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## Company Address

Arrow Electronics, Inc  
9201 East Dry Creek Road  
Centennial, CO 80112

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**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.<br>When the product is incorporated to the machine you have purchased, consult to the machine manufacturer or its dealer.                                                                                                                              |
| URL    | Electronic data of this product (Instruction Manual, CAD data) can be downloaded from the following web site;<br>< <a href="http://industrial.panasonic.com/ww/products/motors-compressors/motors-for-fa-and-industrial-application">http://industrial.panasonic.com/ww/products/motors-compressors/motors-for-fa-and-industrial-application</a> > |

Contact :

ISO 9001

ISO9001 Certificate division

ISO 14001

ISO14001 Certificate division

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Smart Factory Solutions Business Division,  
Automotive & Industrial Systems Company,  
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Tel : +81-72-871-1212  
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The contents of this catalog apply  
to the products as of April 2015.

Network, Linear & Direct Drive Motor Control System

# Collaboration

Motor Business Unit, Smart Factory Solutions Business Division,  
Automotive & Industrial Systems Company, Panasonic Corporation  
<http://industrial.panasonic.com/ww/products/motors-compressors/motors-for-fa-and-industrial-application>

Servo motor that brings out potential of the machine.

“Realtime Express” model

A5IIN series



- Synchronized motion and precise CP control up to 32 axes
- Standard Ethernet cable \*1 using

EtherCAT communication type

A5B series



- Supports PC-based controller
- Standard Ethernet cable \*1 using

\*1 Shielded twisted pair cable (CAT5e or higher)

RS485 communication AE-LINK type

A5A series



- Positioning is possible by built-in NC function
- Can connect up to 31 axes

Linear and DD motor control type

A5L series



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

INDEX

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

|                                                                                                 |    |
|-------------------------------------------------------------------------------------------------|----|
| RTEX (Applicable product : A5IIN / A5IINL / A5IIMN / A5IIMNL series)                            |    |
| Introduction of MINAS A5IIN series and RTEX .....                                               | 3  |
| AJINEXTEK CO., LTD. ....                                                                        | 5  |
| Asahi Engineering Co., Ltd. ....                                                                | 7  |
| Aurotek Corporation .....                                                                       | 9  |
| Delta Tau Data Systems, inc. ....                                                               | 11 |
| Panasonic Industrial Devices SUNX Co., Ltd. ....                                                | 13 |
| Prime Motion Inc. ....                                                                          | 15 |
| Shanghai Bitpass Automation Technology Development Co., Ltd .....                               | 17 |
| SOFT SERVO SYSTEMS, INC. ....                                                                   | 21 |
| TIETECH Co., Ltd. ....                                                                          | 23 |
| Trio Motion Technology Ltd. ....                                                                | 27 |
| Vanguard Systems Inc. ....                                                                      | 31 |
| Anywire Corporation .....                                                                       | 33 |
| RTEX corresponding table and ASIC information .....                                             | 34 |
| AE-LINK (Applicable Product : A5A / A5AL series)                                                |    |
| Introduction of MINAS A5A series and AE-LINK .....                                              | 35 |
| Asahi Engineering Co., Ltd .....                                                                | 37 |
| EtherCAT (Applicable Product : A5B series)                                                      |    |
| Introduction of EtherCAT/ MINAS A5B series .....                                                | 39 |
| acontis technologies GmbH .....                                                                 | 41 |
| ADLINK Technology, Inc. ....                                                                    | 43 |
| ALGO SYSTEM Co.,Ltd. ....                                                                       | 45 |
| Beckhoff Automation GmbH & Co. KG .....                                                         | 47 |
| CONTEC CO., LTD. ....                                                                           | 49 |
| Hivertec, Inc. ....                                                                             | 51 |
| Micronet Company .....                                                                          | 53 |
| SOFT SERVO SYSTEMS, INC. ....                                                                   | 55 |
| TECHNO Co., Ltd. ....                                                                           | 57 |
| Trio Motion Technology Ltd. ....                                                                | 59 |
| EtherCAT corresponding table .....                                                              | 63 |
| LINEAR MOTOR and DIRECT DRIVE MOTOR (Applicable Product : A5L / A5IINL / A5IIMNL / A5AL series) |    |
| Introduction of MINAS A5L series .....                                                          | 65 |
| Akribis Systems Pte Ltd .....                                                                   | 67 |
| Justek Inc. ....                                                                                | 71 |
| Mirae Linear Motor Technology .....                                                             | 73 |
| NIPPON BEARING CO.,LTD. ....                                                                    | 75 |
| Nippon Pulse Motor Co., Ltd. ....                                                               | 77 |
| SINFONIA TECHNOLOGY Co.,LTD. ....                                                               | 81 |
| Sodick Co., Ltd. ....                                                                           | 83 |
| FEED BACK SCALE (Applicable Product : All Products)                                             |    |
| FAGOR AUTOMATION .....                                                                          | 85 |
| HEIDENHAIN .....                                                                                | 87 |
| .....                                                                                           | 89 |
| Magnescale Co., Ltd. ....                                                                       | 90 |
| Mitutoyo Corporation .....                                                                      | 91 |
| NIDEC SANKYO CORPORATION .....                                                                  | 92 |
| Renishaw plc .....                                                                              | 93 |
| Feed back scale selection .....                                                                 | 95 |
| ACTUATOR (Applicable Product : A5II, A5IIN series)                                              |    |
| Harmonic Drive Systems Inc. ....                                                                | 97 |

RTEX

AE-LINK

EtherCAT

LINEAR MOTOR and  
DIRECT DRIVE MOTOR

FEED BACK SCALE

ACTUATOR

Ultra High-Speed Network Servo
MINAS A5IIN series



Realtime Express (RTEX)

Ultimate Real-time performance

- Velocity response 2300 Hz
- Com. speed 100 Mbps Full-duplex
- Com. period min. 0.083 ms

Functionality to meet various needs

- Pos./Vel./Torq. all modes
- Accurate position latch
- IEC safety I/F model available

Simple network

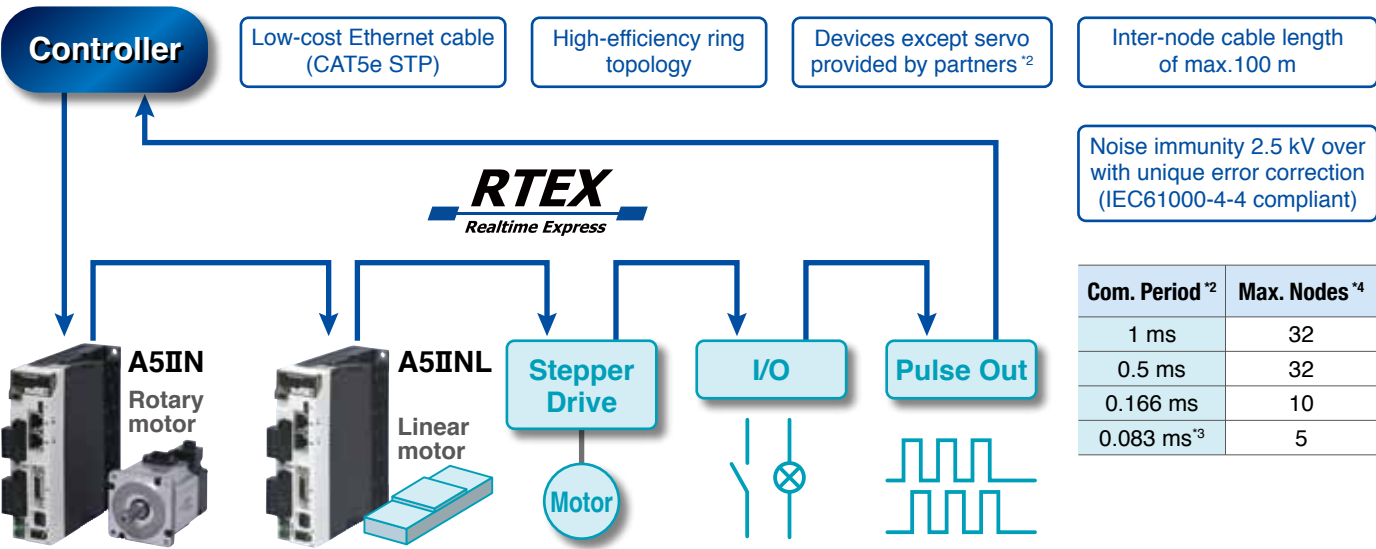
- High-performance & Low-cost
- Isochronous established by ASIC
- Easy device development

By the two-degree-of-freedom control system

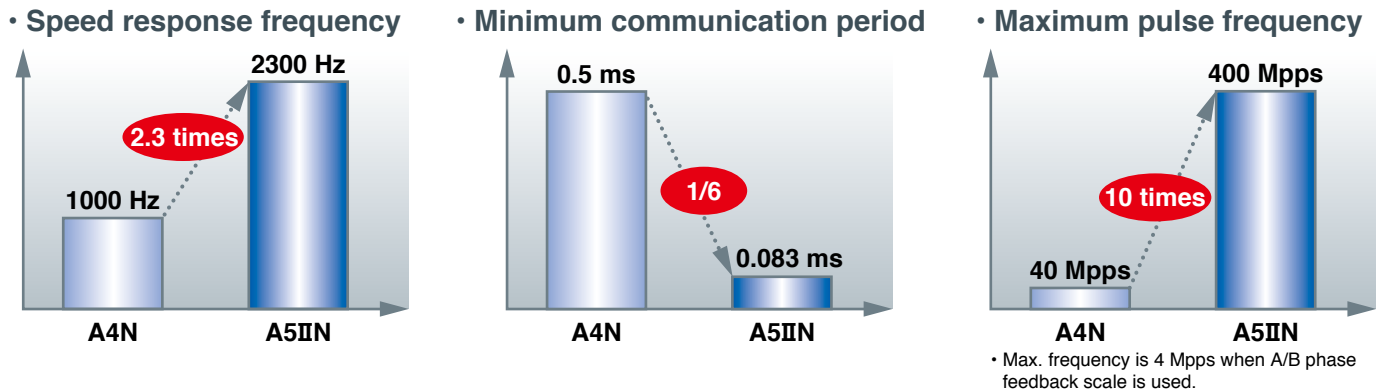
Ball screw settling time 0 ms
Belt device settling time 4 ms



[Typical system configuration]



\*1: Special model. IEC61800-5-2 STO, IEC61508 SIL2. \*2: The communication period and connection of slave devices depend on the controller specification. \*3: For communication period 0.083 ms, command update period is 0.166ms only. \*4: Slave nodes.

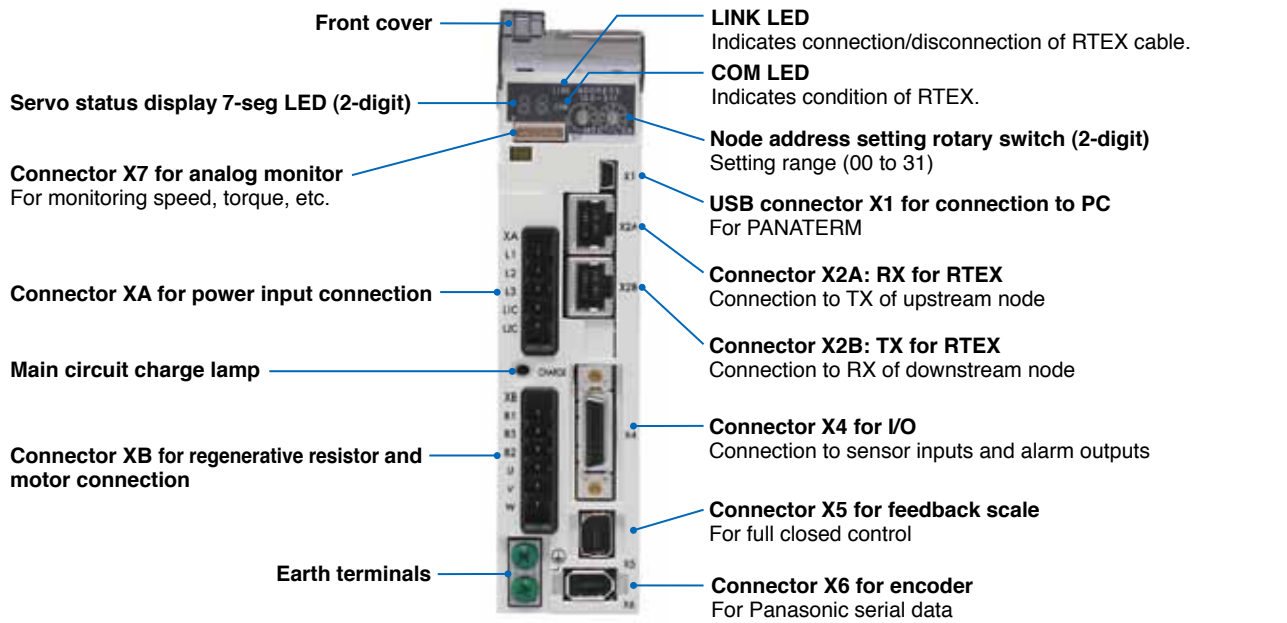


Drive list

Table with columns for Drive power supply, Motor rated output, and various motor models (MMDH, MADH, MBDH, MCDH, MDDH, MEDH, MFDH, MGDH, MHDH).

• Some motors do not match model numbers in the table. Check correct combination in the A5II family catalog.
• Trailing ND1 in the part number for product with safety I/F option is replaced with N21, excluding the M-frame.

Appearance



Dimensions (mm): W40 x H150 x D135 (A-frame)

Applicable standards



# RTEX Master Board

## 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
- Basic configuration is 16 axes control (Can be expanded to 20,24,28, and 32 axes)
- 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                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>RTEX Master Board</b>                  |                                                                                             |
| <b>Max. number of nodes</b>               | 32                                                                                          |
| <b>Max. ring loop length</b>              | 200 m                                                                                       |
| <b>Max. node to node length</b>           | 60 m                                                                                        |
| <b>Connector / cable type</b>             | RJ45 RX/TX, STP (Shielding type)                                                            |
| <b>Power supply / current consumption</b> | 5 V <sub>DC</sub> / 1.0 A                                                                   |
| <b>Position range</b>                     | 32-bit (±2147483648)                                                                        |
| <b>Motion</b>                             |                                                                                             |
| <b>Interpolation</b>                      | Max. 32 synchronized drive, 2 to 4 axes linear interpolation, and 2 axes arc interpolation, |
| <b>Gantry motion</b>                      | Max. 32 slave axes can follow the master axis to move synchronously                         |

| Item                         | Description                                               |
|------------------------------|-----------------------------------------------------------|
| <b>Software</b>              |                                                           |
| <b>User Agent Software</b>   | EzSoftware RM                                             |
| <b>Operating System</b>      | Windows 7 (32-bit, 64-bit)<br>Windows XP (32-bit, 64-bit) |
| <b>General specification</b> |                                                           |
| <b>Dimension</b>             | 174.63 mm × 106.00 mm                                     |
| <b>Weight</b>                | 120 g (Expend 32axes-161 g)                               |
| <b>Operation temperature</b> | 0 °C to 60 °C                                             |

### Application Sample

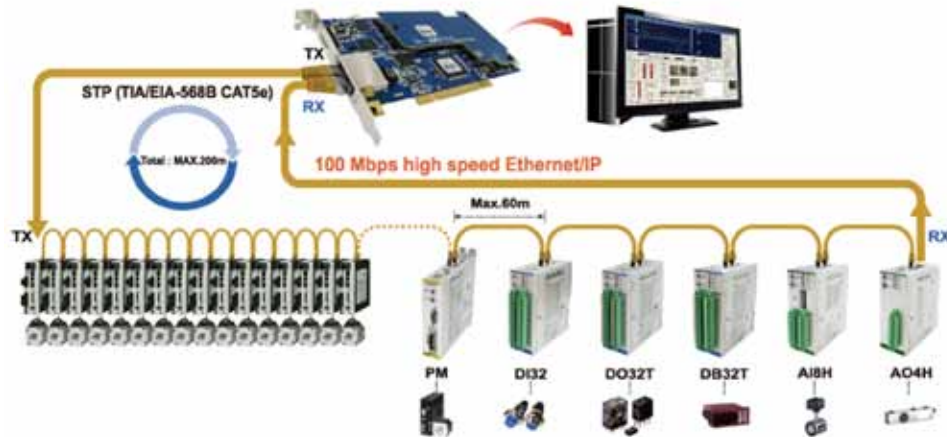
- Semiconductor front/back end process field
- Solar Energy/FPD/PCB field
- Processing machine field

Please contact the following address for details

URL : <http://www.ajinextek.com/ENG/menu04/page01.php>

### System Configuration

#### RTEX Based Motion Network



|                      |            |
|----------------------|------------|
| <b>Master Board</b>  | PCI-RXX04  |
| <b>Motion Module</b> | RTEX-PM    |
| <b>DIO Module</b>    | RTEX-DI32  |
|                      | RTEX-DB32T |
| <b>AIO Module</b>    | RTEX-AI8H  |
|                      | RTEX-AO4H  |

#### Motion Function Module — RTEX-PM

| Item                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RTEX-PM</b>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Module function</b>                    | RTEX based 1axis of slave motion function module                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>NODE ID setting</b>                    | Decimal number rotary switch × 2 (0 to 31)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Mounting Method</b>                    | Standard 35 mm DIN rail mounting                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Power supply / current consumption</b> | 24 V <sub>DC</sub> / 200 mA (Connected to TB1 outside the module, without external I/O power)                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>LED display</b>                        | Power (Yellow), Live (Green), Error (Red), Com (Yellow)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Pulse output</b>                       | PULSE+, PULSE-, DIR+, DIR-<br>LINE TRANSMITTER (5 V <sub>DC</sub> , MAX. 13MPPS)                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Encoder input</b>                      | ENC-A, /A, B, /B, Z, /Z : High-speed Photo-coupler (5 V <sub>DC</sub> , MAX. 8 MPPS)<br>ENCPWR, DGND : 5 V <sub>DC</sub> output (when using the encoder for step motors)                                                                                                                                                                                                                                                                                                                          |
| <b>Motion control Input / Output</b>      | ALARM, INP, RDY (IN4) : Photo-coupler (24 V <sub>DC</sub> Level)<br>SVON, ALMC, DCC, TRG (*) : Dallington Photo-coupler (24 V <sub>DC</sub> Level)<br>LIMIT+, LIMIT-, ORG : Photo-coupler (24 V <sub>DC</sub> Level)<br>TRG+, TRG- : Line Transmitter (5 V <sub>DC</sub> Level)<br>BRK (OUT4) : Photo-coupler + Drive IC (24 V <sub>DC</sub> Level)<br>PCOM, NCOM : Digital I/O Positive and Negative Common<br>Motion Connector : Honda 26 pin X 1 EA<br>Motion I/O Connector : 3M 26 pin X 1 EA |
| <b>Universal input</b>                    | IN2, IN3 : Photo-coupler (24 V <sub>DC</sub> Level)                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Universal output</b>                   | OUT2, OUT3 : Photo-coupler + Drive IC (24 V <sub>DC</sub> Level)                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Software</b>                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>User Agent Software</b>                | EzSoftware RM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Operating System</b>                   | Windows 7 (32-bit, 64-bit), Windows XP (32-bit, 64-bit)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>General specification</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Dimension (HxDxW)</b>                  | 120 mm × 110 mm × 25 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Weight</b>                             | 192 g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Operation temperature</b>              | 0 °C to 60 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

#### Digital Input Function Module — RTEX-DI32

| Item                                      | Description                                                                                                                                                                                                                  |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RTEX-DI32</b>                          |                                                                                                                                                                                                                              |
| <b>Module function</b>                    | RTEX based slave 32ch digital input function module                                                                                                                                                                          |
| <b>NODE ID setting</b>                    | Decimal number rotary switch × 2 (0 to 31)                                                                                                                                                                                   |
| <b>Mounting Method</b>                    | Standard 35 mm DIN rail mounting                                                                                                                                                                                             |
| <b>Power supply / current consumption</b> | 24 V <sub>DC</sub> / Max. 500 mA (TB1 Connection to Outside Module)                                                                                                                                                          |
| <b>LED display</b>                        | Power (Yellow), Live (Green), Error (Red), Com (Yellow)<br>IN1 to IN32 (Yellow)                                                                                                                                              |
| <b>Digital input</b>                      | Input 32 channels, 24 V <sub>DC</sub> Level<br>IN1 to IN32 : Photo-coupler isolation (More over MIN. 2 mA/ch)<br>PCOM, NCOM : Digital I/O Positive and Negative Common<br>Connector : Phoenix 16 X 2 ( MCD 1,5/16-GIF-3,81 ) |
| <b>Software</b>                           |                                                                                                                                                                                                                              |
| <b>User Agent Software</b>                | EzSoftware RM                                                                                                                                                                                                                |
| <b>Operating System</b>                   | Windows 7 (32-bit, 64-bit), Windows XP (32-bit, 64-bit)                                                                                                                                                                      |
| <b>General specification</b>              |                                                                                                                                                                                                                              |
| <b>Dimension (HxDxW)</b>                  | 100 mm × 90 mm × 40 mm                                                                                                                                                                                                       |
| <b>Weight</b>                             | 245 g                                                                                                                                                                                                                        |
| <b>Operation temperature</b>              | 0 °C to 60 °C                                                                                                                                                                                                                |

#### Analog Input Function Module — RTEX-AI8H

| Item                                      | Description                                                                                                                                                                                                        |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RTEX-AI8H</b>                          |                                                                                                                                                                                                                    |
| <b>Module function</b>                    | RTEX based slave 8ch analog input function module                                                                                                                                                                  |
| <b>NODE ID setting</b>                    | Decimal number rotary switch × 2 (0 to 31)                                                                                                                                                                         |
| <b>Mounting Method</b>                    | Standard 35 mm DIN rail mounting                                                                                                                                                                                   |
| <b>Power supply / current consumption</b> | 24 V <sub>DC</sub> / Max. 500 mA (TB1 Connection to Outside Module)                                                                                                                                                |
| <b>LED display</b>                        | Power (Yellow), Live (Green), Error (Red), Com (Yellow)                                                                                                                                                            |
| <b>Number of input channels</b>           | 8 channels                                                                                                                                                                                                         |
| <b>Resolution</b>                         | 16-bit                                                                                                                                                                                                             |
| <b>Analog input</b>                       | Input 8 channel<br>Voltage mode: -10 V to +10 V,<br>Electric current mode : 4 mA to 20 mA (control the switch)<br>Resolution: 16-bit<br>Sampling speed: 100 kHz<br>Connector: Phoenix 10 X 2 (MCD 1,5/20-G1F-3,81) |
| <b>Software</b>                           |                                                                                                                                                                                                                    |
| <b>User Agent Software</b>                | EzSoftware RM                                                                                                                                                                                                      |
| <b>Operating System</b>                   | Windows 7 (32-bit, 64-bit), Windows XP (32-bit, 64-bit)                                                                                                                                                            |
| <b>General specification</b>              |                                                                                                                                                                                                                    |
| <b>Dimension (HxDxW)</b>                  | 100 mm × 90 mm × 40 mm                                                                                                                                                                                             |
| <b>Weight</b>                             | 244 g                                                                                                                                                                                                              |
| <b>Operation temperature</b>              | 0 °C to 60 °C                                                                                                                                                                                                      |

#### Digital Input/Output Function Module — RTEX-DB32T

| Item                                      | Description                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RTEX-DB32T</b>                         |                                                                                                                                                                                                                                                                                                                       |
| <b>Module function</b>                    | RTEX based slave 16ch digital input & 16ch digital output function module                                                                                                                                                                                                                                             |
| <b>NODE ID setting</b>                    | Decimal number rotary switch × 2 (0 to 31)                                                                                                                                                                                                                                                                            |
| <b>Mounting Method</b>                    | Standard 35 mm DIN rail mounting                                                                                                                                                                                                                                                                                      |
| <b>Power supply / current consumption</b> | 24 V <sub>DC</sub> / Max. 500 mA (TB1 Connection to Outside Module)                                                                                                                                                                                                                                                   |
| <b>LED display</b>                        | Power (Yellow), Live (Green), Error (Red), Com (Yellow)<br>IN1 to IN16 (Yellow)<br>OUT1 to OUT16 (Red)                                                                                                                                                                                                                |
| <b>Digital input/output</b>               | 32 channels, 24 V <sub>DC</sub> Level (16ch Input / 16ch Output)<br>IN1 to IN16 : Photo-coupler isolation (More over MIN. 2 mA/ch)<br>OUT1 to OUT16 : Photo-coupler isolation (Below MAX. 50 mA/channel)<br>PCOM, NCOM : Digital I/O Positive and Negative Common<br>Connector : Phoenix 16 X 2 (MCD 1,5/16-GIF-3,81) |
| <b>Software</b>                           |                                                                                                                                                                                                                                                                                                                       |
| <b>User Agent Software</b>                | EzSoftware RM                                                                                                                                                                                                                                                                                                         |
| <b>Operating System</b>                   | Windows 7 (32-bit, 64-bit), Windows XP (32-bit, 64-bit)                                                                                                                                                                                                                                                               |
| <b>General specification</b>              |                                                                                                                                                                                                                                                                                                                       |
| <b>Dimension (HxDxW)</b>                  | 100 mm × 90 mm × 40 mm                                                                                                                                                                                                                                                                                                |
| <b>Weight</b>                             | 245 g                                                                                                                                                                                                                                                                                                                 |
| <b>Operation temperature</b>              | 0 °C to 60 °C                                                                                                                                                                                                                                                                                                         |

#### Digital Output Function Module — RTEX-DO32T

| Item                                      | Description                                                                                                                                                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RTEX-DO32T</b>                         |                                                                                                                                                                                                                                 |
| <b>Module function</b>                    | RTEX based slave 32ch digital output function module                                                                                                                                                                            |
| <b>NODE ID setting</b>                    | Decimal number rotary switch × 2 (0 to 31)                                                                                                                                                                                      |
| <b>Mounting Method</b>                    | Standard 35 mm DIN rail mounting                                                                                                                                                                                                |
| <b>Power supply / current consumption</b> | 24 V <sub>DC</sub> / Max. 500 mA (TB1 Connection to Outside Module)                                                                                                                                                             |
| <b>LED display</b>                        | Power (Yellow), Live (Green), Error (Red), Com (Yellow)<br>OUT1 to OUT32 (Red)                                                                                                                                                  |
| <b>Digital input</b>                      | Output 32 channels, 24 V <sub>DC</sub> Level<br>OUT1 to OUT32 : Photo-coupler isolation (Below MAX. 50 mA/channel)<br>PCOM, NCOM : Digital I/O Positive and Negative Common<br>Connector : Phoenix 16 X 2 (MCD 1,5/16-GIF-3,81) |
| <b>Software</b>                           |                                                                                                                                                                                                                                 |
| <b>User Agent Software</b>                | EzSoftware RM                                                                                                                                                                                                                   |
| <b>Operating System</b>                   | Windows 7 (32-bit, 64-bit), Windows XP (32-bit, 64-bit)                                                                                                                                                                         |
| <b>General specification</b>              |                                                                                                                                                                                                                                 |
| <b>Dimension (HxDxW)</b>                  | 100 mm × 90 mm × 40 mm                                                                                                                                                                                                          |
| <b>Weight</b>                             | 245 g                                                                                                                                                                                                                           |
| <b>Operation temperature</b>              | 0 °C to 60 °C                                                                                                                                                                                                                   |

#### Analog Output Function Module — RTEX-AO4H

| Item                                      | Description                                                                                                                                             |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RTEX-AO4H</b>                          |                                                                                                                                                         |
| <b>Module function</b>                    | RTEX based slave 4ch analog output function module                                                                                                      |
| <b>NODE ID setting</b>                    | Decimal number rotary switch × 2 (0 to 31)                                                                                                              |
| <b>Mounting Method</b>                    | Standard 35 mm DIN rail mounting                                                                                                                        |
| <b>Power supply / current consumption</b> | 24 V <sub>DC</sub> / Max. 500 mA (TB1 Connection to Outside Module)                                                                                     |
| <b>LED display</b>                        | Power (Yellow), Live (Green), Error (Red), Com (Yellow)                                                                                                 |
| <b>Number of output channels</b>          | 4 channels                                                                                                                                              |
| <b>Resolution</b>                         | 16-bit                                                                                                                                                  |
| <b>Analog output</b>                      | Output 4 channel<br>Voltage mode : -10 V to +10 V<br>Resolution : 16-bit<br>Sampling speed :100 kHz<br>Connector : Phoenix 10 X 1 (MCD 1,5/10-G1F-3,81) |
| <b>Software</b>                           |                                                                                                                                                         |
| <b>User Agent Software</b>                | EzSoftware RM                                                                                                                                           |
| <b>Operating System</b>                   | Windows 7 (32-bit, 64-bit), Windows XP (32-bit, 64-bit)                                                                                                 |
| <b>General specification</b>              |                                                                                                                                                         |
| <b>Dimension (HxDxW)</b>                  | 100 mm × 90 mm × 40 mm                                                                                                                                  |
| <b>Weight</b>                             | 246 g                                                                                                                                                   |
| <b>Operation temperature</b>              | 0 °C to 60 °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](mailto: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

### Features

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

##### ● High performance CPU enhances drive capability

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

##### ● RTEX in motion network

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

##### ● Simultaneous multiaxial control within 1 ms communication period



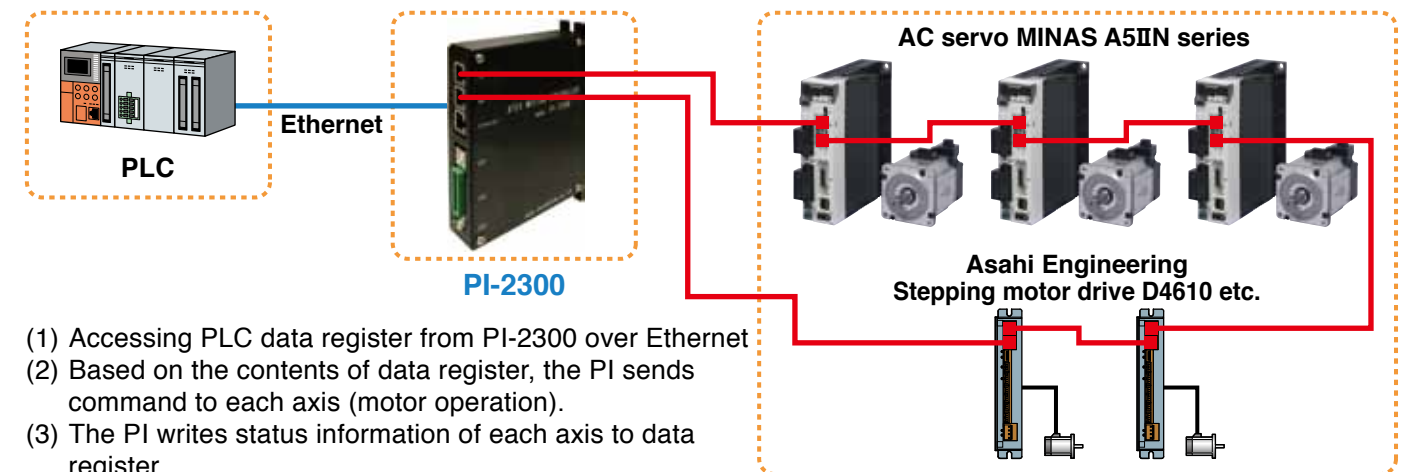
### Specification

| Item                                    | Description                                                                             |
|-----------------------------------------|-----------------------------------------------------------------------------------------|
| Power supply                            | Main power supply: 24 Vdc±10 % (4.0 A max.)<br>Sensor power supply: 24 Vdc±10 % (0.1 A) |
| Applicable motor                        | 2.55 A/phase or less 2-phase HB type stepping motor                                     |
| Driving capacity                        | 2.55 A/phase                                                                            |
| 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 and stop input                    |
| Output signal                           | Brake output and alarm output                                                           |
| Protective function                     | Over current, power supply voltage monitoring and step-out detection                    |
| 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                                                                              |
| Operating vibration (shock) environment | Indoor (no direct sunshine). No corrosive gas, flammable gas, oil mist, dust, etc.      |
|                                         | Altitude                                                                                |
|                                         | Max. 1000 m above sea level                                                             |
| Outline dimensions (mm)                 | 160 × 92 × 29                                                                           |
| Mass                                    | Approx. 300 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](mailto:ae-sales@asahi-engineering.co.jp)]

TEL: +81-42-342-4422 FAX: +81-42-342-4423

# RTEX Network Motion Control board

## MCN-8032P

### Features

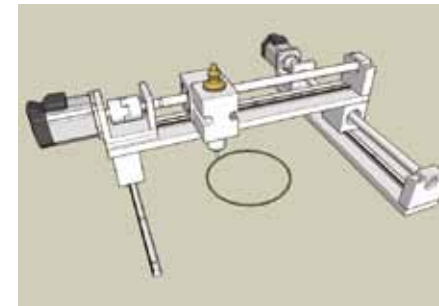
- RTEX (Real Time Express) servo network
- Network Speed 100 Mbps, communication period 0.5 ms
- Easy to wire, saving wiring working-hour
- Up to 32 nodes
- Excellent error correction
- Multi-axis linear / circular interpolation
- Multi-axis synchronous motion (for gentry)
- Up to 16 boards in one PC



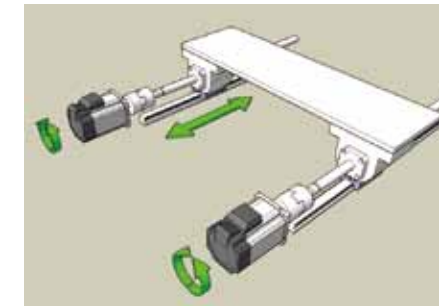
### Specification

| Item                     | Description                                                                                                  |
|--------------------------|--------------------------------------------------------------------------------------------------------------|
| RTEX motion control      |                                                                                                              |
| Module type support      | Servo motor drive, Linear motor drive, Stepper drive, 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 ( $\pm 2147483648$ )                                                                                  |
| Motion                   |                                                                                                              |
| Interpolation            | 32-axes linear interpolation / 2-axes circular interpolation (max. 16 pairs 2-axes circulator 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                                                        |
| Drive/LIB                | Drive for Windows 7 (64 / 32 bits ), Windows XP, DLL function for windows applications                       |
| General specification    |                                                                                                              |
| Certification            | CE (applying)                                                                                                |
| Dimension(L×W×H)         | 175 mm × 100 mm × 20 mm                                                                                      |
| Power consumption        | 5 V @ 500 mA                                                                                                 |
| Operation temperature    | 0 °C to 60 °C                                                                                                |

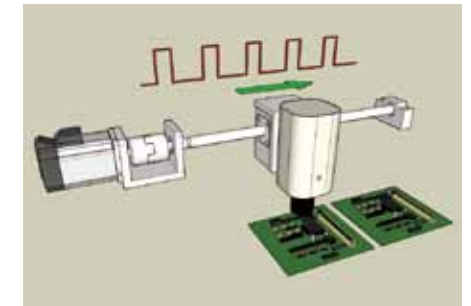
### Application Sample



Linear and Circular Interpolations

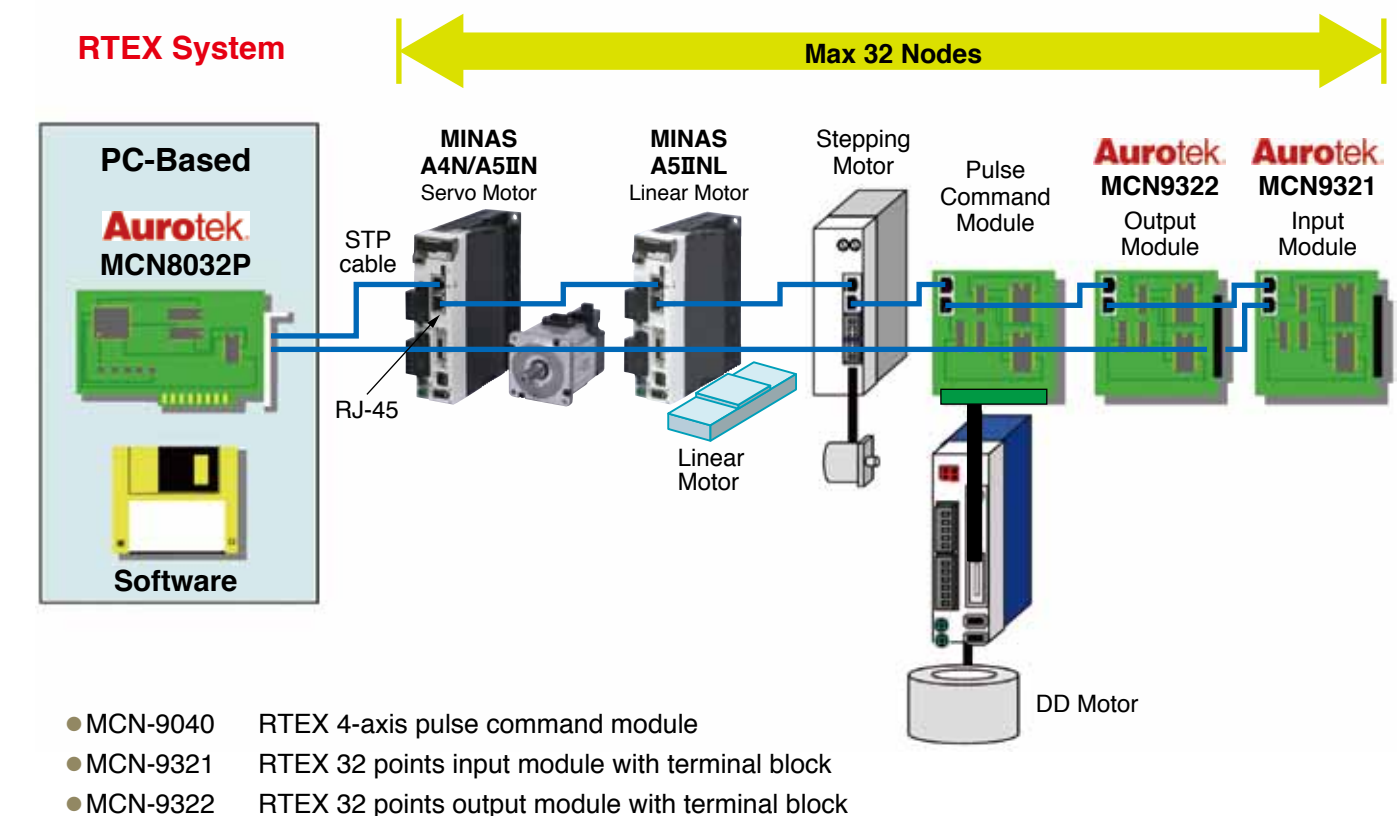


Gentry Motion



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](mailto:sales@robot.com.tw)]

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

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

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

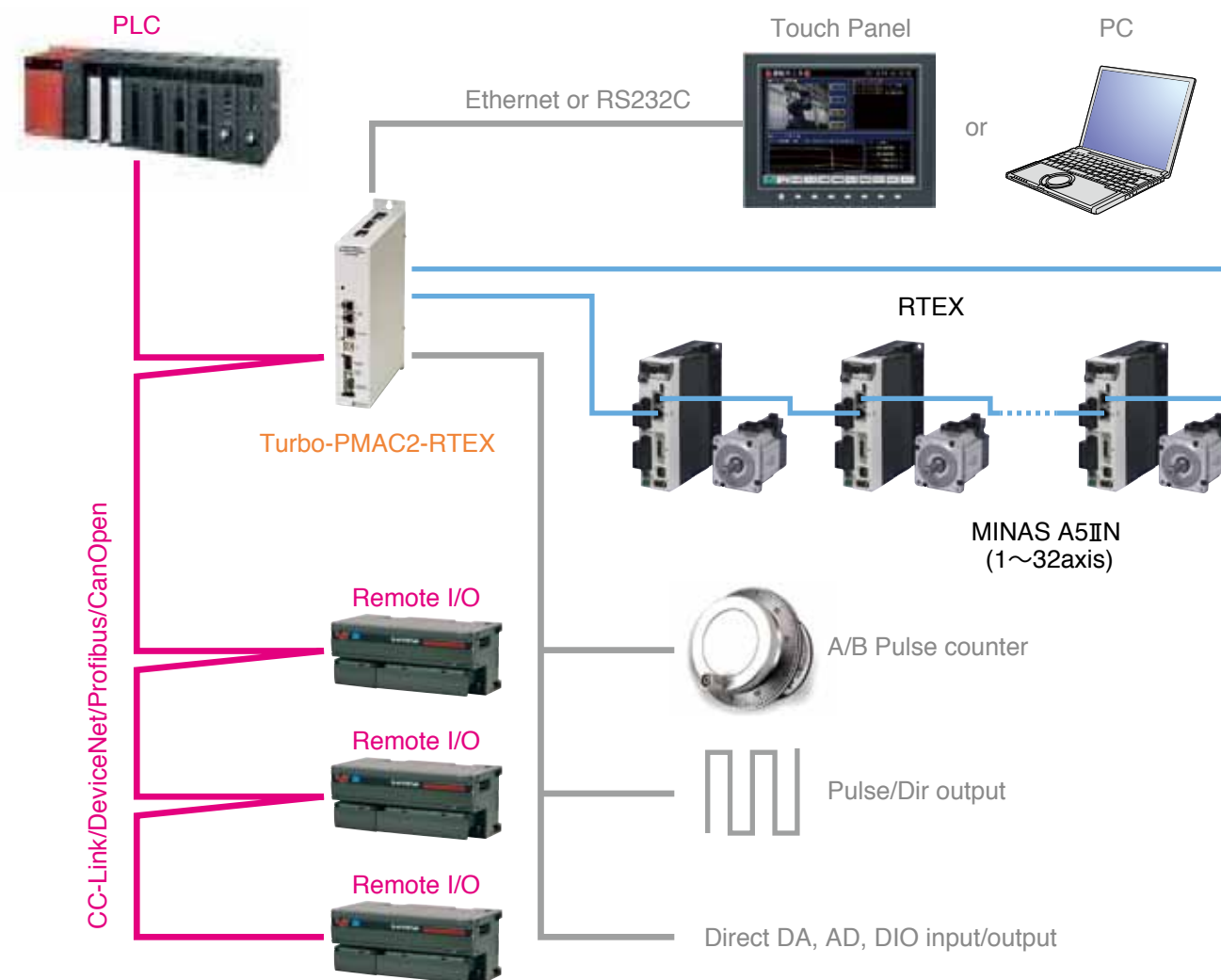
### Application Sample

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

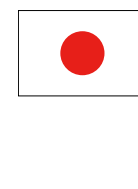
For details, please check out our Video Center for more information.

URL : [http://www.deltatau.com/DT\\_Resources/VideoCenter.aspx](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](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](mailto: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 A4N/A5IIN. (Units of Ver.1.3 or later will support A5IIN.)
- 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

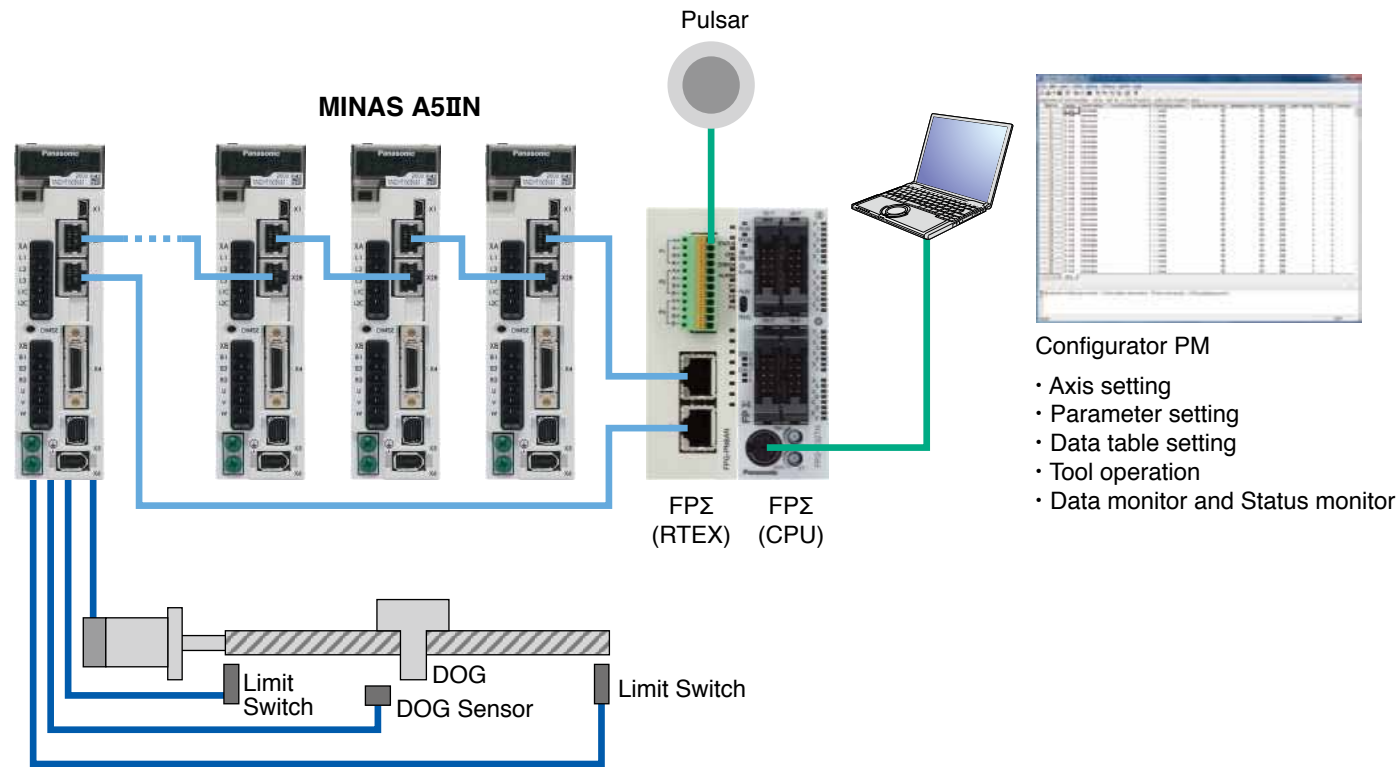
| Part No. (FPΣ/FP2SH)      |                                   | AFPG43610/AFP243610                                                                                                                        | AFPG43620/AFP243620        | AFPG43630/AFP243630        |
|---------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|
| 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 |                            |                            |

\* MINAS A4N and A5IIN cannot be mixed in a system.

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



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] Including PLC (Using C-like Language)

### Features

- Directly connectable to Mitsubishi Electric PLC (CPU with Ethernet: e.g. Q03UDECPU)  
References CPU D register according to MC protocol.
- Directly connectable to OMRON PLC (CPU with Ethernet: e.g. CJ1M-CPU11-ETN)
- Directly connectable to Keyence PLC KV-5000
- Internal control program of [InterMotion] can be developed in the machine control script language [MOS language].  
Motion, I/O, communication and sequence can be controlled.
- 1 ms scan DOUT interlocked trajectory control (coating valve control, spray valve control, etc.) is possible.



### Specification

| Item                                        | Description                                                                                                                                                                                                                                                |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>No. of control axes</b>                  | For max. 8 axes, 10 Mpps pulse train position command can be used as necessary.<br>(Low cost version is available: RTEX axis only without pulse train output)                                                                                              |
| <b>Controlling method</b>                   | Each axis is independent PTP. Max.8 axes sync PTP.<br>Linear interpolation, 2-axis arc interpolation, 3-axis spiral interpolation, 32-bit length.<br>1 ms scan DOUT interlocked trajectory control option (coating valve control, spray valve control)     |
| <b>Internal control program development</b> | Control program can be developed by using the C-like multiprocessing machine control language [MOS language].<br>Motion, IO, communication and sequence can be controlled. As the development environment, [MOS Bench AM] is required.                     |
| <b>Accessory IO</b>                         | ±CW, ±CCW pulse output, ±A, ±B, ±Z input. Servo on, reset output. ±OT, alarm input, for 8 axes.<br>Universal IN 8 points. Universal OUT 8 points. Non-insulated RS232 1 ch, Insulated RS485 1 ch. (By adding remote IO, 192 IN and 192 OUT are available.) |
| <b>Host controller</b>                      | Mitsubishi Electric PLC with CPU with Ethernet (reference CPU D register)<br>Keyence PLC KV-5000 (reference data memory)<br>OMRON PLC with CPU with Ethernet (reference data memory)<br>Or, Windows PC with Ethernet                                       |

## Real-time Windows Software 40-axis Motion Controller [RT40PR] Including Software PLC (Using C-like Language)

### Features

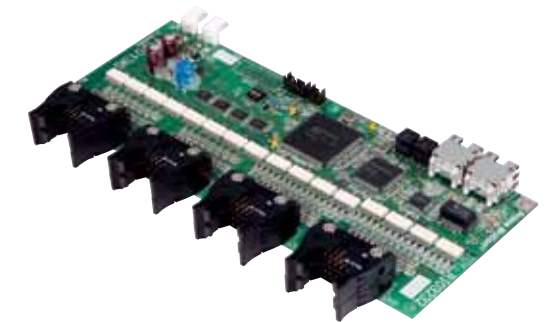
- 32-axis RTEX Interface
- 8-axis 10 MPPS Pulse Train Output
- Synchronization between RTEX-axis and Pulse Output-axis
- Real-time Windows Software PLC Using the C-like Multi-Process machine control script language [MOS language].
- Same as Motion-card, Input, Output, AD, DA, RS232C, and Counter-card can be controlled under Windows Real-time Environment using [MOS Language]



## General Purpose 32/32 Input/Output Board InterMotion Series JOY-RIO3232

### Features

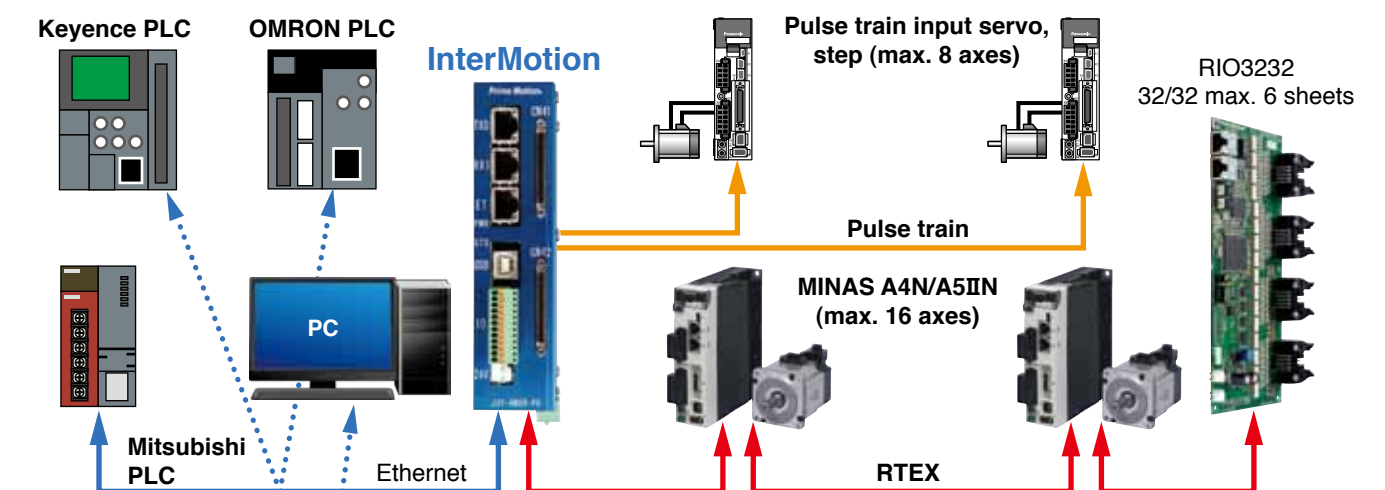
- Single board with 32 IN points and 32 OUT points
- 10 PIN connector for 8-point IN and 8-point OUT. Can be directly connected to terminal block PRS-DG10-O8 (TOYOGIKEN Co., Ltd).
- 24 V DC supply



### Specification

| Item                                  | Description                                                 |
|---------------------------------------|-------------------------------------------------------------|
| <b>Input</b>                          | 32 points (8 points × 4 ports), 24 V <sub>DC</sub> , 4.7 kΩ |
| <b>Output</b>                         | 32 points (8 points × 4 ports), 24 V <sub>DC</sub> , 100 mA |
| <b>Max. No. of connectable boards</b> | 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

# PCI Bus 32 Block Control Board

PCMC-168N

Provided by COSMOTECHS Co.,Ltd.

## Features

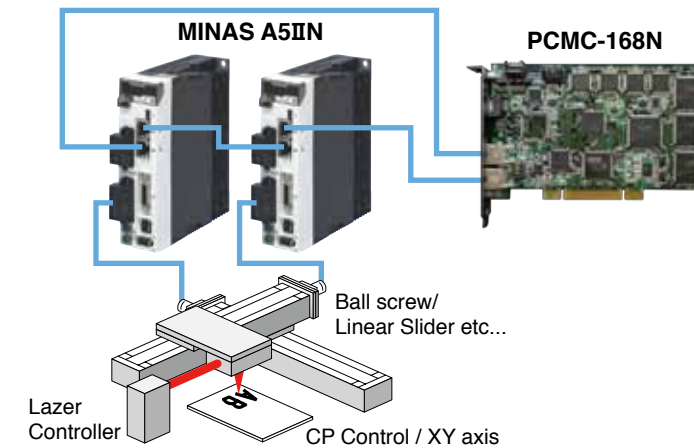
- Control data up to 32 block in 0.5 msec communication period
- Continuous Pass control : Up to 16-axis  
Point to Point control : Up to 16-block
- Complex movement can be realized by the combination of a linear interpolation and a circular interpolation
- Change and tune servo-parameters at once via RTEX communication
- Easy to start-up in synchronization for all axis



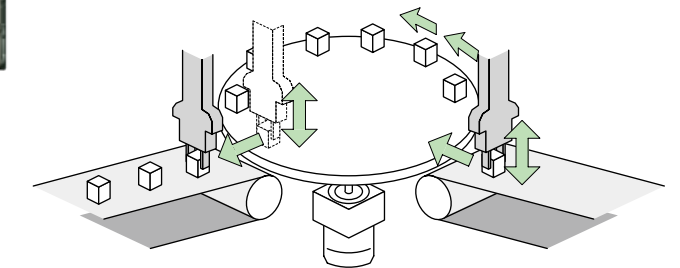
## Specification

| Item                          | Description                                                                                              |
|-------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Number of control axis</b> | 32 Block (Motor Control:16-axis, Module : 16-block)                                                      |
| <b>Motor Control</b>          | Motor Control LSI × 4 (PMC842S : COSMOTECH)                                                              |
| <b>Max.Pulse Frequency</b>    | 8.191 Mpps                                                                                               |
| <b>Command Update Period</b>  | 0.5 ms                                                                                                   |
| <b>Drive Function</b>         | Positioning, Continuous, Mech.signal, Synchronized start, linear, circular and continuous interpolation, |
| <b>AC/DC Mode</b>             | Linear and S-Curve, Asymmetry Linear and S-Curve                                                         |
| <b>Over-ride Function</b>     | Change velocity and distance                                                                             |
| <b>Counter Function</b>       | 32-bit Output counter function, Comparator function                                                      |
| <b>Physical Layer</b>         | LAN Cable (100BASE-TX)                                                                                   |
| <b>Size (mm)</b>              | 174.63 (W) × 106.68 (D)                                                                                  |
| <b>Other function</b>         | Homing, Parameter Setting, Command reservation, Alarm Clear Command, Emergency stop function             |

## Application Sample

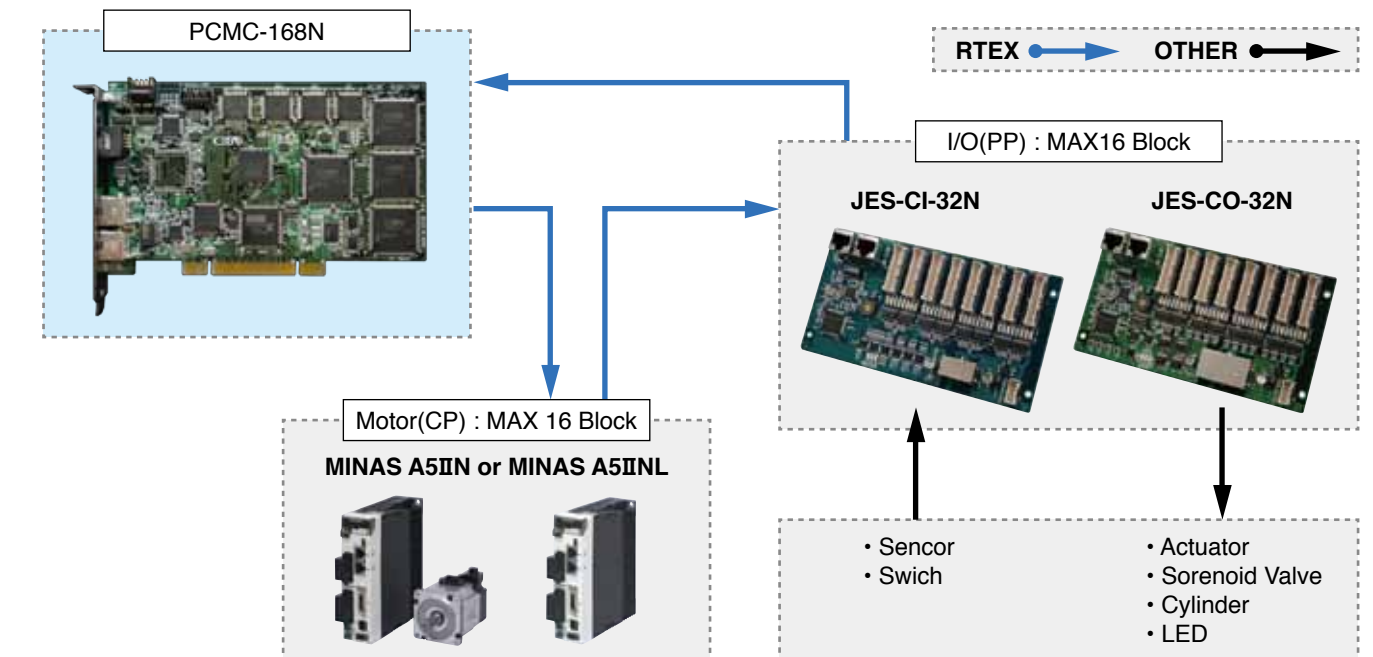


- For continuous pass control like Laser Cutting, Application



- For Index table, Parts feeder etc.

## System Configuration



## Sales area and Language



- Japanese
- Chinese

Please contact the following address for details.

## For more information

URL : <http://www.shhuitong.net/> (Chinese)

URL : <http://www.cosmotechs.co.jp/> (Japanese)

Contact: **Shanghai Bitpass Automation Technology Development Co.,Ltd.**

floor1601 jinyi Mansion.441He Nan N.Rd, Shanghai, China

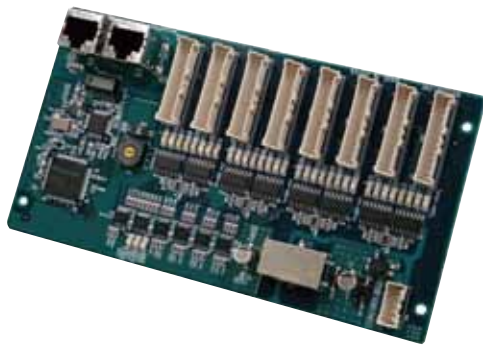
TEL: +86-21-63570803 FAX: +86-21-63570802

General use Input Board  
JES-CI-32N

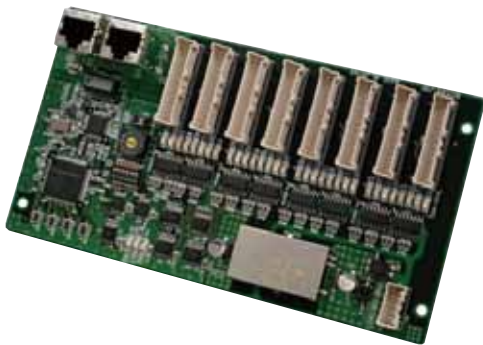
General use Output Board  
JES-CO-32N

Features

- Helpful for the reduction of cable cost and man-hour by using JST connector and terminal block.
- Easy to check the wiring because each signal has one LED.
- Can control the mixed system with servo driver.



General use Input Board  
JES-CI-32N



General use Output Board  
JES-CO-32N

Specification

| General use Input Board<br>JES-CI-32N |                        |                                                            |
|---------------------------------------|------------------------|------------------------------------------------------------|
| Item                                  |                        | Description                                                |
| Input                                 | Slave mode             | IN mode (Without CPU)                                      |
|                                       | Input singnal          | Isolated input 32-point by Photo-Coupler (equal to PS2801) |
|                                       | Input current          | 2 mA to 5 mA                                               |
|                                       | Isolation power supply | DC12 V to 24 V                                             |
| Communication                         | Network                | RTEX                                                       |
|                                       | Communication speed    | 100 Mbps                                                   |
|                                       | Maximum number of axis | 32 sheets (Input :1024-point)                              |

| General use Output Board<br>JES-CO-32N |                                    |                                                                                                        |
|----------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------|
| Item                                   |                                    | Description                                                                                            |
| Output                                 | Slave mode                         | OUT mode (Without CPU)                                                                                 |
|                                        | Output singnal                     | Isolated output 32-point by open-collector (equal to TD62083), -COM is common for each 32-point output |
|                                        | Output dielectric strength voltage | Max. 50 V                                                                                              |
|                                        | Output current                     | Max.100 mA                                                                                             |
|                                        | Isolation power supply             | DC12 V to 24 V                                                                                         |
| Communication                          | Network                            | RTEX                                                                                                   |
|                                        | Communication speed                | 100 Mbps                                                                                               |
|                                        | Maximum number of axis             | 32 sheets (Output :1024-point)                                                                         |

Sales area and Language



• Chinese

Please contact the following address for details.

For more information

URL : <http://www.shhuitong.net/> (Chinese)

Contact: Shanghai Bitpass Automation Technology Development Co.,Ltd.  
floor1601 jinyi Mansion.441He Nan N.Rd, Shanghai, China

TEL: +86-21-63570803 FAX: +86-21-63570802

MEMO

RTEX

# Full-Scale CNC Controller for RTEX

## ServoWorks CNC Series

### Features

- Complete high-end CNC solution for machining centers, laser, plasma, EDM and grinding machines
- FANUC-compatible, full-scale G code and Ladder programming
- High-speed, high-precision milling functions including velocity override control in circular interpolation, corner deceleration, dual-axis synchronous control, tool center point (TCP) control
- Interpolation rate as fast as 0.5 ms
- ServoWorks Development Kit (SDK) with VB and .NET support
- Various I/O modules available for a hand wheel, digital I/O control and spindle drive control
- Real-time performance on Windows based on industry-proven "Soft Motion" technology

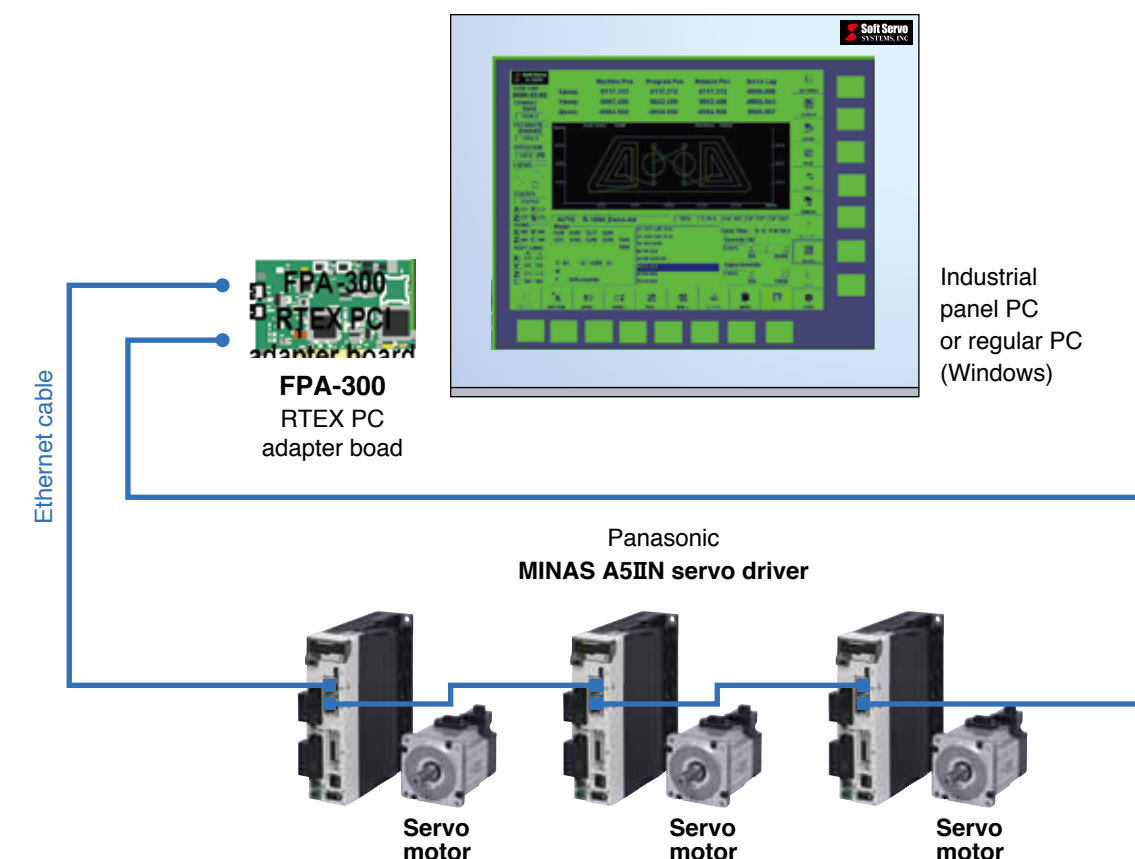
### Specification

| ServoWorks Series                        |                        | MC-Quad                          | S-100M | S-120M | S-140M |
|------------------------------------------|------------------------|----------------------------------|--------|--------|--------|
| Max. No. of control axes                 |                        | 4                                | 8      | 16     | 32     |
| Maximum Number of Axes                   |                        | 4                                | 4      | 8      | 8      |
| Spindle Control                          |                        | —                                | ○      | ○      | ○      |
| Maximum Number of PLC Axes               |                        | —                                | —      | 3      | 2      |
| Max. Number of Interpolated Axes         | Linear Interpolation   | 4                                | 4      | 5      | 6      |
|                                          | Circular Interpolation | 2 (Helical Interpolation)        |        |        |        |
| Interpolation Cycles                     |                        | 1 ms (0.5 ms as an option)       |        |        |        |
| Smoothing Filters                        |                        | Linear, Bell-shaped, Exponential |        |        |        |
| Minimum Machine Unit                     | Linear Axis            | 0.000000001 mm, 0.000000001 inch |        |        |        |
|                                          | Rotational Axis        | 0.000000001 deg                  |        |        |        |
| Macro Programming                        |                        | ○                                |        |        |        |
| Automatic Corner Deceleration            |                        | ○                                |        |        |        |
| Velocity Limit in Circular Interpolation |                        | ○                                |        |        |        |
| Lookahead Contour Control                |                        | ○                                |        |        |        |
| Complete Synchronous Control (Gantry)    |                        | ○                                | —      | ○      | ○      |
| Tool Center Point Control                |                        | —                                | —      | —      | ○      |
| Normal Direction Control                 |                        | —                                | —      | —      | ○      |
| I/O Control (PLC)                        | Control Cycle          | 1 ms                             |        |        |        |
|                                          | Max. Step Number       | 10000                            |        |        |        |
|                                          | Max. Control Points    | I: 800 / O: 800                  |        |        |        |

### Application Sample

- Machining Centers
- Milling and Engraving Machines
- Plasma and Laser Cutting Machines
- Dental Milling Machines
- EDM Machines

### System Configuration



### Sales area and Language



- English
- Japanese
- Korean

Please contact the following address for details.

### For more information

URL : [http://softservo.com/data\\_sheets/S-100M\\_Series\\_DataSheet.pdf](http://softservo.com/data_sheets/S-100M_Series_DataSheet.pdf)

Contact: **SOFT SERVO SYSTEMS, INC.**

272-1 Norieda-cho, Minami-ku, Hamamatsu, 432-8053, Japan

[E-mail: [info@softservo.co.jp](mailto:info@softservo.co.jp)]

TEL: +81-53-444-5771 FAX: +81-53-444-5773

# 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                   | —                                        | ○            |

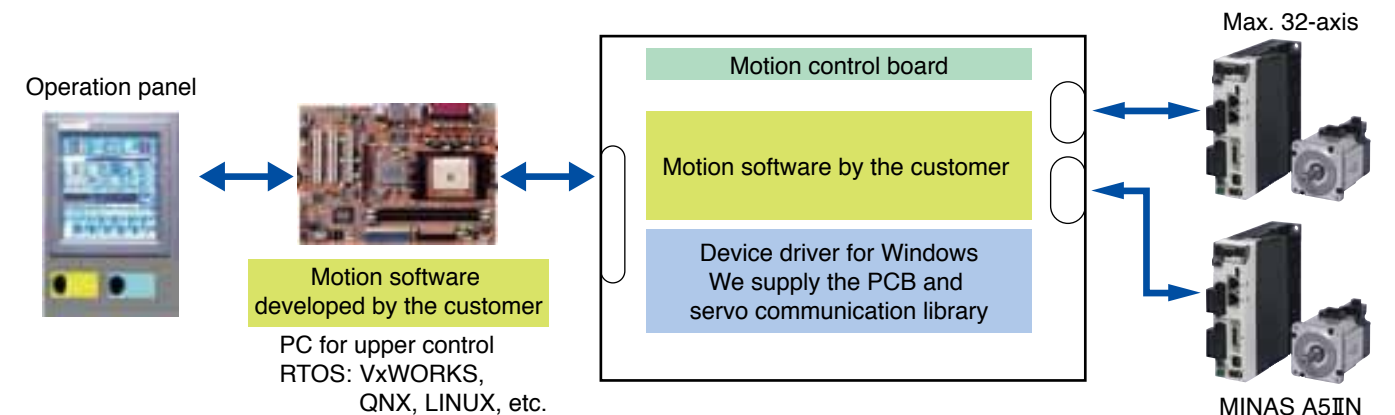
| Item                           | Description              | Remarks                                                                                                                          |
|--------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Architecture                   | <b>CPU</b>               | SH4 HD6417750R 200 MHz                                                                                                           |
|                                | <b>Memory</b>            | FLASH ROM 8 MB<br>SDRAM 16 MB<br>SRAM 128 KB<br>EEPROM 8 KB<br>Shared memory 128 KB<br>with backup function<br>For data transfer |
| Servo interface                | <b>Connector</b>         | RJ-45 × 2                                                                                                                        |
|                                | <b>Interface</b>         | 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 | <b>Interface</b>         | RS-485                                                                                                                           |
|                                | <b>Transmission rate</b> | 115.2 kbps (Max.)                                                                                                                |
| Compatible OS                  |                          | Microsoft Windows XP<br>If you use a different OS, consult us.                                                                   |

## Application Sample

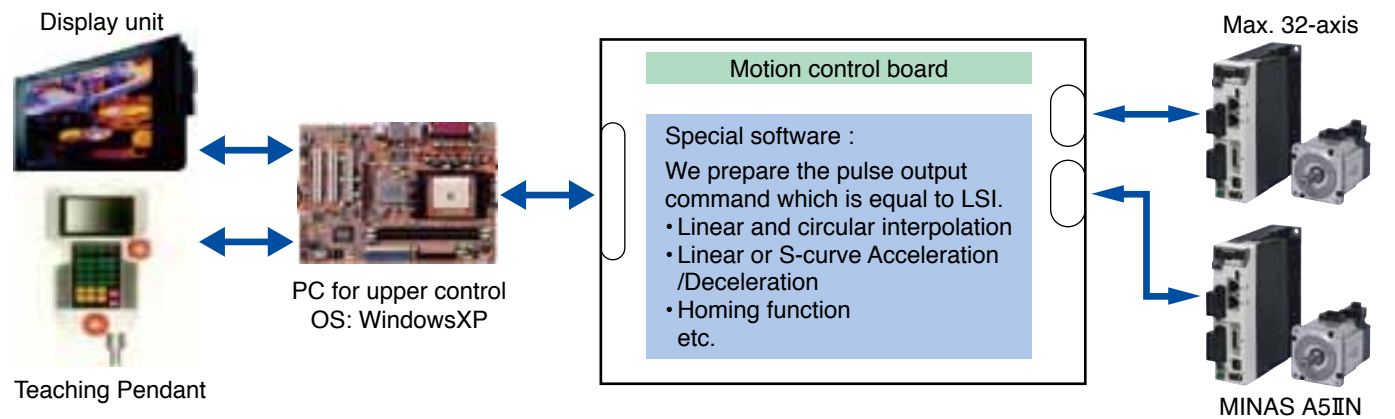
- Semiconductor equipment
- Chip-Mounter
- Machine tool
- Industrial Robot

## 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                  |                                                                 | Item              | Description                 |                         | Remarks                       |
|--------------------------------|-----------------------------------------------------------------|-------------------|-----------------------------|-------------------------|-------------------------------|
| Max. No. of control axes       | 32                                                              | CPU               | SH4 7750R 200 MHz (Renesas) |                         |                               |
| Positioning data quantity      | No limit                                                        |                   | Peripheral clock 50 MHz     |                         |                               |
| Computing period               | 1.0 ms                                                          | Memory            | ROM                         | Flash ROM               | 8 Mbyte                       |
| PLC connection                 | PCI                                                             |                   |                             | EEPROM                  | 8 kbyte                       |
| Interface to servo drive       | RTEX 100 Mbps                                                   |                   | RAM                         | SDRAM                   | 8 Mbyte                       |
| Continuous servo drive         | MINAS A4N/A5IIN series                                          |                   |                             | DPRAM                   | 256 kbyte                     |
| Emergency stop input           | According to host PLC specification *1                          | Bus               | PCI bus interface           | Bus width               | 32-bit                        |
| External signal interface      | According to host PLC specification *1                          |                   |                             | Clock                   | 33 MHz PCI Rev.2.3 compatible |
| Manual signal pulser interface | According to host PLC specification *1                          | Power supply      | Internal power supply       | Main power supply       | 5 V/ 3.3 V                    |
| Various monitoring             | High-speed data processing via PCI bus                          |                   |                             | CPU power supply        | 3.3 V, 1.5 V                  |
| Interpolation                  | Linear, arc, continuous, multiplex, helical pressure control *1 |                   |                             | FPGA                    | 3.3 V, 2.5 V, 1.2 V           |
|                                |                                                                 | Watchdog function | WDT                         | Watching time           | 1.6 s                         |
|                                |                                                                 | Monitor           | LED                         | 2 points                | RUN Green<br>LINK Green       |
|                                |                                                                 |                   |                             |                         |                               |
|                                |                                                                 | Communication     | RS232C                      | 1-ch                    |                               |
|                                |                                                                 |                   | RTEX                        | 1-ch                    |                               |
|                                |                                                                 | Setup             | DIPSW                       | Universal input         | 4                             |
|                                |                                                                 |                   |                             | For JTAG.ICE connection | 1                             |
|                                |                                                                 |                   |                             | For FPGA setting        | 2                             |
|                                |                                                                 | OS                | VxWorks6.4                  |                         |                               |

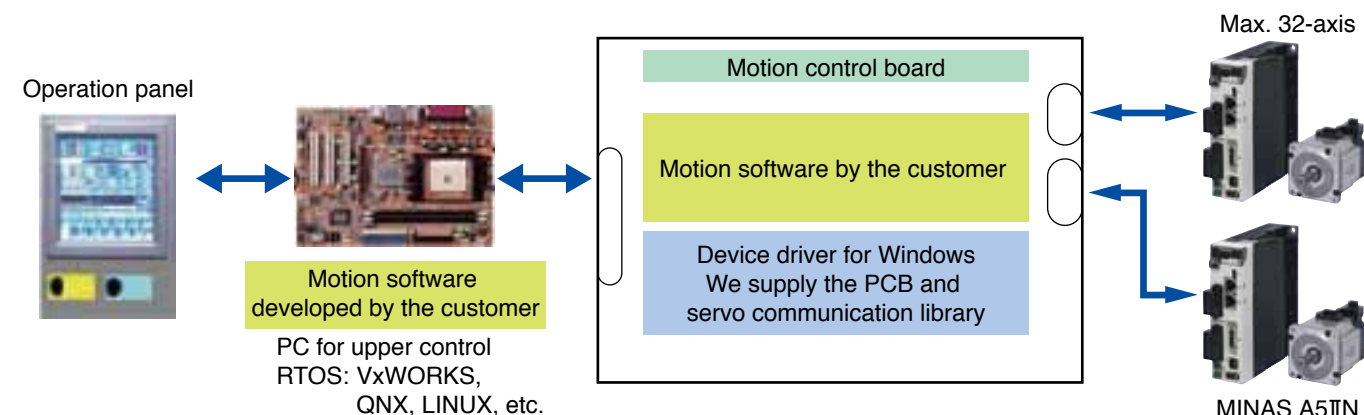
\*1 May be separately defined.

### Application Sample

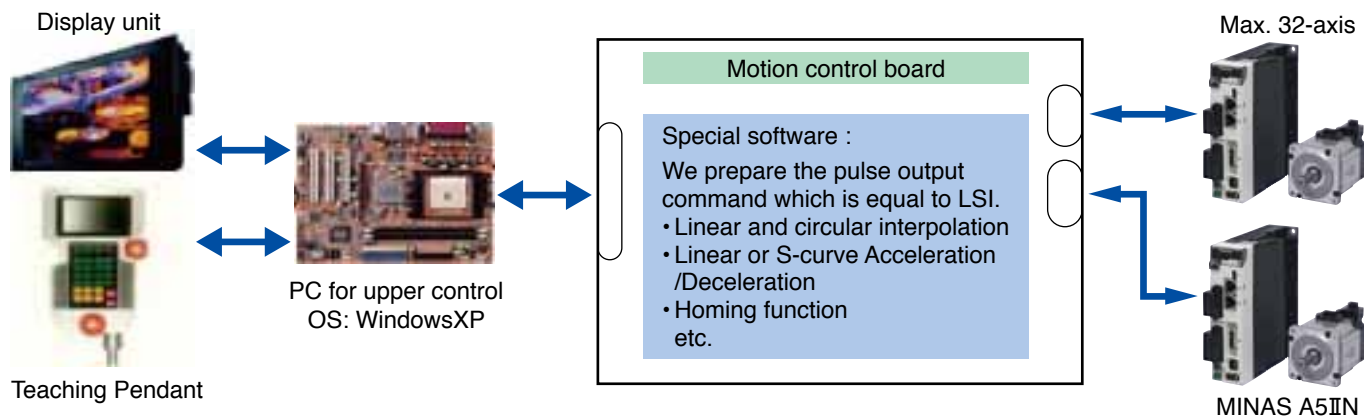
- Semiconductor equipment
- Chip-Mounter
- Machine tool
- Industrial Robot

### 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

## Motion Coordinator MC464 / Panasonic RTEX Interface Module

### Features

- Supports digital drive systems up to 64 axes using multiple RTEX
- Based on 64-bit 400 MHz MIPS processor
- Anybus-CC Module support allowing flexible factory communication options
- High accuracy double floating point / 64-bit integer resolution
- Multi-tasking BASIC programming
- IEC 61131-3 programming support
- Backlit LCD display
- Ethernet programming interface
- Expansion flexibility with clip on modules allowing quick interchangeability
- Built-in Ethernet-IP connectivity



### Specification

| Item               |                                                    | Description                |
|--------------------|----------------------------------------------------|----------------------------|
| <b>MC464</b>       |                                                    |                            |
| System Flexibility | Axes Controlled                                    | Up to 64                   |
|                    | RTEX Drive Networks                                | Up to 7                    |
|                    | Built-in Synchronization Encoder Input             | Yes                        |
| Programming        | Multi-Tasking TrioBASIC                            | Yes                        |
|                    | Number of Simultaneous Programs                    | 30                         |
|                    | Motion Perfect Windows Software                    | Yes                        |
|                    | Stand-Alone operation                              | Yes                        |
|                    | Permanent Flash EPROM for program storage          | Yes                        |
|                    | Available memory for user programs                 | 8 Mbyte                    |
|                    | User table memory                                  | 512000                     |
|                    | Accurate and fast real number mathematics          | 64-bit Int / Double Floats |
|                    | Program Trace Debugger                             | Yes                        |
|                    | Named Constants and variables                      | Yes                        |
| Motion Functions   | Linear, Circular, Helical, Spherical Interpolation | Yes                        |
|                    | Cams, Gearbox, Clutches                            | Yes                        |
|                    | 64-bit position storage                            | Yes                        |
|                    | Acceleration/Deceleration & S-Ramp Controls        | Yes                        |
|                    | 5 Term Control                                     | Yes                        |
|                    | Max Interpolated Axes                              | 64, Multiple groups        |
|                    | Hardware Position Capture (Registration)           | 1 µs                       |
| Interfaces         | Ethernet port                                      | 10/100 Base-T              |
|                    | RS232 Serial Port                                  | 128 kbps                   |
|                    | RS485 Multi-Drop                                   | Yes                        |
|                    | Ethernet IP                                        | Yes                        |
|                    | Modbus TCP                                         | Yes                        |
|                    | Anybus Module                                      | Yes                        |
|                    | Opto-Isolated Inputs                               | 16                         |
|                    | Opto-Isolated Outputs with current limit           | 8                          |
|                    | Max Input / Output Expansion Channels              | 512                        |
|                    | CAN Analogue Inputs Capability                     | Yes                        |
|                    | Real Time Clock                                    | Yes                        |
|                    | SD Card                                            | Programs and data          |
| Packaging          | Module case style                                  | DIN Rail / Panel Mount     |
|                    | Module size (H x W x D)                            | 201 mm x 155 mm x 56 mm    |
|                    | UL and CE marked for EMC                           | Yes                        |

| Item                                   | Description                                       |
|----------------------------------------|---------------------------------------------------|
| <b>Panasonic RTEX Interface Module</b> |                                                   |
| Network                                | Ethernet based MINAS A4N / A5IIN                  |
| Network Speed                          | 100 Mbps 1msec or 500 usec update operation       |
| Topology                               | Ring                                              |
| Max Slaves per Interface Ring          | 32                                                |
| Max Interfaces per MC464               | 7                                                 |
| Max Axes per MC464                     | 64                                                |
| Bus to MC464                           | 32-bit                                            |
| Registration Inputs                    | 8 x 24 V Inputs + 1 Drive Registration Input/Axis |
| Optically Isolated registration Inputs | Y                                                 |
| Map Any I/O to Any Axis                | Y                                                 |
| Supported Modes                        | Cyclic Position, Cyclic Speed, Cyclic Torque      |

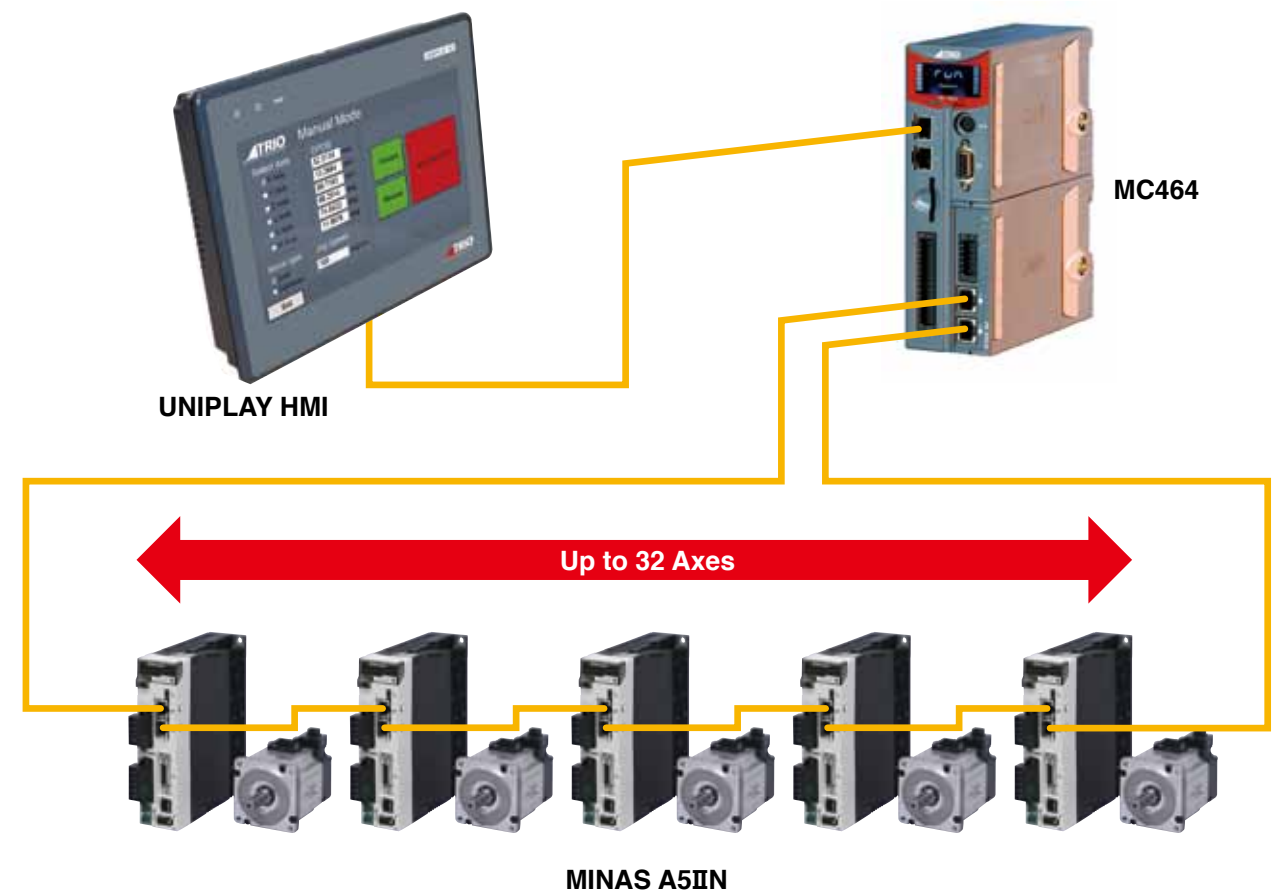
### Application Sample

URL : Sample applications

[http://www.triomotion.com/tmt3/sitefiles/motion\\_control/applications.asp#section=overview](http://www.triomotion.com/tmt3/sitefiles/motion_control/applications.asp#section=overview)

Please refer to the sample and typical applications for the MC464 with A5IIN 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.com/tmt3/sitefiles/products/exp\\_mod\\_panasonic.asp#section=one](http://www.triomotion.com/tmt3/sitefiles/products/exp_mod_panasonic.asp#section=one)

URL: The specifications for the MC464

<http://www.triomotion.com/tmt3/sitefiles/products/mc464.asp#section=one>

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

## Motion Coordinator MC4N-Mini /Panasonic RTEX Interface Module

### Features

- Up to 32 RTEX Digital Drive Axes
- 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
- IEC 61131-3 Programming
- Multi-tasking BASIC Programming
- Ethernet-IP / Modbus TCP / Trio ActiveX / Uniplay HMI / UDP / Ethernet Interface Built-In
- Precise 64Bit Motion Calculations with 532 MHz ARM 11 Processor

- 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 |
|-----------------------|------------------------------------|------------------|-------------|
| <b>MC4N-Mini RTEX</b> |                                    |                  |             |
| Configuration         | Axis 0                             | Extended         |             |
| Axes                  | Max axes                           | 32               |             |
|                       | Max virtual axes                   | 32               |             |
| Performance           | Processor                          | ARM11            |             |
|                       | Clock frequency                    | 532 MHz          |             |
|                       | Servo update rate                  | 1 ms-500 $\mu$ s |             |
|                       | 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              |             |
|                       | CANopen                            | Yes              |             |
|                       | Ethernet (10/100) base-T           | Yes              |             |
|                       | Ethernet IP                        | Yes              |             |
|                       | MODBUS-RTU                         | Yes              |             |
|                       | MODBUS-TCP/IP                      | Yes              |             |
|                       | RS232/RS485                        | Yes              |             |
|                       | Anybus support                     | No               |             |
|                       | Hostlink                           | Yes              |             |
|                       | Feedback input                     | No               |             |
| Encoder Ports         | Reference input                    | Yes              |             |
|                       | Pulse + direction output           | Yes              |             |
|                       | Incremental (A+B) output           | Yes              |             |
| Built-in I/O          | Inputs 24 Vdc                      | 8                |             |
|                       | Outputs 24 Vdc                     | No               |             |
| Expansion I/O         | Bi-directional I/O 24 Vdc          | 8                |             |
|                       | 0-10 V analogue inputs             | No               |             |
| Programming           | $\pm$ 10 V analogue Outputs        | No               |             |
|                       | # registration inputs              | 4                |             |
| Software              | Registration input speed           | 1 $\mu$ s        |             |
|                       | Digital I/O points                 | 1024             |             |
| Physical              | 12 bit $\pm$ 10 V analogue inputs  | 32               |             |
|                       | 12 bit $\pm$ 10 V analogue outputs | 16               |             |
| Power                 | TrioBASIC                          | Yes              |             |
|                       | # programs                         | 32               |             |
| Certification         | # tasks                            | 22               |             |
|                       | IEC61131 Runtime                   | Yes              |             |
| Expansion             | Kinematic Runtime                  | Option           |             |
|                       | G-Code                             | Yes              |             |
| Physical              | HPGL                               | Yes              |             |
|                       | DXF import                         | Yes              |             |
| Power                 | Motion Perfect v3                  | Yes              |             |
|                       | All Support Software               | Yes              |             |
| Physical              | Memory slot card                   | SD               |             |
|                       | Width x Height x Depth (mm)        | 40 x 157 x 120   |             |
| Power                 | Weight                             | 432 g            |             |
|                       | Mounting                           | Panel            |             |
| Certification         | Operating Temp                     | 0 - 45°          |             |
|                       | Supply Voltage dc                  | 24 V             |             |
| Physical              | Consumption (exc. I/O)             | 350 mA           |             |
|                       | CE approval                        | Yes              |             |
| Power                 | RoHS Compliant                     | Yes              |             |
|                       |                                    |                  |             |

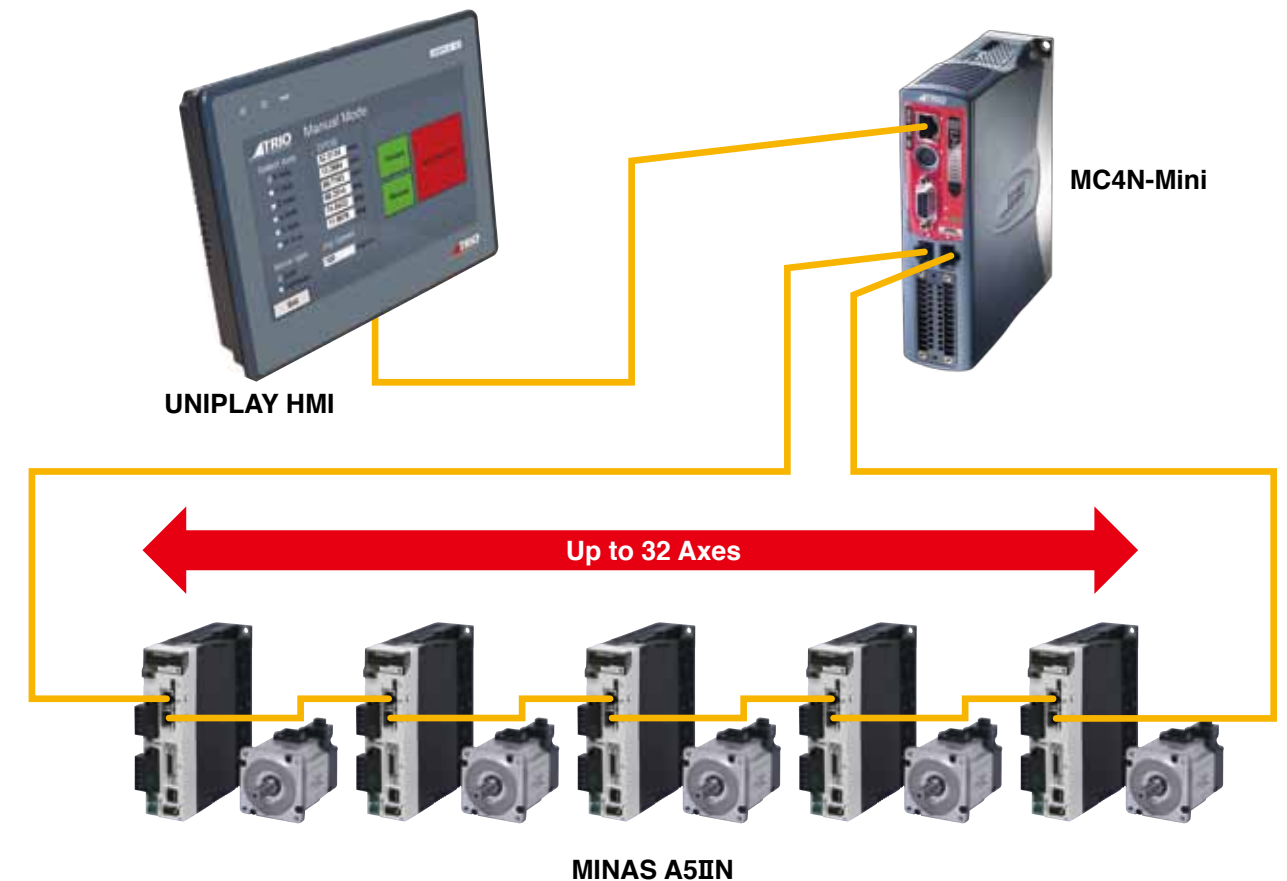
### Application Sample

URL : Sample applications

[http://www.triomotion.com/tmt3/sitefiles/motion\\_control/applications.asp#section=overview](http://www.triomotion.com/tmt3/sitefiles/motion_control/applications.asp#section=overview)

Please refer to the sample and typical applications for the MC4N with A5B as shown above URL.

### System Configuration



### Sales area and Language



• English

Please contact the following address for details.

### For more information

URL: MC4N-Mini RETEX Master

[http://www.triomotion.com/tmt3/sitefiles/motion\\_control/applications.asp#section=overview](http://www.triomotion.com/tmt3/sitefiles/motion_control/applications.asp#section=overview)

Contact: **Trio Motion Technology Ltd.**

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

# Motion Master Control Board

## HCRTEXsd (-PCI)

### Features

- **Motion of up to 32 axes (nodes) can be controlled from the single board.**  
The board can control up to 32 nodes of axes and peripheral devices.
- **Simple sequence function reduces the load on host PC.**
- **Parameters and status of servo drive and motor can be uniformly managed from the host.**  
Parameter setting and changing of servo drive (MINAS-A5II), various monitoring (alarm, limit signal, etc.), diagnosis of condition and troubleshooting can be easily performed.
- **Flexible expandability by expanding peripheral lineup**  
In addition to control of MINAS-A5II, system can be extended to the desired degree by making use of peripheral boards (DI/DO board, Stepper drive board and pulse output board).
- **Full software control**  
Speed (linear, S-curve acceleration/deceleration) and trajectory (linear and arc interpolation) are fully controlled by software, precisely at a low cost.



HCRTEXsd



HCRTEXsd-PCI

### Specification

| Item                |                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                         |
|---------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Part number         |                                    | HCRTEXsd                                                                                                                                                                                                                                                                                                                                                                                                           | HCRTEXsd-PCI                                                            |
| Board specification | Host interface                     | USB2.0 Highspeed (480 Mbps)                                                                                                                                                                                                                                                                                                                                                                                        | PC15 V/3.3 V signal environment compatible (PCI Spec2.1 Target)         |
|                     | Power supply                       | 24 V <sub>DC</sub> ±15 % 300 mA MAX                                                                                                                                                                                                                                                                                                                                                                                | +3.3 V <sub>DC</sub> , 0.96 A (TYP)<br>+5 V <sub>DC</sub> , 0.2 A (TYP) |
|                     | Operating temperature and humidity | 0 °C to 50 °C, 85 %RH max. (no dewing)                                                                                                                                                                                                                                                                                                                                                                             |                                                                         |
|                     | Outline dimensions (mm)            | W130 × D150 × H30                                                                                                                                                                                                                                                                                                                                                                                                  | W167.64 × D64.41 (PCB only)<br>1 slot, LowProfile compatible            |
| Board function      | No. of control nodes               | 32                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |
|                     | Motion control                     | Positioning control by software                                                                                                                                                                                                                                                                                                                                                                                    |                                                                         |
|                     | Motion function                    | <ul style="list-style-type: none"> <li>• Positioning, linear and arc (continuous)</li> <li>• Linear, S-curve acceleration/deceleration (triangle driving avoidance function)</li> <li>• Software accurately maintains arc circumferential velocity constant</li> <li>• Simple sequence function</li> <li>• Setting and reading of servo drive (MINAS-A5II) parameters</li> <li>• Other motion functions</li> </ul> |                                                                         |

### Specification

#### MCRTEX2sd



#### 2-axis pulse output board

- One board can control 2-axis motor (occupies 2 blocks)
- 1 pulse/2 pulse/2-phase pulse output is possible. Pulse train input type drive can be connected, regardless of stepping or servo. (Differential output)
- Up to 8 Mpps pulse can be output, enabling high speed, high resolution control.
- Feedback pulse counting is possible. UP/DOWN, A/B phase (multiplied by 1/2/4) signals can be used for counting.

#### INRTEX16sd/OTRTEX16sd



#### DI board and DO board

- INRTEX16sd**
- Input configuration : Photocoupler isolated
  - No. of inputs : 16
  - Rated voltage : +24 V<sub>DC</sub>
- OTRTEX16sd**
- Output configuration : Photocoupler isolated open collector (sink)
  - No. of outputs : 16
  - Output rated voltage : +24 V<sub>DC</sub>
  - Output rated current : 100 mA Max.

#### ADRTEX2sd

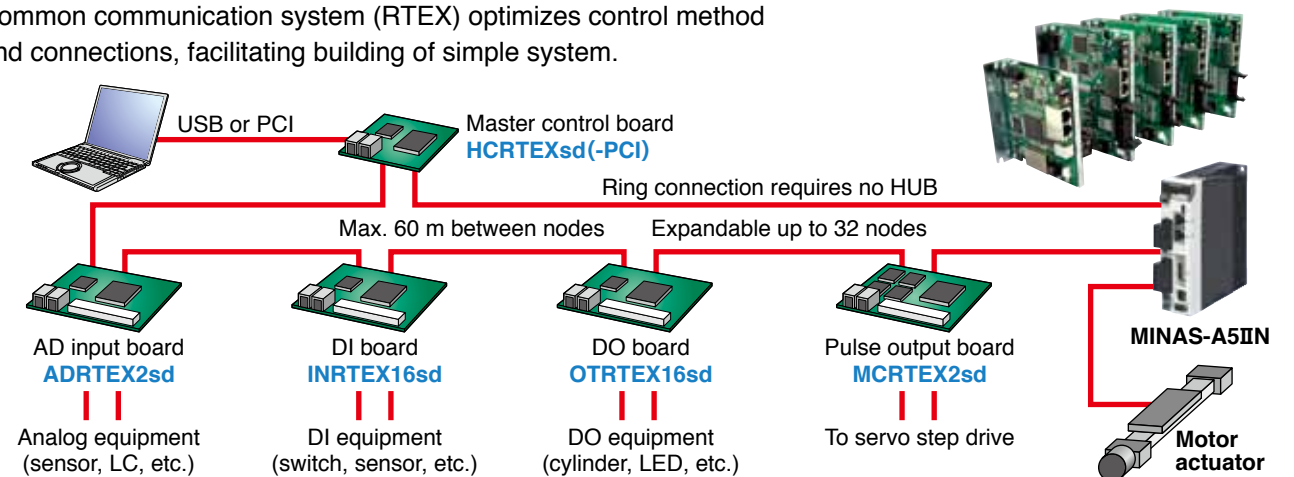


#### 2-ch analog input board

- No. of input channels: 2
- Input configuration : Differential/single end
- Input range : ±10 V, ±5 V, 0-0 V
- Resolution : 12-bit
- Conversion mode : Free run/external trigger

### System Configuration

- Common communication system (RTEX) optimizes control method and connections, facilitating building of simple system.



### 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.hp-vanguard.com/>

Contact: **Vanguard Systems INC. ME Div. Sales Dept.** [E-mail: [sales-div1@hp-vanguard.com](mailto:sales-div1@hp-vanguard.com)]  
1-27-23, Higashitokorozawa, Tokorozawa-shi, Saitama 359-0021, Japan TEL: +81-4-2951-5381 FAX: +81-4-2951-5383

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

## RTEX corresponding table and ASIC information

### RTEX partner products

#### [Corresponding table]

| Partner                                                                              | Master |     |             |     | Slave       |            |              |                |         |
|--------------------------------------------------------------------------------------|--------|-----|-------------|-----|-------------|------------|--------------|----------------|---------|
|                                                                                      | PCI    | USB | Stand Alone | PLC | Digital I/O | Analog I/O | Pulse Output | Stepper Driver | Gateway |
| AJINTEK CO., LTD.                                                                    | ●      |     |             |     | ●           | ●          | ●            |                |         |
| Anywire Corporation                                                                  |        |     |             |     |             |            |              |                | ●       |
| Asahi Engineering Co., Ltd.                                                          |        |     | ●           |     |             |            |              | ●              |         |
| Aurotek Corporation                                                                  | ●      |     |             |     | ●           |            | ●            |                |         |
| Delta Tau Data Systems, inc.                                                         |        |     | ●           |     |             |            |              |                |         |
| Panasonic Industrial Devices SUNX Co., Ltd                                           |        |     |             | ●   |             |            |              |                |         |
| Prime Motion Inc.                                                                    |        |     | ●           |     | ●           |            |              |                |         |
| Shanghaai Bitpass Automation Technology Development Co., Ltd with Cosmoteck Co.,Ltd. | ●      |     |             |     | ●           |            | ●            | ●              |         |
| SOFT SERVO SYSTEMS, INC.                                                             | ●      |     |             |     |             |            |              |                |         |
| TIETECH Co., Ltd.                                                                    | ●      |     |             | ●   |             |            |              |                |         |
| Trio Motion Technology Ltd.                                                          |        |     | ●           |     |             |            |              |                |         |
| Vanguard Systems Inc.                                                                | ●      | ●   |             |     | ●           | ●          | ●            |                |         |

### Communication ASIC MNM1221

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



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

Note: As long as the target is noncompetitive to Panasonic products. For disclosure of technical data, nondisclosure agreement (NDA) is required. For details, consult us.

# RS485 Communication

## MINAS A5A series



### AE-LINK

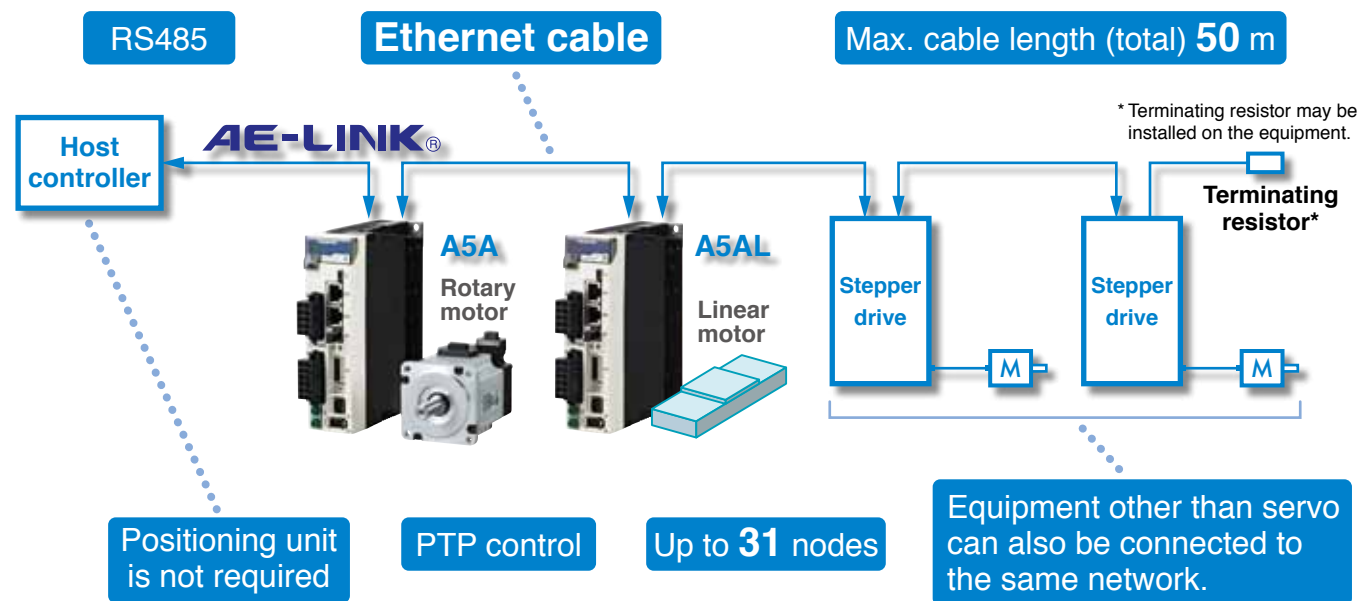
### RS485 open network

PTP control by servo built-in positioning function

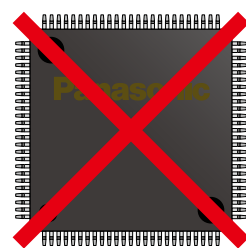
- Positioning unit is not required
- Universal RS485 communication without using specific IC
- Low cost with Ethernet cable
- Adopted New Algorithm “Two-degree-of-freedom control” (2DOF) to improve productivity and machining accuracy.



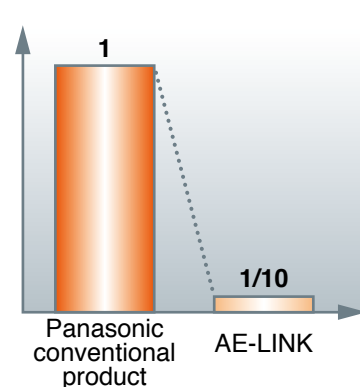
[Typical system configuration]



● Application specific IC is not required.



● Cable cost 1/10



● Network specification

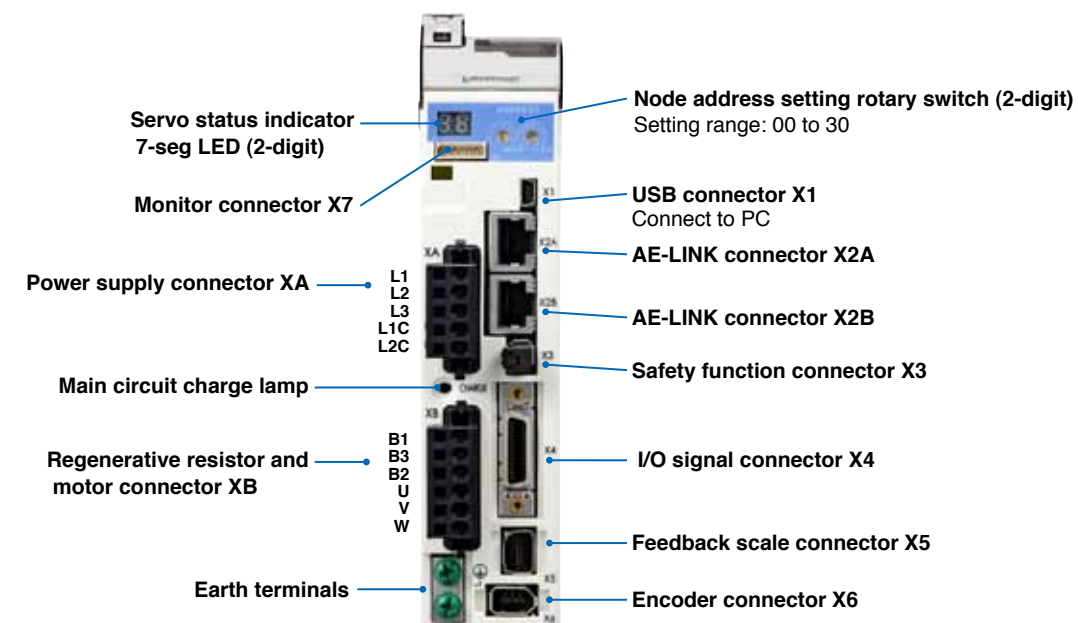
| Item                 | Description                            |
|----------------------|----------------------------------------|
| Communication rate   | 38.4/307.2 kbps                        |
| Physical layer       | RS485 half duplex                      |
| Cable                | Shielded twisted pair cable            |
| Communication period | Approx. 1 ms/axis (@307.2 kbps)        |
| Topology             | Bus (terminating resistor is required) |
| Operating command    | Target position                        |

### Drive list

|                    |                               | 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     |
| Drive power supply | Single phase 100 to 120 VAC   | Frame              | A                | A                | B                | C                |                  |                  |                  |                  |
|                    |                               | Driver Part No.    | MADH T1105 A * * | MADH T1107 A * * | MBDH T2110 A * * | MCDH T3120 A * * |                  |                  |                  |                  |
|                    | Single/3-phase 200 to 240 VAC | Frame              | A                |                  | A                | B                | C                | D                |                  |                  |
|                    |                               | Driver Part No.    | MADH T1505 A * * |                  | MADH T1507 A * * | MBDH T2510 A * * | MCDH T3520 A * * | MDDH T5540 A * * |                  |                  |
|                    | 3-phase 200 to 230 VAC        | Frame              |                  |                  |                  |                  |                  | E                | F                | F                |
|                    |                               | Driver Part No.    |                  |                  |                  |                  |                  | MEDH T7364 A * * | MFDH TA390 A * * | MFDH TB3A2 A * * |

● Some motors do not match model numbers in the table. Check correct combination in the A5 family catalog.

### Appearance



Dimensions (mm): W40 × H150 × D135 (A frame)

### Applicable standards



# PLC Direct Access AE-LINK Motion Controller

**PI-1200 (RS-232C) / PI-1300 (Ethernet)**

## Features

### Building a motion network at low cost under PLC

#### ● PLC direct 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

Motors can be controlled by operating PLC data register.

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

#### ● Stepping motor can be mixed

- The motion network can contain servo motor and stepping motor.



PI-1200

PI-1300

## Specification

| Item                               | Description                                                                                                                                                |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply                       | 24 V <sub>DC</sub> ±10 % 300 mA MAX                                                                                                                        |
| Operating temperature and humidity | 0 °C to 50 °C, 90 %RH max. (no dewing)                                                                                                                     |
| Outline dimensions (mm)            | W24 × D110 × H150 (PI-1200), W25 × D109 × H184 (PI-1300)                                                                                                   |
| Communication with PLC             | PI-1200: RS-232C 115.2 kbps/38.4 kbps Conforms to various corporate protocols.<br>PI-1300: Ethernet 10/100 BASE-T Conforms to various corporate protocols. |
| Program loader                     | RS-232C 38.4 kbps                                                                                                                                          |
| Control signal I/O                 | Initialization input, system alarm output and node alarm output                                                                                            |
| Motion network                     | AE-LINK 307.2 kbps/38.4 kbps (Selection on DIP switch)                                                                                                     |
| No. of connection nodes            | Max. 16                                                                                                                                                    |
| Motion control                     | PTP (Point to Point)                                                                                                                                       |

# AE-LINK Compatible Stepping Motor Drive Series

## Features

### Building servo and step mixed motion network at a low cost

#### ● Drive has built-in software NC, requiring no host NC controller

#### ● High performance CPU enhances drive functionalities

- Built-in origin return function
- Triangle driving prevention function
- Step-out detection function
- Motor over current protection function
- Vibration suppression function

#### ● Up to 31 axes can be connected to the same network (Depending on the master specification)



## Specification

| Part No. | Input power supply       | Applicable motor | Driving capacity | Step-out detection | Drive outline                                   |
|----------|--------------------------|------------------|------------------|--------------------|-------------------------------------------------|
| D4730S   | 24 V <sub>DC</sub>       | 2-phase          | 1.5 A/phase      |                    | Board type micro step drive                     |
| D3080S1  | 24 to 48 V <sub>DC</sub> | 2-phase          | 2.55 A/phase     | ○                  | High precision micro step drive                 |
| D3080S2  | 24 to 48 V <sub>DC</sub> | 2-phase          | 5.1 A/phase      | ○                  | High precision high power micro step drive      |
| D4390S   | 100 VAC                  | 2-phase          | 2.55 A/phase     | ○                  | AC supply input high precision micro step drive |
| D4370S   | 24 V <sub>DC</sub>       | 5-phase          | 1.5 A/phase      |                    | Board type half step drive                      |
| D4130S   | 24 V <sub>DC</sub>       | 5-phase          | 1.5 A/phase      |                    | High precision micro step drive                 |

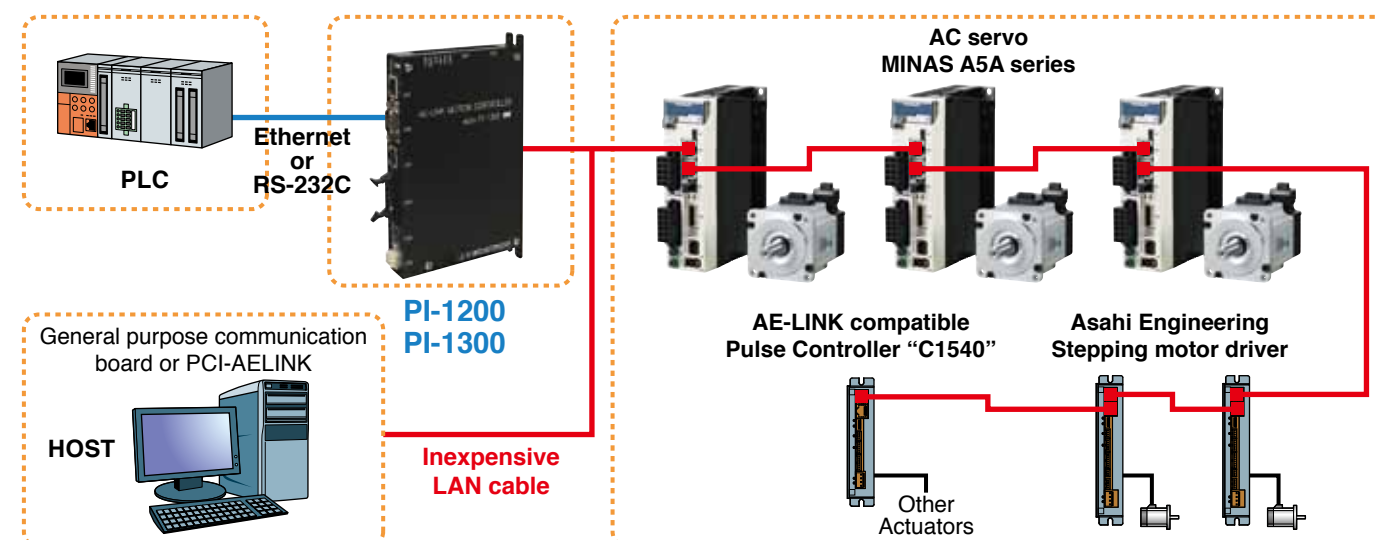
## Application Sample

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

“AE-LINK” is a serial communications protocol published by ASAHIENGINEERING CO.,LTD in 1996 for use with motor drivers, sensor, actuator.

In actual many equipment manufacturers have adopted a variety of more than 15 years.

## System Configuration



- (1) Accessing PLC data register from PI controller over Ethernet or RS-232C
- (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](mailto:ae-sales@asahi-engineering.co.jp)]  
TEL: +81-42-342-4422 FAX: +81-42-342-4423

# EtherCAT communication driver

## MINAS A5B series

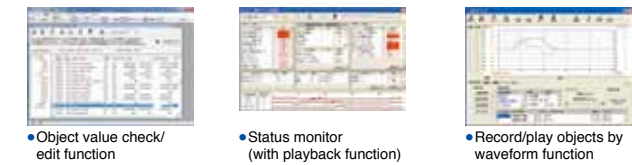


### High-Performance

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

### Operability

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

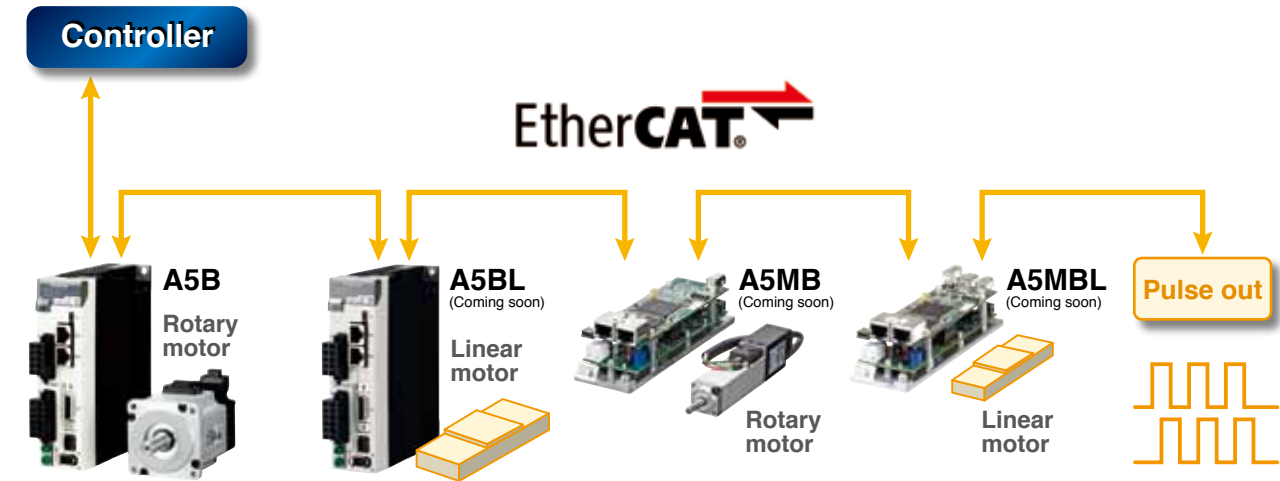


### Standards

- 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.) |
| Minimum cycle time      | 250 μs                                        |

### 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.

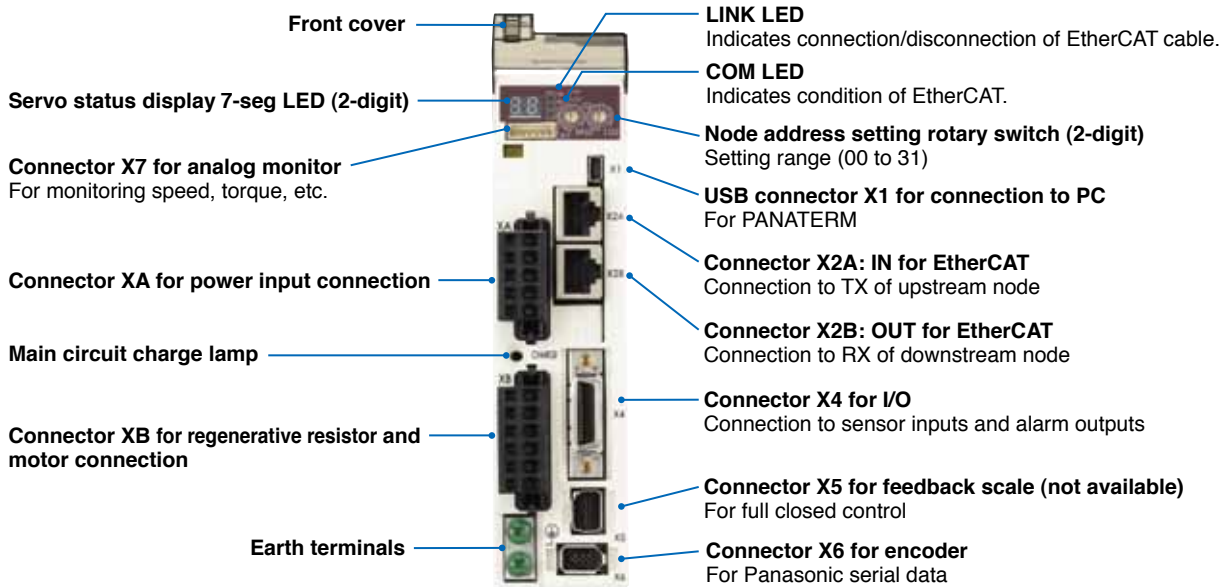


### Drive list

|                    |                               | 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                                | 7.5 kW                                      | 11 kW to 15 kW                              |
| Drive power supply | Single phase 100 to 120 VAC   | Frame A<br>Driver Part No. MADH T1105 B * * | Frame A<br>Driver Part No. MADH T1107 B * * | Frame B<br>Driver Part No. MBDH T2110 B * * | Frame C<br>Driver Part No. MCDH T3120 B * * |                                             |                                             |                                             |                                             |                                             |                                             |                                             |
|                    | Single/3-phase 200 to 240 VAC | Frame A<br>Driver Part No. MADH T1505 B * * | Frame A<br>Driver Part No. MADH T1507 B * * | Frame B<br>Driver Part No. MBDH T2510 B * * | Frame C<br>Driver Part No. MCDH T3520 B * * | Frame D<br>Driver Part No. MDDH T5540 B * * |                                             |                                             |                                             |                                             |                                             |                                             |
|                    | 3-phase 200 to 230 VAC        |                                             |                                             |                                             |                                             |                                             |                                             | Frame E<br>Driver Part No. MEDH T7364 B * * | Frame F<br>Driver Part No. MFDH TA390 B * * | Frame F<br>Driver Part No. MFDH TB3A2 B * * | Frame G<br>Driver Part No. MGDH TC3B4 B * * | Frame H<br>Driver Part No. MHDH TC3B4 B * * |
|                    | 3-phase 380 to 480 VAC        |                                             |                                             |                                             |                                             | Frame D<br>Driver Part No. MDDH T2412 B * * | Frame D<br>Driver Part No. MDDH T3420 B * * | Frame E<br>Driver Part No. MEDH T4430 B * * | Frame F<br>Driver Part No. MFDH T5440 B * * | Frame F<br>Driver Part No. MFDH TA464 B * * | Frame G<br>Driver Part No. MGDH TB4A2 B * * | Frame H<br>Driver Part No. 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.  
D1 : For rotary motor (standard)  
21 : For rotary motor + safety circuit I/F  
L1 : For linear motor (Coming soon)  
91 : For linear motor + safety circuit I/F (Coming soon)

### Appearance



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

### Applicable standards

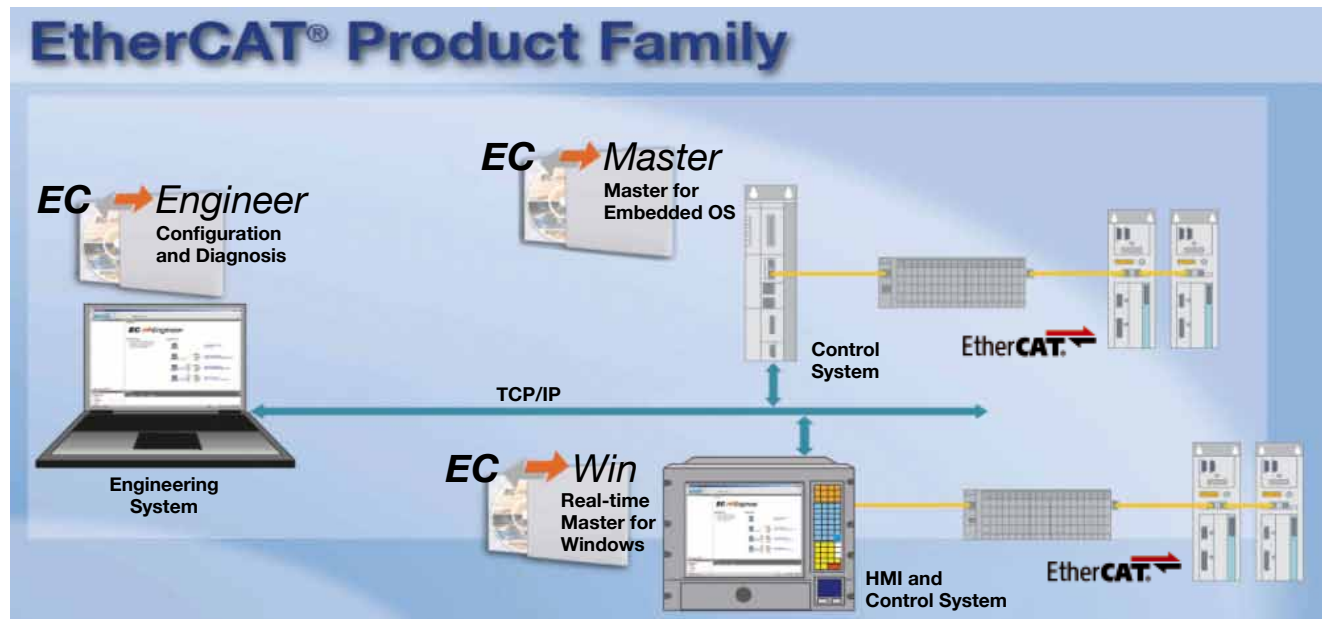


# EtherCAT® Product Family

## 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

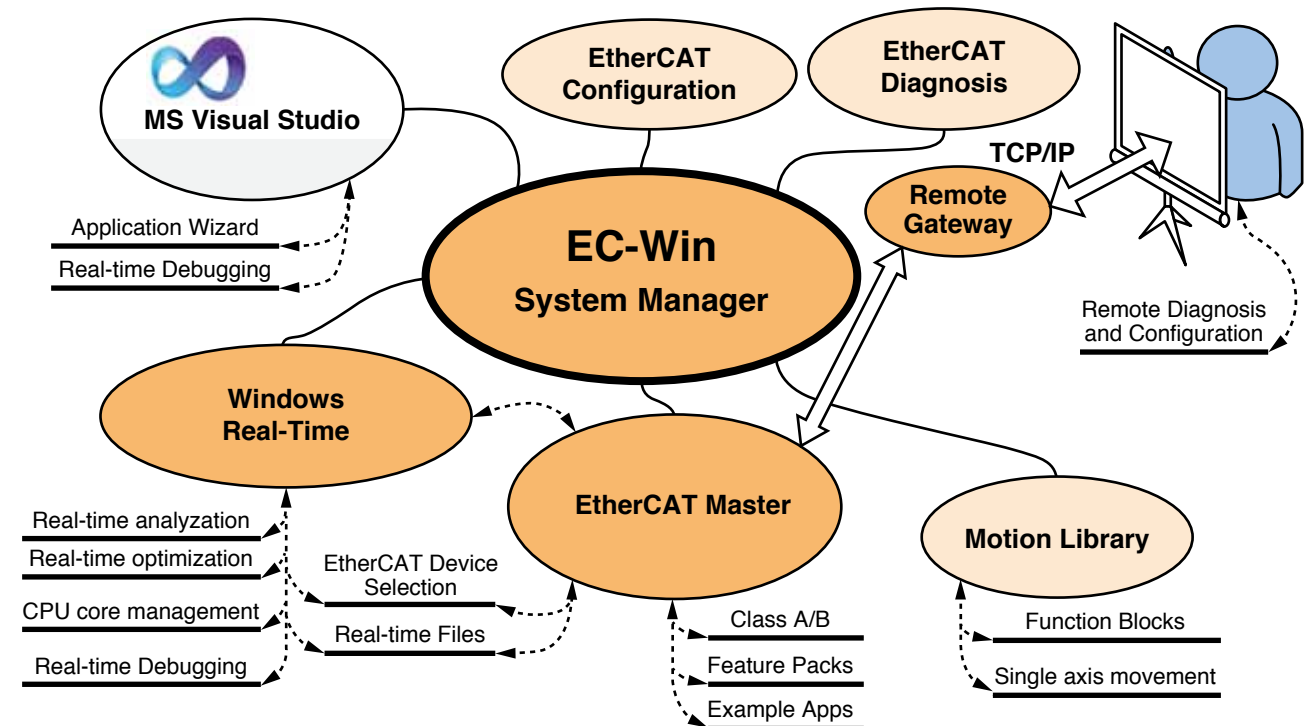


CNC



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](mailto:sales@acontis.com)]

TEL: +49-751-560-3030

# Intel® Atom™ Processor E3845 1.9 GHz-based EtherCAT Master Controller Supporting IEC 61131-3 Talos-3012

## Features

- Powered by ADLINK Softmotion
- Supports IEC 61131-3-compliant programming environment
- Minimal control cycle time as low as 250 μs
- Motion control of up to 64 axes and up to 10,000 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

| Item                            |                             | Description                                          |
|---------------------------------|-----------------------------|------------------------------------------------------|
| <b>Processor</b>                |                             | Intel® Atom™ Processor E3845 1.9 GHz                 |
| <b>Controllable Motion Axis</b> |                             | 16/32/64                                             |
| <b>Controllable I/O Points</b>  |                             | Up to 10000 points                                   |
| <b>Control Cycle Time</b>       |                             | 250 us (min.)                                        |
| <b>Memory</b>                   | RAM (Program & Data Memory) | 2 GB DDR3                                            |
|                                 | Retain Memory               | Configurable on SD card                              |
|                                 | Storage (Data Usage)        | 16 GB SSD / SD Card                                  |
| <b>Field Bus Connectivity</b>   |                             | 1 for EtherCAT                                       |
| <b>Ethernet Connectivity</b>    |                             | 1 GbE                                                |
| <b>System Indicators</b>        |                             | 3 User-defined                                       |
| <b>Programming Environment</b>  |                             | CoDesys v3                                           |
|                                 |                             | IEC 61131-3-Compliant                                |
| <b>Supply Voltage</b>           |                             | 9-32 VDC wide-range DC input                         |
| <b>Environment Certificate</b>  |                             | Vibration: 5 Grms, 5-500 Hz                          |
|                                 |                             | Shock: 50 G, Half Sine 11 ms duration                |
|                                 |                             | EMC: EN 550111 class A                               |
| <b>Operating Temperature</b>    |                             | -20 °C ~ 60 °C (-4 °F to 140 °F)                     |
| <b>Dimension</b>                |                             | 120 (W) × 100 (D) × 55 (H) mm (4.68" × 3.9" × 2.17") |

## Software Support

### ● IEC-61131-3 compliant Environment

Support 5 different PLC Programming Languages

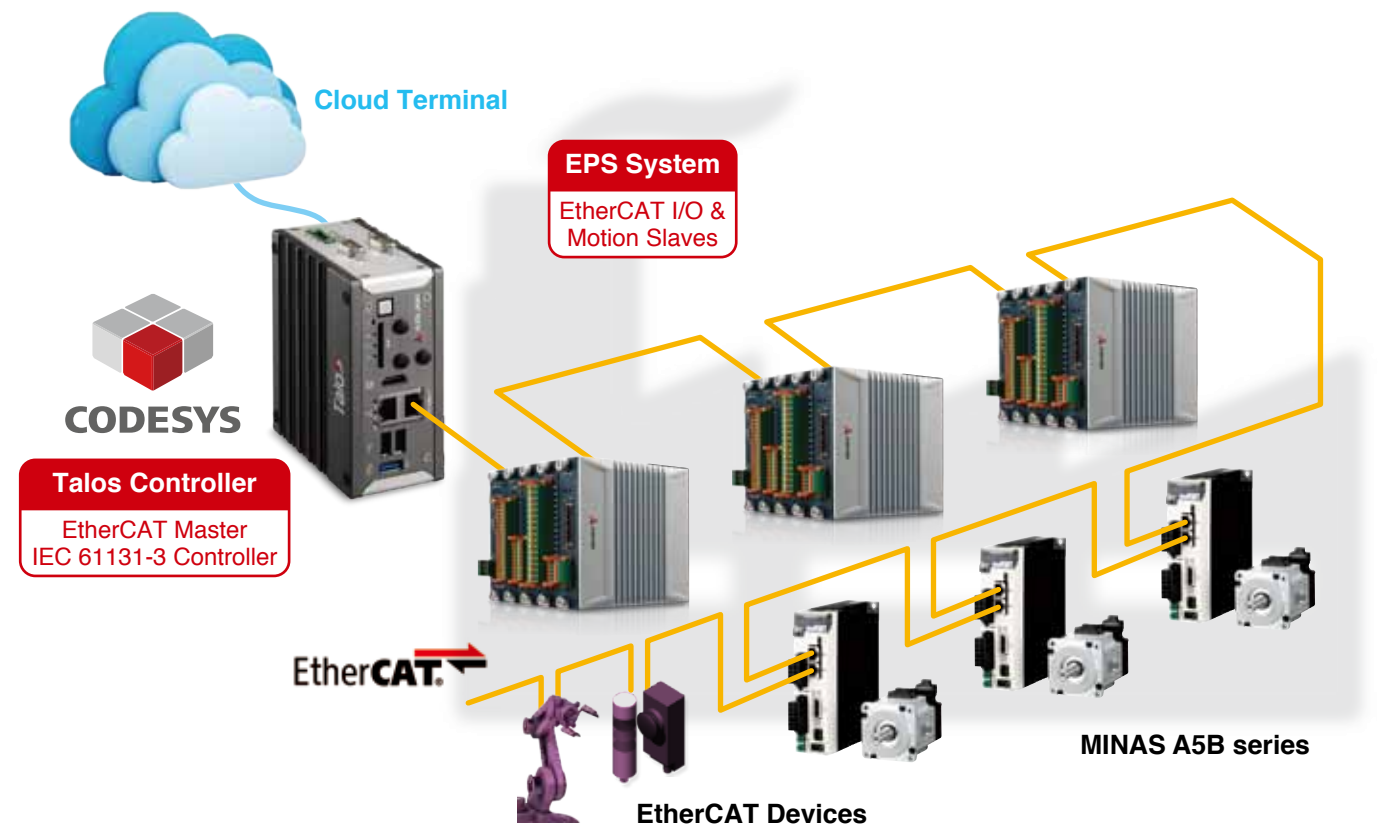


- LD
- IL
- FBD
- ST
- SFC

### ● ADLINK Softmotion Inside



## System Configuration



## Sales area and Language



- English
- S/T Chinese

## For more information

URL : [Http://www.adlinktech.com](http://www.adlinktech.com)

Contact: **ADLINK Technology, Inc.**  
9F, No.166 Jian Yi Road, Zhonghe District, New Taipei City 235, Taiwan  
[E-mail: [service@adlinktech.com](mailto:service@adlinktech.com)]  
TEL: +886-2-8226-5877 FAX: +886-2-8226-5717

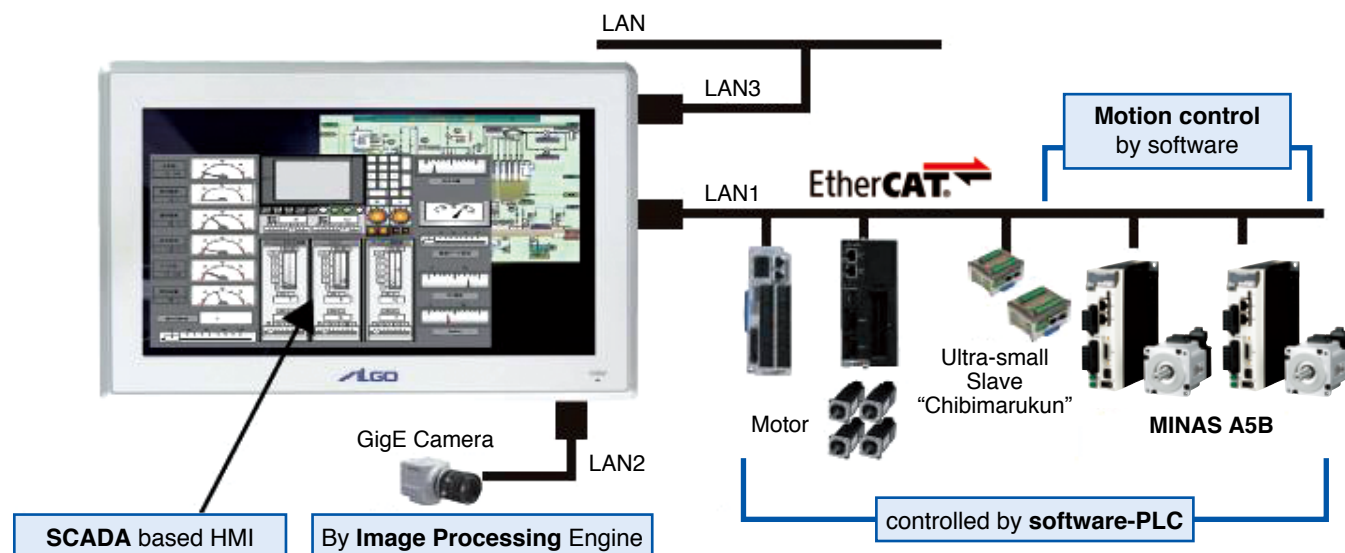
## EtherCAT master

“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

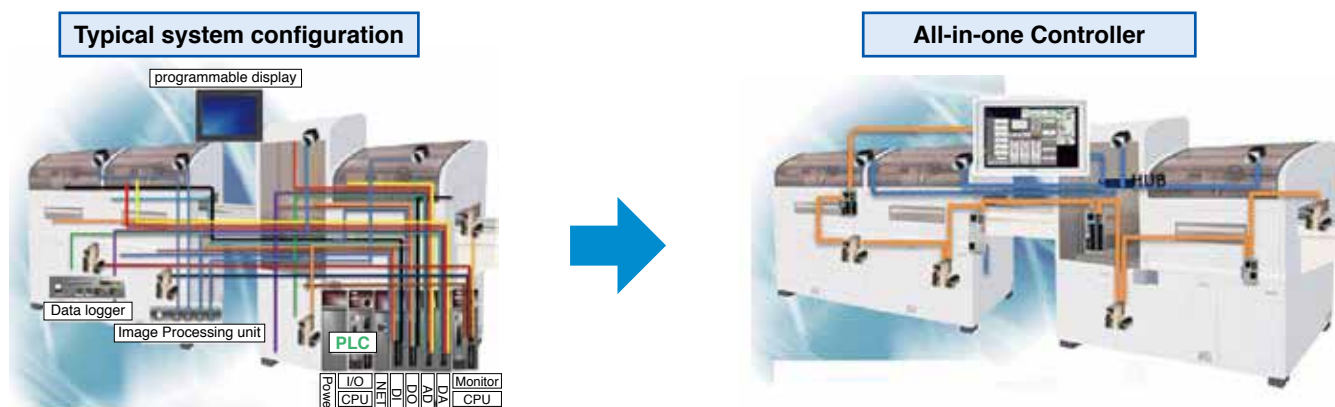
Free switch off

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

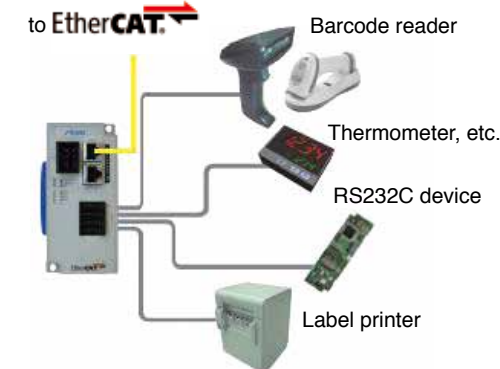
##### MIL connector terminal block

- 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.

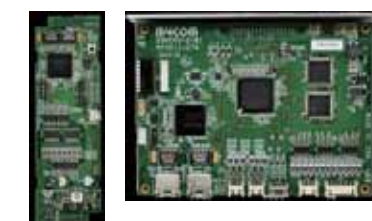
#### Motion controller

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

#### Encoder input

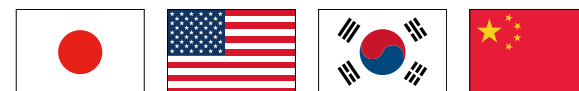
- Line receiver input
- Open collector input

#### 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](mailto:itami@algosystem.co.jp)]

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

## Software PLC/ NC/ CNC

### TwinCAT 3

#### Features



#### PC-based Control

- One tool for PLC, Motion and HMI
- Scalable performance
- Support of multi-core CPUs
- Integrated automation and IT technologies

### Real-time control system in PC-based system

#### Software PLC/NC/CNC TwinCAT® 3

#### 1) IEC 61131-3 3rd edition

Integration of Microsoft Visual Studio® supports object-oriented extensions of the 3rd edition of IEC 61131-3 (IL, ST, FBD, LD, SFC) + CFC

#### 2) Development environment

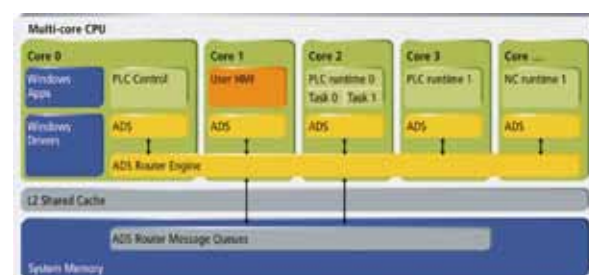
Supports C/C++ and MATLAB®/Simulink® in real-time environments and .NET/C# in programming

#### 3) Link to MATLAB®/Simulink®

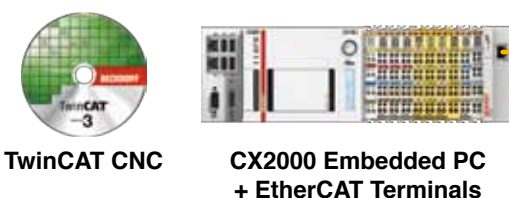
Link to MATLAB®/Simulink® optimizes development and simulation

#### 4) Multi-core CPU support

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



#### System Configuration



- PC-based controller with TwinCAT supports multi-core and maximizes EtherCAT performance
- Compact controller on a DIN rail (CX2000 series)
- TwinCAT PLC processes real-time tasks in 50 µs and controls motion systems in 125 µs

**EtherCAT**

MINAS A5B



## Embedded PC

### CX2000 series

#### Features



- Compact design on a DIN rail
- Scalable CPU options from single- to multi-core, for example Intel® Core™ i7 quad-core
- Compact and scalable system with modular interface
- 4 GB DDR3 RAM integrated
- Direct connection of more than 300 types of EtherCAT Terminals
- Long-term availability

#### Specification

| Technical data                       | CX2020                                                                          | CX2030                    | CX2040                    |
|--------------------------------------|---------------------------------------------------------------------------------|---------------------------|---------------------------|
| <b>Processor</b>                     | Intel® Celeron® single-core                                                     | Intel® Core™ i7 dual-core | Intel® Core™ i7 quad-core |
| <b>Internal main memory</b>          | 2 GB DDR3 RAM                                                                   | 2 GB DDR3 RAM             | 4 GB DDR3 RAM             |
| <b>Flash memory</b>                  | 4 or 8 GB CFast flash card (optionally extendable)                              |                           |                           |
| <b>Persistent memory</b>             | 128 KB NOVRAM integrated                                                        |                           |                           |
| <b>Interfaces</b>                    | 2 × RJ45, 10/100/1000 Mbit/s, DVI-I, 4 × USB 2.0, 1 × optional interface        |                           |                           |
| <b>Operating system</b>              | Microsoft Windows Embedded Compact 7 or Microsoft Windows Embedded Standard 7 P |                           |                           |
| <b>Control software</b>              | TwinCAT 2 PLC runtime, NC PTP runtime, NC I runtime                             |                           |                           |
| <b>Power supply</b>                  | 24 V DC (–15 % / +20 %)                                                         |                           |                           |
| <b>Dimensions (W × H × D)</b>        | 144 mm × 100 mm × 91 mm                                                         |                           |                           |
| <b>Operating/storage temperature</b> | –25 °C ~ +60 °C / –40 °C ~ +85 °C                                               |                           |                           |
| <b>Protection class</b>              | IP 20                                                                           |                           |                           |

#### Application Sample

- Semiconductor manufacturing
- Industrial robotics
- Machine tools
- Forming technology
- Printing machines
- Presses
- Cutting/welding equipment
- Wind turbines
- Stage equipment

#### Sales areas and Languages



Local support: Japan, China, Korea, Southeast Asia, Europe, the Americas, etc. More than 70 countries

#### For more information

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

Contact: **Beckhoff Automation GmbH & Co. KG**  
Huelshorstweg 20 33415 Verl Germany

[E-mail: [info@beckhoff.com](mailto:info@beckhoff.com)]  
TEL: +49 5246 963-0 FAX: +49 5246 963-198

## PC Based Controller

### BX-1000 series

#### Features



No expansion slot model

- Eco-friendly and High-performance CPU  
Core i7-3517UE(1.7 GHz) or Celeron 927UE (1.5 GHz)
- Fanless Naturally-cooled Design
- Supports Measurement & Control Board  
Contec provides over 200 types of measurement & control boards enable various types of sensor input and control output. (Only expansion slot models)
- Expansion Slots Models are Available  
2x PCI, 3x PCI and 1x PCI Express(x8)
- Two Gigabit LAN Ports
- Compatible with EtherCAT Master Stack and Real-Time OS

#### Specification

|                            | BX-1000                                                                                                                 | BX-1000P2                                                                                           | BX-1000P4                      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------|
| CPU                        | Intel Core i7-3517UE 1.70 GHz or Intel Celeron 927UE 1.50 GHz                                                           |                                                                                                     |                                |
| Chipset                    | QM77                                                                                                                    |                                                                                                     |                                |
| BIOS                       | AMI BIOS                                                                                                                |                                                                                                     |                                |
| Memory                     | 4 GB, 2x 204 pin SO-DIMM Socket                                                                                         |                                                                                                     |                                |
| Watchdog timer             | 255 level (1 sec to 255 sec), RESET, interrupt is allowed at time expiration                                            |                                                                                                     |                                |
| RTC/CMOS                   | Lithium backup battery life : 10 years or more<br>The real-time clock is accurate within ± minutes (at 25 °C) per month |                                                                                                     |                                |
| Power management           | Power management setup via BIOS, Power On by Ring/Wake On Lan                                                           |                                                                                                     |                                |
| Video controller           | Intel HD Graphics 4000 (Core i7), Intel HD Graphics (Celeron)                                                           |                                                                                                     |                                |
| Interface                  | Display                                                                                                                 | 1x Analog RGB (HD-SUB), 1x DVI-D, 1x HDMI                                                           |                                |
|                            | Audio                                                                                                                   | HD audio, 1x LINE OUT, 1x LINE IN, 1x MIC IN                                                        |                                |
|                            | CFast card slots                                                                                                        | 1x CFast card slot (1x Type I, bootable)                                                            |                                |
|                            | Storage                                                                                                                 | 2x Slot-in 2.5 inches SATA hard disk                                                                |                                |
|                            | LAN                                                                                                                     | 2x 1000BASE-T/100BASE-TX/10BASE-T (RJ-45 connector),<br>LAN-A : Intel 82579LM, LAN-B : Intel 82583V |                                |
|                            | USB                                                                                                                     | 4x USB 3.0-compliant, 2x USB 2.0-compliant                                                          |                                |
|                            | COM                                                                                                                     | 3x RS-232C (9 pin D-SUB connector [male]) 50 bps to 115200 bps                                      |                                |
| Expansion slots            |                                                                                                                         | —                                                                                                   | 2x PCI                         |
|                            |                                                                                                                         |                                                                                                     | 1x PCI Express (x8),<br>3x PCI |
|                            |                                                                                                                         |                                                                                                     |                                |
| Input power supply voltage | BX-1000 model: 100 VAC to 240 VAC, 0.8 A to 0.4 A                                                                       |                                                                                                     |                                |
| Physical dimensions (mm)   | 262(W) × 262(D) × 65(H)                                                                                                 | 262(W) × 262(D) × 120(H)                                                                            | 262(W) × 262(D) × 160(H)       |
| Weight                     | About 3.4 kg                                                                                                            | About 4.6 kg                                                                                        | About 4.9 kg                   |

#### Applications

- SMT placement equipment
- Semiconductor manufacturing equipment
- LC/FPD manufacturing equipment
- Industrial robot
- Machine tool
- Processing machine

#### System Configuration

##### CONTEC BX-1000 Series

CPU: Core i7-3517UE /  
Celeron 927UE  
Memory: 4 GB  
**Expansion slots: None**

CPU: Core i7-3517UE /  
Celeron 927UE  
Memory: 4 GB  
**Expansion slots: Two**

CPU: Core i7-3517UE /  
Celeron 927UE  
Memory: 4 GB  
**Expansion slots: Four**

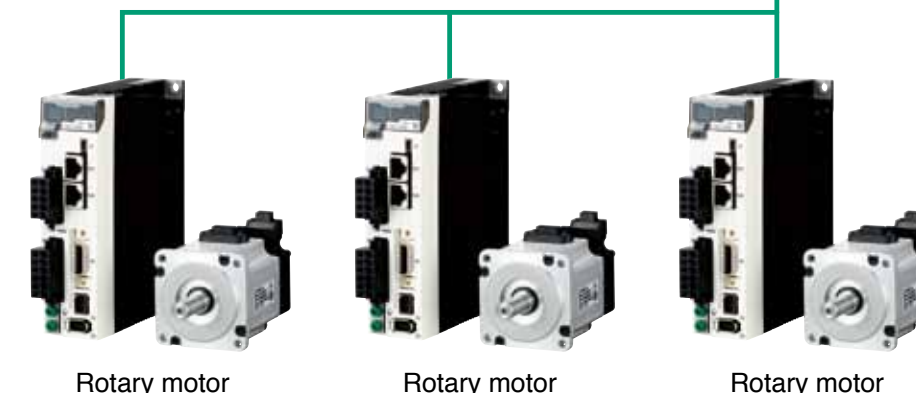
- Motion Library
- EtherCAT Master Software
- Real-Time OS
- Soft-PLC



Master-PC

**EtherCAT**

**MINAS A5B**



Rotary motor

Rotary motor

Rotary motor

#### Sales areas and Languages



- Japanese
- English

#### For more information

URL : <http://www.contec.com/bx-1000/>

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

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

[E-mail: [intsales@contec.jp](mailto:intsales@contec.jp)]

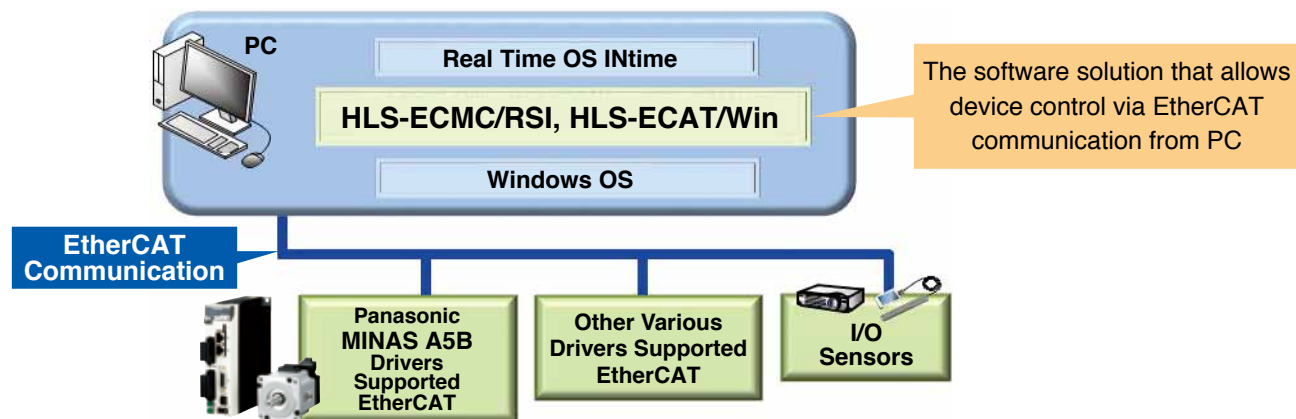
TEL: +81-42-512-5377 FAX: +81-42-512-5388

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

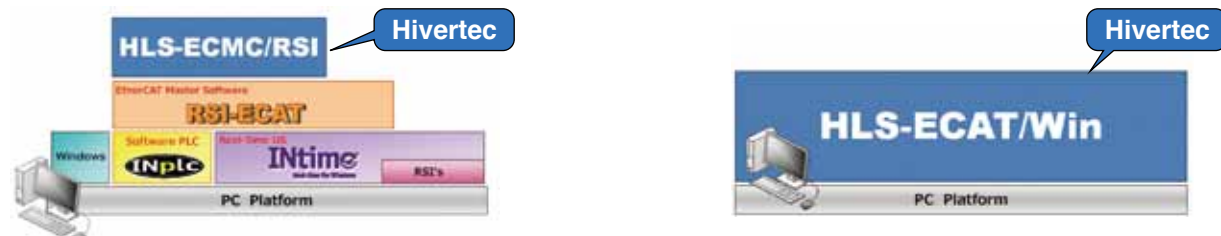
# Motion Control Software, Software Modules

## HLS-ECMC/RSI, HLS-ECAT/Win

### Features



| HLS-ECMC/RSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | HLS-ECAT/Win                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>[EtherCAT Multi-axis Positioning Software Module]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[EtherCAT Start With Windows]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>Software module for motion control on the Real Time OS</li> <li>By Using the INtime SDK, writing a program in C language, motion control with a high degree of performance can be achieved</li> <li>Motion can be controlled easily by the API function with the input and output variables that conforms to international standards</li> <li>Up to maximum 64-axis control from minimum 6-axis (Available in a single-axis units between 6 to 64)</li> <li>EtherCAT communication can control the servo driver (CiA402 drive profile) (There are many connection confirmed drivers)</li> <li>* Control specifications, such as the control period, depends on the specifications and capabilities of the PC</li> </ul> | <ul style="list-style-type: none"> <li>EtherCAT motion control software via PC to be started with Windows</li> <li>Controller is PC only</li> <li>With normal Windows, high reliability can be provided</li> <li>To minimize the complexity of the combination of the master or master stack</li> <li>Maximize the convenience of saving wiring network</li> <li>The benefits of EtherCAT as FA network can be easily operational</li> <li>Programmable motion control in the sense of application development</li> <li>Development environment Visual Studio 2008 or later (VC ++, VC #, VB)</li> </ul> |



### Specification

#### API Function List for ECMC

#### API function is provided in advance for motion control

| Administrative                                                         | Motion                                                          |
|------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>MC_InitAxisSetting</b><br>Initializes the Axis Settings             | <b>MC_ReadStatus</b><br>Reads the Status of State Machine       |
| <b>MC_GetAxisSetting</b><br>Retrieves the Axis Settings                | <b>MC_ReadMotionState</b><br>Reads the Motion Status            |
| <b>MC_SetAxisSetting</b><br>Sets the Axis Settings                     | <b>MC_ReadAxisInfo</b><br>Reads the Axis Information            |
| <b>MC_Power</b><br>Controls switching enable/disable of the drive      | <b>MC_ReadAxisError</b><br>Reads the Axis Error                 |
| <b>MC_Reset</b><br>Resets all the internal error regarding to the axis | <b>MC_SetPosition</b><br>Sets any value as the current position |
| <b>MC_ReadActualPosition</b><br>Reads the Current Position             | <b>MC_SetOverride</b><br>Overrides of Speed                     |
| <b>MC_ReadActualVelocity</b><br>Reads the Current Speed                |                                                                 |

- API functions are offered with the input and output variables that conform to international standard (IEC61131-3).
- By using of this API function, you can make a standard motion control easily.
- Adding function corresponding to the various operations, such as interpolation are scheduled sequentially
- Compliant with PLCopen Technical Specifications

#### API Function List for ECAT

#### Minimizig the complexity of the EtherCAT introduction and selection of models

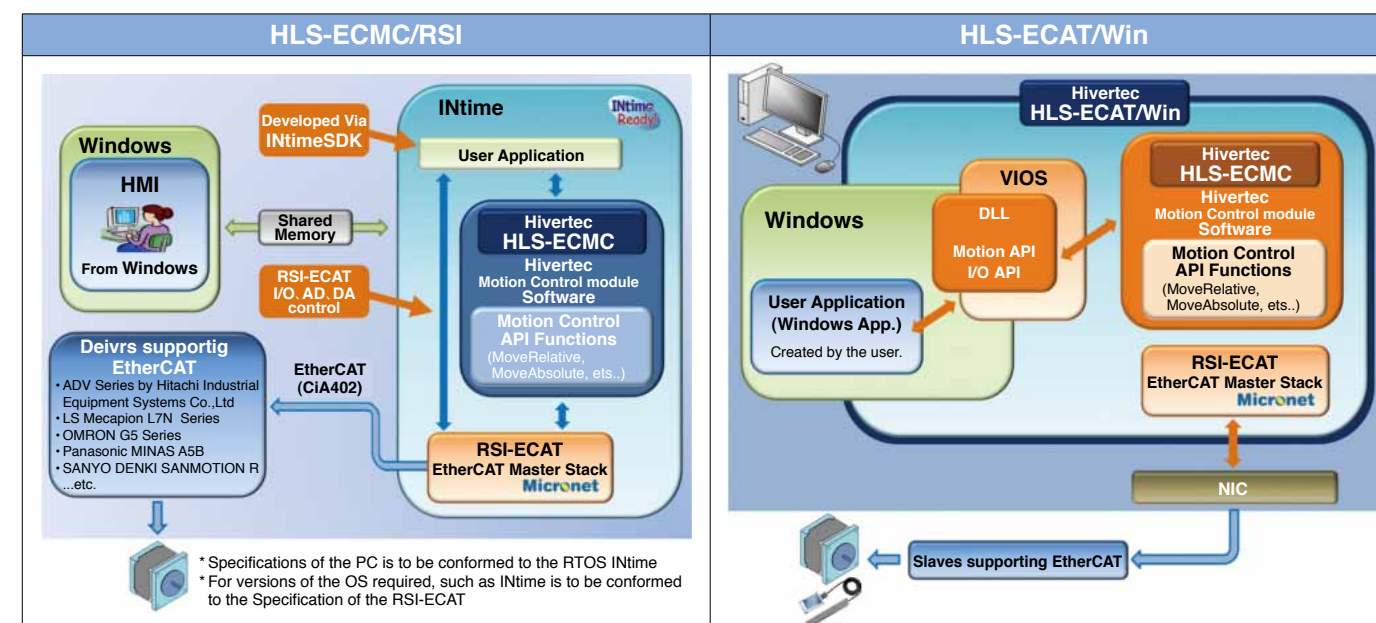
| Administrative                                   | Motion | I/O       | EtherCAT            |
|--------------------------------------------------|--------|-----------|---------------------|
| Same API as the<br>HLS-ECMC has<br>been prepared |        | IO_inp    | EC_ReadVersion      |
|                                                  |        | IO_inpw   | EC_GetMasterInfo    |
|                                                  |        | IO_inpdw  | EC_OpenMaster       |
|                                                  |        | IO_outp   | EC_CloseMaster      |
|                                                  |        | IO_outpw  | EC_InitMaster       |
|                                                  |        | IO_outpdw | EC_GetSlaveInfo     |
|                                                  |        |           | EC_InitMaster       |
|                                                  |        |           | EC_ReadSDO          |
|                                                  |        |           | EC_WriteSDO         |
|                                                  |        |           | EC_ResetDiagMessage |
|                                                  |        |           | EC_QueryDiagMessage |
|                                                  |        |           | EC_SetDiagMessage   |
|                                                  |        |           | EC_GetDiagMessage   |

- Slave information acquisition
  - Continuous feed
  - Relative positioning
  - Absolute positioning
  - Speed override, etc.
  - Parameter input/output via SDO communication
  - Diagnosis message acquisition
  - Acquisition of the current position and speed
  - Axis sensor information acquisition
  - Data input and output to peripheral IO devices (such as analog equipment, Digital input/output devices)etc,
- Adding function corresponding to the various operations, such as interpolation are scheduled sequentially

\* 6-axis, 8-axis, 16-axis, 32-axis control are the standard packages

\* 6-axis is the minimum number of axes, but consultation is available in a single-axis unit other than standard package.

### System Configuration



#### CiA402 drive profile

The CiA402 drive profile is a device profile for drives and motion control prescribed in International Electrotechnical Commission (IEC61800-7-301 and IEC 61800-7-201).  
In the EtherCAT series, it has been applied to the definition part of the controller functional operation.

### Sales area and Language



- Japanese
- English
- (Korean)

### For more information

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

Contact: **Hivertec, Inc.**

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

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

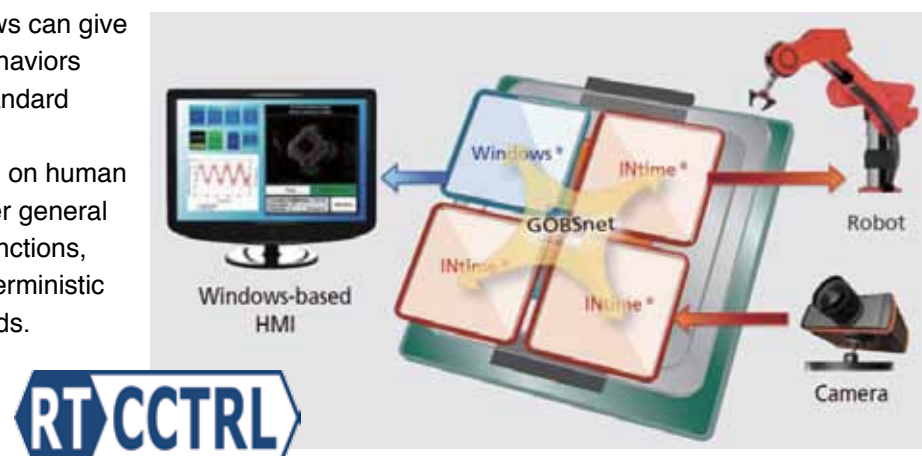
TEL: +81-3-3846-3801 FAX: +81-3-3846-3773

## 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.



**RT CCTRL**

#### ● Complete RTOS for Windows platforms

RT-C Language Controller is a controller which can achieve 100  $\mu$ s period high-speed real time control.

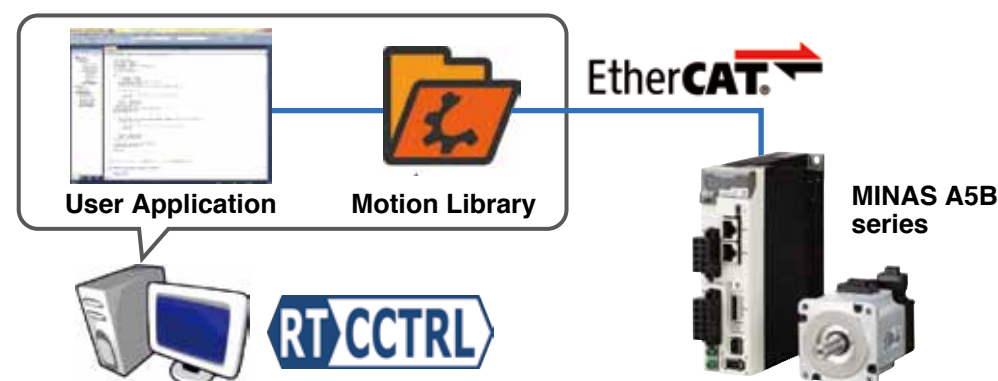
You can realize both real time instrument control function and multi-purpose Windows function on 1 PC platform, since it can also run on Windows.

#### ● 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 the experience 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

### 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



**INplc**



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 ) 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 KW-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)                |

### Sales area and Language



- English
- Japanese

### For more information

URL : <http://www.mnc.co.jp/english/>

Contact: **Micronet Company**

OXSON Building 1F, 1-2-13, Shintomi, Chuo-ku, Tokyo, 104-0041, Japan

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

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

# Versatile Motion Control Library with EtherCAT Master WMX

## Features

- Without a special board, control up to 64 axes as an EtherCAT master on a PC with a LAN port.
- The user can develop an original high-performance motion controller with the WMX API library. There are more than 150 API functions and the library supports multiple threads.
- Includes original EtherCAT master and RTX (Real Time Extension) licenses. Our “SoftMotion” technology has been proven in the field for more than 10 years, providing highly reliable motion control with outstanding cost effectiveness.

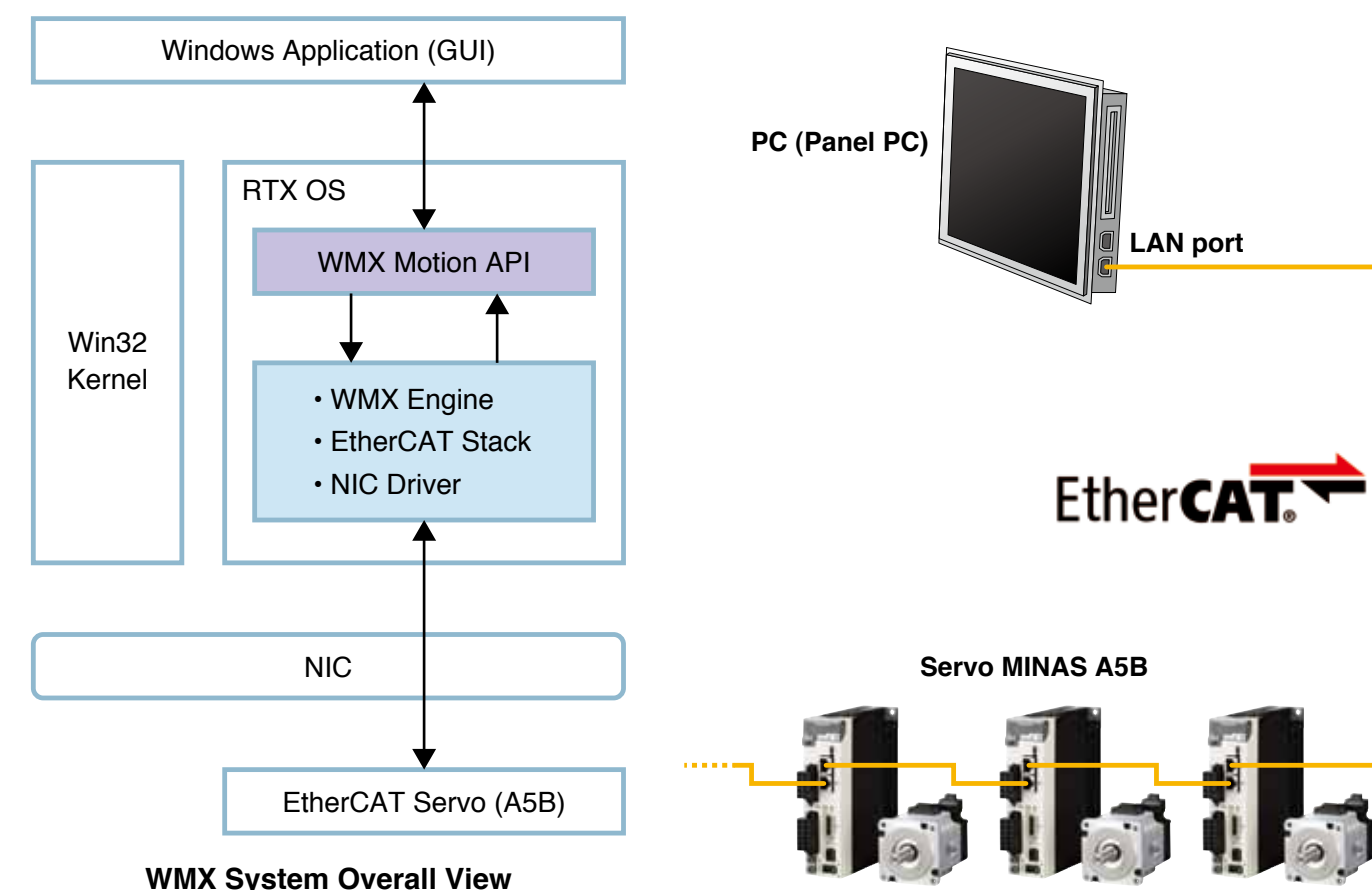
## Specification

|                                                    |                                                                                                                                                                                                                 |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Max number of Axis</b>                          | 64 axes with 64 independent channels (multi-channel control)                                                                                                                                                    |
| <b>Interpolation Types</b>                         | Linear (64 axis), Arc (2 axis), Helical (3 axis)                                                                                                                                                                |
| <b>Acceleration, Deceleration Types (Profiles)</b> | Trapezoidal, Bell-shaped, Jerk-Limited, Jerk-Free, Two-Velocity, User specified profile, Acceleration and Deceleration are set separately                                                                       |
| <b>Motion Control</b>                              | JOG, Homing, PTP, Buffer Mode, LIST Motion                                                                                                                                                                      |
| <b>Override</b>                                    | Change target position, velocity, profile, during motion                                                                                                                                                        |
| <b>Sync Control (Master slave control)</b>         | 32 pairs max (Multiple slave axes / Changing pairs supported), Gantry-axis control with a complete synchronization                                                                                              |
| <b>Interpolation Cycle</b>                         | 1 ms (can be changed depending on the system: 0.5 ms to 8 ms)                                                                                                                                                   |
| <b>Supported Command Methods</b>                   | Position / Velocity / Torque (Transparent mode is available for Torque and Velocity)                                                                                                                            |
| <b>Position Compensation Features</b>              | Pitch error compensation, Backlash compensation, Straightness compensation                                                                                                                                      |
| <b>Max I/O Points</b>                              | 8192 / 8192 (1 KB for each)                                                                                                                                                                                     |
| <b>I/O Control</b>                                 | Supports many commercial EtherCAT modules                                                                                                                                                                       |
| <b>Event Functions</b>                             | Event-based I/O and motion control                                                                                                                                                                              |
| <b>EtherCAT Functions</b>                          | CoE, FoE, DC Mode, Original Configuration Tool for EtherCAT Device and Network, EtherCAT Network Management APIs, Ring Topology for redundancy, Hot Connect                                                     |
| <b>Requirements</b>                                | Windows XP (32-bit) SP3 / Windows 7 (32-bit)<br>RTX Supported NIC for EtherCAT<br>( <a href="http://www.softservo.com/data_sheets/EtherCAT_NIC.pdf">http://www.softservo.com/data_sheets/EtherCAT_NIC.pdf</a> ) |
| <b>IDE</b>                                         | VisualStudio 2005 or later, .NET 2.0 or later                                                                                                                                                                   |

## Application Sample

- Semiconductor Equipments, Flat Panel Equipments
- SMT Equipments (Chip Mounters), Bonding Machines
- Packaging, Printing, Material Handling
- Injection Molding Machines

## System Configuration



WMX System Overall View

## Sales area and Language



- English
- Japanese
- Korean
- Chinese

## For more information

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

Contact: **SOFT SERVO SYSTEMS, INC.**

Well-Done Muto Bldg. B1F, 3-4-3 Akebono-cho, Tachikawa, Tokyo, 190-0012, Japan

[E-mail: [info@softservo.co.jp](mailto:info@softservo.co.jp)]

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

## PC Based Fine Motion RTMC-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 / 8 Axis  
0.5 msec / 16 Axis  
1 msec / 32 Axis

**Reliability**

Not depend on Windows

**Multi Axis Control**

32 Axis / 8 task

**8 task controlled simultaneously**

One PC controls 8 machines

**PC Based Fine Motion**

**Batch control**

Control multiple machines such as precision cutting, robot, molding, injection, deburring.

**G code / Techno code**

Simple operating program

**Abundant motions**

Fully equipped motion functions  
Operate immediately

**PLC/Image processing**

Easily cooperate with various software

**Precision cutting**

**Bending Robot**

**Jointed Robot**

**Coordinate Measuring Machine**

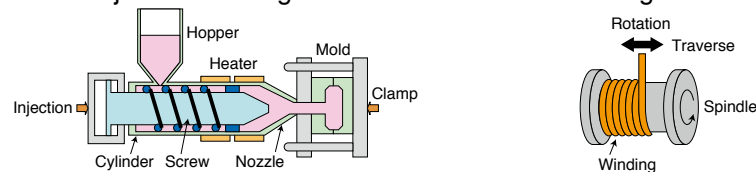
**Servo Press**

**SCARA Robot**

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

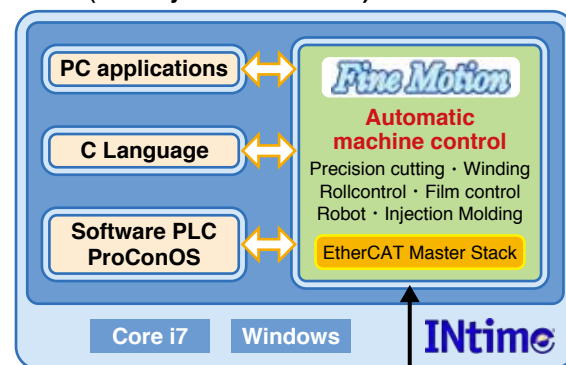
### Application Sample

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



### System Configuration

#### FAPC (Factory Automation PC)



**● Synchronous feed**  
Synchronous feed

**● Roll/Tension control**

**● Tangent control**

**● Parallel axis control**

**● DNC**

**● High-precision position measurement**

**● Electric cam**

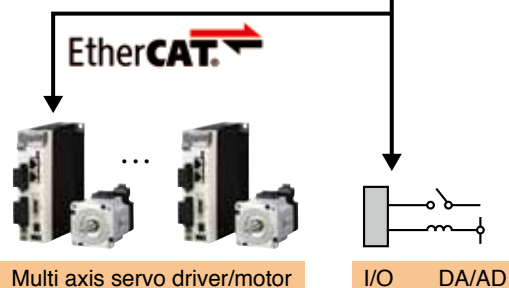
**● Oscillation**

**● Winding command**

**● Thread-cutting**

**● Diameter compensation**

**● Robot mechanism kinematics**



## 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/8 axis 0.5 msec/16 axis 1 msec/32 axis 2 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

- RtplECTInitializeLib()
- RtplECTClearAlarm()
- RtplECTServoON()
- RtplECTLinInterpolate()
- RtplECTCmdActive()
- RtplECTResWait()
- RtplECTServoOFF()
- RtplECTCloseLib()

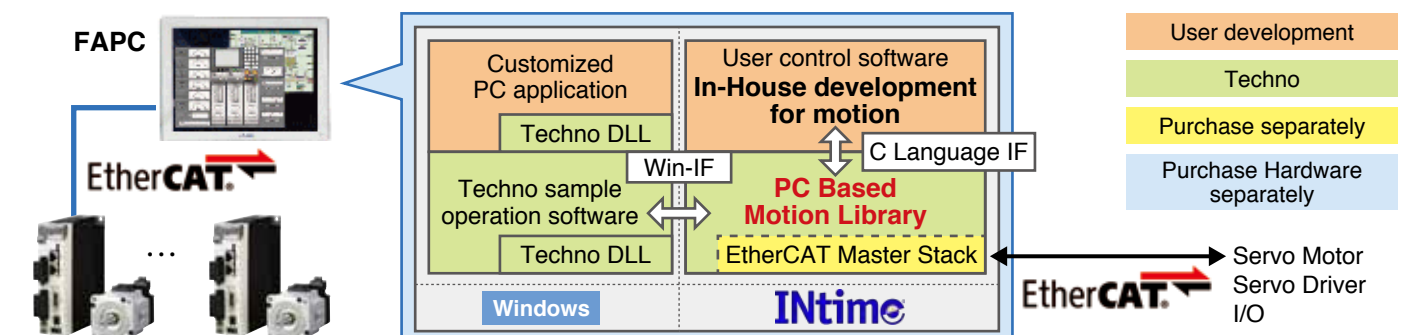
#### PC Based Motion Library function

|                        |                         |                            |                            |
|------------------------|-------------------------|----------------------------|----------------------------|
| Library initialization | RtplECTInitializeLib(); | Pause                      | RtplECTHoldAxis();         |
| Library Close          | RtplECTCloseLib();      | Set Synchronous Axis       | RtplECTSetGantryAxis();    |
| Execute command        | RtplECTCmdActive();     | Set Override               | RtplECTSetOverride();      |
| Wait for Response      | RtplECTResWait();       | Return to origin           | RtplECTHomePosition();     |
| Monitor Status         | RtplECTGetStatus();     | Positioning                | RtplECTPositioning();      |
| SDO Write              | RtplECTSetSDO();        | Latch Positioning          | RtplECTLatchPositioning(); |
| PDO Write              | RtplECTSetPDO();        | Linear Interpolation       | RtplECTLinInterpolate();   |
| Servo ON               | RtplECTServoON();       | Circular arc Interpolation | RtplECTCirInterpolate();   |
| Servo OFF              | RtplECTServoOFF();      | JOG Stop                   | RtplECTJOGStop();          |
| Servo Alarm Clear      | RtplECTClearAlarm();    | Torque control start       | RtplECTTorqueCtrlStart();  |

### Application Sample

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

### System Configuration



### 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](mailto:mail@open-mc.com)]

TEL: +81-4-2964-3677 FAX: +81-4-2964-3322

# Motion Coordinator and EtherCAT Interface Module

## Motion Coordinator MC464 / Panasonic EtherCAT Interface Module

### Features

- Supports digital drive systems up to 64 axes
- Based on 64-bit 400 MHz MIPS processor
- Anybus-CC Module support allowing flexible factory communication options
- High accuracy double floating point / 64-bit integer resolution
- Multi-tasking BASIC programming
- IEC 61131-3 programming support
- Backlit LCD display
- Ethernet programming interface
- Expansion flexibility with clip on modules allowing quick interchangeability
- Built-in Ethernet-IP connectivity



### Specification

| Item               | Description                                        |
|--------------------|----------------------------------------------------|
| <b>MC464</b>       |                                                    |
| System Flexibility | Axes Controlled                                    |
|                    | Up to 64                                           |
|                    | EtherCAT Drive Networks                            |
| Programming        | Up to 7                                            |
|                    | Built-in Synchronization Encoder Input             |
|                    | Yes                                                |
| Motion Functions   | Multi-Tasking TrioBASIC                            |
|                    | Yes                                                |
|                    | Number of Simultaneous Programs                    |
|                    | 30                                                 |
|                    | Motion Perfect Windows Software                    |
|                    | Yes                                                |
|                    | Stand-Alone operation                              |
|                    | Yes                                                |
|                    | Permanent Flash EPROM for program storage          |
|                    | Yes                                                |
|                    | Available memory for user programs                 |
|                    | 8 Mbyte                                            |
|                    | User table memory                                  |
|                    | 512000                                             |
|                    | Accurate and fast real number mathematics          |
| Interfaces         | 64-bit Int / Double Floats                         |
|                    | Program Trace Debugger                             |
|                    | Yes                                                |
|                    | Named Constants and variables                      |
|                    | Yes                                                |
|                    | Linear, Circular, Helical, Spherical Interpolation |
|                    | Yes                                                |
|                    | Cams, Gearbox, Clutches                            |
|                    | Yes                                                |
|                    | 64-bit position storage                            |
|                    | Yes                                                |
|                    | Acceleration/Deceleration & S-Ramp Controls        |
|                    | Yes                                                |
|                    | 5 Term Control                                     |
|                    | Yes                                                |
| Packaging          | Max Interpolated Axes                              |
|                    | 64, Multiple groups                                |
|                    | Hardware Position Capture (Registration)           |
|                    | 1 µs                                               |
|                    | Ethernet port                                      |
|                    | 10/100 Base-T                                      |
|                    | RS232 Serial Port                                  |
|                    | 128 kbps                                           |
|                    | RS485 Multi-Drop                                   |
|                    | Yes                                                |
|                    | Ethernet IP                                        |
|                    | Yes                                                |
|                    | Modbus TCP                                         |
|                    | Yes                                                |
|                    | Anybus Module                                      |
|                    | Yes                                                |
|                    | Opto-Isolated Inputs                               |
|                    | 16                                                 |
|                    | Opto-Isolated Outputs with current limit           |
|                    | 8                                                  |
|                    | Max Input / Output Expansion Channels              |
|                    | 512                                                |
|                    | CAN Analogue Inputs Capability                     |
|                    | Yes                                                |
|                    | Real Time Clock                                    |
|                    | Yes                                                |
|                    | SD Card                                            |
|                    | Programs and data                                  |
|                    | Module case style                                  |
|                    | DIN Rail / Panel Mount                             |
|                    | Module size (H x W x D)                            |
|                    | 201 mm x 155 mm x 56 mm                            |
|                    | UL and CE marked for EMC                           |
|                    | Yes                                                |

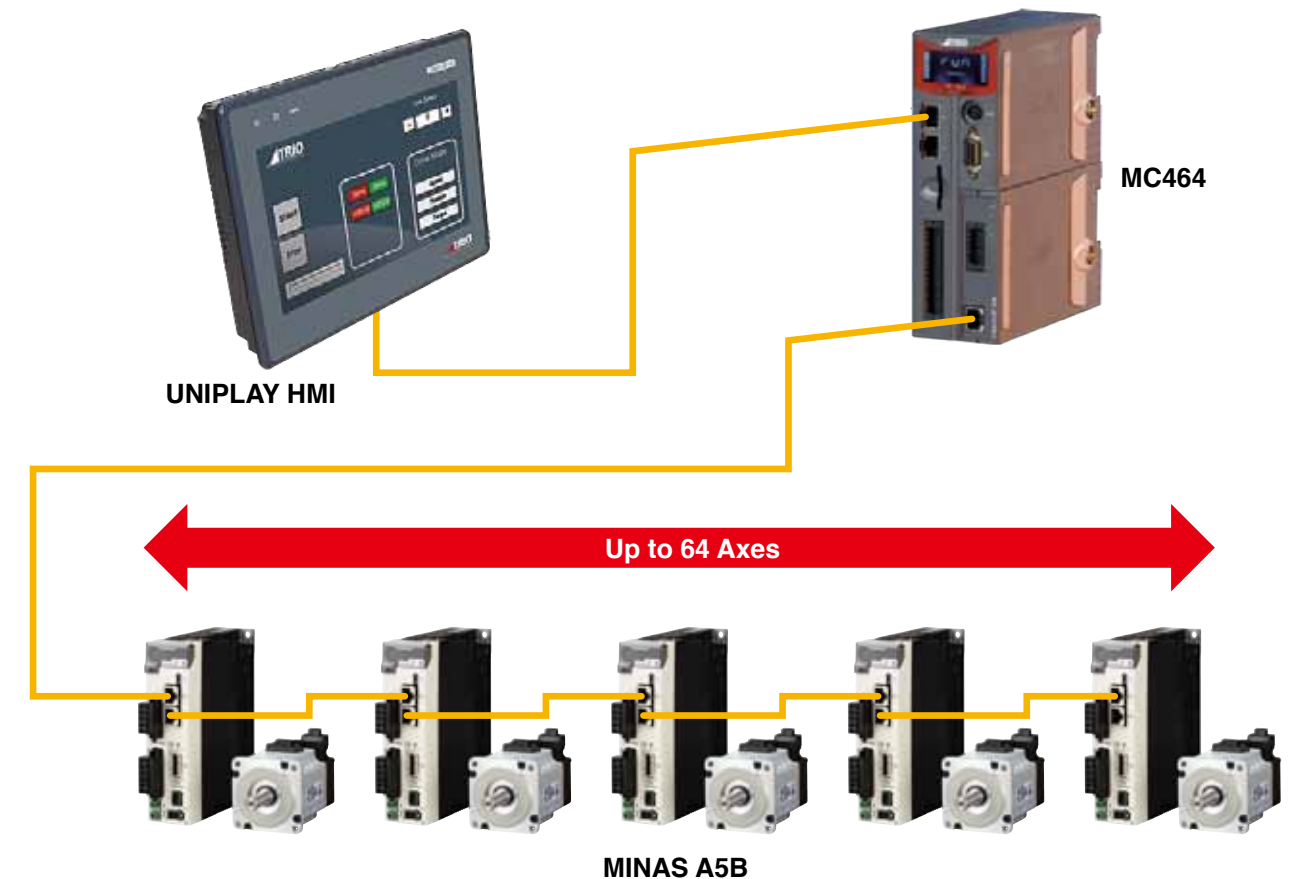
### Application Sample

URL : Sample applications

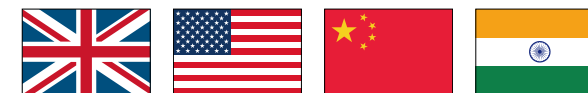
[http://www.triomotion.com/tmt3/sitefiles/motion\\_control/applications.asp#section=overview](http://www.triomotion.com/tmt3/sitefiles/motion_control/applications.asp#section=overview)

Please refer to the sample and typical applications for the MC464 with A5B as shown above URL.

### System Configuration



### Sales area and Language



• English

Please contact the following address for details.

### For more information

URL: MC464 Motion Coordinator

<http://www.triomotion.com/tmt3/sitefiles/products/mc464.asp#section=overview>

URL: EtherCAT Expansion Module

[http://www.triomotion.com/tmt3/sitefiles/products/exp\\_mod\\_ethercat.asp#section=overview](http://www.triomotion.com/tmt3/sitefiles/products/exp_mod_ethercat.asp#section=overview)

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-Mini Ethercat Master

### Features

- Up to 32 EtherCAT Digital Drive Axes
- Up to 1024 EtherCAT I/O
- EtherCAT CoE protocol to CiA402
- 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
- IEC 61131-3 Programming
- Multi-tasking BASIC Programming
- Ethernet-IP / Modbus TCP / Trio ActiveX / Uniplay HMI / UDP / Ethernet Interface Built-In
- Precise 64Bit Motion Calculations with 532 MHz ARM 11 Processor

- 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 |
|------------------|-------------------------------|----------------|-------------|
| <b>MC4N-Mini</b> |                               |                |             |
| Configuration    | Axis 0                        | Extended       |             |
| Axes             | Max axes                      | 32             |             |
|                  | Max virtual axes              | 32             |             |
| Performance      | Processor                     | ARM11          |             |
|                  | Clock frequency               | 532 MHz        |             |
|                  | Servo update rate             | 2 ms-125 µs    |             |
|                  | Encoder input frequency       | 6 MHz          |             |
|                  | Stepper output frequency      | 2 MHz          |             |
|                  | User memory                   | 8 MByte        |             |
|                  | Max data table size           | 512000         |             |
|                  | Flash data memory             | 32 × 16000     |             |
|                  | VR                            | 4096           |             |
|                  | Position register precision   | 64 bit         |             |
|                  | Maths precision               | Double FP      |             |
|                  | Real time clock               | Yes            |             |
| Drive Interfaces | EtherCAT                      | Yes            |             |
|                  | Auxiliary Axis                | Yes            |             |
| Communication    | DeviceNet                     | Yes            |             |
|                  | CANopen                       | Yes            |             |
|                  | Ethernet (10/100) base-T      | Yes            |             |
|                  | Ethernet IP                   | Yes            |             |
|                  | MODBUS-RTU                    | Yes            |             |
|                  | MODBUS-TCP/IP                 | Yes            |             |
|                  | RS232/RS485                   | Yes            |             |
|                  | Anybus support                | No             |             |
|                  | Hostlink                      | Yes            |             |
| Encoder Ports    | Feedback input                | No             |             |
|                  | Reference input               | Yes            |             |
|                  | Pulse + direction output      | Yes            |             |
|                  | Incremental (A+B) output      | Yes            |             |
| Built-in I/O     | Inputs 24 Vdc                 | 8              |             |
|                  | Outputs 24 Vdc                | No             |             |
| Expansion I/O    | Bi-directional I/O 24 Vdc     | 8              |             |
|                  | 0-10 V analogue inputs        | No             |             |
| Programming      | ±10 V analogue Outputs        | No             |             |
|                  | # registration inputs         | 4              |             |
| Software         | Registration input speed      | 1 µs           |             |
|                  | Digital I/O points            | 1024           |             |
| Physical         | 12 bit ±10 V analogue inputs  | 32             |             |
|                  | 12 bit ±10 V analogue outputs | 16             |             |
| Power            | TrioBASIC                     | Yes            |             |
|                  | # programs                    | 32             |             |
| Certification    | # tasks                       | 22             |             |
|                  | IEC61131 Runtime              | Yes            |             |
| Expansion        | Kinematic Runtime             | Option         |             |
|                  | G-Code                        | Yes            |             |
| Physical         | HPGL                          | Yes            |             |
|                  | DXF import                    | Yes            |             |
| Power            | Motion Perfect v3             | Yes            |             |
|                  | All Support Software          | Yes            |             |
| Physical         | Memory slot card              | SD             |             |
|                  | Width × Height × Depth (mm)   | 40 × 157 × 120 |             |
| Power            | Weight                        | 432 g          |             |
|                  | Mounting                      | Panel          |             |
| Power            | Operating Temp                | 0 - 45°        |             |
|                  | Supply Voltage dc             | 24 V           |             |
| Power            | Consumption (exc. I/O)        | 350 mA         |             |
|                  | CE approval                   | Yes            |             |
| Power            | RoHS Compliant                | Yes            |             |

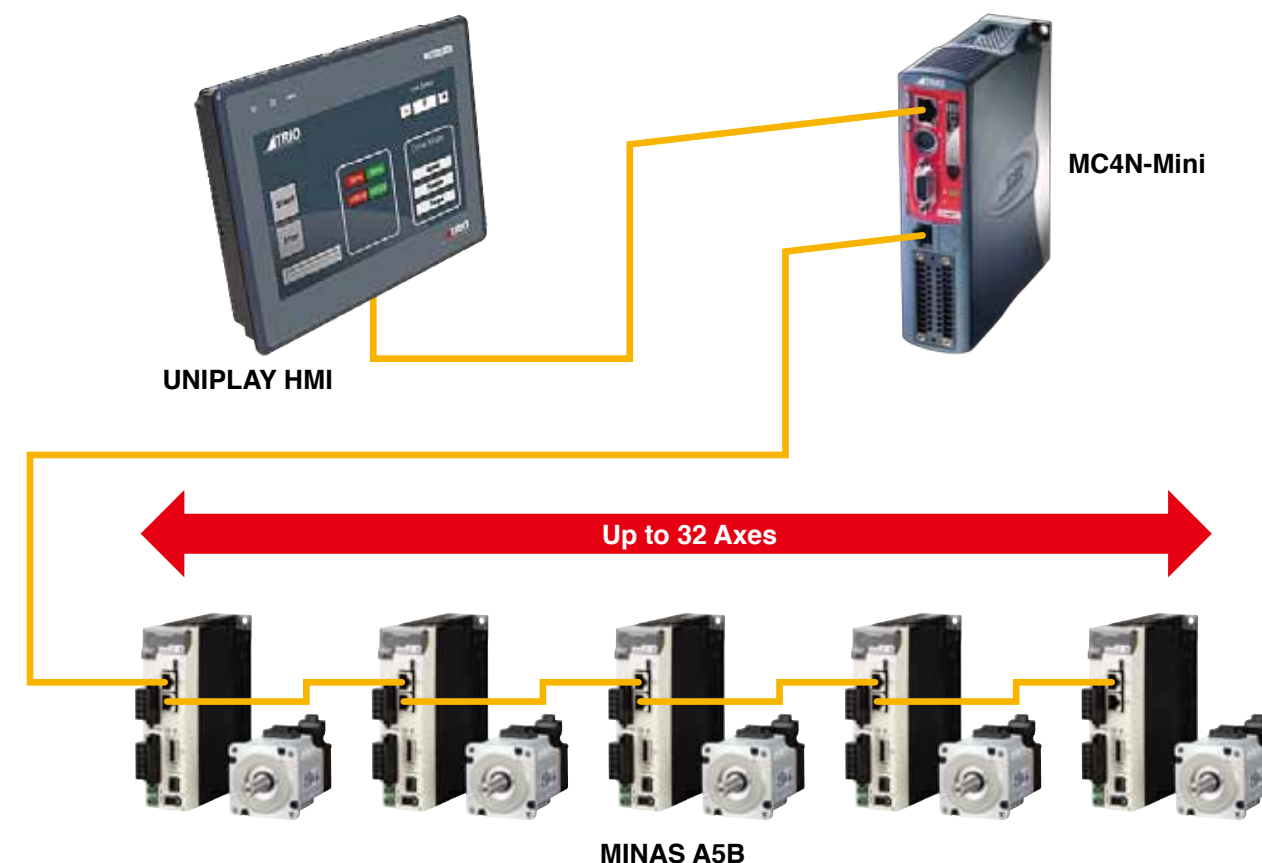
### Application Sample

URL : Sample applications

[http://www.triomotion.com/tmt3/sitefiles/motion\\_control/applications.asp#section=overview](http://www.triomotion.com/tmt3/sitefiles/motion_control/applications.asp#section=overview)

Please refer to the sample and typical applications for the MC4N with A5B as shown above URL.

### System Configuration



### Sales area and Language



• English

Please contact the following address for details.

### For more information

URL: MC4N-Mini Ethercat Master

<http://www.triomotion.com/tmt3/sitefiles/products/mc4n.asp#section=overview>

Contact: **Trio Motion Technology Ltd.**

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

## Corresponding table

| Partner                          | Master   |          |     |          |             |     |
|----------------------------------|----------|----------|-----|----------|-------------|-----|
|                                  | Software | PC Board | IPC | Panel PC | Stand Alone | PLC |
| acontls technologies GmbH        | ●        |          |     |          |             |     |
| ADLINK                           |          |          | ●   |          |             |     |
| ALGO System Co.,Ltd              |          |          | ●   | ●        |             |     |
| Beckhoff Automation GmbH & Co.KG | ●        |          | ●   | ●        |             | ●   |
| CONTEC Co., Ltd.                 |          |          | ●   |          |             |     |
| Hivertec,Inc.                    |          | ●        |     |          |             |     |
| Micronet Company                 | ●        |          | ●   | ●        |             | ●   |
| SOFT SERVO SYSTEMS, INC.         | ●        |          | ●   |          |             |     |
| TECHNO Co.,Ltd.                  | ●        |          |     |          |             |     |
| Trio Motion Technology Ltd.      |          |          |     |          | ●           |     |

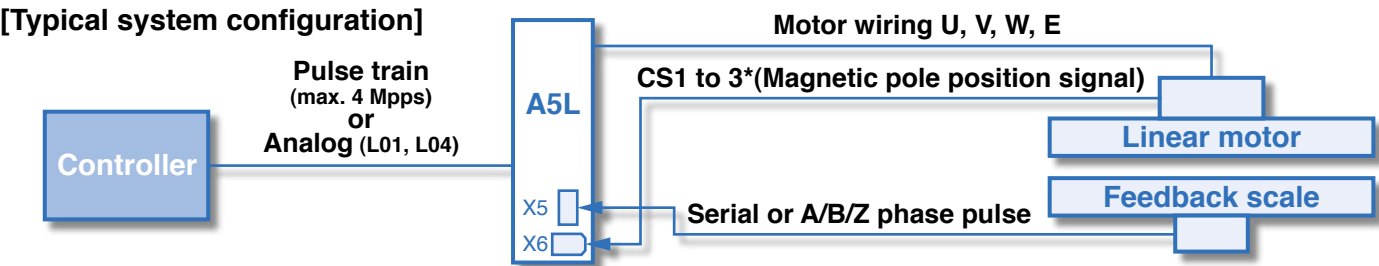
Linear and direct drive (DD) motor control

MINAS A5L, RTEX type: MINAS A5IINL  
AE-LINK type: MINAS A5AL

A5L

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.



[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.

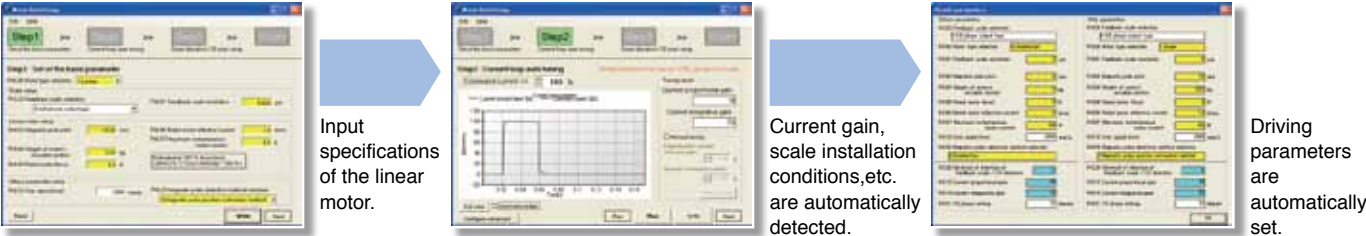
**Drastically reduced setup time.**

**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

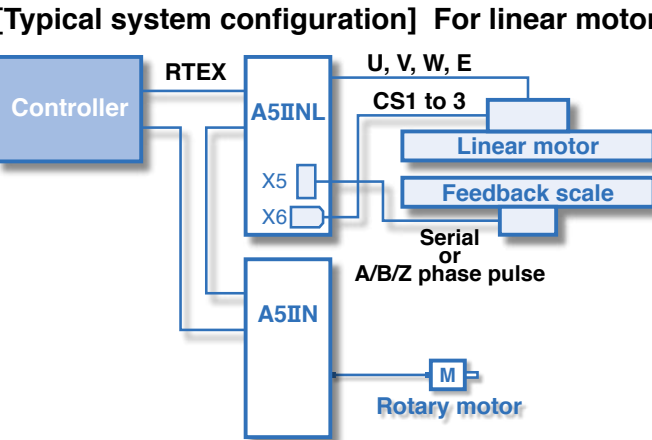


[Lineup]

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

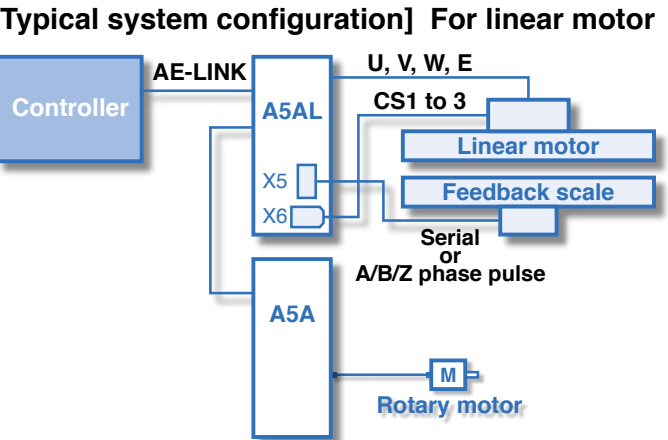
A5IINL

RTEX / Linear and DD Control Drive



A5AL

AE-LINK / Linear and DD Control Drive



Drive List (Common to A5L and A5IINL)

| Power supply         | Drive Part No. (Note) | Motor rated current [Arms] | Motor max. current [Arms] |
|----------------------|-----------------------|----------------------------|---------------------------|
| Single phase 100 V   | MADHT1105***          | 1.2                        | 3.6                       |
|                      | MADHT1107***          | 1.7                        | 5.1                       |
|                      | MBDHT2110***          | 2.5                        | 7.5                       |
|                      | MCDHT3120***          | 4.6                        | 13.8                      |
| Single/3-phase 200 V | 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 V        | 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 400 V        | 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)<sup>†1</sup>  
LA4: Pulse control only (2DOF)<sup>†1</sup>

A5IINL: NL1: Standard  
N91: With safety function

A5AL: 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 |         |

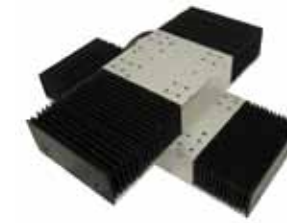
### Application Sample



Single-Axis Module



XY Module

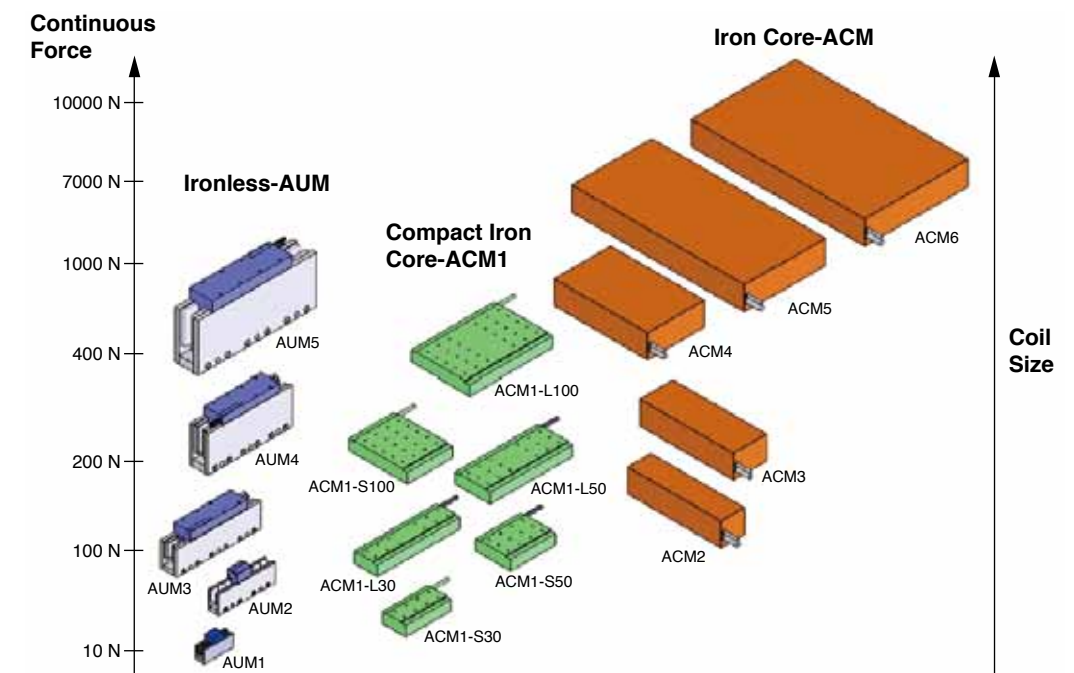


Bellow-Covered Module



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

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# 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

|                                        |            | ADR110     |           | ADR135   |          | ADR175   |          | ADR220     |          | ADR360      |          |
|----------------------------------------|------------|------------|-----------|----------|----------|----------|----------|------------|----------|-------------|----------|
| Performance Parameters                 | Units      | 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       | 36          | 36       |
| 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   |
| Torque constant                        | Nm/A       | 0.32       | 0.70      | 0.86     | 1.83     | 1.97     | 4.11     | 2.84       | 5.86     | 9.24        | 18.90    |
| Back EMF constant                      | V/rpm      | 0.039      | 0.084     | 0.104    | 0.221    | 0.238    | 0.497    | 0.343      | 0.708    | 1.118       | 2.285    |
| Continuous current                     | A rms      | 6.0        | 6.0       | 6.0      | 6.0      | 8.0      | 8.0      | 16.20      | 16.20    | 20.00       | 20.00    |
| Peak current                           | A rms      | 18.0       | 18.0      | 18.0     | 18.0     | 24.0     | 24.0     | 48.60      | 48.60    | 60.00       | 60.00    |
| Resistance                             | ohms       | 0.80       | 1.21      | 1.65     | 2.70     | 1.30     | 2.13     | 0.74       | 1.20     | 0.76        | 1.25     |
| Inductance                             | 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         | 3.20       | 4.60      | 3.90     | 5.70     | 10.0     | 11.6     | 15.6       | 23.4     | 56.0        | 71.0     |
| Rotor Inertia                          | kgm²       | 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                | rpm        | 7278       | 3299      | 2599     | 1137     | 1131     | 501      | 770        | 341      | 228         | 98       |
| Rec. max speed @415V AC                | rpm        | -          | -         | -        | -        | -        | -        | -          | -        | 484         | 224      |
| MS-12000 optical SINCOS encoder        | lines      | 12000      | 12000     | 12000    | 12000    | -        | -        | -          | -        | -           | -        |
| MS-12000 optical digital encoder (40X) | Counts/rev | 480000     | 480000    | 480000   | 480000   | -        | -        | -          | -        | -           | -        |
| Accuracy (based on MS-12000, 40X)      | arc sec    | +/-27      | +/-27     | +/-27    | +/-27    | -        | -        | -          | -        | -           | -        |
| Repeatability (based on MS-12000, 40X) | arc sec    | +/-2.7     | +/-2.7    | +/-2.7   | +/-2.7   | -        | -        | -          | -        | -           | -        |
| MS-16384 optical SINCOS encoder        | lines      | -          | -         | -        | -        | 16384    | 16384    | 16384      | 16384    | -           | -        |
| MS-16384 optical digital encoder (40X) | Counts/rev | -          | -         | -        | -        | 655360   | 655360   | 655360     | 655360   | -           | -        |
| Accuracy (based on MS-16384, 40X)      | arc sec    | -          | -         | -        | -        | +/-20    | +/-20    | +/-20      | +/-20    | -           | -        |
| Repeatability (based on MS-16384, 40X) | arc sec    | -          | -         | -        | -        | +/-2.0   | +/-2.0   | +/-2.0     | +/-2.0   | -           | -        |
| MS-23049 optical SINCOS encoder        | lines      | -          | -         | -        | -        | -        | -        | -          | -        | 23049       | 23049    |
| MS-23049 optical digital encoder (40X) | Counts/rev | -          | -         | -        | -        | -        | -        | -          | -        | 921960      | 921960   |
| Accuracy (based on MS-23049, 40X)      | arc sec    | -          | -         | -        | -        | -        | -        | -          | -        | +/-15       | +/-15    |
| Repeatability (based on MS-23049, 40X) | arc sec    | -          | -         | -        | -        | -        | -        | -          | -        | +/-1.5      | +/-1.5   |
| Radial runout                          | µm         | 25         |           | 30       |          | 35       |          | 40         |          | 50          |          |
| Axial runout                           | µm         | 25         |           | 30       |          | 35       |          | 40         |          | 50          |          |
| Max axial load                         | N          | 700        |           | 1050     |          | 2310     |          | 2800       |          | 11200       |          |
| Max moment load                        | Nm         | 20         |           | 35       | 45       | 53       | 63       | 72         | 95       | 245         |          |
| Cont. Current                          | A rms      | 6          |           |          |          | 8        |          | 16.2       |          | 20          |          |
| Peak Current                           | A rms      | 18         |           |          |          | 24       |          | 48.6       |          | 60          |          |
| MINAS A5L Model                        |            | MDDHT5540L |           |          |          |          |          | MFDHTA464L |          | MFDHTB32A2L |          |

### Application Sample



ATR-IronCore Type



Ironless Type

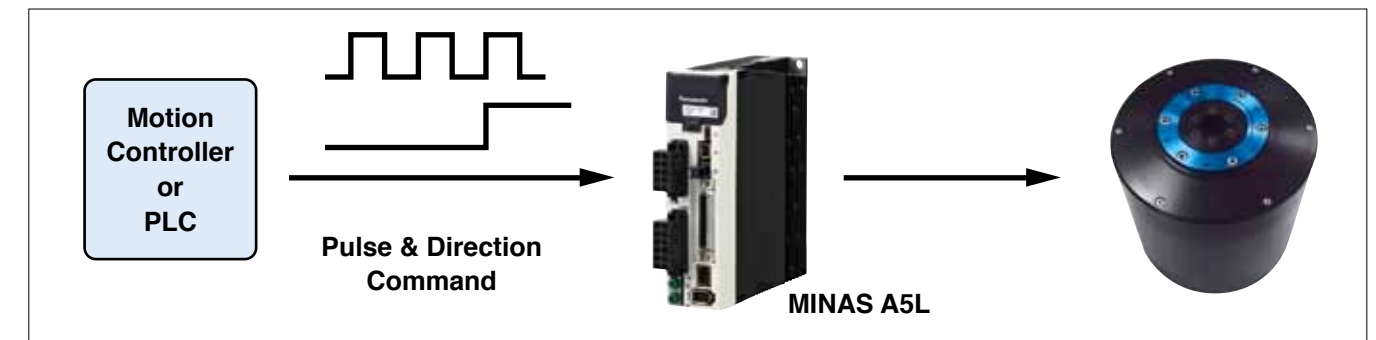
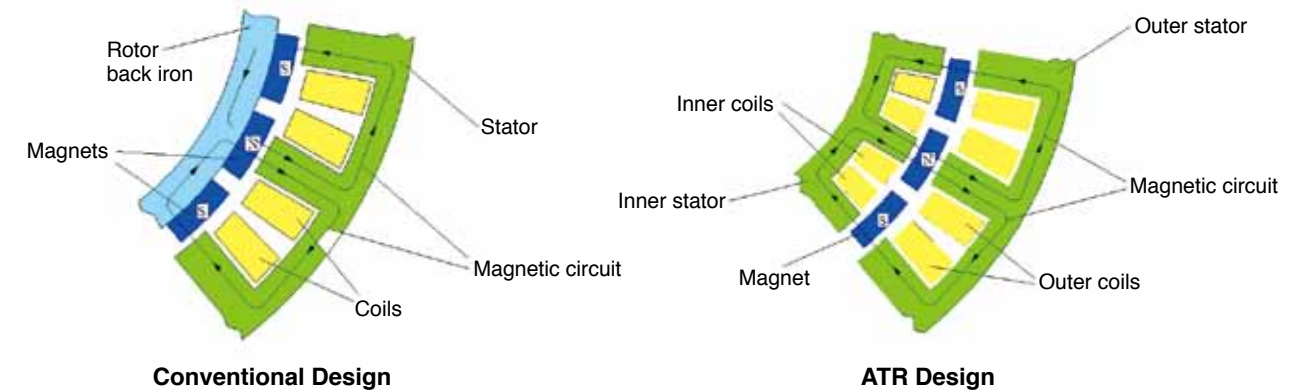


Frameless Type



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

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# 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     |              |          |          |
|-------------------------------------|----------------------|--------------|--------------|---------|---------|------------------|--------------|----------|----------|
|                                     |                      |              | JTR1106      | JTR1112 | JTR1118 | JTR1501E         | JTR1503E     | JTR1505E | JTR1508E |
| Continuous Torque                   | N·m                  | 1.4          | 2            | 4       | 6       | 5                | 10           | 18       | 27       |
| Peak Torque                         | N·m                  | 4.2          | 6            | 12      | 18      | 15               | 30           | 50       | 80       |
| Continuous Current                  | Arms                 | 1.2          | 1            | 1       | 1       | 1.8              | 3.7          | 3.7      | 3.7      |
| Peak Current                        | Arms                 | 3.5          | 3            | 3       | 3       | 5.5              | 11.1         | 11.1     | 11.1     |
| Torque Constant                     | N·m/Arms             | 1.2          | 2            | 4       | 6       | 2.9              | 2.9          | 4.9      | 7.8      |
| Back EMF Constant(ph-ph)            | Vrms/rad/s           | 0.7          | 1.2          | 2.3     | 3.5     | 1.7              | 1.7          | 2.8      | 4.5      |
| Motor Constant                      | N·m/W <sup>1/2</sup> | 0.3          | 0.4          | 0.6     | 0.8     | 0.8              | 1.3          | 1.9      | 2.5      |
| Electrical Time Constant            | ms                   | 0.8          | 1.8          | 2       | 2.1     | 5                | 6.4          | 8.1      | 8.2      |
| Thermal Resistance                  | °C/W                 | 3.3          | 4            | 2.3     | 1.6     | 2.2              | 1.4          | 1.1      | 0.7      |
| Max. Speed1)                        | rps                  | 10           | 10           | 8       | 5       | 5                | 5            | 5        | 4.5      |
| Resolution2)                        | ppr                  | 655360       | 518400       |         |         | 655360           |              |          |          |
| Accuracy1)                          | arcsec               | ±30          | ±30          |         |         | ±30              |              |          |          |
| Repeatability1)                     | arcsec               | ±2           | ±2.5         |         |         | ±2               |              |          |          |
| 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      |
| Max. Moment Load                    | N·m                  | 15           | 12           | 12      | 12      | 96               | 96           | 96       | 96       |
| Rotor Inertia                       | kg·m²                | 0.00226      | 0.0007       | 0.0012  | 0.0023  | 0.012            | 0.021        | 0.024    | 0.029    |
| Motor Weight                        | kg                   | 4.4          | 3.9          | 5.4     | 6.9     | 6.4              | 9.8          | 12.2     | 15.6     |
| Applicable drive<br>MINAS A5L Model | 200 V                | MADHT1505L** |              |         |         | MBDHT<br>2510L** | MCDHT3520L** |          |          |
|                                     | 100 V                | MADHT1105L** |              |         |         | MBDHT<br>2110L** | MCDHT3120L** |          |          |

| PERFORMANCES                        | UNIT                    | JTR16 series     |                  | JTR24 series |         |         | JTR30 series     |              |         |
|-------------------------------------|-------------------------|------------------|------------------|--------------|---------|---------|------------------|--------------|---------|
|                                     |                         | JTR1604          | JTR1608          | JTR2403      | JTR2408 | JTR2413 | JTR3015          | JTR3030      | JTR3045 |
| Continuous Torque                   | N·m                     | 14               | 27               | 10           | 27      | 44      | 50               | 100          | 150     |
| Peak Torque                         | N·m                     | 40               | 80               | 30           | 80      | 130     | 150              | 300          | 450     |
| Continuous Current                  | A <sub>rms</sub>        | 4.3              | 9                | 3.1          | 4.2     | 4       | 4.1              | 9            | 9       |
| Peak Current                        | A <sub>rms</sub>        | 12.9             | 27               | 9.3          | 12.6    | 12      | 13.6             | 27.1         | 28.5    |
| Torque Constant                     | N·m/A <sub>rms</sub>    | 3.1              | 3                | 3.3          | 6.4     | 11      | 12.2             | 11.1         | 16.7    |
| Back EMF Constant(ph-ph)            | V <sub>rms</sub> /rad/s | 1.8              | 1.7              | 1.9          | 3.7     | 6.4     | 6.7              | 6.7          | 9.6     |
| Motor Constant                      | N·m/W <sup>1/2</sup>    | 1.3              | 1.9              | 1.1          | 2.2     | 3.1     | 3.8              | 5.4          | 7.1     |
| Electrical Time Constant            | ms                      | 3.5              | 3.5              | 6.7          | 7.4     | 4.7     | 8.3              | 9.1          | 9.4     |
| Thermal Resistance                  | °C/W                    | 0.9              | 0.5              | 1.1          | 0.6     | 0.5     | 0.54             | 0.27         | 0.21    |
| Max. Speed1)                        | rps                     | 8                | 9                | 5            | 4.5     | 2.8     | 2.9              | 3            | 2       |
| Resolution2)                        | ppr                     | 327680           |                  | 655360       |         |         | 864000           |              |         |
| Accuracy1)                          | arcsec                  | ±30              |                  | ±30          |         |         | ±30              |              |         |
| Repeatability1)                     | arcsec                  | ±4               |                  | ±2           |         |         | ±2               |              |         |
| Axial Run-out (no-load)             | um                      | 20/10/5          |                  |              |         |         |                  |              |         |
| Radial Run-out (no-load)            | um                      | 20/10/5          |                  |              |         |         |                  |              |         |
| Max. Axial Load                     | kg                      | 120              | 120              | 410          | 410     | 410     | 1100             | 1100         | 1100    |
| Max. Moment Load                    | N·m                     | 15               | 15               | 80           | 80      | 80      | 250              | 250          | 250     |
| Rotor Inertia                       | kg·m <sup>2</sup>       | 0.0031           | 0.0052           | 0.0092       | 0.0143  | 0.0203  | 0.1004           | 0.1288       | 0.1576  |
| Motor Weight                        | kg                      | 13.9             | 22               | 10.7         | 14.7    | 19.7    | 42.7             | 54.5         | 66.2    |
| Applicable drive<br>MINAS A5L Model | 200 V                   | MDDHT<br>3530L** | MDDHT<br>5540L** | MCDHT3520L** |         |         | MDDHT<br>3530L** | MDDHT5540L** |         |
|                                     | 100 V                   | □                | □                | MCDHT3120L** |         |         | □                | □            |         |

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

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Coreless and Core Linear Motor

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

Features

| U-Coreless Type                                                                                                                                                    | T-Core Type                                                                                                                                                                    | Platen-Core Type                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   |                                                                                               |                                                                                                           |
| <ul style="list-style-type: none"><li>● No Cogging</li><li>● No Magnetic Attraction Force</li><li>● Fast Setting-time Response</li><li>● Easy to install</li></ul> | <ul style="list-style-type: none"><li>● Cogging Optimization</li><li>● High-density Force &amp; Attraction Force</li><li>● No normal Force</li><li>● Easy to install</li></ul> | <ul style="list-style-type: none"><li>● Cogging Optimization</li><li>● High-density Force &amp; Attraction Force</li><li>● Most economic design solution</li><li>● Easy to install</li></ul> |

Specification

| Item                 | Model         | Dimension [mm]          | Continu. Force [N] | Continu. Current [Arms] | Max. Force [N] | Max. Current [Arms] | Back EMF [Vrms/m/sec] | Force Constant [N/Arms] | Magnetic Attraction (N) | Resistance [Ohm] | Inductance [mH] | Weight [kg] | Motor Constant [N/sqrt(W)] | Thermal Resistance [°C/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)×37(W)×77.5(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)×37(W)×77.5(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)×37(W)×77.5(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)×37(W)×77.5(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)×38.4(W)×92(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)×38.4(W)×92(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)×38.4(W)×92(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)×38.4(W)×92(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)×38.4(W)×92(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)×47.4(W)×121.5(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)×47.4(W)×121.5(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)×47.4(W)×121.5(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)×47.4(W)×121.5(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)×47.4(W)×121.5(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-U LL-3PA*  | 397(L)×50.4(W)×152(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-U LL-4PA*  | 517(L)×50.4(W)×152(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-U LL-5PA*  | 637(L)×50.4(W)×152(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      |
| U-Coreless (X-large) | ML-ULX-2PA*   | 336(L)×66.6(W)×224(H)   | 771                | 7.40                    | 2313           | 22.20               | 36.2                  | 104.2                   | 0                       | 1.4              | 4.6             | 5.5         | 45.47                      | 0.21                      | 37.50                    | 2.0                | MDDHT5540L01     | MEDHT7364L01      |
|                      | ML-ULX-3PA*   | 486(L)×66.6(W)×224(H)   | 1157               | 11.10                   | 3471           | 33.30               | 36.2                  | 104.2                   | 0                       | 1.0              | 3.1             | 8.3         | 53.83                      | 0.13                      |                          | 2.0                | MEDHT7364L01     | MFDHTA390L01      |
|                      | ML-ULX-4PA*   | 636(L)×66.6(W)×224(H)   | 1542               | 14.80                   | 4626           | 44.40               | 36.2                  | 104.2                   | 0                       | 0.7              | 2.3             | 11.1        | 64.31                      | 0.10                      |                          | 2.0                | MFDHTA390L01     | MFDHTB3A2L01      |
|                      | ML-TCT-1P     | 101(L)×38.7(W)×67.5(H)  | 118                | 1.3                     | 354            | 3.9                 | 30.7                  | 92.1                    | 0                       | 17.3             | 56.4            | 2.2         | 13.61                      | 0.80                      | 22.50                    | 2.1                |                  | MADHT1507L01      |
| T-Core (Tiny)        | ML-TCT-2P     | 191(L)×38.7(W)×67.5(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      |
|                      | ML-TCT-3P     | 281(L)×38.7(W)×67.5(H)  | 354                | 3.9                     | 1062           | 11.7                | 30.7                  | 92.1                    | 0                       | 5.8              | 18.8            | 6.7         | 23.57                      | 0.27                      |                          | 2.1                | MCDHT3520L01     | MDDHT3530L01      |
|                      | ML-TCT-4P     | 371(L)×38.7(W)×67.5(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      |
| T-Core (Medium)      | ML-TCM-2P     | 191(L)×72.3(W)×135(H)   | 550                | 4.5                     | 1650           | 13.5                | 37.76                 | 113.3                   | 0                       | 2.0              | 17.3            | 4.5         | 44.85                      | 0.40                      | 22.50                    | 2.0                | MDDHT3530L01     | MDDHT5540L01      |
|                      | ML-TCM-3P     | 281(L)×72.3(W)×135(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      |
|                      | ML-TCM-4P*    | 371(L)×72.3(W)×135(H)   | 1100               | 9.0                     | 3300           | 27.0                | 37.76                 | 113.3                   | 0                       | 1.0              | 8.7             | 8.9         | 63.43                      | 0.20                      |                          | 2.0                | MDDHT5540L01     | MEDHT7364L01      |
|                      | ML-TCM-5P     | 461(L)×72.3(W)×135(H)   | 1375               | 11                      | 4125           | 34                  | 37.76                 | 113.3                   | 0                       | 0.8              | 6.9             | 11.1        | 70.92                      | 0.16                      |                          | 2.0                | MEDHT7364L01     | MFDHTA390L01      |
| Platen Core (Tiny)   | ML-PCT-1SF*   | 69(L)×55(W)×45(H)       | 43                 | 1.44                    | 129            | 4.32                | 14.6                  | 29.8                    | 192.0                   | 3.4              | 17.5            | 0.7         | 8.42                       | 2.30                      | 15.00                    | 7.30               |                  | MADHT1507L01      |
|                      | ML-PCT-2SF*   | 129(L)×55(W)×45(H)      | 86                 | 1.44                    | 258            | 4.32                | 29.2                  | 59.5                    | 384.0                   | 6.7              | 35.1            | 1.4         | 11.91                      | 1.15                      |                          | 3.10               |                  | MADHT1507L01      |
|                      | ML-PCT-3SF    | 189(L)×55(W)×45(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)×55(W)×45(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      |
| Platen Core (Small)  | ML-PCS-1SE    | 69(L)×75(W)×46.3(H)     | 80                 | 2.30                    | 240            | 6.90                | 11.6                  | 34.8                    | 320.0                   | 1.4              | 11.3            | 0.8         | 15.18                      | 2.16                      | 15.00                    | 9.00               | MBDHT2510L01     | MDDHT3520L01      |
|                      | ML-PCS-2SE*   | 129(L)×75(W)×46.3(H)    | 150                | 2.25                    | 450            | 6.75                | 23.2                  | 69.6                    | 640.0                   | 2.8              | 22.6            | 1.6         | 20.57                      | 1.13                      |                          | 3.70               | MBDHT2510L01     | MDDHT3520L01      |
|                      | ML-PCS-3SE*   | 189(L)×75(W)×46.3(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               | MBDHT2510L01     | MDDHT3520L01      |
|                      | ML-PCS-2S2PE* | 249(L)×75(W)×46.3(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)×133(W)×58(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)×133(W)×58(H)     | 1000               | 9.29                    | 3000           | 27.87               | 37                    | 111                     | 4800.0                  | 0.8              | 4.0             | 10.2        | 62.15                      | 0.23                      |                          | 2.3                | MEDHT7364L01     | MFDHTA390L01      |

Application Sample

| X-Y Gantry                                                                          | Compact X-Y Table                                                                   | High Precision Air-Bearing Stage                                                    | Multi-Mover Linear Stage                                                            |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| For Heavy duty Industrial Equipment                                                 | Has enough stroke even in a small area                                              | Air Bearing is applied for non-touching moving structure                            | 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 |                                                                 |                                                        |                                                           |                    |  |
|---------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|--------------------|--|
| <div>ML - PCL - 2S2PE</div> <div>① ② ③④ ⑤ ⑥</div> |                                                                 |                                                                 |                                                        |                                                           |                    |  |
| ① Shape                                           | ② Core                                                          | ③ Magnet size                                                   | ④ Number of Serial Coil                                | ⑤ Number of Parallel Coil                                 | ⑥ Design oder      |  |
| U : U shape<br>T : T shape<br>P : Platen          | C : Core type<br>L : Core-less                                  | T : Tiny<br>S : Small<br>M : Medium<br>L : Large<br>X : X-Large | 1S : 1 serial<br>2S : 2 serial<br>3S : 3 serial<br>... | 1P : 1parallel<br>2P : 2parallel<br>3P : 3parallel<br>... | A, B, C, D, E, ... |  |

| Stator                                             | The fixed parts are made up of the Magnet and the Back Ilon |                                                  |                       |                                              |  |  |
|----------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|-----------------------|----------------------------------------------|--|--|
| <div>ML - PCL - SE - 540</div> <div>① ② ③④ ⑤</div> |                                                             |                                                  |                       |                                              |  |  |
| ① Shape                                            | ② Core                                                      | ③ Magnet size                                    | ④ Stator Desgin Oderl | ⑤ Stator Length                              |  |  |
| U : U shape<br>T : T shape<br>P : Platen           | C : Core type<br>L : Core-less                              | T : Tiny<br>S : Small<br>M : Medium<br>L : Large | SA, AB, SC, ...       | 270 : 270 mm<br>330 : 330 mm<br>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-U LL-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-U LL-SA-300   | 300         |                                  | ML-TCT-SA-360 | 360         |                                | ML-PCT-SE-180  | 180         |
|                                    | ML-ULT-SA-480     | 480         |                                     | ML-U LL-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-U LL-SA-600   | 600         | T-Shape Core Type (Medium model) | ML-TCM-SA-270 | 270         | Platen Core Type (Tiny model)  | ML-PCT-SE-300  | 300         |
|                                    | ML-ULS-SA-420     | 420         |                                     | ML-ULX-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-ULS-SA-600     | 600         | U-Shape Coreless (X-large economic) | ML-ULX-SA-600    | 600         |                                  | ML-TCM-SA-495 | 495         | Platen Core Type (Small model) | ML-PCS-SE-270  | 270         |
|                                    | ML-U LM-SA-270    | 270         |                                     | ML-ULX(e)-SA-150 | 150         |                                  | ML-TCM-SA-540 | 540         |                                | ML-PCS-SE-540  | 540         |
|                                    | ML-U LM-SA-360    | 360         |                                     | ML-ULX(e)-SA-300 | 300         |                                  | ML-TCM-SA-630 | 630         | Platen Core Type (Large model) | ML-PCL-SE-120* | 120         |
|                                    | ML-U LM-SA-450    | 450         |                                     |                  |             |                                  | ML-TCM-SA-720 | 720         |                                | ML-PCL-SE-270* | 270         |
|                                    | ML-U LM-SA-540    | 540         |                                     |                  |             |                                  | ML-TCM-SA-945 | 945         |                                | ML-PCL-SE-540  | 540         |
| U-Shape Coreless (Medium economic) | ML-U LM-SA-630    | 630         |                                     |                  |             |                                  |               |             |                                |                |             |
|                                    | ML-U LM(e)-SA-360 | 360         |                                     |                  |             |                                  |               |             |                                |                |             |
|                                    | ML-U LM(e)-SA-540 | 540         |                                     |                  |             |                                  |               |             |                                |                |             |
|                                    | ML-U LM(e)-SA-630 | 630         |                                     |                  |             |                                  |               |             |                                |                |             |

\* special

Sales area and Language

|                                                                                       |                                                                                       |                                                                                       |                               |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------|
|  |  |  | • Korea : +82-70-8230-8770    |
|                                                                                       |                                                                                       |                                                                                       | • English : +82-70-8230-8771  |
|                                                                                       |                                                                                       |                                                                                       | • Chinese : +86-138-2520-1988 |

For more information

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

|                                                                                           |                                                                       |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>Contact: Mirae Linear Motor Technology</b>                                             | [E-mail: <a href="mailto:miraelmt@naver.com">miraelmt@naver.com</a> ] |
| Headquarters #714 Baekseok-Dong, Seobuk-Gu, Cheonan-Si, Chungcheongnam-Do, 330-220, Korea |                                                                       |
| LM Business Team                                                                          | TEL: +82-70-8230-8770                                                 |

# Coreless Linear Motor Positioning Table

## Smart Table DSTN14 Type

### Features

- Uses High Performance Neodymium Magnets
- Low velocity ripple & smooth motion with non-cogging coreless motor
- High accuracy with fully closed optical linear encoder feedback
- Thin and compact design
- Independently controlled multiple slider carriages



### Specification

| No. | Item                           | Specifications                                                                                                     |
|-----|--------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 1   | Motor Type                     | Coreless Synchronous Motor                                                                                         |
| 2   | Continuous force (N)           | 30                                                                                                                 |
| 3   | Peak force (N)                 | 90                                                                                                                 |
| 4   | Continuous current (A rms)     | 1.5                                                                                                                |
| 5   | Peak current (A rms)           | 4.5                                                                                                                |
| 6   | Table moving mass (kg)         | 1.7                                                                                                                |
| 7   | Max. speed (m/s)               | 2                                                                                                                  |
| 8   | Max. load at 0.5G accel. (kg)  | 8.6                                                                                                                |
| 9   | Max. load at 1.0G accel. (kg)  | 3.5                                                                                                                |
| 10  | Max. load at 2.0G accel. (kg)  | 0.9                                                                                                                |
| 11  | Resolution (μm)                | 1.0 (Standard) / 0.5 / 0.1                                                                                         |
| 12  | Positioning repeatability (μm) | ±1                                                                                                                 |
| 13  | Positioning accuracy (μm)      | 20                                                                                                                 |
| 14  | Standard stroke option (mm)    | 40, 100, 160, 220, 280, 340, 400, 460, 520, 580, 640, 700, 760, 820, 940, 1060, 1180, 1300, 1420, 1540, 1660, 1780 |
| 15  | Ambient temperature            | 0 °C to 40 °C                                                                                                      |
| 16  | Ambient humidity               | 20 % to 80 % (Avoid condensation)                                                                                  |
| 17  | Standard driver                | Panasonic Corp. MINAS A5L (MADHT1107L01)                                                                           |

\* Specifications No.2, No.3, No.4, No.5 under following conditions: Ambient temperature at 20 °C, average coil temperature up to 100 °C.

\* No.7 max. speed can vary depending on specifications such as stroke and resolution.

\* No.12 is the resolution when 1 μm resolution encoder is used.

\* No.13 is the accuracy value of 640 mm stroke model.

\* Custom stroke models can be manufactured.

\* Standard stroke is the distance between limit sensors. Physical stroke limit between mechanical stoppers is std stroke+20 mm.

\* Conditions for No.8 to 10: cycle = [accel. → max. speed → decel. → rest],

max. speed = 2 m/s, accel. time = decel. time, max. speed time = 2x accel. time, rest time = max. speed time.

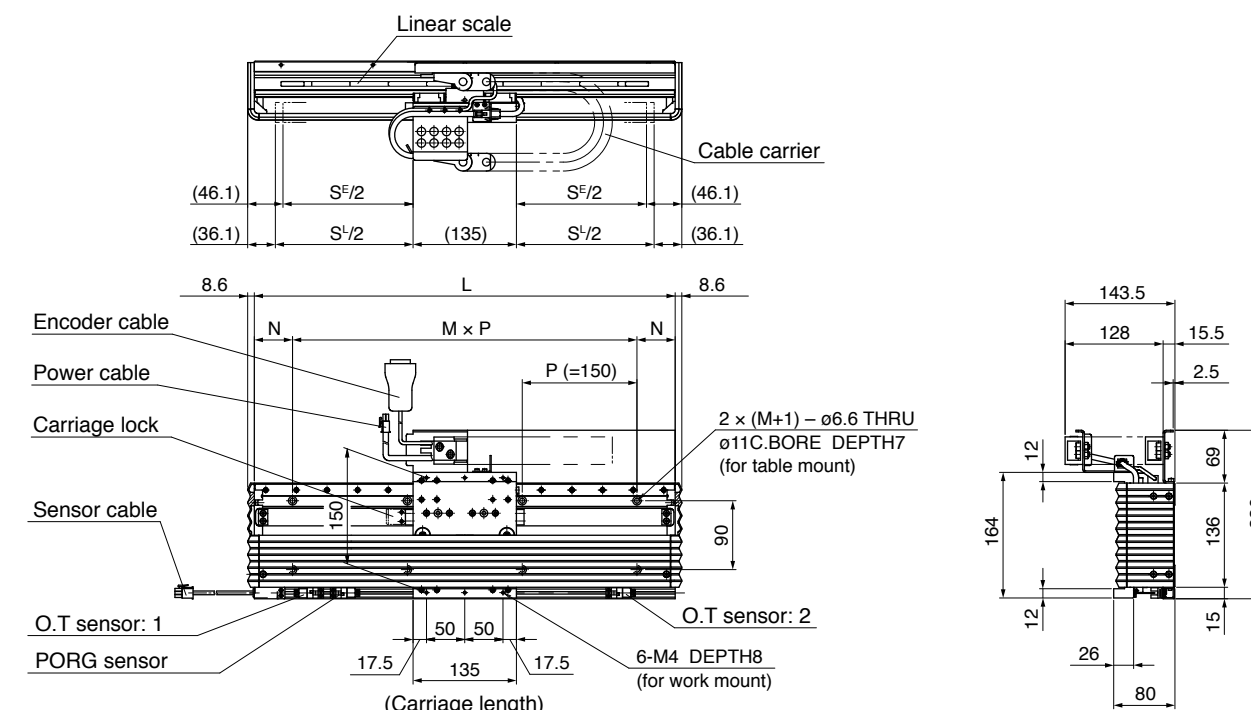
### Application Sample

- Laser application machine
- Semiconductor equipment
- Industrial robot
- Automatic fabricating machine
- Motion picture camera
- Various electronic parts manufacturing machine in chamber
- Measuring instrument

### System Configuration

| Standard Stroke Se (mm) | Physical Stroke Sl (mm) | L (mm) | M | N (mm) | Table Mass (kg) |
|-------------------------|-------------------------|--------|---|--------|-----------------|
| 40                      | 60                      | 250    | 1 | 50     | 8.5             |
| 100                     | 120                     | 310    | 1 | 80     | 10.0            |
| 160                     | 180                     | 370    | 2 | 35     | 11.0            |
| 220                     | 240                     | 430    | 2 | 65     | 12.5            |
| 280                     | 300                     | 490    | 3 | 20     | 13.5            |
| 340                     | 360                     | 550    | 3 | 50     | 15.0            |
| 400                     | 420                     | 610    | 3 | 80     | 16.0            |
| 460                     | 480                     | 670    | 4 | 35     | 17.5            |
| 520                     | 540                     | 730    | 4 | 65     | 18.5            |
| 580                     | 600                     | 790    | 5 | 20     | 20.0            |
| 640                     | 660                     | 850    | 5 | 50     | 21.0            |

| Standard Stroke Se (mm) | Physical Stroke Sl (mm) | L (mm) | M  | N (mm) | Table Mass (kg) |
|-------------------------|-------------------------|--------|----|--------|-----------------|
| 700                     | 720                     | 910    | 5  | 80     | 22.5            |
| 760                     | 780                     | 970    | 6  | 35     | 23.5            |
| 820                     | 840                     | 1030   | 6  | 65     | 25.0            |
| 940                     | 960                     | 1150   | 7  | 50     | 27.5            |
| 1060                    | 1080                    | 1270   | 8  | 35     | 30.0            |
| 1180                    | 1200                    | 1390   | 9  | 20     | 32.0            |
| 1300                    | 1320                    | 1510   | 9  | 80     | 35.0            |
| 1420                    | 1440                    | 1630   | 10 | 65     | 37.0            |
| 1540                    | 1560                    | 1750   | 11 | 50     | 40.0            |
| 1660                    | 1680                    | 1870   | 12 | 35     | 42.0            |
| 1780                    | 1800                    | 1990   | 13 | 20     | 45.0            |



### Sales area and Language



- Japanese
- English

Please contact the following address for details.

### For more information

URL: <http://www.nb-linear.co.jp/>

Contact: **NIPPON BEARING CO.,LTD.**

2833 Chiya,Ojiya-city, Niigata-pref, 947-8503, Japan

[E-mail: [info@nb-linear.co.jp](mailto:info@nb-linear.co.jp)]

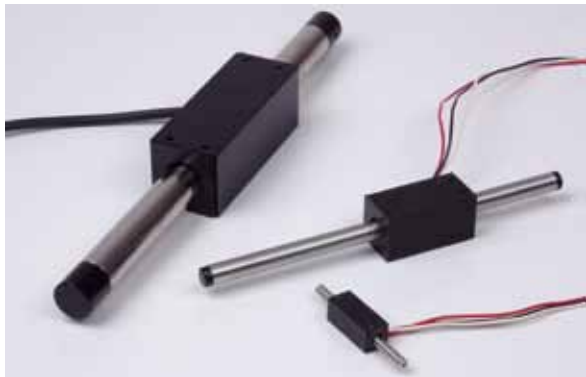
TEL: +81-258-82-0011 FAX: +81-258-81-1135

Linear Shaft Motor

S series/L series

Features

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

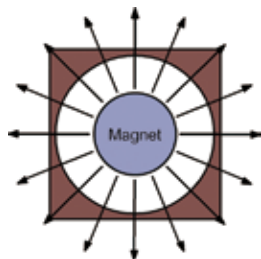


Specification

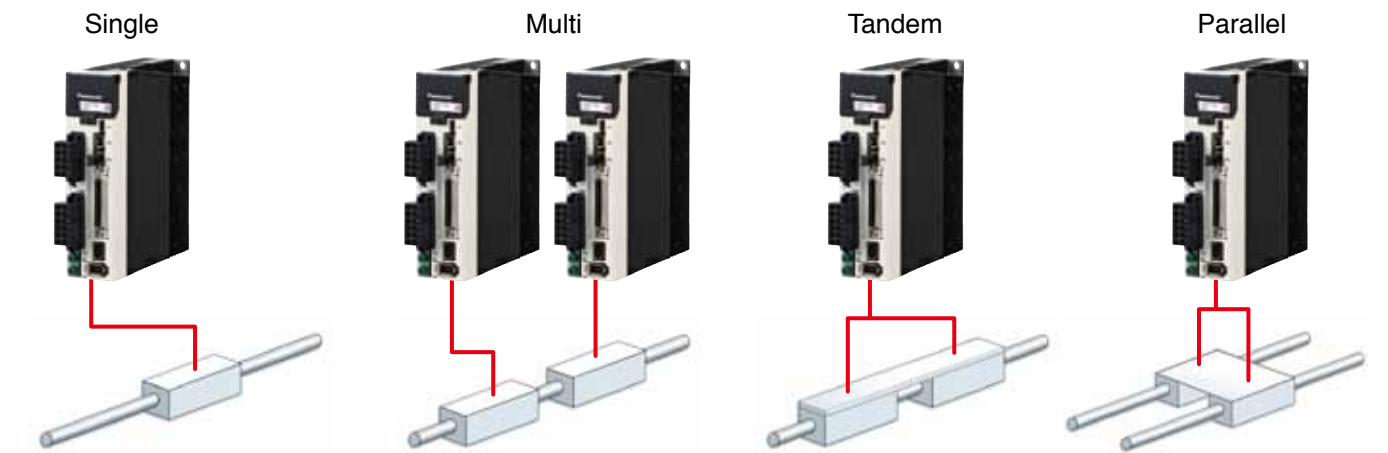
|                     |       | S080 series  |        |        | S120 series |         |         | S160 series |          |          | S200 series |          |          | S250 series  |          |          |
|---------------------|-------|--------------|--------|--------|-------------|---------|---------|-------------|----------|----------|-------------|----------|----------|--------------|----------|----------|
|                     | Units | S080D        | S080T  | S080Q  | S120D       | S120T   | S120Q   | S160D       | S160T    | S160Q    | S200D       | S200T    | S200Q    | S250D        | S250T    | S250Q    |
| Shaft Diameter      | mm    | 8            | 8      | 8      | 12          | 12      | 12      | 16          | 16       | 16       | 20          | 20       | 20       | 25           | 25       | 25       |
| Stroke Length Range | mm    | 25~300       | 25~300 | 25~300 | 50~1750     | 50~1750 | 50~1750 | 100~1750    | 100~1750 | 100~1750 | 100~2700    | 100~2700 | 100~2700 | 100~2550     | 100~2550 | 100~2550 |
| Continuous Force    | N     | 1.8          | 2.7    | 3.5    | 4.5         | 6.6     | 8.9     | 10          | 15       | 20       | 18          | 28       | 38       | 40           | 60       | 75       |
| Continuous Current  | A rms | 0.84         | 0.84   | 0.84   | 0.4         | 0.4     | 0.4     | 0.62        | 0.62     | 0.62     | 0.59        | 0.59     | 0.59     | 1.28         | 1.28     | 1.28     |
| Peak Force          | N     | 7.2          | 10.7   | 14     | 18          | 27      | 36      | 40          | 60       | 81       | 72          | 112      | 152      | 160          | 240      | 300      |
| Peak Current        | A rms | 3.4          | 3.4    | 3.4    | 1.6         | 1.6     | 1.6     | 2.5         | 2.5      | 2.5      | 2.4         | 2.4      | 2.4      | 5.1          | 5.1      | 5.1      |
| Magnet Pitch N-N    | mm    | 30           | 30     | 30     | 48          | 48      | 48      | 60          | 60       | 60       | 72          | 72       | 72       | 90           | 90       | 90       |
| Gap                 | mm    | 0.5          | 0.5    | 0.5    | 0.5         | 0.5     | 0.5     | 0.5         | 0.5      | 0.5      | 0.75        | 0.75     | 0.75     | 0.75         | 0.75     | 0.75     |
| MINAS A5L Model     | 200 V | MADHT1505LXX |        |        |             |         |         |             |          |          |             |          |          | MADHT1507LXX |          |          |
|                     | 100 V | MADHT1105LXX |        |        |             |         |         |             |          |          |             |          |          | MADHT1107LXX |          |          |

|                     |       | S320 series  |          |          | S350 series  |          |          | S427 series  |              |          | S435 series |          |          | S500 series  |          |          |
|---------------------|-------|--------------|----------|----------|--------------|----------|----------|--------------|--------------|----------|-------------|----------|----------|--------------|----------|----------|
|                     | Units | S320D        | S320T    | S320Q    | S350D        | S350T    | S350Q    | S427D        | S427T        | S427Q    | S435D       | S435T    | S435Q    | S500D        | S500T    | S500Q    |
| Shaft Diameter      | mm    | 32           | 32       | 32       | 35           | 35       | 35       | 42.7         | 42.7         | 42.7     | 43.5        | 43.5     | 43.5     | 50           | 50       | 50       |
| Stroke Length Range | mm    | 100~2700     | 100~2700 | 100~2700 | 100~2500     | 100~2500 | 100~2500 | 100~3600     | 100~3600     | 100~3600 | 100~2600    | 100~2600 | 100~2600 | 100~3850     | 100~3850 | 100~3850 |
| Continuous Force    | N     | 56           | 85       | 113      | 104          | 148      | 190      | 100          | 150          | 200      | 116         | 175      | 233      | 289          | 440      | 585      |
| Continuous Current  | A rms | 1.22         | 1.17     | 1.15     | 1.5          | 1.5      | 2.7      | 3            | 3            | 3        | 3           | 3        | 3        | 3.8          | 5.8      | 7.7      |
| Peak Force          | N     | 226          | 338      | 451      | 416          | 592      | 760      | 400          | 600          | 800      | 464         | 700      | 932      | 1156         | 1760     | 2340     |
| Peak Current        | A rms | 5            | 5        | 5        | 6            | 6        | 10.8     | 12           | 12           | 12       | 12          | 12       | 12       | 15.2         | 23.2     | 30.8     |
| Magnet Pitch N-N    | mm    | 120          | 120      | 120      | 120          | 120      | 120      | 180          | 180          | 180      | 180         | 180      | 180      | 180          | 180      | 180      |
| Gap                 | mm    | 1.0          | 1.0      | 1.0      | 1.0          | 1.0      | 1.0      | 1.65         | 1.65         | 1.65     | 1.25        | 1.25     | 1.25     | 1.75         | 1.75     | 1.75     |
| MINAS A5L Model     | 200 V | MADHT1507LXX |          |          | MADHT1507LXX |          |          | MCDHT3520LXX | MCDHT3520LXX |          |             |          |          | MDDHT5540LXX |          |          |
|                     | 100 V | MADHT1107LXX |          |          | MADHT1107XX  |          |          | MCDHT3120LXX | MCDHT3120LXX |          |             |          |          | —            |          |          |

|                     |       | S605 series  |          | L250 series  |          |          | L350 series |          |          |
|---------------------|-------|--------------|----------|--------------|----------|----------|-------------|----------|----------|
| Model Number        | Units | S605T        | S605Q    | L250D        | L250T    | L250Q    | L320D       | L320T    | L320Q    |
| Shaft Diameter      | mm    | 60.5         | 60.5     | 25           | 25       | 25       | 32          | 32       | 32       |
| Stroke Length Range | mm    | 100~3850     | 100~3850 | 100~3650     | 100~3650 | 100~3650 | 100~3600    | 100~3600 | 100~3600 |
| Continuous Force    | N     | 610          | 780      | 34           | 52       | 69       | 55          | 82       | 109      |
| Continuous Current  | A rms | 8.6          | 8.4      | 1.3          | 1.3      | 1.3      | 1.25        | 1.25     | 1.25     |
| Peak Force          | N     | 2400         | 3100     | 138          | 207      | 276      | 218         | 327      | 436      |
| Peak Current        | A rms | 34           | 34       | 5.2          | 5.2      | 5.2      | 5           | 5        | 5        |
| Magnet Pitch N-N    | mm    | 240          | 240      | 90           | 90       | 90       | 120         | 120      | 120      |
| Gap                 | mm    | 1.75         | 1.75     | 2            | 2        | 2        | 2.5         | 2.5      | 2.5      |
| MINAS A5L Model     | 200 V | MDDHT5540LXX |          | MADHT1507KXX |          |          |             |          |          |
|                     | 100 V | —            |          | MADHT1107LXX |          |          |             |          |          |

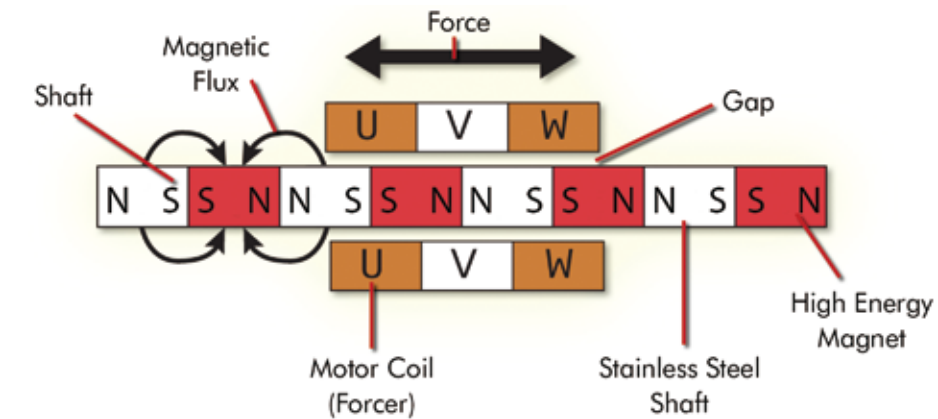


Application Sample



Constuction

- 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/>

# Linear Shaft Motor Stage

## SLP series / SCR series

### Features

#### SLP-series

- High Force
- High Speed



#### SCR-series

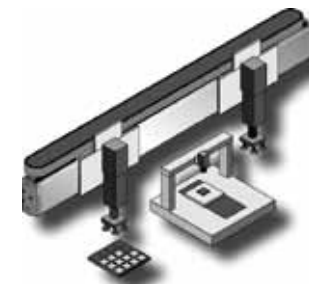
- High Precision
- Low Ripple at Low Speed
- High Repeatability



### Specification

|                       | Units | SLP series                    |                               |                               | SCR series                                  |                                             |
|-----------------------|-------|-------------------------------|-------------------------------|-------------------------------|---------------------------------------------|---------------------------------------------|
|                       |       | SLP15                         | SLP25                         | SLP35                         | SLR075                                      | SCR100                                      |
| Resolution            | μm    | 1<br>(Hidenhain LIDA279)      | 1<br>(Hidenhain LIDA279)      | 1<br>(Hidenhain LIDA279)      | 1, 0.5, 0.1, 0.05, 0.01<br>(Renishaw Tonic) | 1, 0.5, 0.1, 0.05, 0.01<br>(Renishaw Tonic) |
| Stroke/Single Slider  | mm    | 100 to 1300<br>(100 interval) | 200 to 1200<br>(100 interval) | 200 to 1200<br>(100 interval) | 50, 100, 150                                | 50 to 300<br>(50 interval)                  |
| Strike/ Double Slider | mm    | 100 to 1200<br>(100 interval) | 200 to 1000<br>(100 interval) | 300 to 900<br>(100 interval)  | -                                           | -                                           |
| Continuous Force      | N     | 17                            | 80                            | 185                           | 3.5                                         | 3.5                                         |
| Continuous Current    | A rms | 0.51                          | 1.2                           | 2.7                           | 0.84                                        | 0.84                                        |
| Peak Force            | N     | 90                            | 340                           | 970                           | 14                                          | 14                                          |
| Peak Current          | A rms | 2.7                           | 5.1                           | 14.4                          | 3.4                                         | 3.4                                         |
| Max. Velocity         | m/sec | 3.0                           | 3.0                           | 3.0                           | 1.1 to 1.5 (depends)                        | 0.9 to 1.3 (depends)                        |
| Resistance            | Ω     | 56                            | 22                            | 22                            | 9.0                                         | 9.0                                         |
| Inductance            | mH    | 24                            | 31                            | 12                            | 1.3                                         | 1.3                                         |
| Magnet Pitch N-N      | mm    | 60                            | 90                            | 120                           | 30                                          | 30                                          |
| Load Capacity         | kg    | 3                             | 15                            | 30                            | 45.5                                        | 45.5                                        |
| Panasonic MINAS A5L   | 200 V | MADHT1505LXX                  | MADHT1507KXX                  | MCDHT3520LXX                  | MADHT1505LXX                                | MADHT1505LXX                                |
|                       | 100 V | MADHT1105LXX                  | MADHT1107LXX                  | MCADHT3120LXX                 | MADHT1105LXX                                | MADHT1105LXX                                |

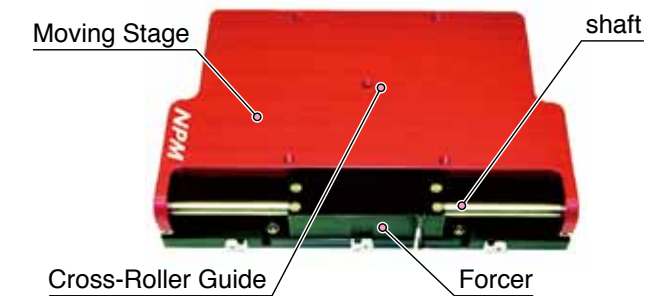
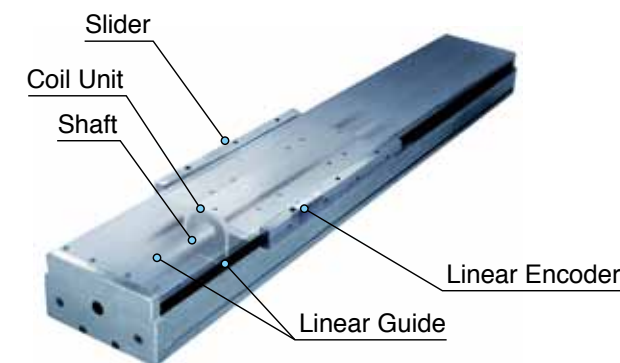
### Application Sample



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](mailto:info@nipponpulse.com)]  
TEL: +1-540-633-1677 / +1-540-633-1674

# 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

Outstandig precision

High reliability

Maintenance-free

### Specification

| Model                               |                   | ZMD-1003                         | ZMD-1007 | ZMD-1010 |
|-------------------------------------|-------------------|----------------------------------|----------|----------|
| Maximum torque                      | N·m               | 30                               | 65       | 100      |
| Continuos torque                    | N·m               | 10                               | 21       | 33       |
| Maximum current                     | A <sub>rms</sub>  | 3.5                              | 7.1      | 8.8      |
| Rated current                       | A <sub>rms</sub>  | 1.2                              | 2.4      | 2.9      |
| Maximum rotation speed              | s <sup>-1</sup>   | 5                                | 4.5      | 4        |
| Sensor resolution                   | ppr               | 1310720 <sup>*1</sup>            |          |          |
| Repeatability positioning precision | Second            | ±3                               |          |          |
| Allowed axial load                  | N                 | 3500 <sup>*2</sup>               |          |          |
| Allowed moment load                 | N·m               | 150 <sup>*3</sup>                |          |          |
| Axial rigidity                      | mm/N              | $2 \times 10^{-6}$ <sup>*4</sup> |          |          |
| Moment rigidity                     | rad/N·m           | $2 \times 10^{-6}$               |          |          |
| Rotor inertia                       | kg·m <sup>2</sup> | 0.014                            | 0.017    | 0.02     |
| Axial run-out/side run-out accuracy | μm                | 70 <sup>*5</sup>                 |          |          |
| Weight                              | kg                | 8.2                              | 11.5     | 14.5     |

• 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.

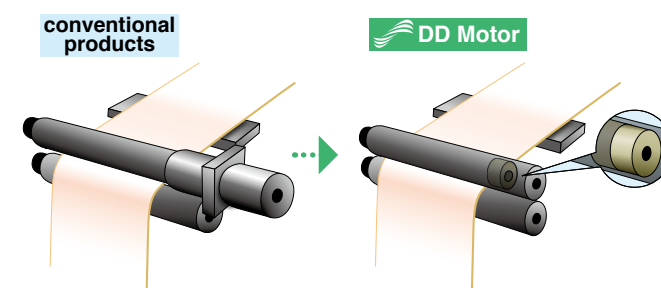
<sup>\*1</sup> With the use of RD1416SPW (RD converter) <sup>\*2</sup> Horizontal installation <sup>\*3</sup> Horizontal installation <sup>\*4</sup> By using cross-roller bearings

<sup>\*5</sup> 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.

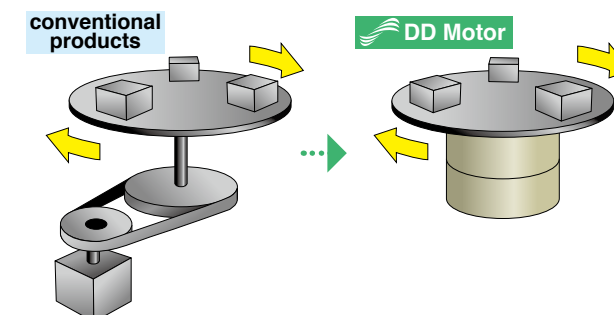


- Thanks to the outer motor, it's possible to build the motor inside the roller, saving space
- It works smoothly, avoiding uneven operations or movements

#### <Other possible applications>

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

#### Indexing rotation application e.g.

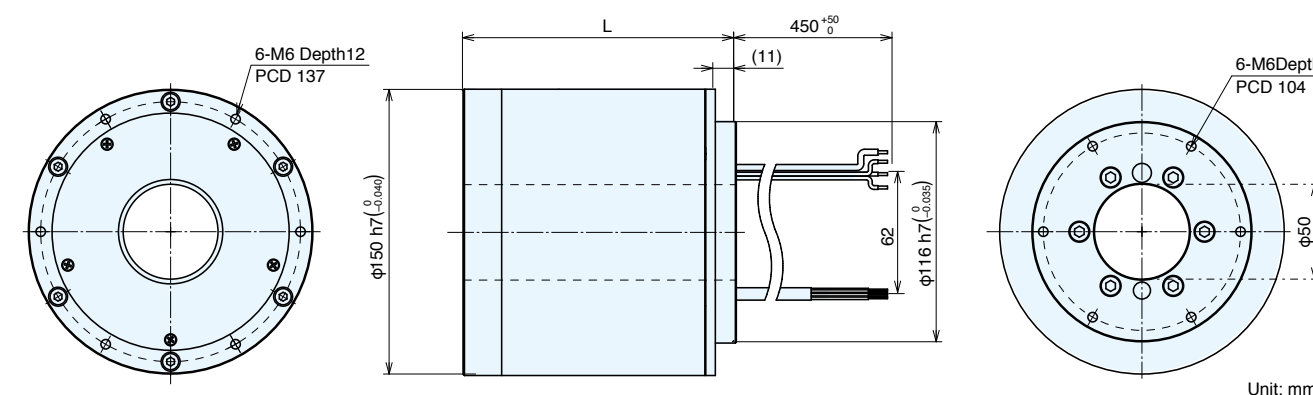


- Space-saving design for a more compac structure
- As no reduction device is needed, it's possible to avoid complex installations, improving its efficiency and reliability with no back-lash

#### <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

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 Linaer 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

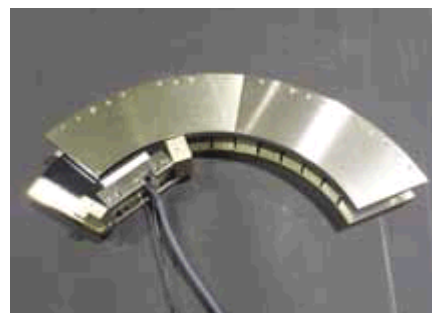
CM SERIES 190N-1172N  
CE (M) 800N-1600N CE (L) 1600N-6400N  
CE (W) 4800N-7200N CE (W2) 6400N-9600N



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 circlar 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

### Serial & Analog I/F by MINAS A5L



## Specification

### ● Coreless Linear Motor CA Series

| Motor Type       | Name    | CA010*(V)      |        |         | CA020*(V)      |        |         | CA030*(V)      |        |         | CA040*(V)      |        |         |
|------------------|---------|----------------|--------|---------|----------------|--------|---------|----------------|--------|---------|----------------|--------|---------|
|                  | Cooling | A Oil          | B None | D Water | A Oil          | B None | D Water | A Oil          | B None | D Water | A Oil          | B None | D Water |
| Driver [12 kHz]  |         | MCDHT3520L     |        |         | MDDHT5540L     |        |         | MEDHT7364L     |        |         | MEDHT7364L     |        |         |
| Cont. FORCE      | N       | 48             | 16.8   | 60      | 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 × W × L) | mm      | 30 × 110 × 130 |        |         | 30 × 110 × 202 |        |         | 30 × 110 × 274 |        |         | 30 × 110 × 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     |

### ● Coreless Linear Motor CB Series

| Motor Type       | Name    | CB100          |       | CB110          |       | CB160i         |       | CB200i         |       |
|------------------|---------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|
|                  | Cooling | None           | Water | None           | Water | None           | Water | None           | Water |
| Driver [6 kHz]   |         | MDDHT5540L     |       | MDDHT5540L     |       | MEDHT7364L     |       | MFDHTA390L     |       |
| Cont. FORCE      | N       | 135            | 350   | 139            | 406   | 188            | 536   | 251            | 744   |
| Max. FORCE       | N       | 1200           |       | 1392           |       | 1600           |       | 2133           |       |
| Rated SPEED      | m/sec   | 2.5            |       | 1.8            |       | 2.7            |       | 2.7            |       |
| Max. SPEED       | m/sec   | 4              |       | 3.6            |       | 3              |       | 3              |       |
| SIZE (D × W × L) | mm      | 50 × 165 × 303 |       | 50 × 165 × 303 |       | 50 × 165 × 303 |       | 50 × 165 × 375 |       |
| WEIGHT           | kg      | 3.5            |       | 3.6            |       | 3.9            |       | 5.0            |       |

### ● Coreless Linear Motor CG Series

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

### ● Ironcore Linear Motor CM Series

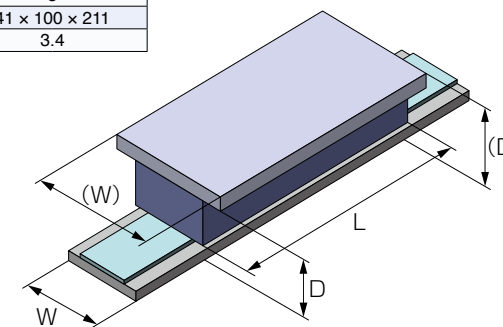
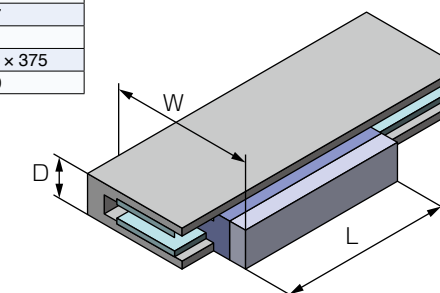
| Motor Type       | Name    | CM003(V)      |     | CM007(V)      |     | CM010(V)       |     | CM020(V)       |     |
|------------------|---------|---------------|-----|---------------|-----|----------------|-----|----------------|-----|
|                  | Cooling | None          | Fin | None          | Fin | None           | Fin | None           | Fin |
| Driver [6 kHz]   |         | MBDHT2510L    |     | MDDHT3530L    |     | MDDHT5540L     |     | MEDHT7364L     |     |
| 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                          |      |       | CE066L                         |      |       |
|------------------|---------|--------------------------------|------|-------|--------------------------------|------|-------|
|                  | Cooling | Oil                            | None | Water | Oil                            | None | Water |
| Driver [6 kHz]   |         | MDDHT5540L                     |      |       | MFDHTB3A2L                     |      |       |
| Cont. FORCE      | N       | 400                            | 200  | 500   | 800                            | 400  | 1000  |
| Max. FORCE       | N       | 800                            |      |       | 1600                           |      |       |
| Rated SPEED      | m/sec   | 4                              |      |       | 4                              |      |       |
| Max. SPEED       | m/sec   | 6                              |      |       | 6                              |      |       |
| SIZE (D × W × L) | mm      | 60 × 81 × 244 (75 × 125 × 247) |      |       | 60 × 81 × 433 (75 × 125 × 436) |      |       |
| WEIGHT           | kg      | 7.5                            |      |       | 13.8                           |      |       |

### ● Ironcore Linear Motor CE(L) Series

| Motor Type       | Name    | CE066                           |      |       | CE133                           |      |       | CE200                           |      |       | CE266                           |      |       |
|------------------|---------|---------------------------------|------|-------|---------------------------------|------|-------|---------------------------------|------|-------|---------------------------------|------|-------|
|                  | Cooling | Oil                             | None | Water | Oil                             | None | Water | Oil                             | None | Water | Oil                             | None | Water |
| Driver [6 kHz]   |         | MEDHT7364L                      |      |       | MFDHTB3A2L                      |      |       | MGDHTC3B4L                      |      |       | MHDHTC3B4L                      |      |       |
| Cont. FORCE      | N       | 870                             | 390  | 900   | 1740                            | 780  | 2000  | 2610                            | 1170 | 3000  | 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 × W × L) | mm      | 63 × 150 × 244 (78 × 160 × 247) |      |       | 63 × 150 × 465 (78 × 160 × 471) |      |       | 63 × 150 × 641 (78 × 160 × 647) |      |       | 63 × 150 × 854 (83 × 160 × 860) |      |       |
| WEIGHT           | kg      | 12                              |      |       | 24                              |      |       | 33                              |      |       | 42                              |      |       |



LINEAR MOTOR and  
DIRECT DRIVE MOTOR

## 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

# Linear Encoder

## SAP/GAP series/ LAP series

### Features

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

#### ABS glass

SAP and GAP series  
(MINAS A4, A5II and A5L)



#### ABS steel tape

LAP series  
(MINAS A4, A5II and A5L)



### Specification

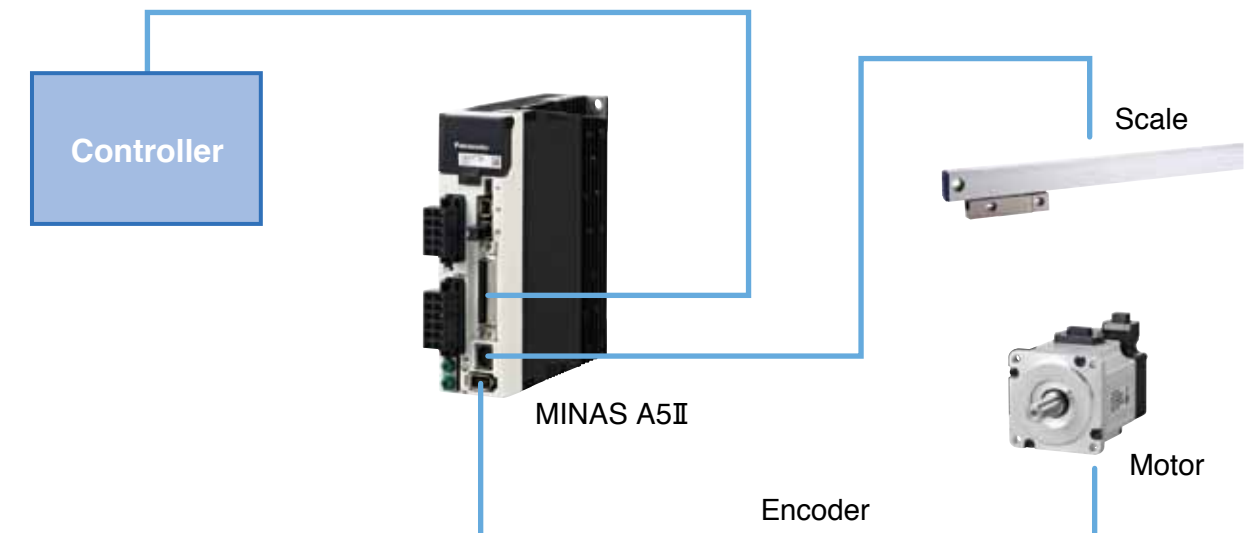
| Item                            | Description                                          |            |            |                                                        |
|---------------------------------|------------------------------------------------------|------------|------------|--------------------------------------------------------|
| Measuring standard              | Glass scale with absolute and incremental track *    |            |            | Steel tape scale with absolute and incremental track * |
| Valid for Panasonic models      | A5II, A5L                                            |            |            |                                                        |
| Linear scale model              | SAP                                                  | SVAP       | GAP        | LAP                                                    |
| Resolution                      | 0.05 μm or 0.01 μm                                   |            |            | 0.05 μm                                                |
| Max. Length                     | 1240 mm                                              | 2040 mm    | 3040 mm    | 60 m                                                   |
| Accuracy                        | ±3 μm / ±5 μm                                        |            |            | ±5 μm                                                  |
| Max. Travel speed               | 3 m/s                                                |            |            | 2 m/s                                                  |
| Vibration / shock               | 10 G/ 30 G                                           | 20 G/ 30 G | 20 G/ 30 G | 10 G/ 30 G                                             |
| Coef. Linear expansion          | (8±0.5) × 10 <sup>-6</sup> /°C                       |            |            | (11±0.5) × 10 <sup>-6</sup> /°C                        |
| Operating / storage temperature | 0 °C to 50 °C/ -20 °C to 70 °C                       |            |            |                                                        |
| Protection                      | IP 53 as standard. When using air purge system IP 64 |            |            |                                                        |
| Power supply                    | DC 5 V ± 10 %                                        |            |            |                                                        |
| Current consumption             | 250 mA                                               |            |            |                                                        |

\* For incremental, A/B phase type is only available.

### Application Sample

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

### System Configuration



### 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](mailto:Jmviniegra@fagorautomation.es)]

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

# Absolute Exposed Linear Encoder

## LIC 2100 Series

### Features

- Measuring length up to 3 m (6 m upon request)
- Compact and light design (Weight of head: < 20 g\*) \* Without connecting cable
- High speed and high resolution (10 m/sec, 50 nm)
- High robustness against contamination
- Large mounting tolerance



**LIC 2197:**  
The steel scale is pulled into an aluminum scale-tape carrier and fixed at center with the fastener kit.



**LIC 2199:**  
The steel scale tape is glued onto the mounting surfaces by means of an adhesive film.

### Specification

|                               | LIC 2197P                                                                                       | LIC 2199P     |
|-------------------------------|-------------------------------------------------------------------------------------------------|---------------|
| Scale CTE                     | Steel scale tape with absolute track<br>≈ 10 ppm/K                                              |               |
| Accuracy grade                | ±15 μm                                                                                          |               |
| Resolution                    | 100 nm, 50 nm                                                                                   |               |
| Max. Measuring length ML (mm) | 120 320 520 770 1020 1220 1520 2020 2420 3020<br>(Larger ML 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                    | IP67                                                                                            |               |
| Mounting                      | Scale tape is drawn into aluminum extrusions and fixed at center                                | Adhesive film |

# Absolute Exposed Linear Encoder

## LIC 4100 Series

### Features

- High interpolation accuracy
- Measuring length up to 28 m
- Compact and light design (Weight of head: <20 g\*) \* Without connecting cable
- High speed and high resolution (10 nm @ 4 m/sec, 5 nm @ 2 m/sec, 1 nm @ 0.4 m/sec)
- High robustness against contamination
- Glass and glass ceramic scales are available



**LIC 4195:**  
Steel tape is drawn into aluminum extrusions and tensioned



**LIC 4197:**  
Steel scale-tape is drawn into aluminum extrusions and fixed at center



**LIC 4193/4199:**  
Glass or steel tape scale cemented with adhesive film

### Specification

|                               | LIC 4193P                                              | LIC 4195P                                             | LIC 4197P                                                   | LIC 4199P           |
|-------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|---------------------|
| Scale CTE                     | Glass or glass ceramic<br>≈ 8 ppm/K<br>= 0+/-0.1 ppm/K | Steel<br>Depends on the mounting surface              | Steel<br>≈ 10 ppm/K                                         | Steel<br>≈ 10 ppm/K |
| Accuracy grade                | Up to ± 3 μm                                           |                                                       |                                                             |                     |
| Resolution                    | 1 nm, 5 nm, 10 nm                                      |                                                       |                                                             |                     |
| Max. Measuring length ML (mm) | 3040                                                   | 28440                                                 | 6040                                                        | 1020                |
| Interface                     | Panasonic serial interface (Pana01)                    |                                                       |                                                             |                     |
| Voltage supply                | DC 3.6 V ~ 14 V                                        |                                                       |                                                             |                     |
| Operating temperature         | -10 °C ~ 70 °C                                         |                                                       |                                                             |                     |
| Protection                    | IP67                                                   |                                                       |                                                             |                     |
| Mounting                      | Adhesive film                                          | Scale is drawn into aluminum extrusions and tensioned | Scale is drawn into aluminum extrusions and fixed at center | Adhesive film       |

### Sales area and Language



- English
- German
- Japanese

Please contact the following address for details.

### For more information

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

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

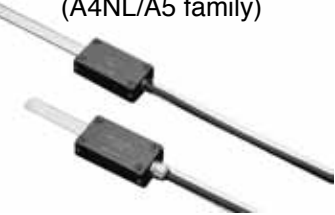
[E-mail: [info@heidenhain.de](mailto:info@heidenhain.de)]  
TEL: +49 8669 31-0 FAX: +49 8669 5061

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)
- Absolute scales (SR77/SR87) up to 10 nm resolution with 200 m/min response speed.

| Open Type<br>(DIGIRULER)                                                            | Slim Type<br>Sealed Scale                                                           | Robust Type<br>Sealed Scale                                                         | High-resolution Reflective<br>Type (LASERSCALE)                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| SL700 + PL101RP/RHP<br>(A4NL/A5 family)<br>SL710 + PL101RP/RHP<br>(A4NL/A5 family)  | SR77 Series<br>(A4/A4N/A4NL/A5 family)<br>SR75 Series<br>(A4NL/A5 family)           | SR87 Series<br>(A4/A4N/A4NL/A5 family)<br>SR85 Series<br>(A4NL/A5 family)           | BF1 Series<br>(A5 family)                                                           |
|  |  |  |  |

Specification

| Item                   | Description                                                                                                             |                       |                        |                        |                                                                  |                    |                               |                    |                                                                                                                                   |
|------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|------------------------|------------------------------------------------------------------|--------------------|-------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Type                   | Open Type (DIGIRULER)                                                                                                   |                       |                        |                        | Slim Type Sealed Scale                                           |                    | Robust Type Sealed Scale      |                    | High-resolution Reflective Type (LASERSCALE)                                                                                      |
| Part No.               | SL700<br>+<br>PL101RP                                                                                                   | SL710<br>+<br>PL101RP | SL700<br>+<br>PL101RHP | SL710<br>+<br>PL101RHP | SR77                                                             | SR75               | SR87                          | SR85               | BF1                                                                                                                               |
| Compatible servo drive | A4NL/A5 family                                                                                                          |                       |                        |                        | A4/A4N/<br>A4NL/<br>A5 family                                    | A4NL/<br>A5 family | A4/A4N/<br>A4NL/<br>A5 family | A4NL/<br>A5 family | A5 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 Lμm (integral number in unit of 1 m when effective length is 3 m or shorter)<br>* When longer than 3 m, consult us. |                       |                        |                        | 3+3L/1000 μmp-p or 5+5L/1000 μmp-p<br>* L= Effective length (mm) |                    |                               |                    | ±0.5 μm (30 to 170 mm)/<br>±1 μm (220 to 370 mm)/<br>±3 μm (420 to 520 mm)/<br>±5 μm (570 to 970 mm)/<br>±10 μm (1070 to 1400 mm) |
| Resolution             | 0.1 μm                                                                                                                  |                       |                        |                        | A5 family: 0.01 μm to 1 μm<br>A4/A4N/A4NL: 0.05 μm to 1 μm       |                    |                               |                    | 0.001/0.01 μm                                                                                                                     |
| Type                   | Incremental                                                                                                             |                       |                        |                        | Absolute                                                         | Incremental        | Absolute                      | Incremental        | Incremental                                                                                                                       |
| Response speed         | 10 m/s                                                                                                                  |                       |                        |                        | 3.3 m/s                                                          |                    |                               |                    | 0.4/1.8 m/s                                                                                                                       |
| Output signal          | Specific to MINAS series. Serial output                                                                                 |                       |                        |                        |                                                                  |                    |                               |                    |                                                                                                                                   |
| Origin signal          | None                                                                                                                    | 1 point               | None                   | 1 point                | —                                                                | 1 point            | —                             | 1 point            | 1 point                                                                                                                           |
| Degree of protection   | IP50 equivalent                                                                                                         |                       | IP67 equivalent        |                        | IP54 (without air purge)/IP65 (with air purge)                   |                    |                               |                    | —                                                                                                                                 |

\* High speed, quick response and high reliability are secured through serial communications.  
\* Conversion cable CK-T185 is required for A5II connection.

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.** [E-mail: [info-mgs-eng@magnescape.com](mailto:info-mgs-eng@magnescape.com)]  
To identify local distributors, please contact Magnescape Co., Ltd. International Sales Division Isehara Headquarters  
45 Suzukawa, Isehara, Kanagawa 259-1146, Japan TEL: +81-463-92-7971 FAX: +81-463-92-7978

## Linear Scale

### ABS AT500 series/ST700 series

#### Features

- Encoders of various types, assembly type, separate type, absolute linear support various applications
- Directly connectable to MINAS series servo drive.
- Provide high resolution and high precision. Assembly configuration is best suited to mechanical processing (AT500 series).
- Electromagnetic induction type is resistant to dirt and its separate construction is best suited to semiconductor and liquid crystal devices (ST700 series).

#### ABS AT500 series (assembly type)



#### ABS ST700 series (separate type)



#### Specification

| Item                                            | Description                                                                                  |                |                                                                                          |
|-------------------------------------------------|----------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------|
|                                                 | ABS AT5000 series                                                                            |                | ABS ST7000 series (compact specification)                                                |
| Detection system                                | Assembly type absolute scale Combined electro-static capacity and optical ABS linear encoder |                | Electromagnetic induction type ABS linear encoder                                        |
| Part No.                                        | AT573A-SC                                                                                    | AT573A-HC      | AT573A-HR/HL                                                                             |
| Resolution                                      | 0.05 μm                                                                                      |                | 0.1 μm                                                                                   |
| Max. effective range                            | 100 to 2200 mm                                                                               | 100 to 1000 mm | 100 to 350 mm                                                                            |
| Detection head size (mm)                        | —                                                                                            |                | 50 × 28 × 11                                                                             |
| Accuracy (μm): 20 °C                            | 3 + 3 L/1000 *                                                                               | 2 + 2 L/1000 * | 5 + 5 L/1000 *                                                                           |
| Max. response rate                              | 2.5 m/s                                                                                      |                | 5 m/s                                                                                    |
| Vibration resistance/shock resistance           | 20 G/35 G                                                                                    | 15 G/20 G      | —                                                                                        |
| Linear expansivity                              | (8.5±0.5) × 10 <sup>-6</sup> /°C                                                             |                | (12±1.5) × 10 <sup>-6</sup> /°C                                                          |
| Operating temperature/storage temperature range | 0 °C to 45 °C/−20 °C to 70 °C                                                                |                | 0 °C to 50 °C/−20 °C to 70 °C                                                            |
| Operating humidity/storage humidity range       | 20 % to 80 %RH (No dewing)                                                                   |                | —                                                                                        |
| Power supply                                    | 5 V <sub>DC</sub> ± 5 %                                                                      |                | 5 V <sub>DC</sub> ± 10 %<br>(Ripple + spike noise components should be 100 mV or below.) |
| Max. current consumption                        | 270 mA (MAX)                                                                                 |                | —                                                                                        |
| Head cable length                               | 2 m (Detection head to interface BOX)                                                        |                | 1 m                                                                                      |
| Signal cable length                             | 3 m                                                                                          |                | —                                                                                        |
| Max. cable length                               | 29 m (Including length of head cable)                                                        |                | —                                                                                        |
| Detection head mount                            | —                                                                                            |                | 1 on the top and 1 on one side                                                           |

L: Effective range (mm)

#### 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**

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

## 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 <sub>DC</sub> to 5.5 V <sub>DC</sub>        |
| 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 <sup>-6</sup> / °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**

Tokyo Office, Nidec Tokyo Bldg., 1-20-13, Osaki, Shinagawa-ku, Tokyo 141-0032, Japan

[E-mail: [sensor-sales@nidec-sankyo.co.jp](mailto:sensor-sales@nidec-sankyo.co.jp)]

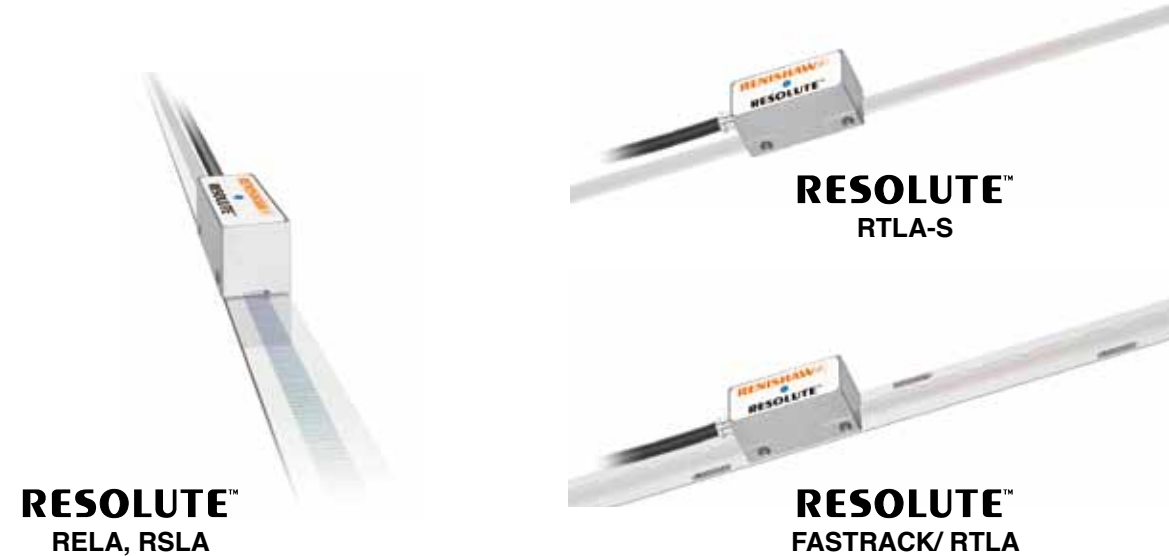
TEL: +81-3-5740-3006 FAX: +81-3-6843-3123

# Optical Absolute Linear Encoder

## RESOLUTE™ series

### Features

- True absolute encoder
- Resolution (velocity) : 0.1 μm (40 m/s)  
: 50 nm (20 m/s)  
: 1 nm (0.4 m/s)
- Unique single-track scale eliminates yaw de-phasing problems
- Determines absolute position upon power up
- Range of scales for a variety of applications
- Low SDE for smooth velocity control
- Worldwide subsidiary support network



### Specification

| Series                        | RESOLUTE™<br>RELA                                            | RESOLUTE™<br>RSLA                            | RESOLUTE™<br>FASTRACK/RTLA       | RESOLUTE™<br>RTLA-S  |
|-------------------------------|--------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------|
| Feature                       | Fine precision and low thermal expansion                     | The world's most accurate long-length scales | Quick and easy scale replacement | Easiest installation |
| Scale material                | ZeroMet                                                      | Stainless steel                              | Stainless steel tape             | Stainless steel tape |
| Thermal expansion coefficient | ~0.6 ppm/°C (0 °C to 30 °C)<br><1.4 ppm/°C (30 °C to 100 °C) | 10.8 ppm/°C                                  | 10.6 ppm/°C                      | 10.6 ppm/°C          |
| Scale accuracy                | ±1 μm                                                        | ±1.5 μm/m                                    | ±5 μm/m                          | ±5 μm/m              |
| Scale length                  | 80 mm to 1130 mm                                             | 80 mm to 5000 mm                             | 100 mm to 10000 mm               | 100 mm to 5000 mm    |
| Scale mounting options        | Bonding or Clip/Clamp                                        | Bonding or Clip/Clamp                        | Track (carrier) mounting         | Self-adhesive        |
| Read head size<br>H x L x W   | 18 mm x 36 mm x 16.5 mm                                      |                                              |                                  |                      |
| Scale size<br>H x W           | 1.5 mm x 15 mm                                               | 1.5 mm x 15 mm                               | 0.4 mm x 18 mm                   | 0.2 mm x 8 mm        |

# Optical Incremental linear/Ring(Rotary) Encoder

## TONiC™ ATOM™ series (Digital output signal)

### Features

- The unique filtering optics withstand a variety of contaminants such as dirt, dust and scratches..
- Resolution : 5 μm to 1 nm (TONiC)  
10 μm to 1 nm (ATOM)
- Velocity : 6.48 m/sec @ 1 μm  
0.648 m/sec @ 0.1 μm  
(Clocked input frequency is 8 MHz)
- Range of linear and ring (Disc) scales for a variety of applications
- Easy installation and diagnostics using set-up LED
- Low Sub-Divisional Error (SDE) and Jitter.
- IN-TRAC optical reference mark



### Application Sample

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

SEMICONDUCTOR  
Manufacturing / Inspection Machine

FPD  
Manufacturing / Inspection Machine

Linear Motor / Motion Stage

DDR motor

Laser Scanner

CMM arms and Microscope stage

### 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](mailto:international@renishaw.com)]  
TEL: +44-1453-524524

### Feedback scale table for serial communication

| Scale Type                               | Partner                  | Series                                     | Resolution*<br>[μm]                                 | Max. rate*<br>[m/s] |
|------------------------------------------|--------------------------|--------------------------------------------|-----------------------------------------------------|---------------------|
| Parallel Type<br>(A/B/Z phase)           | General                  | —                                          | Maximum speed after4× multiplication :<br>4 Mpps *3 |                     |
| Serial<br>communication<br>(Absolute)    | FAGOR AUTOMATION         | SAP / SVAP / GAP                           | 0.05                                                | 2.5                 |
|                                          |                          | LAP                                        | 0.1                                                 | 2                   |
|                                          |                          | SAP10/SVAP10/GAP10                         | 0.01                                                | 3                   |
|                                          |                          | LAP10                                      | 0.01                                                | 2                   |
|                                          | HEIDENHAIN               | LIC 2197P/LIC 2199P                        | 0.05/0.1                                            | 10                  |
|                                          |                          | LIC 4193P/LIC 4195P<br>LIC 4197P/LIC 4199P | 0.01                                                | 4                   |
|                                          |                          |                                            | 0.005                                               | 2                   |
|                                          |                          |                                            | 0.001                                               | 0.4                 |
|                                          | Magnescale Co., Ltd.     | SR77                                       | 0.01 to 1                                           | 3.3                 |
|                                          |                          | SR87                                       | 0.01 to 1                                           | 3.3                 |
|                                          | Mitutoyo Corporation     | AT573A                                     | 0.05                                                | 2.5                 |
|                                          |                          | ST778A(L)                                  | 0.1                                                 | 5                   |
|                                          | Renishaw plc             | RESOLUTE                                   | 0.001                                               | 0.4                 |
|                                          |                          |                                            | 0.05                                                | 20                  |
|                                          |                          |                                            | 0.1                                                 | 40                  |
| Serial<br>communication<br>(Incremental) | -                        | -                                          | -                                                   | -                   |
|                                          | Magnescale Co., Ltd.     | SL700 + PL101RP/RHP                        | 0.1                                                 | 10                  |
|                                          |                          | SL710 + PL101RP/RHP                        | 0.1                                                 | 10                  |
|                                          |                          | SR75                                       | 0.01 to 1                                           | 3.3                 |
|                                          |                          | SR85                                       | 0.01 to 1                                           | 3.3                 |
|                                          |                          | BF1                                        | 0.001/0.01                                          | 0.4/1.8             |
|                                          | Nidec Sankyo Corporation | PSLH                                       | 0.1                                                 | 6                   |

\* Figures under Resolution and maximum rate indicate values specified for A5 family drivers. These values will be different from those in the feedback scale due to drive maximum pulse frequency limit.

### Driver and corresponding feedback scale table

|                            |             | For Linear Motor control |          |           | For Rotary Motor Control |          |          |
|----------------------------|-------------|--------------------------|----------|-----------|--------------------------|----------|----------|
| MINAS series No.           |             | A5L                      | A5ΠNL *4 | A5ΠMNL *4 | A5/A5Π                   | A5ΠN *4  | A5A *4   |
| Maximum Pulse Frequency *1 |             | 400 Mpps                 | 400 Mpps | 400 Mpps  | 400 Mpps                 | 400 Mpps | 400 Mpps |
| Serial communication *2    | Absolute    | ○                        | ○        | ○         | ○                        | ○        | ○        |
|                            | Incremental | ○                        | ○        | ○         | ○                        | ○        | ○        |
| A/B/Z phase *3             | Incremental | ○                        | ○        | ○         | ○                        | ○        | ○        |

\*1 The value of resolution and maximum velocity of feedback scale are limited by maximum pulse frequency of each driver.

\*2 For A4 family (A4N, A4NL and A4AL), some feedback scales of serial type cannot be connected. Please contact us for details. For A5 family, all partner's feedback scale of serial type can be connected.

\*3 Maximum pulse frequency is up to 4 Mpps (After A/B phase multiplied by 4).

In case of 50 % duty being fine, the value of maximum pulse frequency is available up to 8 Mpps.

\*4 Network servo (A5IN, A5INL, A5A, A5IMNL) has no function to output the A/B/Z regeneration pulse.

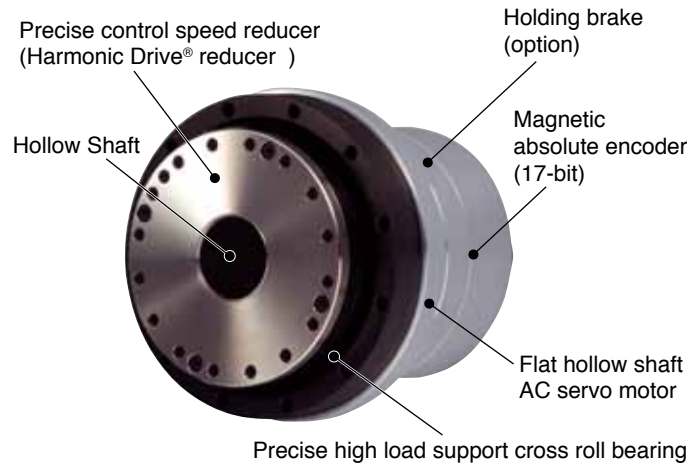
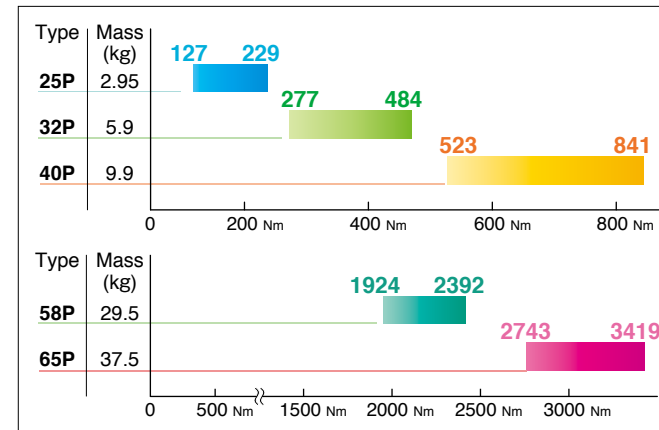
# AC Servo Actuator SHA-P Series

## SHA25P/SHA32P/SHA40P/SHA58P/SHA65P

### Features

- The AC servo actuator incorporates the precise control speed reducer (Harmonic Drive® 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.
- Excellent one way positioning accuracy : 50 sec (0.0139°) with reduction ratio 1/51, and 40 sec (0.0111°) with reduction 1/81 or higher ratio.
- Torque-volume ratio is 5 times or more that of direct drive motor.

### Max. torque mapping



### Specification

| Item                                          |                                    | Model             | SHA25P                             |          |          |          |          | SHA32P                    |          |          |          |          |
|-----------------------------------------------|------------------------------------|-------------------|------------------------------------|----------|----------|----------|----------|---------------------------|----------|----------|----------|----------|
|                                               |                                    |                   | 51                                 | 81       | 101      | 121      | 161      | 51                        | 81       | 101      | 121      | 161      |
| Associated drive                              | MINAS A5II series <sup>*4</sup>    |                   | MCDKT3520/MCDKT3520E               |          |          |          |          | MDDKT3530/MDDKT3530E      |          |          |          |          |
|                                               | MINAS A5IIN series <sup>*5*6</sup> |                   | MCDHT3520N21/MCDHT3520ND1          |          |          |          |          | MDDHT3530N21/MDDHT3530ND1 |          |          |          |          |
| Max. torque <sup>*2</sup>                     |                                    | Nm                | 127                                | 178      | 204      | 217      | 229      | 277                       | 395      | 433      | 459      | 484      |
| Allowable continuous torque <sup>*2,*3</sup>  |                                    | Nm                | 41                                 | 67       | 81       | 81       | 81       | 92                        | 153      | 178      | 178      | 178      |
| Max. revolution speed                         |                                    | r/min             | 109.8                              | 69.1     | 55.4     | 46.3     | 34.8     | 94.1                      | 59.3     | 47.5     | 39.7     | 29.8     |
| Max. current <sup>*2</sup>                    |                                    | A                 | 8.6                                | 7.5      | 7.0      | 6.3      | 5.2      | 17.1                      | 15.2     | 13.5     | 12.2     | 9.9      |
| Allowable continuous current <sup>*2,*3</sup> |                                    | A                 | 3.0                                | 3.0      | 2.9      | 2.6      | 2.1      | 6.0                       | 6.0      | 5.7      | 5.0      | 4.1      |
| Moment of Inertia (without brake)             | GD <sup>2</sup> /4                 | kg·m <sup>2</sup> | 0.56                               | 1.42     | 2.2      | 3.2      | 5.6      | 2.0                       | 5.1      | 8.0      | 11       | 20       |
| Moment of Inertia (with brake)                | GD <sup>2</sup> /4                 | kg·m <sup>2</sup> | 0.66                               | 1.66     | 2.6      | 3.7      | 6.6      | 2.3                       | 5.9      | 9.2      | 13       | 23       |
| Reduction ratio                               |                                    |                   | 1:51                               | 1:81     | 1:101    | 1:121    | 1:161    | 1:51                      | 1:81     | 1:101    | 1:121    | 1:161    |
| Allowable moment load                         |                                    | Nm                | 258                                |          |          |          |          | 580                       |          |          |          |          |
| Moment rigidity                               |                                    | Nm/rad            | 39.2×10 <sup>4</sup>               |          |          |          |          | 100×10 <sup>4</sup>       |          |          |          |          |
| One way positioning accuracy                  |                                    | sec               | 50                                 | 40       | 40       | 40       | 40       | 50                        | 40       | 40       | 40       | 40       |
| Encoder                                       |                                    |                   | Magnetic absolute encoder          |          |          |          |          |                           |          |          |          |          |
| Output resolution                             |                                    | Pulses/Rev.       | 6684672                            | 10616832 | 13238272 | 15859712 | 21102592 | 6684672                   | 10616832 | 13238272 | 15859712 | 21102592 |
| Mass (without brake)                          |                                    | kg                | 2.95                               |          |          |          |          | 5.9                       |          |          |          |          |
| Mass (with brake)                             |                                    | kg                | 3.1                                |          |          |          |          | 6.2                       |          |          |          |          |
| Mounting direction                            |                                    |                   | Can be installed in any direction. |          |          |          |          |                           |          |          |          |          |

- \*1: Values in the table above represent typical values at output shaft.
- \*2: Typical values obtained when above associated drives are used (driving with ideal sine wave).
- \*3: Values obtained at temperature rise saturated with the actuator mounted on the aluminum heatsink shown below.  
SHA25P: 350 mm × 350 mm × 18 mm SHA32P: 400 mm × 400 mm × 20 mm
- \*4: M\*DKT\*\*\*\* : Applicable to the speed, position, torque, full-close controls and safety standard.  
M\*DKT\*\*\*\*E : The position-control-only type, non-applicable for the safety standard.
- \*5: M\*DHT\*\*\*\*N21 : Applicable to the safety standard.  
M\*DHT\*\*\*\*ND1 : Non-applicable to the safety standard.
- \*6: The A5IIN series require system parameter setting changes at the initial setting.  
For details, please contact Harmonic Drive Systems Inc. (The A5II series do not require setting changes.)

### Specification

| Item                                         |                                    | Model             | SHA40P                             |          |          |          |          | SHA58P                        |          |          |          | SHA65P                        |          |          |          |
|----------------------------------------------|------------------------------------|-------------------|------------------------------------|----------|----------|----------|----------|-------------------------------|----------|----------|----------|-------------------------------|----------|----------|----------|
|                                              |                                    |                   | 51                                 | 81       | 101      | 121      | 161      | 81                            | 101      | 121      | 161      | 81                            | 101      | 121      | 161      |
| Associated drive                             | MINAS A5II series <sup>*4</sup>    |                   | MDDKT5540/MDDKT5540E               |          |          |          |          | MFDKTA390/MFDKTA390E          |          |          |          | MFDKTB3A2/MFDKTB3A2E          |          |          |          |
|                                              | MINAS A5IIN series <sup>*5*6</sup> |                   | MDDHT5540N21/<br>MDDHT5540ND1      |          |          |          |          | MFDHTA390N21/<br>MFDHTA390ND1 |          |          |          | MFDHTB3A2N21/<br>MFDHTB3A2ND1 |          |          |          |
| Max. torque <sup>*2</sup>                    |                                    | Nm                | 523                                | 675      | 738      | 802      | 841      | 1924                          | 2067     | 2236     | 2392     | 2743                          | 2990     | 3263     | 3419     |
| Allowable continuous torque <sup>*2,3</sup>  |                                    | Nm                | 160                                | 263      | 330      | 382      | 382      | 714                           | 905      | 969      | 969      | 921                           | 1149     | 1236     | 1236     |
| Max. revolution speed                        |                                    | r/min             | 78.4                               | 49.4     | 39.6     | 33.1     | 24.8     | 37.0                          | 29.7     | 24.8     | 18.6     | 34.6                          | 27.7     | 23.1     | 17.4     |
| Max. current <sup>*2</sup>                   |                                    | A                 | 26.7                               | 21.8     | 19.4     | 17.9     | 14.6     | 45.0                          | 39.0     | 36.0     | 30.0     | 62.0                          | 55.0     | 51.0     | 41.0     |
| Allowable continuous current <sup>*2,3</sup> |                                    | A                 | 9.0                                | 9.0      | 9.0      | 8.8      | 7.2      | 17.7                          | 17.8     | 16.4     | 13.4     | 22.0                          | 21.9     | 20.1     | 16.3     |
| Moment of Inertia (without brake)            | GD <sup>2</sup> /4                 | kg·m <sup>2</sup> | 5                                  | 13       | 20       | 28       | 50       | 96                            | 149      | 214      | 379      | 110                           | 171      | 245      | 433      |
| Moment of Inertia (with brake)               | GD <sup>2</sup> /4                 | kg·m <sup>2</sup> | 6.1                                | 15       | 24       | 34       | 61       | 106                           | 165      | 237      | 420      | 120                           | 187      | 268      | 475      |
| Reduction ratio                              |                                    |                   | 1:51                               | 1:81     | 1:101    | 1:121    | 1:161    | 1:81                          | 1:101    | 1:121    | 1:161    | 1:81                          | 1:101    | 1:121    | 1:161    |
| Allowable moment load                        |                                    | Nm                | 849                                |          |          |          |          | 2180                          |          |          |          | 2740                          |          |          |          |
| Moment rigidity                              |                                    | Nm/rad            | 179 × 10 <sup>4</sup>              |          |          |          |          | 531 × 10 <sup>4</sup>         |          |          |          | 741 × 10 <sup>4</sup>         |          |          |          |
| One way positioning accuracy                 |                                    | sec               | 50                                 | 40       | 40       | 40       | 40       | 40                            | 40       | 40       | 40       | 40                            | 40       | 40       | 40       |
| Encoder                                      |                                    |                   | Magnetic absolute encoder          |          |          |          |          |                               |          |          |          |                               |          |          |          |
| Output resolution                            |                                    | Pulses/Rev.       | 6684672                            | 10616832 | 13238272 | 15859712 | 21102592 | 10616832                      | 13238272 | 15859712 | 21102592 | 10616832                      | 13238272 | 15859712 | 21102592 |
| Mass (without brake)                         |                                    | kg                | 9.9                                |          |          |          |          | 29.5                          |          |          |          | 37.5                          |          |          |          |
| Mass (with brake)                            |                                    | kg                | 10.7                               |          |          |          |          | 32                            |          |          |          | 40                            |          |          |          |
| Mounting direction                           |                                    |                   | Can be installed in any direction. |          |          |          |          |                               |          |          |          |                               |          |          |          |

- \*1: Values in the table above represent typical values at output shaft.
- \*2: Typical values obtained when standard drives are used (driving with ideal sine wave).
- \*3: Values obtained at temperature rise saturated with the actuator mounted on the aluminum heatsink shown below.  
SHA40P: 500 mm × 500 mm × 25 mm SHA58P/SHA65P: 650 mm × 650 mm × 30 mm
- \*4: M\*DKT\*\*\*\* : Applicable to the speed, position, torque, full-close controls and safety standard.  
M\*DKT\*\*\*\*E : The position-control-only type, non-applicable for the safety standard.
- \*5: M\*DHT\*\*\*\*N21 : Applicable to the safety standard.  
M\*DHT\*\*\*\*ND1 : Non-applicable to the safety standard.
- \*6: The A5IIN series require system parameter setting changes at the initial setting.  
For details, please contact Harmonic Drive Systems Inc. (The A5II series do not require setting changes.)

### Application Sample

URL : Sample applications

<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: +82-0236-83-6901