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Find the *Fastech EZI-STEP-BM-42L* at our website: *Click HERE*

# Ezi-STEP®

## Micro Stepping System

- Motor + Drive + Controller + Network
- Embedded Controller
- Micro Stepping
- Sensorless Stall Detection
- Software Damping
- Run / Stop Signal Output

**ALL**



FASTECH

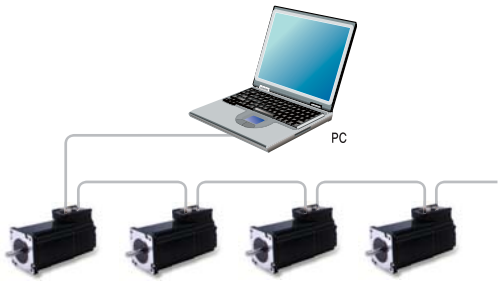
Fast, Accurate, Smooth Motion

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# Features

## 1. Network Based Motion Control

A maximum of 16 axis can be operated from a PC through RS-485 communications. All of the Motion conditions are set through the network and saved in Flash ROM as a parameter. Motion Library(DLL) is provided for programming under Windows 2000 / XP / 7 / 8 / 10 / Vista.




## 2. Position Table Function

Position Table can be used for motion control by digital input and output signals of host controller. You can operate the motor directly by sending the position table number, start / stop, origin search and other digital input values from a PLC.

The PLC can monitor the In-position, origin search, moving / stop, servo ready and other digital output signals from a drive. A maximum of 64 positioning points can be set from PLC.




## 3. Microstep and Filtering

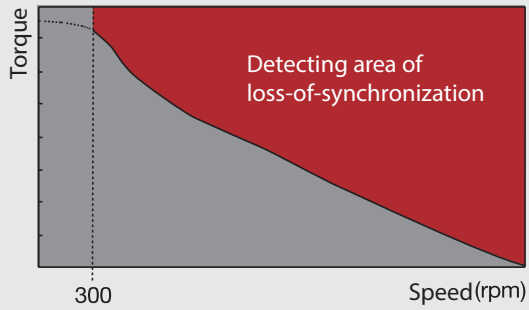
High precision Microstep function and Filtering(Patent pending) The high-performance DSP operates at step resolutions of 1.8° up to maximum 0.0072°steps) and Ezi-STEP ALL adjusts PWM control signal in every 25μsec, which makes it possible for more precise current control, resulting in high-precision Microstep operation.

## 4. Sensorless Stall Detection

Detecting the loss-of-synchronization with on-board DSP(Patent pending Ezi-STEP ALL can detect the loss-of-synchronization of a stepping motor without the addition of an external sensor.

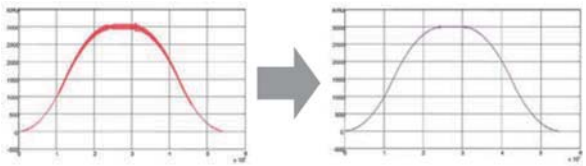
By monitoring the voltage, current, and back-emf signal, the on-board DSP estimates the current position of a rotor and enables it to detect the loss-of-synchronization(an impossible task for a conventional stepping motor drive), this allows for high-speed operation at 100% torque rating without loss-of-synchronization. *1

*1 : Effective only over 300[rpm]




## 5. Software Damping

Vibration suppression and High-speed operation(Patent pending) Motor vibration is created by magnetic flux variations of the motor, lower current from the drive due to back-emf from the motor at high speeds and lowering of phase voltages from the drive. Ezi-STEP ALL drive detects these problems and the DSP adjusts the phase of the current according to the pole position of the motor, drastically suppressing vibration. This allows the smooth operation of the motor at high speeds.




[This is real measured speed that using 100000[ppr]encoder.]



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# Part Numbering Method

## Ezi-STEP-ALL-56L-BK-□

| | |
|---|---|
| Ezi-STEP | **Product Name** |

| | |
|---|---|
| **MNB** : Mini | **Drive Series Type** |
| **MPB** : Mini Power | |
| **HPB** : High Power | |
| **MI** : Mini Type | |
| **PR** : Plus RS-485 | |
| **PR-MI** : Plus RS-485 Mini Type | |
| **BT** : Built In | |
| **ALL** : All Type | |

| | |
|---|---|
| 42mm | **Motor Flange Size** |
| 56mm | |

| | |
|---|---|
| **User Code** | |

| | |
|---|---|
| **Brake** | No Indication : No |
| | BK-Brake |

| | |
|---|---|
| **Motor Length** | **S :** Single |
| | **M :** Middle |
| | **L :** Large |
| | **XL :** Extra Large |

## Motor, Drive Combination

| UNIT No. | MOTOR No. | DRIVE No. |
|---|---|---|
| Ezi-STEP-ALL-42S | Motor & Drive & Controller Integrated | |
| Ezi-STEP-ALL-42M | | |
| Ezi-STEP-ALL-42L | | |
| Ezi-STEP-ALL-42XL | | |
| Ezi-STEP-ALL-56S | | |
| Ezi-STEP-ALL-56M | | |
| Ezi-STEP-ALL-56L | | |

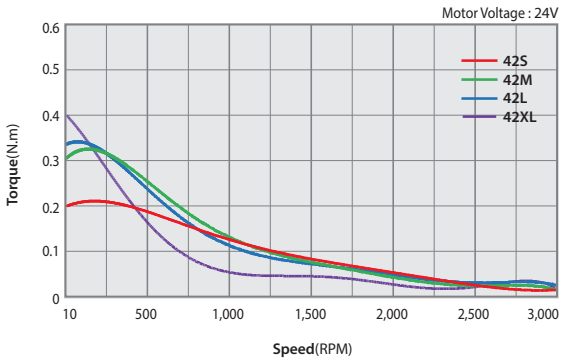


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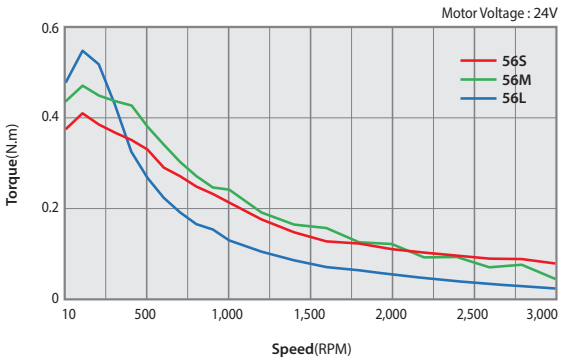
# Motor Specification Table

| Model | | Unit | 42 | | | | 56 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 42S | 42M | 42L | 42XL | 56S | 56M | 56L |
| DRIVE METHOD | | - | BI-POLAR | | | | | | |
| Number OF PHASES | | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| VOLTAGE | | VDC | 3.36 | 4.32 | 4.56 | 7.2 | 1.35 | 1.62 | 2.58 |
| CURRENT per PHASE | | A | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 3.0 | 3.0 |
| RESISTANCE per PHASE | | Ohm | 2.8 | 3.6 | 3.8 | 6.0 | 0.45 | 0.54 | 0.86 |
| INDUCTANCE per PHASE | | mH | 5.4 | 7.2 | 8.0 | 15.6 | 1.2 | 2.0 | 4.0 |
| HOLDING TORQUE | | N·m | 0.32 | 0.44 | 0.5 | 0.8 | 0.64 | 1.0 | 2.0 |
| ROTOR INERTIA | | g·cm$^2$ | 35 | 54 | 77 | 114 | 180 | 280 | 520 |
| WEIGHTS | | g | 250 | 280 | 350 | 500 | 500 | 720 | 1150 |
| LENGTH(L) | | mm | 34 | 40 | 48 | 60 | 46 | 55 | 80 |
| ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT) | 3mm | N | 22 | 22 | 22 | 22 | 52 | 52 | 52 |
| | 8mm | | 26 | 26 | 26 | 26 | 65 | 65 | 65 |
| | 13mm | | 33 | 33 | 33 | 33 | 85 | 85 | 85 |
| | 18mm | | 46 | 46 | 46 | 46 | 123 | 123 | 123 |
| ALLOWABLE THRUST LOAD | | N | Lower than motor weight | | | | | | |
| INSULATION RESISTANCE | | Mohm | 100 MΩ MIN.(at 500VDC) | | | | | | |
| INSULATION CLASS | | - | CLASS B(130℃) | | | | | | |
| OPERATING TEMPERATURE | | ℃ | 0 to 55 | | | | | | |

**Ezi-STEP ALL_ 42 Series**




**Ezi-STEP ALL_ 56 Series**

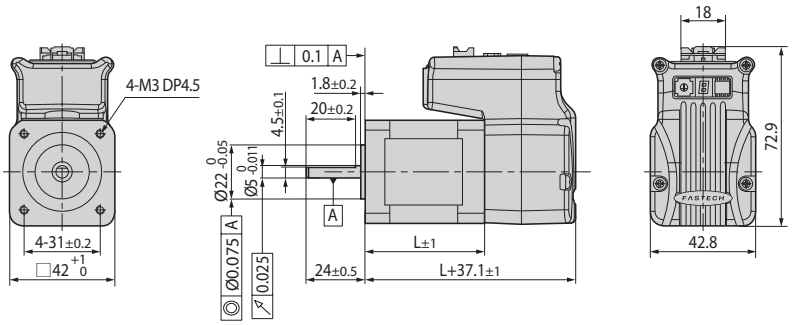





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# Motor Drawing

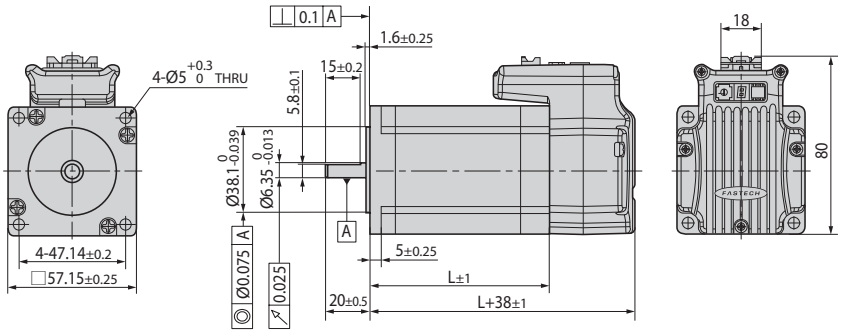
**Ezi-STEP ALL_ 42mm**




## 42mm

| Model Name | Length(L) |
|---|---|
| 42S | 34 |
| 42M | 40 |
| 42L | 48 |
| 42XL | 60 |

**Ezi-STEP ALL_ 56mm**




## 56mm

| Model Name | Length(L) |
|---|---|
| 56S | 46 |
| 56M | 55 |
| 56L | 80 |



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# Drive Specification

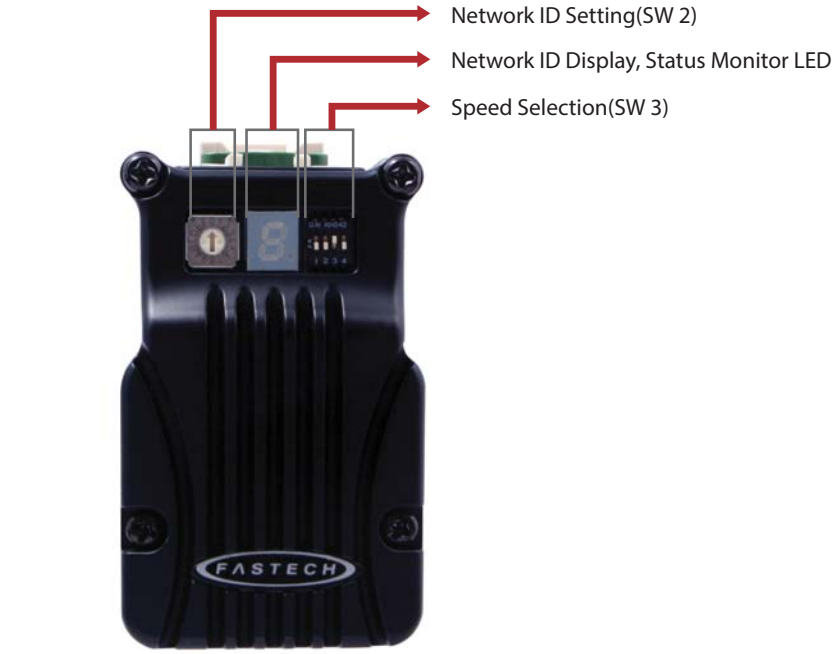
## Specifications

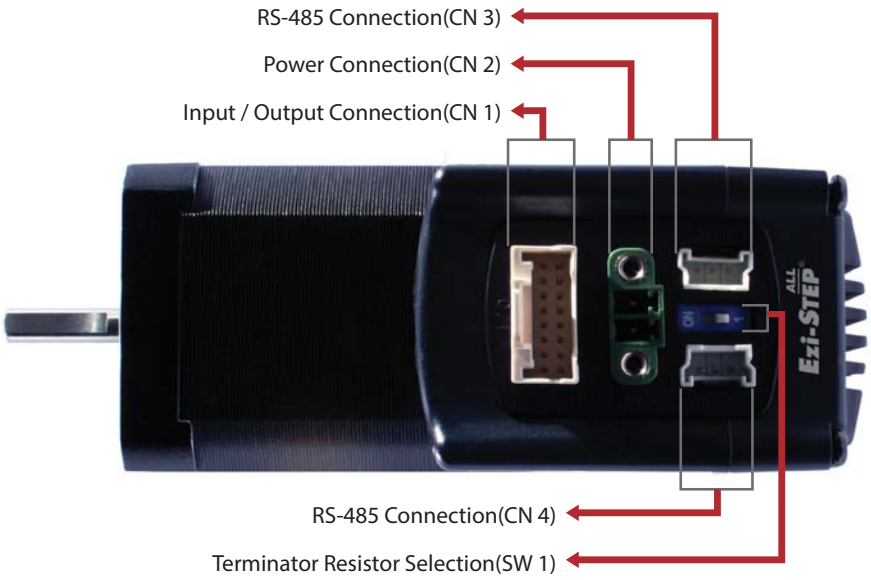
| | | |
|---|---|---|
| **Input Voltage** | | 24VDC ±10% |
| **Control Method** | | Bipolar PWM drive with 32bit DSP |
| **Multi Axes Drive** | | Maximum 16 axes through Daisy-Chain |
| **Position Table** | | 64 Motion Command Steps(Continuous, Wait, Loop, Jump and External start etc.) |
| **Current Consumption** | | Max. 500mA(Except Motor Current) |
| **Operating Condition** | **Temperature** | · In Use : 0 ~ 50˚C · In Storage : -20 ~ 70˚C |
| | **Humidity** | · In Use : 35 ~ 85%RH(Non-condensing) · In Storage : 10~90%RH(Non-condensing) |
| | **Vib. Resist.** | 0.5G |
| **Function** | **Rotation Speed** | 0 ~ 3,000[rpm] |
| | **Resolution[ppr]** | 500 / 1,000 / 1,600 / 2,000 / 3,200 / 3,600 / 4,000 / 5,000 / 6,400 / 8,000 / 10,000 / 20,000 / 25,000 / 36,000 / 40,000 / 50,000(Selectable by Parameter) ※ Default : 10,000 |
| | **Protection** | Over Current Error, Over Speed Error, Step Out Error, Over Temperature Error, Over Regenerated Voltage Error, Motor Connection Error, Motor Voltage Error, System Error, ROM Error |
| | **7-Segment** | Power, Alarm, Communication ID |
| | **Stop Current** | 10% ~ 100%(Selectable by Parameter) Be setted to set value of Stop Current after 0.1 second after motor stop. ※ Default : 50% |
| | **Rotational Direction** | CW / CCW(Selectable by Parameter) Used when changing the direction of motor rotate. ※ Default : CW |
| **I/O Signal** | **Input Signal** | 3 dedicated input(LIMIT+, LIMIT-, ORIGIN), 7 programmable input(Photocoupler Input) |
| | **Output Signal** | 1 dedicated output(Compare Out), 1 programmable output(Photocoupler Output), Brake Signal |
| **Communication Interface** | | The RS-485 serial communication with PC Transmission speed : 9,600 ~ 921,600[bps] |
| **Position Control** | | Incremental mode / Absolute mode Data Range : -134,217,727 to +134,217,727pulse, Operating speed : Max. 3000[rpm] |
| **MPI Version** | | Origin Sensor, ±Limit sensor, Z phase(By External Encoder) |
| **GUI** | | User Interface Program within Windows |
| **Software** | | Motion Library(DLL) for windows 2000 / XP / 7 / 8 / 10 / Vista. |



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## Setting and Operation






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## Status Monitor LED

### 1. Protection function and 7-Segment flash times

| Time | Protection | Conditions |
|---|---|---|
| 1 | Over Current Error | Excessive current flowed into a motor |
| 2 | Over Speed Error | Motor speed exceed 3,000[rpm] |
| 3 | Step out Error | Abnormally motor do not followed pulsed input |
| 5 | Over Temperature Error | Inside temperature of drive exceeds 55˚C |
| 6 | Over Regeneratived Voltage Error | Back EMF more than 50V |
| 7 | Motor Connect Error | The power is ON without connection of the motor cable to drive |
| 9 | Motor Voltage Error | Motor voltage is below 20V |
| 11 | System Error | Error occurs in drive system |
| 12 | ROM Error | Error occurs in parameter storage device(ROM) |

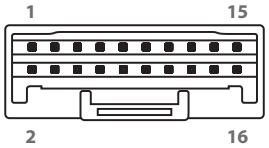
**Alarm 7-Segment flash(ex : Step out)**




## Connector

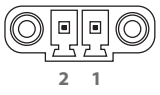
### 1. Input / Output Connection(CN 1)

| No. | Function | I/O |
|---|---|---|
| 1 | 24VDC | Input |
| 2 | 24VDC GND | Input |
| 3 | BRAKE+ | Output |
| 4 | BRAKE- | Output |
| 5 | +Limit Sensor | Input |
| 6 | -Limit Sensor | Input |
| 7 | Origin Sensor | Input |
| 8 | Digital IN 1 | Input |
| 9 | Digital IN 2 | Input |
| 10 | Digital IN 3 | Input |
| 11 | Digital IN 4 | Input |
| 12 | Digital IN 5 | Input |
| 13 | Digital IN 6 | Input |
| 14 | Digital IN 7 | Input |
| 15 | Compare Out | Output |
| 16 | Digital OUT 1 | Output |




### 2. Power Connection(CN 2)

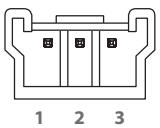
| No. | Function |
|---|---|
| 1 | 24VDC ±10% |
| 2 | GND |




### 3. RS-485 Connection(CN 3, CN 4)

RS-485 Communication port to connect with Host Controller

| No. | Function |
|---|---|
| 1 | +DATA |
| 2 | -DATA |
| 3 | GND |






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# Cable Connector

### 1. Input / Output Connection(CN 1)

| Item | Specification | Maker |
|---|---|---|
| Housing | 501646-1600 | MOLEX |
| Terminal | 501648-1000(AWG 26 ~ 28) | |

### 2. Power Connection(CN 2)

| Item | Specification | Maker |
|---|---|---|
| Terminal Block | AKZ1550 / 2F-3.81 | PTR |

### 3. RS-485 Connection(CN 3, CN 4)

| Item | Specification | Maker |
|---|---|---|
| Housing | 33507-0300 | MOLEX |
| Terminal | 50212-8100 | |

# Switch

### 1. Terminator Resistor Selection(SW 1)

Terminator Resistor Selection switch under RS-485 communication.
Please set ON for Terminator Controller of Network.

### 2. Network ID Setting(SW 2)

| Position | ID No. | Position | ID No. |
|---|---|---|---|
| 0 | 0 | 8 | 8 |
| 1 | 1 | 9 | 9 |
| 2 | 2 | A | 10 |
| 3 | 3 | B | 11 |
| 4 | 4 | C | 12 |
| 5 | 5 | D | 13 |
| 6 | 6 | E | 14 |
| 7 | 7 | F | 15 |




※ Maximum 16 axis can be connected in one network.

### 3. Speed selection(SW 3)

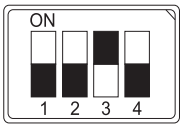
The purpose of this is to setting the communication speed.

| SW 3.1 | SW 3.2 | SW 3.3 | Baud Rate[bps] |
|---|---|---|---|
| OFF | OFF | OFF | 9,600 |
| ON | OFF | OFF | 19,200 |
| OFF | ON | OFF | 38,400 |
| ON | ON | OFF | 57,600 |
| OFF | OFF | ON | 115,200*1 |
| ON | OFF | ON | 230,400 |
| OFF | ON | ON | 460,800 |
| ON | ON | ON | 921,600 |

※ Possible to use common PCI Bus type RS-485 communication board for High speed communication.
(Please contact with Distributor)

*1 : Default setting value

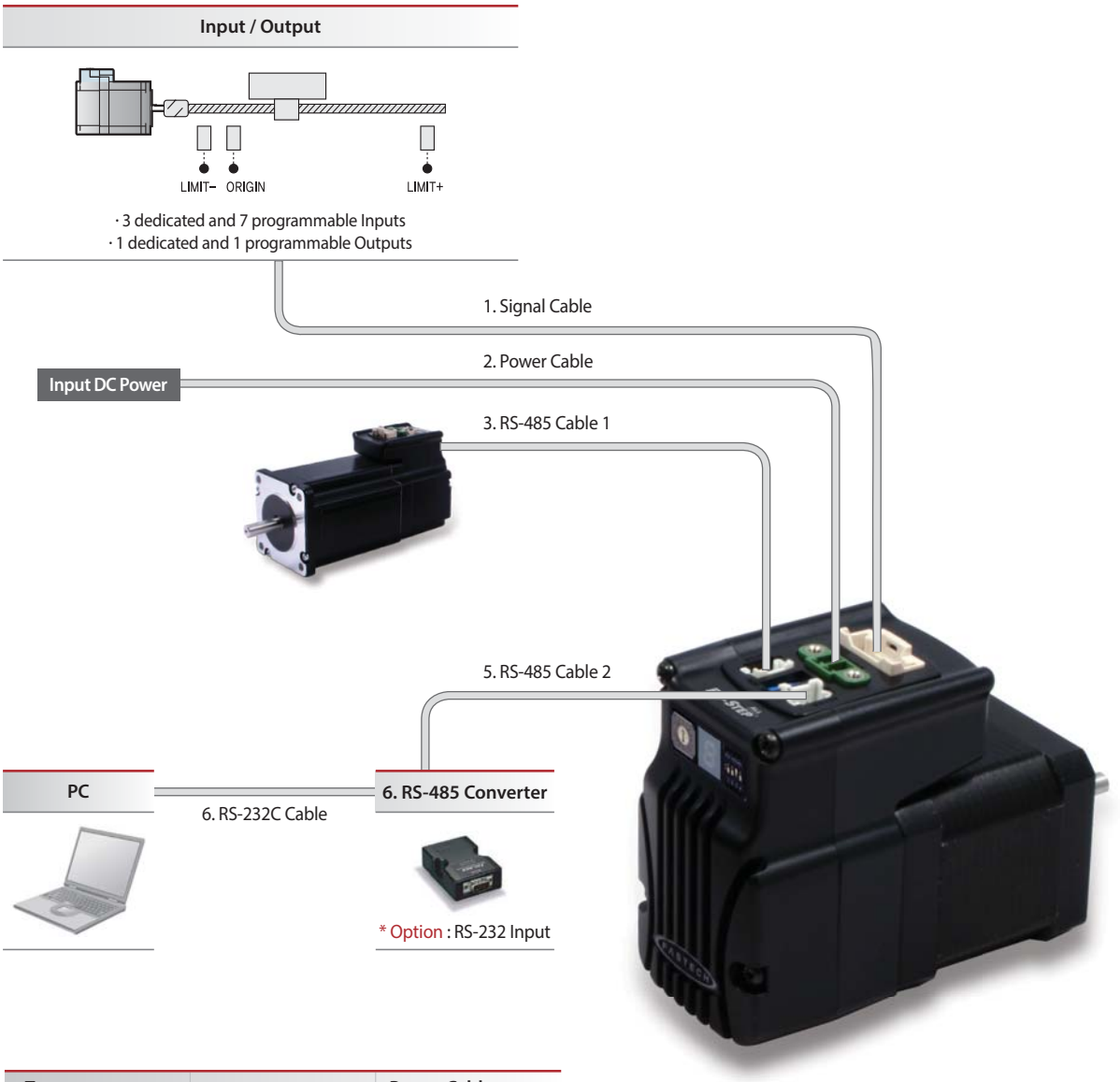
※ If SW 3.4 is disconnected.






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# System Configuration




| Type | Signal Cable | Power Cable |
|---|---|---|
| Standard Length | - | - |
| Max. Length | 20m | 2m |



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# Option

## 1. Signal Cable

Available to connect between Control System and Ezi-STEP ALL.

| Model Name | Length[m] | Remark |
|---|---|---|
| CSVA-S-□□□F | □□□ | Normal Cable |
| CSVA-S-□□□M | □□□ | Robot Cable |

※ □□□ is for Cable Length, The unit is 1m and Max. 20m Length.

## 2. Power Cable

Available to connect between Power and Ezi-STEP ALL.

| Model Name | Length[m] | Remark |
|---|---|---|
| CSVA-P-□□□F | □□□ | Normal Cable |
| CSVA-P-□□□M | □□□ | Robot Cable |

※ □□□ is for Cable Length, The unit is 1m and Max. 2m Length.

## 3. RS-485 Cable 1

| Model Name | Length[m] | Remark |
|---|---|---|
| CGNB-R-0R6F | 0.6 | Normal Cable |
| CGNB-R-001F | 1 | |
| CGNB-R-1R5F | 1.5 | |
| CGNB-R-002F | 2 | |
| CGNB-R-003F | 3 | |
| CGNB-R-005F | 5 | |

※ Common cable to connect Ezi-SERVO ALL, Ezi-STEP ALL,
Ezi-MOTIONLINK and Ezi-SERVO MINI Plus-R thru by Network.

## 4. FAS-RCR(RS-232C to RS-485 Converter)

| Type | Specification |
|---|---|
| Transmission speed | Max. 115.2Kbps |
| Comm. Distance | RS-232C : Max. 15m<br>RS-485 : Max. 1.2km |
| Connector | RS-232C : DB9 Female<br>RS-485 : RJ-45 |
| Dimension | 50×75×23mm |
| Weight | 38g |
| Power Status | Powered from PC<br>(Usable for external DC5~24V) |

## 5. RS-485 Cable 2

FAS-RCR to Ezi-SERVO ALL, FAS-RCR to Ezi-STEP ALL,
FAS-RCR to Ezi-SERVO Plus-R MINI, FAS-RCR to Ezi-MOTIONLINK

| Model Name | Length[m] | Remark |
|---|---|---|
| CGNA-R-0R6F | 0.6 | Normal Cable |
| CGNA-R-001F | 1 | |
| CGNA-R-1R5F | 1.5 | |
| CGNA-R-002F | 2 | |
| CGNA-R-003F | 3 | |
| CGNA-R-005F | 5 | |

## 6. RS-232C Cable

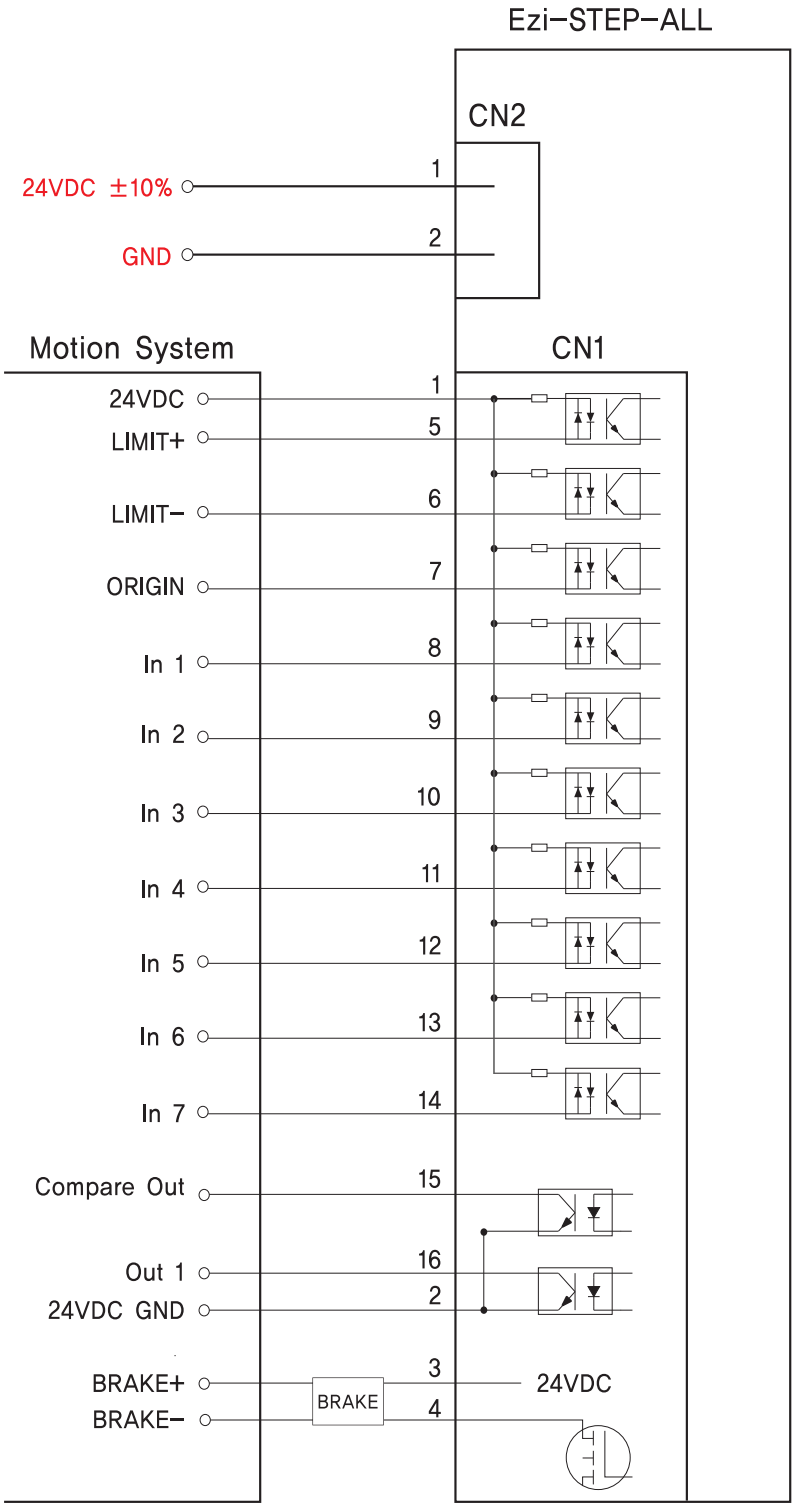
| Model Name | Length[m] | Remark |
|---|---|---|
| CGNR-C-002F | 2 | Normal Cable |
| CGNR-C-003F | 3 | |
| CGNR-C-005F | 5 | |



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# External Wiring Diagram

## Ezi-STEP ALL





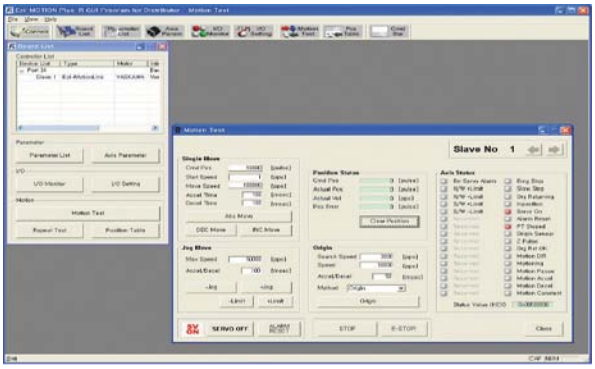

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# Graphic User Interface(GUI)

## Screen Configuration

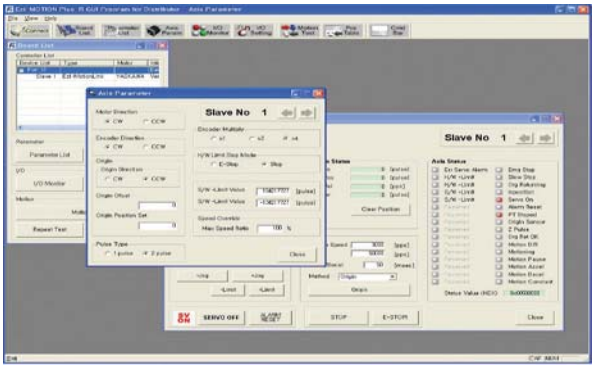
### 1. Controller Lists and Motion Test

This screen display the controller list that connected to system.
You can make a single move, jog and origin command and also the motor status is displayed.



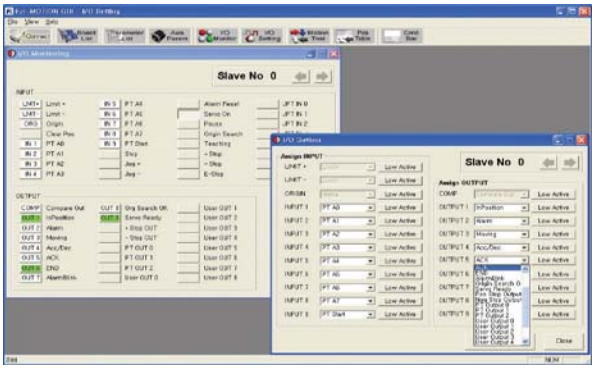
### 2. Axis Parameter Setup

You can select various parameters that frequently used.
(ex : sensor input logic)



### 3. I/O Monitoring and Setting

You can select various digital input and output signals of controller.



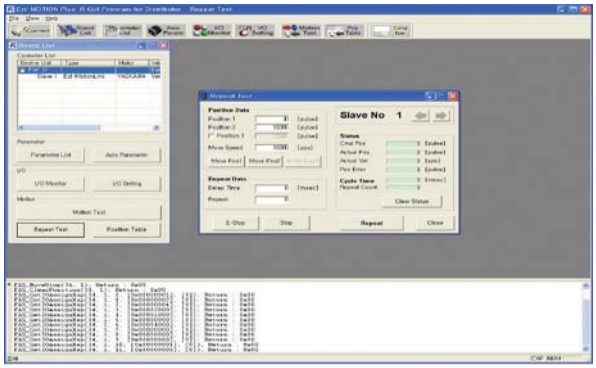
### 4. Parameter List

All of the parameters are displayed and modified on this screen.



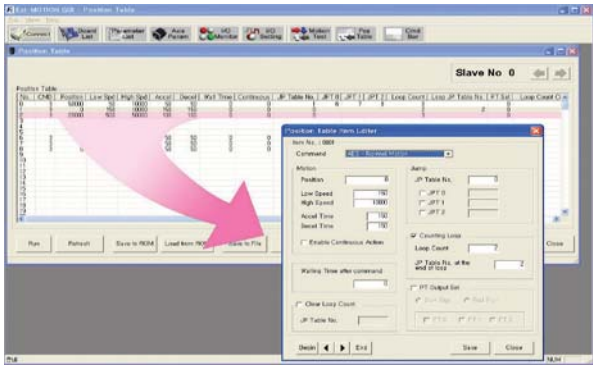

### 5. Motion Repeat and Monitor Status

Target position, speed, delay time and repeat count are selected for repeat motion test. Motion library(DLL) is also displayed on screen.



### 6. Position Table

You can edit the position table and execute it. The position table data can be saved and loaded from Flash ROM and Windows file.





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**FASTECH Co., Ltd.**
Rm#1202, 401-dong, Bucheon Techno-Park,
655, Pyeongcheon-ro, Bucheon-si Gyeonggi-do,
Republic of Korea (Zip:14502)
TEL : +82-32-234-6300 FAX : +82-32-234-6302
E-mail : fastech@fastech.co.kr
Homepage : www.fastech.co.kr

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