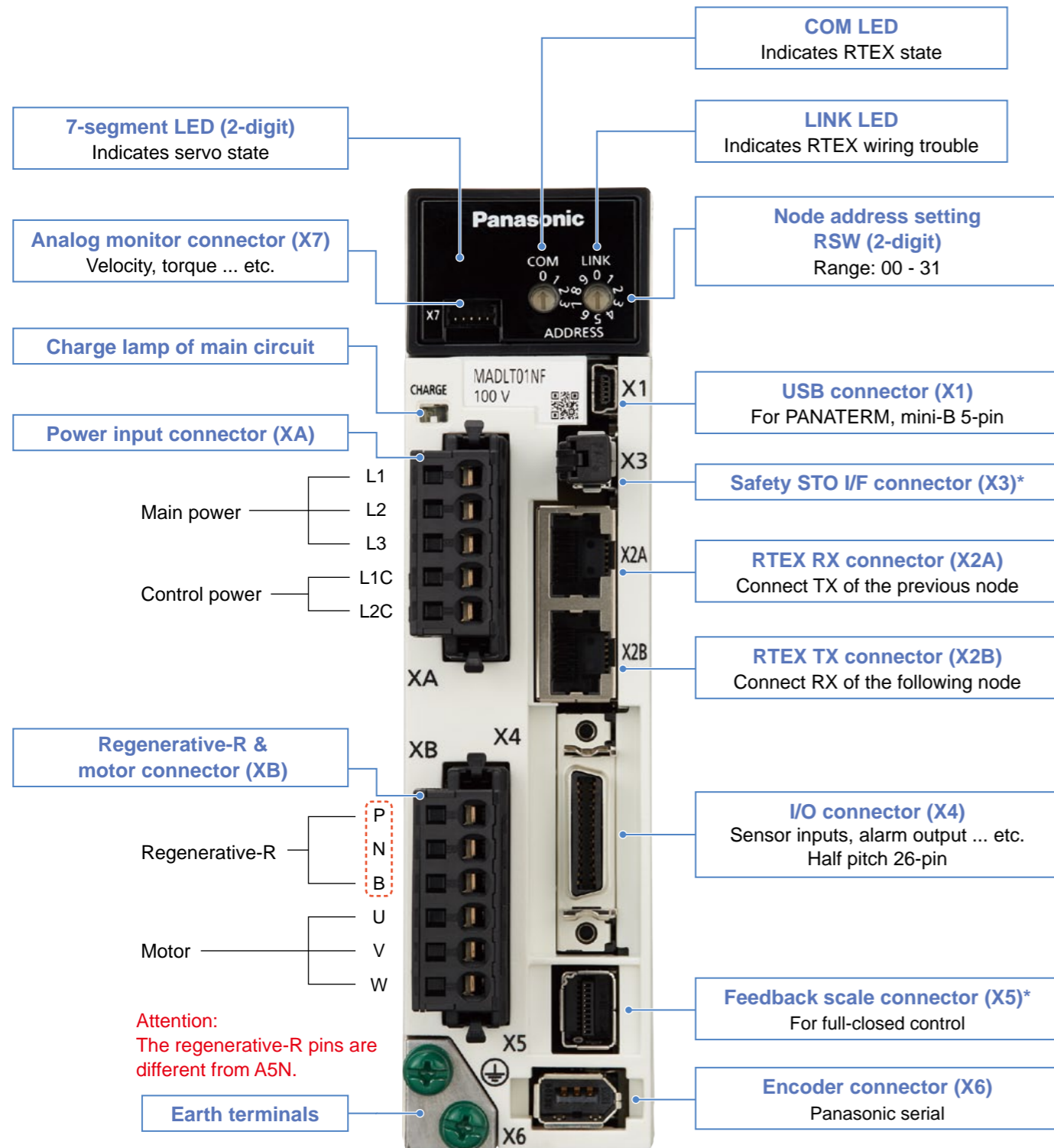
Ultra High-Speed Network Servo MINAS A6N series



Drive appearance

A6N size A

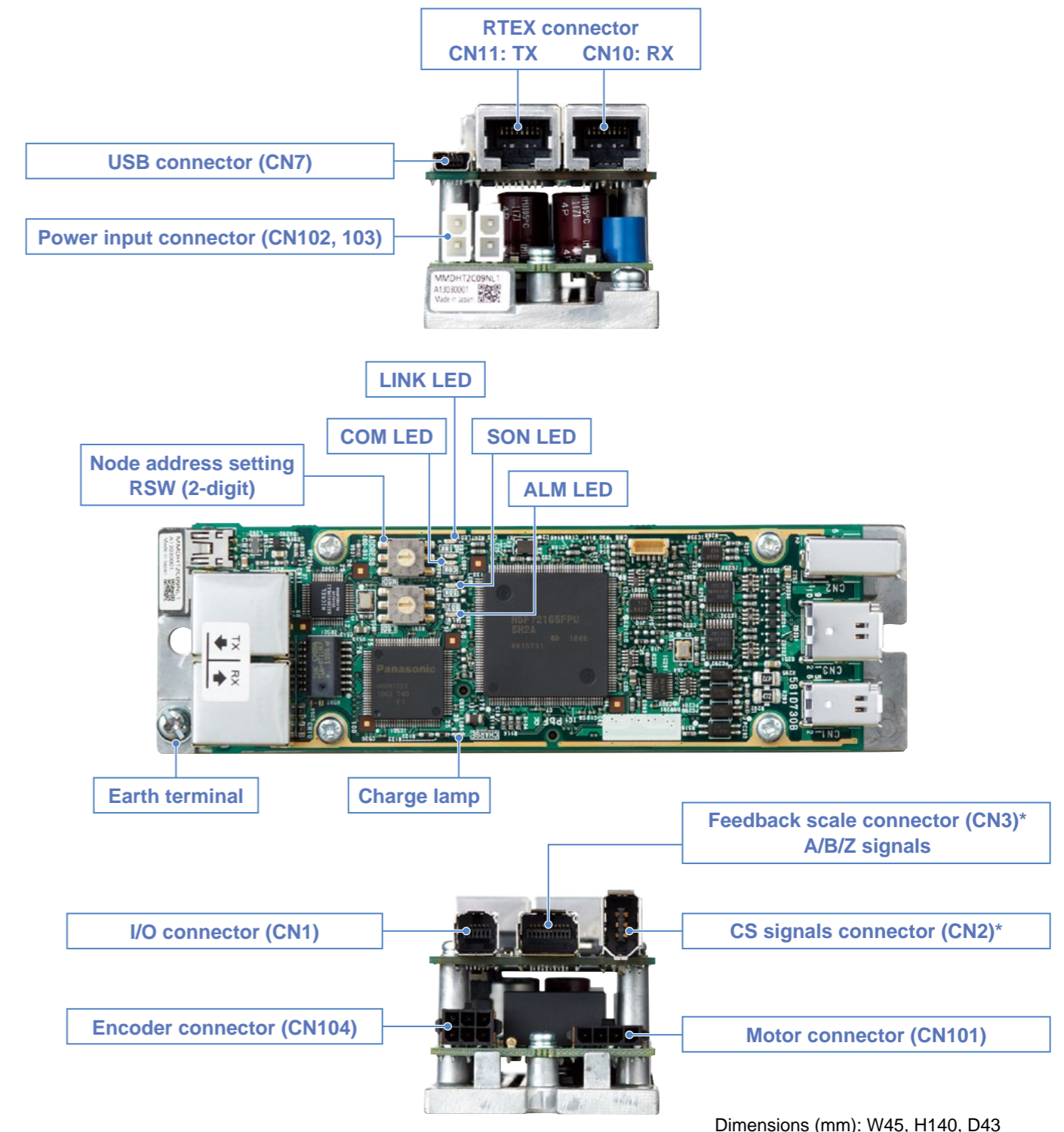
* This photo shows multi-functional type F. Standard type E does not have X3 and X5 connectors.



Ultra compact A5MN size M (24 VDC 10 W to 30 W)

• This product is not A6N, but A5N series for specific customers. For more details, refer to the specifications.

* This photo shows the type for linear motor. The type for rotary motor does not have CN2 and CN3 connectors.

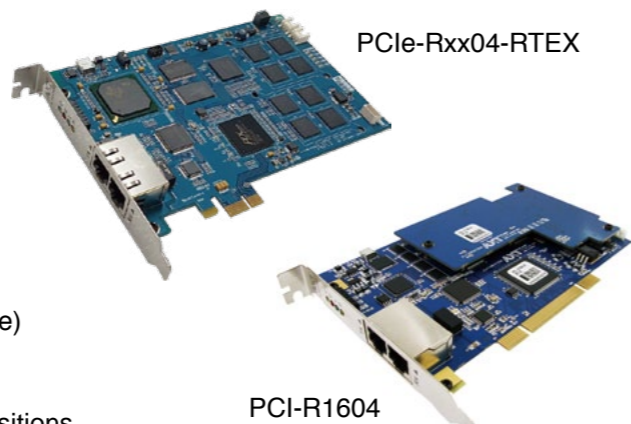


RTEX Master Board

PCIe-Rxx04-RTEX, PCI-R1604

Features

- RTEX network Master Board
- Network Speed 100 Mbps, Communication Period 0.5 ms
- Support RTEX Standard Servo Profile, Standard I/O Profile
- PCIe-Rxx04-RTEX Basic configuration is 8 axes control (Can be expanded to 16, 24 and 32axes)
- PCI-R1604 Basic configuration is 16 axes control (Can be expanded to 20, 24, 28 and 32axes)
- Easy to wire, saving wiring working-hour
- Max. 32 nodes
- Network connection - 100 BASE-TX, STP Cable (above CAT5e)
- Excellent Error correction
- Multi-axes linear / circular interpolation
- Limit setting functions : soft stop, emergency stop, and two positions



Specification

Item	Description
RTEX Master Board	
Max. number of nodes	32
Max. ring loop length	200 m
Max. node to node length	60 m
Connector / cable type	RJ45 RX/TX, STP (Shielding type)
Power supply / current consumption	3.3 Vdc / 1.5 A (PCIe-Rxx04-RTEX) 5 Vdc / 1.0 A (PCI-R1604)
Position range	32-bit (±2147483648)
Motion	
Interpolation	Max. 32 synchronized drive, 2 to 4 axes linear interpolation, and 2 axes arc interpolation
Gantry motion	Max. 32 slave axes can follow the master axis to move synchronously

Item	Description
Software	
User Agent Software	EzSoftware UC
Operating System	Windows 7 (32-bit, 64-bit) Windows 10 (32-bit, 64-bit)
General specification (PCIe-Rxx04-RTEX)	
Dimension	167.65 mm x 111.15 mm
Weight	116 g
Operation temperature	0 °C to 55 °C
General specification (PCI-R1604)	
Dimension	174.63 mm x 106.00 mm
Weight	120 g (Expend 32axes-161 g)
Operation temperature	0 °C to 60 °C

Application Sample

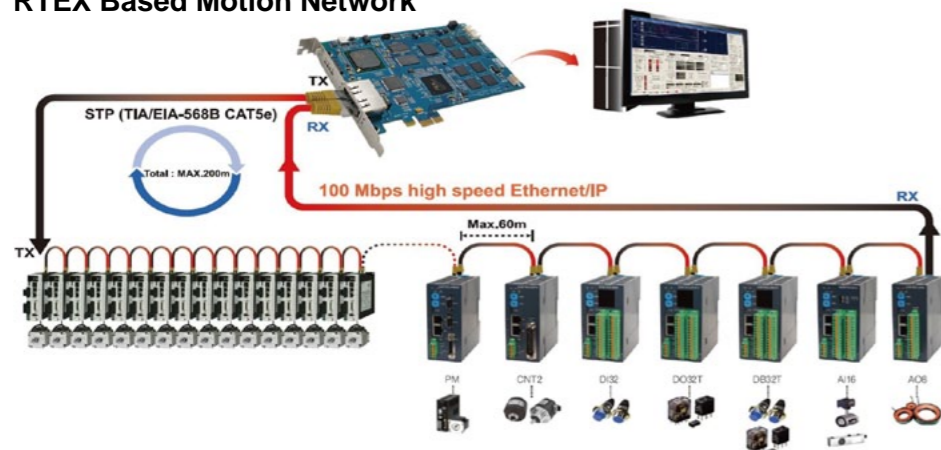
- Semiconductor front/back end process field
- Solar Energy/FPD/PCB field
- Processing machine field

Please contact the following address for details

URL : <http://www.ajinextek.com/ENG/menu02/page01.php>




System Configuration

RTEX Based Motion Network






Master Board	PCIe-Rxx04-RTEX PCI-R1604
Motion Module	N3RTEX-PM2Q/4Q
DIO Module	N3RTEX-DI32 N3RTEX-DO32T N3RTEX-DB32T
AIO Module	N3RTEX-AI16 N3RTEX-AO8
Counter Module	N3RTEX-CNT2



Motion Function Module - N3RTEX-PM2Q/4Q, N3RTEX-CNT2

Item	Description		
	N3RTEX-PM2Q	N3RTEX-PM4Q	N3RTEX-CNT2
Model	 2Axes Motion Control Module	 4Axes Motion Control Module	 2ch Counter Module Encoder count range : 28 Bit
Node ID setting	Decimal number rotary switch x 2 (0~31)		
Power supply	DC 24 V / 200 mA		
LED display	Power(Yellow), Link(Green), Error(Red), Communication(Green)		
Pulse output	Interface : Differential Speed : Max. 10 MPPS	None	
Encoder input interface	High-speed Photo-coupler		Line Receiver
Trigger output	Differential, Open collector (24 VDC Level)		Differential, TTL (5 VDC Level), Open-collector (24 VDC Level)
Connector	Comm. : RJ45 LAN x 2EA 26pin axis connector x 2EA 26pin Motion I/O connector x 1EA	Comm. : RJ45 LAN x 2EA 26pin axis connector x 4EA 26pin Motion I/O connector x 2EA	Comm. : RJ45 LAN X 2EA Cnt : D-SUB 25pin X 1EA

Digital Input / Output Function Module - N3RTEX-DI32, N3RTEX-DO32T, N3RTEX-DB32T

Item	Description		
	N3RTEX-DI32	N3RTEX-DO32T	N3RTEX-DB32T
Model	 32ch Digital Input Module	 32ch Digital Output Module	 16ch Digital Input & 16ch Digital Output Module
Node ID setting	Decimal number rotary switch x 2 (0~31)		
Power supply	DC 24 V / 300 mA		
LED display	Power(Yellow), Link(Green), Error(Red), Communication(Green)		
Connector	Comm. : RJ45 LAN x 2EA DINKLE 16 x 2EA (ESC381VM-16P)	Comm. : RJ45 LAN x 2EA DINKLE 16 x 2EA (ESC381VM-16P)	Comm. : RJ45 LAN x 2EA DINKLE 16 x 2EA (ESC381VM-16P)

Analog Input / Output Function Module - N3RTEX-AI16, N3RTEX-AO8

Item	Description	
	N3RTEX-AI16	N3RTEX-AO8
Model	 16ch Analog Input Module	 8ch Analog Output Module
Node ID setting	Decimal number rotary switch x 2 (0~31)	
Power supply	DC 24 V / 150 mA	
LED display	Power(Yellow), Link(Green), Error(Red), Communication(Green)	
Connector	Comm. : RJ45 LAN x 2EA DINKLE 16 x 2EA (ESC381VM-16P)	Comm. : RJ45 LAN x 2EA DINKLE 16 x 1EA (ESC381VM-16P)

General Specification

- Dimension (HxDxW) : 112 mm x 90 mm x 54 mm (N3RTEX-PM4Q, DI32, DO32T, DB32T, AI16)
112 mm x 90 mm x 44 mm (N3RTEX-PM2Q, CNT2, AO8)
- Operation temperature : 0 ~ 55 °C

Sales area and Language



- Korean
- Chinese
- English

Please contact the following address for details.

For more information

URL : <http://www.ajinextek.com/ENG/>

Contact: **AJINEXTEK CO., LTD.**
9-3, Horim-dong, Dalseo-gu, Daegu-city, Korea

[E-mail: marketing@ajinextek.com]
TEL: +82-53-593-3700 FAX: +82-53-593-3703

PLC Direct Access RTEX Motion Controller

PI-2300

Features

Building a leading edge high speed motion network at low cost under PLC

● Direct PLC access

The controller runs the motion program installed in PI while accessing PLC data register.

- Preparation of ladder program for communication is not required on PLC.
- No CPU burden on PLC.

● Simple motion control through data register

Motor can be controlled by operating PLC data register.

- Multiaxial motor can be controlled/monitored by simply operating numeric values on the data register.
- PLC operator having no knowledge on communication of motion (RTEX) can control the motor.

● Stepping motor can be mixed

- The motion network can contain servo motor and stepping motor.
- Ultra high-speed fully-synchronized motion system can be built.



Specification

Item	Description
Power supply	24 Vdc±10 % 300 mA MAX
Operating temperature and humidity	0 °C to 50 °C, 90 %RH max. (no dewing)
Outline dimensions (mm)	W24.5 × D105 × H160
Communication with PLC	Ethernet 10/100 BASE-T Conforms to MC protocol
Setting tool	PI Assistance (complimentary)
Control signal I/O	Initialization input, system alarm output and node alarm output
Motion network	RTEX command updating period: 1 ms
No. of connection nodes	Max. 16
Motion control	Positioning and synchronized operation

2-phase Microstep Drive

D4610 (1 Axis type) / D4620 (2 Axis type)

Features

Leading Edge High Speed Motion Network (RTEX) At Low Cost

● High performance CPU enhances drive capability

- Step-out detection
- Motor over current protection
- Brake control (only D4610)
- Closed loop control by encoder signal (only D4610)
- Triangle drive prevention
- Vibration suppression

● RTEX in motion network

● Network can connect up to 32 axes (depending on master specification)

● Simultaneous multiaxial control within 0.16 ms, 0.5 msec, 1 msec communication period



D4610

D4620

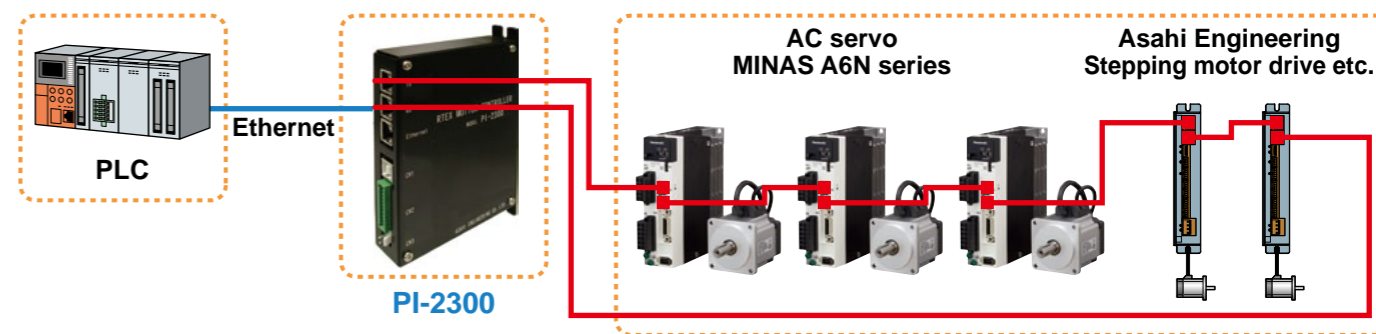
Specification

Item	Description	
	D4610	D4620
Axis	1	2
Power supply	Main power supply : 24 VDC±10 % (3.0 A MAX) Control power supply : 24 VDC±10 % (1.0 A MAX) Sensor power supply : 24 VDC±10 % (0.1 A)	Main power supply : 24 VDC±10 % (5.0 A MAX) Control power supply : 24 VDC±10 % (1.0 A MAX) Sensor power supply : 24 VDC±10 % (0.1 A)
Applicable motor	2.55 A/phase or less 2-phase HB type stepping motor	
Micro step resolution	Basic step divided by 200 (for 40000 p/r basic step 1.8 deg motor)	
Communication specification	Realtime Express (RTEX)	
Input signal	Sensor input 4 (HOME, EX, CWLS, CCWLS), encoder input (only D4610) and stop input	
Output signal	Brake output and alarm output	Alarm output
Protective function	Over current, power supply voltage monitoring and step-out detection(only D4610)	
Environment	Ambient temperature	0 °C to 50 °C (no freezing), Storage: -20 °C to 60 °C (no freezing)
	Ambient humidity	90 %RH max. (no dewing). Storage: 90 %RH max. (no dewing)
	Atmosphere	Indoor (no direct sunshine). No corrosive gas, flammable gas, oil mist, dust, etc.
	Altitude	Max. 1000 m above sea level
	Operating vibration (shock) environment	Max. 2 G (10 Hz to 250 Hz, in X,Y,Z direction 1 hour), max. 10 G (Ones)
Outline dimensions (mm)	160 × 95 × 29	180 × 85 × 35
Mass	275 g	308 g

Application Sample

This controller is suitable for semiconductor manufacturing equipment, machine tools, measuring machines, and other machinery.

System Configuration



- (1) Accessing PLC data register from PI-2300 over Ethernet
- (2) Based on the contents of data register, the PI sends command to each axis (motor operation).
- (3) The PI writes status information of each axis to data register.

Sales area and Language



- Japanese
- English

Only Japanese is used for inquiry over the phone.

When making an inquiry in English, please send it to the following address.

For more information

URL : <http://www.asahi-engineering.co.jp/english>

Contact: **Asahi Engineering Co., Ltd. Kodaira Works**
3-3-22, Gakuen-Higashicho, Kodaira-shi, Tokyo 187-0043, Japan

[E-mail: ae-sales@asahi-engineering.co.jp]
TEL: +81-42-342-4422 FAX: +81-42-342-4423

RTEX Network Motion Control board

MCN-8032P

Features

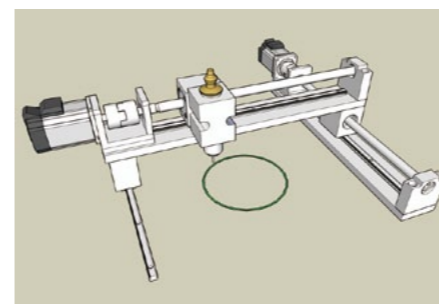
- RTEX (Real Time Express) servo network
- Network Speed 100 Mbps, communication period 1 ms
- Easy to wire, saving wiring working-hour
- Up to 32 nodes
- Excellent error correction
- Multi-axis linear / circular interpolation
- Multi-axis synchronous motion (for gantry)
- Up to 16 boards in one PC



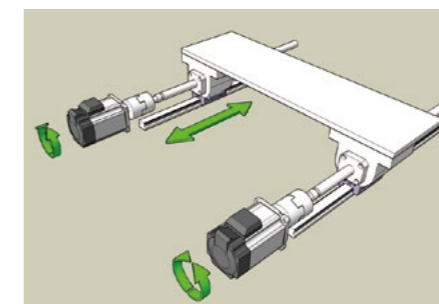
Specification

Item	Description
RTEX motion control	
Module type support	Servo motor, Linear motor, Stepper motor, I/O module, Pulse module
Max. number of nodes	32 (MCN-8032P)
Max. ring loop length	200 m
Max. node to node length	60 m
Connector / cable type	RJ45 8 pins, STP (Shielding type)
Isolation voltage	1500 Vrms
Noise immunity	Over 2.5 kV
LED loop status	Link / Comm (two elements LED)
Position range	32-bit (± 2147483648)
Motion	
Interpolation	32-axes linear interpolation / 2-axes circular interpolation (max. 16 pairs 2-axes circular interpolation)
Gantry motion	Max. 31 slave axes can follow the master axis to move synchronously
Position compare signal	All servo axis, up to 1 kHz
Software	
Software utility	MCN80XXP series utility for motion test and diagnosis
Driver / LIB	Driver for Windows 7 (64 / 32 bits), Windows XP (32 bits), DLL function for windows applications
General specification	
Certification	CE (applying)
Dimension(LxWxH)	175 mm x 107 mm x 20 mm
Power consumption	5 V / 3.3 V @ 1 A (Max.)
Operation temperature	0 °C to 60 °C

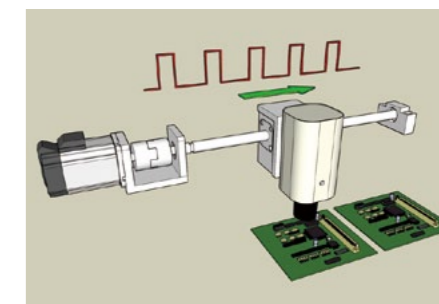
Application Sample



Linear and Circular Interpolations

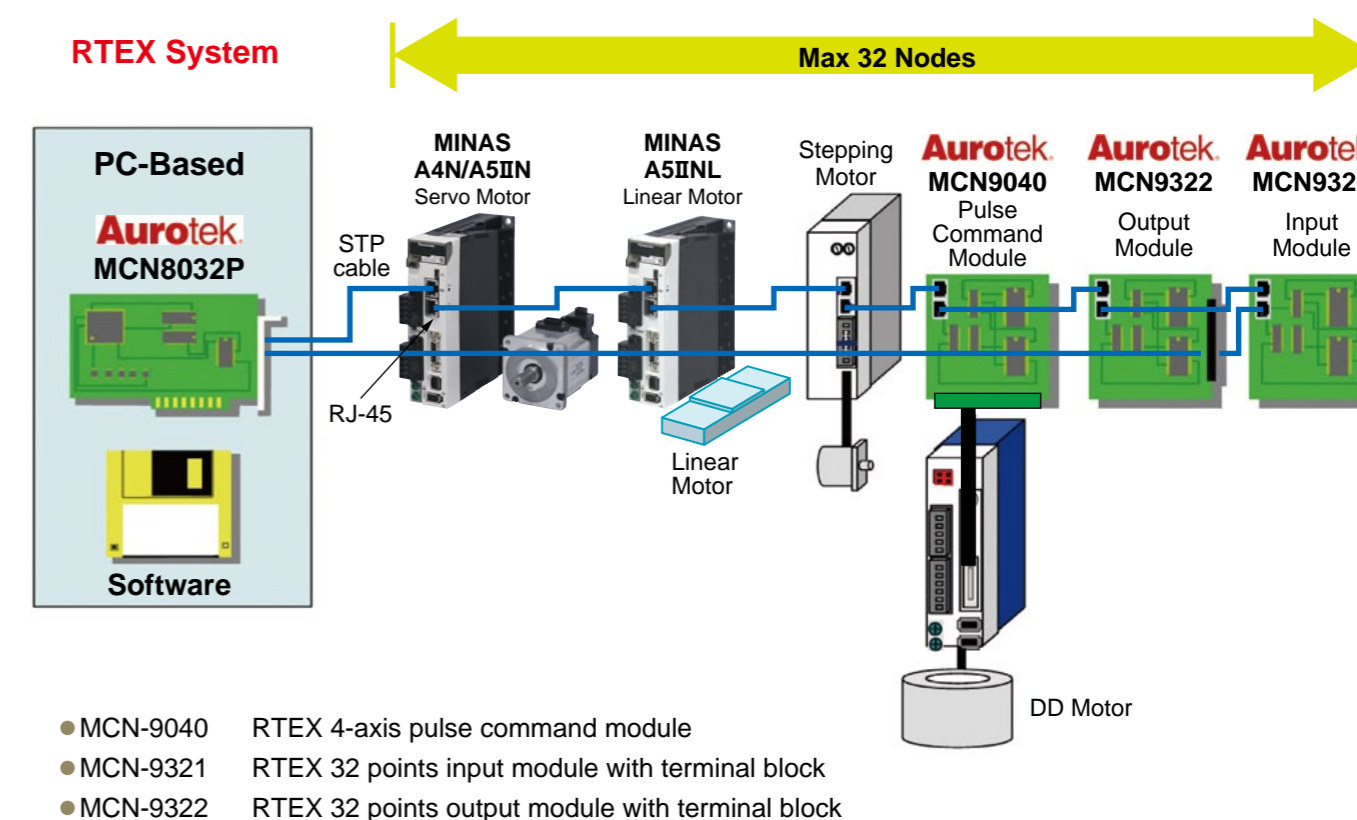


Gantry Motion



Position Comparing & Triggering Function

System Configuration



Sales area and Language



- English
- Chinese

For more information

URL : <http://www.robot.com.tw/EN/Default.aspx>

Contact: **Aurotek Corporation**

1st. Floor No. 60, Jhou-Zih St. Nei-Hu District, Taipei 114, Taiwan

[E-mail: sales@robot.com.tw]

TEL: +886-2-6600-7574 FAX: +886-2-8752-3347

PCI-Express RTEX Motion Controller

PXRP-3216CN

Features

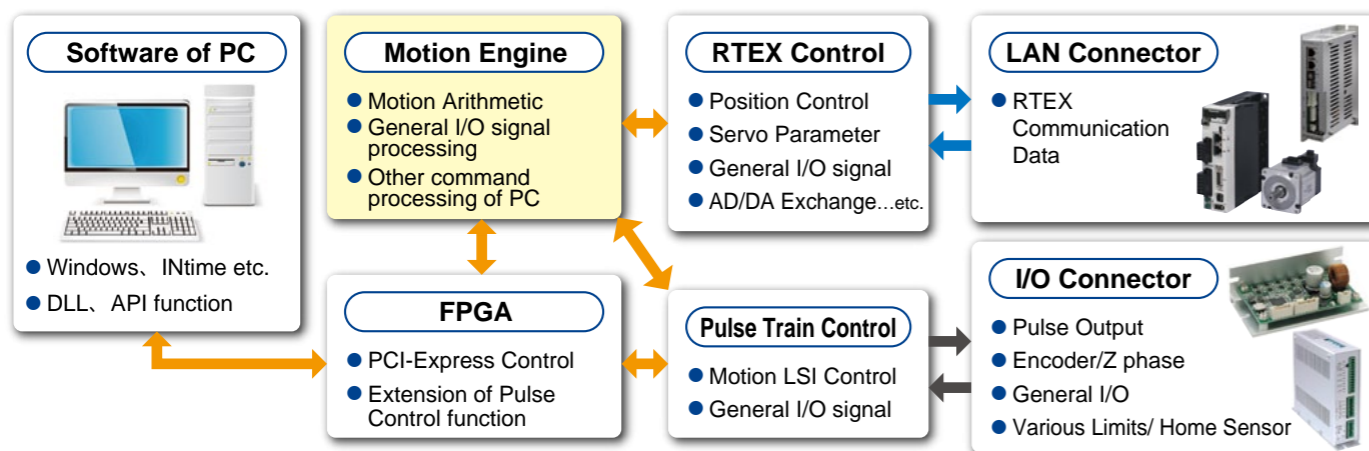
- 32 axes for RTEX, 4 axes for Pulse Control, total up to 36 axes.
- A device that cannot be connected to network, such as Stepping motor or Hollow motor, can be controlled by pulse train or I/O Control.
- the Input signal of I/O connector can use either Sink or Source.
- Torque Control or Position Control can be changed freely in Servo Amplifier, Various parameters can be set from Controller directly.
- It is expert in start with Liner or Circular, then Special interpolation control, such as, Ellipse, Cubic Interpolation or Cam action etc.



Specification

Item	Description	
	RTEX Control	Pulse Control
Number of Axis	32 axes	4 axes
Pulse Frequency	1 pps to 400 Mpps	8.191 Mpps
Accelerating/Decelerating function	Liner/S-Curve Acceleration/Deceleration (Asymmetric is OK), Stop Speed	Liner/S-Curve Acceleration/Deceleration (Asymmetric is OK)
Drive function	Absolute (relative) position drive, Continuous drive	
Interpolation function	Liner, Circular, Helical, 3 dimension	—
Synchronous function	Synchronous start, Axle linkage, Gantry Axis	Synchronous start
Override function	Acceleration time, Deceleration time, Object speed, Movement distance	Object speed, Movement distance
Command method	Realtime Express®	DIR/PULSE, CW/CCW, A phase /B phase
Communication/Update period	0.5 msec	—
Bus	PCI-Express Rev1.1	
OS	Windows (32 bit/64 bit) 7 / 8 / 10, INtime, Linux Ubuntu etc.	
Development environment	After Visual studio 2010	

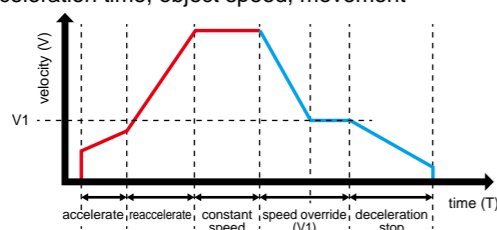
System Configuration



Main functions

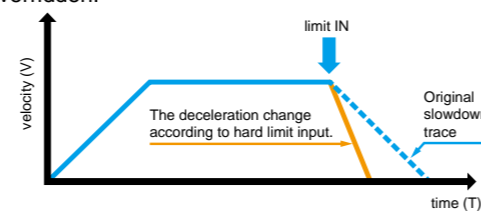
Free acceleration and deceleration setting

Starting speed and stopping speed set separately, during working, acceleration time, deceleration time, object speed, movement overrides is possible. Between 1 PPS and 400 MPPS, acceleration and deceleration setting can be set freely in 1msec as a unit.



Hard limit deceleration stop function

The Deceleration while hard limit is collided can be overridden.

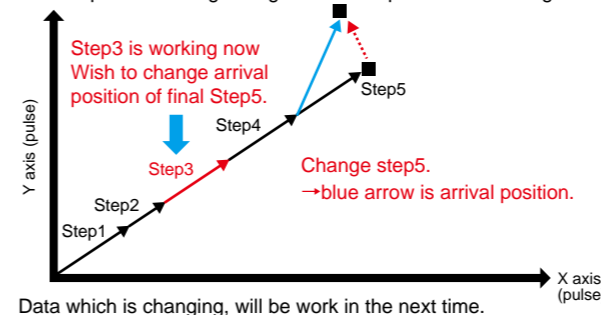


Main functions

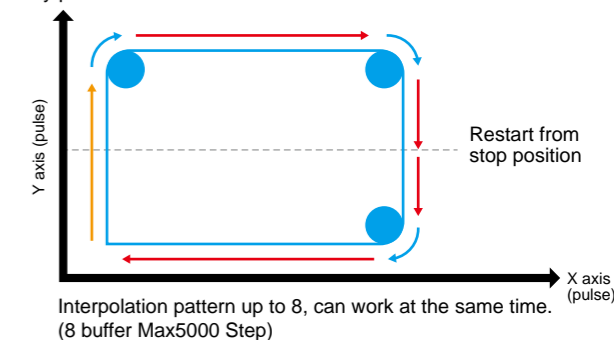
Interpolation Control function

Interpolation data up to 5000 steps can be recorded. During working, changing Interpolation data, changing/revising object position, pausing interpolation actions is possible at any time. In addition, from pausing to restarting, exchanging interpolation axis etc, is possible.

example)
The arrival position change image when interpolation is working

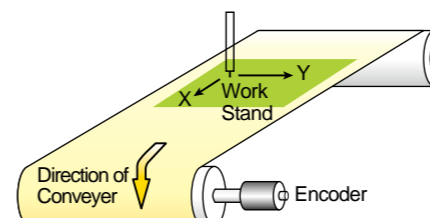


The following image when 7Step is working continuously, it can be stopped at any position.



Axle linkage function

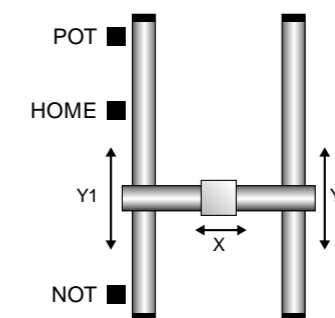
Axle linkage function is on one axis we can addition and subtraction command position (output pulse) or actual position (input pulse) of another axis.



Connect Work Stand (XYZ axis) to the encoder of conveyor, we do not need to stop conveyor to control Work Stand.

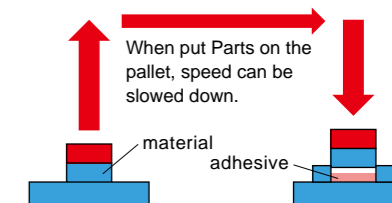
Gantry Axis Control

Gantry Axis Control is carried as a base function. Using axle linkage function, connect axis Y2 to axis Y1, then send command to axis Y1 only, axis Y2 is also operating.



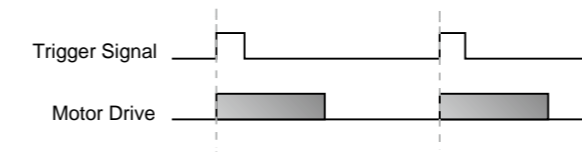
Soft landing function

When to stop the bonding equipment etc., according to the overshoot, shock will happen. Parts may be damaged. Soft landing function can control the overshoot, protects machine, material, or worker.



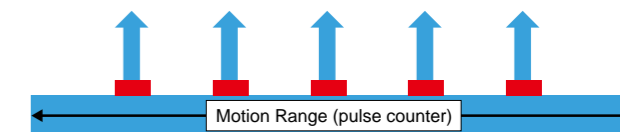
Trigger Input Drive function

Using General input as trigger signal, executing actions that was set beforehand. This function can be used for drive start, synchronous start.



Timing Output function

In the designated position or schedule time, sending output signal. This function can be used for ON/OFF Control of strobe light, camera shutter, sensor etc.



Sales area and Language



- Japanese
- Chinese

Please contact the following address for details.

For more information

URL : <http://www.cosmotechs.co.jp/> <http://www.shuitong.net/> (chinese)

Contact: **COSMOTECHS CO., LTD.**

2-6-1 Matsue Atsugi Kanagawa 245-0005 Japan

TEL: +81-49-222-7351 FAX: +81-46-222-7355

PCI Bus RTEX Motor Control Board

PCPG-168N-V / PCMC-168N

Features

PCPG-168N-V

- Control up to 16 axes in 0.5 ms period, accurate and fast control is possible.
- 4 axes pulse train output is possible. Also it can be performed by mixing with Network Control.
- Provide standard device driver, DLL, API

PCMC-168N

- CP Control : besides 16 axes, it can be performed up to 16 axes by PP control or connected to 16 I/O board.
- Max. 32 block can be controlled in 0.5 ms period.
- Provide standard device driver, DLL. We provide sample API to reduce the pressure of user application.



Specification

Item	Description	
Series	PCPG-168N-V	PCMC-168N
Max . Number of Axes	16 axes (CP Control)	CP Control : 16 axes + 16 blocks (I/O or PP Control)
Pulse Control	4 axes (output with RTEX at the same time is possible)	none
Interpolation Control	Liner Interpolation, Circular Interpolation, Continuous Interpolation	Liner Interpolation, Circular Interpolation, Continuous Interpolation
Accelerating / Decelerating Control	Liner Acceleration/Deceleration, S-Curve Acceleration/Deceleration	Liner Acceleration/Deceleration, S-Curve Acceleration/Deceleration
Max . Pulse Frequency	8 Mpps	8 Mpps
Command Updating Period	0.5 ms	0.5 ms

Line-up

● RTEX Stepping Driver

CTDR-0514NS

- 5-phase stepping driver
- CP Control method



CTDR-0514NS-4L

- 5-phase stepping driver
- PP Control method
- 4-axis type



● RTEX Input/Output Module

CTI-16NSW

- 16-point input
- WAGO733 connector
- 2 mA to 5 mA



CTO-16NSW

- 16-point output
- WAGO733 connector
- output : 100 mA



CTI-32NS

- 32-point input
- WAGO733 connector
- 2 mA to 5 mA



CTO-32NS

- 32-point output
- WAGO733 connector
- output : 100 mA



● RTEX Analog Input/Output Module

CTAD-08NSB

- AD converter : 8CH
- Analog ⇒ Digital exchange



CTADA-44NS

- AD/DA converter : 4CH
- Analog ⇔ Digital exchange



● RTEX Pulse Train Output Module

CTPG-48HNS

- Used for PP Control up to 4 axes
- RTEX ⇔ Pulse Train exchange



Stand-Alone Series RTEX Motor Controller

CSRC-32CN

Features

- A Stand-Alone motor control which can control up to 32 axes.
- ECAM, Liner Interpolation, Circular Interpolation, Ellipse Interpolation, Synchronous Control is possible.
- Max. Velocity can reach to 400 M pps, velocity can be changed in 1 ms, and accurate control is possible.
- Positioning data and feedback can be controlled by 32-bit counter. The resolution of Servo can be used flexibly.
- Modbus Touch Panel can be controlled, Stand-Alone Control is also possible.

Specification

Item	Description
Max . Number of Axes	CP Control : 32 axes + Dummy-Axis : 1 axis
Position Control	-2147483648 to 2147483647
Interpolation Control	Liner, Circular, Ellipse, Continuous Interpolation, EAM
Accelerating / Decelerating Control	1 ms to 65535 ms
Pulse Frequency	1 pps to 400 Mpps
Command Updating Period	0.5 ms
Others	It can be used with Modbus. We provide a multiple support tool.



PLC RTEX Motor Controller Module

CPLM-3216N-YE

Features

- Connect to Yokogawa PLC FA-M3.
- CP Control up to 16 axes, also PP Control up to 16 nodes.
- Special Interpolation mix with Liner, Circular, Ellipse Interpolation is possible.
- Max. Velocity can reach to 200 Mpps, velocity can be changed in 1 ms.
- Positioning data and feedback can be controlled by 32-bit counter. The resolution of Servo can be used flexibly.

Specification

Item	Description
Max . Number of Axes	CP Control : 16 axes + 16 blocks (I/O or PP Control)
Position Control	-2147483648 to 2147483647
Interpolation Control	Liner, Circular, Ellipse, Continuous Interpolation, Special Interpolation
Accelerating / Decelerating Control	1 ms to 65535 ms
Pulse Frequency	1 pps to 200 Mpps
Command Updating Period	0.5 ms
Others	WideField3 (Ladder). Provide motion data creating tool.



Sales area and Language



Please contact the following address for details.

- Japanese
- Chinese

For more information

URL : <http://www.cosmotechs.co.jp/>
<http://www.shhuitong.net/> (chinese)

Contact: **COSMOTECHS CO., LTD.**

2-6-1 Matsue Atsugi Kanagawa 245-0005 Japan

TEL: +81-49-222-7351 FAX: +81-46-222-7355

Turbo PMAC2 Realtime Express Controller

Turbo-PMAC2-RTEX series

Features

High specification motion controller with built-in PLC

- **Stand alone specification with built-in high-speed DSP (max. 240 MHz)**
Provided with USB 2.0, Ethernet or RS232C as standard port to communicate with host PC. Memory sharing with DPRAM option is possible.
- **Advanced trajectory calculations such as inverse kinematics and look ahead**
Advanced trajectory calculations necessary for linear interpolation, arc interpolation and spline interpolation, and robot control, and CP control by micro line segment feed are provided as standard features. All Turbo PMAC functions such as 2D and 3D positional compensation are available.
- **Various field networks promote multivendor environment (option)**
By adding CC-Link/DeviceNet/Profibus communication module, different manufacturers' devices can be connected.
- **I/O, pulse I/O, A/D and D/A function without intervention of network**
To standard accessories such as universal I/O, pulse input and pulse output, optional A/D and D/A can be added. By using the remote I/O unit ACC-34AA, expansion of 32 inputs, 32 outputs and universal I/O are possible. Because these can directly access the memory without intervention of a network, they can be easily handled.



Specification

Hardware specification	
Item	Description
Processor	DSP56300 series (Freescale) Standard 80 MHz (option 240 MHz)
Memory	Built-in 128 K x 24-bit SDRAM (option 512 K x 24-bit)
Backup	Settings and program can be stored to Flash RAM.
Communication interface	USB 2.0/Ethernet 100 BASE-TX (concurrent use is not possible), RS232C
Communication Period	Up to 6 kHz (only for Position command)
Power supply	24 Vdc 900 mA Min.
Pulse input	A/B phase rectangular input x 1-ch (6 MHz before multiplied by 4)
Pulse output	Pulse/direction output x 1-ch (max. 1.31 MHz)
Universal I/O	Input 8 points, output 4 points (sink/source selectable) Remote I/O expandable (ACC-34AA)
Universal A/D	12-bit x 2-ch (option)
Universal D/A	±10 V 12-bit x 1-ch (option)

Software specification	
Item	Description
No. of control axes	Max. 32 axes/16 coordinate systems
Controlling method	PTP control, trajectory (CP) control
Interpolation control	2-axis to 9-axis linear interpolation, 2-axis arc interpolation (rotatable) 3-axis spiral interpolation, spline interpolation
Unit of control	Pulse, or other desired industrial metrological unit
Accelerating/ decelerating method	Trapezoid/ S-curve Optional acceleration/ deceleration pattern (PVT mode)
Accelerating/ decelerating time	Min. 1 ms
Positioning range	±2 ³⁵ counts
Position compensation	Ball screw pitch error correction, orthogonal axis correction, plane correction
Other correcting functions	Backlash compensation, tool diameter compensation
PLC function	Interpreter/compile type total: 64 programs
Synchronous control	Electronic gear, electronic cam, motion synchronous I/O output (synchronous M variable)
Advanced trajectory calculation	Look ahead, forward/inverse kinematics operation

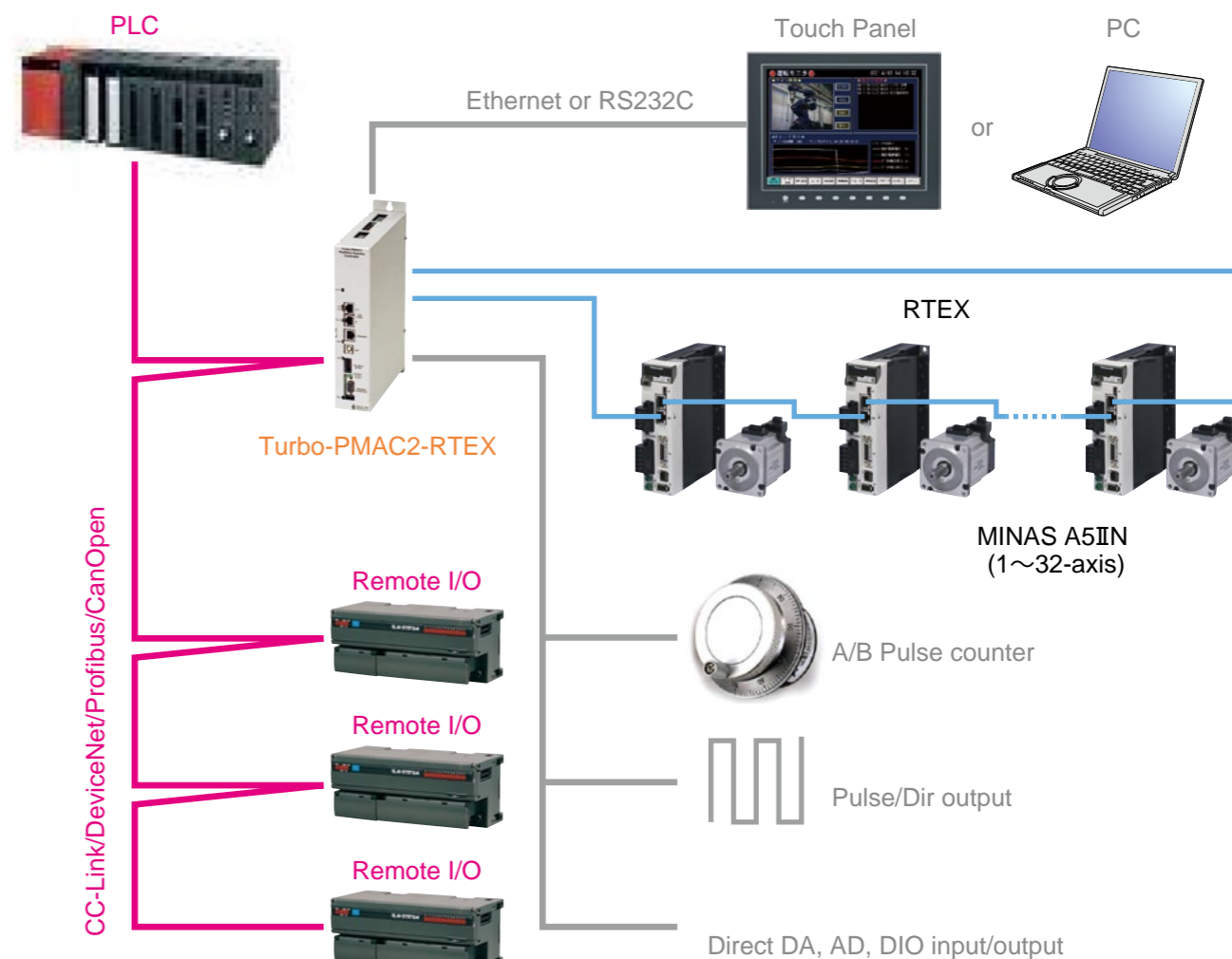
Application Sample

From the Simplest Application, to the Most Complex and EVERYTHING in Between...

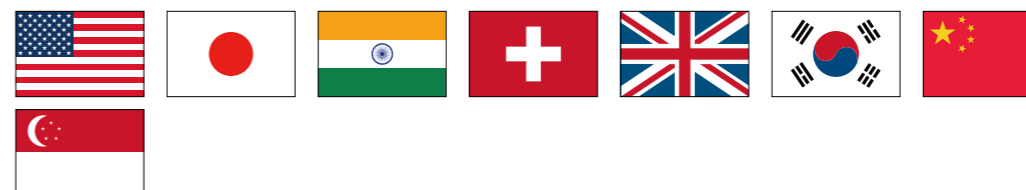
For details, please check out our Video Center for more information.

URL : http://www.deltatau.com/DT_Resources/VideoCenter.aspx

System Configuration



Sales area and Language



- English
- Chinese
- Korean
- Japanese

Please contact the following URL for details :

URL : http://www.deltatau.com/DT_About/aboutCorporateOffices.aspx

For more information

URL : <http://www.deltatau.com>

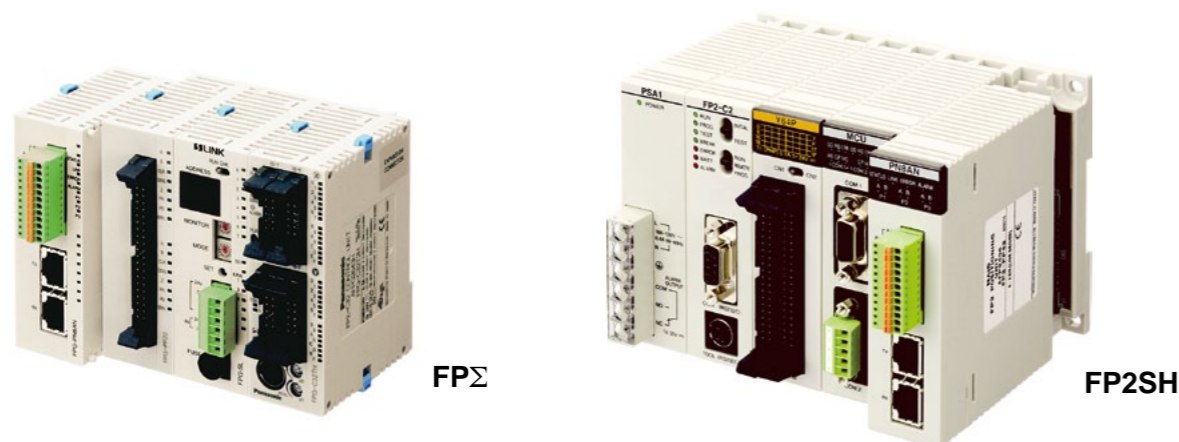
Contact: **Delta Tau Data Systems, Inc. USA West Coast Headquarters** [E-mail: sales@deltatau.com]
21314 Lassen Street Chatsworth, CA 91311, United States TEL: +1-818-998-2095 FAX: +1-818-998-7807

PLC Positioning Unit RTEX

AFPG43610, etc.

Features

- Compact PLC is easier to operate to control network servo MINAS A6N. (Units of Ver.1.4 or later supports A6N.)
- High speed 100 Mbps communications enable high precision arc/linear/spiral interpolation.
- 2-axis, 4-axis and 8-axis units are lined up and can be used to configure system of up to 16 axes with FPΣ and 256 axes with FP2SH.
- User-friendly tool software [Configurator PM] provides strong support for setup, start and monitor.
- Max. No. of position command points is 600/axis and max. position command rate is 32 Mpps, assuring margin of performance.
- Manual pulser input is provided to enable fine teaching.



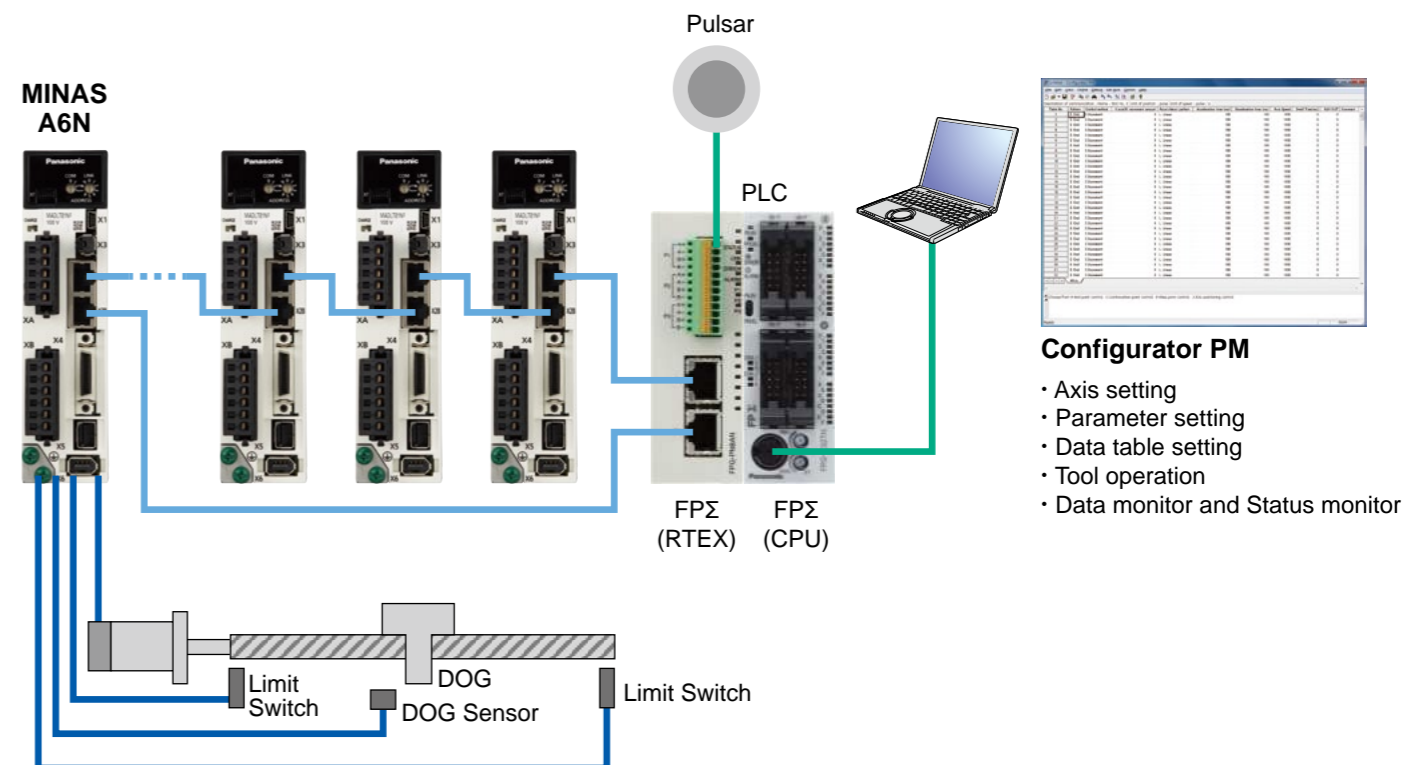
Specification

Part No. (FPΣ/FP2SH)		AFPG43610/AFP243610	AFPG43620/AFP243620	AFPG43630/AFP243630
No. of control axes		2-axis (2 axes × 1 system)	4-axis (4 axes × 1 system)	8-axis (8 axes × 1 system)
Position control function	Control method	PTP control, trajectory (CP) control		
	Interpolation control	2-axis, 3-axis linear interpolation, 2-axis arc interpolation, 3-axis spiral interpolation		
	Control unit	pulse/ μm/ inch/ degree		
	Positioning data	600 points/axis		
	Backup	Parameter and data table can be stored to FROM.		
	Accelerating/ decelerating method	Linear acceleration/deceleration and S-curve acceleration/deceleration		
	Accelerating/ decelerating time	0 to 10000 ms (in unit of 1 ms)		
	Positioning range	Signed 32-bit (-1073741823 to 1073741823 pulses) increment, absolute designation		
Velocity control function		With JOG operation (infinite feed operation)		
Torque control function		With real time torque limit function		
Origin return	Searching method	Near home (DOG) search, limit search, Z phase search, hit and stop		
	Creep velocity	Setting is optional		
Other		Pulser input operation/ auxiliary output code, auxiliary output contact/ dwell time/ in position contact/ 2-axis synchronization operation		

Application Sample

- Coil winding machine (Synchronized operation)
- Lens Polish machine
- Inspection machine for electronic device
- Heavy LCD panel handling (synchronized operation)
- Others

System Configuration



Sales area and Language



- Japanese
- English

For more information

FPΣ URL : <http://www3.panasonic.biz/ac/e/fasys/plc/plc/fpg/index.jsp>
 FP2SH URL : <http://www3.panasonic.biz/ac/e/fasys/plc/plc/fp2sh/index.jsp>
 URL : <http://panasonic.net/id/pidsx/global>

Contact: **Panasonic Industrial Devices SUNX Co.,Ltd.**

2431-1, Ushiyama-cho, Kasugai-shi, Aichi, 486-0901, Japan

TEL: +81-568-33-7861 FAX: +81-568-33-8591

Multi PLC Direct Connection 16-axis Motion Controller

"InterMotion" Series JOY-AMXR-P8 Including PLC (Using a C-like Language)

Features

- Directly connectable to Mitsubishi PLC (CPU with Ethernet: e.g. Q03UDECPU). Reference to the CPU D register in accordance with MC Protocol.
- Directly connectable to Keyence PLC KV-5000. Reference to the CPU D register in accordance with MC Protocol.
- Directly connectable to OMRON PLC (CPU with Ethernet: e.g. CJ1M-CPU11-ETN). Reference to CPU the Data Memory in accordance with FINS commands.
- Control with the .NET Framework interface on a Windows PC with Ethernet is possible.
- Position command generation and DIN/DOUT scan controls with the cycle time of 1ms.



Specification

Item	Description
No. of control axes	16: Max. 16-axis RTEX interface. For max. 8 axes out of the 16 axes, 10Mpps pulse train position command is possible.
Controlling method	Independent PTP control for each axis. Max. 8-axis synchronized PTP control. Linear interpolation, 2-axis arc interpolation, 3-axis spiral interpolation. 32-bit length.
Internal control program development	Control program can be developed using the C-like multiprocessing machine control language "MOS language." Motion control, IO control, communication control, and sequence control are possible. "MOS Bench AM" is required as a development environment.
Accessory IO	±CW/±CCW pulse output, ±A/±B/±Z input. Servo on, reset output. ±OT, alarm input. (The above-mentioned items are for 8 axes.) General-purpose IN 8 points. General-purpose OUT 8 points. Non-insulated RS232-1ch. Insulated RS485-1ch.
Optional functions	Camera trigger function using ±A/±B input counter and general-purpose OUT.
Optional devices	192IN, 192OUT are available by adding 6 general-purpose 32/32 IO boards. Non-insulated RS232-6ch is available using a RS232C extender board.

PCIExpress-40-axis Motion Control Board, PCI-40-axis Motion Control Board

"RT40PRE", "RT40PR" Including PLC (Using a C-like Language)

Features

- Max. 40 axes: 32-axis RTEX Interface and 10Mpps pulse train position command for 8 axes.
- Synchronization of axes controlled by RTEX and those controlled by pulse train output is possible.
- Windows Real-time software PLC using the C-like multiprocessing machine control language "MOS language."
- Windows7 Professional 64 bit and 32 bit are supported.
- Windows10 IoT Enterprise LTSB High End is supported.
- DIN, DOUT, AD, DA, RS232, and RS485 can be controlled in real time as well as motion control boards.

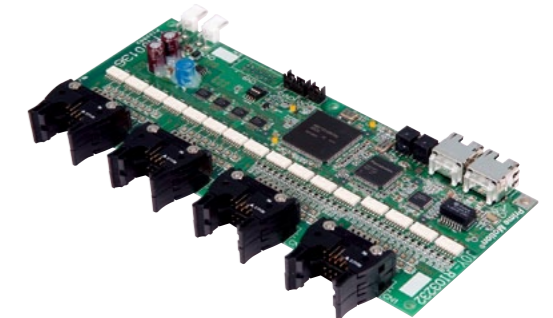


General Purpose 32/32 Input/Output Board

InterMotion Series JOY-RIO3232

Features

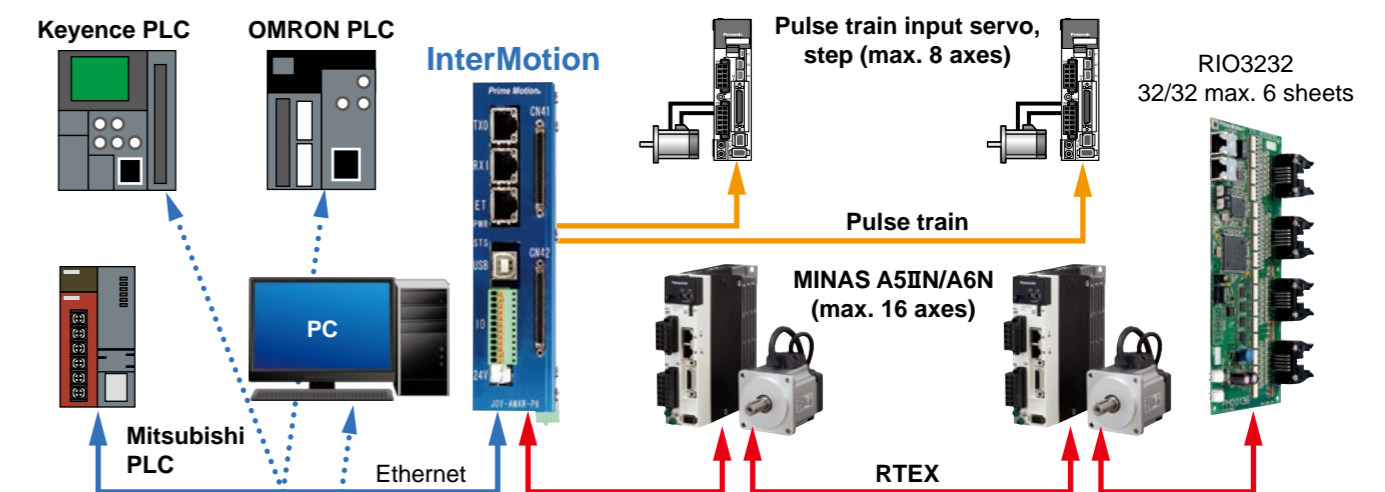
- Single board with 32 IN points and 32 OUT points
- 10 PIN connector for 8-point IN and 8-point OUT. Can be directly connected to terminal block PRS-DG10-O8 (TOYOGIKEN Co., Ltd).
- 24 V DC supply



Specification

Item	Description
Input	32 points (8 points x 4 ports), 24 V _{DC} , 4.7 kΩ
Output	32 points (8 points x 4 ports), 24 V _{DC} , 100 mA
Max. No. of connectable boards	6 (IN 192 points, OUT 192 points)

System Configuration



Sales area and Language



• Japanese

Please contact the following address directly in Japanese.
Note) Now preparing for a document in English.

For more information

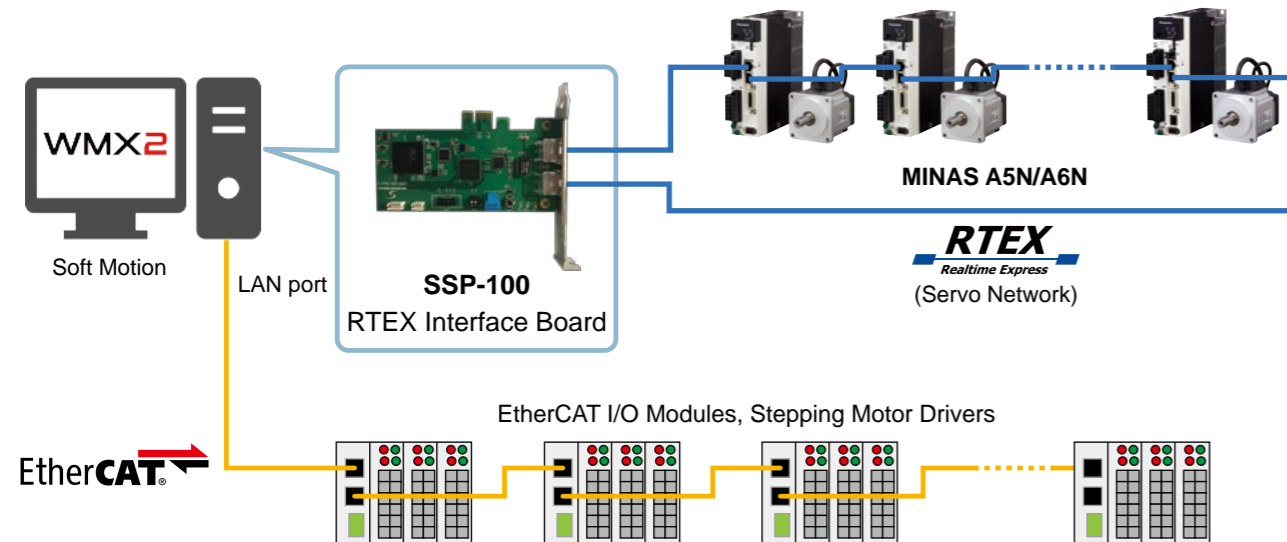
URL : <http://www.primemotion.com/index.php>

Contact: **Prime Motion Inc.** (InterMotion - Special site: <http://www.intermotion.jp>)
1134-12, Akaho, Komagane-shi, Nagano, 399-4117, Japan TEL: +81-265-82-2990 FAX: +81-050-3774-8184

64-Axis Multi-Function Soft Motion Controller WMX2 for Realtime Express

Features

- Soft Motion controller with “hybrid” network: simultaneous communication of RTEX and EtherCAT. Can reduce the system cost with inexpensive and abundant EtherCAT I/O modules.
- Over 500 API functions for C/C++ and .NET languages. Functions for communication with servos, motion control, and I/O control are available to develop original user motion applications.
- Advanced features such as gantry control, acceleration/deceleration profiles, etc. can be used easily.



Specification

Interface Board (SSP-100)	Low Profile PCI Express, Supports 32-Axis RTEX Communication (64 Axes with 2 Boards)
Maximum number of axes	Maximum 64 axes (CP, PTP, when using 2 SSP-100 boards)
Interpolation Types	Linear (Maximum 32 axes), Arc (2 axes), 3D Arc (3 axes), Helical (3 axes)
Interpolation / Communication Cycle	0.25ms (16 axes), 0.5ms (32 axes), 0.5ms (64 axes, requires 2 SSP-100 boards)
Command Modes	Position, Velocity, Torque
Motion Functions	Positioning (PTP), JOG, Homing, Buffered API Execution, List Motion, Cubic-Spline, Path Interpolation
	Dynamic change of Target position / Speed / Acceleration / Deceleration profile during operation is possible Execution time simulation function of API buffer
Acceleration / Deceleration Profiles	Trapezoidal, S-Curve, Jerk (Jerk-limited or Jerk ratio), Sinusoidal, Parabolic, Trapezoidal moving average, Other Profiles: Two-Velocity, PVT, Profile Specification by Acceleration/Deceleration
Gantry Control	Complete synchronous gantry control (Synchronization by position synchronization control + speed offset)
Synchronization Control	Max 32 pairs, One-to-many axis combination, dynamic synchronization axis can be set, changed, released Simple synchronization, perfect synchronization (sync displacement correction function for gantry)
I/O	11600 inputs / 11600 outputs, Supports most commercial EtherCAT I/O modules
Event Function	Motion command execution based on axis-position and input events, etc., I/O control, Event with output to Windows
Compensation Functions	Pitch error, Backlash, Straightness correction
API Supported Language	C (C/C++), .NET (C#, VB), .NET Framework: 4.0 or later
Development Environment	Visual Studio 2008, 2010, 2012, 2013, 2015, C++ Builder XE7, LabView (32 bit)
Recommended Operating Environment	OS: Windows 7, Windows 10 CPU: Min. Atom 2 GHz (E3845, etc.) 2 cores or more, Memory: 4 GB or more

Optional Packages

<PLC Package>

- Integration of WMX2 with Soft PLC developed by Phoenix Contact Software (formerly known as KW Software).
- IEC 61131-3 standard programming languages (LD, FBD, ST, IL, SFC) are available. Not only various motion functions of the PLCopen standard but also a wide variety of unique motion functions of WMX2 are offered as FB.
- Also included is an HMI creation tool based on Microsoft Visual Studio. It also integrates with the API library of WMX2, enabling flexible and powerful programming with C/C++, .NET/C#, and PLC languages.

<Robot Control Package>

- Supports kinematics and inverse kinematics of various robots (6 axis vertical articulated, SCARA, Delta etc.) as well as closed link mechanisms and link offset.
- Controls multiple robots and other devices with one commercial PC.
- Complete synchronization control between multiple robots and other positioning devices (with 1ms units).
- In combination with the PLC package, program all strokes and all devices with one programming environment (IEC 61131-3)
- Simple programming with our original robot language “RBC”. Teaching pendants also available as hardware options.



Application Sample

- Semiconductor Manufacturing Equipment: Various Image Inspection Equipment, Coater/Developer, Etching Equipment, Flip Chip Bonder, Handler, Die Bonder
- FPD Manufacturing Equipment: FPD Exposure Apparatus, LCD Inspection Equipment, Mask defect repair system
- Industrial Robots / Processing machines: Wafer Transfer Robot, Pipe Bender, Various smartphone related automated equipment, Various battery related automated equipment

Sales area and Language



- English
- Japanese
- Korean
- Chinese

For more information

URL WMX2 for RTEX : <http://en.softservo.co.jp/technology/platform/rtex/>

Contact: **Soft Servo Systems, Inc.**

[E-mail: sales@softservo.com]

3-1-13 AS Building 2F, Nishiki-cho, Tachikawa, Tokyo 190-0022, Japan

TEL: +81-42-512-5377 FAX: +81-42-512-5388

PCI Motion Control Board

169002-MBP-LE01/01, etc.

Features

Motion control board best suited to build motion control system

- **32 axes synchronous control**
 - Servo control of 32 axes in 1 ms period for various applications.
- **Wide array of external interfaces**
 - Because the board is provided with such external interfaces as RS485 communication, 2 external inputs (24 V compatible) and 1 external output, it can be connected to various devices.
 - When multiple inputs/outputs are required, it supports remote I/O function (CUnet).



Specification

Series list			
Model	No. of control axes	Built-in pulse train conversion software	Built-in PLC
169002-MBP-LE01/01	32	-	-
169002-MBP-LE01/02	32	○	-
169002-MBP-LE01/11	16	-	-
169002-MBP-LE01/12	16	○	-
169002-MBP-LE01/21	8	-	-
169002-MBP-LE01/22	8	○	-
169002-MBP-LE01/23	8	-	○

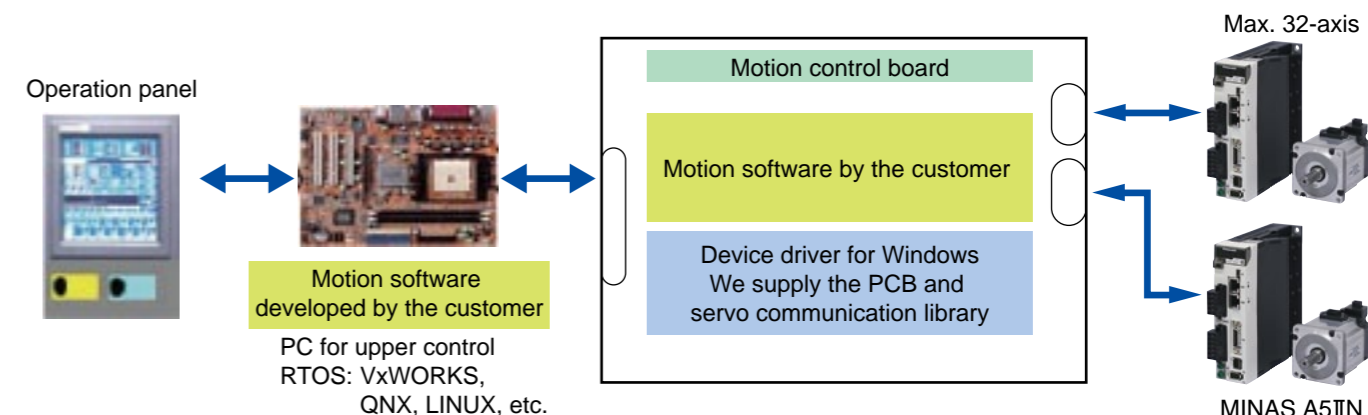
Item	Description	Remarks	
Architecture	CPU	SH4 HD6417750R 200 MHz	
	Memory	FLASH ROM 8 MB	with backup function For data transfer
		SDRAM 16 MB	
		SRAM 128 KB	
		EEPROM 8 KB	
Shared memory 128 KB			
Servo interface	Connector	RJ-45 x 2	
	Interface	Compatible with MINAS A4N/A5IN series	
External input	2 PORT (with sink/source switching)		
External output	1 PORT (with sink/source switching)		
Remote I/O	CUnet		
Serial interface specification	Interface	RS-485	MKY40 (Step Technica Co., Ltd.)
	Transmission rate	115.2 kbps (Max.)	
Compatible OS	Microsoft Windows XP	If you use a different OS, consult us.	

Application Sample

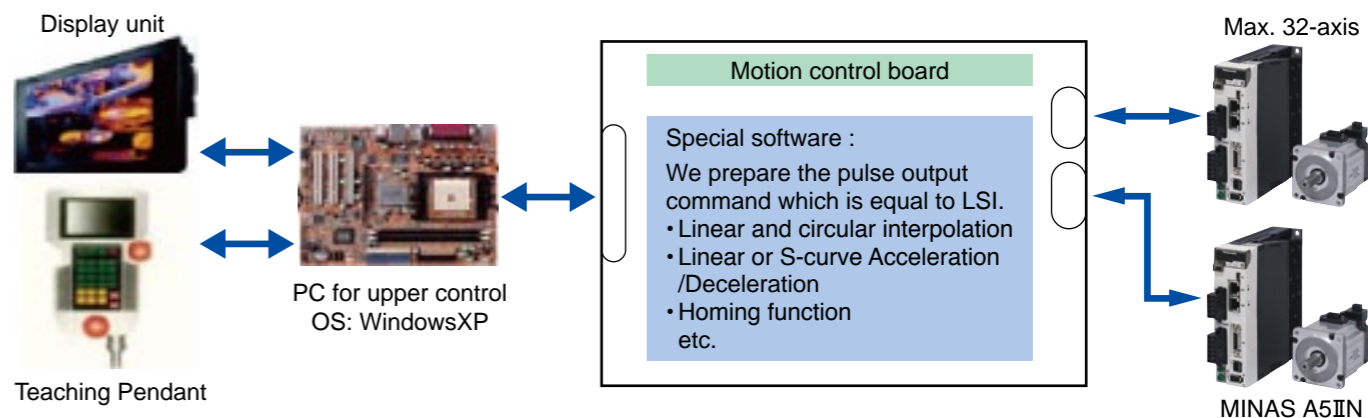
- Semiconductor equipment
- Chip-Mounter
- Machine tool
- Industrial Robot

System Configuration

Sample 1 : In case that the customer develops the motion software



Sample 2 : In case that the customer uses installed software and develops the upper application.



Sales area and Language



- Japanese
- English

For more information

URL : <http://www.tietech.co.jp/english/index.html> (Japan)
URL : <http://www.tietech.com.cn> (China)

Contact: **TIETECH Co.,Ltd.**

1-3-4 Shioya-cho, Minami-ku, Nagoya 457-0078, Japan

TEL: +81-52-824-7375 FAX: +81-52-811-4737

PLC Motion Unit

B3632101-UNT-LE02

Features

PLC motion unit best suited to build motion control system

- **32 axes synchronous control**

All servos sync to the host device assuring precise CP control.

Communication period is 1 ms over max. 32 axes allowing various control settings.

- **Software interface easily transportable from pulse train type software**

Command functions such as single axis PTP control, linear interpolation, arc interpolation, origin return and drive parameter change are provided. The unit will operate as the host controller sets the parameters and calls DLL functions. (DLL functions will be disclosed.)

- **Connection of Yokogawa PLC to Panasonic network servo**

By connecting the unit to the host PLC via PCI bus and to the driving section via network interface, various monitoring operations can be performed without stress.

The combination of the unit and PLC expands functions such as to external signal interface.

A4N/A5IIN series
Servo drive compatible



Yokogawa Electric
e-RT3 2.0 series
PLC compatible



Specification

Specification	
Max. No. of control axes	32
Positioning data quantity	No limit
Computing period	1.0 ms
PLC connection	PCI
Interface to servo drive	RTEX 100 Mbps
Continuous servo drive	MINAS A4N/A5IIN series
Emergency stop input	According to host PLC specification *1
External signal interface	According to host PLC specification *1
Manual signal pulsers interface	According to host PLC specification *1
Various monitoring	High-speed data processing via PCI bus
Interpolation	Linear, arc, continuous, multiplex, helical pressure control *1

Item	Description	Remarks		
CPU	SH4 7750R 200 MHz (Renesas) Peripheral clock 50 MHz Bus clock 50 MHz			
Memory	ROM			
	Flash ROM	8 Mbyte		
	EEPROM	8 kbyte		
	RAM			
	SDRAM	8 Mbyte		
	DPRAM	256 kbyte		
Bus	PCI bus interface			
	Bus width	32-bit		
	Clock	33 MHz PCI Rev.2.3 compatible		
Power supply	Internal power supply			
	Main power supply	5 V/ 3.3 V		
	CPU power supply	3.3 V, 1.5 V		
	FPGA	3.3 V, 2.5 V, 1.2 V		
Watchdog function	WDT	Watching time 1.6 s		
Monitor	LED	2 points	RUN Green LINK Green	Blinks during operation
Communication	RS232C	1-ch		
	RTEX	1-ch		
Setup	DIPSW	Universal input	4	
		For JTAG.ICE connection	1	
		For FPGA setting	2	
OS	VxWorks6.4			

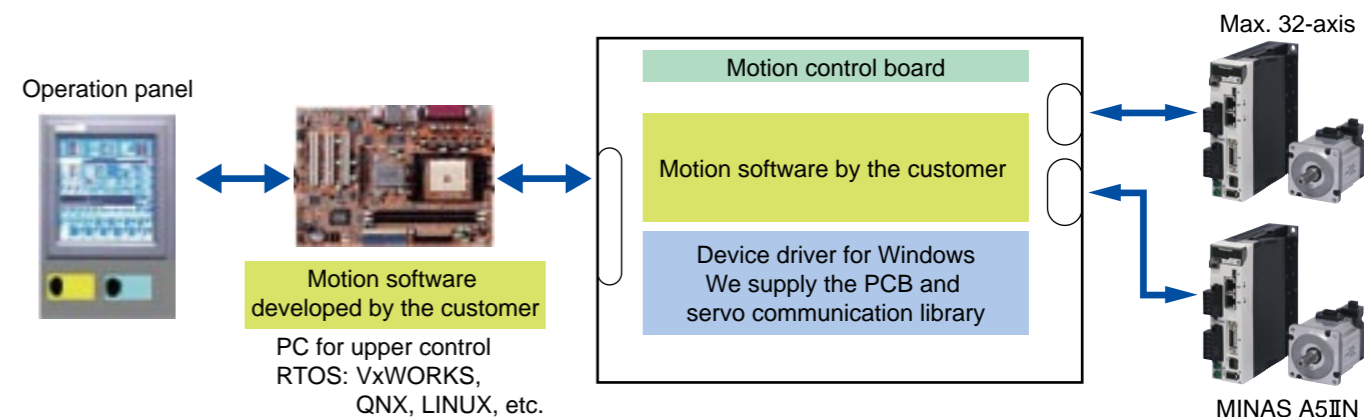
*1 May be separately defined.

Application Sample

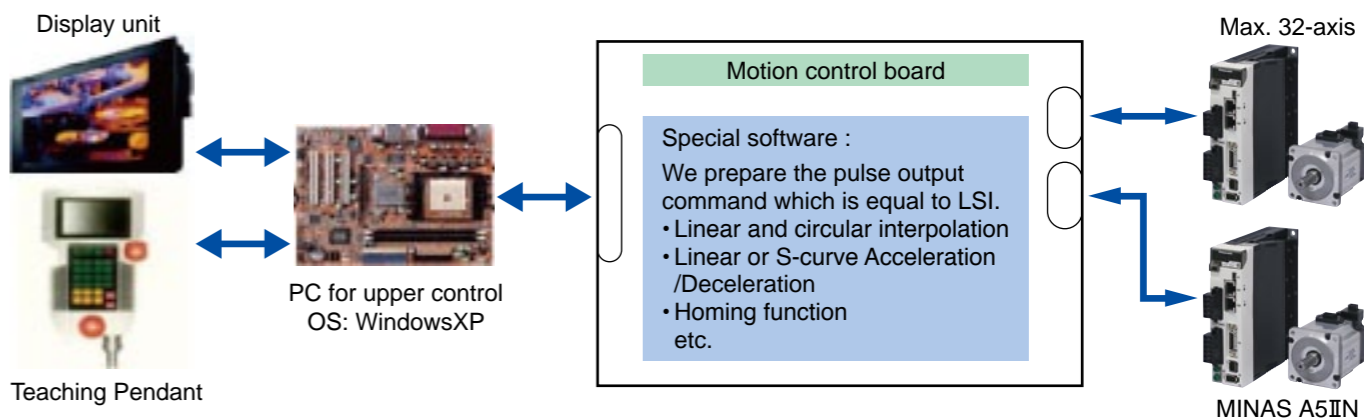
- Semiconductor equipment
- Chip-Mounter
- Machine tool
- Industrial Robot

System Configuration

Sample 1 : In case that the customer develops the motion software



Sample 2 : In case that the customer uses installed software and develops the upper application.



Sales area and Language



- Japanese
- English

For more information

URL : <http://www.tietech.co.jp/english/index.html> (Japan)
URL : <http://www.tietech.com.cn> (China)

Contact: **TIETECH Co.,Ltd.**

1-3-4 Shioya-cho, Minami-ku, Nagoya 457-0078, Japan

TEL: +81-52-824-7375 FAX: +81-52-811-4737

Motion Coordinator and RTEX Interface Module

MC664 / MC664-X

Features

- Up to 128 Axes
- Servo period 50 µsec minimum (8 axes)
- Precise 64 Bit Motion Calculations with Quad Core Cortex A9 1 GHz Processor (P862)
- Dedicated Communications Core (P862)
- Built-in EtherCAT Port
- EtherCAT, Sercos, SLM and RTEX Digital Drive Interfaces
- Linear, Circular, Helical and Spherical Interpolation
- Flexible CAM shapes, Linked Motion
- EnDAT, BISS and SSI Absolute Encoder Supported
- Hardware Linked Outputs for Camera / Laser Control
- Ethernet-IP / Modbus TCP / Ethernet Interface Built-In
- Anybus-CC Module for Flexible Factory Comms Including ProfiNet/Profibus
- IEC 61131-3 Programming
- Multi-tasking BASIC Programming
- Text File Handling
- Robotic Transformations
- SD Memory Card Slot
- CANopen + EtherCAT I/O Expansion
- Backlit LCD Display
- RoHS and CE Approved



Specification

Item	Description	Item	Description
MC664 / MC664-X			
Configuration	Axis 0	Extended	
Axes	Max axes	128	Encoder Ports
	Max discrete wired axes	24	
	Max Networked axes	128 (P862) 64 (P861)	
	Max virtual axes	128	
	Processor	ARM A9 (Single/Quad core)	
Performance	Clock frequency	1000 MHz (Max)	Built-In I/O
	Servo update rate	2 ms (4 ms = MC664) -50 µs (8 axes at 50 µs)	
	Encoder input frequency	6 MHz	
	Stepper output frequency	2 MHz	
	User memory	8 Mbyte	
	Max data table size	512000	Expansion I/O
	Flash data memory	32 x 16000	
	VR	65536	
	Position register precision	64 bit	
	Maths precision	Double FP	
Drive Interfaces	Real time clock	Yes	Programming
	Stepper (Step & Direction)	Option	
	Servo (±10 V & Encoder)	Option	
	Piezo	Option	
	Panasonic RTEX	Option	
Communication	Hydraulic	Option	Software
	EtherCAT	YES/Option	
	Profibus	Option	
	DeviceNet	Yes (slave)	
	CANopen	Yes (server)	
	USB (V1.1)	Option	Expansion
	Ethernet (10/100) base-T	Yes	
	Ethernet IP	Yes (server)	
	MODBUS-RTU	Yes	
	MODBUS-TCP/IP	Yes	
	RS232/RS485	Yes	Physical
	CC-Link	Option	
	ProfiNet	Option	
	Bluetooth	Option	
	Anybus support	Option	
Hostlink	Yes	Power	
		Certification	

Item	Description	Item	Description
RTEX Interface Specification			
Network	Ethernet based MINAS A4N / A5N / A6N	Bus to MC664	32 Bit
Network Speed	100 Mbps 1 msec or 500 usec update operation	Registration Inputs	8 x 24 V Inputs + 1 Drive Registration Input / Axis
Topology	Ring	Optically Isolated registration Inputs	Yes
Max Slaves per Interface Ring	32	Map Any I/O to Any Axis	Yes
Max Interfaces per MC664	6 (7 with Ethercat)	Supported Modes	Cyclic Position, Cyclic Speed, Cyclic Torque
Max Axes per MC664	128	Axis Feature Enable Codes	P914
Cable	STP Cat 5-e or Better	Certification	UL and CE marked for EMC RoHs Compliant

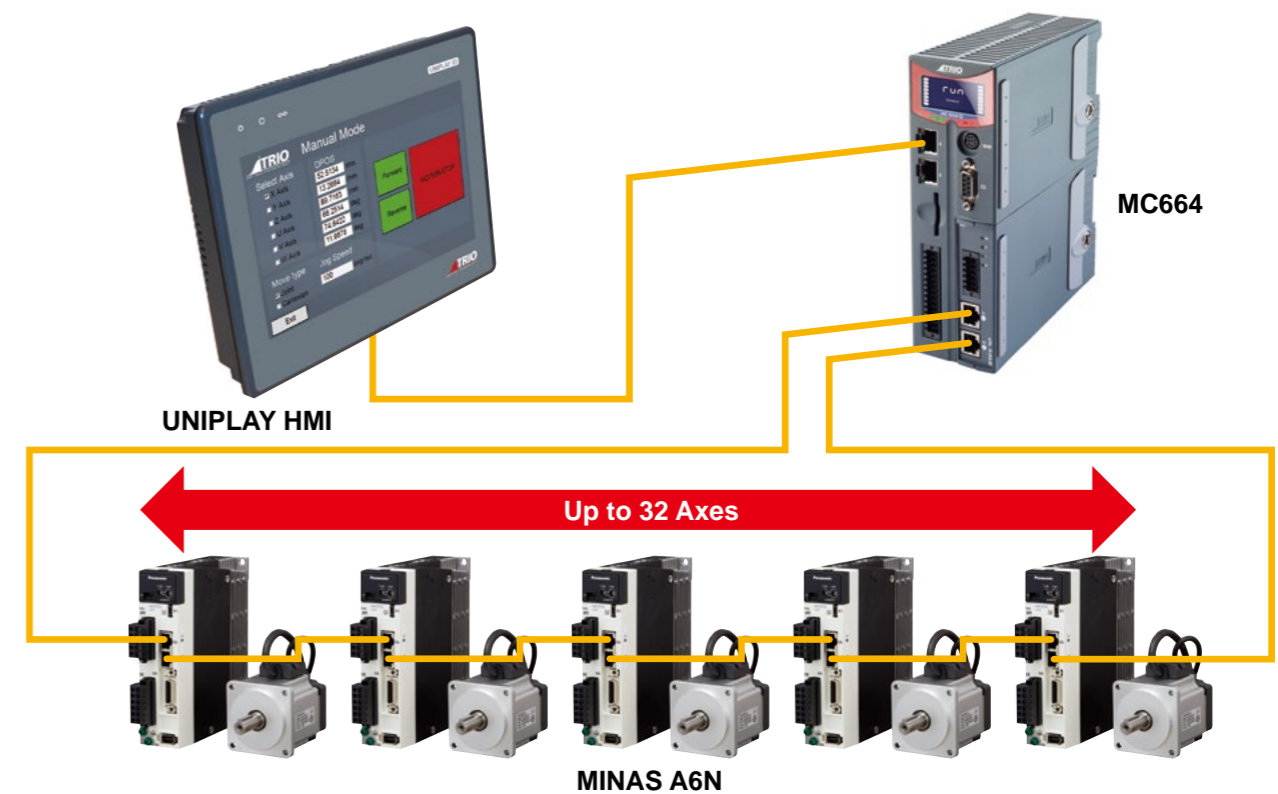
Application Sample

URL : Sample applications

<http://www.triomotion.uk/public/applications/applications.php>

Please refer to the sample and typical applications for the MC464 with A6N as shown above URL.

System Configuration



Sales area and Language



• English

Please contact the following address for details.

For more information

URL: Panasonic Expansion Module

<http://www.triomotion.uk/public/products/clipOnExpansion.php?tabno=1>

URL: The specifications for the MC664

<http://www.triomotion.uk/public/products/p862.php>

Contact: **Trio Motion Technology Ltd.**

Shannon Way, Tewkesbury, Gloucestershire, GL20 8ND, United Kingdom TEL: +44-1684-292333 FAX: +44-1684-297929

Motion Coordinator and RTEX Interface Module

MC4N-RTEX

Features

- Up to 32 RTEX Digital Drive Axes
- Supports Position, Speed and Torque Drive Modes
- Up to 1024 I/O
- Linear, Circular, Helical and Spherical Interpolation
- Flexible CAM shapes, Linked Motion
- Isolated Encoder Port
- EnDAT and SSI Absolute Encoder Supported
- Hardware Linked Output for Camera / Laser Control
- Ethernet-IP / Modbus TCP / Trio ActiveX / TCIP / Uniplay HMI / UDP / Ethernet Interface Built-In
- Precise 64 Bit Motion Calculations with 532 MHz ARM 11 Processor
- IEC 61131-3 Programming
- Multi-tasking BASIC Programming
- Text File Handling
- Robotic Transformations
- 4 high speed registration inputs
- Isolated RS232 and RS485 ports
- SD Memory Card Slot
- CANopen I/O Expansion
- Backlit LCD Display
- RoHS and CE Approved



Specification

Item	Description	Item	Description	
MC4N-Mini RTEX				
Configuration	Axis 0	Extended		
Axes	Max axes	32		
	Networked axes	32		
	Max virtual axes	32		
Performance	Processor	ARM11		
	Clock frequency	532 MHz		
	Servo update rate	1 ms - 500 μs		
	Encoder input frequency	6 MHz		
	Stepper output frequency	2 MHz		
	User memory	8 MByte		
	Max data table size	512000		
	Flash data memory	32 x 16000		
	VR	4096		
	Position register precision	64 bit		
	Maths precision	Double FP		
	Real time clock	Yes		
	Drive interfaces	Panasonic RTEX	Yes	
Auxiliary Axis		Yes		
Communication	DeviceNet	Yes (slave)		
	CANopen	Yes (server)		
	Ethernet (10/100) base-T	Yes		
	Ethernet IP	Yes (server)		
	TCIP Client	Yes		
	MODBUS-RTU	Yes		
	MODBUS-TCP/IP	Yes		
	RS232/RS485	Yes		
	Hostlink	Yes		
	Encoder ports	Reference input	Yes	
Pulse + direction output		Yes		
Incremental (A+B) output		Yes		
SSI Absolute		Yes		
EnDat Abs		Yes		
Built-in I/O	Inputs 24 VDC	8		
	Bi-directional I/O 24 VDC	8		
	# registration inputs	4		
	Registration input speed	1 μs		
	WDOG output	1		
	Digital I/O points	1024		
	12 bit ±10 V analogue inputs	32		
	12 bit ±10 V analogue outputs	16		
	Expansion I/O	TrioBASIC	Yes	
		# programs	32	
# tasks		22		
IEC61131 Runtime		Yes		
Kinematic Runtime		Option		
G-Code		Application option		
HPGL		Application option		
DXF import		PC Application		
Programming	Motion Perfect v4	Yes		
	All Support Software	Yes		
Software	Memory slot card	SD		
	Width x Height x Depth (mm)	40 x 157 x 120		
Expansion	Weight	432 g		
	Mounting	Panel		
	Operating Temp	0 - 45 °C		
Physical	Supply Voltage DC	24 V		
	Consumption (exc. I/O)	350 mA		
Power	UL Listed	Yes		
	CE approval	Yes		
Certification	RoHS Compliant	Yes		

Item	Description	Item	Description
RTEX Interface Specification			
Max Slaves per Interface Ring	32	Optically Isolated registration Inputs	Yes
Max Axes per MC664	128	Map Any I/O to Any Axis	Yes
Cable	STP Cat 5-e or Better	Supported Modes	Cyclic Position, Cyclic Speed, Cyclic Torque
Bus to MC664	32 Bit	Axis Feature Enable Codes	P914
Registration Inputs	8 x 24V Inputs + 1 Drive Registration Input / Axis	Certification	UL and CE marked for EMC RoHs Compliant

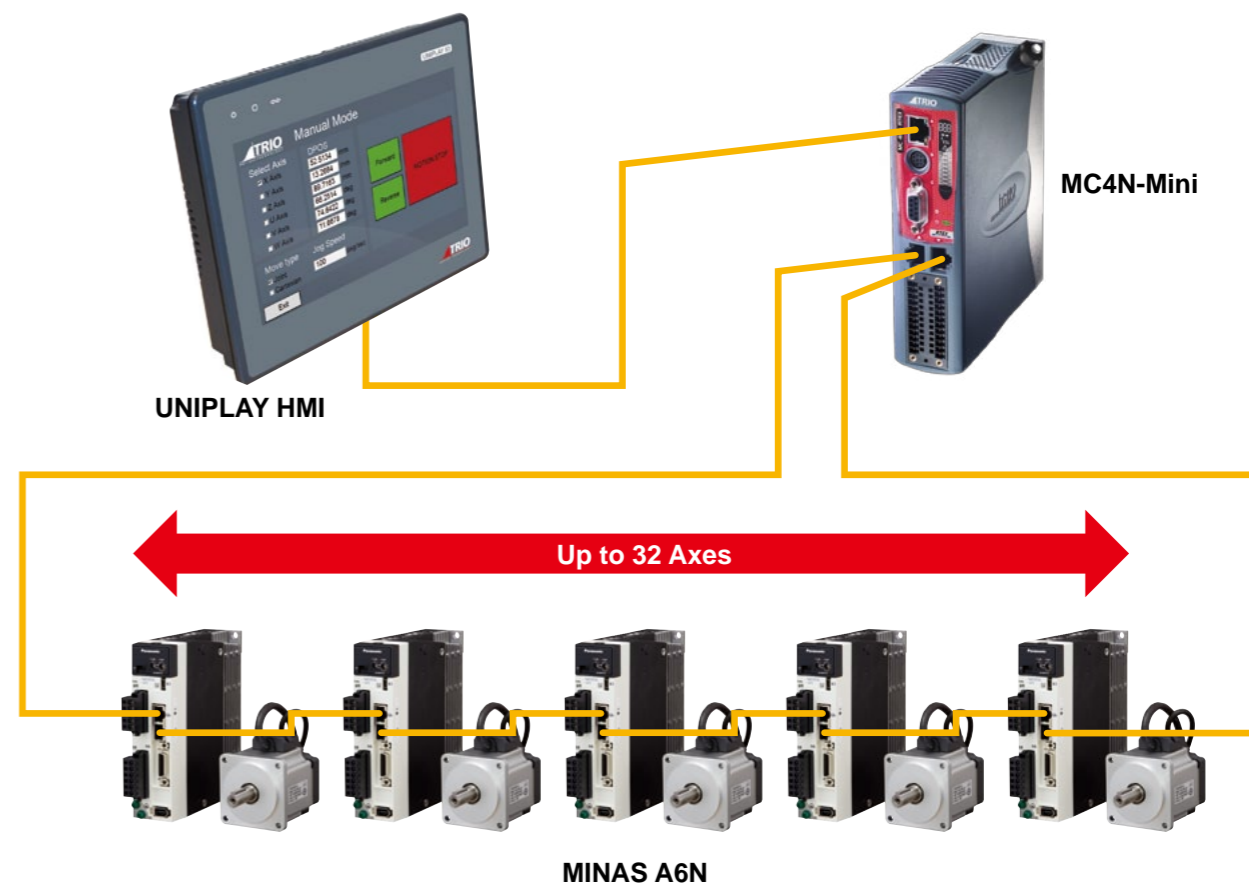
Application Sample

URL : Sample applications

<http://www.triomotion.uk/public/applications/applications.php>

Please refer to the sample and typical applications for the MC4N with A6N as shown above URL.

System Configuration



Sales area and Language



• English

Please contact the following address for details.

For more information

URL: Specification for the MC4-N RTEX Mini Master

<http://www.triomotion.uk/public/products/p906.php>

Contact: **Trio Motion Technology Ltd.**

Shannon Way, Tewkesbury, Gloucestershire, GL20 8ND, United Kingdom TEL: +44-1684-292333 FAX: +44-1684-297929

RTEX/AnyWire Gateway

AG42-R1

Features

Connect AnyWire Reduced Wiring I/O System to RTEX

- AnyWire reduced wiring system has Dual-Bus function which transfers DI/O and AI/O on the same transfer line but independent of each other.
- AnyWire reduced wiring system is cable free specification and uses general purpose wires
- Layout free, e.g. T branch, multi drop and tree wiring
- Simple one-touch connection, branch and extension by using insulation displacement connector
- Max. No. of I/O points is 2560 and max. No. of units connected to I/O terminal is 128
- Max. connecting route length 1000 m



Specification

Item	Description
RTEX	
No. of exclusive blocks	3 to 11 (depending on No. of points used)
Effective data transmission rate	183 kbps/256 points (@ transfer clock: 62.5 kHz)
Transmission scheme	Full quadruplex total frame cyclic system
Synchronization system	Frame/bit synchronization system
Data length/frame	1-bit to 1024-bit
Connection topology	Bus (multi drop, T branch, tree)
Transmission protocol	Dedicated protocol (AnyWireBus)
Error control	Double check
AnyWire	
Max. No. of connecting I/O points^{*1}	Bit-Bus 512 points (IN 256 points + OUT 256 points) Word-Bus 2048 points (IN 1024 points + OUT 1024 points) or 128 words (IN 64 words + OUT 64 words)
Max. No. of connected units	128 (Total of Bit-Bus terminals and Word-Bus terminals)
Max. cycle time^{*2}	[0.85 ms/128 points], [1.4 ms/256 points], [2.4 ms/512 points], [4.4 ms/1024 points] (transfer clock @62.5 kHz)
RAS function	Transmission line breakage position detection and transmission line short-circuit detection
Transmission cable^{*3}	Cable free • General purpose (VCTF) 2-core /0.75 mm ² to 1.25 mm ² : transmission only (D, G) • General purpose (VCTF) 4-core /0.75 mm ² to 1.25 mm ² : including power supply (D, G, 24 V, 0 V) • Other general purpose cables /0.9 mm ² to 1.25 mm ² : e.g. parallel • Special flat cable /0.75 mm ² to 1.25 mm ² : including power supply (D, G, 24 V, 0 V)
Max. transmission distance^{*4}	[1 km/7.8 kHz] [500 m/15.6 kHz] [200 m/31.3 kHz] [100 m/62.5 kHz]

*1: The number depends on the master. *2: Typical values at the top speed. *3: Diameter varies with transmission distance.

*4: Distance is the cable total length.

Sales area and Language



- English
- Japanese

Only Japanese is used for inquiry over the phone.

When making an inquiry in English, please send it to the following address.

For more information

URL: <http://www.anywire.jp/>

Contact: **Anywire corporation Headquarters**

[E-mail: info_e@anywire.jp]

1 Babazusho, Nagaokakyo-city, Kyoto 617-8550, Japan

TEL: +81-75-956-4911(Japanese only) FAX: +81-75-356-1613

* Only Japanese is used for inquiry over the phone. When making an inquiry in English, send it to: info_e@anywire.jp.

RTEX corresponding table and ASIC information

RTEX partner products

[Corresponding table]

Partner	Master				Slave					
	PCI	PCI-e	Stand Alone	PLC	Digital I/O	Analog I/O	Pulse Output	Stepper Driver	Counter	Gateway
AJINTEK CO., LTD.	●	●			●	●	●		●	
Anywire Corporation										●
Asahi Engineering Co., Ltd.			●					●		
Aurotek Corporation	●				●		●			
COSMOTECHS	●	●	●	●	●	●	●			
Delta Tau Data Systems, inc.			●							
Panasonic Industrial Devices SUNX Co., Ltd				●						
Prime Motion Inc.	●	●	●		●					
Soft Servo Systems, Inc.	●									
TIETECH Co., Ltd.	●			●						
Trio Motion Technology Ltd.			●							

Communication ASIC MNM1221

For developing RTEX product, this ASIC is necessary. (See note)



	Specification
Part No. for ordering	DV0P444-9
Packing quantities	90
Power supply voltage	3.3 V
Current consumption	Max. approx. 100 mA (for reference)
Operating ambient temperature	-40 °C to +85 °C
Package	LQFP100pin 14 mm x 14 mm Lead pitch 0.5 mm
RoHS	Compliant
Operation mode	Master/slave

Note: As long as the target is noncompetitive to Panasonic products.

EtherCAT communication driver MINAS A6B series



High-Performance

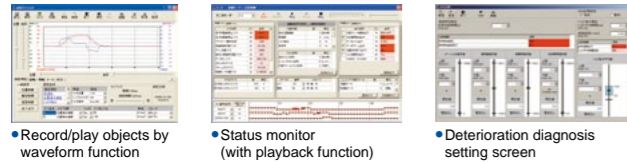
- Frequency response: **3200 Hz**
- Supports network communication “EtherCAT”.
- High-Speed **100 Mbps**
- Real-time auto tuning function, Anti-vibration filters are available.

High-functions

- **EtherCAT** with many supported applications <7 control modes, 32 hm methods, DC(Synch), SM2(Synch), FreeRUN (Non-synch)>
- System-up possible with various slaves.
- Supports PC-based controller.
- A6BL/A6BM (for Linear Motor) will be available soon.

Operability

- Smallest **EtherCAT** drive in market.
- **Wireless connection** using wireless LAN dongle (option)
 - Wireless connection with PC and smartphone via access point by just mounting to servo driver.
- Supports pc setup software “**PANATERM**”
- Lifespan diagnosis/Deterioration diagnosis
 - Warning output for Servo (motor and driver) lifespan and machine deterioration limit.



Wireless LAN Dongle (Option)

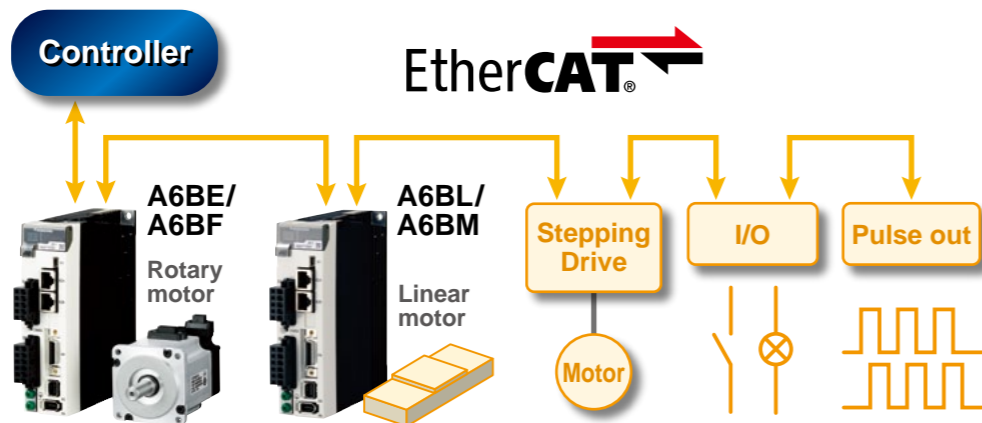


Standards



- Official EtherCAT Conformance Tested model available.
- IEC safety I/F model available.^{*1} *1: Supported by multifunction type. EN61800-5-2 STO, EN61508 SIL3.

[System configuration example]



EtherCAT specification

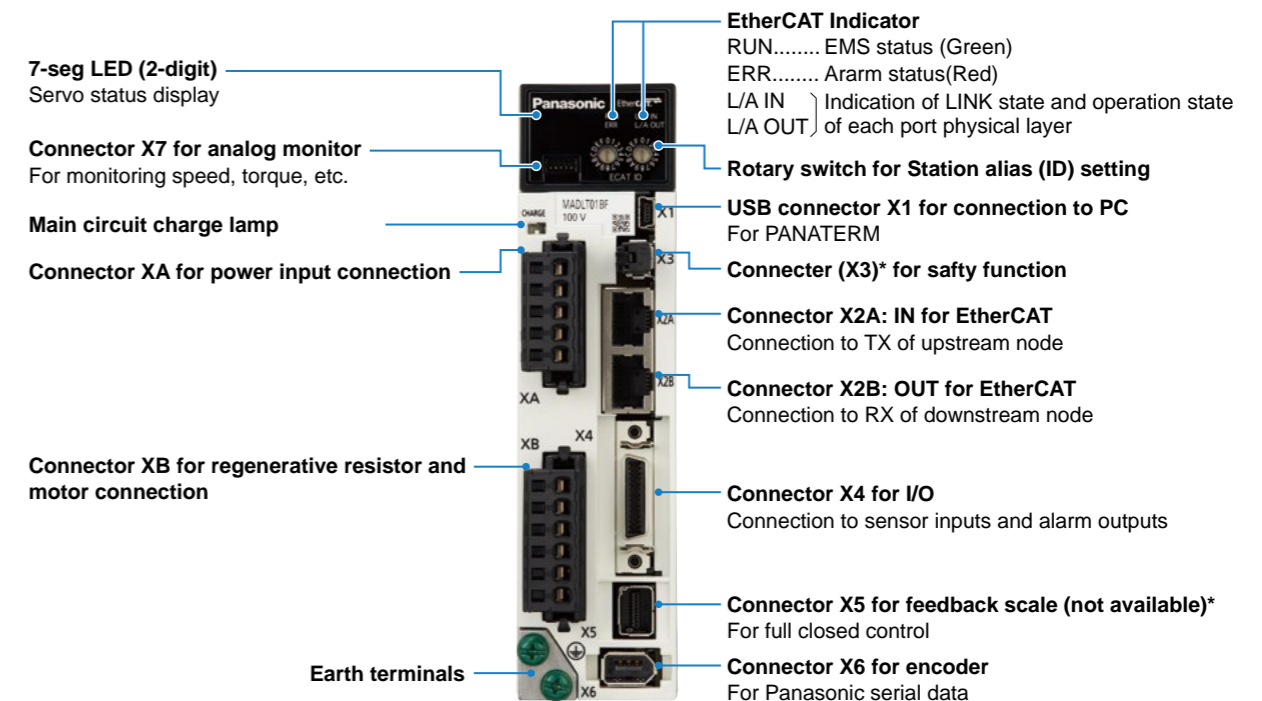
Device profile	CoE (CANOpen over EtherCAT)
Control mode	csp, pp, hm, csv, cst, pv, tq
hm method (homing mode)	1 to 14, 17 to 30, 33, 34, 35, 37
Synchronized mode	DC (Synch.), SM2 (Synch.), FreeRun (Non-synch.)
Supported cycle time	125 μs, 250 μs, 500 μs, 1 ms, 2 ms, 4 ms

Drive list

Drive power supply	Motor rated output									
	50 W	100 W	200 W	400 W	750 W	1 kW to 1.5 kW	2 kW	3 kW	4 kW to 5 kW	
1-phase 100 to 120 VAC	Frame	A			B	C				
	Driver Part No.	MADL□ 01B☆	MADL□ 11B☆	MBDL□ 21B☆	MCDL□ 31B☆					
1 or 3-phase 200 to 240 VAC	Frame	A			B	C	D			
	Driver Part No.	MADL□ 05B☆		MADL□ 15B☆	MBDL□ 25B☆	MCDL□ 35B☆	MDDL□ 55B☆			
3-phase 200 to 230 VAC	Frame						E	F	F	
	Driver Part No.						MEDL□ 83B☆	MFDL□ A3B☆	MFDL□ B3B☆	

- Because there is the case that is different from the part number in the table by the motor, please check the combination in the catalog of the A6 series always.
- □ : Drivers specification..... N : Without safety function T : With safety function
- ☆ : Drivers specification..... E : For rotary motor (standard) F : For rotary motor (multifunction)
- L : For linear/DD motor (standard) M : For linear/DD motor (multifunction)

Appearance



Dimensions (mm): W40 × H150 × D130 (A frame)

* The photo is A6BF series. There are no X3 and X5 connectors in the A6BE series.

Compliance



EtherCAT communication driver MINAS A5B series



High-Performance

- Frequency response: **2300 Hz**
- Supports network communication "EtherCAT".
- High-Speed **100 Mbps**
- Real-time auto tuning function, Anti-vibration filters are available.

High-functions

- **EtherCAT** with many supported applications <7 control modes, 32 hm methods, DC(Synch), SM2(Synch), FreeRUN (Non-synch)>
- System-up possible with various slaves.
- Supports PC-based controller.
- A5BL(for Linear motor), A5MB(DC24 V, 48 V) are available.

Operability

- Smallest **EtherCAT** drive in market.
- Supports pc setup software "**PANATERM**"



Standards

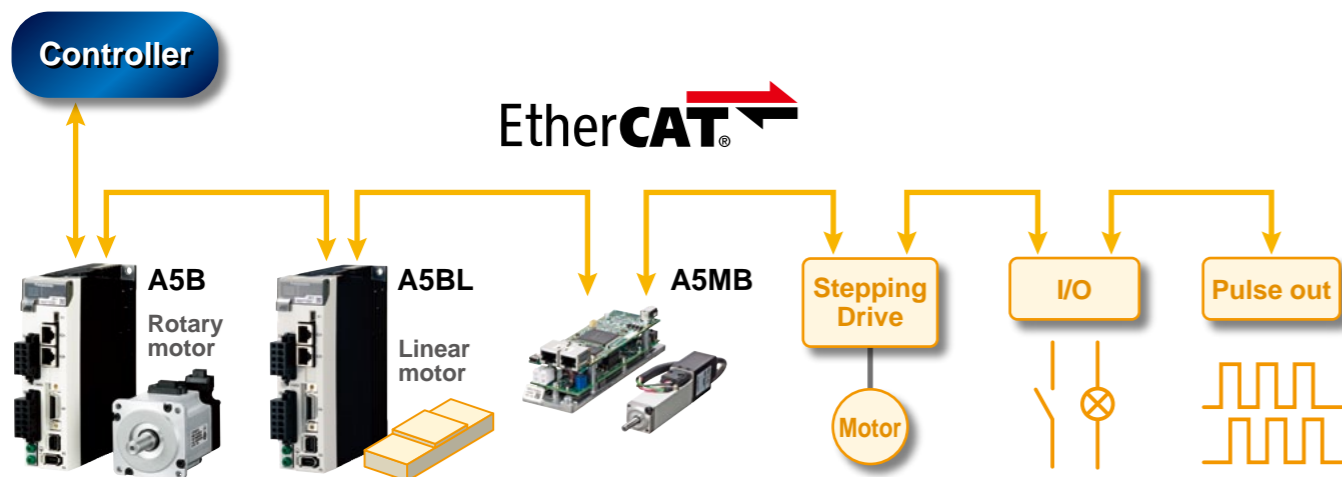


- Official EtherCAT Conformance Tested model available.
- IEC safety I/F model available.*1

*1: Supported by special specification. IEC61800-5-2 STO, IEC61508 SIL2.



[System configuration example]



• EtherCAT specification

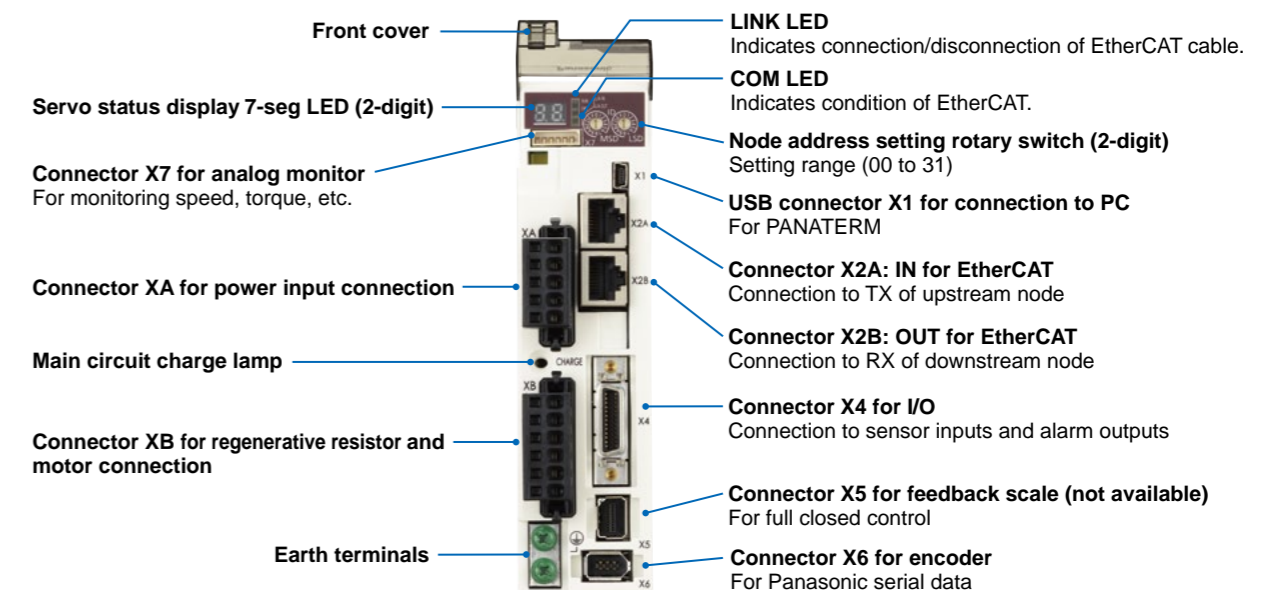
Device profile	CoE (CANOpen over EtherCAT)
Control mode	csp, pp, hm, csv, cst, pv, tq
hm method (homing mode)	1 to 14, 17 to 30, 33, 34, 35, 37
Synchronized mode	DC (Synch.), SM2 (Synch.), FreeRun (Non-synch.)
Supported cycle time	250 μs, 500 μs, 1 ms, 2 ms, 4 ms

Drive list

Drive power supply	Motor rated output											
	10 W to 30 W	50 W	100 W	200 W	400 W	750 W	1 kW to 1.5 kW	2 kW	3 kW	4 kW to 5 kW	7.5 kW	11 kW to 15 kW
DC 24 V, 48 V * C: 24 V, B: 48 V	Frame	M										
	Driver Part No.	MMDH T2*09 BD1										
1-phase 100 to 120 VAC	Frame		A	A	B	C						
	Driver Part No.		MADH T1105 B**	MADH T1107 B**	MBDH T2110 B**	MCDH T3120 B**						
1 or 3-phase 200 to 240 VAC	Frame		A	A	B	C	D					
	Driver Part No.		MADH T1505 B**	MADH T1507 B**	MBDH T2510 B**	MCDH T3520 B**	MDDH T5540 B**					
3-phase 200 to 230 VAC	Frame							E	F	F	G	H
	Driver Part No.							MEDH T7364 B**	MFDH TA390 B**	MFDH TB3A2 B**	MGDH TC3B4 B**	MHDH TC3B4 B**
3-phase 380 to 480 VAC	Frame					D	D	E	F	F	G	H
	Driver Part No.					MDDH T2412 B**	MDDH T3420 B**	MEDH T4430 B**	MFDH T5440 B**	MFDH TA464 B**	MGDH TB4A2 B**	MHDH TB4A2 B**

- Because there is the case that is different from the part number in the table by the motor, please check the combination in the catalog of the A5 series always.
- Trailing * * in the part number is replaced with the following symbol.
A1: For rotary motor (standard) 01: For rotary motor + safety circuit I/F
L1: For linear motor 91: For linear motor + safety circuit I/F

Appearance



Dimensions (mm): W40 × H150 × D136 (A frame)

Compliance

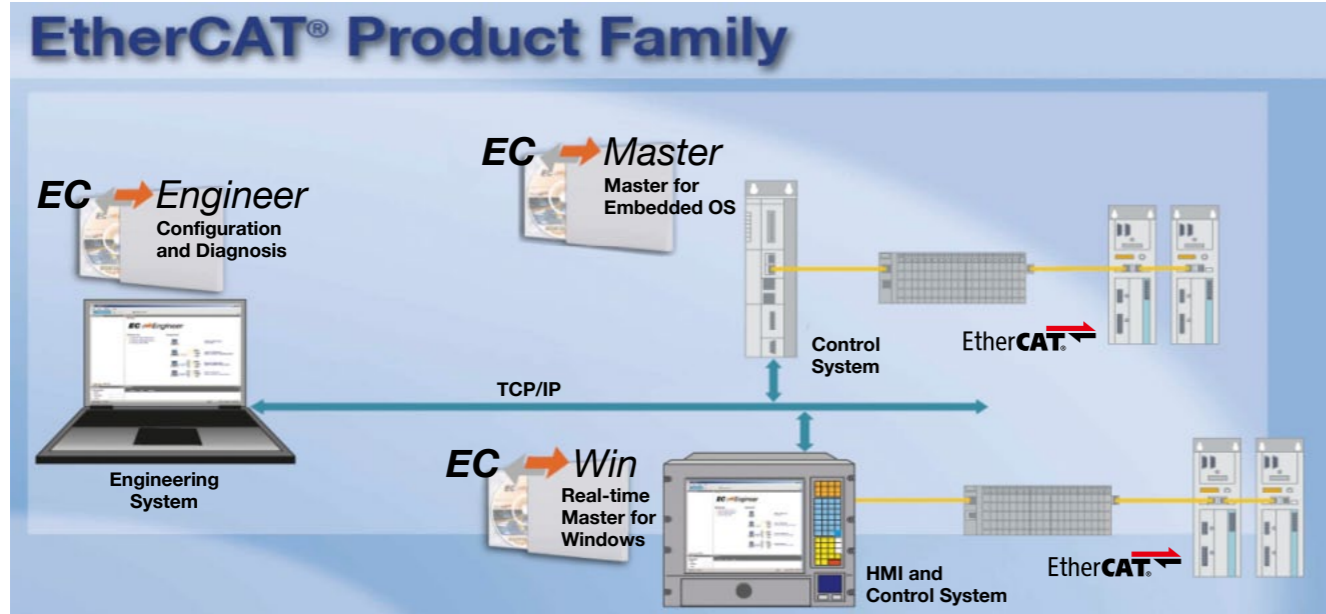


EtherCAT® Product Family

Features

EtherCAT® Master Stack software, available for real-time OS as well as Windows

- Ready-to-run implementations for many embedded operating systems
- EC-Win: high performance Windows Real-time extension included to achieve up to 50 µsec cycle time on Windows!
- Use multiple CPU cores on Windows for distributed EtherCAT applications
- CPU architectures: x86, ARM, PowerPC, SH, MIPS
- Reliable and well proven in many customer applications worldwide. Market leading companies in the Semiconductor, Robotics, PLC/Motion, Measurement and other industries rely on this software.



Specification

EC-Master according to ETG.1500 Master Classes Directive

Class A Core

- Compare network configuration
- Cyclic process data exchange
- All mailbox protocols: CoE, SoE, EoE, FoE, AoE, VoE
- Slave to slave communication
- **Distributed Clocks with master synchronization**

Class B Core

- Compare network configuration
- Cyclic process data exchange
- Mailbox protocol CoE
- Mailbox protocol SoE
- Mailbox protocol EoE
- Slave to slave communication

Feature Pack
Cable Redundancy

Feature Pack
Hot Connect

Feature Pack
Remote Access

Feature Pack
Superset ENI

Feature Pack
EoE Endpoint

Feature Pack
Master Obj. Dict.

The ETG (EtherCAT Technology Group) has defined EtherCAT Master Classes (ETG.1500) with a well defined set of Master functionalities.

2 Master Classes are defined:

- Class A: Standard EtherCAT Master Device
- Class B: Minimum EtherCAT Master Device

Additional functionality is described by Feature Packs. Acontis supports all Feature Packs in industry proven quality.

Application Sample

On Windows



Robotics



Semiconductor



CNC

On Embedded Systems



Industrial Automation

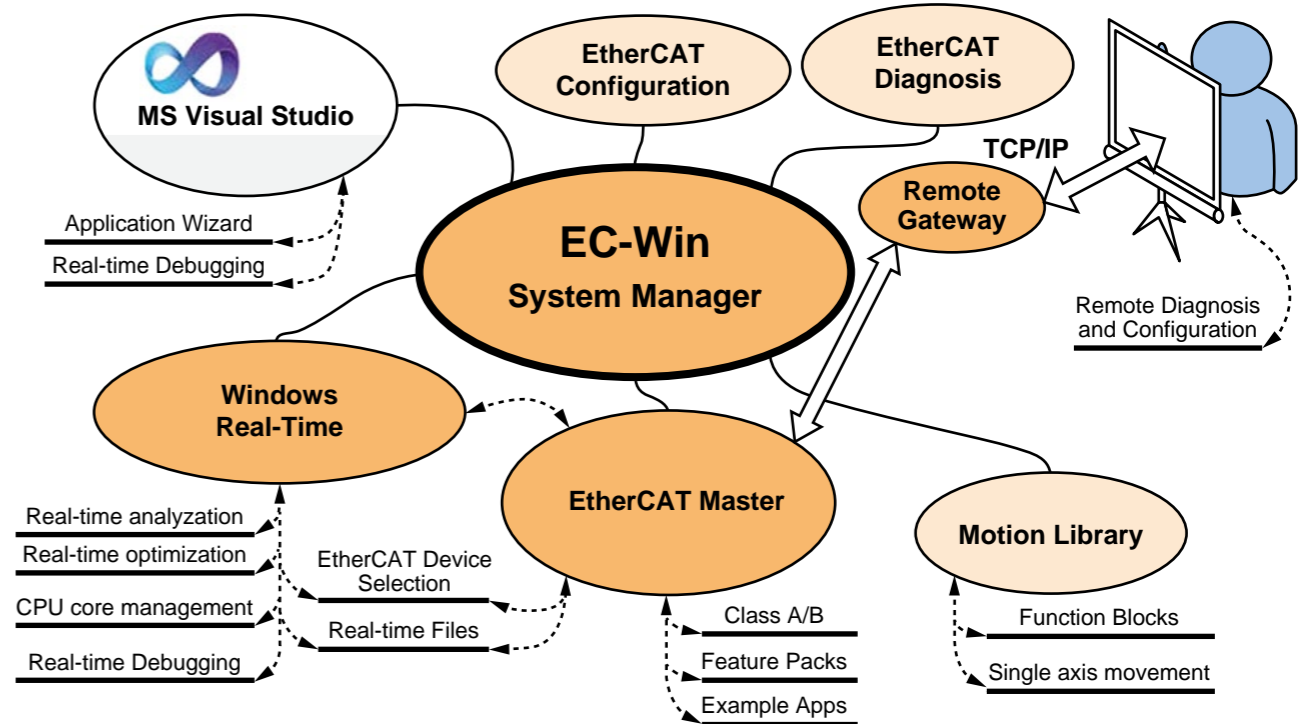


CNC



Test & Measurement

System Configuration



Sales area and Language



- English
- Japanese

For more information

URL : <http://www.acontis.com/eng/index.php>

Contact: **acontis technologies GmbH**

St.-Konrad-Str.51 88250 Weingarten Germany

[E-mail: sales@acontis.com]

TEL: +49-751-560-3030

EtherCAT Master Controller

Talos-3012

Features

- Powered by ADLINK Softmotion
- Supports IEC 61131-3-compliant programming environment
- Minimal control cycle time as low as 250 μ s
- Motion control of up to 64 axes and up to 10000 I/O points of control
- Supports EtherCAT COE, FOE as well as EOE protocols
- Code executable when host Windows system crashed
- Built-in SD socket for logging manufacturing data
- 3 user-defined indicators for CTR diagnostic
- Rugged, compact construction with fanless design at -20°C to 60°C



Specification

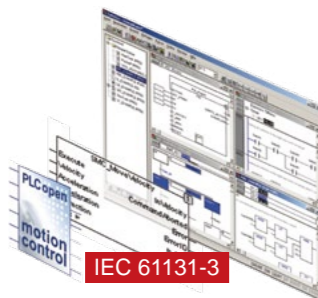
Model Name	Talos-3012	
Processor	Intel® Atom™ Processor E3845 1.9 GHz	
Controllable Motion Axis	64	
Controllable I/O Points	Up to 10000 points	
Control Cycle Time	250 μ s (min.)	
Memory	RAM (Program & Data Memory)	2 GB DDR3
	Retain Memory	Configurable on SD card
	Storage (Date Usage)	16 GB SSD / SD Card
Field Bus Connectivity	1 for EtherCAT	
Ethernet Connectivity	1 GbE	
System Indicators	3 User-defined	
Programming Environment	CoDesys v3	
Supply Voltage	9-32 VDC wide-range DC input	
Environment Certificate	Vibration: 5 Grms, 5 - 500 Hz	
	Shock: 50 G, Half Sine 11 ms duration	
	EMC: EN 55011 class A	
Operating Temperature	-20°C to 60°C (-4°F to 140°F)	
Dimension	120 (W) \times 100 (D) \times 55 (H) mm (4.68" \times 3.9" \times 2.17")	

Software Support

- **IEC-61131-3 compliant Environment**
Support 5 different PLC Programming Languages

- **ADLINK Softmotion Inside**

- LD
- IL
- FBD
- ST
- SFC



IEC 61131-3



EtherCAT Slave System and Modules

EPS Series

Features

- EtherCAT COE, FOE, AOE protocols supported
- Communication quality diagnostic
- Slave module status monitoring
- Wide operation temperature range: -20°C to 60°C
- Compact size: 130 (L) \times 110 (W) \times 105 (H) mm
- SMART mechanical design for convenient installation
- IEC-61131 compliant



Specification

Model Name	EPS-9905 with EPS-6000
Installed Slots	5 (max.)
Protection Type	IP31
Hot Swap	Yes
Operating Temp.	-20°C to 60°C
Dimension (mm)	130 (L) \times 110 (W) \times 105 (H)
Weight (estimated)	< 1000 gram
Power Consumption	6.6 W
Supply Voltage	24 VDC ($\pm 10\%$)
Environment Certificate	Vibration: 5 Grms, 5 - 500 Hz
	Shock: 50 G, Half Sine 11 ms duration
	EMC: EN 55011 class A

Model Name	EPS-1132	EPS-2032	EPS-2132
I/O Type	Digital Input	Digital Output	Digital Output
Channel	32	32	32
Hot Swap	Yes		
Input / Output Type	Sinking	Sourcing	Sinking
Input Range (by Voltage/Current)	IEC 61131-2 Type 1/3, 2.3 mA	-	-
Sampling Rate	<1 ms	4 kHz	4 kHz
Resolution	-	-	-
Output Current Capacity	-	300 mA / ch	300 mA / ch
Connector Type	Phoenix Contact DFMC		

Model Name	EPS-2308	EPS-3216	EPS-3032	EPS-3504	EPS-4008	EPS-7002
I/O Type	Relay Output	Analog Input	Analog Input	Thermal Input	Analog Output	Motion Control
Channel	8	16	32	4	8	2
Hot Swap	Yes					
Input / Output Type	Relay	Differential	Single-ended /Differential	RTD	Single-ended	Pulse-Train
Input Range (by Voltage/Current)	-	0 mA to 20 mA	+/- 10 V	RTD (PT100, 500, 1000)	± 10 V	PUS/DIR: 4 MHz ENC: 20 MHz
Sampling Rate	5 ms	100 kHz	100 kHz	5 - 20 Hz	100 kHz	-
Resolution	-	16 bit	16 bit	24 bit	16 bit	32 bit
Output Current Capacity	AC: 125 V @ 0.5 A DC: 30 V @ 2 A	-	-	-	5 mA	-
Connector Type	Phoenix Contact DFMC					SCSI VHDCI 68p

Sales area and Language



- English
- S/T Chinese

For more information

URL : <http://www.adlinktech.com/EtherCAT/index.php>

Contact: **ADLINK Technology, Inc.**

9F, No.166 Jian Yi Road, Zhonghe District, New Taipei City 235, Taiwan

[E-mail: service@adlinktech.com]

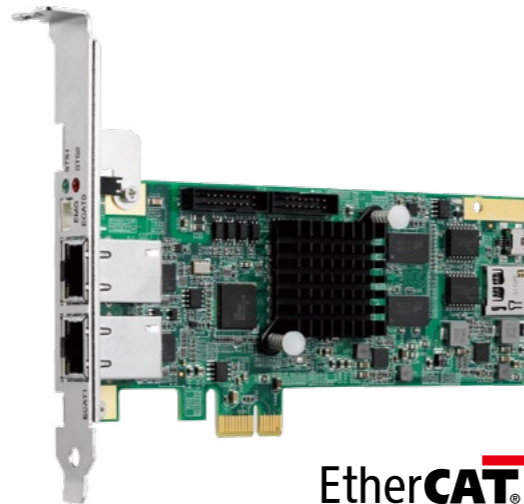
TEL: +886-2-8226-5877 FAX: +886-2-8226-5717

PCIe EtherCAT Master Motion Controller

PCIe-8338

Features

- PCI Express® x 1 compliant
- Up to 64-axis motion control & 10000 I/O point control via EtherCAT
- EtherCAT cycle times up to 250 μs
- Broad range of compatible EtherCAT slaves
- Dedicated emergency stop input
- 4CH isolated digital input/4CH isolated digital output
- 1CH pulsar input
- Point-table functions for contouring application
- Support for up to 16D linear interpolation, 3D circular and 3D spiral interpolation
- 8 program tasks downloadable for standalone application
- Card ID selection



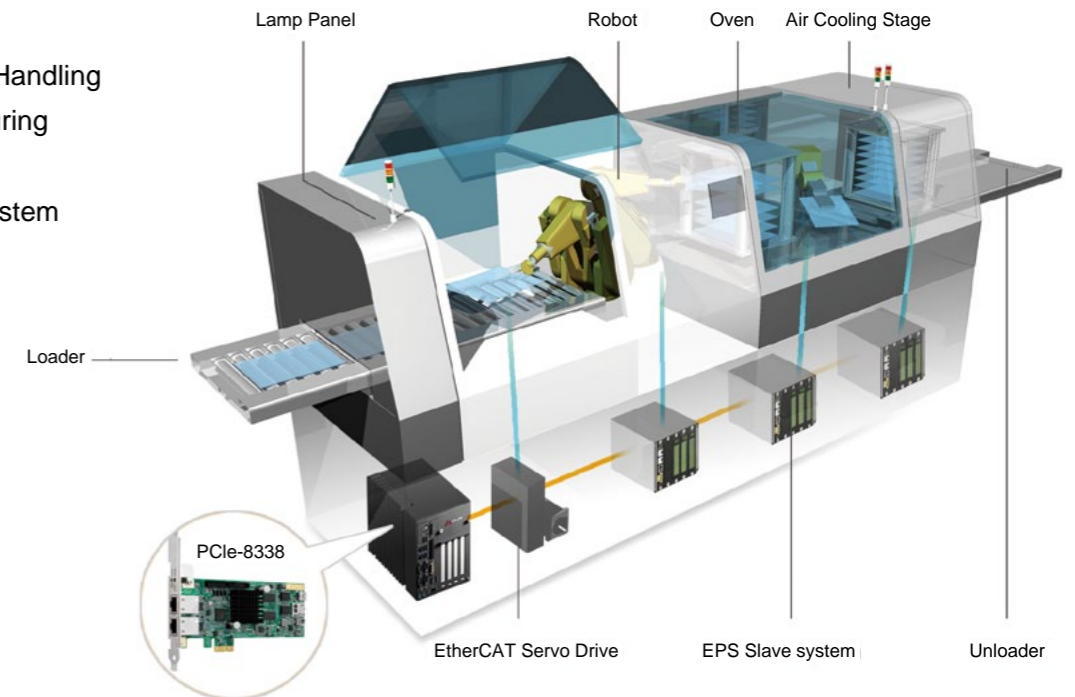
EtherCAT

Specification

Model Name	PCIe-8338
EtherCAT Cycle Time	1CH @ 250 μs / 500 μs / 1000 μs / 2000 μs
EtherCAT Motion	Up to 64 axes
EtherCAT I/O	Up to 10000 Points
Motion I/O Interface Signals	
Emergency Stop In	1CH
Isolated I/O Signals	
Digital Input	4CH (2CH configured as Pulsar Input)
Pulsar Input Mode	CW/CCW; 1x/2x/4x AB Phases
Pulsar Input Frequency	Up to 1 MHz
Digital Input Voltage	24 Vdc (typ.) / 5 Vdc for pulsar connection
Digital Input Type	Sourcing type
Digital Output	4CH, Isolated
Digital Output Voltage	24 V (typ.)
Digital Output Type	90 mA, NPN sinking type
General Specification	
Operating Temp	0 °C to +60 °C (32 °F to 140 °F)
Humidity	5 % to 95 %, non-condensing
Environmental Specification	
Safety compliance	CE/FCC, RoHS

Application Sample

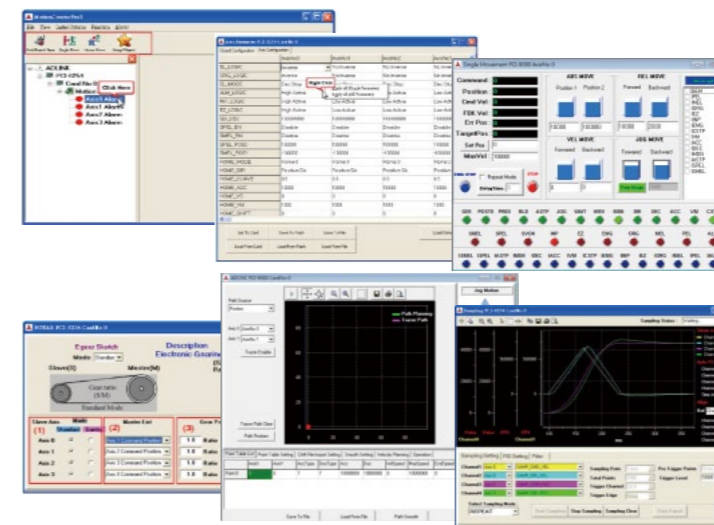
- Printing
- Packaging
- Logistics & Material Handling
- Electronic Manufacturing
- Robot ARM Control
- Conveyor Control System



EtherCAT

Software Support

- Easy-to-Use Utility - MotionCreatorPro2



- ADLINK Softmotion Inside



Sales area and Language



- English
- S/T Chinese

For more information

URL : <http://www.adlinktech.com/EtherCAT/index.php>

Contact: **ADLINK Technology, Inc.**

9F, No.166 Jian Yi Road, Zhonghe District, New Taipei City 235, Taiwan

[E-mail: service@adlinktech.com]

TEL: +886-2-8226-5877 FAX: +886-2-8226-5717

Intelligent EtherCAT® Master Board

Low CPU load EtherCAT® Master Communication

Features

Low CPU load EtherCAT® Master Communication

EtherCAT® environment is enabled typically by implementing the master stack on Ethernet hardware. Advanet provides EtherCAT® master communications on-board by implementing the Xilinx Zynq® with ARM® Cortex®-A9 on a board to minimize the impact for the host CPU as bus master.

Secure Cable Redundancy

The redundant cable configuration adopting ring topology which recovers the communication cable failure in the EtherCAT® system allows the communications to reach any branch even in case of cable fracturing happened at any point.

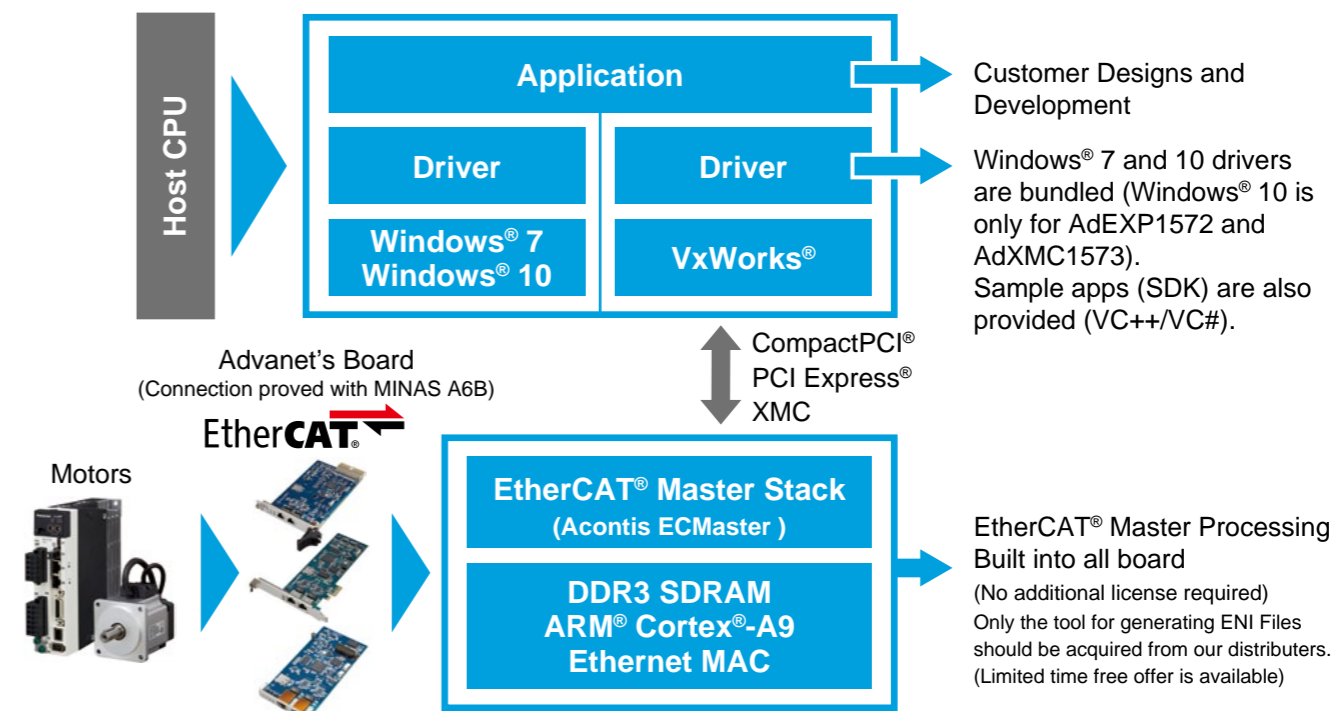
Hot Connect Responds to Unexpected Replacement

The protocol of the EtherCAT® system utilizing a hot connect capability provides flexible and responsive functionalities to change the system configuration which allows you to connect/disconnect or reconfigure any part of the network “on-the-fly”.

Specification

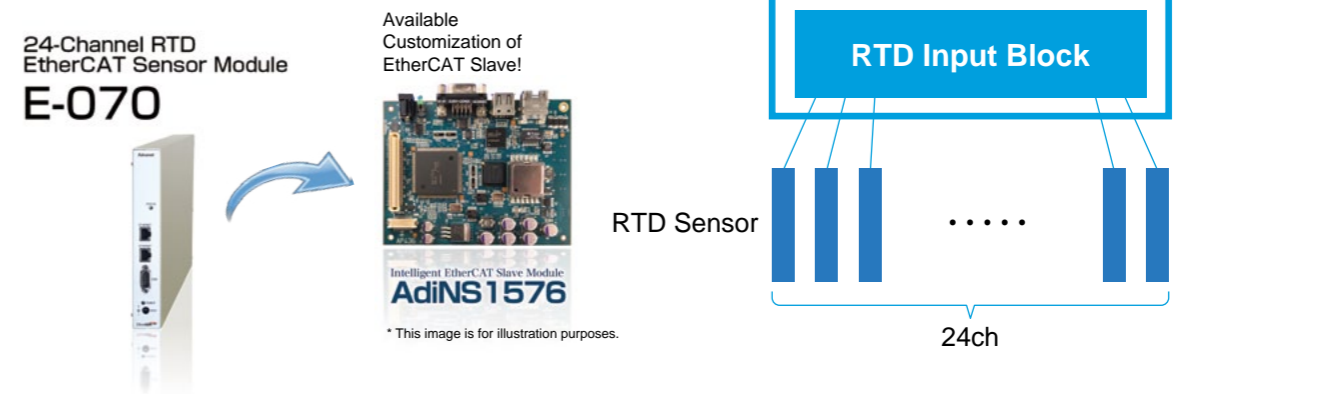
	A3pci1571	AdEXP1572	AdXMC1573
Form Factor	3U CompactPCI®	PCI Express®	XMC
CPU	ARM® Cortex®-A9 Dual-Core (Xilinx: Included in Zynq®-7010)		
Main Memory	DDR3 SDRAM 256 MB		
Boot ROM1	SPI-FLASH 16 MB		
Boot ROM2	microSD (Spare)		
Shared Memory	256 KB (Included in Zynq® PL)		
EtherCAT®	Master Class A Compliant / Redundant Cable, Hot Connect / Controllable Cycle 100 µs to 10 ms		
Front IO	2x EtherCAT® ports, 100BASE-TX, RJ45 Connector		
Bus Interface	PCI Local Bus Specification Revision 2.2 Compliant PCIMG 2.0 R3.0 CompactPCI® Specification Compliant PCIMG 2.1 R2.0 CompactPCI® Hot Swap Specification Compliant	PCI Express Base Specification Revision 1.0a Compliant PCI Express Card Electromechanical Specification Revision 1.1 Compliant	IEEE1386.1-2001 ANSI/VITA42.3-2006 PCI Express Base Specification Revision 1.0a Compliant
Power Supply	DC5 V ±5 %	DC12 V ±8 % DC3.3 V ±9 %	DC12 V ±5 % DC3.3 V ±0.3 V
Dimension	160 mm × 100 mm (3U Size CompactPCI® Bus 1 Slot width)	167.5 mm × 68.75 mm (Low Profile or Standard Height)	74 mm × 139 mm
Operating Environment	Operating Temperature Range : 0 °C to 55 °C Operating Humidity Range : 35 % to 80 %RH (non-condensing) Non-Operating Temperature Range : -10 °C to 70 °C Non-Operating Humidity Range : Under 90 %RH (non-condensing)		
Device Driver	Wind River® VxWorks® 6.9.x, Microsoft® Windows® 7 (Driver Implementation Document is available)		

System Configuration



Features of Advanet EtherCAT Slave

- Simultaneous measurement of 24ch in 1 slave
- Connectable 4-wire Pt100 or JPt100
- Temperature conversion on module
- Measurement overall precision at ±0.1 °C (*Measurement range: -20 °C to 80 °C)



Sales area and Language



Except for some area.
Please contact the following address for details.

For more information

URL : http://www.advanet.co.jp/ethercat_en

Contact: **Advanet Inc.**
616-4 Tanaka, Kita-Ku, Okayama 700-0951, Japan

[E-mail: sales@advanet.jp]
TEL: 086-245-2861
URL : <http://www.advanet.co.jp>

EtherCAT Motion Control Master Card

PCI-1203

Features

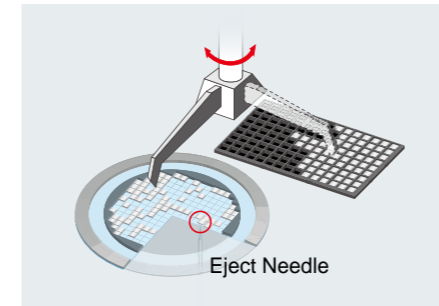
- Dual EtherCAT ports for high-performance of Motion and I/O applications
- Up to 32 axes support for motion control
- Motion cycle time=500 μs; I/O cycle time=200 μs
- Supports ready-to-use API for rapid application development
- 2/3-axis linear / circular interpolation
- Multi-axis synchronous motion
- Trace logger for fast error diagnostics
- Easy to wire, saving wiring working-hour



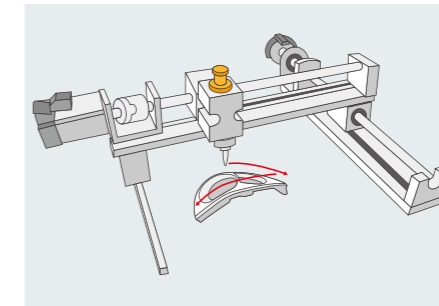
Specification

Item	Description
EtherCAT	
Number of Rings	2 (Motion x 1, I/O x 1)
Number of Axis	6/10/16/32
Cycle Time	Motion: 500 μs; I/O: 200 μs
Motion Control	
Single-Axis Motion	JOG Move Position/Velocity/Time Planning Position/Torque Limit
Motion Trajectory Planning	2/3-axis Line Interpolation 1~8 axis Direct Interpolation 2/3-axis Circular Interpolation Support 6 Path Table (size: 7k points / table)
Master & Slave Synchronized Motion	Gantry E-Gear E-CAM Tangential Following Position Latch
Software	
Utility	Common Motion Utility
Driver	Windows XP/7/8/10
Example	VC, VB, VB.NET, C#, BCB, LabVIEW

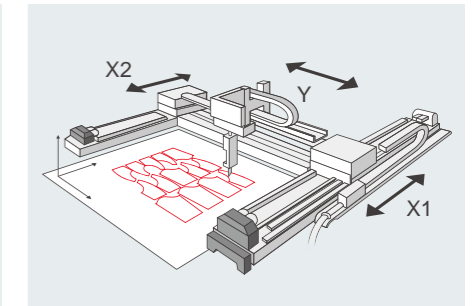
Application Sample



Torque Limit Table

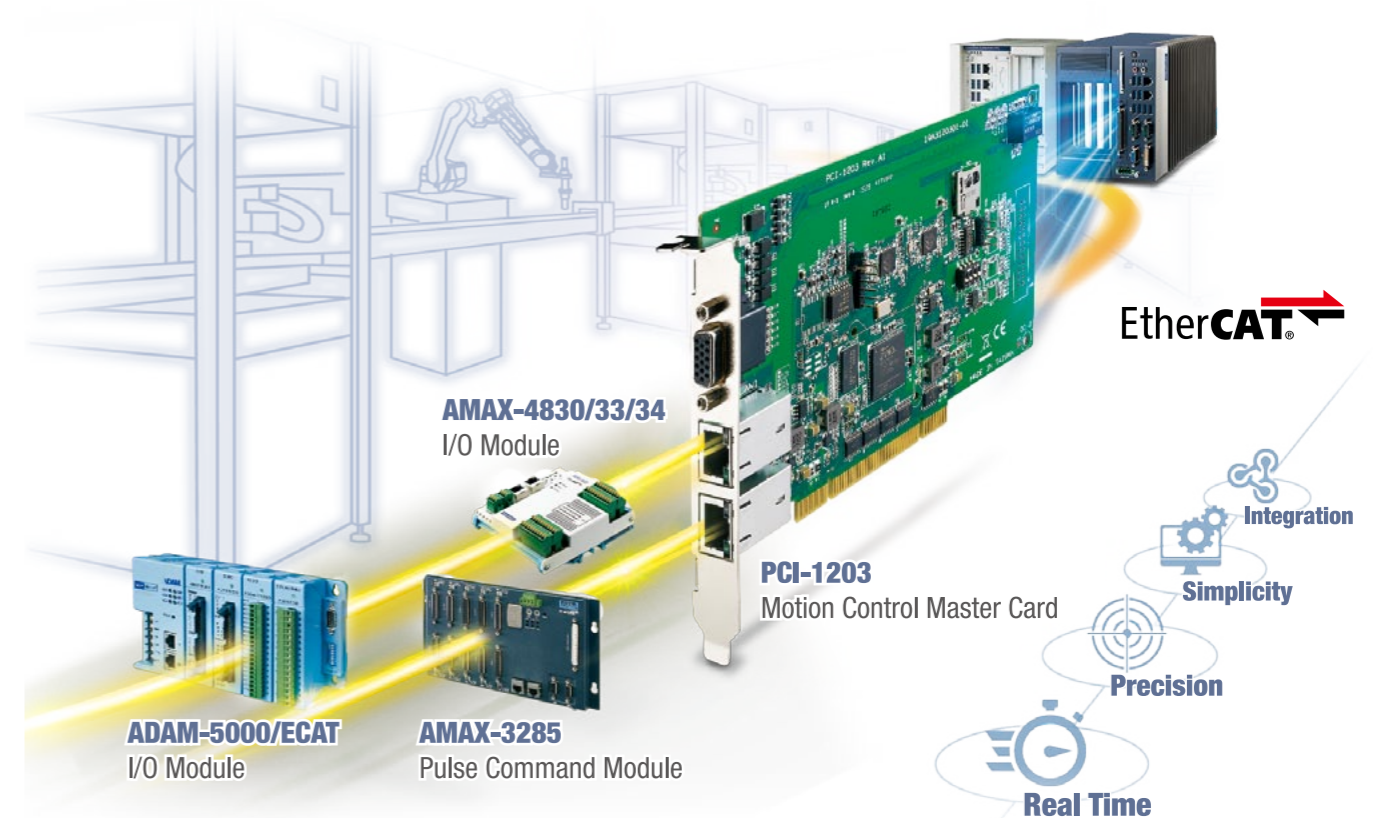


3D Arc Interpolation



Gantry

System Configuration



Sales area and Language



Please contact the following address for details.

For more information

URL : http://www.advantech.com/products/machine-automation/sub_machine_automation

Contact: **Advantech Co., Ltd.**

No. 1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan

[E-mail: buy@advantech.com.tw]

TEL: +886-2-2792-7818 FAX: +886-2-2794-7327

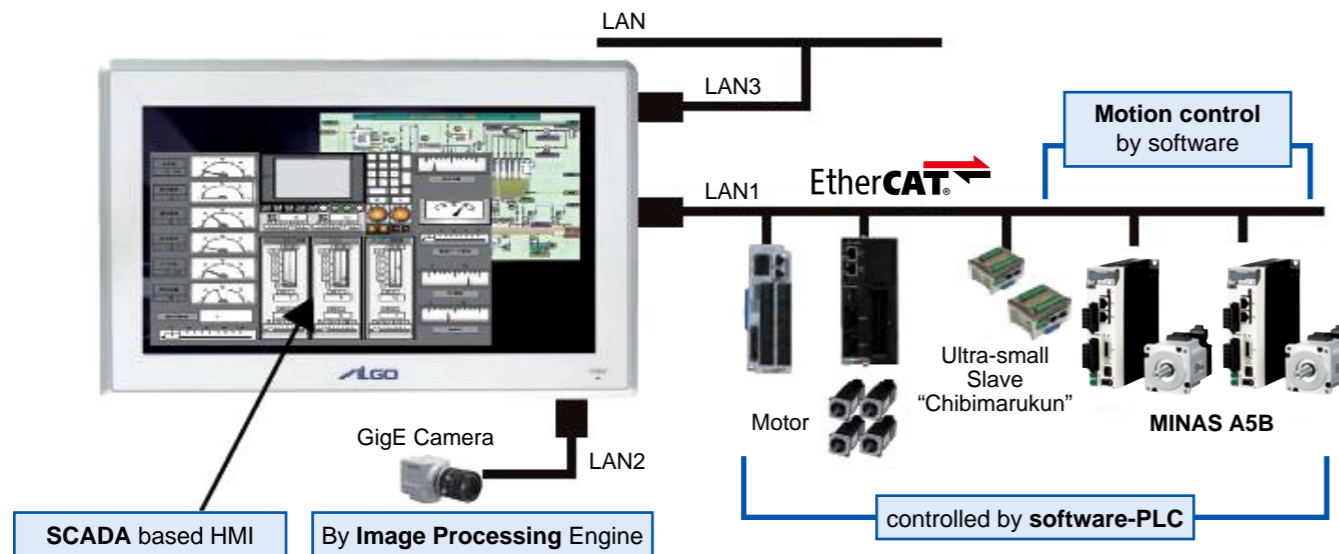
EtherCAT master

“All-in-one Controller”, based on the Industrial PC equipped with EtherCAT master stack

Features

All-in-one controller can execute SCADA, synchronous motion control and image processing just by itself.

- International standard (IEC 61131-3) compliant software PLC
- PLCopen compliant positioning/synchronous motion control software
- OpenCV compliant image processing engine (option)
- SCADA-based HMI software

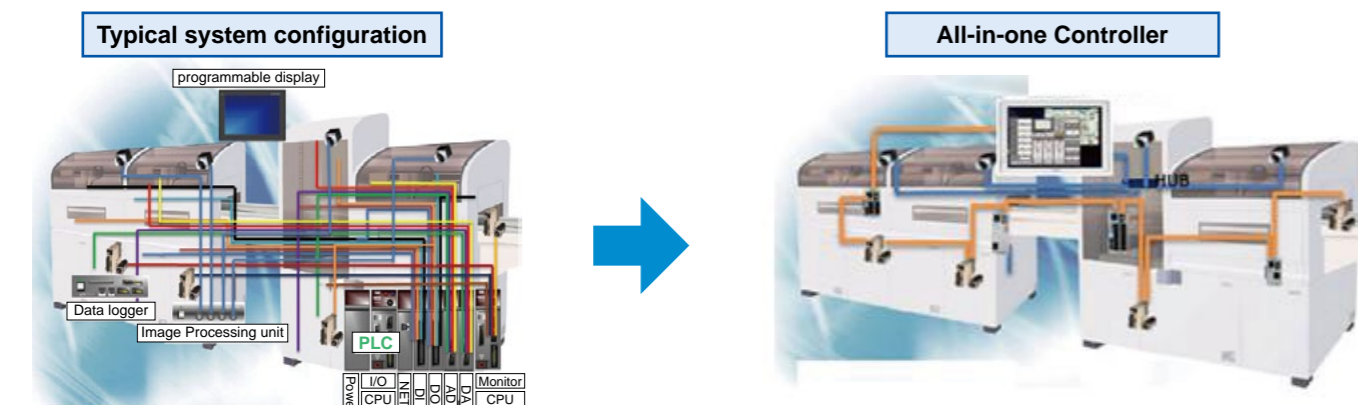


Specification

- Intel® high-performance processor, Atom E3845 Quad Core 1.91 GHz
- Real time OS (INtime). High-speed 28000 steps/50 μs processing.
- Windows Embedded Standard 7 allows effective utilization of various software
- Top-class ultra-thin compact design and lower power consumption allow for installation in small or space for new, expanded use
- Fanless, diskless and completely spindleless Highly reliable design

Free switch off 2 storage (m-SATA) slots Multi-touch panel Multilingual support

Application Sample



EtherCAT slaves

Features/ Specification

Digital input/output (NPN/PNP)

- 16-point input unit
- 16-point output unit
- 32-point input unit
- 32-point output unit
- 16-point input/16-point output unit



Analog input/output

- 4ch analog input unit
- 4ch analog output unit



<“Chibimarukun” series>

e-CON connector

- 8-point input unit
- 8-point output unit
- 4-point input/4-point output unit



MIL connector terminal block

- 16-point input unit
- 16-point output unit
- 8-point input/8-point output unit

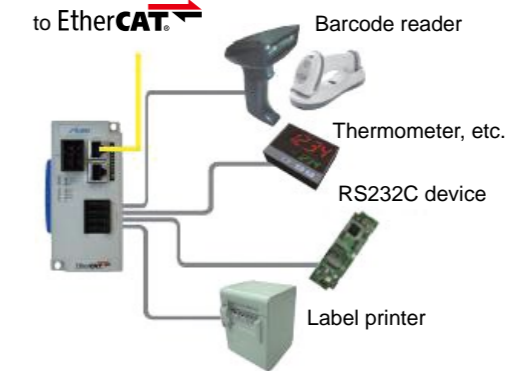


Relay output (terminal block)

- 4-point relay output unit



4ch SIO Gateway



* Serially controlled devices such as RS-232C and RS-485 devices are converted to EtherCAT. EtherCAT can be installed without putting old assets to waste.

Motion controller

- Up to 4-axis control
- Execute from high-order PC, etc. via restricted EtherCAT connection

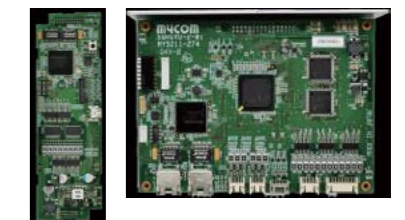


Encoder input

- Line receiver input
- Open collector input



Contract-based Development



Interface board example

Sales area and Language



- Japanese
- English

For more information

URL : <http://www.algosystem.co.jp/>

Contact: **ALGO SYSTEM Co.,Ltd.**

656 Kobirao Mihara-ku, Sakai, Osaka, 587-0021 Japan

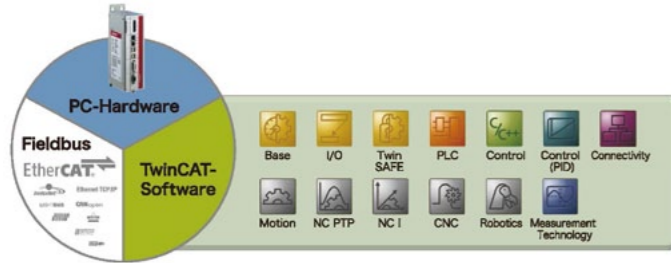
[E-mail: itami@algosystem.co.jp]

TEL: +81-72-362-5067 FAX: +81-72-362-4856

Software PLC/ NC/ CNC

TwinCAT 3

Features



PC base automated control

- One tool for PLC, motion and HMI
- Scalable performance and lower cost by using general-purpose CPU
- Fusion of automation and IT

Real-time control system in PC base system

Software PLC/ NC/ CNC TwinCAT® 3

1) IEC 61131-3 3rd edition

Integration of Microsoft Visual Studio
Support for IEC61131-3 (IL, ST, FBD, LD, SFC) +CFC and object-oriented extension of the 3rd edition

2) Development environment

Support for C/C++, real-time environment in Matlab®/ Simulink®, programming in .NET/C#.

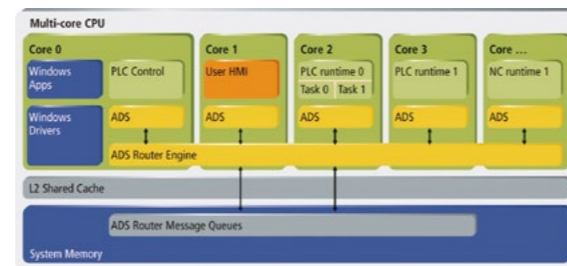
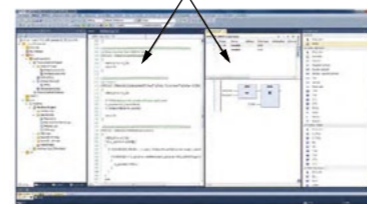
3) Link to MATLAB®/Simulink®

Link to MATLAB®/Simulink® optimizes development and simulation

4) Multi-core CPU support

Impressive real-time performance and high level integration by assigning HMI, PLC, NC, CNC tasks to individual CPU cores..

Supports simultaneous editing of IEC61131 and C/C++ language



System Configuration



TwinCAT CNC



CX5100 series controller + EtherCAT Terminals

- PC base controller with TwinCAT supporting multi-core maximizes EtherCAT performance
- Compact controller on DIN rail (CX5100 series)
- TwinCAT PLC processes minimum 50 µs real-time task, and controls motion system in minimum 125 µs

EtherCAT



Industrial PC

C6015

Features



- Intel® Atom™ CPU with up to four cores and integrated graphic adapter
- Fanless entry-level PC
- For industrial use: high temperature range (0...55 °C)
- Flexible mounting mechanism for the free alignment of the connecting area
- Most compact form factor: 82 mm x 82 mm x 40 mm
- EtherCAT compatibility, high resistance to vibration and shocks

Specification

Technical data	C6015	C6015	C6015
Processor	Intel® Atom™ E3815 1.46 GHz, 1 core (TC3: 40)	Intel® Atom™ E3827 1.75 GHz, 2 cores (TC3: 40)	Intel® Atom™ E3845 1.91 GHz, 4 cores (TC3: 50)
Internal main memory	2 GB DDR3 RAM	4 GB DDR3 RAM	4 GB DDR3 RAM
Flash memory	30 GB M.2 SSD, 3D flash, extended temperature range		
Interfaces	2 x RJ-45 Ethernet 100/1000BASE-T/1 x Display-Port/1 x USB 2.0/1 x USB 3.0		
Operating system	Microsoft Windows Embedded Compact 7, English		
Power supply	24 V DC (-15 %/+20 %)		
Dimensions (W x H x D)	compact dimensions (W x H x D) 82 mm x 82 mm x 40 mm (3.2" x 3.2" x 1.6") without mounting plate		
Operating/storage temperature	0 °C to +55 °C (operation)/ -25 °C to +65 °C (transport/ storage)		
Protection class	IP20		

Application Sample

- Semiconductor manufacturing equipment
- Industrial robot
- Machine tool
- Injection machine
- Industrial print machine
- Pressing machine
- Cutting / welding equipment
- Wind turbine
- Stage equipment

Sales areas and Languages



Local support: Japan, China, Korea, south-eastern Asia, Europe, the Americas, etc. More than 75 countries

For more information

URL : www.beckhoff.com

Beckhoff worldwide : <https://www.beckhoff.com/english/beckhoff/world.htm>

Contact: **Beckhoff Automation GmbH&Co.KG**

[E-mail: info@beckhoff.com]

TEL: +49 5246 963-0

IEC61131-3 Standard Industrial IoT Controller

CONPROSYS PAC(Programmable Automation Controller) Solution

Features

Configurable Type



EtherCAT Module
CPS-PCS341EC-DS1-1201
Modbus Module
CPS-PCS341MB-DS1-1201

Integrated Type



EtherCAT Module
CPS-PC341EC1-9201
Modbus Module
CPS-PC341MB-ADSC1-9201

IEC 61131-3 Standard CODESYS Programming

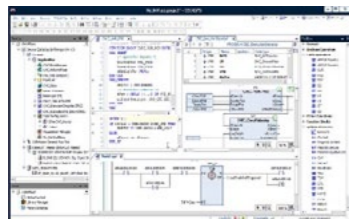
Equipped with the PLC engine "CODESYS," which continues to be used more and more commonly in the global market. Applications can be developed in programming languages, such as Ladder/SFC/Function Block etc., that comply with international standard IEC 61131-3.

Integrated Development Environment Provided free of charge

An integrated development environment for developing applications is provided free of charge. This makes it possible to seamlessly perform all the required development such as control logic and field bus I/O.

Supported integrated development environment: V3.5 SP7 Patch 2 or later

Supported languages: LD / SFC / FBD / ST / IL / CFC



Equipped with Field-Bus Master Functions EtherCAT / Modbus Supported

Equipped with an open-field network EtherCAT / Modbus master function. In the CODESYS integrated development environment, fieldbus I/O can be directly assigned to variables in the same manner as the built-in I/O and the stack I/O.

SCADA / MES / ERP Linking Built-in OPC-UA Server

OPC-UA is essential for the M2M communication. The controller has a built-in server function. This enables the safe and stable exchange of data with SCADA software and MES/ERP systems.

Equipped with a Web HMI Engine Web Monitor Function

The controller has a built-in web server function and tools for creating screens for use on the web. This makes it possible to easily view equipment information without using a cloud server or a similar device.



Specification

Item		EtherCAT Module	Modbus Module
CODESYS Function	Version	V3.5 SP7 Patch2 or later version	
	Languages	LD, SFC, FBD, ST, IL, CFC (IEC61131-3 compliant)	
	Field Bus	EtherCAT Master, Modbus TCP Slave	Modbus TCP Master / Slave
	Communication Protocol	OPC-UA Server	
Program size	ROM Size	1 MB	
	Maximum Steps	250 K Steps	
CPU basic performance	Basic Instruction Execution Speed (LD)	1.6 ns	
	Application Instruction Execution Speed (ST)	5.8 ns	
	Variance	Maximum 300 μs	
	Scan Time	74 μs (20000 steps)	
EtherCAT Performance	Input Processing Time (LD)	144 ns	-
	Output Processing Time (ST)	138 ns	-
	Scan time	166 μs (64 Input and 64 Outputs)	

Application Sample

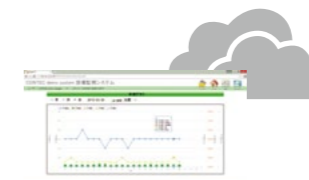
- Electronic Component Mounting Machine
- Semiconductor Manufacturing Equipment
- LCD/FPD Manufacturing Equipment
- Industrial Robot / Arm
- Machine Tools and Processing Machine

System Configuration

SCADA / MES / ERP Linking OPC-UA



Big Data Analysis Cloud Service



Web Monitoring Web HMI



Host Network

CONPROSYS PAC
IEC 61131-3 standard
PLC Programming System
LD / SFC / FBD / ST / IL / CFC



EtherCAT

Stack I/O

Motion Control, Switch On/Off, Flow Rate, Pressure, Temperature, Voltage, Current

MINAS A6B



Sales areas and Languages



- Japanese
- English

For more information

URL : <https://www.contec.com>

Contact: **CONTEC CO., LTD.**

3-9-31 Himesato, Nishiyodogawa-ku, Osaka 555-0025 JAPAN

[E-mail: intsales@contec.jp]

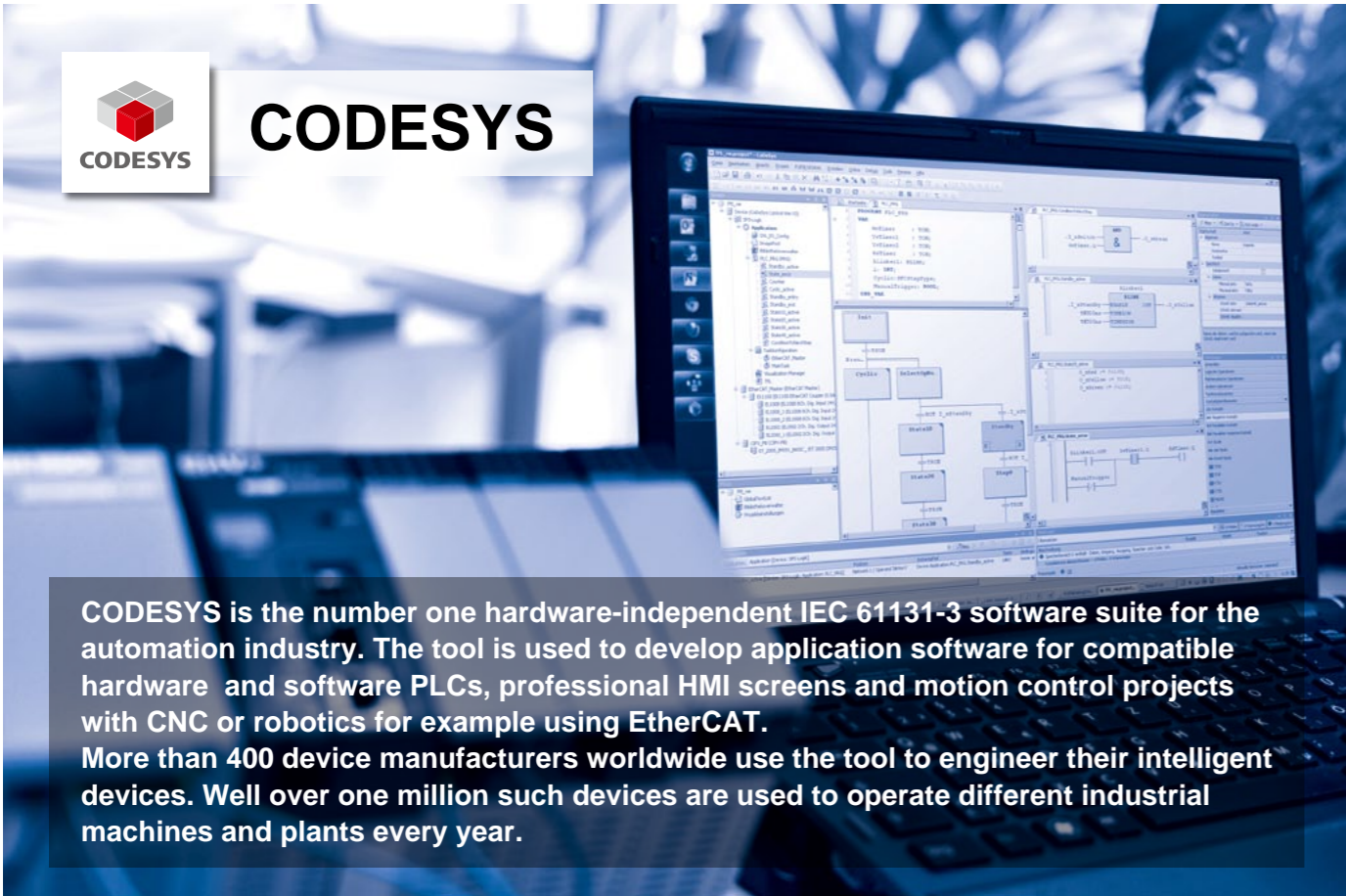
TEL: +81-6-6477-5219

URL: <http://www.contec.com>

CODESYS

IEC 61131-3 Engineering / Software PLC / Motion / CNC / HMI

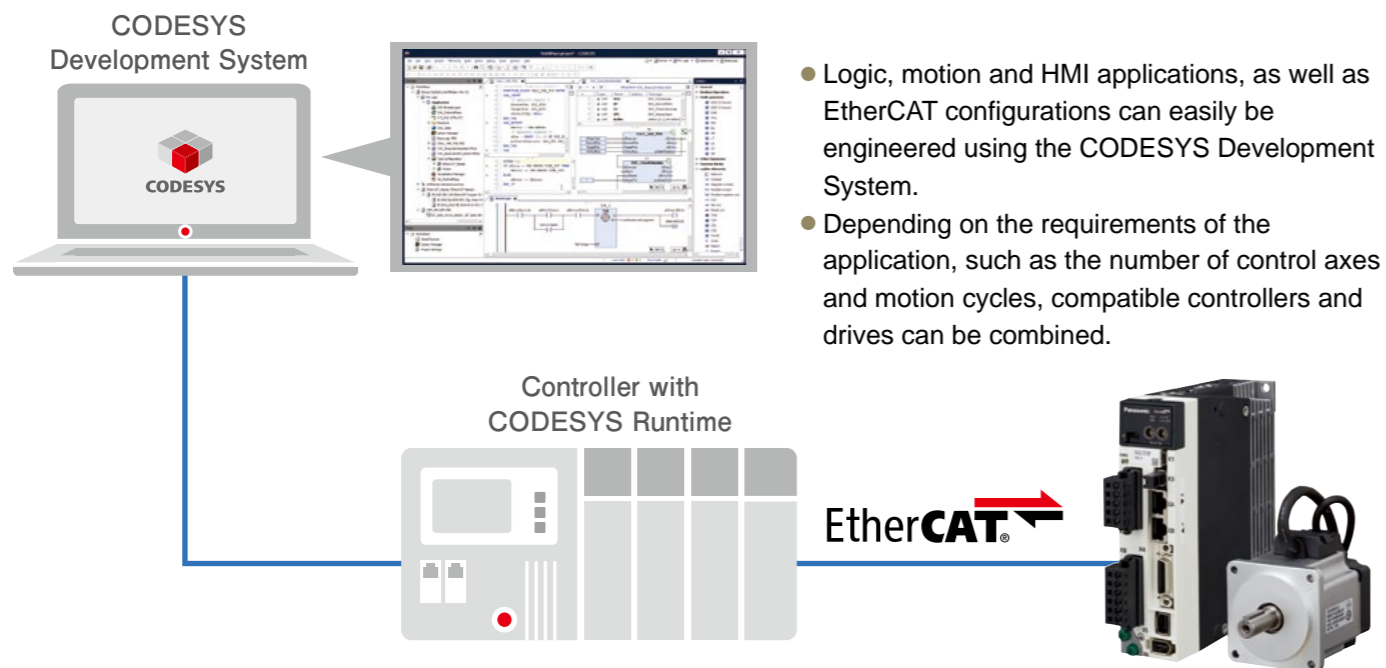
Features



CODESYS

CODESYS is the number one hardware-independent IEC 61131-3 software suite for the automation industry. The tool is used to develop application software for compatible hardware and software PLCs, professional HMI screens and motion control projects with CNC or robotics for example using EtherCAT. More than 400 device manufacturers worldwide use the tool to engineer their intelligent devices. Well over one million such devices are used to operate different industrial machines and plants every year.

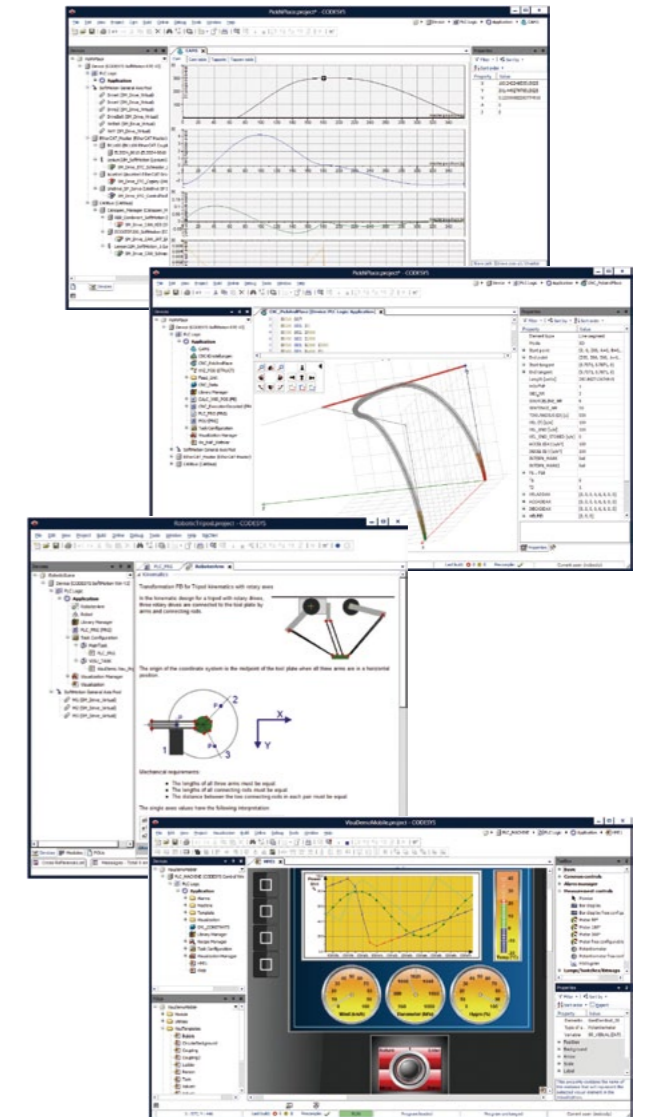
System Configuration



Specification

Fully integrated: Realize PLC, Motion and HMI functions on a single device with CODESYS.

- Engineering** **PLC Programming**
IEC 61131-3-compliant, all languages (ST, Ladder, FBD, SFC, CFC) supported, plus real object oriented programming
- Motion + CNC** **SoftMotion**
For single axis control, electric cam and gear, using the integrated FBs (PLCopen Motion Control part 1, 2 compliant)
- Motion + CNC** **SoftMotion CNC+Robotics**
For complex coordinated motion control tasks such as robotics/CNC applications using the integrated FBs (PLCopen Motion Control part 4); linear / circular interpolation, various kinematics, G-code programming, comfortable axis configuration etc.
- Visualization** **HMI, Visualization**
Integrated visualization editor in the CODESYS Development System: easy creation of modern operation screens and linking to IEC 61131-3 variables; display of the generated screens on IPCs, on panel PLCs with CODESYS TargetVisu, on standard Web browsers with CODESYS WebVisu (via HTML5) or in the engineering tool
- Fieldbus** **Fieldbus**
Integrated fieldbus configurators and protocol stacks as CODESYS libraries seamlessly integrated in the CODESYS Development System for numerous fieldbus systems, such as EtherCAT, PROFINET, Ethernet/IP



Sales areas and Languages



- Japanese
- English
- Chinese
- German
- Italian
- Russian
- Spanish
- French

For more information

URL : <https://www.codesys.com>

Contact: **3S-Smart Software Solutions GmbH** [E-mail: info@codesys.com]
 Memminger Str. 151, 87439 Kempten, Germany TEL: +49-831-54031-0 FAX: -50

Stand-alone Motion Computer Power-PMAC series

Power-PMAC-Clipper

Features

Compact embedded EtherCAT master solution packed with the power of the cutting edge Power PMAC

● **Real-time motion computer equipped Dual-Core PowerPC processor**

The power PMAC is a general-purpose embedded computer running under a hard real-time Linux OS with a sophisticated motion and machine control application built in. Users can program in the easy-to-use Script language as well as standard C language, leveraging its sophistication and flexibility.

● **Real All-In-One package with on-board GPIO, Pulse-counter and Analog I/O**

Not like any other EtherCAT master solution, Power-PMAC-Clipper can interface directly with encoders, sensors and I/Os which allows you the integration of any kind of industrial motion control application.

● **Power PMAC Integrated Development Environment (IDE)**

Power PMAC IDE software is based on the Visual Studio programming environment. It is used to develop, debug and test Power PMAC programs as well as setting up, detect, configure and diagnose Power PMAC hardware. MATLAB/Simulink Power PMAC Target is also included for user-servo ANSI C code generation.



Specification

Hardware specification	
Item	Description
Processor	PowerPC EP465EX (Dual-Core) Standard 1.0 GHz (option 1.2 GHz)
Memory	1 GB DDRAM3 (option 2 GB)
Backup	1 GB Flash-RAM (Max. 4 GB)
Communication interface	100 Mbps Ethernet, RS232C, USB2.0 EtherCAT Master (option)
Power supply	DC5 V@3.5 A, DC15 V@0.3 A, DC-15 V@0.25 A
Output command	Analog +/-10 V Torque/Velocity Pulse and Direction
EtherCAT Master	Up to 64 axes (option) CSP/CSV/CST mode
Encoder input	Quadrature, Halls, EnDat2.2, Mitsubishi, SSI, Mitutoyo, Tamagawa, Yaskawa, Panasonic
AUX Pulse input	2 Quadrature
Flag input	HM, +/-LIM, USER, FAULT AUX Flag UVW (TTL)
Flag output	AENA, Automatic Brake control
Universal Inputs/Outputs	32-DIO (5 V CMOS), 4-A/D and 1-D/A (option)
Dimension (mm)	W241 x D115 x H25

Software specification	
Item	Description
No. of control axes	Up to 256 axes Up to 128 coordinate systems
Controlling method	Point to Point, Continuous Pass
Control period	Up to 60 kHz/1 axis (Up to 16 kHz when EtherCAT)
Trajectory generation	Linear, Circular, Rapid, PVT, Spline, Helical
Unit of control	Any industrial unit
Accel/Decel method	Trapezoid, S-curve accel/dec,el, Vibration suppression filter
Accel/Decel time unit	Sub-millisecond
Positioning range	53 bit (signed)
Position compensation	Ball screw pitch, 1D, 2D or 3D, 1 st /3 rd order interpolation, Torque, Backlash, Tool radius
PLC function	C-PLC (ANSI C), PMAC Script PLC
User algorithm	Custom-written servo/phase routines (Matlab/Simlink friendly)
Synchronous control	Electronic Gearing and Cams, Time-base control, EQU
Advanced features	Spectral Decomposition, Lookahead, Forward/Inverse kinematics

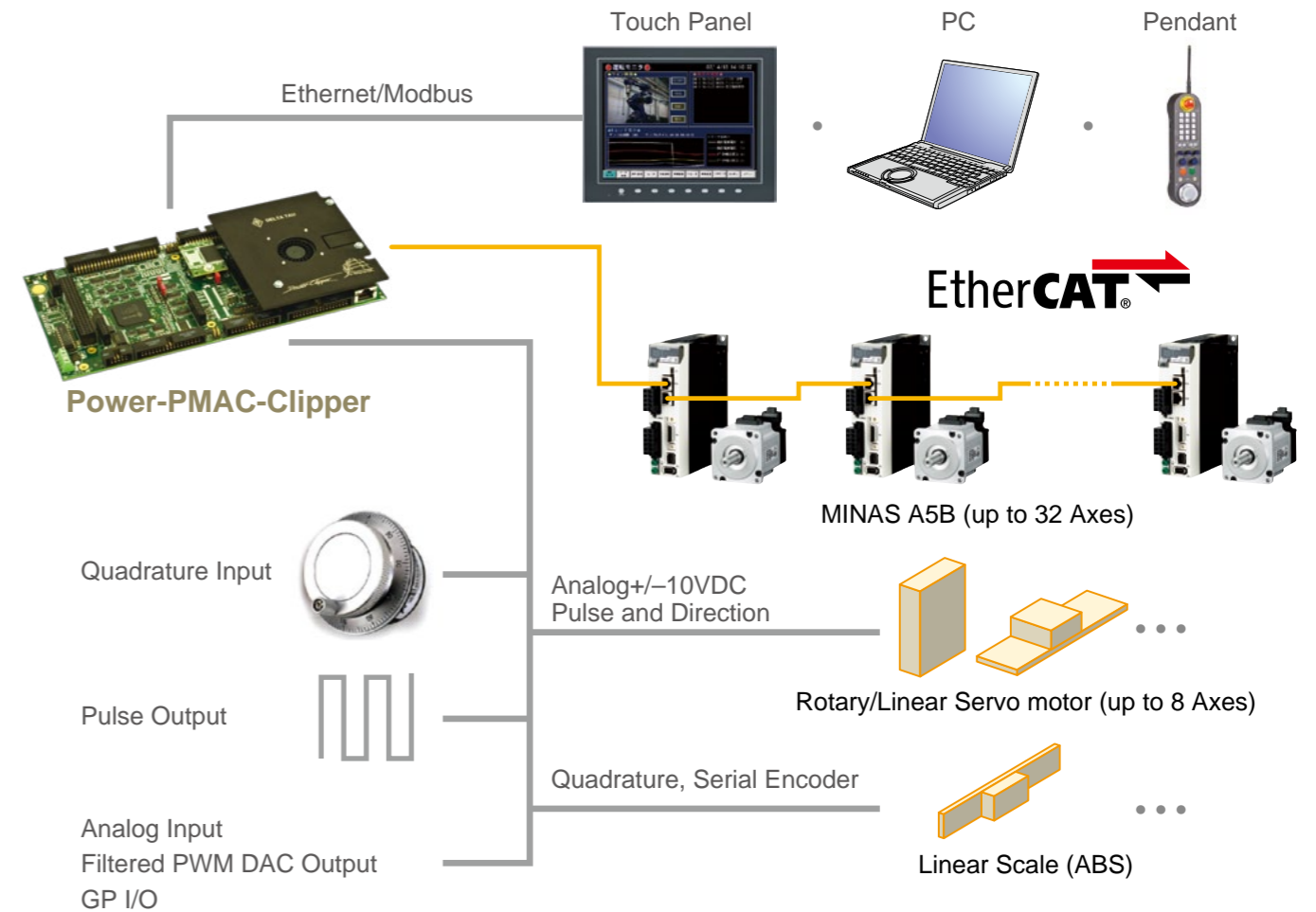
Application Sample

From the Simplest Application, to the Most Complex and EVERYTHING in Between...

For details, please check out our Video Center for more information.

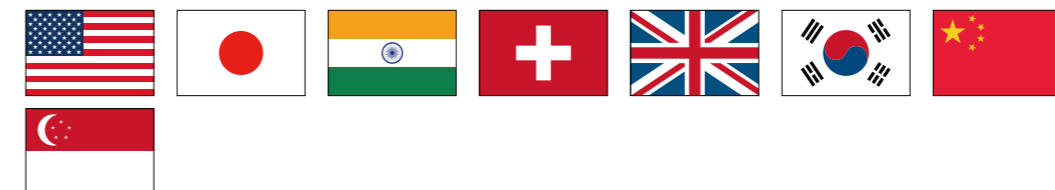
URL : http://www.deltatau.com/DT_Resources/VideoCenter.aspx

System Configuration



EtherCAT

Sales area and Language



- English
- Chinese
- Korean
- Japanese

Please contact the following URL for details :

URL : http://www.deltatau.com/DT_About/aboutCorporateOffices.aspx

For more information

URL : <http://www.deltatau.com>

Contact: Delta Tau Data Systems, Inc. USA West Coast Headquarters [E-mail: sales@deltatau.com]
21314 Lassen Street Chatsworth, CA 91311, United States TEL: +1-818-998-2095 FAX: +1-818-998-7807

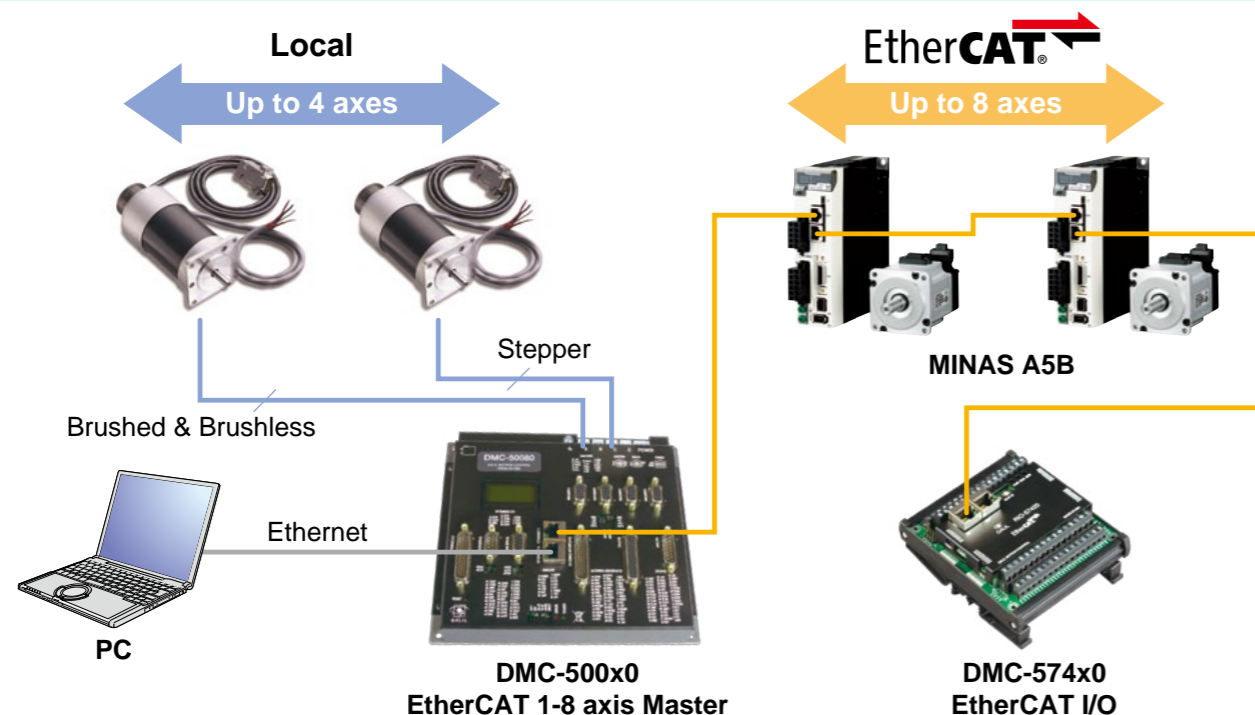
EtherCAT Master Controller

Model DMC-50000

Features

- Configurable controller for up to 8 axes of EtherCAT Master with any of the first 4 axes for local control or EtherCAT Master
- 10/100BASE-T Ethernet port; (1) EtherCAT Port; (2) RS232 ports up to 115 kbaud
- Available with internal, multi-axis servo or stepper drives. Or, connect to conventional external drives (only first four axes)
- For local axes, accepts up to 22 million counts per second of quadrature encoder for servos; Outputs up to 6 MHz for steppers; EtherCAT command speed up to 1 billion counts per second
- Sample times as low as 375 microseconds for 1-4 axes and 750 microseconds for 5-8 axes
- First four axes, advanced PID compensation with velocity and acceleration feedforward, integration limits, notch filter and low-pass filter
- Modes of motion include jogging, point-to-point positioning, position tracking, contouring, linear and circular interpolation, electronic gearing, ECAM and PVT
- Ellipse scaling, slow-down around corners, infinite segment feed and feed rate override
- Multitasking for concurrent execution of up to eight application programs
- Non-volatile memory for application programs (4000 Lines), variables and arrays (2400)
- Dual encoders for every local servo axis
- Optically isolated home input and forward and reverse limits for every local axis; Uses EtherCAT drive for home and limit switches
- Uncommitted, I/O:
 - 8 optically isolated inputs and 8 optically isolated outputs
 - Isolated, high-power outputs for driving brakes or relays (local axis only)
 - 8 uncommitted analog inputs
 - High speed position latch and output compare
 - 32 additional 3.3 V TTL I/O (5 V option)
 - More I/O available with RIO PLC
- 2 line x 8 character LCD
- Accepts single 20 - 80 VDC input
- Communication drivers for Windows and Linux
- Custom hardware and firmware options available

System Configuration



EtherCAT Master Controller

Model DMC-52000

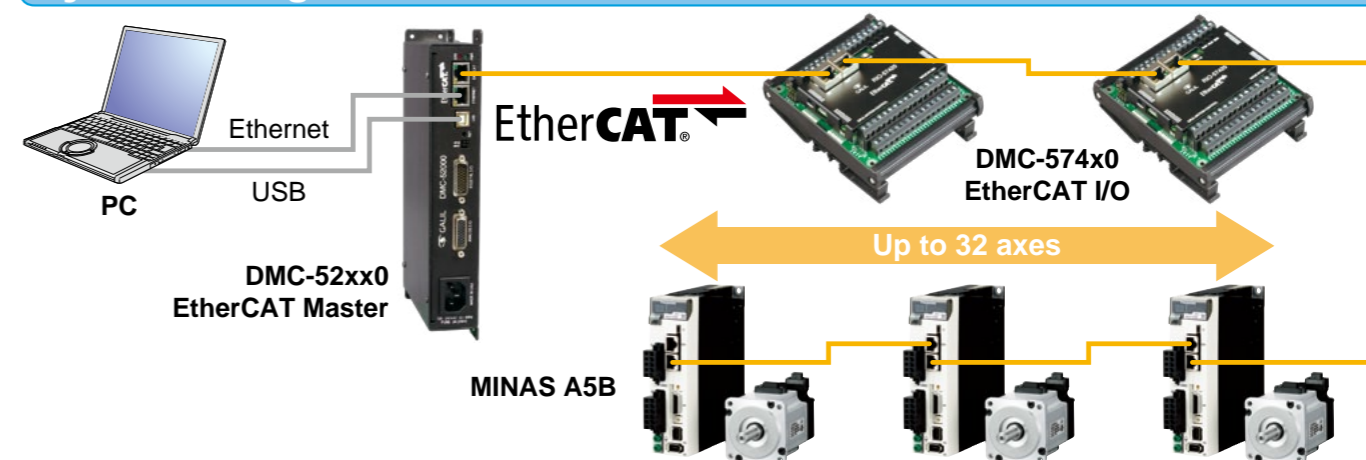
Features

- Available in 2, 4, 8, 16, and 32 axis configurations
- 10/100BASE-T Ethernet port; (1) EtherCAT Port; (1) USB port
- EtherCAT cycle time 1000 microseconds
- Cyclic Synchronous Position mode (CSP)
- Modes of motion include jogging, point-to-point positioning, position tracking, contouring, linear and circular interpolation, electronic gearing, ECAM and PVT
- Ellipse scaling, slow-down around corners, infinite segment feed and feed rate override
- Multitasking for concurrent execution of up to eight application programs
- Non-volatile memory for application programs (4000 Lines), variables and arrays (2400)
- Inputs including forward limits, reverse limits, and homing inputs are located on drives that support these inputs
- Uncommitted, I/O:
 - 8 optically isolated inputs
 - 8 optically isolated high powered outputs
 - 8 uncommitted analog inputs
 - 8 uncommitted analog outputs
 - More I/O available with the RIO-47xxx or RIO-574x0
- Accepts single 120 - 240 VAC input
- Communication drivers for Windows and Linux

Application Sample

Customer Stories URL: <http://www.galil.com/learn/customer-stories>
 Sample DMC Code URL: <http://www.galil.com/learn/sample-dmc-code>

System Configuration



Sales areas and Languages

Galil Headquarters in California   World-wide sales network • English

Please see our rep finder tool or contact us for more details.
 URL : <http://www.galil.com/order/find-reps-and-distributors>

For more information

URL : <http://www.galil.com/>

Contact: **Galil Motion Control, Inc.**
 270 Technology Way, Rocklin, CA 95765, United States

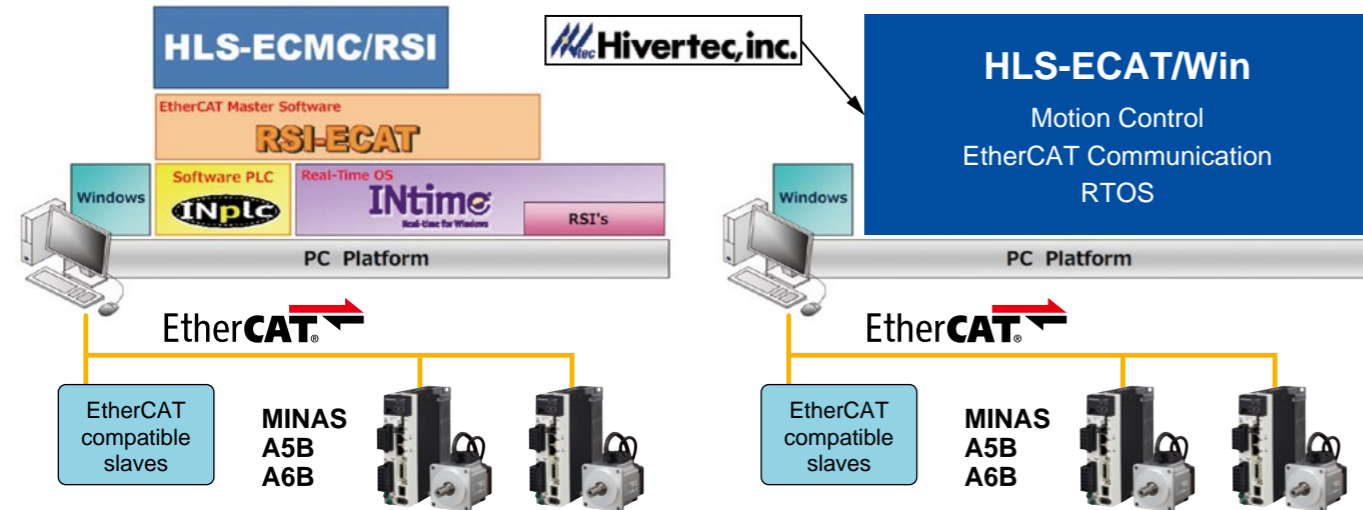
[E-mail: support@galil.com]
 TEL: +1-916-626-0101 or 800-377-6329 (US Only)

Motion Control Software - Software Modules

HLS-ECAT02xx/Win, HLS-ECMC01xx/RSI (xx: represents the number of axes)

Features

HLS-ECMC/RSI	HLS-ECAT · Win
EtherCAT multi-axis positioning software module	EtherCAT that can be developed with VC ++, VC #, VB
<ul style="list-style-type: none"> The software module that performs motion control on real time OS Controlling servo driver with EtherCAT communication (CiA 402 drive profile) Control axes will be from 6 up to 64 axes (can be handled in by 1 axis unit) The program is written in C language API functions conforming to international standard specifications Development environment: Visual Studio + INtime SDK <p>* The cycle time will depend on the PC (PDO cycle: 125 μs possible)</p>	<ul style="list-style-type: none"> EtherCAT motion control software by Windows PC Execute real-time processing on the RTOS with Windows as the interface. Easy developing the EtherCAT system Control axes will be 32 axes Motion control can be embedded into Windows application development Development environment: Visual Studio 2008 or later (VC++, VC#, VB) <p>* The cycle time will depend on the PC (PDO cycle: 125 μs possible)</p>



Specification

API Function List (not all)

Administrative	Motion	I/O
MC_InitAxisSetting Initializes axis setting	MC_Home Homing	IO_inp Reads address 1 byte within slave
MC_GetAxisSetting Acquires axis setting	MC_MoveAbsolute Absolute positioning	IO_inpw Writes address 1 byte within slave
MC_SetAxisSetting Configures axis settings	MC_MoveRelative Relative positioning	IO_inpdw Reads address 2 byte within slave
MC_Power Enables / disables operation	MC_MoveVelocity Continuous feed by constant velocity	IO_outp Writes address 2 byte within slave
MC_Reset Resets errors	MC_MoveAdditive Relative position override	IO_outpw Reads address 4 byte within slave
MC_ReadActualPosition Reads current position	MC_Stop Stop	IO_outpdw Writes address 4 byte within slave
MC_ReadActualVelocity Reads current velocity	MC_ReadFunctionResult Acquire execution result	
MC_ReadStatus Reads motion state machine	MC_WaitForNextInterrupt Event waiting	
MC_SetPosition Writes setting position in axis	MC_CancelWaitInterrupt Cancel event waiting	
MC_SetOverride Executes velocity override	MC_MoveLinearAbsolute Absolute linear interpolation	
MC_TouchProve Latches with trigger input	MC_MoveLinearRelative Relative linear interpolation	
	MC_GroupStop Group stop	
	MC_MovePath Curving interpolation	

- **Common Spec.**
 - Acquire slave information
 - Homing
 - Continuous feed
 - Relative/absolute Positioning
 - Velocity override etc.
 - Acquire current position, velocity
 - Acquire axis sensor information
- **Below is only for "HLS-ECAT/Win"**
 - Relative/absolute Linear Interpolation
 - Interpolation (by specified passing points)
 - Acquire Diagnosis message
 - Various parameter input/output via SDO communication
 - Data input/output to peripheral devices (analog devices, Digital input/output devices, etc.) etc.

IPC base PAC (Programmable Automation Controller)

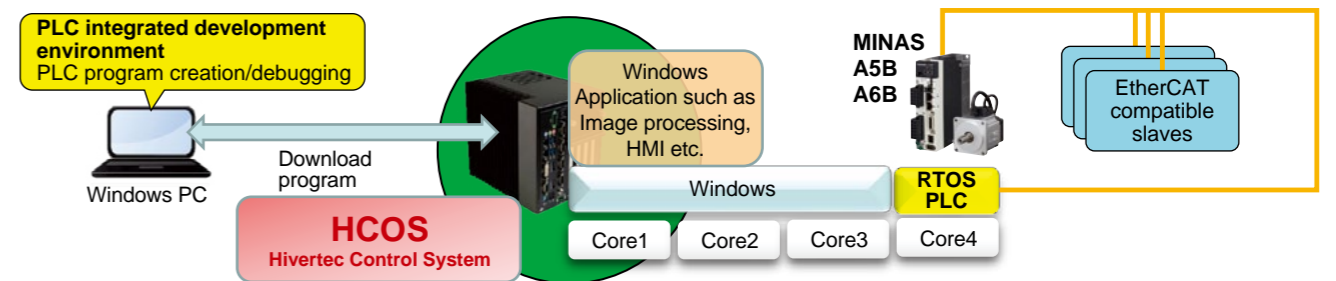
HCOS series

Features

- **Easy to use**
→ The open international standard IEC 61131-3
- **Stable supply**
→ Cooperated with IPC manufacturers
- **Benefits of using a PC**
→ Huge memory, storage, connectivity with the network, Windows
- **Real time**
→ PLC operating on RTOS



Programmable Automation Controller to realize the above



Specification

- **IPC**
A variety of platforms that can be chosen, such as BOX PC, 19 inch rack, Wall mount, Panel PCs etc. Customizable for such as CPU, Mmemory, Storage, External interface (Such as RS-232C, USB, Expansion slot etc.), Response to standards etc.
- **EtherCAT Specification**
EtherCAT Master Class A + Cable Redundancy + Motion Control
- **PLC Specification**
 - **Task**
 - Task type** : Cyclic task, Event task, Freewheeling, Status task
 - Number of Task** : up to 100
 - Task Priority** : 32 Levels
 - Period of cyclic task** : Minimum 50 μs
 - **Development Language**
Corresponds to 6 development languages, such as IL, LD, FBD, ST, SFC, CFC
 - **Debugging**
Capable of Writing during operation, Editing online, Tracing
- **Motion Functions**
These functions are possible such as Continuous feed, Relative/Absolute positioning, Velocity override, Acquisition of current position/velocity, Acquisition of axis sensor information and others. Functions such as Interpolation including kinematics are to be added sequentially

Sales area and Language



- Japanese
- English

For more information

URL : <http://www.hivertec.co.jp/>

Contact: **Hivertec, Inc.**

Mitsuseimei Shin-ohashi Bldg. 1-8-11 Shin-ohashi Koto-ku, Tokyo, 135-0007, Japan

[E-mail: sales@hivertec.co.jp]

TEL: +81-3-3846-3801 FAX: +81-3-3846-3773

Software CNC

COSTANTINO CNC

Features

Costantino is a **SoftCNC** that can be completely customized by OEM customer to create their own CNC solution, using proven and robust components.

Costantino **runs on any** IPC so you can choose your favorite brand that can guarantee international support on hardware components. It runs completely independent on Windows using its dedicated CPU processors in a multicore environment using its dedicated memory amount and its Ethernet controller. Costantino connects with servo and IO devices of any brand using its integrated **EtherCAT master and configurator**. If customer wishes to use different fieldbus such as **Meatrolink or CANopen**, Costantino can interface an ISAC-provided EtherCAT slave device that provides compatibility with all of these interfaces, and more. In addition to the natively supported fieldbuses, OEM customers can add support to any other fieldbus using an SDK that allow to easily develop by themselves or using ISAC engineering help.

Costantino comes with a PLC environment that is compatible **IEC61131-3**, so you can program it with any of the languages that are part of the standard: ST, IL, LD, FBD, SCD. In addition, you can create FBs in C language and thus reuse components written for different hardware solutions.

Costantino CNC interprets **G-codes** (ISO6983) with some features that are important in many application; with 25000 blocks/sec and more than 250 blocks of look ahead, it is one of the fastest CNC in the market.

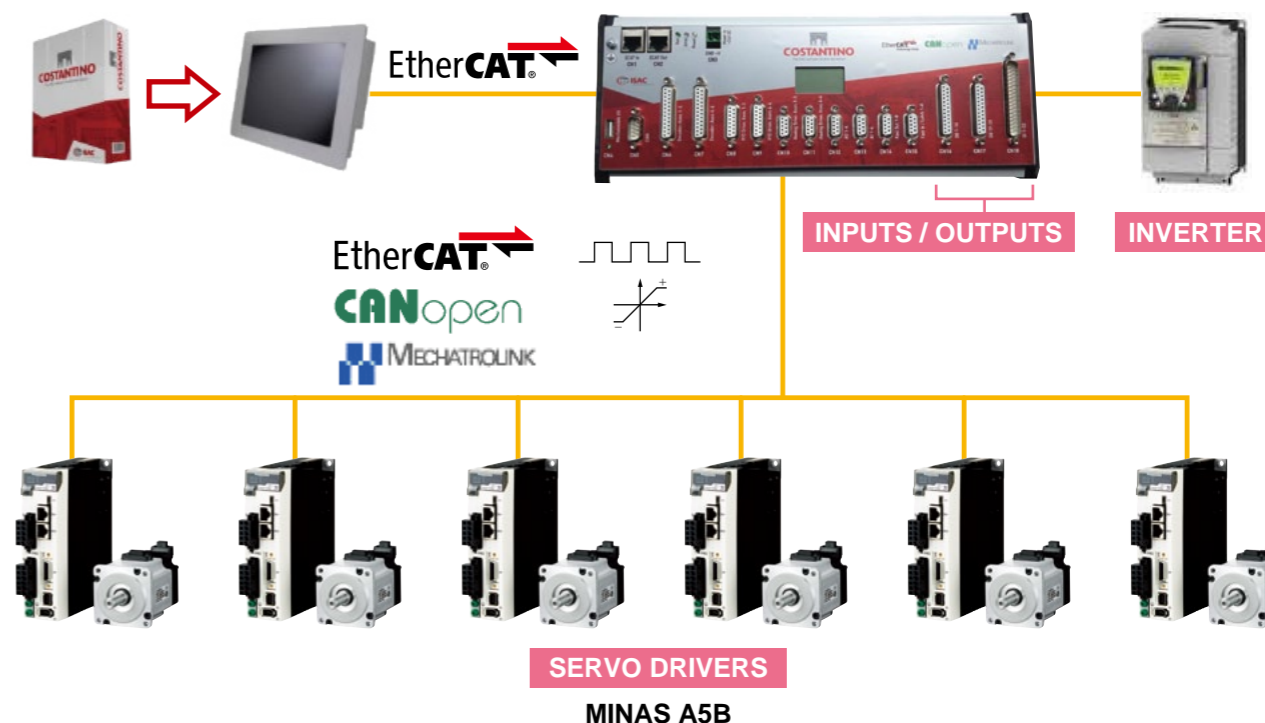
- All movements are under **Jerk** control for tooltip and joints, this guarantees the best mechanics lifetime and performance;
- It runs up to 8 different interpolation programs at the same time, and handle auxiliary axes for clams, loaders and unloaders, or tool change, for a total of 128 axes;
- It supports **High Speed Machining**, that keeps cutting feedrate constant, reduces machining timing, and reduces machine vibrations;
- It comes with high accurate vibration suppression algorithms, following error compensation, velocity feed forward and many other tools to achieve the best cutting results;
- It compensates **tool length and radius**;
- It can handle online tool measures, tool wearing and life, and complex tool change procedure;
- It includes **5 axis machining interpolator** to program tool tip in machines equipped with bi-rotative heads, tilting tables, and even robots.
- It comes with a powerful **simulation engine** capable of showing results on the material before machining takes part.

Application Sample

- Stone Cutting
- Metal Milling
- Thermal Cutting (Plasma, Laser, Oxi)
- Waterjet
- Glass Cutting
- Glass Engraving
- Wood Working
- Dental Applications

System Configuration

- Software CNC Costantino
- Panel PC or Industrial PC
- EtherCAT Bridge for connecting servodrivers and I/Os



Sales areas and Languages



Please contact us for details.

- English
- Italian
- Turkish
- Chinese
- Portuguese

For more information

URL : www.costantinocnc.com

<p>Contact: ISAC s.r.l. Via Maestri del Lavoro, 30, 56021 CASCINA (PI) - Italy</p> <p>AMU, LLC Mr. Andrew Urda, Chicago, IL, USA</p> <p>GTT co. LTD (Stone Market representative for China) Mr. Jason Ou</p> <p>Seromsys #304 Engineering P-Block, 237 Sangidaehak-ro, Siheung-si, Gyeonggi-do 429-793 - Korea</p>	<p>[E-mail: isacsrl@isacsrl.eu] URL: www.isacsrl.eu TEL: +39 (0)50 711131 FAX: +39 (0)50 711472</p> <p>[E-mail: contact@amu-llc.com - aurda@amu-llc.com] TEL: +1 224 830 0240</p> <p>[E-mail: 46092672@qq.com] TEL: +86 139 5951 0697</p> <p>[E-mail: jeongyong.kim@seromsys.com] TEL: +82 (0)31 434-9048 FAX: +82 (0)31 434-9049</p>
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Programmable Automation Control

PAC ILIUM

Features

Ilium is a newly developed PAC (Programmable Automation Controller) based on more than 10 years of ISAC experience in the field. It includes all main functionalities needed to build an Industrial Automation application, all in one device: **PLC Logic Execution + Motion Control + Communication and integration with other software components + HMI.**

Those functionalities **do not interfere between each other**, as it is possible to use more than one core of the processor; all of the tasks are executed with **high precision** and with **defined execution times**. Ilium interfaces with other devices through an Ethernet port that supports **EtherCAT** or **Powerlink**. Using the ISAC Bridge, Ilium supports many other fieldbuses (**CANopen, Mechatrolink, Analog interface** with position reading through **Encoder, SSI or ENDAT, Pulse/Direction** or **Stepper** interface). Ilium offers complete diagnostic tools for faults and anomalies detected on the I/Os peripherals and on the servo drivers. All of the errors are stored, allowing to analyze them at a later time, even in the case of unattended operation.

Ilium is available in **two formats**: the application is **portable** between different formats, the development tools are the same, as well as the application libraries.

Ilium Embedded is a compact device, powerful enough to drive **up to 11 EtherCAT axes**. It is available with **touch screen**, it supports **USB, COM** ports, external **HDMI** video, one **Ethernet** port for programming and Web interfaces.

It does not contain moving parts, all of the components are non-removable, few Watts are enough to allow it to run.

Ilium soft-Motion is a **real-time software** that runs on an IPC; it uses exclusively **a part of the hardware resources**: one or more cores of the CPU, a portion of RAM, one Ethernet port; communication and HMI is managed by Windows. **You can choose the PC**: choose the ISAC model that suits your needs, or your preferred IPC supplier.

Ilium soft-Motion comes with no performance compromises, and offers the flexibility and the power of the PC to realize a customized user interface, using ISAC tools or alternative ones.

Ilium offers powerful and integrated development tools in order to make easier the PLC logic development and its debug, the start-up of the machine or of the plant, and its maintenance. You can develop the application in the IEC61131 standard languages (ST, IL, LD, FBD, SCD). Program the PLC logic with Multiprog, from Phoenix Contact Software. You can also use ANSI C, and compile in native code, in order to obtain the maximum performance and reliability, to create whole tasks with this language, or to create FBs to be used inside Multiprog. Ilium supports PLCopen MC part 1 and 2, version 2.0. The supplied FBs includes Cams (programmable from PLC logic or to be created from sampling), Gears, Electric Shafts, Phasing, Slave Synchronous Movement (referred on more Masters), all movements based on space or speed control, with speed, acceleration and Jerk control to assure fluid movements and the dampening of the resonances. The servo drivers can be tuned using the integrated diagnostic tools, as the oscilloscope, and all of the parameters will be stored and sent to the servo drivers by Ilium itself, making the replacing of servo drivers very easy.

ISAC ILIUM: TRY TO STOP IT!

Application Sample

- Packaging
- Material Handling
- Printing machines
- Building Automation
- Textile machines
- Paper processing machines

System Configuration

x86 version	EMBEDDED version
<ul style="list-style-type: none"> ● Software PAC ILIUM x86 ● Panel PC or Industrial PC ● EtherCAT Bridge for connecting servo drivers and I/Os 	<ul style="list-style-type: none"> ● ISAC ILIUM Carrier Board ● Software PAC ILIUM Embedded ● Optional EtherCAT Bridge for connecting servo drivers and I/Os

Sales areas and Languages



Please contact us for details.

- English
- Italian
- Turkish
- Chinese
- Portuguese

For more information

URL : www.isacsrl.it

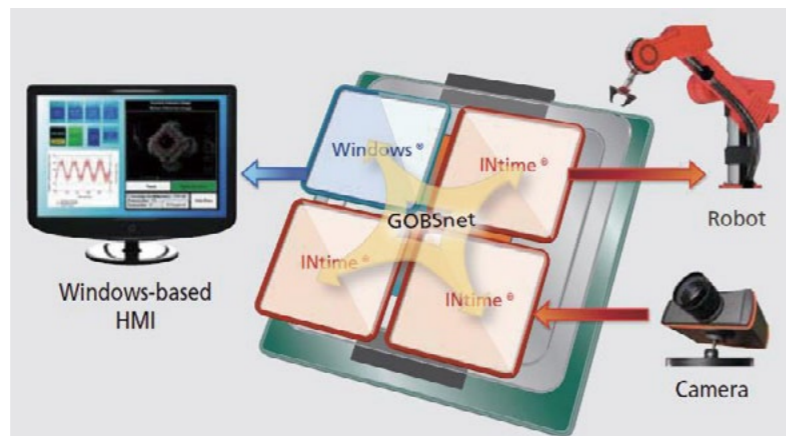
Contact: ISAC s.r.l. Via Maestri del Lavoro, 30, 56021 CASCINA (PI) - Italy	[E-mail: isacsrl@isacsrl.eu] URL: www.isacsrl.eu TEL: +39 (0)50 711131 FAX: +39 (0)50 711472
AMU, LLC Mr. Andrew Urda, Chicago, IL, USA	[E-mail: contact@amu-llc.com - aurda@amu-llc.com] TEL: +1 224 830 0240
GTT co. LTD (Stone Market representative for China) Mr. Jason Ou	[E-mail: 46092672@qq.com] TEL: +86 139 5951 0697
Seromsys #304 Engineering P-Block, 237 Sangidaehak-ro, Siheung-si, Gyeonggi-do 429-793 - Korea	[E-mail: jeongyong.kim@seromsys.com] TEL: +82 (0)31 434-9048 FAX: +82 (0)31 434-9049

PC Based Controller RT-C Language Controller

Features

RT-C Language Controller for Windows can give determinism to ensure predictable behaviors and can support real-time tasks to standard Windows platforms.

Though Windows is a global standard on human machine interfaces (HMI) and on other general purpose operating system (GPOS) functions, but only Windows cannot provide deterministic supports for real-time application needs.



● Complete RTOS for Windows platforms

RT-C Language Controller is a controller which can achieve 100 μs period high-speed real time control.

You can realize both real time instrument control function and multi-purpose Windows function on 1 PC platform.

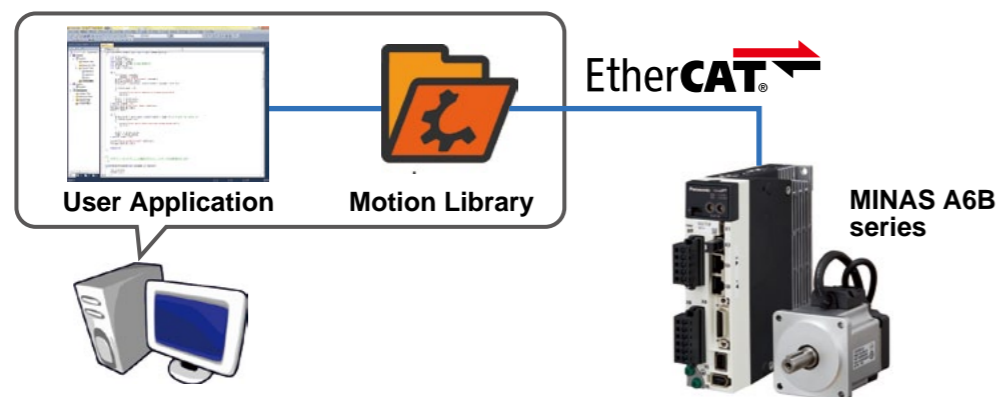
since it can also run on Windows.

● Machine control by RT-C Language Controller

RT-C Language Controller which makes use of PC platform can offer unmatched performance since it uses latest Intel CPU.

In developing control program, since it adopts the integrated development environment "Visual Studio" which is the most popular all over the world, if you have experienced Windows programs with C# language, you can smoothly introduce it to your systems.

System Configuration



Specification

Priority Scheduling	0 (highest) - 16 (lowest) 16 levels
Constant Scan Time	More than 0.1 ms
Number of Maximum Tasks	16
Data Area Size	64 MB
Supported OS	Windows10, Windows8.1, Windows8, Windows7 [32 bit/64 bit]
Development languages and Environments	Visual Studio 2008/2010/2013/2015 * More than Professional Edition

PC Based Controller INplc PLC based on IEC61131-3

Features

● INplc-Controller with "INplc Runtime License"

The most advantageous point of INplc is that it can be used with Windows together.

It is a multifunctional controller equipped with not only PLC applications but also C language applications / HMI applications.

You can use add-in boards or field buses as I/O interfaces of INplc.

EtherCAT is also contained in the field bus category which INplc supports.

INplc-Controller

- Real-time sequence control
- Network communication function
- High functionality human interface
- Motion Control function



Development Tool INplc-SDK

- IEC 61131-3 Conforming
- Motion Function Block
- Supports language mix



EtherCAT



You can develop and maintain PLC programs on standard Windows PC platforms using it. The created PLC programs can be downloaded to PLC controllers via network.

- INplc has corresponded to 5 languages in accordance with IEC61131-3 that IEC (International-Electrotechnical Commission) provides.
- You can code different languages together in INplc-SDK environment.
- INplc-SDK also allows you to convert across languages.

INplc is a real software-PLC in accordance with IEC61131-3.

INplc adopts MULTIPROG & ProConOS (by PHOENIX CONTACT Software, Germany) which have achieved a lot of satisfactory results in the world. And INplc-Controller adopts INtime and a standard Windows computer as its basic structure.

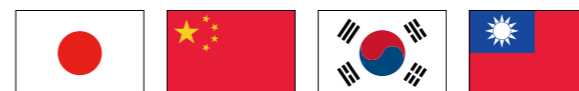
Therefore,

- No specialized hardware is needed.
- Efficient hardware can be selected from among marketed commodities. From high-end systems to embedded-systems, you can construct various systems with a high-flexibility.

Specification

Priority Scheduling	0 (highest) - 16 (lowest) 16 levels
Constant Scan Time	More than 0.1 ms
Number of Maximum Tasks	16
Data Area Size	64 MB
Supported OS	Windows10, Windows8.1, Windows8, Windows7 [32 bit/64 bit]
Development languages and Environments	IEC61131-3 Language (IL, ST, LD, FBD, SFC), C#

Sales area and Language



- English
- Japanese

For more information

URL : http://www.mnc.co.jp/index_E.htm

Contact: Micronet Company

TMY Building 9F,17-13, Hacchobori 3-chome,
Cyuuou-ku, Tokyo, Japan (Zip 104-0032)

[E-mail: bcd@mnc.co.jp]

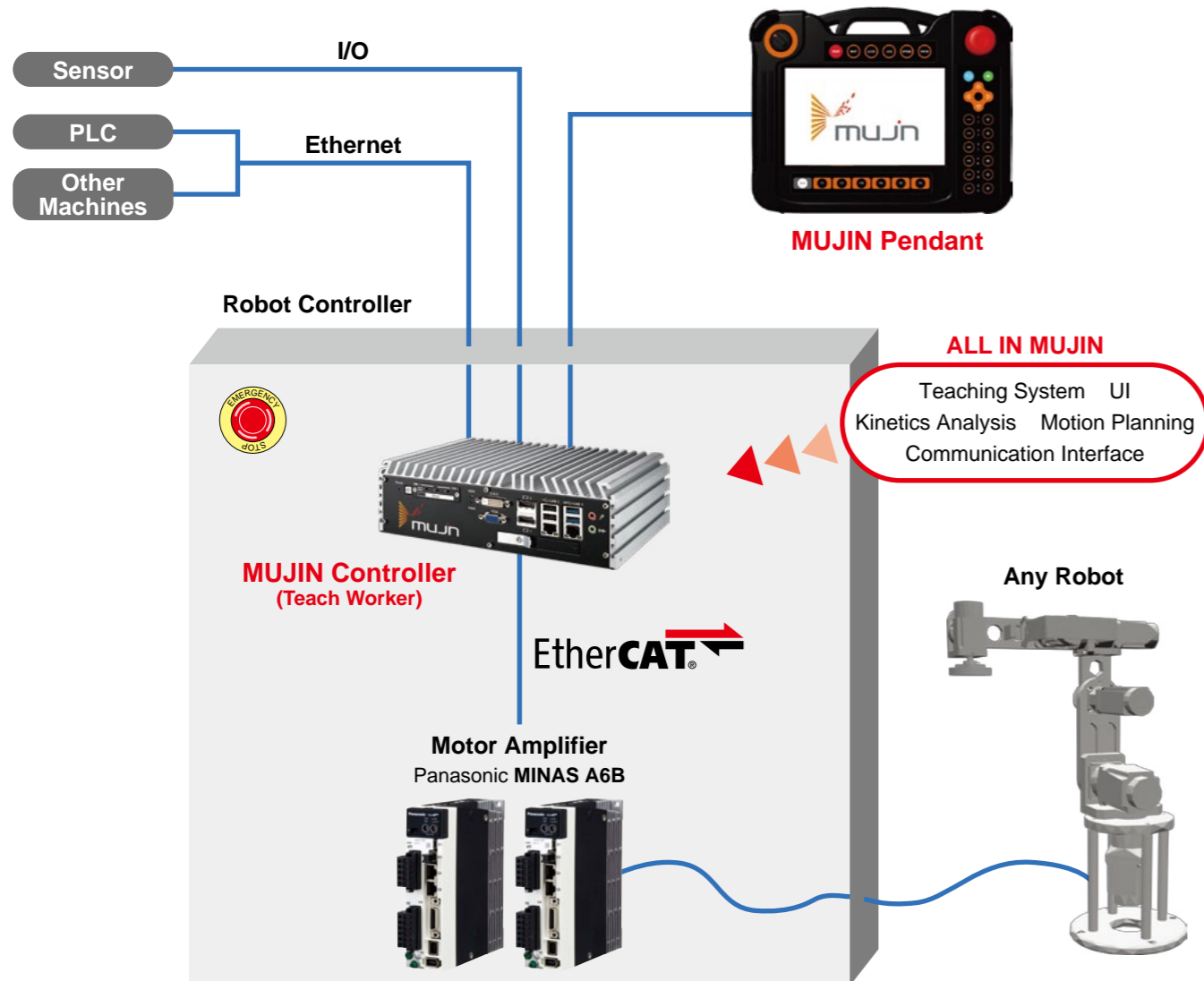
TEL: +81-3-6909-3371 FAX: +81-3-6909-3373

Teach Worker Intelligent Robot Controller for Any Robot

The World's First Robot Controller with Motion Planning

Features

Industrial Robots for Everyone



Panasonic "AC Servo Motor"



Integration of Mujin's Teach Worker with "AF Series" or "SHA-P Series" gearbox equipped Panasonic servo motors can be completed within 1 month.

Custom robots only require 1 month or less to integrate

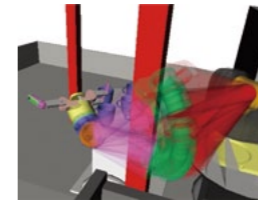
Specification

Innovative User Interface(UI)



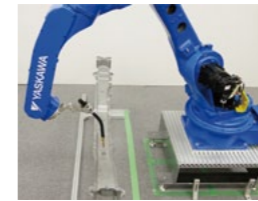
"Teach Worker" removes the burden of traditional complex task programming by presenting an interactive user interface with 3D graphics and support for Mujin's optimized programming language ITL.

Less Teaching (Autonomous Collision Avoidance)



Mujin's motion planning technology with advanced collision avoidance logic can be configured easily, enabling robotics systems to operate in small footprint and complex environments without risk of collision.

CAD/CAM



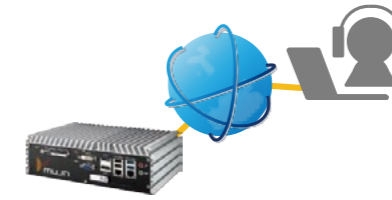
Welding, laser cutting, and deburring related data can be imported using standard CAD formats to easily produce production-ready tasks.

3D Simulator



A simulator is included that can be used to validate tasks before deployment in real-world environments, reducing overall time to deployment and manual tuning on-site.

Remote Maintenance



You can support robots within your facility remotely regardless of robots location via Mujin's Teach Worker.

Sales areas and Languages



- English
- Japanese
- Chinese

For more information

URL : <http://www.mujin.co.jp>

Contact: **Mujin, Inc.**
1-1-9 Narihira, Sumida, Tokyo, 130-0002, JAPAN

[E-mail: info@mujin.co.jp]
TEL: +81-3-4577-7638

Rugged, Reconfigurable Smart Machine Controller

CompactRIO Performance Controller (cRIO-9034, cRIO-9039)

Features

- Motion, Vision, signal-conditioned I/O, and HMI integration on one platform
- High Performance Real-Time processor
- User-Programmable FPGA
- Over 100 signal-conditioned I/O modules to customize your application
- EtherCAT, Ethernet/IP, ProfiBus, ProfiNet, Modbus, OPC UA, and other common buses supported
- Pre-written motion control and vision analysis libraries for real-time and FPGA



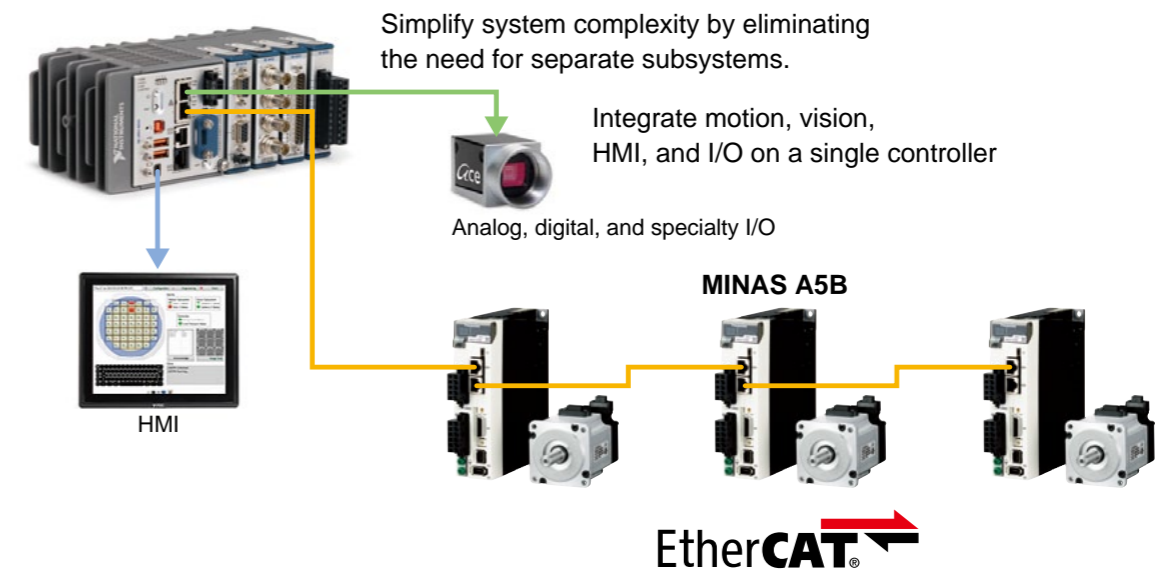
Specification

	4-slot Performance	8-slot Performance
Processor	Up to Quad-Core Intel Atom E3845, 1.91 GHz	
Modular C Series I/O Slots	4	8
Control Cycle Time	250 μ s (min.) over EtherCAT	
RAM	Up to 2 GB DDR3 + 128 MB DDR3 for FPGA	
Storage	Up to 16 GB + SDHC Card Slot	
Programming Environments	LabVIEW, C/C++, IEC 61131-3	
Shock/Vibration Ratings	50 G Operational shock; 10 Hz – 500 Hz Random Vibration	
Operating Temperature	-20 °C to 55 °C (-40 °C to 70 °C extended temp models available)	
Operating System	NI Linux Real-Time, 64-bit	
FPGA Type	Up to Kintex-7 325T	
Certifications		

Application Sample

- Machine control systems
- Manufacturing machines
- Pick-and-place machines
- Industrial robotics and automation
- CNC machines
- Vision-guided motion
- Material handling machines
- Hydraulic control
- Power conversion equipment
- Mining and drilling equipment
- Multi-axis motion control
- Machine tools
- Condition Monitoring

System Configuration



Sales areas and Languages



Please contact us for details.

- Operations in over 50 countries
- Support for dozens of languages
- Global training and support

For more information

URL : <http://www.ni.com/motion>

Contact: **National Instruments Corporation**
11500 N. Mopac Expy. Austin, TX 78759

[E-mail: support@ni.com]
TEL: +1-866-275-6964

EtherCAT General Motion Controller

NET200-GMC

Features

- Standardized EtherCAT master
- Built-in integrated development environment:
NexMotion Studio
- Master control cycle: 1ms



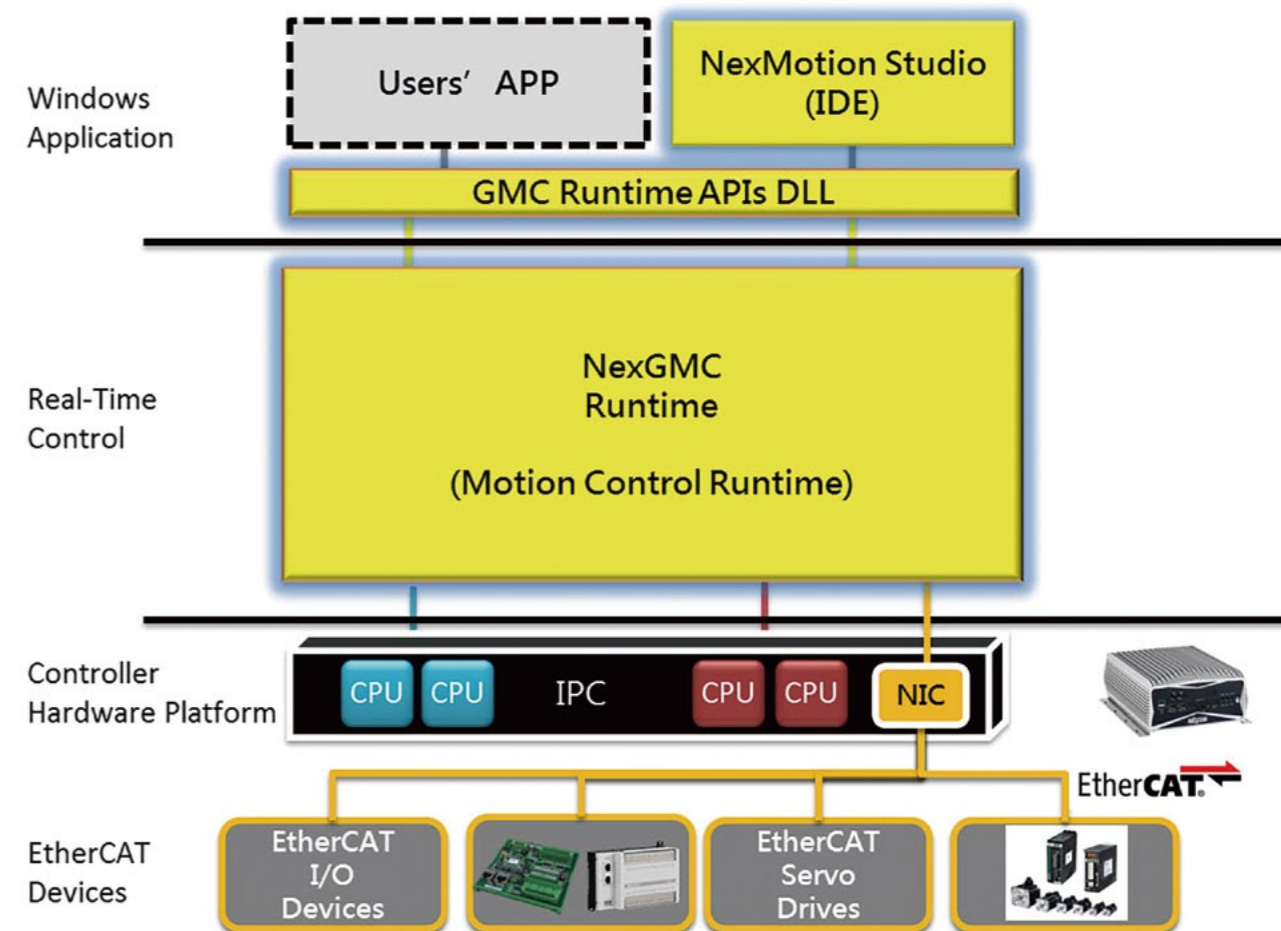
Specification

Item	Description
NexGMC Runtime	
Axis No.	8 Axes
Cycle Time	1 ms
Single Axis Control Functions	PTP/ Jog/ Halt/ Stop
Single Axis Blending Motion	Aborting/ Buffered/ Blending
Single Axis Command Override	Position/ Velocity/ Acceleration/ Deceleration
Axes Group Types	Cartesian Coordinated
Axes Group Control Functions	PTP/ Linear/ 2D Arc/3D Arc
Axes Group Blending Motion	Aborting/ Buffered/ Blending
Platform Specifications	
CPU	Intel® Celeron® processor J1900 Quad Core 2.0 GHz
Memory	4 GB RAM (2 x DDR3L)
Display	Dual independent display: DVI-I and DP
I/O Interface-Front	<ul style="list-style-type: none"> ● ATX power on/off switch LEDs for HDD LED, Batty LEDs, Power LED, COM port Tx/Rx, 5x programmable GPO LEDs ● 1 x External SD Card ● 1 x SIM card holder ● 2 x Intel® I210AT GbE LAN ports, support WoL, Teaming and PXE ● 1 x DP display output ● 1 x DVI-I display output ● 1 x USB 3.0 (900 mA per each) ● 3 x USB 2.0 (500 mA per each) ● 2 x RS232/422/485 support auto flow control <ul style="list-style-type: none"> - Jumper-free setting on RS232/422/485 - Support 2.5 KV isolation protection on COM1 ● 1 x 3-pin DC input, Typical 24 V DC input with +/-20 % range
Dimensions	85 mm (W) x 157 mm (D) x 214 mm (H)
Certifications	CE/FCC Class A
Operation Environment	Operating system: Windows Embedded Standard 7 Real-time extension: RTX

NexMotion Studio

- EtherCAT devices online scan and offline edit
- EtherCAT master configuration
- PDO mapping edit, online SDO edit
- Import ESI and export ENI
- CiA 402 device operation: CSP
- Single axis operation
- Group axes operation
- I/O mapping edit and operation
- Support simulation mode

System Configuration



For more information

URL : <http://www.nexcom.com.tw/Products/industrial-computing-solutions/machine-automation/ethercat-motion-controller/ethercat-rx-net-200-ecm>

Contact: NEXCOM International Co., Ltd. / Headquarters

9F, No.920, Chung-Cheng Road, Zhonghe Dist., New Taipei City, Taiwan 23586, R.O.C.
TEL: +886-2-8226-7786 FAX: +886-2-8226-7782 www.nexcom.com

NEXCOM Intelligent Systems / Taipei Office

13F, No.920, Chung-Cheng Road, Zhonghe Dist., New Taipei City, Taiwan 23586, R.O.C.
TEL: +886-2-8226-7796 FAX: +886-2-8226-7792 www.nexcom.com.tw

PLC Motion Control Unit

FP7 series AFP7MC64EC, etc.

Features

- A single FP7 Motion Control Unit can control 64 axes of MINAS A5B, A6B and 32 virtual axes.
- Up to 32 synchronous groups (32 groups of 2 axes to 2 groups of 32 axes)
- Control system: Cyclic position control
- Equipped with SD memory card. Communications log can be analyzed at startup which makes debugging easy.
- Through use of Web server function on FP7 CPU unit, remote monitoring is possible of things such as torque, speed and position of the motor.



Specification

Motion Control Unit

Product name	Number of axis		Part No.
	Real axis	Virtual axis	
Motion Control Unit EtherCAT type	16	8	AFP7MC16EC
	32	16	AFP7MC32EC
	64	32	AFP7MC64EC

Motion Control Setting Tool

Product name	Description	Part No.
Motion control setting tool Control Motion Integrator	Windows version. Downloadable free of charge from our website. Please purchase Key unit separately.	AFPSMTEN
Control Motion Integrator Key unit	License key for Control Motion Integrator. 1 license. For USB port.	AFPSMTKEY

Control Motion Integrator facilitates setting of parameters such as the unit's motion control parameter.

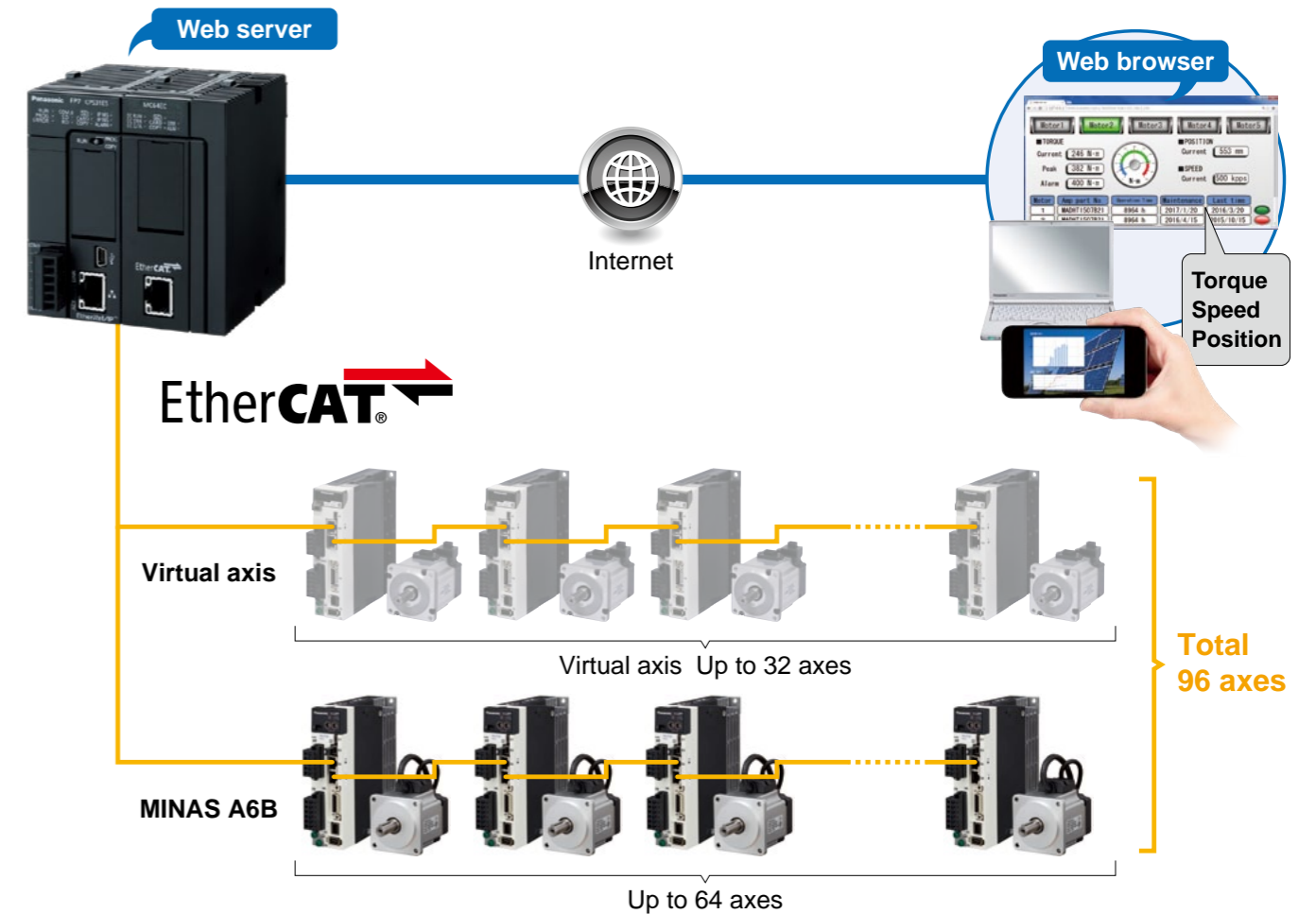


Application Sample

Semiconductor manufacturing system, LCD/FPD manufacturing device, electronic component manufacturing device, industrial machine, food processing machine, automatic warehouse system, physical distribution conveyance system

System Configuration

A single FP7 Motion Control Unit can control 64 axes of MINAS A5B, A6B and 32 virtual axes. Through use of Web server function on FP7 CPU unit, remote monitoring is possible of things such as torque, speed and position of the motor.



Sales areas and Languages



- Japanese
- English

For more information

FP7 URL : <http://www3.panasonic.biz/ac/e/fasys/plc/plc/fp7/index.jsp>
 URL : <http://panasonic.net/id/pidsx/global>

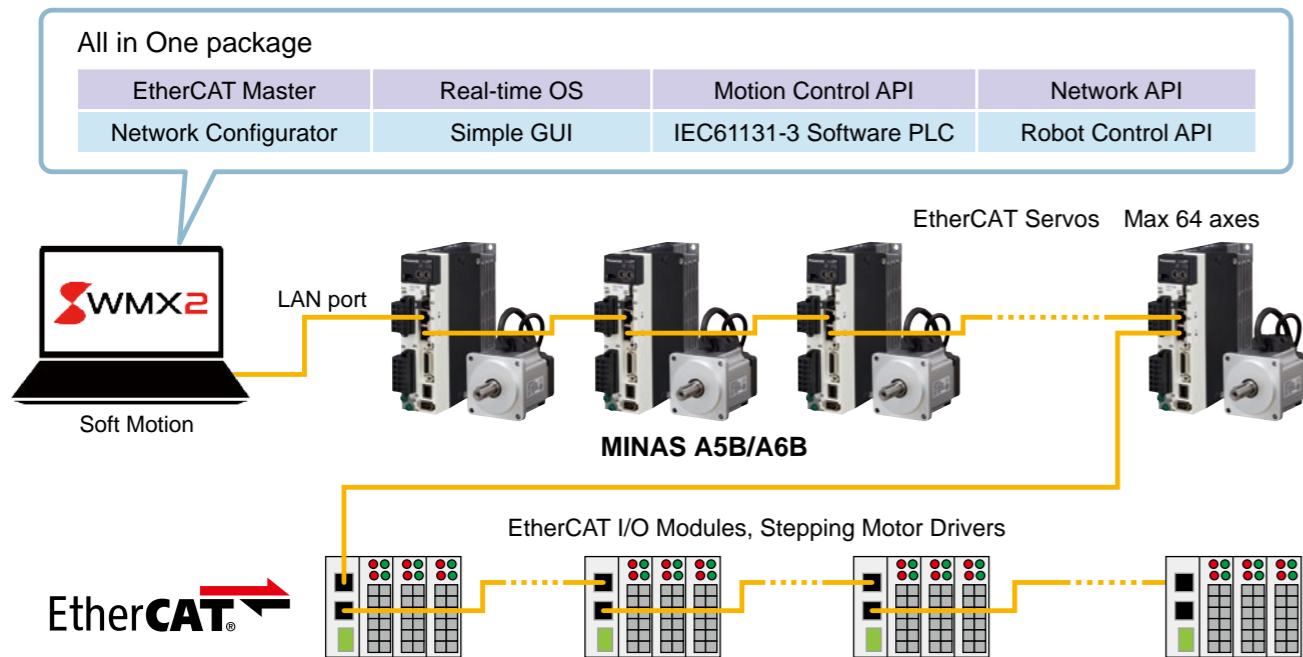
Contact: **Panasonic Industrial Devices SUNX Co.,Ltd.**
 2431-1, Ushiyama-cho, Kasugai-shi, Aichi, 486-0901, Japan TEL: +81-568-33-7861 FAX: +81-568-33-8591

PC-Based, Advanced Soft Motion Controller

WMX2 for EtherCAT

Features

- Connects all servo drives and I/O modules from a single LAN port - no additional motion board required. Fully synchronized control of 64 axes in 0.5 ms cycle time can be realized with a commercially available PC.
- Over 500 API functions for C/C++ and .NET. functions for EtherCAT communication, motion control, and I/O control are available to develop original user motion applications.
- Advanced features such as gantry control, acceleration/deceleration profiles, etc. can be used easily.



Utility Tools



WMX Manager

- Device (user application, thread, etc.) management tool
- Device management; monitors and logs EtherCAT connection status

General Operator

- Basic motion command and status confirmation, I/O operation
- Motion parameters can be freely set with intuitive and easy operation
- Loads the I/O output setting file and reflects it on the output

EcConfigurator

- Communication setting, status monitoring tool
- Parameter upload / download via network
- Network topology display function
- Network diagnosis function

Profile Analyzer

- Tool for displaying multi-axis motion in real time or from log data graphically
- Timing control by trigger setting is possible
- Trajectory analysis for multi-axis interpolation

Specification

Number of Axes	Maximum 64 axes (CP, PTP) + Profile mode n axes
Interpolation Types	Linear (Maximum 64 axes), Arc (2 axes), 3D Arc (3 axes), Helical (3 axes)
Interpolation / Communication Cycle	0.25ms (16 axes), 0.5ms (64 axes)
Command Modes	Position, Velocity, Torque, Profile mode
Motion Functions	Positioning (PTP), JOG, Homing, Buffered API Execution, List Motion, Cubic-Spline, Path Interpolation, Soft Landing
	Dynamic change of target position / speed / acceleration / deceleration profile during operation is possible Execution time simulation function of API buffer
Acceleration / Deceleration Profiles	Trapezoidal, S-Curve, Jerk (Jerk-limited or Jerk ratio), Sinusoidal, Parabolic, Trapezoidal moving average, Other Profiles: Two-Velocity, PVT, Profile Specification by Acceleration/Deceleration
Gantry Control	Complete synchronous gantry control (Synchronization by position synchronization control + speed offset)
Synchronization Control	Max 32 pairs, One-to-many axis combination, dynamic synchronization axis can be set, changed, released Simple synchronization, perfect synchronization (sync displacement correction function for gantry)
I/O	11600 inputs / 11600 outputs, Supports most commercial EtherCAT I/O modules
Event Function	Motion command execution based on axis-position and input events, etc., I/O control, Event with output to Windows
Compensation Functions	Pitch error, Backlash, Straightness correction
API Supported Language	C Language (C/C++), .NET Languages (C#, VB), .NET Framework: 4.0 or later
Development Environment	Visual Studio 2008, 2010, 2012, 2013, 2015, C++ Builder XE7, LabView (32 bit)
Recommended Operating Environment	OS: Windows 7, Windows 10 CPU: Min. Atom 2 GHz (E3845, etc.) 2 cores or more, Memory: 4 GB or more

Soft PLC Package

- Integration of WMX2 with Soft PLC developed by Phoenix Contact Software (formerly known as KW Software).
- IEC 61131-3 standard programming languages (LD, FBD, ST, IL, SFC) are available. Not only various motion functions of the PLCopen standard but also a wide variety of unique motion functions of WMX2 are offered as FB.
- Also included is an HMI creation tool based on Microsoft Visual Studio. It also integrates with the API library of WMX2, enabling flexible and powerful programming with C/C++, .NET/C#, and PLC languages.



Application Sample

- Semiconductor Manufacturing Equipment: Various Image Inspection Equipment, Coater/Developer, Etching Equipment, Flip Chip Bonder, Handler, Die Bonder
- FPD Manufacturing Equipment: FPD Exposure Apparatus, LCD Inspection Equipment, Mask defect repair system
- Industrial Robots / Processing machines: Wafer Transfer Robot, Pipe Bender, Various smartphone related automated equipment, Various battery related automated equipment

Sales area and Language



- English
- Japanese
- Korean
- Chinese

For more information

URL WMX2 for EtherCAT : <http://www.en.softservo.co.jp/products/wmx2/>

Contact: **Soft Servo Systems, Inc.**

[E-mail: sales@softservo.com]

3-1-13 AS Building 2F, Nishiki-cho, Tachikawa, Tokyo 190-0022, Japan

TEL: +81-42-512-5377 FAX: +81-42-512-5388

Industrial Robot Controller Software

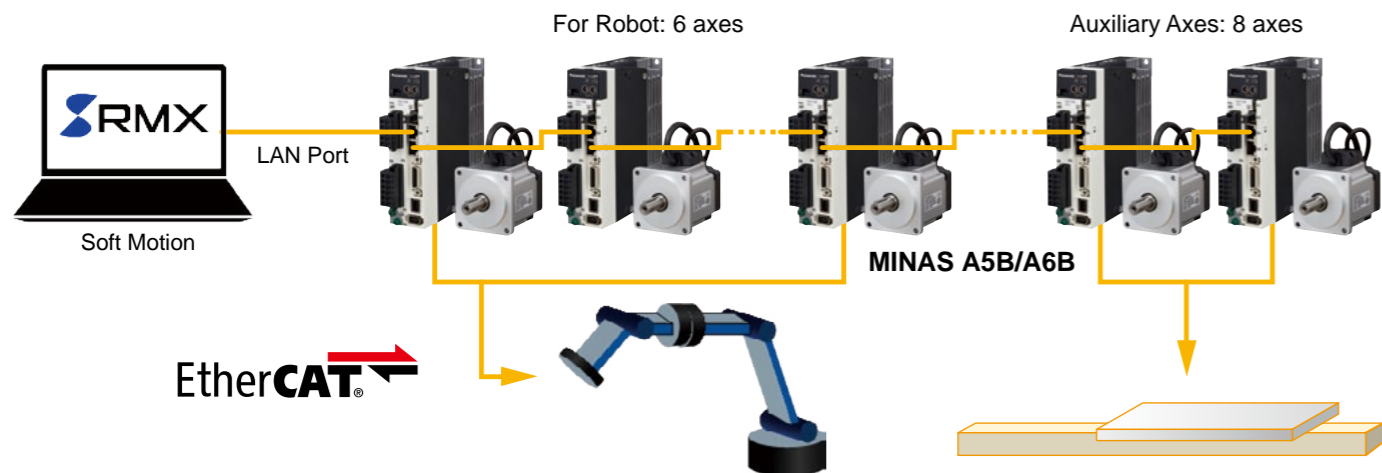
RMX for EtherCAT

Features

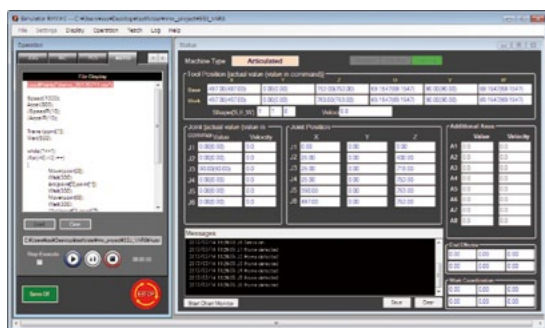
- With specialized software running on a commercially available PC, simultaneously controls industrial robots' axes and eight auxiliary axes at 1ms (Soft Motion Technology).
- Supports forward kinematics and inverse kinematics of various robots (6 axis vertical articulated, SCARA, Delta, etc.) as well as closed link mechanisms and link offset.
- By a simple and flexible original robot language "RBC", can program robot motions and control peripheral devices such as I/O and CCD cameras.
- With various APIs for communication, robot control, and auxiliary axis control, original robot controller development is possible.

All in one Package

EtherCAT Master	Real-time OS	Robot Control API	Auxiliary Axis Motion API
Network Configurator	Robot Language	Robot Operation GUI	Real-time API



Robot Control GUI



Parameter Settings

- Mechanism setting: Mechanism type, Link length, Link offset, Auxiliary axes, etc.
- Motor setting: Encoder resolution, Gear ratio, etc.
- Operation: Tip speed, Each axis speed, In-position width, Acceleration/deceleration profile selection, etc.
- Limit: Hard limit, Soft limit.
- Home: Homing speed, Home devices, etc.
- Safety: Emergency stop operation, Interlock device, etc.

Status Display

- Tip position, Orientation, Velocity, Axis position and speed, Motor travel distance.

Operation (manual / automatic)

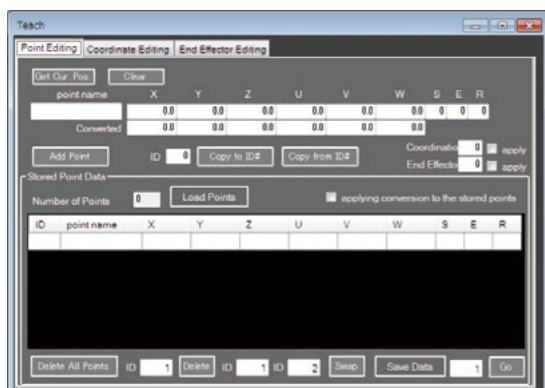
- Homing, Jog, Inching, Positioning, Teaching Playback, Robot language execution, I/O control and monitoring.

Teaching

- Create point data file for moving the robot tip.

Logging

- Log acquisition of each axis and tip position coordinates at 1 ms cycle (Up to 10 seconds).



Specification

Maximum Number of Axes	Max. 6 axes for a robot and Max. 8 axes for auxiliary axes
Interpolation / Communication Cycle	1ms
Supported Robots	Vertical articulated (up to 7 axes, closed link and link offset supported), SCARA robots, Delta robots, Orthogonal robots
Robot Operations	Positioning (PTP), Continuous Path Control (line, arc, spline), Jog, Homing, Inching, Teaching Playback, Robot Language Execution
Teaching Function	Workpiece Coordinate Management, Tool Offset Management, Acquisition Operating Point
Other Functions	Logging (1ms cycle data of each axis and tip coordinates)
API Supported Language	C (C/C++), .NET (C#, VB), .NET Framework: 4.0 or later
Development Environment	Visual Studio 2008, 2010, 2012, 2013, 2015, LabView (32 bit)
Recommended Operating Environment	OS: Windows 7 32 bit CPU: Min. Atom 2 GHz (E3845, etc.) 2 cores or more, Memory: 2 GB or more
Robot Language "RBC"	Simple C language-like structure for RMX. Linear Interpolation, Arc Interpolation, PTP Operation, Read Teaching File, I/O Device Control <Command Examples> TTrans: Perform PTP operation to point in tool coordinates. Arc: Performs a circular interpolation operation that passes through the current position, intermediate point, and target point.

Hardware Options

IPC: TERA17

- Intel's 4 core high performance CPU installed (Bay Trail-D J1900)
- Memory: DDR3L 4 GB / Storage: SSD 120 GB
- W: 145 mm, H: 56.5 mm (Compact size)
- Onboard NIC used for EtherCAT communication
- With this one IPC, EtherCAT master controller is available.



Teaching Pendant: DTP7-D



- By connecting to RMX-installed PC, various buttons, keyboard, touch panel can be used for robot teaching.
- Waterproof / dustproof, 900 g (lightweight)
- Low noise screen with VGA.
- 800x480 resolution (1024x600 coming soon)

Application Sample

- Cutting, Transportation, Welding, Assembly, Pipe Bender, etc. Other Robots in General

Sales area and Language



- English
- Japanese
- Korean
- Chinese

For more information

URL RMX for EtherCAT : <http://www.en.softservo.co.jp/products/rmx/>

Contact: **Soft Servo Systems, Inc.**

[E-mail: sales@softservo.com]

3-1-13 AS Building 2F, Nishiki-cho, Tachikawa, Tokyo 190-0022, Japan

TEL: +81-42-512-5377 FAX: +81-42-512-5388

PC Based Fine Motion

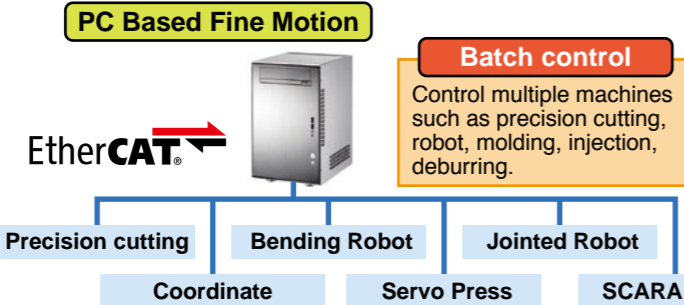
RTMC64-EC

Features

- **PC Based Fine Motion is a controller software for EtherCAT.**
Your PC becomes a high performance motion controller. PC Based Fine Motion whose ability is several hold higher than that of a general NC or a robot controller controls at most eight precise machines by one PC.
The reliability of your controller can be improved by "INtime" and FAPC(Factory Automation PC).

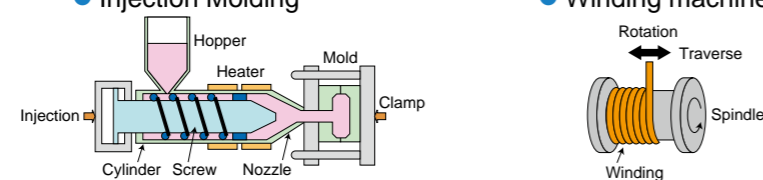


Specification

High-speed 0.25 msec / 32-Axis 0.5 msec / 64-Axis	 <p>PC Based Fine Motion</p> <p>Batch control Control multiple machines such as precision cutting, robot, molding, injection, deburring.</p> <p>G code / Techno code Simple operating program</p> <p>Abundant motions Fully equipped motion functions Operate immediately</p> <p>PLC/Image processing Easily cooperate with various software</p>	Reliability Not depend on Windows
Multi Axis Control 64-Axis / 8 task		8 task controlled simultaneously One PC controls 8 machines

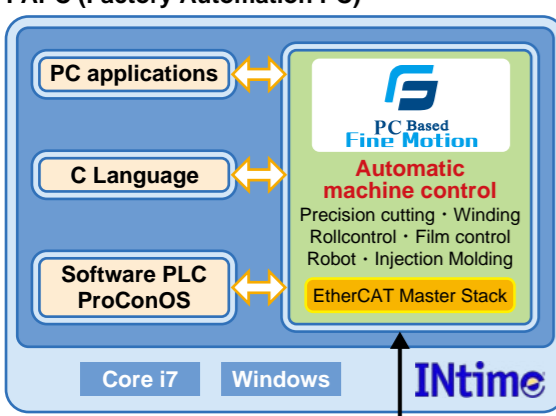
• High reliability by INtime, not depending on Windows
• Make user enable to control precise machines without special knowledge

Application Sample

- Precision cutting
 - Robot
 - Laser cutting
 - Injection Molding
 - Winding machine
- 

System Configuration

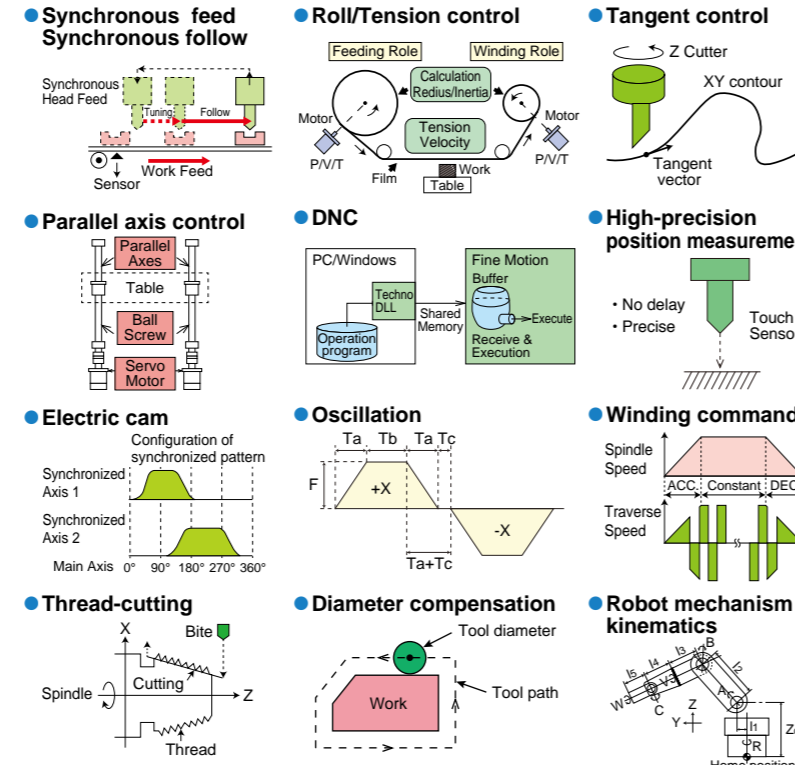
FAPC (Factory Automation PC)



PC Based Fine Motion Automatic machine control
Precision cutting · Winding
Roll control · Film control
Robot · Injection Molding

Core i7 Windows INtime

- **Synchronous feed Synchronous follow**
- **Roll/Tension control**
- **Tangent control**
- **Parallel axis control**
- **DNC**
- **High-precision position measurement**
- **Electric cam**
- **Oscillation**
- **Winding command**
- **Thread-cutting**
- **Diameter compensation**
- **Robot mechanism kinematics**



Multi axis servo driver/motor **I/O DA/AD**

PC Based Motion Library

RTPL-EC

Features

- PC Based Motion Library is a motion development software for EtherCAT user. (Function group for carious motion)
- In-house development of motion controller by C language with Visual Studio.
- Sample sources are prepared.
- High-speed operation with an efficient CPU. (0.25 msec/32-axis 0.5 msec/64-axis)
- High reliability by INtime, not depending on Windows. / High reliability by FAPC(Fanless/SSD)
- Easily operate from an application software on Windows.
- Easily cooperate with software such as image processing.



Specification

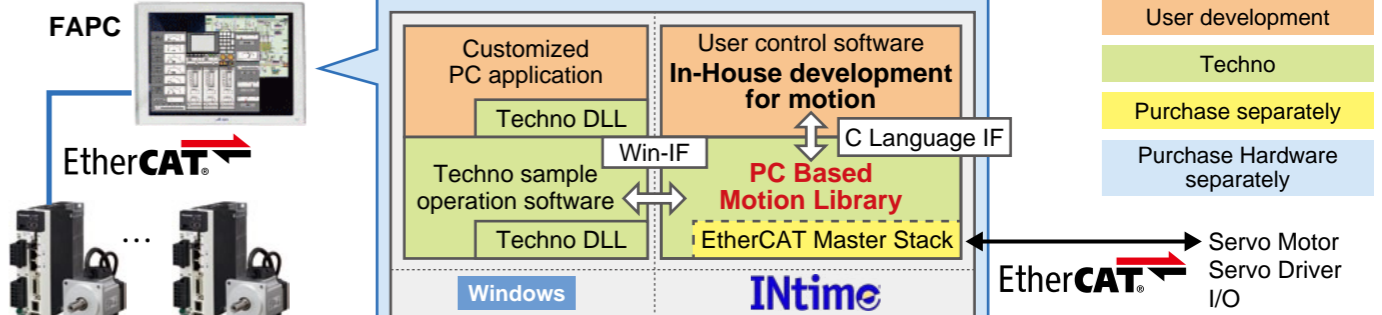
Example of Function Call Flow

• RtpIectInitializeLib ()	Library initialization	RtpIectInitializeLib();	Pause	RtpIectHoldAxis();
• RtpIectClearAlarm ()	Library Close	RtpIectCloseLib();	Set Synchronous Axis	RtpIectSetGantryAxis();
• RtpIectServoON ()	Execute command	RtpIectCmdActive();	Set Override	RtpIectSetOverride();
• RtpIectLinInterpolate ()	Wait for Response	RtpIectResWait();	Return to origin	RtpIectHomePosition();
• RtpIectCmdActive ()	Monitor Status	RtpIectGetStatus();	Positioning	RtpIectPositioning();
• RtpIectResWait ()	SDO Write	RtpIectSetSDO();	Latch Positioning	RtpIectLatchPositioning();
• RtpIectServoOFF ()	PDO Write	RtpIectSetPDO();	Linear Interpolation	RtpIectLinInterpolate();
• RtpIectCloseLib ()	Servo ON	RtpIectServoON();	Circular arc Interpolation	RtpIectCirInterpolate();
	Servo OFF	RtpIectServoOFF();	JOG Stop	RtpIectJOGStop();
	Servo Alarm Clear	RtpIectClearAlarm();	Torque control start	RtpIectTorqueCtrlStart();

Application Sample

- Semiconductor-fabrication equipment
- Printing System
- Electronic equipment production line
- Other multi axis control devices

System Configuration



User development
Techno
Purchase separately
Purchase Hardware separately

Sales area and Language

- Japanese
- English

Please contact the following address for details.

For more information

- PC Based Fine Motion URL: <http://www.open-mc.com/products/pdt05.html>
 PC Based Motion Library URL: <http://www.open-mc.com/products/pdt06.html>
 INtime URL: <http://www.mnc.co.jp/INtime/>

Contact: **TECHNO Co., Ltd.**
 1304-5, Shimo-fujisawa, Iruma-shi, Saitama, 358-0011, Japan
 [E-mail: mail@open-mc.com]
 TEL: +81-4-2964-3677 FAX: +81-4-2964-3322

Programmable Automation Controllers

Power Family

Features

All controllers of the **Power family** are equipped with 32 bit Risc (Reduced Instruction Set Computer) CPU to allow use of a sole **Real Time Multitasking Operative System (OS)** to manage PLC, CNC, HMI and IT tasks. The **scale** between the different models depends on:

- CPU with different clock (132 or 264 MHz) and cores (1 or 2)
- Memory architectures with different parallelism (16 or 32 bit)

The **compiler**, which generates the executable code, is integrated in the firmware of the controller so the system becomes completely autonomous and independent from the evolutions of the consumer world (PC) and **unaffected by computer viruses**.

There are two main executors, each one with its set of instructions:

- **PLC executor** which cycles continuously between the first and the last instruction of the PLC program
- **CNC executor** which starts only on request, it can be put on hold or deleted and it ends after the last instruction of the CNC program

CNC executor can process up to **5 CNC task** at the same time. Their execution are transferred in a buffer (**Look Ahead**) where they are processed to obtain effective trajectories of the interpolated axes. The commands inserted in ISO editor (the user program written in **G-code**) are interpreted and executed launching the execution of different blocks present in the BLC editor.

The OS manages many types of communication ports:

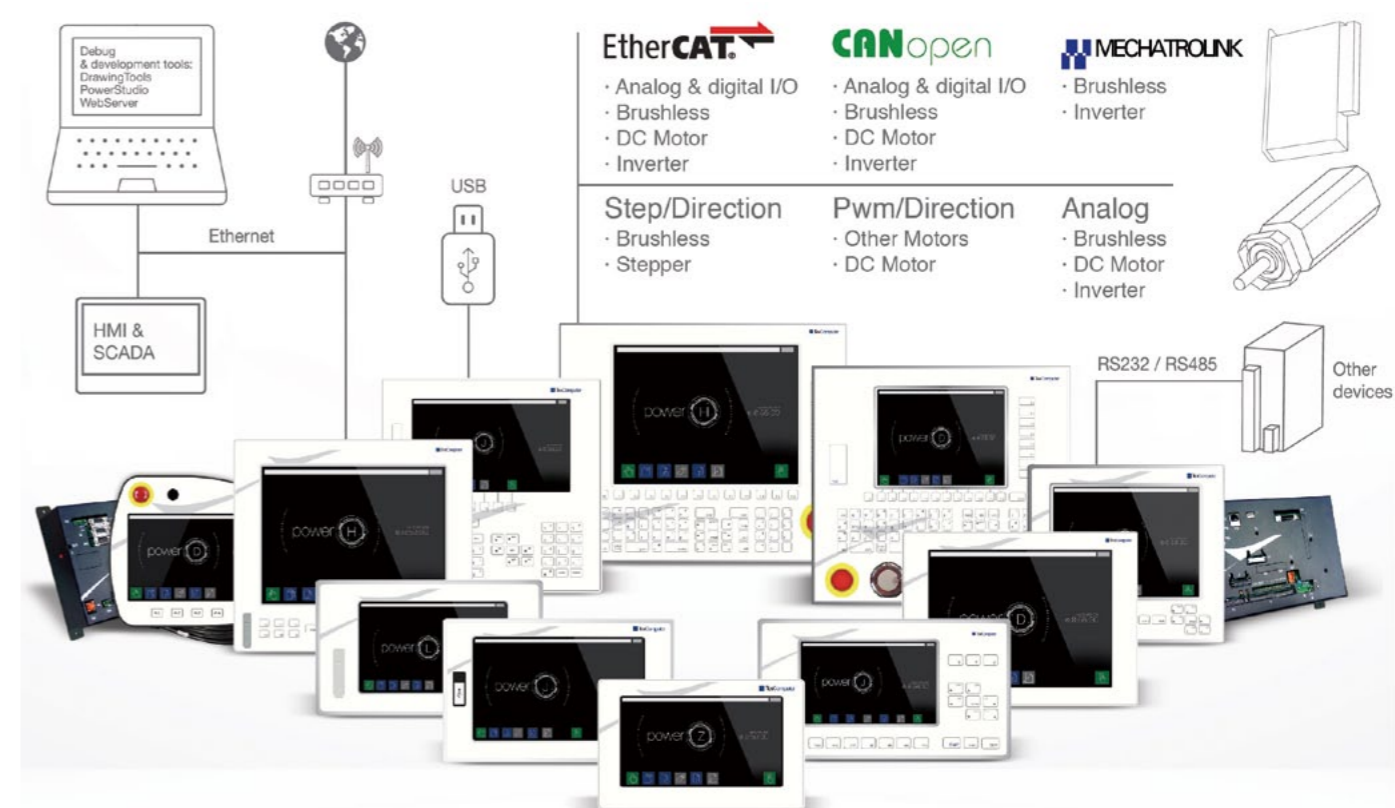
- **Ethernet** with the support of TCP/IP, FTP and ModbusTCP protocols; **OPC server** and **WEB server** are also available
- **RS232/RS485** serials with **Modbus** protocol (ASCII and RTU)
- **USB** which can connect **MSD** (Mass Storage Device) of different types and with more memory volumes, **HID** (Human Interface Device) like keypads / mouse and tracking devices like Gamepad

It can manage up to **28 axes** in point to point, gearing, camming and interpolation mode. Their trajectory can be shaped via many different levels of **Jerk** in order to reduce the inertial effect of load without great losses in performances.

Application Sample

- Plane cutting machines (Plasma, Laser, Oxy, Waterjet, Diamond disk)
- Stone working machines (Bridge saws, Polishing, CNC contouring)
- Woodworking machines (CNC for drilling, routing, tenoning, sawing)
- Metal machining (3-5 axes milling, parallel & automatic lathe turning)
- Textile (Cutting, Sawing, Labelling, Finishing & Washing)
- Pick & Place with Articulated, Cartesian, SCARA or DELTA robots
- Packaging and all sort of automatic machines

System Configuration



Sales area and Language



• English

Please contact us for details.

For more information

URL: www.texcomputer.com

Contact: **Tex Computer srl**

via Mercadante, 35 – 47841 Cattolica (RN) – Italy

TEL: +39 (0)541 832511 FAX: +39 (0)541 832519

Motion Coordinator and EtherCAT Interface Module

Motion Coordinator MC664 /MC664-X Panasonic EtherCAT Interface Module

Features

- Up to 128 Axes
- Servo period 50 µsec minimum (8 axes)
- Precise 64 Bit Motion Calculations with Quad Core Cortex A9 1 GHz Processor (P862)
- Dedicated Communications Core (P862)
- Built-in EtherCAT Port
- EtherCAT, Sercos, SLM and RTECH Digital Drive Interfaces
- Linear, Circular, Helical and Spherical Interpolation
- Flexible CAM shapes, Linked Motion
- EnDAT, BISS and SSI Absolute Encoder Supported
- Hardware Linked Outputs for Camera / Laser Control
- Ethernet-IP / Modbus TCP / Ethernet Interface Built-In
- Anybus-CC Module for Flexible Factory Comms Including ProfiNet/Profibus
- IEC 61131-3 Programming
- Multi-tasking BASIC Programming
- Text File Handling
- Robotic Transformations
- SD Memory Card Slot
- CANopen + EtherCAT I/O Expansion
- Backlit LCD Display
- RoHS and CE Approved



Specification

Item	Description	Item	Description	
MC664 / MC664-X				
Configuration	Axis 0	Encoder / Pulse out		
Axes	Max axes	128	Encoder Ports	
	Max discrete wired axes	24		
	Max Networked axes	128 (P862) 64 (P861)		
	Max virtual axes	128		
Performance	Processor	ARM A9 (Quad)	Built-In I/O	
	Clock frequency	1000 MHz (Max)		
	Servo update rate	2 ms (4 ms = MC664) -50 µs (8 axes at 50 µs)		
	Encoder input frequency	6 MHz		
	Stepper output frequency	2 MHz		
	User memory	8 Mbyte	Expansion I/O	
	Max data table size	512000		
	Flash data memory	32 x 16000		
	VR	65536		
	Position register precision	64 bit		
	Maths precision	Double FP	Programming	
	Real time clock	Yes		
	Stepper (Step & Direction)	Option		
	Servo (±10 V & Encoder)	Option		
	Piezo	Option		
Drive Interfaces	Panasonic RTECH	Option	Software	
	Hydraulic	Option		
	EtherCAT	YES/Option		
Communication	Profibus	Option		Expansion
	DeviceNet	Yes (slave)		
	CANopen	Yes (server)	Physical	
	USB (V1.1)	Option		
	Ethernet (10/100) base-T	Yes		
	Ethernet IP	Yes (server)		
	MODBUS-RTU	Yes		Power
	MODBUS-TCP/IP	Yes		
	RS232/RS485	Yes		
	CC-Link	Option		
	ProfiNet	Option	Certification	
	Bluetooth	Option		
	Anybus support	Option	CE approval	Yes
	Hostlink	Yes	RoHS Compliant	Yes

Item	Description
EtherCAT Interface Specification	
Max Slaves per chain	128
Cable	Cat 5e or better
Regist Inputs	8 x 24 V
Supported modes	CSP, CSV, CST, Open speed
Axis Feature Enable Codes	P914

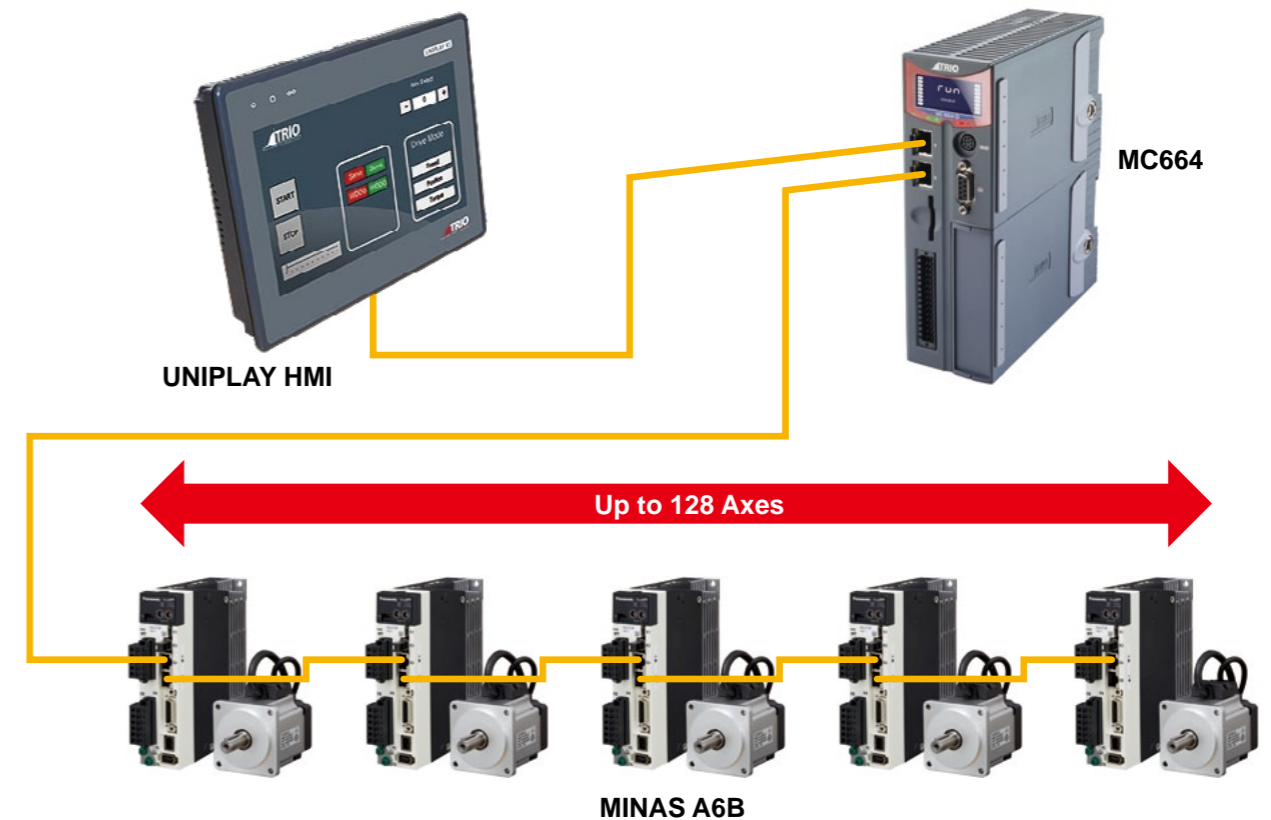
Application Sample

URL : Sample applications

<http://www.triomotion.uk/public/applications/applications.php>

Please refer to the sample and typical applications for the MC664 with A6B as shown above URL.

System Configuration



Sales area and Language



• English

Please contact the following address for details.

For more information

URL: Specification for the MC664 / MC664-X

<http://www.triomotion.uk/public/products/p862.php>

Contact: **Trio Motion Technology Ltd.**

Shannon Way, Tewkesbury, Gloucestershire, GL20 8ND, United Kingdom TEL: +44-1684-292333 FAX: +44-1684-297929

Motion Coordinator and EtherCAT Interface Module

Motion Coordinator MC4N-ECAT

Features

- Up to 32 EtherCAT Digital Drive Axes
- Supports Position, Speed and Torque Drive Modes
- Up to 2048 EtherCAT I/O
- EtherCAT CoE, SoE, FoE
- Linear, Circular, Helical and Spherical Interpolation
- Flexible CAM shapes, Linked Motion
- Isolated Encoder Port
- EnDAT and SSI Absolute Encoder Supported
- Hardware Linked Output for Camera / Laser Control
- Ethernet-IP / Modbus TCP / Trio ActiveX / TCIP/ Uniplay HMI / UDP / Ethernet Interface Built-In
- Precise 64 Bit Motion Calculations with 532 MHz ARM 11 Processor
- IEC 61131-3 Programming
- Multi-tasking BASIC Programming
- Text File Handling
- Robotic Transformations
- 4 high speed registration inputs
- Isolated RS232 and RS485 ports
- SD Memory Card Slot
- EtherCAT I/O Expansion
- CANopen I/O Expansion
- Backlit LCD Display
- RoHS and CE Approved



Specification

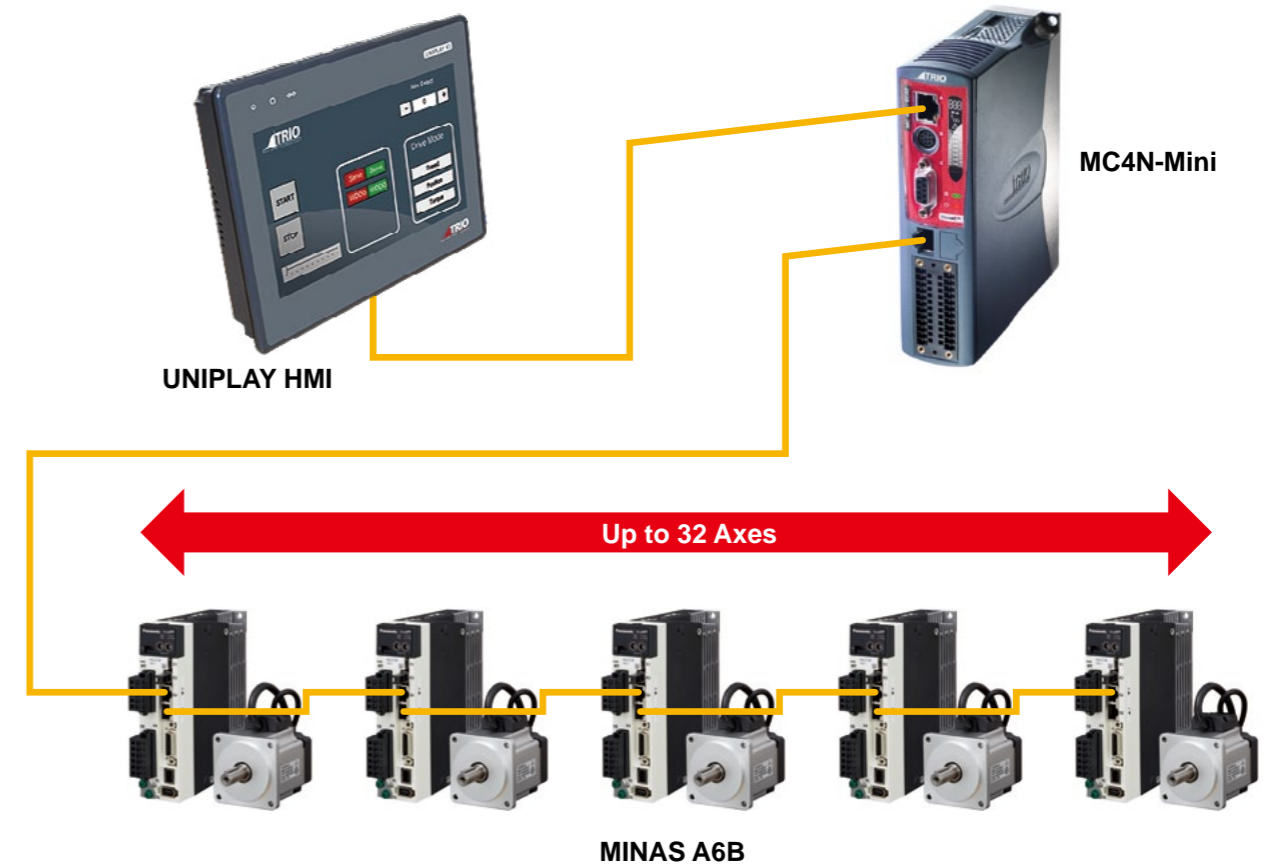
Item	Description	Item	Description
MC4N-ECAT			
Configuration	Axis 0	Extended	
Axes	Max axes	32	Built-in I/O
	Networked axes	32	
	Max virtual axes	32	
Performance	Processor	ARM11	Expansion I/O
	Clock frequency	532 MHz	
	Servo update rate	2 ms-125 µs	
	Encoder input frequency	6 MHz	
	Stepper output frequency	2 MHz	Programming
	User memory	8 MByte	
	Max data table size	512000	
	Flash data memory	32 x 16000	
	VR	4096	
	Position register precision	64 bit	
	Maths precision	Double FP	
	Real time clock	Yes	
Drive Interfaces	EtherCAT	Yes	Software
	Auxiliary Axis	Yes	
Communication	DeviceNet	Yes (slave)	Expansion
	CANopen	Yes (master)	
	Ethernet (10/100) base-T	Yes	Physical
	Ethernet IP	Yes (server)	
	MODBUS-RTU	Yes	
	MODBUS-TCP/IP Client	Yes	
	RS232/RS485	Yes	Power
	Hostlink	Yes	
Encoder Ports	Reference input	Yes	Certification
	Pulse + direction output	Yes	
	Incremental (A+B) output	Yes	
	SSI Absolute	Yes	
	EnDat Abs	Yes	

Application Sample

URL : Sample applications

<http://www.triomotion.uk/public/applications/applications.php>

System Configuration



Sales area and Language



• English

Please contact the following address for details.

For more information

URL: Specification for the MC4-N ECAT Mini Master

<http://www.triomotion.uk/public/products/p900.php>

Contact: **Trio Motion Technology Ltd.**

Shannon Way, Tewkesbury, Gloucestershire, GL20 8ND, United Kingdom TEL: +44-1684-292333 FAX: +44-1684-297929

Motion Coordinator and EtherCAT Interface Module

Motion Coordinator PC-MCAT Ethercat Master

Features

- Motion + PC Solution for Automation Machinery
- Fanless compact PC with E3845 Quad Core Atom Processor at 1.91 GHz
- Powerful up to 64 Axis EtherCAT Based Trio Motion Coordinator
- RTX64 Real Time Extension to allow Motion + Windows Running Directly on Their Own Processor Cores
- Plug and Play EtherCAT Configuration Expandable Support for Servo Drives, I/O and Devices From Over 100 Manufacturers
- Programmable In Easy Trio BASIC, built-in IEC 61131 or PC based Programming Languages Such As 'C'
- 4 GByte RAM + 64 GByte Upgradable SSD
- Windows Operating System
- Built-in Additional GBit Ethernet Port For Vision Cameras



Specification

Item	Description
PC-MCAT	
Motion Axes	2 / 4 / 8 / 16 / 32 / 64
Servo Cycle	250 / 500 / 1000 / 2000 μsec
Drive Modes	Position / Speed / Torque
Interpolation	Linear / Circular / Helical / Spherical / Transition Curves / Tangential
Linked Modes	Cam, Cambox, Flexlink, Movelink, Camlink

EtherCAT Specification	
Speed	100 Mbps
Physical Layer	100BASE-TX full duplex (IEEE 802.3)
Cable	Shielded Twisted Pair (TIA/EIA-568B CAT5e)
Topology	Line, tree or star
Isolation	Pulse transformer with common-mode choke
Connector	RJ45
Cable Length	100 m max between nodes
Cyclic period	250 μsec, 500 μsec, 1000 μsec or 2000 μsec
Synchronisation	Distributed Clocks technology. Jitter <1 μsec
Protocol	CoE, SoE
Number of Axes	64
Number of Nodes	128 slave nodes maximum
Motion modes	Cyclic Synchronous Position, Cyclic Synchronous Velocity, Cyclic Synchronous Torque
Parameter transe	CoE Object read/write. SoE IDN read/write
In put/Ou tput	Up to 8192

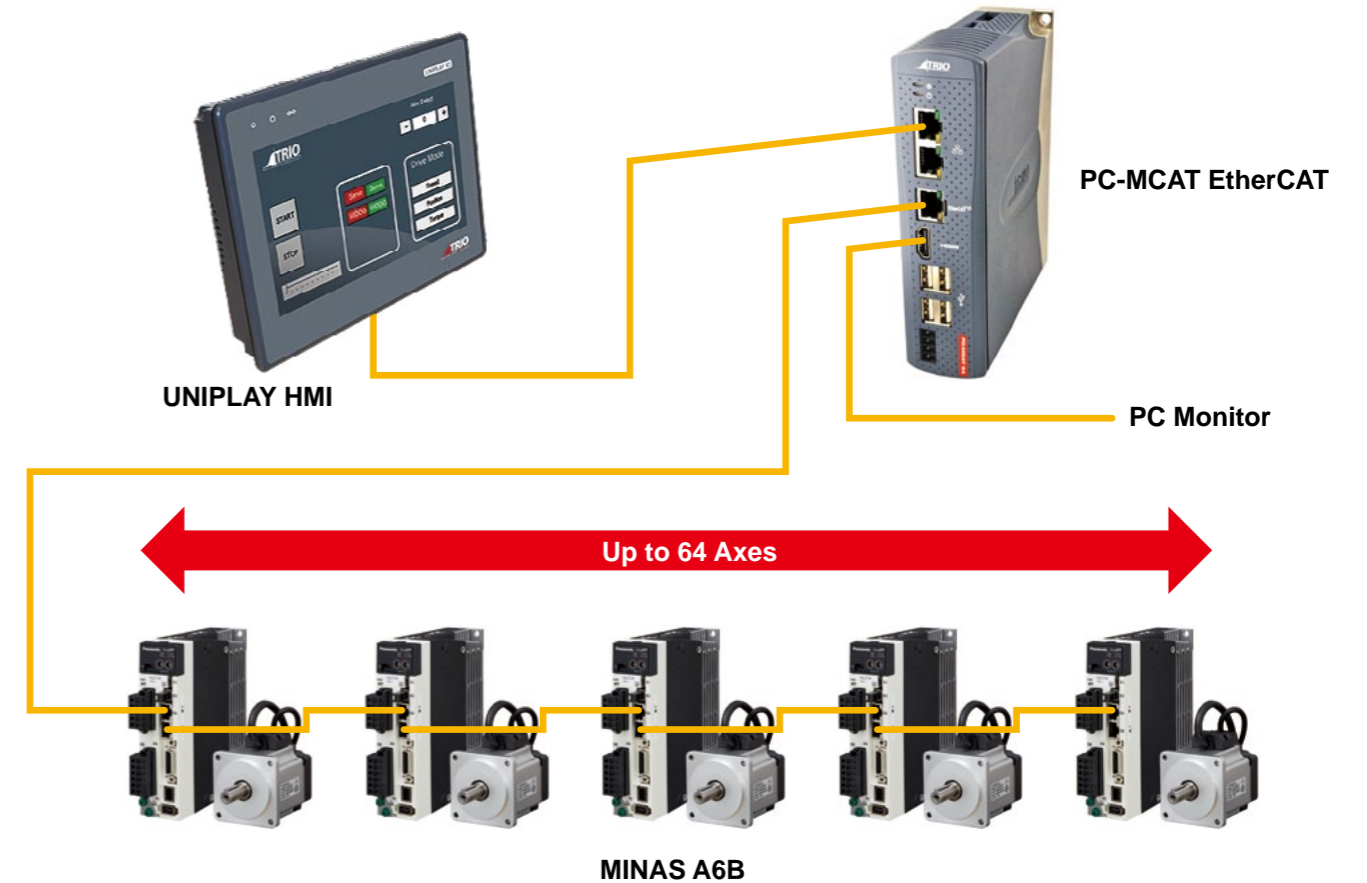
PC Specification	
Processor	Intel® Atom™ E3845 Quad Core 1.91 GHz
Memory	4 GBytes DDR3
Ethernet	2 x Gb Ethernet + EtherCAT port
HDMI	2560 x 1600 @ 60 Hz Max
Audio	Via HDMI
USB	5 USB ports
Battery	8 Year life PLC compatible type. Replaceable without opening case.
Power Supply	24 V +/-20 % Isolated Power Supply
Operating Temp	0 deg – 55 deg C
Cooling	Fanless
Operating System	Windows with RTX64 Real Time Extension

Application Sample

URL : Sample applications

<http://www.triomotion.uk/public/applications/applications.php>

System Configuration



Sales area and Language



• English

Please contact the following address for details.

For more information

URL: Specification for the PC-MCAT Ethercat Master

<http://www.triomotion.uk/public/products/p760.php>

Contact: **Trio Motion Technology Ltd.**

Shannon Way, Tewkesbury, Gloucestershire, GL20 8ND, United Kingdom TEL: +44-1684-292333 FAX: +44-1684-297929

Linear and direct drive (DD) motor control MINAS A6L

A6SL, A6SM

High precision and high speed advancement of linear and DD control drive



Motor

- Various motors such as 3-phase cored/coreless, shaft motor and DD motor

Scale

- Serial communication incremental/absolute and A/B/Z phase pulse scale

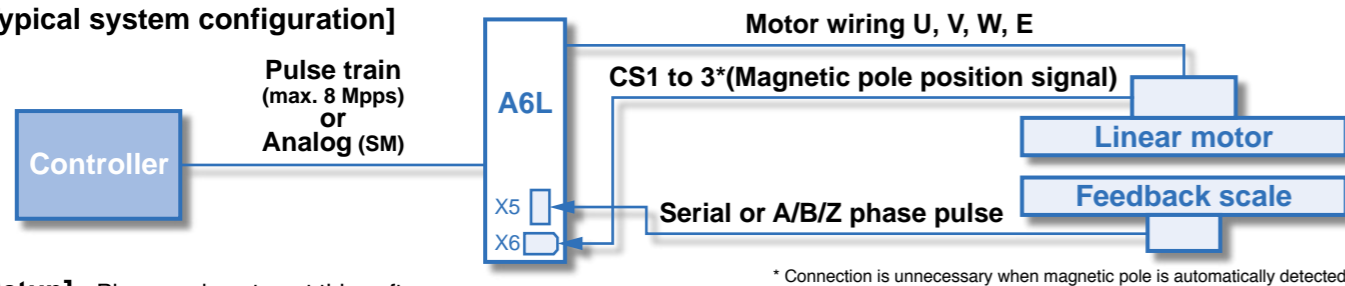
Magnetic pole detection

- Both with and without hole sensor signal (automatic detection)

Setup

- Automatic setup of magnetic pole, scale direction, gain, etc.

[Typical system configuration]



* Connection is unnecessary when magnetic pole is automatically detected.

[Setup] • Please ask us to get this software.

Automatic Setup

Automatically sets various parameters such as magnetic pole, scale orientation and gain accordingly to the motor specification.

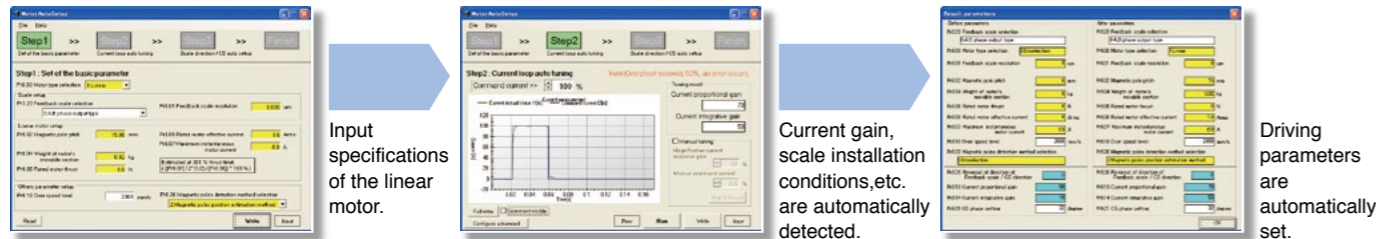
Drastically reduced setup time.

Automatic Magnetic Pole Detection

When CS signal is not available, the automatic magnetic pole detection function will detect the magnetic pole position of the linear motor.

Short adjustment time without magnetic pole sensor

Simple setup for easy and speedy adjustment



[Lineup]

SM	Specifications	SL
[Standard]		[Pulse and I/O input only]
Position, speed and thrust command, Block operation	Instruction	Position command, Block operation
Capable	Two-degree-of-freedom control	Capable
Capable	RS232, RS485	Capable
Compliant	Safety function (STO)	N/A
Capable	Analog input	N/A

Drive List

Power supply	Drive Part No. (Note 1)	Motor rated current [Arms] (Note 2)	Motor max. current [Arms] (Note 2)
1-phase 100 to 120 VAC	MADL □ 01 △△	1.1	3.7
	MADL □ 11 △△	1.6	5.6
	MBDL □ 21 △△	2.5	7.5
	MCDL □ 31 △△	4.6	14.4
1-phase or 3-phase 200 to 240 VAC	MADL □ 05 △△	1.1	3.9
	MADL □ 15 △△	1.5	4.9
	MBDL □ 25 △△	2.4	7.4
	MCDL □ 35 △△	4.1	13.3
	MDDL □ 45 △△	5.9	17.1
3-phase 200 to 240 VAC	MEDL □ 83 △△	12.5	37.5
	MEDL □ 93 △△	16.0	48.1
	MFDL □ A3 △△	19.3	56.6
	MFDL □ B3 △△	27.1	72.1

Note 1: Please refer to "□" and "△△" as per below ;

- □ Common: N (Without Safety)
T (With Safety STO)
- △△ A6L : SM (Full Version)
SL (Only Pulse control)

Note 2: According to the setting value of carrier frequency, we have the possibility of derating. In detail, please refer to the A6L driver specification.

Linear and Direct Drive (DD) motor control

MINAS A5L,

RTEX type : MINAS A5IINL
 EtherCAT type: MINAS A5BL
 DC type : MINAS A5ML, A5MNL, A5MBL

A5L, A5ML

High precision and high speed advancement of linear and DD control drive

Motor

- Various motors such as 3-phase cored/coreless, shaft motor and DD motor

Scale

- Serial communication incremental/absolute and A/B/Z phase pulse scale

Magnetic pole detection

- Both with and without hole sensor signal (automatic detection)

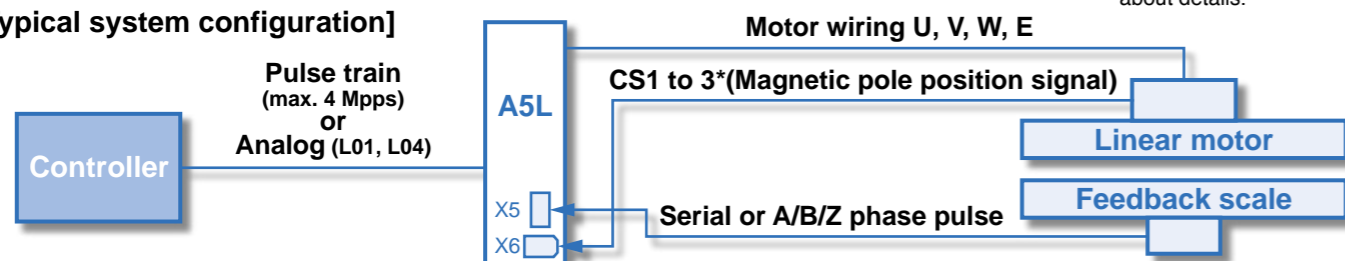
Setup

- Automatic setup of magnetic pole, scale direction, gain, etc.



• This product is specific for customers. Please contact us about details.

[Typical system configuration]



[Setup] • Please ask us to get this software.

* Connection is unnecessary when magnetic pole is automatically detected.

Automatic Setup

Automatically sets various parameters such as magnetic pole, scale orientation and gain accordingly to the motor specification.

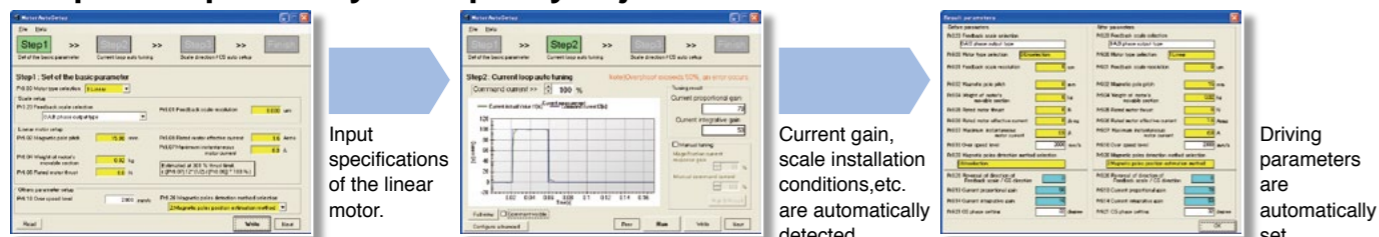
Drastically reduced setup time.

Automatic Magnetic Pole Detection

When CS signal is not available, the automatic magnetic pole detection function will detect the magnetic pole position of the linear motor.

Short adjustment time without magnetic pole sensor

Simple setup for easy and speedy adjustment



[Lineup]

Specifications	L01	L04	Specifications		LA1	LA4
	[Standard]	[Standard]	[Pulse input only]		[Standard]	[Standard]
Position, speed and thrust command	Capable	Capable	Instruction		Capable	Capable
	N/A	Capable	Two-degree-of-freedom control		N/A	Capable
	Capable	Capable	RS232, RS485		N/A	N/A
	Compliant	Compliant	Safety function (STO)		N/A	N/A
	Capable	Capable	Analog input		N/A	N/A

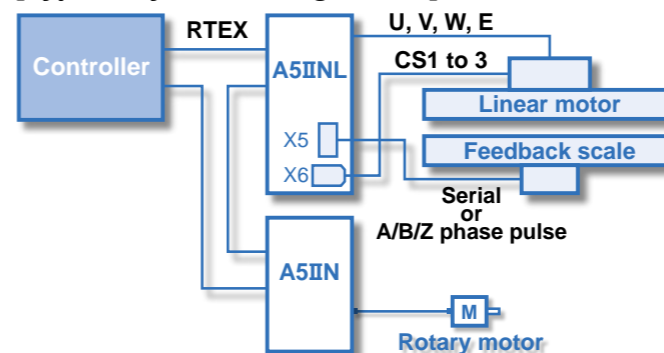
A5IINL

RTEX / Linear and DD Control Drive



• This product is specific for customers. Please contact us about details.

[Typical system configuration] For linear motor



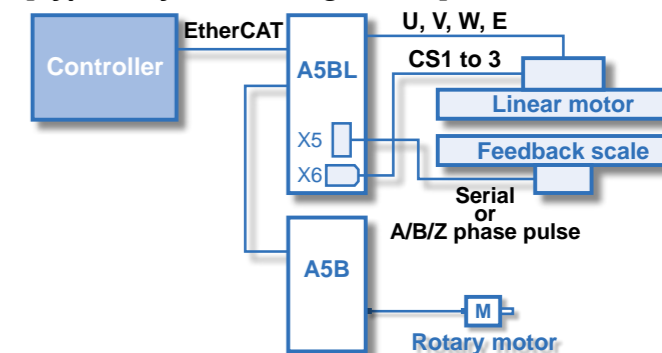
A5BL

EtherCAT / Linear and DD Control Drive



• This product is specific for customers. Please contact us about details.

[Typical system configuration] For linear motor



Drive List (Common to A5L and A5IINL)

Power supply	Drive Part No. (Note)	Motor rated current [Arms]	Motor max. current [Arms]
DC24 V	MMDHT2C09L**	2.8	7.5
	MMDHT2B09L**	2.2	6.5
1-phase 100 to 120 VAC	MADHT1105***	1.2	3.6
	MADHT1107***	1.7	5.1
	MBDHT2110***	2.5	7.5
	MCDHT3120***	4.6	13.8
1 or 3-phase 200 to 240 VAC	MADHT1505***	1.2	3.6
	MADHT1507***	1.6	4.8
	MBDHT2510***	2.6	7.8
	MCDHT3520***	4.1	12.3
	MDDHT3530***	5.9	16.9
	MDDHT5540***	9.4	28.2
3-phase 200 to 230 VAC	MEDHT7364***	13.4	40.2
	MFDHTA390***	18.7	56.1
	MFDHTB3A2***	33.0	84.8
	MGDHTC3B4***	44.0	116.6
	MHDHTC3B4***	66.1	167.2
	MDDHT2407***	1.5	4.5
3-phase 380 to 480 VAC	MDDHT2412***	2.9	8.7
	MDDHT3420***	4.7	14.1
	MEDHT4430***	6.7	19.7
	MFDHT5440***	9.4	28.2
	MFDHTA464***	16.5	42.4
	MGDHTB4A2***	22.0	58.7
MHDHTB4A2***	33.1	83.7	

Note:

Trailing *** in the part number is replaced with the following symbol:

- A5L : L01 : Standard
- LA1 : Pulse control only
- L04 : Standard (2DOF)^{†1}
- LA4 : Pulse control only (2DOF)^{†1}

- A5IINL : NL1 : Standard
- N91 : With safety function

- A5BL : BL1 : Standard
- B91 : With safety function

A5ML : Please consult us.

A5MNL : Please consult us.

A5MBL : Please consult us.

†1) 2DOF: Two-degree-of-freedom control

Ironless Brushless Linear Motor

AUM Series

Features

- Ironless technology
- Zero cogging force
- Patented technology
- Ironless linear motors with the highest motor constant and shortest coils lengths
- Large continuous force and peak force



Specification

Performance Parameters	Unit	AUM3				AUM4				AUM5				
		S-S1	P-S2	P-S4	P-S6	S-S1	P-S2	P-S4	P-S6	S-S1	P-S2	P-S4	P-S6	P-S8
Continuous Force, coil @100 °C	N	36.0	72.0	144.0	216.0	56.0	112.0	224.0	336.0	98.0	196.0	392.0	588.0	784.0
	lb	8.1	16.1	32.3	48.4	12.6	25.1	50.2	75.4	22.0	44.0	87.9	131.9	175.8
Peak Force	N	144.0	288.0	576.0	864.0	312.0	624.0	1248.0	1872.0	392.0	1414.8	2829.6	4244.4	5659.2
	lb	32.3	64.6	129.2	193.8	70.0	139.9	279.9	419.8	87.9	317.3	634.6	951.9	1269.1
Motor Constant	N/SqRt(W)	7.24	10.24	14.48	17.74	11.19	15.83	22.38	27.41	19.18	27.12	38.35	46.97	54.24
	lb/SqRt(W)	1.62	2.30	3.25	3.98	2.51	3.55	5.02	6.15	4.30	6.08	8.60	10.53	12.16
Continuous Power	W	24.7	49.4	98.8	148.3	25.0	50.1	100.2	150.3	26.1	52.2	104.5	156.7	208.9
Peak Power	W	395.4	790.8	1581.6	2372.3	777.4	1554.8	3109.6	4664.4	417.9	2721.6	5443.2	8164.8	10886.4
Electrical Cycle	mm	60	60	60	60	60	60	60	60	84.0	84.0	84.0	84.0	84.0
	in	2.362	2.362	2.362	2.362	2.362	2.362	2.362	2.362	3.31	3.31	3.31	3.31	3.31
Max Bus Voltage	V	330	330	330	330	330	330	330	330	330	330	330	330	330
Max Coil Temperature	°C	125	125	125	125	125	125	125	125	125	125	125	125	125
Thermal Dissipation Constant	W/°C	0.33	0.66	1.32	1.98	0.33	0.67	1.34	2.00	0.35	0.70	1.39	2.09	2.79
Continuous current	A rms	2.3	4.6	4.6	9.2	2.3	4.6	4.6	4.6	2.5	5.0	5.0	5.0	5.0
Peak current	A rms	9.2	18.4	18.4	36.8	13.0	26.0	26.0	26.0	18.0	36.0	36.0	36.0	36.0
Force Constant	N/A	15.7	15.7	31.4	47.1	24.0	24.0	48.0	72.0	39.3	39.3	78.6	117.9	157.2
	lb/A	3.5	3.5	7.0	10.6	5.4	5.4	10.8	16.1	8.8	8.8	17.6	26.4	35.3
Back EMF Constant	V/m/s	18.1	18.1	36.3	54.4	27.7	27.7	55.4	83.1	45.4	45.4	90.8	136.1	181.5
	V/in/s	0.46	0.46	0.92	1.38	0.70	0.70	1.41	2.11	1.15	1.15	2.31	3.46	4.61
Inductance	mH	3.13	1.57	3.13	4.70	3.50	1.75	3.50	5.25	6.50	3.25	6.50	9.75	13.00
Terminal Resistance @25 °C	Ω	4.70	2.35	4.70	7.05	4.60	2.30	4.60	6.90	4.20	2.10	4.20	6.30	8.40
Electrical Time Constant	ms	0.67	0.67	0.67	0.67	0.76	0.76	0.76	0.76	1.55	1.55	1.55	1.55	1.55
Mechanical Parameters														
Coil Mass	g	0.22	0.45	0.91	1.37	0.28	0.56	1.19	1.78	0.73	1.45	2.88	4.32	5.76
	oz	0.484	0.990	2.002	3.010	0.607	1.24	2.62	3.92	1.60	3.19	6.34	9.50	12.67
Coil Length	mm	61	121	241	361	61	121	241	361	85.0	169.0	337.0	505.0	673.0
	in	2.40	4.76	9.49	14.21	2.40	4.76	9.49	14.21	3.3	6.65	13.27	19.88	26.50
Track Mass (per 63 mm)	g	1.00				1.77				4.26				
	oz	2.20				3.89				9.37				
Magnetic Attraction	N (lb)	0				0				0				
Cont. Current	A rms	2.3	4.6			2.3	4.6			2.5	5			
Peak Current	A rms	9.2	18.4			13	26			18	36			
MINAS A5L Model		MCDHT 3520L	MDDHT5540L			MCDHT 3520L	MDDHT5540L			MDDHT 5540L	MFDHTA464L			

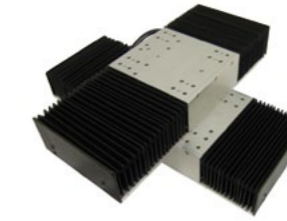
Application Sample



Single-Axis Module



XY Module

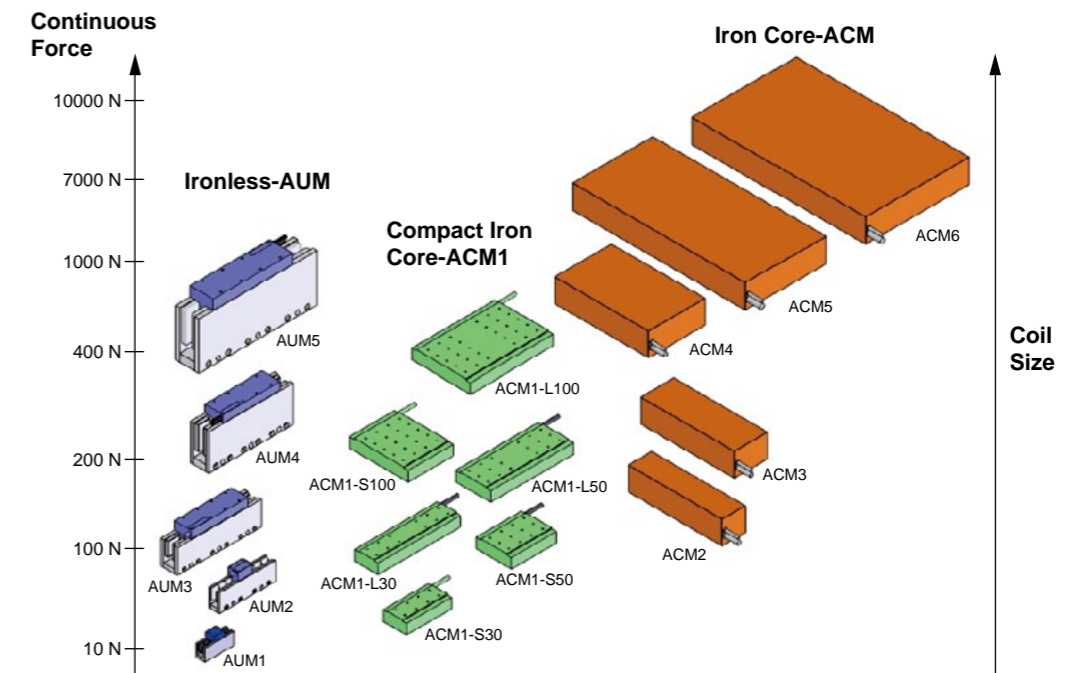


Bellow-Covered Module



Granite Stages

System Configuration



Recommended Drivers:

MADHT1505*, MADHT1507***, MBDHT2510***, MCDHT3520***, MDDHT3530***, MDDHT5540***, MEDHT7364***, MFDHTA390***, MFDHTB3A2*****

Sales area and Language



- English
- Chinese
- Korean
- Thai

Please contact the following address for details.

For more information

URL: <http://www.akribis-sys.com/>

Contact: **Akribis Systems Pte Ltd**

5012 Techplace II Ang Mo Kio Ave 5 #01-05 Singapore 569876

[E-mail: cust-service@akribis-sys.com]

TEL: +65-6484-3357 FAX: +65-6484-3361

Direct Drive Rotary Motor

ADR-A Series

Features

- Direct drive, brushless motor fully integrated with encoder and bearing
- Low cogging torque
- Low speed and high speed windings
- High Continuous and Peak Torque



Specification

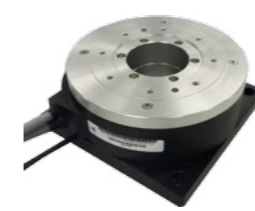
Performance Parameters	Units	ADR110		ADR135		ADR175		ADR220		ADR360	
		P-A75	P-A98	P-A90	P-A115	P-A102	P-A138	P-A120	P-A165	P-A150	P-A215
Table diameter	mm	110	110	135	135	175	175	220	220	360	360
Table height	mm	75	98	90	115	102	138	120	165	150	215
Number of poles		16	16	16	16	16	16	24	24	32	32
Continuous torque	Nm	1.9	4.2	5.2	11.0	15.7	32.9	46.0	94.9	184.8	377.9
Peak torque	Nm	5.8	12.6	15.5	32.9	47.2	98.6	137.9	284.6	554.5	1133.8
Max. cogging torque (peak to peak)	Nm	0.0024	0.0049	0.010	0.022	0.094	0.197	0.357	0.736	1.98	4.09
Torque constant	Nm/Arms	0.32	0.70	0.86	1.83	1.97	4.11	2.84	5.86	9.24	18.90
Back EMF constant	Vpeak/rpm	0.028	0.060	0.074	0.156	0.168	0.351	0.243	0.501	0.790	1.616
Continuous current	Arms	6.0	6.0	6.0	6.0	8.0	8.0	16.20	16.20	20.00	20.00
Peak current	Arms	18.0	18.0	18.0	18.0	24.0	24.0	48.60	48.60	60.00	60.00
Resistance ^{*1}	ohms	0.80	1.21	1.65	2.70	1.30	2.13	0.74	1.20	0.76	1.25
Inductance ^{*1}	mH	4.29	6.49	11.20	18.63	11.27	18.51	6.30	11.90	7.92	13.00
Electrical time constant	ms	5.36	5.36	6.79	6.90	8.67	8.67	8.51	9.92	10.40	10.40
Motor constant	Nm/SqRt(W)	0.36	0.63	0.67	1.11	1.72	2.81	3.30	5.35	10.59	16.90
Mass	Kg	2.9	3.2	4.8	4.9	8.5	12.7	18.3	24.1	56.0	71.0
Rotor Inertia	Kgm ²	0.0003086	0.0004419	0.000992	0.001332	0.005422	0.007621	0.017858	0.025216	0.204636	0.322304
Rec. max speed @230V AC ^{*3} (SINCOS)	rpm	2000	2000	2000	1190	1080	558	846	395	230	115
Rec. max speed @415V AC ^{*3} (SINCOS)		-	-	-	-	-	-	-	-	685	317
AB-3005 optical SINCOS encoder	lines	3005		4103		7500					
Resolution (at 512 X interpolation)	Counts/rev	1538560		2100736		3840000					
Resolution (at 4096 X interpolation)	Counts/rev	12308480		16805888		30720000					
Accuracy (based on AB-3005)	arc sec	+/-20		+/-25		+/-30					
Repeatability (based on AB-3005)	arc sec	+/-2.7		+/-2		+/-2					
Axial / Radial runout	um	15 (10, 5) ^{*2}		20 (10, 5) ^{*2}		25 (10) ^{*2}		40 (15) ^{*2}			
Max axial load	N	700		1050		2310		2800		11200	
Max moment load	Nm	20		35		53		72		245	

*1. Terminal to terminal, at 25 Deg C.

*2. Optional.

*3. Limit by Bus Voltage and Encoder Output Frequency

Application Sample



AXD Type



Ironless Type

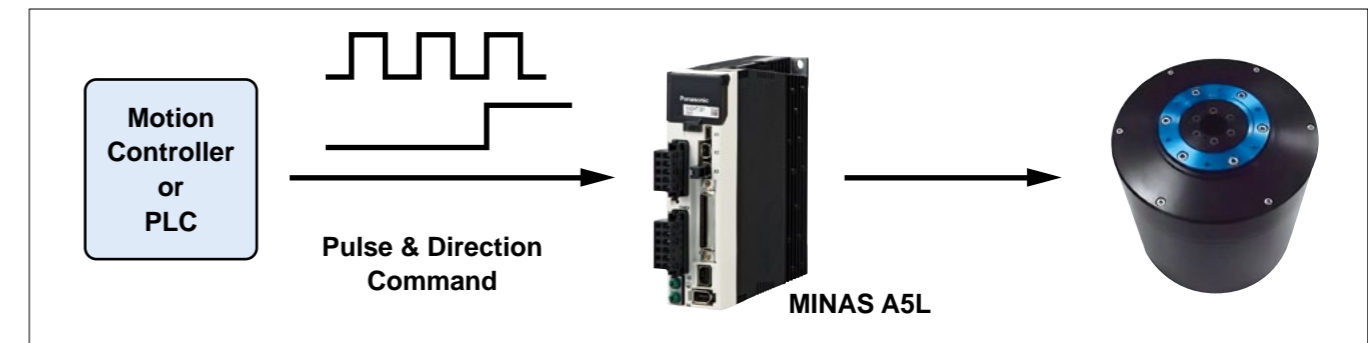
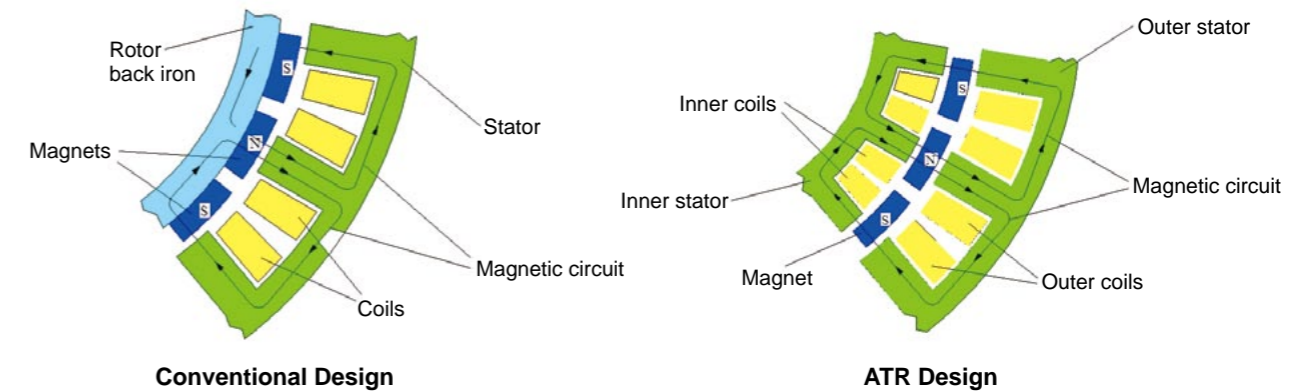


Frameless Type



IronCore Type

System Configuration



Recommended Drivers:

MCDHT3520***, MDDHT3530***, MDDHT5540***, MEDHT7364***, MFDHTA390***

Sales area and Language



- English
- Chinese
- Korean
- Thai

Please contact the following address for details.

For more information

URL: <http://www.akribis-sys.com/>

Contact: Akribis Systems Pte Ltd

5012 Techplace II Ang Mo Kio Ave 5 #01-05 Singapore 569876

[E-mail: cust-service@akribis-sys.com]

TEL: +65-6484-3357 FAX: +65-6484-3361

Direct Drive Rotary Motor

JTR series

Features

- High precision indexing rotary table
- Minimal cogging design
- High resolution and high torque
- Flexibility in division of angles and control of rotating direction and speed



Specification

PERFORMANCES	UNIT	JTR15T	JTR11 series			JTR15 series				JTR16 series	
			JTR1106	JTR1112	JTR1118	JTR1501E	JTR1503E	JTR1505E	JTR1508E	JTR1604	JTR1608
Continuous Torque	N·m	1.4	2	4	6	5	10	18	27	14	27
Peak Torque	N·m	4.2	6	12	18	15	30	50	80	40	80
Continuous Current	A _{rms}	1.2	1	1	1	1.8	3.7	3.7	3.7	4.3	9
Peak Current	A _{rms}	3.5	3	3	3	5.5	11.1	11.1	11.1	12.9	27
Torque Constant	N·m/A _{rms}	1.2	2	4	6	2.9	2.9	4.9	7.8	3.1	3
Back EMF Constant(ph-ph)	V _{rms} /rad/s	0.7	1.2	2.3	3.5	1.7	1.7	2.8	4.5	1.8	1.7
Motor Constant	N·m/W ^{1/2}	0.3	0.4	0.6	0.8	0.8	1.3	1.9	2.5	1.3	1.9
Electrical Time Constant	ms	0.8	1.8	2	2.1	5	6.4	8.1	8.2	3.5	3.5
Thermal Resistance	°C/W	3.3	4	2.3	1.6	2.2	1.4	1.1	0.7	0.9	0.5
Max. Speed1)	rps	10	10	8	5	5	5	5	4.5	8	9
Resolution2)	ppr	655360	518400			655360				327680	
Accuracy1)	arcsec	±30	±30			±30				±30	
Repeatability1)	arcsec	±2	±2.5			±2				±4	
Axial Run-out (no-load)	μm	20/10/5									
Radial Run-out (no-load)	μm	20/10/5									
Max. Axial Load	kg	120	90	90	90	530	530	530	530	120	120
Max. Moment Load	N·m	15	12	12	12	96	96	96	96	15	15
Rotor Inertia	kg·m ²	0.00226	0.0007	0.0012	0.0023	0.012	0.021	0.024	0.029	0.0031	0.0052
Motor Weight	kg	4.4	3.9	5.4	6.9	6.4	9.8	12.2	15.6	13.9	22
Applicable drive MINAS A5L Model	200 V	MADHT1505L**				MBDHT 2510L**	MCDHT3520L**			MDDHT 3530L**	MDDHT 5540L**
	100 V	MADHT1105L**				MBDHT 2110L**	MCDHT3120L**			<input type="checkbox"/>	<input type="checkbox"/>

PERFORMANCES	UNIT	JTR24 series			JTR30 series			JTR49 series		
		JTR2403	JTR2408	JTR2413	JTR3015	JTR3030	JTR3045	JTR4960	JTR4990	JTR49C0
Continuous Torque	N·m	10	27	44	50	100	150	200	300	400
Peak Torque	N·m	30	80	130	150	300	450	600	900	1200
Continuous Current	A _{rms}	3.1	4.2	4	4.1	9	9	13.3	13.3	13.3
Peak Current	A _{rms}	9.3	12.6	12	13.6	27.1	28.5	39.9	39.9	39.9
Torque Constant	N·m/A _{rms}	3.3	6.4	11	12.2	11.1	16.7	15.0	22.6	30.1
Back EMF Constant(ph-ph)	V _{rms} /rad/s	1.9	3.7	6.4	6.7	6.7	9.6	8.7	13.0	17.4
Motor Constant	N·m/W ^{1/2}	1.1	2.2	3.1	3.8	5.4	7.1	10.3	13.2	16.1
Electrical Time Constant	ms	6.7	7.4	4.7	8.3	9.1	9.4	8.7	9.6	10.7
Thermal Resistance	°C/W	1.1	0.6	0.5	0.54	0.27	0.21	0.2	0.2	0.2
Max. Speed1)	rps	5	4.5	2.8	2.9	3	2	3.0	2.0	1.5
Resolution2)	ppr	655360			864000			1036800		
Accuracy1)	arcsec	±30								
Repeatability1)	arcsec	±2								
Axial Run-out (no-load)	μm	20/10/5						40/20		
Radial Run-out (no-load)	μm	20/10/5						40/20		
Max. Axial Load	kg	410	410	410	1100	1100	1100	1100	1100	1100
Max. Moment Load	N·m	80	80	80	250	250	250	250	250	250
Rotor Inertia	kg·m ²	0.0092	0.0143	0.0203	0.1004	0.1288	0.1576	0.536	0.631	0.762
Motor Weight	kg	10.7	14.7	19.7	42.7	54.5	66.2	80.2	91.5	100.5
Applicable drive MINAS A5L Model	200 V	MCDHT3520L**			MDDHT 3530L**	MDDHT5540L**		MEDHT7364L**		
	100 V	MCDHT3120L**			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		

1) Dependent on the encoder resolution. 2) Possible to get more high resolution.

Application Sample

- Alignment and indexing equipment
- Semiconductor test handler
- Glass titler
- Machine tools
- Loader / unloader
- Die bonder, LED handler

Sales area and Language



- Chinese
- Japanese
- English
- Korean

For more information

URL: <http://www.justek.com>

Contact: Justek, Inc.

630-46 Nambudae-ro, Jinwi-myeon, Pyeongtaek, Gyeonggi-do, Korea

[E-mail: info@justek.com]

TEL: +82-31-647-5500 FAX: +82-31-647-5555

Justek, Inc. Japan Branch

WBC 6F, Yokohama World Porters, 2-2-1, Shinkou, Naka-ku, Yokohama, 231-0001, Japan

[E-mail: sjkang@justek.com]

TEL: +81-45-222-2061 FAX: +81-45-222-2061

Tubular Linear Motor

Series P10-54

Features

- Controlled by standard third-party servo drives
- 230 VAC and 3x400 VAC Technology
- Forces up to 900 N
- Speed up to 11 m/s
- Stroke range up to 2'000 mm
- A/B incremental encoder 1 µm
- Extremely high dynamics
- Rotating push-pull TWIN connector for power and encoder cables
- One-piece clamping flange

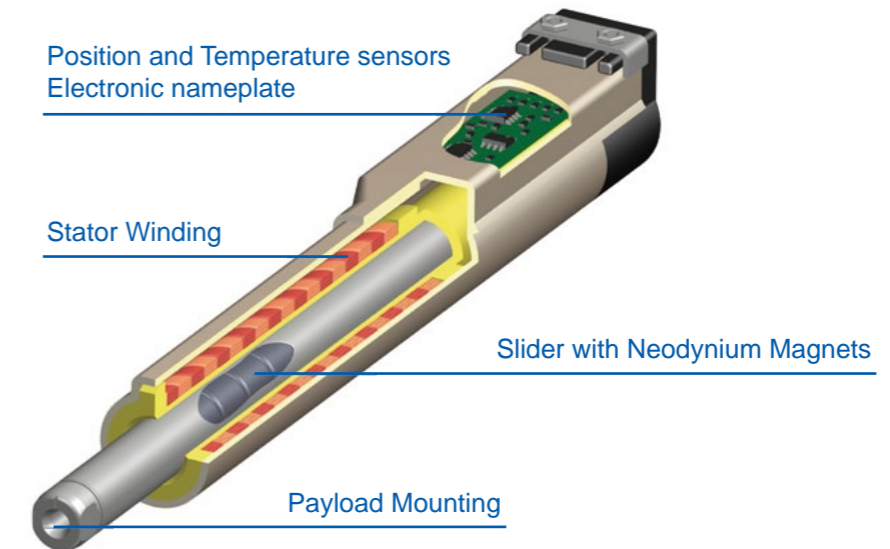


Specification

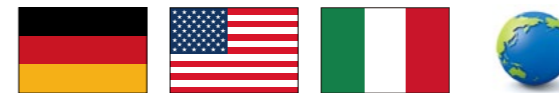
	PS10-54x120U	PS10-54x180U	PS10-54x240U	PS10-54x330U
Maximum stroke (mm)	2240	2180	2120	2060
Peak force (N)¹⁾	357	535	714	892
Continuous force (N)^{2)/3)}	70 / 102	105 / 153	140 / 204	175 / 255
Peak velocity (m/s)	8.5	11.1	8.4	8.7
Peak acceleration (m/s²)¹⁾	245	366	410	413
Force constant (N/Arms)	65	50	66	64
Nominal DC-Link voltage (Vdc)	560			
Applicable MINAS drive⁴⁾	A5BL / A6BL, 1- to 3-phase, 2DOF			

- 1) Real time calculation of motor winding temperature required (including temperature sensor monitoring)
 2) Motor with flange @ 25 °C ambient temperature
 3) Motor with flange and fan cooling @ 25 °C ambient temperature
 4) Rating (voltage and current) act on application requirements. Please contact us with application details to evaluate appropriate model.

Principle



Sales area and Language



- German
- English
- Italian

Headquarter in Europe and USA. Worldwide representatives.

For more information

NTI AG URL: www.linmot.com
 LinMot USA, Inc. URL: www.linmot-usa.com/

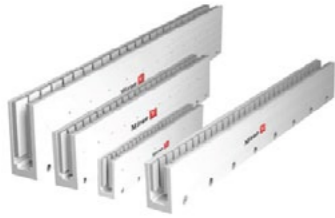
Contact: NTI AG	[E-mail: office@linmot.com]
Bodenaeckerstrasse 2 CH-8957 Spreitenbach Switzerland	TEL: +41 (0)56 419 91 91 FAX: +41 (0)56 419 91 92
LinMot USA, Inc.	[E-mail: usasales@linmot.com]
204 E Morrissey Dr. Elkhorn, WI 53121 USA	TEL: 877 546 3270 FAX: 800 463 8708

Coreless and Core Linear Motor

U-Coreless/T-Core/Platen-Core Type

Features

U-Coreless Type



- No Cogging
- No Magnetic Attraction Force
- Fast Setting-time Response
- Easy to install

T-Core Type



- Cogging Optimization
- High-density Force & Attraction Force
- No normal Force
- Easy to install

Platen-Core Type



- Cogging Optimization
- High-density Force & Attraction Force
- Most economic design solution
- Easy to install

Specification

Item	Model	Dimension [mm]	Continu. Force [N]	Continu. Current [Arms]	Max. Force [N]	Max. Current [Arms]	Back EMF [Vrms/Arms]	Force Constant [N/Arms]	Magnetic Attraction [N]	Resistance [Ohm]	Inductance [mH]	Weight [kg]	Motor Constant [N/sqrt(W)]	Thermal Resistance [oC/W]	Pole-Pitch [N to S] (mm)	Max Velocity [m/sec]	MINAS A5L Model	
																	Carrier f : 6KHz	Carrier f : 12KHz
U-Coreless (Tiny)	ML-ULT-1SA*	80(L)x37(W)x77.5(H)	21	1.39	63	4.17	5.3	15.3	0	3.3	1.7	0.3	4.29	2.51	15.00	17.3		MADHT1507L01
	ML-ULT-2SA*	140(L)x37(W)x77.5(H)	43	1.39	129	4.17	10.7	30.8	0	6.6	3.4	0.6	6.22	1.25		7.2		MADHT1507L01
	ML-ULT-3SA*	200(L)x37(W)x77.5(H)	64	1.39	192	4.17	16	46.1	0	9.9	5.1	0.9	7.56	0.84		3.6		MADHT1507L01
	ML-ULT-2S2PA*	260(L)x37(W)x77.5(H)	86	2.79	258	8.37	10.7	30.8	0	3.3	1.7	1.1	8.76	0.62		7.2	MCDHT3520L01	MDDHT3530L01
U-Coreless (Small)	ML-ULS-3SA*	202(L)x38.4(W)x92(H)	97	3.26	292	9.78	10.4	30.0	0	2.0	1.2	0.8	10.86	0.75	15.00	7.3	MCDHT3520L01	MDDHT3530L01
	ML-ULS-4SA*	262(L)x38.4(W)x92(H)	130	3.26	390	9.78	13.8	39.7	0	2.6	1.7	1.1	12.77	0.58		5.1	MCDHT3520L01	MDDHT3530L01
	ML-ULS-5SA*	322(L)x38.4(W)x92(H)	162	3.26	486	9.78	17.3	49.8	0	3.3	2.1	1.4	14.13	0.46		3.7	MCDHT3520L01	MDDHT3530L01
	ML-ULS-6SA*	382(L)x38.4(W)x92(H)	195	3.26	585	9.78	20.8	59.9	0	3.9	2.5	1.6	15.64	0.39		2.8	MCDHT3520L01	MDDHT3530L01
	ML-ULS-7SA*	442(L)x38.4(W)x92(H)	227	3.26	681	9.78	24.2	69.7	0	4.6	2.9	1.9	16.77	0.33		2.1	MCDHT3520L01	MDDHT3530L01
U-Coreless (Medium)	ML-ULM-1SA(S)	120(L)x47.4(W)x121.5(H)	85	3.00	254	9.00	9.8	28.2	0	0.85	2.05	0.7	15.78	2.09	22.50	11.0	MCDHT3520L01	MDDHT3530L01
	ML-ULM-2SA(S)	210(L)x47.4(W)x121.5(H)	169	3.00	507	9.00	19.6	56.4	0	1.70	4.10	1.4	22.31	1.05		4.6	MCDHT3520L01	MDDHT3530L01
	ML-ULM-3SA*	300(L)x47.4(W)x121.5(H)	254	6.00	762	18.00	14.7	42.3	0	1.30	3.10	2.0	19.17	0.34		6.4	MDDHT5540L01	MEDHT7364L01
	ML-ULM-4SA*	390(L)x47.4(W)x121.5(H)	338	6.00	1014	18.00	19.6	56.4	0	1.70	4.10	2.7	22.31	0.26		4.6	MDDHT5540L01	MEDHT7364L01
	ML-ULM-5SA*	480(L)x47.4(W)x121.5(H)	424	6.00	1272	18.00	24.5	70.6	0	2.10	5.10	3.3	25.18	0.21		3.6	MDDHT5540L01	MEDHT7364L01
U-Coreless (Large)	ML-ULL-3PA*	397(L)x50.4(W)x152(H)	506	7.16	1518	21.48	24.6	70.7	0	1.3	2.9	3.4	32.01	0.24	30.00	2.8	MDDHT3530L01	MDDHT5540L01
	ML-ULL-4PA*	517(L)x50.4(W)x152(H)	675	9.55	2025	28.65	24.6	70.7	0	1.0	2.2	4.5	36.50	0.18		2.8	MDDHT5540L01	MEDHT7364L01
	ML-ULL-5PA*	637(L)x50.4(W)x152(H)	844	11.94	2531	35.81	24.6	70.7	0	0.8	1.8	5.6	40.81	0.14		2.8	MDDHT5540L01	MEDHT7364L01
	ML-ULL-2PA*	336(L)x66.6(W)x224(H)	771	7.40	2313	22.20	36.2	104.2	0	1.4	4.6	5.5	45.47	0.21		2.0	MDDHT5540L01	MEDHT7364L01
U-Coreless (X-large)	ML-ULX-3PA*	486(L)x66.6(W)x224(H)	1157	11.10	3471	33.30	36.2	104.2	0	1.0	3.1	8.3	53.83	0.13	37.50	2.0	MEDHT7364L01	MFHTA390L01
	ML-ULX-4PA*	636(L)x66.6(W)x224(H)	1542	14.80	4626	44.40	36.2	104.2	0	0.7	2.3	11.1	64.31	0.10		2.0	MFHTA390L01	MFHTB3A2L01
	ML-TCT-1P	101(L)x38.7(W)x67.5(H)	118	1.3	354	3.9	30.7	92.1	0	17.3	56.4	2.2	13.61	0.80		2.1		MADHT1507L01
	ML-TCT-2P	191(L)x38.7(W)x67.5(H)	236	2.6	708	7.8	30.7	92.1	0	8.7	28.2	4.5	19.25	0.40		2.1	MBDHT2510L01	MCDHT3520L01
T-Core (Tiny)	ML-TCT-3P	281(L)x38.7(W)x67.5(H)	354	3.9	1062	11.7	30.7	92.1	0	5.8	18.8	6.7	23.57	0.27	22.50	2.1	MCDHT3520L01	MDDHT3530L01
	ML-TCT-4P	371(L)x38.7(W)x67.5(H)	472	5.2	1416	15.6	30.7	92.1	0	4.3	14.1	8.9	27.22	0.20		2.1	MDDHT3530L01	MDDHT5540L01
	ML-TCM-2P	191(L)x72.3(W)x135(H)	550	4.5	1650	13.5	37.76	113.3	0	2.0	17.3	4.5	44.85	0.40		2.0	MDDHT3530L01	MDDHT5540L01
	ML-TCM-3P	281(L)x72.3(W)x135(H)	825	6.8	2475	20.3	37.76	113.3	0	1.3	11.6	6.7	54.93	0.27		2.0	MDDHT5540L01	MEDHT7364L01
T-Core (Medium)	ML-TCM-4P*	371(L)x72.3(W)x135(H)	1100	9.0	3300	27.0	37.76	113.3	0	1.0	8.7	8.9	63.43	0.20	22.50	2.0	MDDHT5540L01	MEDHT7364L01
	ML-TCM-5P	461(L)x72.3(W)x135(H)	1375	11	4125	34	37.76	113.3	0	0.8	6.9	11.1	70.92	0.16		2.0	MEDHT7364L01	MFHTA390L01
	ML-PCT-1SF*	69(L)x55(W)x45(H)	43	1.44	129	4.32	14.6	29.8	192.0	3.4	17.5	0.7	8.42	2.30		7.30		MADHT1507L01
Platen Core (Tiny)	ML-PCT-2SF*	129(L)x55(W)x45(H)	86	1.44	258	4.32	29.2	59.5	384.0	6.7	35.1	1.4	11.91	1.15	15.00	3.10		MADHT1507L01
	ML-PCT-3SF	189(L)x55(W)x45(H)	129	1.44	387	4.32	43.8	89.3	576.0	10.1	52.6	2.1	14.59	0.77		1.60		MADHT1507L01
	ML-PCT-2S2PF	249(L)x55(W)x45(H)	172	2.88	516	8.64	29.2	59.5	768.0	3.4	17.5	2.8	16.85	0.58		3.10	MCDHT3520L01	MDDHT3530L01
	ML-PCS-1SE	69(L)x75(W)x46.3(H)	80	2.30	240	6.90	11.6	34.8	320.0	1.4	11.3	0.8	15.18	2.16		9.00	MBDHT2510L01	MDDHT3520L01
Platen Core (Small)	ML-PCS-2SE*	129(L)x75(W)x46.3(H)	150	2.25	450	6.75	23.2	69.6	640.0	2.8	22.6	1.6	20.57	1.13	15.00	3.70	MBDHT2510L01	MDDHT3520L01
	ML-PCS-3SE*	189(L)x75(W)x46.3(H)	225	2.25	675	6.75	34.8	104.4	960.0	4.1	33.9	2.4	25.50	0.77		2.10	MDDHT2510L01	MDDHT3520L01
	ML-PCS-2S2PE*	249(L)x75(W)x46.3(H)	300	4.5	900	13.50	23.2	69.6	1280.0	1.4	11.3	3.2	29.10	0.56		3.70	MDDHT3530L01	MDDHT5540L01
Platen Core (Large)	ML-PCL-2PE*	251(L)x133(W)x58(H)	670	6.2	2000	18.60	37	111	3200.0	1.2	5.9	6.8	50.94	0.35	30.00	2.3	MDDHT5540L01	MEDHT7364L01
	ML-PCL-3PE*	371(L)x133(W)x58(H)	1000	9.29	3000	27.87	37	111	4800.0	0.8	4.0	10.2	62.15	0.23		2.3	MEDHT7364L01	MFHTA390L01

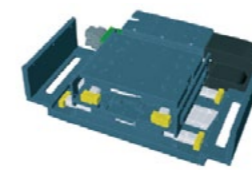
Application Sample

X-Y Gantry



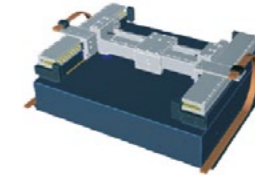
For Heavy duty Industrial Equipment

Compact X-Y Table



Has enough stroke even in a small area

High Precision Air-Bearing Stage



Air Bearing is applied for non-touching moving structure

Multi-Mover Linear Stage



4sets of independent driving Linear Motor applied in a single line

Selection Guide

Mover The moving parts are made up of the coll, Frame, and Epoxy Moid

ML - PCL - 2S2PE
① ② ③ ④ ⑤ ⑥

① Shape	② Core	③ Magnet size	④ Number of Serial Coil	⑤ Number of Parallel Coil	⑥ Design oder
U : U shape T : T shape P : Platen	C : Core type L : Core-less	T : Tiny S : Small M : Medium L : Large X : X-Large	1S : 1 serial 2S : 2 serial 3S : 3 serial ...	1P : 1parallel 2P : 2parallel 3P : 3parallel ...	A, B, C, D, E, ...

Stator The fixed parts are made up of the Magnet and the Back Ilon

ML - PCL - SE - 540
① ② ③ ④ ⑤

① Shape	② Core	③ Magnet size	④ Stator Desgin Oderl	⑤ Stator Length
U : U shape T : T shape P : Platen	C : Core type L : Core-less	T : Tiny S : Small M : Medium L : Large	SA, AB, SC, ...	270 : 270 mm 330 : 330 mm 540 : 540 mm

Stators Specification

Item	Model	Length [mm]	Item	Model	Length [mm]	Item	Model	Length [mm]	Item	Model	Length [mm]
U-Shape Coreless (Tiny model)	ML-ULT-SA-240	240	U-Shape Coreless (Large model)	ML-ULL-SA-180	180	T-Shape Core Type (Tiny model)	ML-TCT-SA-270	270	Platen Core Type (Tiny model)	ML-PCT-SE-120	120
	ML-ULT-SA-360	360		ML-ULL-SA-300	300		ML-TCT-SA-360	360		ML-PCT-SE-180	180
	ML-ULT-SA-480	480		ML-ULL-SA-480	480		ML-TCT-SA-540	540		ML-PCT-SE-240	240
U-Shape Coreless (Small model)	ML-ULS-SA-360	360	U-Shape Coreless (X-large model)	ML-ULL-SA-600	600	T-Shape Core Type (Medium model)	ML-TCM-SA-270	270	Platen Core Type (Small model)	ML-PCT-SE-300	300
	ML-ULS-SA-420	420		ML-ULL-SA-150	150		ML-TCM-SA-360	360		ML-PCT-SE-360	360
	ML-ULS-SA-480	480		ML-ULX-SA-300	300		ML-TCM-SA-450	450		ML-PCT-SE-420	420
U-Shape Coreless (Medium model)	ML-ULM-SA-600	600	U-Shape Coreless (X-large economic)	ML-ULX-SA-600	600	T-Shape Core Type (Large model)	ML-TCM-SA-495	495	Platen Core Type (Large model)	ML-PCT-SE-270	270
	ML-ULM-SA-270	270		ML-ULX(e)-SA-150	150		ML-TCM-SA-540	540		ML-PCS-SE-540	540
	ML-ULM-SA-360	360		ML-ULX(e)-SA-300	300		ML-TCM-SA-630	630		ML-PCL-SE-120*	120
U-Shape Coreless (Medium economic)	ML-ULM-SA-450	450				ML-TCM-SA-720	720	ML-PCL-SE-270*	270		
	ML-ULM-SA-540	540				ML-TCM-SA-945	945	ML-PCL-SE-540	540		
	ML-ULM(e)-SA-360	360									
	ML-ULM(e)-SA-540	540									
	ML-ULM(e)-SA-630	630									

* special

Sales area and Language



- Korea : +82-41-559-8749
- English : +82-41-529-1033
- Chinese : +86-186-2221-7474

For more information

URL: <http://www.miraelmt.co.kr>

Contact: **Mirae Linear Motor Technology**

[E-mail: lmstales@mirae.com]

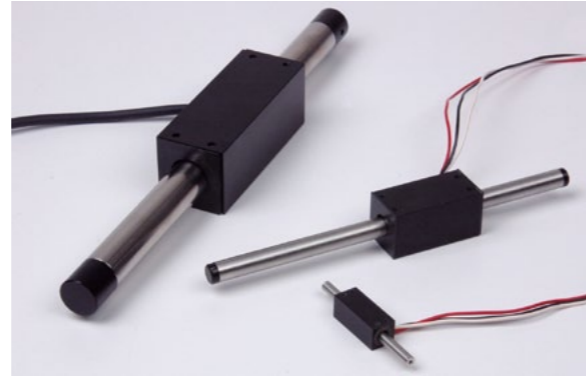
65, Baekseokgongdan 7-ro, Cheonan-si Seobuk-gu, Chungcheongnam-Do, 331-220 Korea

Linear Shaft Motor

S series/L series

Features

- Coreless Technology
- Zero Cogging
- High Force and High Precision
- Energy Efficient
- Simple Design and Easy Integration

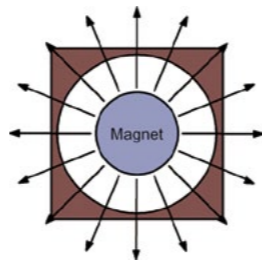


Specification

	Units	S040 series			S080 series			S120 series			S160 series			S200 series			
		S040D	S040T	S040Q	S080D	S080T	S080Q	S120D	S120T	S120Q	S160D	S160T	S160Q	S200D	S200T	S200Q	
Shaft Diameter	mm	4	4	4	8	8	8	12	12	12	16	16	16	20	20	20	
Stroke Length Range	mm	20~40	20~40	20~40	25~300	25~300	25~300	50~1750	50~1750	50~1750	100~1750	100~1750	100~1750	100~2700	100~2700	100~2700	
Continuous Force	N	0.29	0.45	0.58	1.8	2.7	3.5	4.5	6.6	8.9	10	15	20	18	28	38	
Continuous Current	A rms	0.3	0.3	0.3	0.84	0.84	0.84	0.4	0.4	0.4	0.62	0.62	0.62	0.59	0.59	0.59	
Peak Force	N	1.2	1.8	2.3	7.2	10.7	14	18	27	36	40	60	81	72	112	152	
Peak Current	A rms	1.1	1.1	1.1	3.4	3.4	3.4	1.6	1.6	1.6	2.5	2.5	2.5	2.4	2.4	2.4	
Magnet Pitch N-N	mm	18	18	18	30	30	30	48	48	48	60	60	60	72	72	72	
Gap	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75	
MINAS A5L Model	200 V	—			—			—			—			MADHT1505L△△			
	100 V	—			—			—			—			MADHT1105L△△			
MINAS A6L Model	200 V	—			—			—			—			MADL□05△△			
	100 V	—			—			—			—			MADL□01△△			
MINAS A5ML Model	24 V	MMDHT2C09LA						—						—			

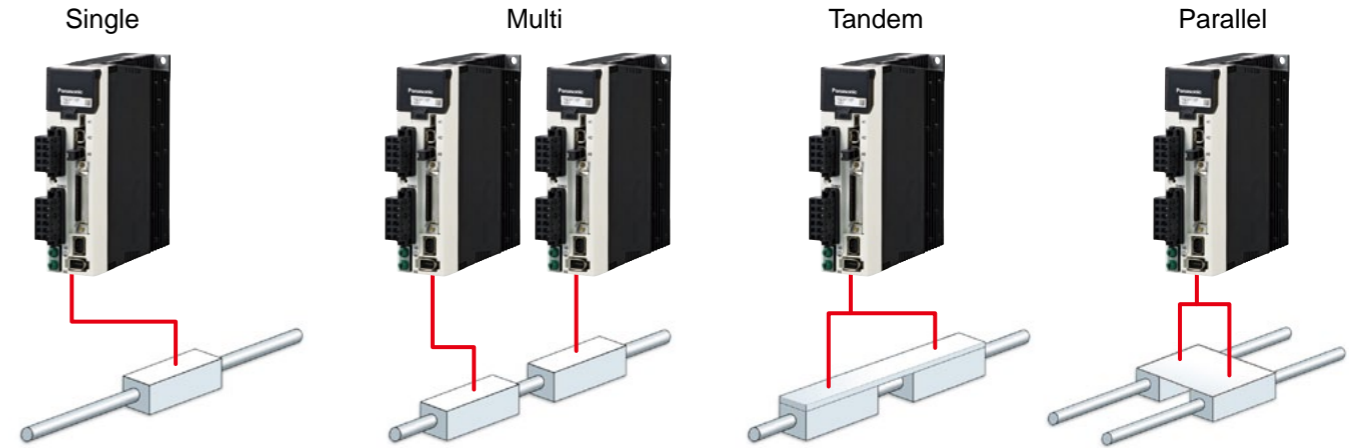
	Units	S250 series			S320 series			S350 series			S427 series			S435 series		
		S250D	S250T	S250Q	S320D	S320T	S320Q	S350D	S350T	S350Q	S427D	S427T	S427Q	S435D	S435T	S435Q
Shaft Diameter	mm	25	25	25	32	32	32	35	35	35	42.7	42.7	42.7	43.5	43.5	43.5
Stroke Length Range	mm	100~2550	100~2550	100~2550	100~2700	100~2700	100~2700	100~2500	100~2500	100~2500	100~3600	100~3600	100~3600	100~2600	100~2600	100~2600
Continuous Force	N	40	60	75	56	85	113	104	148	190	100	150	200	116	175	233
Continuous Current	A rms	1.28	1.28	1.28	1.22	1.17	1.15	1.5	1.5	2.7	3	3	3	3	3	3
Peak Force	N	160	240	300	226	338	451	416	592	760	400	600	800	464	700	932
Peak Current	A rms	5.1	5.1	5.1	5	5	5	6	6	10.8	12	12	12	12	12	12
Magnet Pitch N-N	mm	90	90	90	120	120	120	120	120	120	180	180	180	180	180	180
Gap	mm	0.75	0.75	0.75	1.0	1.0	1.0	1.0	1.0	1.0	1.65	1.65	1.65	1.25	1.25	1.25
MINAS A5L Model	200 V	* MADHT1507L△△			* MADHT1507L△△			MBDHT2510L△△			MCDHT3520L△△			MCDHT3520L△△		
	100 V	MADHT1107L△△			MADHT1107L△△			MBDHT2110L△△			MCDHT3120L△△			MCDHT3120L△△		
MINAS A6L Model	200 V	* MADL□15△△			* MADL□15△△			MBDL□25△△			MCDL□35△△			MCDL□35△△		
	100 V	MADL□11△△			MADL□11△△			MBDL□21△△			MCDL□31△△			MCDL□31△△		

	Units	S500 series			S605 series		L250 series			L320 series		
		S500D	S500T	S500Q	S605T	S605Q	L250D	L250T	L250Q	L320D	L320T	L320Q
Shaft Diameter	mm	50	50	50	60.5	60.5	25	25	25	32	32	32
Stroke Length Range	mm	100~3850	100~3850	100~3850	100~3850	100~3850	100~3650	100~3650	100~3650	100~3600	100~3600	100~3600
Continuous Force	N	289	440	585	610	780	34	52	69	55	82	109
Continuous Current	A rms	3.8	5.8	7.7	8.6	8.4	1.3	1.3	1.3	1.25	1.25	1.25
Peak Force	N	1156	1760	2340	2400	3100	138	207	276	218	327	436
Peak Current	A rms	15.2	23.2	30.8	34	34	5.2	5.2	5.2	5	5	5
Magnet Pitch N-N	mm	180	180	180	240	240	90	90	90	120	120	120
Gap	mm	1.75	1.75	1.75	1.75	1.75	2	2	2	2.5	2.5	2.5
MINAS A5L Model	200 V	* MDDHT5540L△△			* MDDHT5540L△△		* MADHT1507L△△			—		
	100 V	—			—		MADHT1107L△△			—		
MINAS A6L Model	200 V	* MDDL□55△△			* MDDL□55△△		* MADL□15△△			—		
	100 V	—			—		MADL□11△△			—		



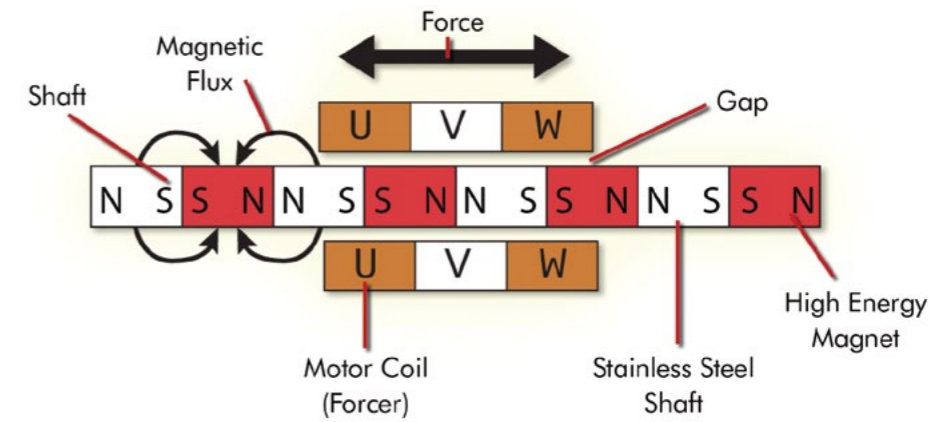
* In case you drive around the motor maximum current value, please let us know so that we will select an appropriate driver.

Application Sample



Construction

- Simple
- High Precision
- Non Contact



Sales area and Language



- English
- Japanese
- Chinese

Please contact the following address for details.

For more information

URL: <http://nipponpulse.com/products/overview/linear-shaft-servomotors/>

Contact: **Nippon Pulse America., Inc.**

4 Corporate Drive, Radford, Virginia 24141 U.S.A.

[E-mail: info@nipponpulse.com]

TEL: +1-540-633-1677 / +1-540-633-1674

Linear Shaft Motor Stage

SLP series / SCR series

Features

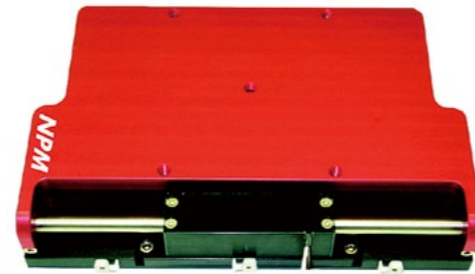
SLP-series

- High Force
- High Speed



SCR-series

- High Precision
- Low Ripple at Low Speed
- High Repeatability



Specification

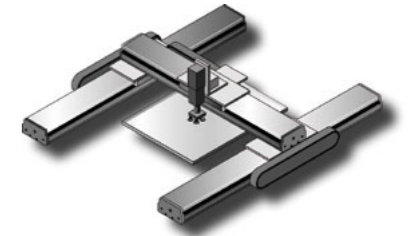
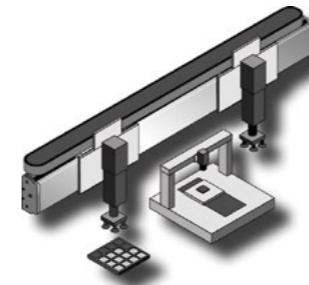
		SLP series		
		SLP15	SLP25	SLP35
Resolution	μm	1 (Hidenhain LIDA279)	1 (Hidenhain LIDA279)	1 (Hidenhain LIDA279)
Stroke/Single Slider	mm	100 to 1300 (100 interval)	200 to 1200 (100 interval)	200 to 1200 (100 interval)
Strike/ Double Slider	mm	100 to 1200 (100 interval)	200 to 1000 (100 interval)	300 to 900 (100 interval)
Continuous Force	N	17	80	185
Continuous Current	A rms	0.51	1.2	2.7
Peak Force	N	90	340	970
Peak Current	A rms	2.7	5.1	14.4
Max. Velocity	m/sec	3.0	3.0	3.0
Resistance	Ω	56	22	22
Inductance	mH	24	31	12
Magnet Pitch N-N	mm	60	90	120
Load Capacity	kg	5	30	60
MINAS A5L Model	200 V	MADHT1505L△△	*1 MADHT1507L△△	*1 MCDHT3520L△△
	100 V	MADHT1105L△△	MADHT1107L△△	*1 MCDHT3120L△△
MINAS A6L Model	200 V	MADL□05△△	*1 MADL□15△△	*1 MCDL□35△△
	100 V	MADL□01△△	MADL□11△△	MCDL□31△△

*1 In case you drive around the motor maximum current value, please let us know so that we will select an appropriate driver.

		SCR series			
		SCR050	SCR075	SCR100	SCR150
Motor part number	Units	S040Q	S080Q	S080Q	S160D
Resolution	μm	1, 0.5, 0.1, 0.05, 0.01	1, 0.5, 0.1, 0.05, 0.01 (Renishaw Tonic)	1, 0.5, 0.1, 0.05, 0.01 (Renishaw Tonic)	1, 0.5, 0.1, 0.05, 0.01 (Renishaw Tonic)
Stroke	mm	20, 40	50, 100, 150	50 to 300 (50 interval)	100 to 300 (50 interval)
Continuous Force	N	0.58	3.5	3.5	10
Continuous Current	A rms	0.3	0.84	0.84	0.62
Peak Force	N	2.3	14	14	40
Peak Current	A rms	1.1	3.4	3.4	2.5
Max. Velocity	m/sec	0.5 to 0.6 *2	1.1 to 1.5 *2	0.9 to 1.3 *2	1.3 to 1.5 *2
Resistance	Ω	22.4	9.0	9.0	21
Inductance	mH	1.0	1.3	1.3	8.2
Magnet Pitch N-N	mm	18	30	30	60
Load Capacity	kg	10	45.5	45.5	45.5
MINAS A5L Model	200 V	—	MADHT1505L△△		—
	100 V	—	MADHT1105L△△		—
MINAS A6L Model	200 V	—	MADL□05△△		—
	100 V	—	MADL□01△△		—
MINAS A5ML Model	24 V	MMDHT2C09LA			—

*2 The encoder resolution is 1μm and with no load condition

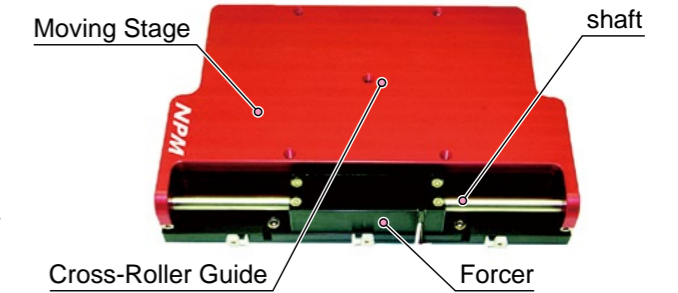
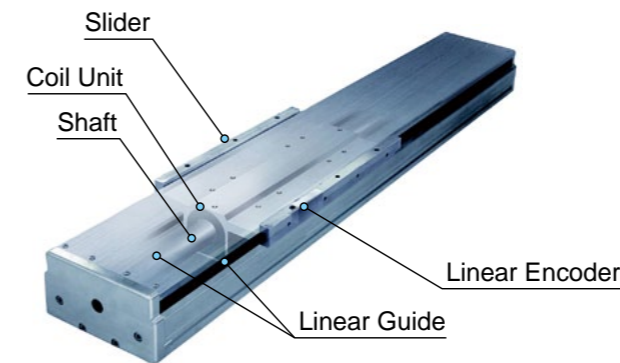
Application Sample



Customized SCR stage



Construction



Sales area and Language



- English
- Japanese
- Chinese

Please contact the following address for details.

For more information

<SLP series>

URL: <http://nipponpulse.com/products/overview/slp-stage/>

<SCR series>

URL: <http://nipponpulse.com/products/overview/linear-shaft-stages>

Contact: **Nippon Pulse America, Inc.**

4 Corporate Drive, Radford, Virginia 24141 U.S.A.

[E-mail: info@nipponpulse.com]

TEL: +1-540-633-1677 / +1-540-633-1674

Linear stages with integrated linear motors

MLE-, MLL- and MLU-Series

Features

- Compact and smart design
- Low carriage weight for high dynamic
- High force density
- High resolution encoder
- Long axis up to 10000 mm stroke
- Big range of sizes and options

Competent partner in electromechanical solutions
Standard Plug & Play linear units
Customized and flexible solutions



Specification

Ironcore MLE, MLL Series			
Performance Parameters	MLE3, MLL20, MLL30	MLE5, MLL5	MLE7
Continuous Force (N)	55 - 210	200 - 800	400 - 1000
Peak Force (N)	105 - 420	400 - 1600	1600 - 4000
Thermal Resistance (°C/W)	1.5 - 0.38	0.48 - 0.12	0.15 - 0.06
Coil Unit Mass (kg)	0.6 - 1.6	1.5 - 5.2	4.9 - 11.6
Weight of carriage with coil (kg)	2.2 - 4.7	4.5 - 14.0	10.5 - 21.5
Attraction Force (N)	300 - 900	950 - 3400	3400 - 8300
Recommended Drivers (230 V)	MADHT1507L** to MDDHT3530L**	MBDHT2510L** to MFDHTA390L**	MCDHT3520L** to MFDHTA390L**
Recommended Drives (400 V)	MDDHT2407L** to MEDHT4430L**	MDDHT2412L** to MFDHTA464L**	MDDHT3420L** to MGDHTB4A2L**

Notes: MLE linear motor stages with incr. encoder SIN/COS 40 µm
MLL linear motor stages with incr. encoder SIN/COS 24000 µm

Ironless MLU Series				
Performance Parameters	MLU30100	MLU30200	MLU30300	MLU30400
Continuous Force (N)	29	58	87	116
Peak Force (N)	100	200	300	400
Thermal Resistance (°C/W)	1.8	0.9	0.6	0.45
Coil Unit Mass (kg)	0.084	0.162	0.240	0.318
Weight of carriage with coil (kg)	0.6	0.7	1.5	2.0
Recommended Drivers (230 V)	MADHT1507L**	MCDHT3520L**	MDDHT3530L**	MDDHT5540L**

Sales area and Language



- English
- German
- Spanish
- Russian

For more information

URL : <http://www.sinadrives.com/>

Contact: **SINADRIVES**

SINADRIVES Spanien, Bescano/Spain

[E-mail: info@sinadrives.com] TEL: +34 972 442 452

For German-speaking countries (DACH):

SINADRIVES Deutschland, Munich/Germany

[E-mail: info@sinadrives.com] TEL: +49 89 255 575 898

Servo actuator

DD Motor (ZMD series)

Features

Realizing outstanding high speed and precision performances thanks to its small and compact design

● **Outer rotor mechanism**

The outer diameter's compact design enables to drive directly the roller, making it suitable for indexing rotation

● **High-resistance bearings**

Simple and rigid structure for a higher load resistance

● **Hollow diameter $\phi 50\text{mm}$**

Wiring and piping can be easily stored in the hollow space of the motor, reducing the installation space.

● **Low price**

Model's size reduction leads to a more competitive price matching today's markets needs

● **Short lead time/ quick delivery**

The reduction of the components and a smarter stock arrangement critically reduce the production lead time



● **What is a Direct Drive Motor?**

A DD Motor can transmit the torque of the electric motor directly to the driving objects, without the use of any reductions such as belts, pulleys or reduction drives.

- High efficiency
- Low noise
- Outstanding precision
- High reliability
- Maintenance-free

Specification

Model		ZMD-1003	ZMD-1007	ZMD-1010
Maximum torque	N·m	30	65	100
Continuous torque	N·m	10	21	33
Maximum current	Arms	3.5	7.1	8.8
Rated current	Arms	1.2	2.4	2.9
Maximum rotation speed	s ⁻¹	5	4.5	4
Sensor resolution	ppr	1310720 ^{*1}		
Repeatability positioning precision	Second	±3		
Allowed axial load	N	3500 ^{*2}		
Allowed moment load	N·m	150 ^{*3}		
Axial rigidity	mm/N	2 × 10 ⁻⁶ ^{*4}		
Moment rigidity	rad/N·m	2 × 10 ⁻⁶		
Rotor inertia	kg·m ²	0.014	0.017	0.02
Axial run-out/side run-out accuracy	μm	70 ^{*5}		
Weight	kg	8.2	11.5	14.5
MINAS A5L Model		MBDHT2510L*	MBDHT2510L*	MCDHT3520L*
MINAS A6L Model		MBDL*25S*	MBDL*25S*	MCDL*35S*

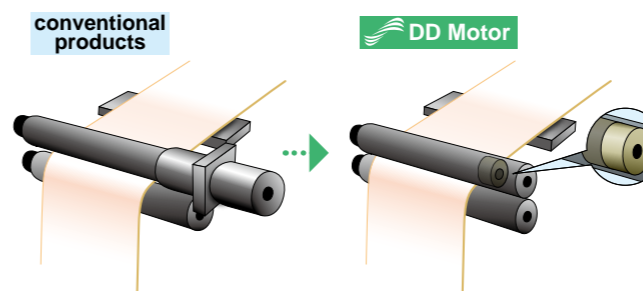
- If using radial load, axial load and moment load at the same time, please contact us.
- This motor can be used with any type of servo driver. However, when using a servo-driver that differs from the one suggested, please be sure to use it below the rated current value.

*1 With the use of RD1416SPW (RD converter) *2 Horizontal installation *3 Horizontal installation *4 By using cross-roller bearings *5 As option, it is also possible to improve the accuracy of surface deflection. For further details, please contact us.

Application Sample

The installation of the DD Motor enables more efficient operations and it doesn't require any maintenance

Roller-drive application e.g.

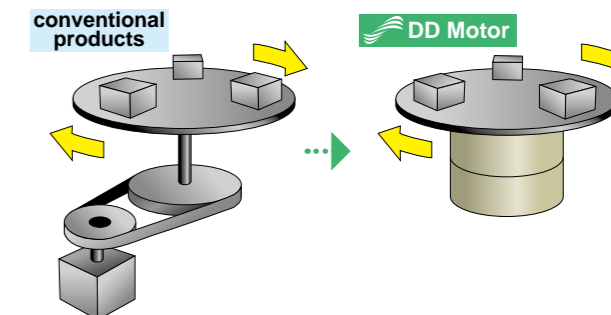


- Thanks to the outer motor, it's possible to build the motor inside the roller, saving space
- It works smoothly, avoiding uneven operations or movements

<Other possible applications>

- Printing equipment
- Coating machines
- Film-manufacturing machinery
- Roll-feeders

Indexing rotation application e.g.

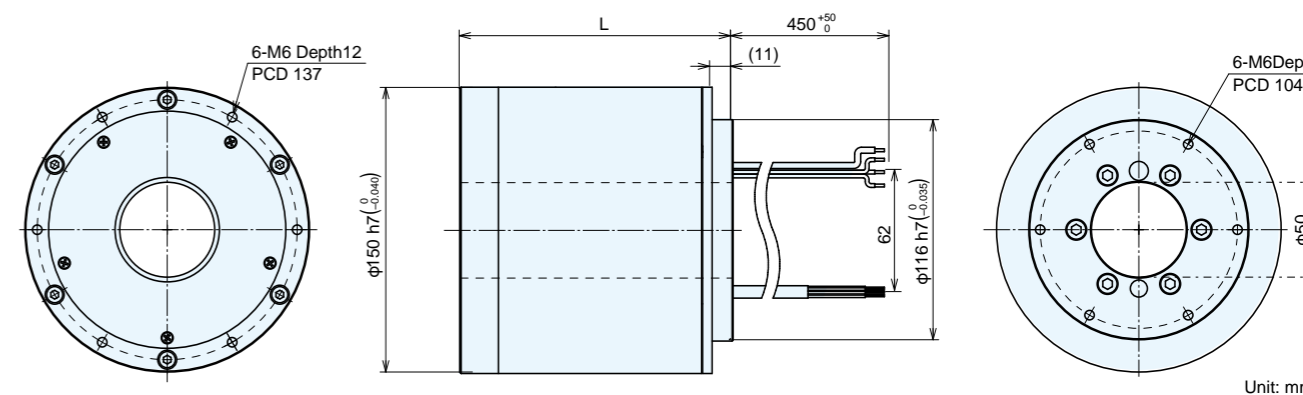


- Space-saving design for a more compact structure
- As no reduction device is needed, it's possible to avoid complex installations, improving its efficiency and reliability with no back-lash

<Other possible applications>

- Semiconductor making equipment
- Devices for manufacturing
- liquid crystal display panels
- Assembling robots
- All kind of indexing applications

Dimensional out drawing



Model	ZMD-1003	ZMD-1007	ZMD-1010	
External diameter of the motor	mm	Φ150		
Total length (L)	mm	113	143	173

Sales area and Language



- Japanese
- English
- Chinese

Please contact the following address for details.

For more information

URL : <http://www.sinfo-t.jp/servo>

Contact: SINFONIA TECHNOLOGY CO., LTD. Motion-Control Products Sales Dept.
 Shiba NBF Tower, 1-30, Shibadaimon 1-chome, Minato-ku, Tokyo, 105-8564, Japan
 TEL: +81-3-5473-1827 FAX: +81-3-5473-1845

Coreless Linear Motor, Ironcore Linear Motor, Special Sodick V series

Features

In linear motors that will be assembled at the internal of machine tools, the generated heat must not influence the machine. Sodick linear motors have special cooling structure internal. And, In servo motors that will be assembled at the side of machine tools, the generated heat influence the machine a little.

Coreless Linear Motors

CA SERIES 144N-576N
CB SERIES 1200N-2133N
CG SERIES 3432N-4800N



Ironcore Linear Motors

CM SERIES 190N-1172N
CE (M) 800N-1600N CE (L) 1600N-6400N
CE (W) 4800N-7200N CE (W2) 6400N-9600N



Internal cooling structure * Patented in JAPAN, USA, CHINA

Special Motors

Sodick performs the design of a special motor according to a customer's demand.



← Circular Arc Motors

DD motor and the circular arc motor of ironcore and coreless motors are designed by Sodick.

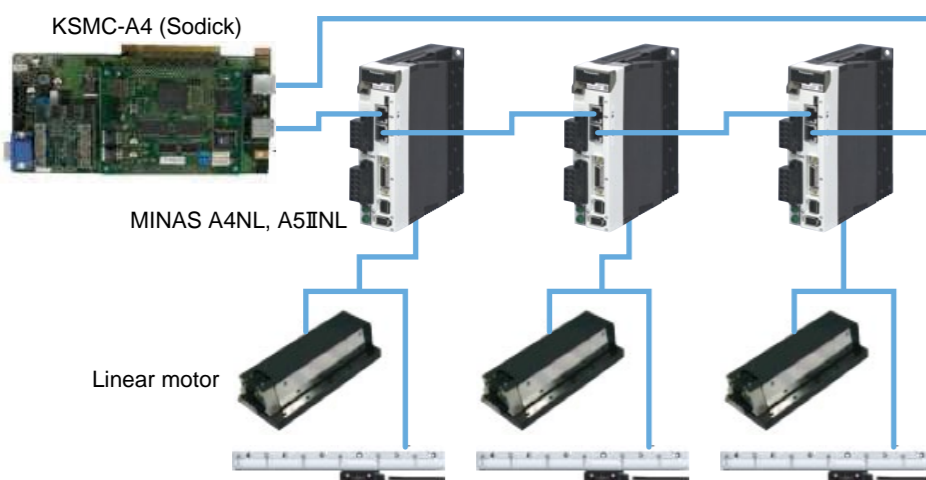
→ Ultra Vacuum Linear Motors

The linear motor corresponding to the vacuum of Sodick is equipped with the system which can be efficiently cooled also in a vacuum.

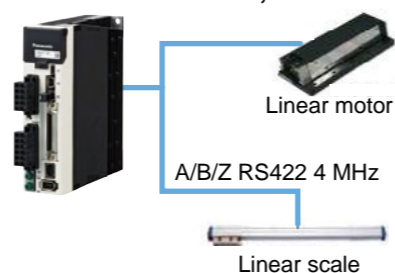


The configuration example of a linear motor system

Network Servo System by Panasonic MINAS A5INL



Pulse or Analog I/F by MINAS A5L, A6L



Specification

● Coreless Linear Motor CA Series

Motor Type	Name	CA010(V)			CA020(V)			CA030(V)			CA040(V)		
		Oil	None	Water	Oil	None	Water	Oil	None	Water	Oil	None	Water
Driver [12 kHz]		MCDHT3520L / MCDLT35SM			MDDHT5540L / MDDL55SM			MEDHT7364L / MEDLT83SM			MEDHT7364L / MEDLT83SM		
Cont. FORCE	N	48	16.8	60 <57.6>	96	36	120	134.4	55.2	168	176	72	220
Max. FORCE	N	144			288			432			576		
Rated SPEED	m/sec	7			7			7			7		
Max. SPEED	m/sec	7			7			7			7		
SIZE (D x W x L)	mm	30 x 110 x 130			30 x 110 x 202			30 x 110 x 274			30 x 110 x 346		
WEIGHT	kg	0.5	0.5	0.8	0.8	0.8	1.1	1.1	1.1	1.4	1.4	1.4	1.8

< > is available for A6L.

● Coreless Linear Motor CB Series

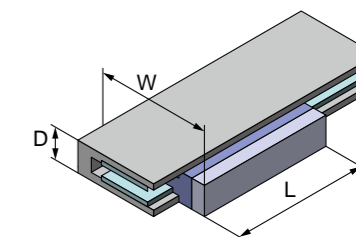
Motor Type	Name	CB100		CB110		CB160i		CB200i	
		None	Water	None	Water	None	Water	None	Water
Driver [6 kHz]		MDDHT5540L / MDDL55SM		MDDHT5540L / MDDL55SM		MEDHT7364L / MEDLT83SM		MFDHTA390L / MFDLTA3SM	
Cont. FORCE	N	135	350	139	406	241	610 <569>	251	846
Max. FORCE	N	1200		1392		1820		2427	
Rated SPEED	m/sec	2.5		1.8		2.2		2.2	
Max. SPEED	m/sec	4		3.6		4		4	
SIZE (D x W x L)	mm	50 x 165 x 303		50 x 165 x 303		50 x 165 x 303		50 x 165 x 375	
WEIGHT	kg	3.5		3.6		3.9		5.0	

< > is available for A6L.

● Coreless Linear Motor CG Series

Motor Type	Name	CG300		CG400	
		None	Water	None	Water
Driver [6 kHz]		MFDHTB3A2L / MFDLTB3SM		MGDHTC3B4L	
Cont. FORCE	N	520	1000	700	1300
Max. FORCE	N	3432 <3396>		4800	
Rated SPEED	m/sec	1.5		1.5	
Max. SPEED	m/sec	2.4		2.4	
SIZE (D x W x L)	mm	62 x 240 x 478		62 x 240 x 595	
WEIGHT	kg	13.3		17.3	

< > is available for A6L.



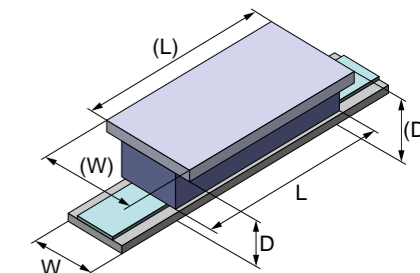
● Ironcore Linear Motor CM Series

Motor Type	Name	CM003(V)		CM007(V)		CM010(V)		CM020(V)	
		None	Fin	None	Fin	None	Fin	None	Fin
Driver [6 kHz]		MBDHT2510L / MBDLT25SM		MDDHT3530L / MDDL45SM		MDDHT5540L / MDDL55SM		MEDHT7364L / MEDLT83SM	
Cont. FORCE	N	28	41	58	86	89	132	178	264
Max. FORCE	N	160		390		600		1200	
Rated SPEED	m/sec	2.2		2.2		2.2		2.2	
Max. SPEED	m/sec	5		5		5		5	
SIZE (D x W x L)	mm	41 x 50 x 115		41 x 75 x 115		41 x 100 x 115		41 x 100 x 211	
WEIGHT	kg	0.9		1.3		1.7		3.4	

● Ironcore Linear Motor CE(M) Series

Motor Type	Name	CE033			CE066(M)		
		Oil	None	Water	Oil	None	Water
Driver [6 kHz]		MEDHT7364L / MEDLT83SM			MFDHTB3A2L / MFDLTB3SM		
Cont. FORCE	N	400	200	424 <400>	800	400	1000 <872>
Max. FORCE	N	800			1600		
Rated SPEED	m/sec	4			4		
Max. SPEED	m/sec	6			6		
SIZE (D x W x L)	mm	60 x 81 x 244 (75 x 125 x 247)			60 x 81 x 433 (75 x 125 x 436)		
WEIGHT	kg	7	7	7.5	13	13	14

< > is available for A6L.



● Ironcore Linear Motor CE(L) Series

Motor Type	Name	CE066			CE133			CE200			CE266		
		Oil	None	Water	Oil	None	Water	Oil	None	Water	Oil	None	Water
Driver [6 kHz]		MEDHT7364L / MEDLT83SM			MFDHTB3A2L / MFDLTB3SM			MGDHTC3B4L			MHDHTC3B4L		
Cont. FORCE	N	870 <837>	390	900 <837>	1740	780	2000 <1783>	2610	1170	2914	3480	1560	4000
Max. FORCE	N	1600			3200			4800			6400		
Rated SPEED	m/sec	2			2			2			2		
Max. SPEED	m/sec	3			3			3			3		
SIZE (D x W x L)	mm	63 x 150 x 244 (78 x 160 x 247)			63 x 150 x 465 (78 x 160 x 471)			63 x 150 x 641 (78 x 160 x 647)			63 x 150 x 854 (83 x 160 x 860)		
WEIGHT	kg	11	11	12	20	20	22	30	30	32	48	48	50

< > is available for A6L.

Sales area and Language



- English
- Chinese
- Japanese

Please contact the following address for details.

For more information

URL: <http://www.sodick.jp/>

Contact: **Sodick Co., Ltd.**

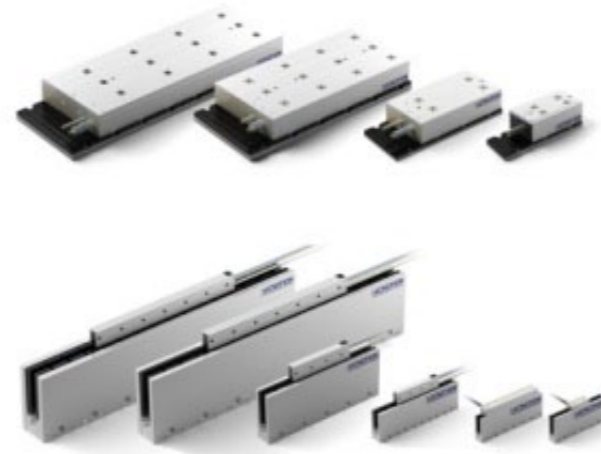
3-12-1 Nakamachidai, Tsuzuki-ku, Yokohama-city, Kanagawa-Pref. 224-8522, Japan TEL: +81-45-948-1403 FAX: +81-45-941-5271

Ironcore and ironless linear motors

T- and U-Series

Features

- High force density
More force in a smaller packing means lowering footprint
- Low thermal resistance
Allowing good heat transfer
- Ironcore linear motors:
Low cogging for smooth motion and position accuracy
Approved for CSA, CE, and RoHS
Optional watercooling for TL- and TBW-series
- Ironless linear motors:
High acceleration and dynamics
No cogging, extremely low force ripple
Approved for CE and RoHS
Also available as vacuum-rated motors



Specification

Ironcore T-Series				
Performance Parameters	TM	TL	TB	TBW
Continuous Force (N)	60 - 240	200 - 840	760 - 1900	1200 - 3000
Peak Force (N)	120 - 480	450 - 1800	1800 - 4500	2700 - 6750
Thermal Resistance (°C/W)	1.5 - 0.38	0.48 - 0.12	0.15 - 0.06	0.10 - 0.04
Coil Unit Mass (kg)	0.6 - 1.6	1.5 - 5.2	4.9 - 11.6	7.3 - 18.2
Attraction Force (N)	300 - 900	950 - 3400	3400 - 8300	4900 - 12450
Recommended Drivers (230 V)	MADHT1507L** to MDDHT3530L**	MBDHT2510L** to MFDHTA390L**	MCDHT3520L** to MFDHTA390L**	MDDHT3530L** to MFDHTB3A2L**
Recommended Drives (400 V)	MDDHT2407L** to MEDHT4430L**	MDDHT2412L** to MFDHTA464L**	MDDHT3420L** to MGDHTB4A2L**	MEDHT4430L** to MHDHTB4A2L**

Ironless U-Series				
Performance Parameters	UM3	UM6	UM9	UM12
Continuous Force (N)	29	58	87	116
Peak Force (N)	100	200	300	400
Thermal Resistance (°C/W)	1.8	0.9	0.6	0.45
Coil Unit Mass (kg)	0.084	0.162	0.240	0.318
Recommended Drivers (230 V)	MADHT1507L**	MCDHT3520L**	MDDHT3530L**	MDDHT5540L**

Sales area and Language



- English
- German
- Korean

Tecnotion has worldwide subsidiaries and representatives:
Please contact the following addresses for details.

For more information

URL : <http://www.tecnotion.com/>

Contact: Tecnotion

International:
Tecnotion BV, Almelo/The Netherlands [E-mail: sales@tecnotion.com] TEL: +31 546536 300

For German-speaking countries (DACH):
Tecnotion GmbH, Munich/Germany [E-mail: info@tecnotion.de] TEL: +49 89 381537 400

For Korea:
Tecnotion Rep. of Korea, 883 Gwangyang 2-Dong [E-mail: korea@tecnotion.com] TEL: +82 10 7164 2525

Absolute Encoder

Linear / Non-contact linear / Angular Encoder

Features

- Extremely robust optoelectronic linear encoders.
- Longest absolute measuring length available up to 60 m.
- Connectivity to MINAS series drives.
- Enclosed and exposed families available.
- Great accuracy at high speeds.
- Advanced diagnosis tool, via PC connection.

Absolute glass

S2AP, SV2AP and G2AP series
(MINAS A5II, A5L, A6 and A6L)



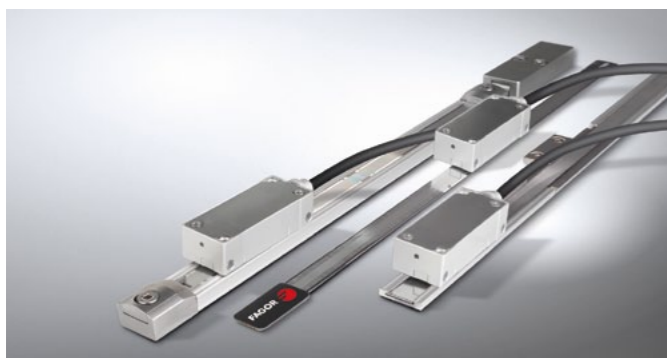
Absolute steel tape

LAP series
(MINAS A5II, A5L, A6 and A6L)



Absolute steel tape

EXA, EXG and EXT series
(MINAS A5II, A5L, A6 and A6L)



Absolute glass

H2AP-D200, H2AP-D90, S2AP-D170 and S2AP-D90
(MINAS A5II, A5L, A6 and A6L)



Specification

● Linear encoder Specification

Item	Description			
Encoder model	S2AP	SV2AP	G2AP	LAP
Measuring standard	Optical Absolute			Optical Absolute
Interface	Connectivity to MINAS drives			Connectivity to MINAS drives
Scale material	Glass			Steel
Coef. Linear expansion	$(8\pm 0.5)\times 10^{-6}/^{\circ}\text{C}$			$(11\pm 0.5)\times 10^{-6}/^{\circ}\text{C}$
Resolution	0.01 μm , 0.05 μm			0.01 μm , 0.05 μm
Max. Length	1240 mm	2040 mm	3240 mm	60 m
Accuracy	$\pm 3 \mu\text{m/m}$, $\pm 5 \mu\text{m/m}$			$\pm 5 \mu\text{m/m}$
Max. Travel speed	3 m/s			3 m/s
Vibration/Shock	10 G/30 G	20 G/30 G	20 G/30 G	10 G/30 G
Operating/storage temperature	0 °C ~ 50 °C / -20 °C ~ 70 °C			
Protection	IP53 (standard), IP64 (with air purge)			
Power supply	DC5 V \pm 10 %, 250 mA			
Max. Cable Length	30 m			

● Non-contact open linear encoder Specification

Item	Description		
	EXA	EXG	EXT
Encoder model	EXA	EXG	EXT
Measuring standard	Optical Absolute		
Installation	Adhesive	Guided	Tensioned
Interface	Connectivity to MINAS drives		
Scale material	Steel		
Coef. Linear expansion	$(11\pm 0.5)\times 10^{-6}/^{\circ}\text{C}$		
Resolution	0.01 μm , 0.05 μm		
Max. Length	3020 mm	3040 mm	3040 mm
Accuracy	$\pm 10 \mu\text{m/m}$	$\pm 10 \mu\text{m/m}$	$\pm 5 \mu\text{m/m}$
Max. Travel speed	8 m/s		
Vibration/Shock	20 G/100 G		
Operating/storage temperature	0 °C ~ 50 °C / -20 °C ~ 70 °C		
Protection	IP40		
Power supply	DC5 V \pm 10 %, 250 mA		
Max. Cable Length	30 m		

● Angular encoder Specification

Item	Description			
	H2AP-D200	H2AP-D90	S2AP-D170	S2AP-D90
Encoder model	H2AP-D200	H2AP-D90	S2AP-D170	S2AP-D90
Measuring standard	Optical Absolute			
Type of shaft / Outside diameter	Hollow shaft / ϕ 200	Hollow shaft/ ϕ 90	Solid shaft/ ϕ 170	Solid shaft/ ϕ 90
Interface	Connectivity to MINAS drives			
Scale material	Glass			
Resolution	29 bits	23 bits	23 bits	23 bits
Accuracy	$\pm 1''$, $\pm 2''$	$\pm 2.5''$, $\pm 5''$	$\pm 2''$	$\pm 2.5''$, $\pm 5''$
Max. rpm	750 rpm	1500 rpm	1500 rpm	1500 rpm
Vibration/Shock	10 G/100 G			
Operating/storage temperature	0 °C ~ 50 °C / -30 °C ~ 80 °C			
Protection	IP64			
Power supply	DC 5 V (3.6 V ~ 5.25 V)			
Current consumption	350 mA	150 mA	250 mA	150 mA
Max. Cable Length	30 m			

Application Sample

- Milling machines
- Machining centres
- Turning machines
- Grinding machines
- Gear hobbing machines
- Special purpose machines

Sales area and Language



Please contact the following address for details.

- Japanese
- English
- Chinese
- Spanish

For more information

URL: <http://www.fagorautomation.com/en/>

Contact: **Fagor Automation, S. Coop.**

Bo San Andrés No19 E-20500 – Arrasate/Mondragón, Spain

[E-mail: Jmviniegra@fagorautomation.es]

TEL: +34-943-719200 FAX: +34-943-791712

Absolute Exposed Linear Encoder LIC 2100 Series

Features

- Absolute linear encoder for measuring lengths up to 6 m
- Compact and light scanning head (scanning head weight 20 g without connecting cable)
- High traversing speed and high resolution (10 m/sec , 50 nm)
- Robust to contamination and wide mounting tolerances (nominal gap ± 0.5 mm: LIC 2199P)



LIC 2197P:
Steel scale tape is drawn into aluminum extrusions and fixed at center



LIC 2199P:
Steel scale tape cemented on mounting surface

Specification

	LIC 2197P	LIC 2199P
Measuring standard	Steel scale tape with absolute track	
Coefficient of linear expansion	≈ 10 ppm/K	
Accuracy grade	± 15 μm	
Resolution	100 nm or 50 nm	
Measuring Length ML (mm)	120 320 520 770 1020 1220 1520 2020 2420 3020 Larger measuring lengths up to 6020 mm available on request	
Interface	Panasonic serial interface (Pana01)	
Voltage supply	DC 3.6 V ~ 14 V	
Operating temperature	-10 °C ~ 70 °C	
Protection degree IEC60529	IP67 Only for scanning head	
Mounting method	Steel scale tape is drawn into aluminum extrusions and fixed at center	Steel scale tape cemented on mounting surface

Absolute Exposed Linear Encoder LIC 4100 Series

Features

- Absolute linear encoder for measuring lengths up to 28 m (in case of LIC 4195P)
- Compact and light scanning head (scanning head weight 20 g without connecting cable)
- High traversing speed and high resolution (10 m/s; 1 nm)
- Very small interpolation error
- Contains two tracks: absolute and incremental
- Robust to contamination and wide mounting tolerances (nominal gap ± 0.25 mm: LIC 4199P)
- Glass scale with low thermal expansion co-efficiency available.



LIC 4195P:
steel scale tape is drawn into the aluminum extrusions and tensioned



LIC 4197P:
steel scale tape is drawn into the aluminum extrusions and fixed at center



LIC 4193P/4199P:
Steel scale tape cemented on mounting surface

Specification

	LIC 4193P	LIC 4195P	LIC 4197P	LIC 4199P
Measuring standard	Glass or Glass ceramic	Steel tepe	Steel tepe	Steel tape
Coefficient of linear expansion	≈ 8 ppm/K ≈ 0 ppm/k	Depends on the mounting surface	≈ 10 ppm/K	≈ 10 ppm/K
Accuracy grade (depends on ML)	± 1 μm/± 3 μm/ ± 5 μm	± 5 μm	± 3 μm/ ± 5 μm/ ± 15 μm	± 3 μm/ ± 15 μm
Resolution	1 nm, 5 nm, 10 nm			
Measuring Length ML (mm)	240 ~ 3040	140 ~ 28840	240 ~ 6040	70 ~ 1020
Interface	Panasonic serial interface (Pana01)			
Voltage supply	DC 3.6 V ~ 14 V			
Operating temperature	-10 °C ~ 70 °C			
Protection degree IEC60529	IP67 Only for scanning head			
Mounting method	cemented on mounting surface	Aluminum extrusion and tensioned	Aluminum extrusion and fixed at center	cemented on mounting surface

Sales area and Language



- English
- German
- Japanese
- Chinese

For more information

URL : <http://www.heidenhain.de>

Contact: **DR. JOHANNES HEIDENHAIN GmbH**
Dr.-Johannes-Heidenhain-Straße 5 83301 Traunreut, Germany

[E-mail: info@heidenhain.de]
TEL: +49 8669 31-0 FAX: +49 8669 5061

Absolute Linear Encoder with Scale Housing

LC series

Features

- Optical absolute linear encoder up to 4.2 m
- High vibration resistance
- High traversing speed with high resolution (3 m/sec , 1 nm /10 nm)
- High reliability through double sealing lips (LC 195P)



LC 195P



LC 495P

Specification

	LC 195P	LC 495P
Measuring standard CTE	DIADUR glass scale with absolute and incremental track ≈ 8 ppm/K	
Accuracy grade	± 3 μm (up to 3040 mm) or ± 5 μm	
Resolution	± 3 μm : 1 nm ± 5 μm : 10 nm	
Measuring Length ML (mm)	140 mm ~ 4240 mm	70 mm ~ 2040 mm
Interface	Panasonic serial interface (Pana01)	
Voltage supply	DC 3.6 V ~ 14 V	
Operating temperature	0 °C ~ 50 °C	
Protection degree IEC60529	IP53 or IP64 (with compressed air)	

Absolute Angle Encoder without Integral Bearing

ECA 4490 series

Features

- Absolute angle encoder with high accuracy
- Steel scale drum with three-point centering
- Integrated large hollow shaft



ECA 4492P

Specification

		ECA 4490P									
Measuring standard CTE	Steel drum with absolute and incremental track ≈ 10.5 ppm/K										
Accuracy grade	± 1.5" ~ ±3 .0" depends on drum size										
Resolution	27 bits ~ 29 bits depends on drum size										
Drum size (mm)	inside diameter	70	80	120	150	185	180	210	270	425	512
	outside diameter	104.6	127.6	178.6	208.9	208.9	254.9	254.9	331.3	484.1	560.5
Interface	Panasonic serial interface (Pana01)										
Voltage supply	DC 3.6 V ~ 14 V										
Operating temperature	-10 °C ~ 70 °C										
Protection degree IEC60529	IP67 only for scanning head										

Sales area and Language



- English
- German
- Japanese
- Chinese

For more information

URL : <http://www.heidenhain.de>

Contact: **DR. JOHANNES HEIDENHAIN GmbH**
Dr.-Johannes-Heidenhain-Straße 5 83301 Traunreut, Germany

[E-mail: info@heidenhain.de]
TEL: +49 8669 31-0 FAX: +49 8669 5061

Absolute Angle Encoder with Integral Bearing RCN series

Features

- Absolute angle encoder with high accuracy
- Large hollow shaft up to $\Phi 100\text{mm}$
- Integrated stator coupling
- Fault exclusion for loosening of the mechanical connection is possible



RCN 2x90P



RCN 5x90P



RCN 8x90P

Specification

	RCN 2590P	RCN 2390P	RCN 5590P	RCN 5390P	RCN 8590P	RCN 8390P
Measuring standard	DIADUR circular scale with absolute and incremental track					
Accuracy grade	$\pm 2.5''$	$\pm 5''$	$\pm 2.5''$	$\pm 5''$	$\pm 1''$	$\pm 2''$
Position error per signal period	$\leq \pm 0.4''$	$\leq \pm 0.4''$	$\leq \pm 0.4''$	$\leq \pm 0.4''$	$\leq \pm 0.2''$	
Position values/Revolution	28 bits	26 bits	28 bits	26 bits	29 bits	
Hollow shaft	$\phi 20$		$\phi 35$		$\phi 60$ or $\phi 100$	
Electrical permissible speed *1	$\leq 3000 \text{ min}^{-1}$				$\leq 1500 \text{ min}^{-1}$	
Mechanical permissible speed	$\leq 1500 \text{ min}^{-1}$					
Interface	Panasonic serial interface (Pana01)					
Voltage supply	DC 3.6V ~ 14V					
Operating temperature	0 °C ~ 50 °C	-20 °C ~ 60 °C	0 °C ~ 50 °C	-20 °C ~ 60 °C	0 °C ~ 50 °C	
Protection degree IEC60529	IP64					

*1: in case of for continuous position value requires

Sales area and Language



- English
- German
- Japanese
- Chinese

For more information

URL : <http://www.heidenhain.de>

Contact: **DR. JOHANNES HEIDENHAIN GmbH**
Dr.-Johannes-Heidenhain-Straße 5 83301 Traunreut, Germany

[E-mail: info@heidenhain.de]
TEL: +49 8669 31-0 FAX: +49 8669 5061



Absolute Exposed Linear encoder MC 15 series

Features

- Absolute linear encoder for measuring lengths up to 6 m (upon request)
- Very compact (36 x 13.5 x 14.8) and light scanning head (scanning head mass <18 g without connecting cable)
- High traversing speed and high resolution (10 m/sec, 50 nm)
- Wide mounting tolerances (nominal gap $\pm 0.25 \text{ mm}$)



MC 15P MP:
steel scale tape is drawn into the aluminum extrusions and fixed at center



MC 15P MK:
Steel scale tape cemented on mounting surface

Specification

	MC 15P MP	MC 15P MK
Measuring standard Coefficient of linear expansion	Steel scale tape with absolute track $\approx 10 \text{ ppm/K}$	
Accuracy grade	$\pm 15 \mu\text{m}$	
Resolution	50 nm, 100 nm	
Measuring Length ML (mm)	Up to 3000 mm Longer lengths on request	
Interface	Panasonic Serial Interface (Pana01)	
Voltage supply	DC 3.6 V ~ 14 V	
Operating temperature	-10 °C ~ 50 °C	
Mounting method	Aluminum extrusion and fixed at center	Cemented on mounting surface

Sales area and Language



- English
- German
- Japanese
- Chinese

For more information

URL : <http://www.heidenhain.de>

Contact: **REF Elektronik Ges. m.b.H**
A-5121 Tarsdorf 93, Austria

[E-mail: info@rsf.at]
TEL: +43-6278-8192-0 FAX: +43-6278-8192-79

Feedback Scale

SR70/SR80/SL700/BF1 series

Features

- High speed response with serial interfaces for MINAS series
- Direct connection with servo drive
- Total cost reduction
- Excellent durability to harsh environment (Dirt, Oil and Vibration except BF1)
- Magnetic absolute scales (SR77/SR87) up to 10 nm resolution with 200 m/min response speed.
- High-resolution refractive Laserscale with signal wave length of 250 nm (BF1)

Separate type magnetic principle Incremental type Digiruler

SL700 + PL101RP/RHP
(A4NL, A5, A6 family)
SL710 + PL101RP/RHP
(A4NL, A5, A6 family)

Slim type magnetic principle Absolute type

SR77 series
(A4, A4N, A4NL, A5, A6 family)
SR75 series
(A4NL, A5, A6 family)

Robust type magnetic principle Absolute type

SR87 series
(A4, A4N, A4NL, A5, A6 family)
SR85 series
(A4NL, A5, A6 family)

High-resolution refractive type Laserscale

BF1 series
(A5, A6 family)



* Please contact Panasonic for the combination of A6 series driver and feedback scale.

Specification

Item	Description									
Type	Separate type magnetic principle Digiruler				Slim type magnetic principle		Robust type magnetic principle		High-resolution reflective type Laserscale	
Part No.	SL700 + PL101RP	SL710 + PL101RP	SL700 + PL101RHP	SL710 + PL101RHP	SR77	SR75	SR87	SR85	BF1	
Compatible servo drive	A4NL/A5/A6 family				A4/A4N/A4NL/A5/A6 family	A4NL/A5/A6 family	A4/A4N/A4NL/A5/A6 family	A4NL/A5/A6 family	A5/A6 family	
Effective length	50 mm to 100000 mm				70 mm to 2040 mm		140 mm to 3040 mm		30 mm to 1400 mm	
Accuracy	±10 L μ m (Integral number in unit of 1 m when effective length is 3 m or less) * When longer than 3 m, please contact us				3+3 L/1000 μ m p-p or 5+5 L/1000 μ m p-p * L=Effective length (mm)				±0.5 μ m (30 to 170 mm)/ ±1 μ m (220 to 370 mm)/ ±3 μ m (420 to 520 mm)/ ±5 μ m (570 to 970 mm)/ ±10 μ m (1070 to 1400 mm)	
Resolution	0.1 μ m				A5 family: 0.01 μ m to 1 μ m A4/A4N/A4NL: 0.05 μ m to 1 μ m				0.001/0.01 μ m	
Signal type	Incremental				Absolute	Incremental	Absolute	Incremental	Incremental	
Response speed	10 m/s				3.3 m/s				0.4/1.8 m/s	
Output signal	Dedicated to MINAS series, serial output									
Origin signal	None	1 point	None	1 point	None	1 point	None	1 point	1 point	
Protective design grade	Equivalent to IP50		Equivalent to IP67		IP54(Without air purge), IP65(With air purge)				-	

* Provide high speed, high response, high reliability are secured through serial communications

* CK-T185 conversion cable is required when connecting to A5, A6 family

Feedback Scale

SmartSCALE

Features

- Maximum response speed 3 m/s, maximum resolution 50 nm, and ±5 μ m accuracy (1000 mm or less)
- Individual non-contact component design
- IP65 protection grade against liquid and solid contaminants
- Space-saving small head (W33 mmxD16 mmxH8 mm)
- Signal LED display for ease of installation

Separate type magnetic principle Incremental type

SQ10 + PQ11
SQ10 + PQ10 + MQ10
(A5, A6 family)



* Please contact Panasonic for the combination of A6 series driver and feedback scale

Specification

Item	Description	
Type	Separate type magnetic principle	
Part No.	SQ10 + PQ11	SQ10 + PQ10 + MQ10
Configuration	SQ10 scale + PQ11 head with interpolator	SQ10 scale + PQ10 interpolator + MQ10 head
Compatible servo drive	A5/A6 family	
Effective length	20 mm to 3800 mm	
Accuracy	±5 μ m (when effective length is less than 1 m) ±10 μ m (when effective length is 1 m to 3 m) ±15 μ m (when effective length is more than 3 m)	
Resolution	0.05 μ m/0.1 μ m/0.5 μ m/1 μ m	
Signal type	Incremental	
Response speed	3 m/s	
Output signal	Dedicated to MINAS series, serial output	
Origin signal	1 point	
Protective design grade	IP65	

* Provide high speed, high response, high reliability are secured through serial communications

* CK-T185 conversion cable is required when connecting to A5, A6 family

Sales area and Language



- Japanese
- German
- English

Please contact the following address for details.

For more information

URL : <http://www.magnescape.com/mgs/language/english/>

Contact: **Magnescape Co., Ltd.**

To identify local distributors, please contact Magnescape Co., Ltd. International Sales Division Isehara Headquarters
45 Suzukawa, Isehara, Kanagawa 259-1146, Japan

[E-mail: info-mgs-eng@magnescape.com]

TEL: +81-463-92-7971 FAX: +81-463-92-7978

Linear Scale

ABS AT500 series /ST700 series/ST1300 series

Features

- Many years of experience that has opened up the absolute system solution in the world with collaboration of MINAS series originally.
- By changing from the Incremental scale system to the absolute scale, machine homing becomes unnecessary for AT500 and ST700 series.
- Absolute use, Photoelectric, Electromagnetic detection method, High resolution, High accuracy, non-contact type and so on support various applications widely.

ABS AT500 series

High Rigid SC type



High Resolution H type



Specification

Item	Description	
	AT573-SC	AT573-H
Max. effective range	2200 mm	1000 mm
Resolution	0.05 μm	
Max. response rate	2.5 m/sec	
Accuracy (μm) : 20 °C	3 + 3 L/1000 μm *	2 + 2 L/1000 μm *
Vibration resistance	20 G	15 G
Shock resistance	35 G	20 G
Max. current consumption	270 mA	
Operation temperature	0 °C ~ 45 °C	

* Please refer to the catalog and manual issued by Mitutoyo.

* L = effective length mm

Application Sample

- Machining Center
- Lathe Machine
- Grinding Machine

ST700 series/ ST1300 series

ABS ST700 series Electromagnetic induction type



ABS ST1300 series Photoelectric type



Specification

Item	Description			
	ABS ST700		ABS ST1300	
Detection system	Electromagnetic induction type		Photoelectric type	
Scale type	Scale base	Glass Scale	Metal tape	
			Fixed at both ends	Double-sided tape
Max. effective range	6 m	1.1 m	12 m	3 m
Position accuracy (20 °C)	5 + 5 L/1000 μm *	3 + 3 L/1000 μm *	±5 μm (~1 m) ±5 μm/m (1.1 m~)	
Min. resolution	0.1 μm		0.001 μm / 0.01 μm	
Max. response speed	5 m/s		8 m/s	
Coefficient of thermal expansion	≈ 12 × 10 ⁻⁶ /K	≈ 8 × 10 ⁻⁶ /K	≈ 10 × 10 ⁻⁶ /K	

* L = Effective length mm

* Please refer to the catalog and manual issued by Mitutoyo.

Application Sample

- Semiconductor machine
- LCD manufacturing machine

Sales area and Language



North America area: **Mitutoyo America Corporation**
965 Corporate Blvd., Aurora, IL 60502, U.S.A.
TEL: +1-630-820-9666 Toll Free No.: +1-888-648-8869

Europe area: **Mitutoyo Europe GmbH**
Borsigstrasse 8-10, 41469 Neuss, GERMANY TEL: +49-2137-102-0

Other area: Please contact the following address for details. Or Please contact Mitutoyo JAPAN.

For more information

URL: <http://www.mitutoyo.co.jp/eng/>

Contact: **Mitutoyo Corporation Overseas Custom Equipment Sales Promotion Section**

[E-mail: kaigaitokuhan3@mitutoyo.co.jp]

20-1, Sakado 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan TEL: +81-44-813-8234

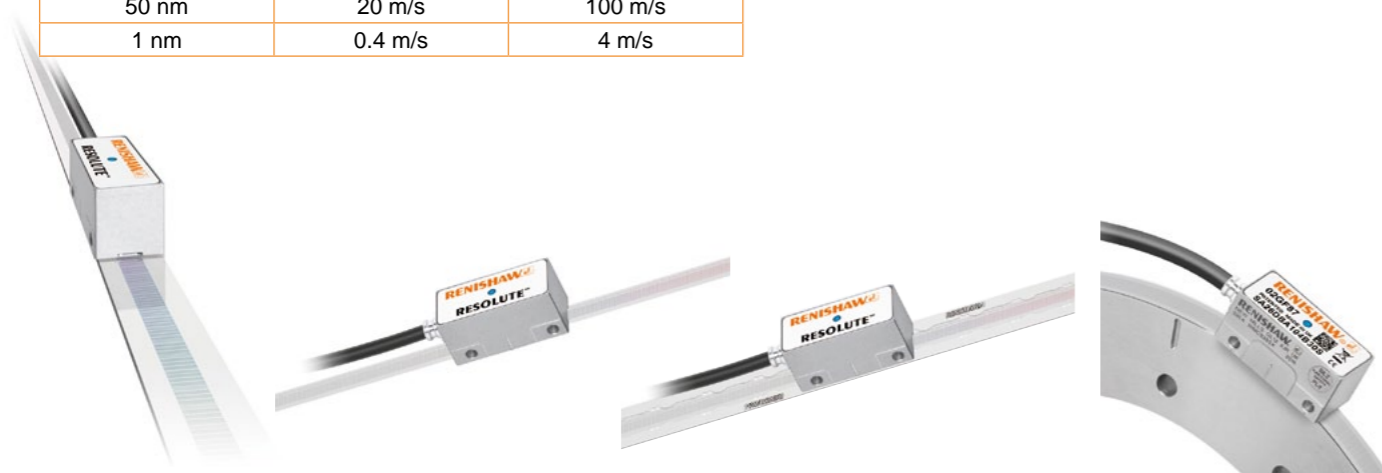
Optical Absolute Linear/Rotary Encoder

RESOLUTE™ series (Panasonic serial output)

Features

- True absolute encoder
- Resolution : 0.1 μm, 50 nm, 1 nm
- Velocity
- The industry's first unique signal-track scale
- Determines absolute position upon power-up
- Range of scales for a variety of applications
- Low SDE for smooth velocity control
- Worldwide subsidiary support network

Resolution	Panasonic A5 series	Panasonic A6 series
100 nm	40 m/s	100 m/s
50 nm	20 m/s	100 m/s
1 nm	0.4 m/s	4 m/s



RESOLUTE™
RELA, RSLA

RESOLUTE™
RTLA-S

RESOLUTE™
FASTRACK/ RTLA

RESOLUTE™
RESA/REXA

Specification

Series Feature	RESOLUTE™ RELA	RESOLUTE™ RSLA	RESOLUTE™ RTLA-S	RESOLUTE™ FASTRACK/RTLA	RESOLUTE™ RESA/REXA
Scale	ZeroMet	Stainless steel	Stainless steel tape	Stainless steel tape	Stainless steel
Thermal expansion coefficient @ 20 °C	0.75 ±0.35 μm/m/°C	10.1 ±0.2 μm/m/°C	10.1 ±0.2 μm/m/°C	10.1 ±0.2 μm/m/°C	10.1 ±0.2 μm/m/°C
Scale accuracy @ 20 °C	±1 μm up to 1 m. ± 1 μm/m for lengths >1 m	±1.5 μm up to 1 m ±2.25 μm from 1 m to 2 m ±3 μm from 2 m to 3 m ±4 μm from 3 m to 5 m	±5 μm/m	±5 μm/m	±0.52 to ±5.49 arc second
Scale length	80 mm to 1500 mm	80 mm to 5000 mm	100 mm to 21000 mm	100 mm to 21000 mm	52 mm to 550 mm diameter
Scale mounting options	Self-adhesive or Clip/Clamp	Self-adhesive or Clip/Clamp	Self-adhesive	Track (carrier) mounting	Taper/flange mount
Read head size H x L x W	18 mm x 36 mm x 16.5 mm				
Scale size H x W	1.6 mm x 15 mm (clip/clamp) 1.8 mm x 15 mm Adhesive tape	1.5 mm x 15 mm (clip/clamp) 1.7 mm x 15 mm Adhesive tape	0.4 mm x 8 mm	0.4 mm x 18 mm	

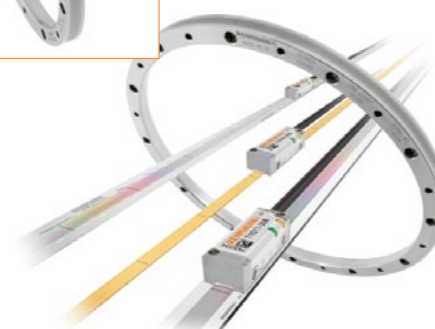
Optical Incremental linear/Ring(Rotary) Encoder

TONiC, VIONiC & ATOM series (Digital & Analogue output signal)

Features

- Range of linear and rotary (ring or disc) scales for a variety of applications
- Easy installation and diagnostics using set-up LEDs
- Low Sub-Divisional Error (SDE) and Jitter
- IN-TRAC optical reference mark (Tonic)
- Auto-phased optical reference mark (ATOM)
- Resolution: 5 μm to 1 nm (TONiC)
5 μm to 2.5 nm (VIONiC)
10 μm to 1 nm (ATOM)
- Velocity : 6.48 m/sec @ 1 μm
0.648 m/sec @ 0.1 μm
(For clocked input frequency of 8 MHz)

VIONiC Series



TONiC Series



ATOM Series

Application Sample

Our encoder are suitable to use in a variety of applications that require high positioning accuracy and speed stability.

Semiconductor

Flat Panel Display

Motion Control

Medical

Precision Measurements

Machine Tool

Industrial Robot

Science

Sales area and Language



Please contact the following address for details.

For more information

URL: <http://www.renishaw.jp/> (Japanese)
<http://www.renishaw.com/> (English)

Contact: **Renishaw plc**

New Mills Wotton-under-Edge Gloucestershire GL12 8JR, United Kingdom

[E-mail: international@renishaw.com]

TEL:+44-1453-524524

The incremental linear encoder of a magnetic type

SENSOR / PSLH Series, SCALE / PSLG Series

Features

This encoder has achieved an excellent total performance.

- It is high-speed serial communications corresponding to the MINAS series.
- This encoder is strong in the environment of the magnetic noise, oil, and dust.
- A miniaturization and an excellent cost performance are achieved by the internal manufacturing of the MR element.
- Accuracy is improved by an original magnetization pattern.
- It is a tough encoder structure in the extrinsic noise.



Specification

Item	Description
Model number	sensor PSLH040 + scale PSLG040
Output signals	MINAS series serial output
Resolution (R)	0.1 μm
Power supply voltage	4.6 V _{dc} to 5.5 V _{dc}
Power consumption	250 mA max
Gap of detection	0.25 mm ±0.1 mm
Maximum response speed	6 m/sec
IP code	Correspond to IP50
Detection of reference	Correspond up to three places
Position accuracy	±(5+5×L/1000) μm L=Measuring length (mm) at 20 °C
Measuring length (L)	2400 mm MAX
Thermal expansion coefficient	11.0×10 ⁻⁶ / °C
Operating temperature range	0 °C to 50 °C
Preservation temperature range	-15 °C to 70 °C

Another specifications of resolution, the size of the detection head, and the ABZ output, etc. can correspond.

Sales area and Language



Please contact the following address for details.

For more information

URL: <http://www.nidec-sankyo.co.jp/>

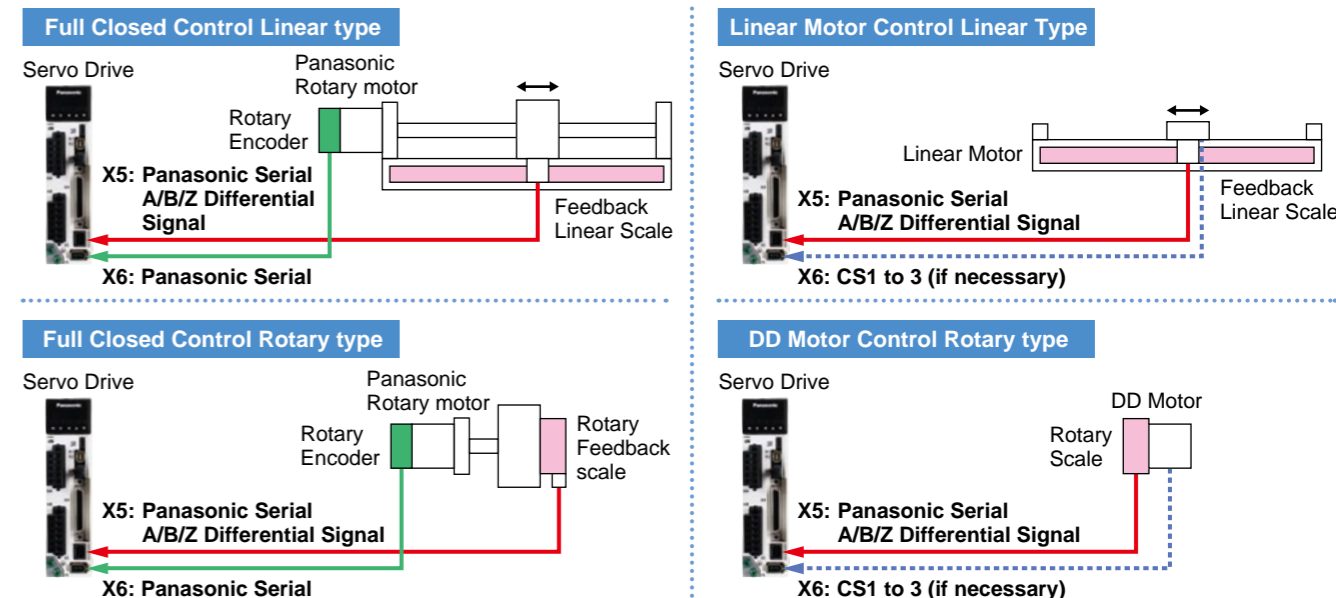
Contact: NIDEC SANKYO CORPORATION [E-mail: sensor-sales@nidec-sankyo.co.jp]
 Tokyo Office, Nidec Tokyo Bldg., 1-20-13, Osaki, Shinagawa-ku, Tokyo 141-0032, Japan
 TEL: +81-3-5740-3006 FAX: +81-3-6843-3123

Feed back scale selection

Feed back scale table for serial communication

Scale Type	Partner	Series	Resolution*1 [μm]	Max. rate*1 [m/s]	
Parallel Type (A/B/Z phase)	General	—	Maximum speed after 4× multiplication : 4 Mpps		
	Serial communication (Absolute)	FAGOR AUTOMATION	S2AP/SV2AP/G2AP	0.01/0.05	3
LAP			0.01/0.05	3	
EXA/ EXG/ EXT			0.01/0.05	8	
H2AP-D200/H2AP-D90			29 bit/23 bit	750 rpm/1500 rpm	
S2AP-D170,/S2AP-D90			23 bit	1500 rpm	
HEIDENHAIN		LIC 2197P/LIC 2199P	0.05/0.1	10	
		LIC 4193P/LIC 4195P	0.001/0.005/0.01	10	
		LIC 4197P/LIC 4199P	0.001/0.01	3	
		ECA 4490P	27 bits to 29 bits	7000 rpm~550 rpm (Depends on drum size)	
		RCN 2x90P/RCN 5x90P	26 bits/28 bits	1500 rpm	
RSF Elektronik	Magnescale Co.,Ltd.	RCN 8x90P	29 bit	500 rpm	
		MC 15P MP/MC 15P MK	0.05/0.1	10	
Mitutoyo Corporation	Renishaw plc	SR77	0.01 to 1	3.3	
		SR87	0.01 to 1	3.3	
		AT573-SC/AT573-H	0.05	2.5	
Serial communication (Incremental)	Magnescale Co., Ltd.	RESOLUTE	0.001	A5/0.4, A6/4	
			0.05	A5/20, A6/100	
			0.1	A5/40, A6/100	
		SL700+PL101RP/RHP	0.1	10	
		SL710+PL101RP/RHP	0.1	10	
	Nidec Sankyo Corporation	Renishaw plc	SR75/SR85	0.01 to 1	3.3
			BF1	0.001/0.01	0.4/1.8
			SQ10+PQ11	0.05/0.1/0.5/1	3
			SQ10+PQ10+MQ10	0.05/0.1/0.5/1	3
			PSLH041+PSLG	0.1	6
Renishaw plc		TONiC	0.001 to 5	6.48 m/s @ 1 μm 0.648 m/s @ 0.1 μm	
		ATOM	0.001 to 10		
		VIONIC	0.0025 to 5		

Feed back scale application example



*1 There is the difference of resolution and maximum rate from the specification by original supplier as per the servo driver limitation of maximum pulse frequency. The maximum pulse frequency is 400 Mpps for A5 family and 4 Gpps for A6 series. We show the value of A6 family on this table.

● Please contact us when you study the system with a scale because the driver and the scale combination has restriction as per the feedback system between full closed control system and linear system.

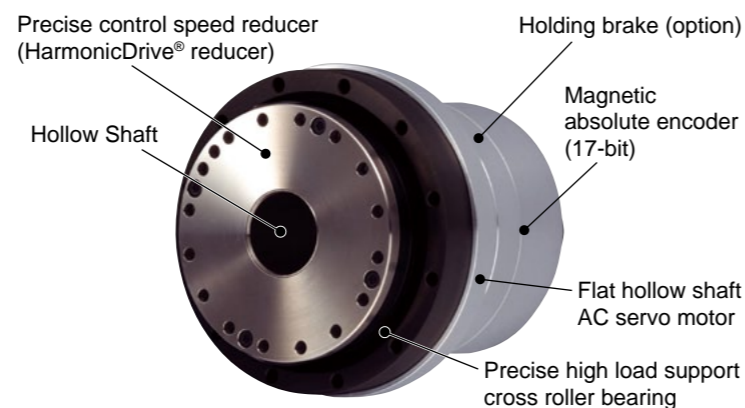
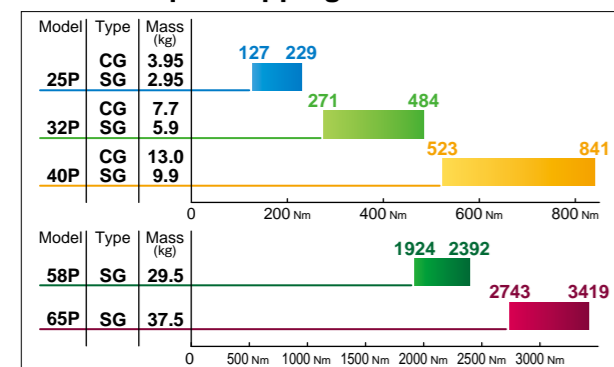
AC Servo Actuator SHA-P Series

SHA25P/SHA32P/SHA40P/SHA58P/SHA65P

Features

- The AC servo actuator incorporates the precise control speed reducer (HarmonicDrive® reducer) to the flat AC servo motor.
- The design of the actuator is flat and has hollow shaft structure. Piping, wiring, laser light, etc., can be passed through the through-hole in the center.
- Precise one-way positioning accuracy: Gear Ratio 50:1 = 40 arc-sec (0.011 degrees) Gear Ratio 80:1 and higher = 30 arc-sec (0.008 degrees) (for SHA32P/40P-CG types)
- Torque-volume ratio is 5 times or more than that of direct drive motor.
- There are two types of option; SHA-SG type that has compact shape feature or SHA-CG type that has improved output flange runout accuracy.

Max. torque mapping



Specification

SHA-SG Type

Item	Model	SHA25P					SHA32P					SHA40P				
		51	81	101	121	161	51	81	101	121	161	51	81	101	121	161
Recommended Driver	MINAS A5II series ³	MCDKT3520 / MCDKT3520E					MDDKT3530 / MDDKT3530E					MDDKT5540 / MDDKT5540E				
	MINAS A5IIN series ⁴	MCDHT3520N21 / MCDHT3520ND1					MDDHT3530N21 / MDDHT3530ND1					MDDHT5540N21 / MDDHT5540ND1				
	MINAS A5B series ⁵	MCDHT3520B21 / MCDHT3520BD1					MDDHT3530B21 / MDDHT3530BD1					MDDHT5540B21 / MDDHT5540BD1				
Maximum Torque ¹	Nm	127	178	204	217	229	277	395	433	459	484	523	675	738	802	841
Continuous Torque ^{1,2}	Nm	41	67	81	81	81	92	153	178	178	178	160	263	330	382	382
Maximum Speed ¹	r/min	109.8	69.1	55.4	46.3	34.8	94.1	59.3	47.5	39.7	29.8	78.4	49.4	39.6	33.1	24.8
Maximum Moment Load	Nm	258					580					849				
One-way Positioning Accuracy	arc-sec	50	40	40	40	40	50	40	40	40	40	50	40	40	40	40
Encoder Type	—	Magnetic Type Absolute Encoder														
Output Resolution	Pulse/Rotation	6684672	10616832	13238272	15859712	21102592	6684672	10616832	13238272	15859712	21102592	6684672	10616832	13238272	15859712	21102592
Mass(without brake)	kg	2.95					5.9					9.9				
Mass(with brake)	kg	3.1					6.2					10.7				

Item	Model	SHA58P				SHA65P			
		81	101	121	161	81	101	121	161
Recommended Driver	MINAS A5II series ³	MFDKTA390 / MFDKTA390E				MFDKTB3A2 / MFDKTB3A2E			
	MINAS A5IIN series ⁴	MFDHTA390N21 / MFDHTA390ND1				MFDHTB3A2N21 / MFDHTB3A2ND1			
	MINAS A5B series ⁵	MFDHTA390B21 / MFDHTA390BD1				MFDHTB3A2B21 / MFDHTB3A2BD1			
Maximum Torque ¹	Nm	1924	2067	2236	2392	2743	2990	3263	3419
Continuous Torque ^{1,2}	Nm	714	905	969	969	921	1149	1236	1236
Maximum Speed ¹	r/min	37.0	29.7	24.8	18.6	34.6	27.7	23.1	17.4
Maximum Moment Load	Nm	2180				2740			
One-way Positioning Accuracy	arc-sec	40	40	40	40	40	40	40	40
Encoder Type	—	Magnetic Type Absolute Encoder							
Output Resolution	Pulse/Rotation	10616832	13238272	15859712	21102592	10616832	13238272	15859712	21102592
Mass(without brake)	kg	29.5				37.5			
Mass(with brake)	kg	32				40			

Specification

SHA-CG Type

Item	Model	SHA25P					SHA32P					SHA40P				
		50	80	100	120	160	50	80	100	120	160	50	80	100	120	160
Recommended Driver	MINAS A5II series ³	MCDKT3520 / MCDKT3520E					MDDKT3530 / MDDKT3530E					MDDKT5540 / MDDKT5540E				
	MINAS A5IIN series ⁴	MCDHT3520N21 / MCDHT3520ND1					MDDHT3530N21 / MDDHT3530ND1					MDDHT5540N21 / MDDHT5540ND1				
	MINAS A5B series ⁵	MCDHT3520B21 / MCDHT3520BD1					MDDHT3530B21 / MDDHT3530BD1					MDDHT5540B21 / MDDHT5540BD1				
Maximum Torque ¹	Nm	127	178	204	217	229	271	395	433	459	484	523	675	738	802	841
Continuous Torque ^{1,2}	Nm	40	66	81	81	81	90	151	178	178	178	157	260	327	382	382
Maximum Speed ¹	r/min	112	70	56	46.7	35	96	60	48	40	30	80	50	40	33.3	25
Maximum Moment Load	Nm	258					580					849				
One-way Positioning Accuracy	arc-sec	50	40	40	40	40	40	30	30	30	30	40	30	30	30	30
Repeatability	arc-sec	±5					±4					±4				
Bi-directional Positioning Accuracy	arc-sec	60	25	25	25	25	60	25	25	25	25	50	20	20	20	20
Encoder Type	—	Magnetic Type Absolute Encoder														
Output Resolution	Pulse/Rotation	6553600	10485760	13107200	15728640	20971520	6553600	10485760	13107200	15728640	20971520	6553600	10485760	13107200	15728640	20971520
Mass(without brake)	kg	3.95					7.7					13				
Mass(with brake)	kg	4.1					8					13.8				

The values in the table above are typical values for the output shaft.

*1: Typical values when used with recommended drivers (driven with the ideal sine wave).

*2: Value for saturated temperature when actuators are mounted on the aluminum radiation plate.

SHA25P: 350×350×18[mm] SHA32P: 400×400×20[mm]

SHA40P: 500×500×25[mm] SHA58P/65P: 650×650×30[mm]

*3: M*DKT**** : Applicable to the speed, position, torque, full-closed controls and safety standard.

M*DKT****E : The position-control-only type, non-applicable for the safety standard.

*4: M*DHT****N21 : Applicable to the safety standard.

M*DHT****ND1 : Non-applicable to the safety standard.

*5: M*DHT****B21 : Applicable to the safety standard.

M*DHT****BD1 : Non-applicable to the safety standard.

Application Sample

URL : <http://www.hds.co.jp/english/products/application/>

Please refer to the sample and typical applications for the SHA-P Series with Panasonic Servo as shown above URL.

Sales area and Language



- English
- Japanese

Please contact the following address for details.

For more information

Product URL: <http://www.hds.co.jp/english/>

Contact URL: <https://www.hds.co.jp/english/contact/index.php>

Contact: **Harmonic Drive Systems Inc. Overseas Division**

1856-1 Hotakamaki, Azumino-shi, Nagano, 399-8305, Japan

TEL: +81-263-83-6935 FAX: +81-263-83-6901

Compact Actuator AF series

AF017N/042N/080N/125N/380N/500N/050C/120C/200C/320C

Features

High precision, stiffness, quality

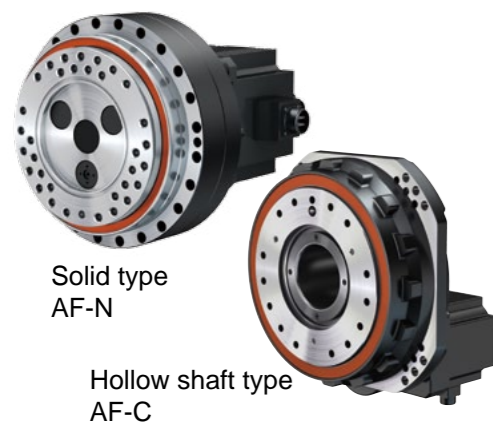
Integrating Panasonic servo motors with global industrial robot market leader Precision Reduction Gear RV

Compact

Compact drive unit is made possible by machining gear directly onto motor shaft

High versatility

Compatible with the MINAS-A5/A6 family of standard servo drivers



Merit 1 Before After

Compact design

The total length is extended due to the input gear and coupling. **With the AF series...** The machining of gears onto the motor shaft results in a very compact design; **up to 23% shorter than conventional models.**

Merit 2 Before After

Greater reliability

Machining is very difficult, resulting in axial runout, poor concentricity accuracy, and producing abnormal noise. **With the AF series...** Shipped after machining and assembly, **no need to worry about abnormal noise.**

Merit 3 Before After

Greater quality

O-ring or liquid sealant Oil seal O-ring **With the AF series...** Greasing can be troublesome, If seals are forgotten, grease can leak. **Already contains grease; no need to worry about leaking.**

Specification

Motor series: MINAS A6

Item	Model	Solid type					Hollow shaft type	
		AF017N	AF042N	AF080N	AF125N	AF200C	AF320C	
Actuator								
Motor model		MHMF042	MDMF102	MDMF102	MDMF152	MDMF202	MDMF102	MDMF202
Motor rated capacity	kW	0.4	1.0	1.0	1.5	2.0	1.0	2.0
Speed ratio		81	126	126	126	129	120.47(2289/19)	120
Rated torque	Nm	82	415	481	722	986	460	917
Momentary max. torque	Nm	289	415	1029	1029	1960	1225	2746
Rated output speed	min ⁻¹	37.0	15.9	15.9	15.9	15.5	16.6	16.7
Momentary max. speed	min ⁻¹	80.2	31.7	31.7	31.7	31.0	33.2	33.3
Allowable load inertia moment	kgm ²	11	117	117	164	221	84	158
Backlash	arc.min.	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Motor brake		With / Without	With	With	With	With	Without	Without
Allowable moment	Nm	784	784	1660	1660	2150	1764	3920
mass	kg	7.2/6.8	15	16	17	26	32	43
Motor torque limit *1	%	350	86	214	142	198	266	299

Compatible servo driver								
A6SE : Basic type	MBDLN25SE***	MDDL45SE***	MDDL45SE***	MDDL55SE***	MEDLN83SE***	MDDL45SE***	MEDLN83SE***	MEDLN83SE***
A6SG : RS485 communication type	MBDLN25SG***	MDDL45SG***	MDDL45SG***	MDDL55SG***	MEDLN83SG***	MDDL45SG***	MEDLN83SG***	MEDLN83SG***
A6SF : Multifunction type	MBDLT25SF***	MDDL45SF***	MDDL45SF***	MDDL55SF***	MEDLT83SF***	MDDL45SF***	MEDLT83SF***	MEDLT83SF***
A6NE : RTEX network standard type	MBDLN25NE***	MDDL45NE***	MDDL45NE***	MDDL55NE***	MEDLN83NE***	MDDL45NE***	MEDLN83NE***	MEDLN83NE***
A6NF : RTEX network multi function	MBDLT25NF***	MDDL45NF***	MDDL45NF***	MDDL55NF***	MEDLT83NF***	MDDL45NF***	MEDLT83NF***	MEDLT83NF***
A6BE : EtherCAT network standard type	MBDLN25BE***	MDDL45BE***	MDDL45BE***	MDDL55BE***	MEDLN83BE***	MDDL45BE***	MEDLN83BE***	MEDLN83BE***
A6BF : EtherCAT network multi function	MBDLT25BF***	MDDL45BF***	MDDL45BF***	MDDL55BF***	MEDLT83BF***	MDDL45BF***	MEDLT83BF***	MEDLT83BF***

*1 Set the torque limit of the servo amplifier so that the torques does not exceed the momentary maximum torque of the compact actuator.

Specification

Motor series: MINAS A5

Item	Model	Solid type				Hollow shaft type	
		AF042N	AF125N	AF380N	AF500N	AF200C	AF320C
Actuator							
Motor model		MDME102SC	MHME302SC	MDME402SC	MDME402SC	MDME302SC	MDME502SC
Motor rated capacity	kW	1.0	3.0	4.0	4.0	3.0	5.0
Speed ratio		93	102.18 (1737/17)	217.86 (1525/7)	252.33 (757/3)	155.96	157
Rated torque	Nm	355	1169	3329	3856	1784	3002
Momentary max. torque	Nm	1029	3062	9310	11567	4900	7840
Rated output speed	min ⁻¹	21.5	19.6	9.2	7.9	12.8	12.7
Momentary max. speed	min ⁻¹	32.3	29.4	13.8	11.9	19.2	19.1
Allowable load inertia moment	kgm ²	51	371	2026	2713	303	1216
Backlash	arc.min.	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Motor brake		With	With	With	With	With	With
Allowable moment	Nm	1660	3430	7050	11000	8820	20580
mass	kg	17	40	77	93	116	163
Motor torque limit *1	%	289	261	279	300	274	261

Compatible servo driver						
A5II : Analog / pulse	MDDKT3530***	MFDKTA390***	MFDKTB3A2***	MFDKTB3A2***	MFDKTA390***	MFDKTB3A2***
A5IIN : RTEX network	MDDHT3530ND1	MFDHTA390ND1	MFDHTB3A2ND1	MFDHTB3A2ND1	MFDHTA390ND1	MFDHTB3A2ND1
A5A : RS485 AE link network	MDDHT3530A**	MFDHTA390A**	MFDHTB3A2A**	MFDHTB3A2A**	MFDHTA390A**	MFDHTB3A2A**
A5B : EtherCAT network	MDDHT3530BD1	MFDHTA390BD1	MFDHTB3A2BD1	MFDHTB3A2BD1	MFDHTA390BD1	MFDHTB3A2BD1

*1 Set the torque limit of the servo amplifier so that the torques does not exceed the momentary maximum torque of the compact actuator.

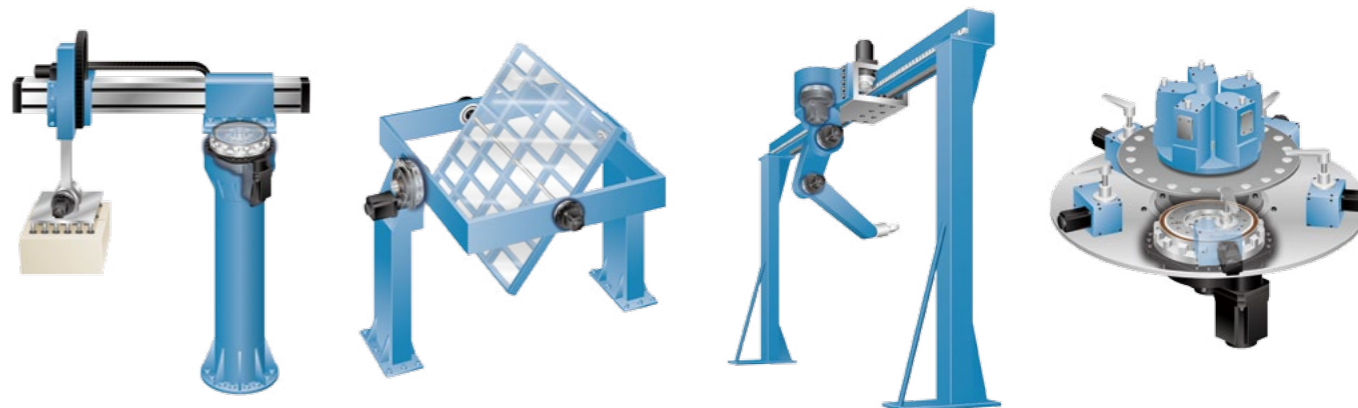
Application Sample

Pick & Place Robot

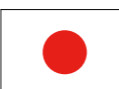
Positioner

Gantry Robot

Index Table



Sales area and Language



- Japanese
- Chinese
- English

For more information

URL: <http://precision.nabtesco.com/>

Contact: Nabtesco Corporation

Europe and Africa: [E-mail: info@nabtesco.de] TEL: +49-211-173790
 North and South America: [E-mail: engineer@nabtescomotioncontrol.com] TEL: +1-248-553-3020
 China: [E-mail: info@nabtesco-motion.cn] TEL: +86-21-3363-2200
 India: - TEL: +91-80-4123-4901
 Asia and others: [E-mail: P_information@nabtesco.com] TEL: +81-6-6341-7180

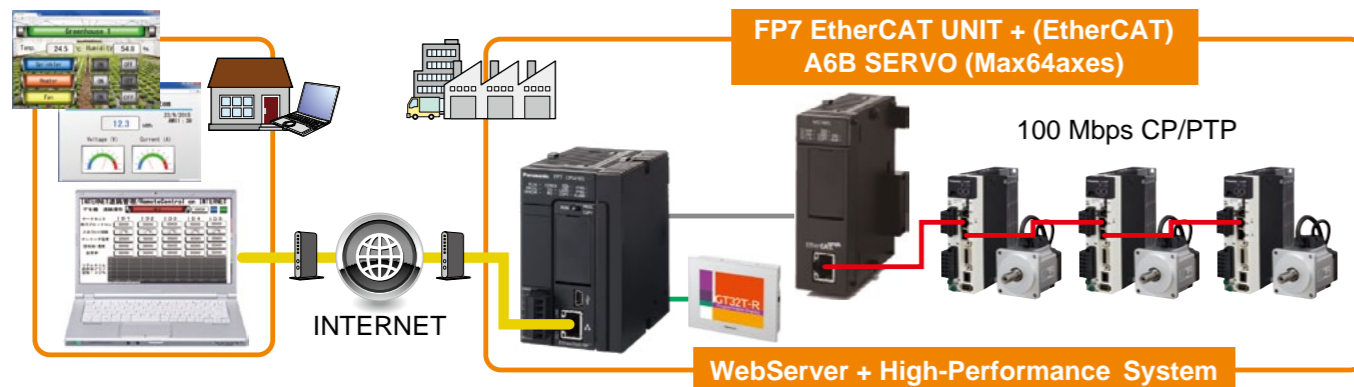
IoT Solution

A6 series + FP7, FP0R

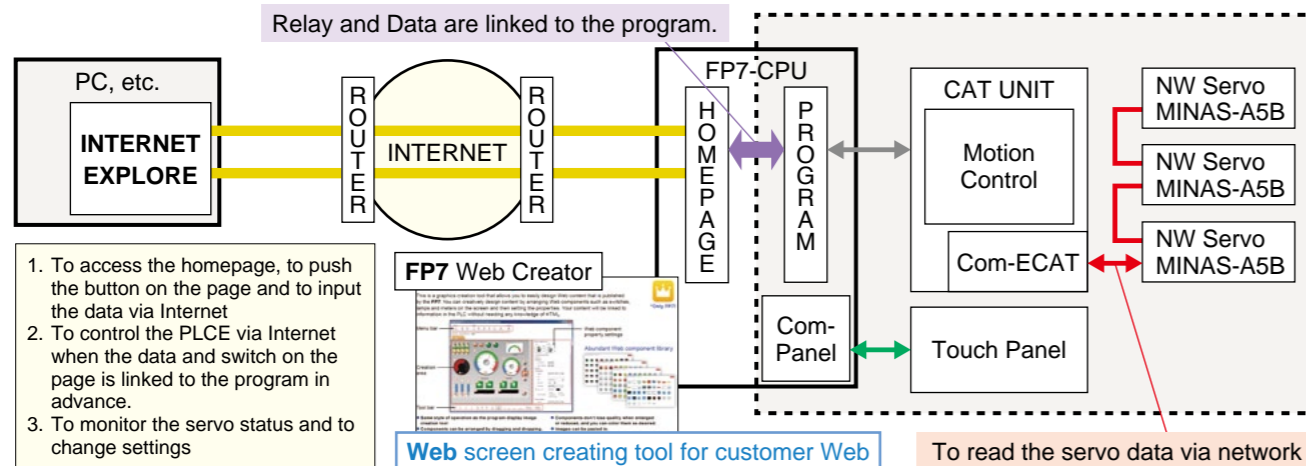
① Remote monitoring & control System by WebServer and E-Mail function

Solutions

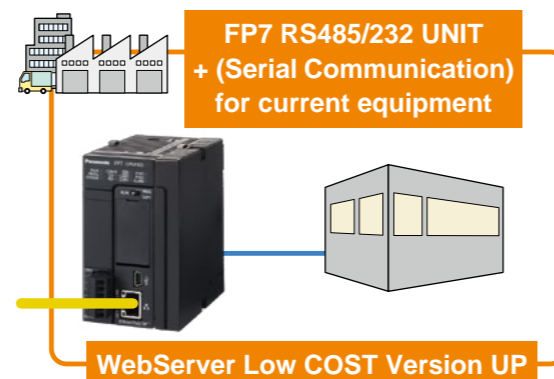
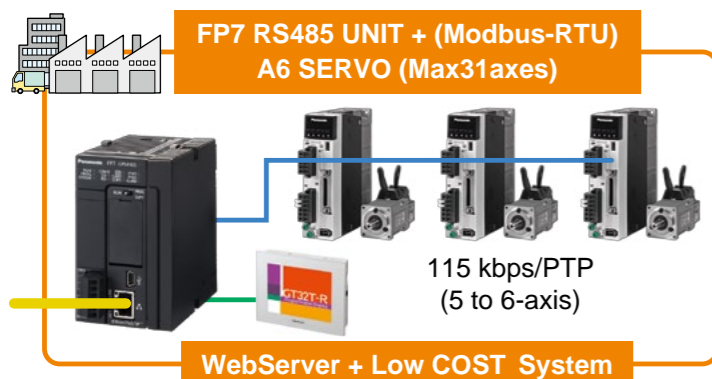
- Remote monitoring not to go the site
- Quick check of machine abnormal condition
- Not sure when trouble occurs in any time
- Remote trouble shooting when trouble occurs after installation at factory
- To collect the data or change parameters when the person cannot touch or reach the machine directly
- Need a guide message for each predetermined period of time in order to judge the exchange timing



System Configuration



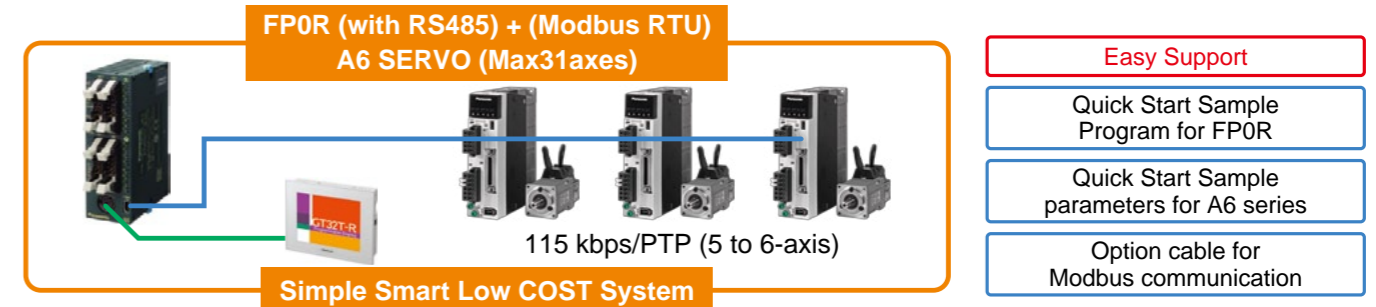
Another Proposals



② Simple Smart Modbus SYSTEM: FP0R(RS485) + A6 SERVO

Solutions

- Less wiring
- To control a trouble by the data of load ratio and torque and so on
- To save the cost of positioning unit
- Improve the roughness of input pulse resolution due to the restriction of command pulse output frequency



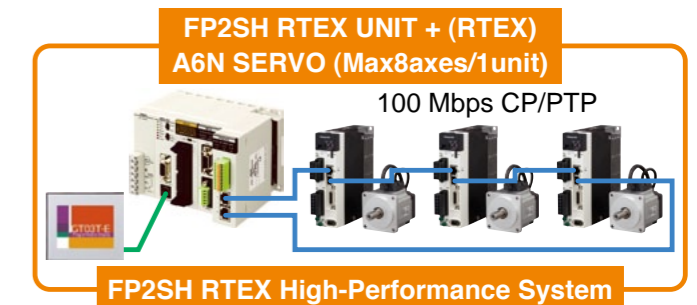
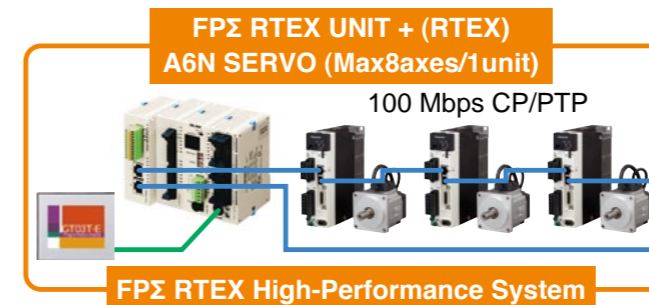
To be able to make a wireless system with wide line-up products of Modbus RTU



③ High-COST Performance SYSTEM: FPΣ + RTEX UNIT + A6N SERVO FP2SH + RTEX UNIT + A6N SERVO

Solutions

- To realize the reasonable high speed synchronized operation
- Less wiring
- To read a real time data of load ration and torque value
- To write and change the servo parameters



Sales area and Language



- Japanese
- English

For more information

URL:
<http://www3.panasonic.biz/ac/e/fasys/plc/index.jsp>

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