Ezi-MOTIONLINK® Plus-R

Network based Motion Controller Plug-in to Servo Drives

# User Manual

# User Program(GUI) Function

( Rev.04)

FASTECH

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**This manual describes how to operate User Program(GUI) for Ezi-MOTIONLINK Plus-R.**

**For more information, refer related manuals.**

(1) User Manual-Text
(2) User Manual-Communication Function
(3) User Manual-Position Table

# 1 . Installation and Connection of the Program

Ezi-MOTIONLINK Plus-R consists of two operation modes as follows:

1) Using Motion Library(DLL) provided for the program from Windows 2000/XP/WINDOW7.

2) Using external signals input by the user.

For the operation modes above, refer to each related manual.

This chapter describes the user program used for installation and running test of the controller. Ezi-MOTIONLINK Plus-R is associated with RS-485. So, the user needs to convert RS-232C or USB for the PC into RS-485

## 1 - 1 . Installation Environment of PC

Machine Type :

Compatible with PC/AT
RS - 232C Port or USB Port
Hard disk more than 10MB
Screen SVGA(1024×768 or more)
CPU Pentium4 2.0 GHz or more

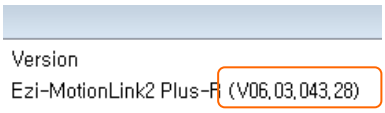
OS : Windows 2000/XP/VISTA/WINDOW7 should be normally installed.

## 1 - 2 . User Program(GUI) Version

There are 2 kinds of program version.

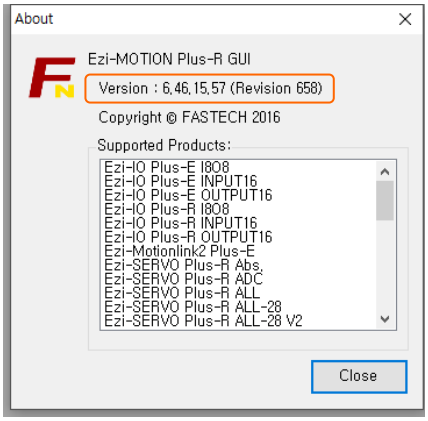
(1) Firmware program in drive :

After connecting the User Program(GUI), Version number can be check in 'Board List' Window.




(2) User Program(GUI) in PC :

After connecting the User Program(GUI), Version number can be check in 'About Plus-R GUI...'menu in 'Help' menu.



The level of 2 kinds program must be same as follows.

| Firmware version | compatability | User Program(GUI) version |
|---|---|---|
| Level 6 (V06.0x.0xx.xx) | <-> | Level 6 (6.xx.x.xxx) |
| Level 8 (V08.xx.0xx.xx) | <-> | Level 8 (8.xx.x.xxx) |

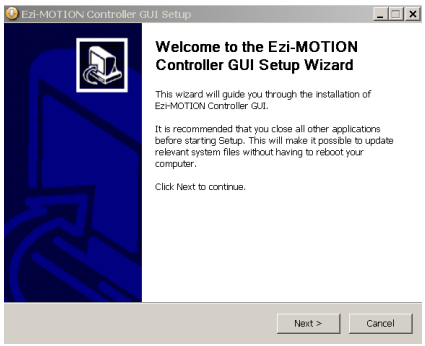
| | |
|---|---|
| Caution | **Do not mixed the drive of different Firmware version level in one network segment.** |

## 1 - 3 . User Program(GUI) Installation Method

Click icon at the installation program provided with the product, and perform as described at the window.

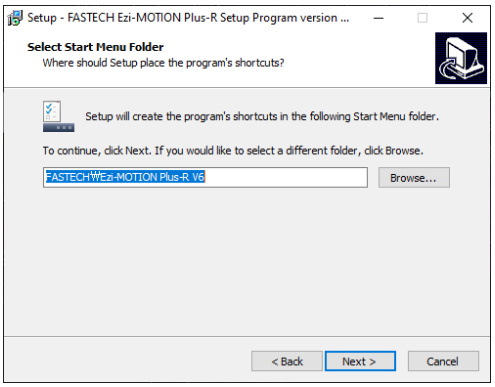
Select a language of installation screen.


Installation Start window.
Click 'Next' button.

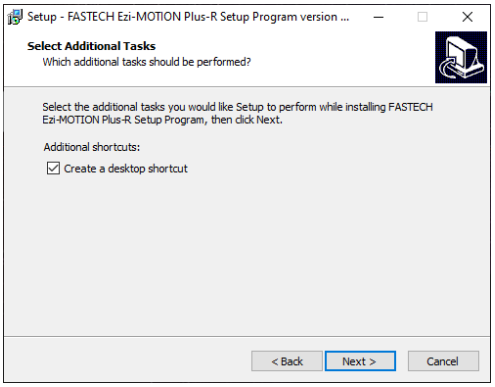



Select a folder where the program is installed,
and click 'Next'

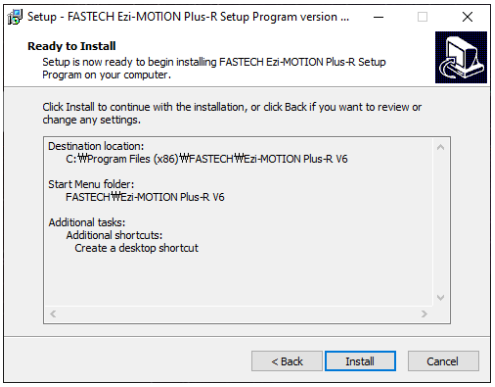
Select start menu folder and click 'Next'.




Choose whether to create a desktop icon and click 'Next'.




Check the installation environment, then click 'Install'.

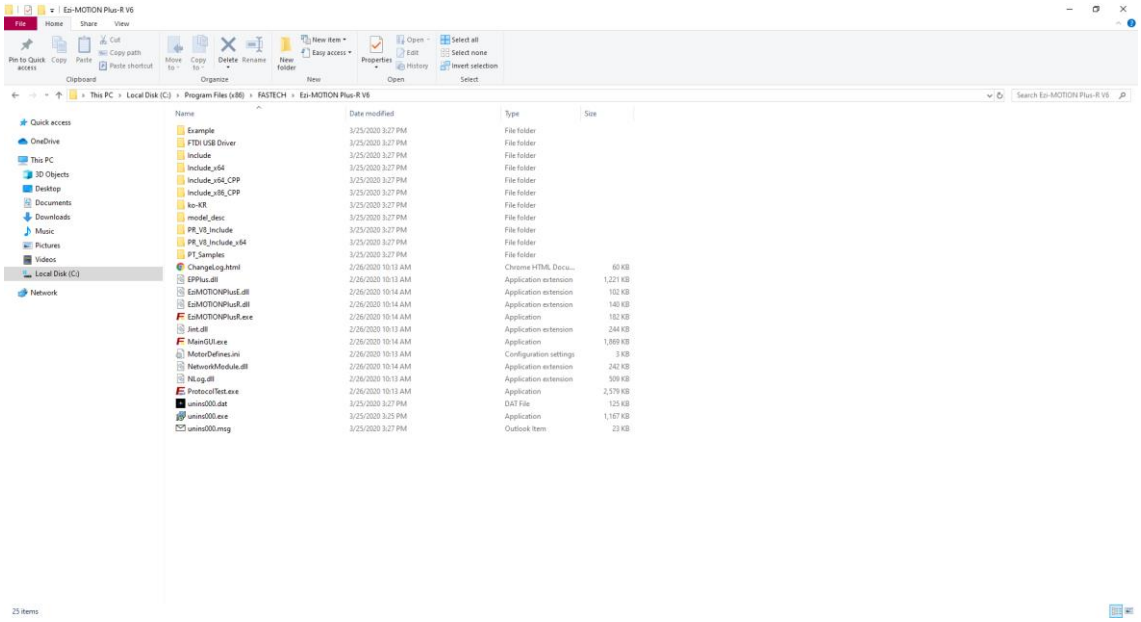



Installation complete

When installation is completed in the designated folder, you can check GUI and required files in the designated folder as shown below.

Version 6 GUI will be installed at 'Program Files (x86)₩FASTECH₩Ezi-MOTION Plus-R V6'.

Version 8 GUI will be installed at "Program Files (x86)₩FASTECH₩Ezi-MOTION Plus-R V8'.



1) Include folder : *.dll, *.lib, *.h, *.cs files (for 32bit, include files for C#)
2) Include_x64 folder : *.dll, *.lib, *.h, *.cs files(for 64bit,include files for C#)
3) Example folder : Sample source code
4) PT_Samples folder : Sample data files for position data test
5) FTDI USB Driver folder : USB converter driver installing program.

## 1 - 4 . USB to RS-485 Converter Installation Method

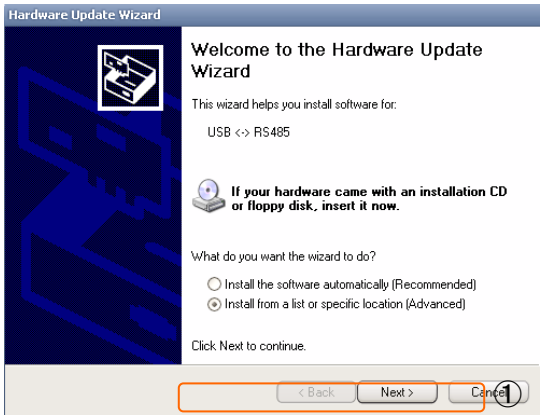
The first time you connect the converter to PC, the new hardware is recognized and the following

window appears.

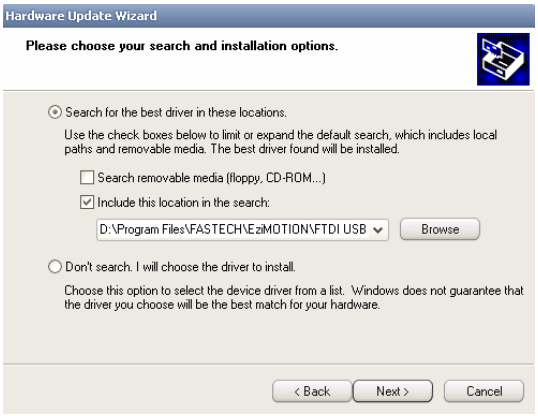
Follow the instructions on the screen to install.

After select ①, click 'Next' button.

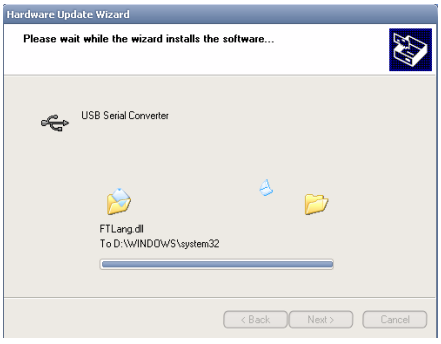
When internet is connected to PC, it is possible to use 'automatically'installation



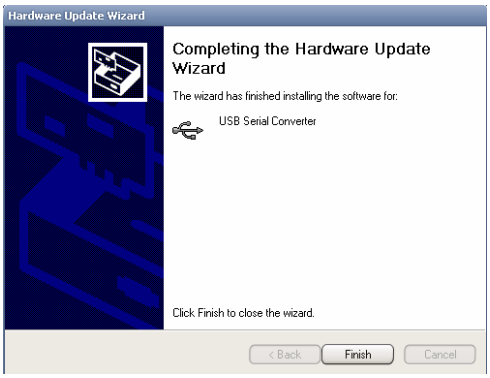

After select the 'FTDI USB Driver'folder that is installed as '1.2 User Program(GUI) Version', click 'Next' button.



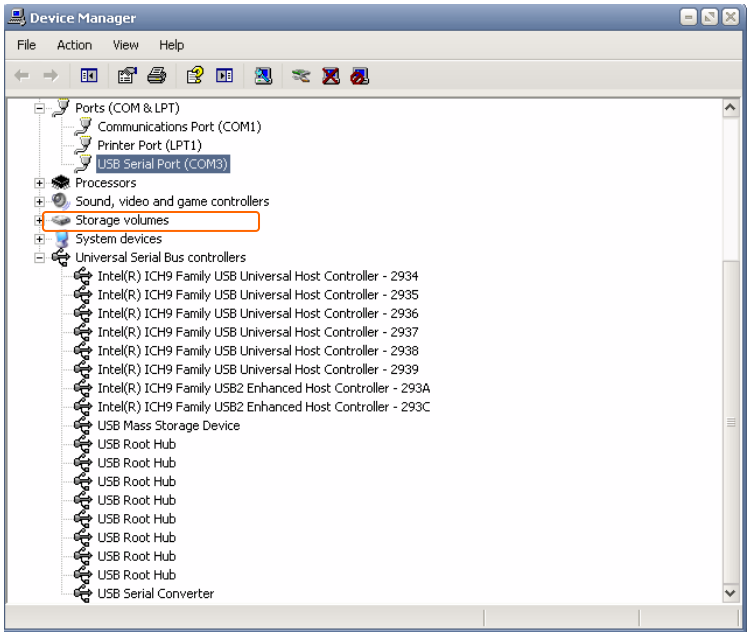

Now installing.



Installing is finished.




After installation finished, converter can be checked in Device Manager window.




## 1 - 5 . Connecting PC

(1) To connect communication between PC and drive module, prepare the communication converter and communication cable.
For details, refer to 「User Manual_Text.

After running Ezi-MOTION Plus-R V6, you will see the window below.

| Name | Description |
|---|---|
| Port No. | Specifies the port number of the RS-232 or USB to connect to the drive among the communication ports of the PC. |
| Baudrate | As a function to select the communication speed for connecting the drive and RS-485 communication, it must match the setting of the controller's communication speed switch (SW2).<br>(Default : 115,200[bps]) |

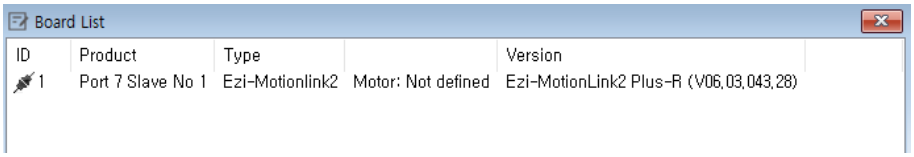
After completing the setting, click the 'Connect' button to try to connect all drives of the same version from ID No. 0 to 15 at the speed set through the corresponding communication port.

| | |
|---|---|
| Caution | **1. The communication speed values of drive modules connected in one segment must be set to the same value.**<br>**2. If connection to the drive fails, check the port No. or baudrate.** |

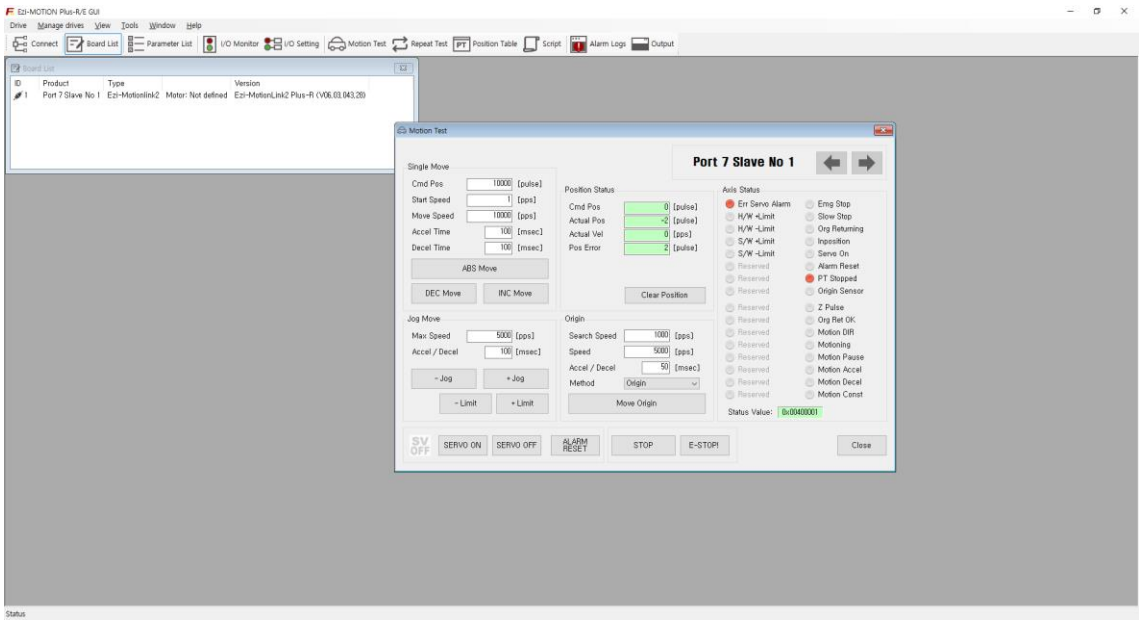
(2) After drive is connected, you can check the followings.

1) Types of all products connected.

2) Firmware Version.

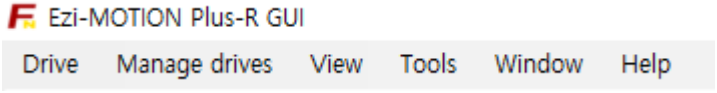


# 2. Main Window




This is the basic window to operate the program. Each window is displayed in this window. The user can open each window with a toolbar.

## 2 - 1 . Menu




There is 'View' menu to display other windows simply and 'File' menu which the user can connect and disconnect communication.

## 2 - 2 . Toolbar

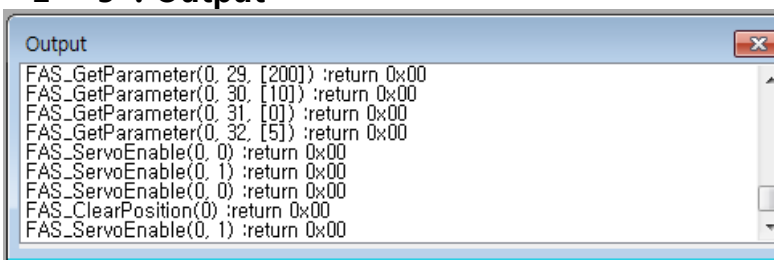

There are various buttons to go to the next window.

Click each button, and the following functions will be executed.

| Button | Description |
|---|---|
| Connect | To connect or disconnect with the drive |
| Board List | To display connected module information and communication status |
| Parameter list | To set parameter values related to operation control like a position command |
| I/O Monitor | To monitor digital I/O signals of CN1 connector |
| I/O Setting | To set digital I/O signal assignment of CN1 connector |
| Motion Test | To execute motion commands such as Jog operation, Position operation, Origin return operation |
| Position Table | To input and execute position table data |

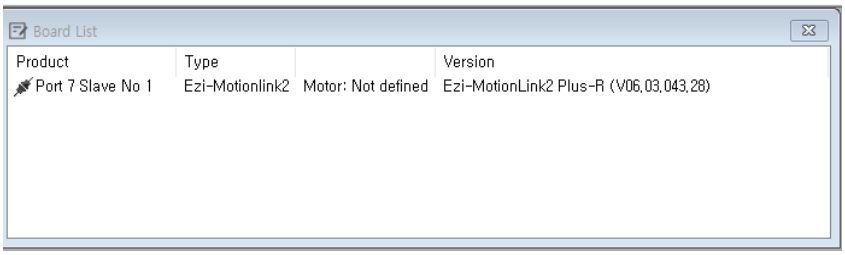
| | |
|---|---|
| | In Ezi-MOTIONLINK Plus-R, there is not a position table function. |
| Repeat Test | To do the repeat test of one axis |
| Output | The DLL function corresponding to the currently executing command is displayed. |

## 2 - 3 . Output




Click 'Cmd Bar' at the toolbar or check 'Menu –View – Command Bar', and the above window will be displayed. This window includes commands used for the controller. The user can check that which function is used, how parameter values are inputted, and how they are normally processed. The above window displays functions which the user inputs or functions used when he clicks. For more information of commands, refer to 「User Manual-Communication Function」.

## 2 - 4 . Board List




As this window can check the drive list connected with communication. The user can check information of each drive. There are buttons to go to windows for function setting or testing.

Informations :

1) Slave ID number and type of drive.
2) Firmware version number of drive.

### 2 - 4 - 1 . Parameter Area

| Button | Function |
|---|---|
| Parameter List | To display the window that the user can check, edit, and manage drive parameters |

2 - 4 - 2 . I/O Area

| Button | Function |
|---|---|
| I/O Monitor | To monitor digital I/O signals of CN3 connector |
| I/O Setting | To set digital I/O signal assignment of CN3 connector. |

2 - 4 - 3 . Motion Area

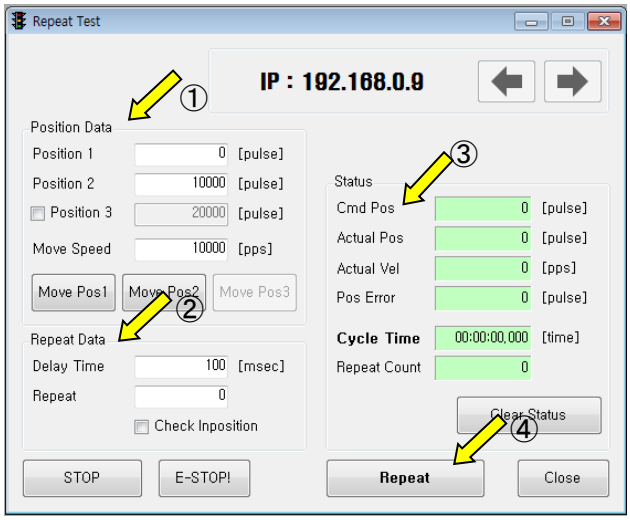
| Button | Function |
|---|---|
| Motion Test | To execute motion commands such as Jog operation, Position operation, Origin return operation |
| Repeat Test | To test fixed motioning for 1 axis repeatedly |
| Position Table | To input and execute position table data |

## 2 - 5 . Repeat Test

① The repeat test is possible for up to 3 absolute position values.

② Delay time and repeat count can be set every repeat.

* Delay Time : Stand-by time until each motion is done and then next motion is started. The unit is [msec].
* Repeat : To define the motion loop count. If this is set to '0', the test is endlessly repeated.

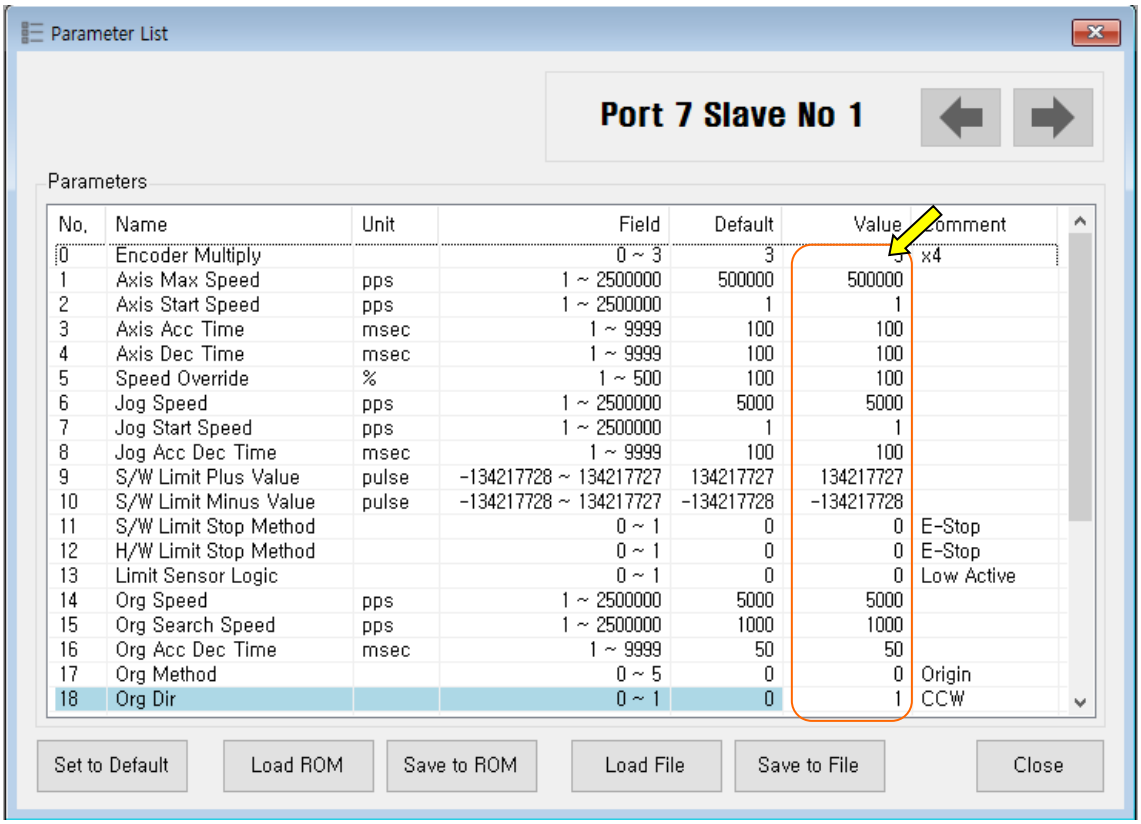



③ Operation status and repeat count are displayed.

* Cycle Time : displays the time until repeat test is completely finished.
* Repeat Count : Increment by 1 whenever one motion loop is finished.

④ When the user clicks 'Repeat' button, repeat operation starts according to the condition. When the user clicks 'Repeat' button while the machine is operating, the cycle in service ends and the machine stops operating. Click 'Stop' or 'E-Stop' button, and the machine will stop regardless of the cycle.

# 3 . Parameter List



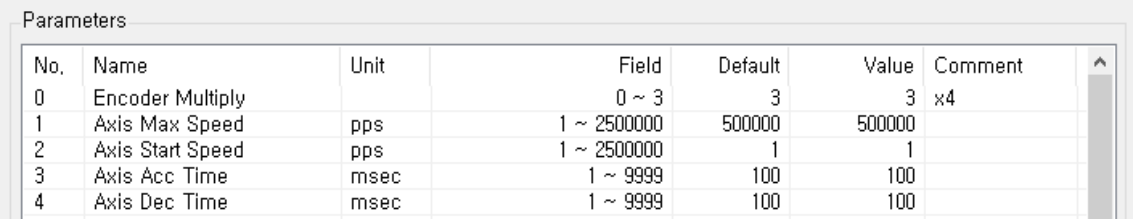

The user can set and save parameter values related to motion control by each drive module. 'Value' column displays the value applied to current motion control and can be edited.

## 3 - 1 . Slave No


To display drive number for the current parameter list window. By using right/left arrow key, the user can select other drive.

Buttons at the bottom bar including 'SAVE to ROM' is available only for the current drive. To control several drive parameters, the user should execute related each one of slave independently.

## 3 - 2 . Parameter Input


Parameters

| No. | Name | Unit | Field | Default | Value | Comment |
|---|---|---|---|---|---|---|
| 0 | Encoder Multiply | | 0 ~ 3 | 3 | 3 | x4 |
| 1 | Axis Max Speed | pps | 1 ~ 2500000 | 500000 | 500000 | |
| 2 | Axis Start Speed | pps | 1 ~ 2500000 | 1 | 1 | |
| 3 | Axis Acc Time | msec | 1 ~ 9999 | 100 | 100 | |
| 4 | Axis Dec Time | msec | 1 ~ 9999 | 100 | 100 | |

Select parameters as shown at the table and the input box that the user can edit parameter values will be displayed. When the user inputs the parameter value, it is saved to RAM area of the drive. The machine operates as the parameter is edited. However, when the drive is powered off, the value is deleted. To continuously operate the machine as the parameter value is set, the user must click 'SAVE to ROM' button and save the edited value to ROM.

When the input value is out of right range, it is displayed in red color. The value cannot be inputted in RAM of the drive.

## 3 - 3 . Parameter List Window Buttons

Click each button, and the following functions will be executed.

| Button | Description |
|---|---|
| SET to DEFAULT | Converts all parameter values into 'Default Value'. |
| LOAD ROM | Converts 'Value' items into values saved to the ROM area. |
| SAVE to ROM | Saves current 'Value' items to the ROM area.<br>(Even though the drive is powered off, they are not deleted.) |
| LOAD FILE | Sets 'Value' items to the values saved to an external file. |
| SAVE to FILE | Saves the current values to an external file.<br>(The user defines folder position and file name. The extension is *.fpt.) |

For more information of parameter types and their functions, refer to 「User Manual–Text, 15. Parameters」.

## 3 - 4 . Save/Load to a File

Ezi-MOTIONLINK Plus-R can save parameters, Input/output setting and position table data to an external file folder and can read them if necessary.

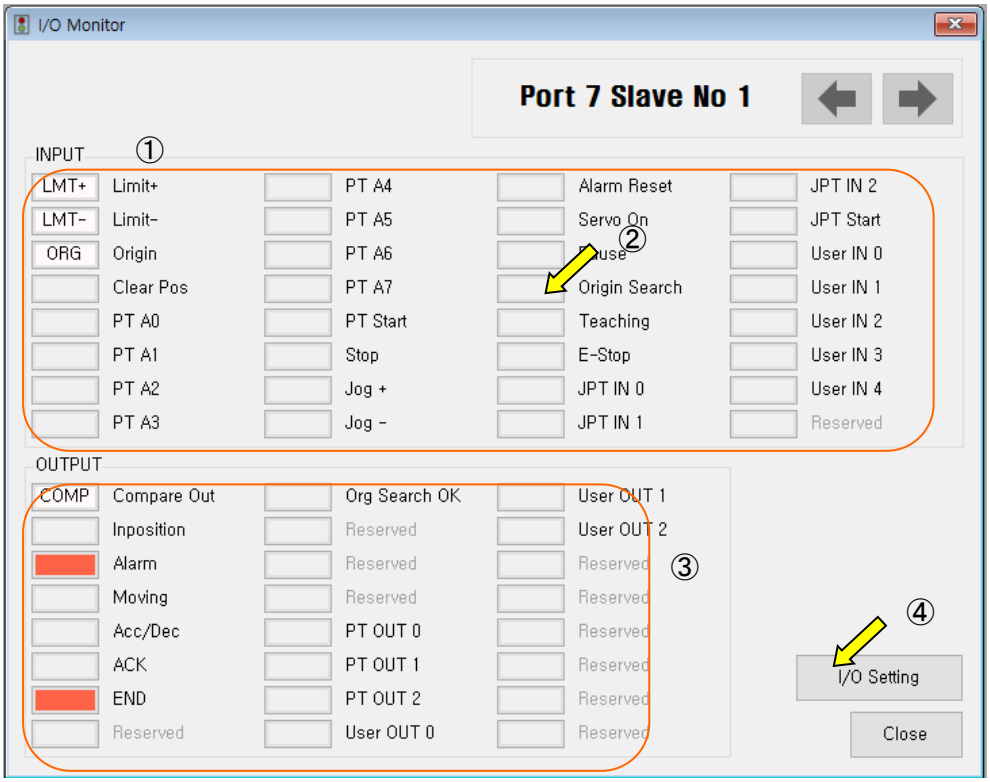
When saving, input as file name and click "Save' button. When reading, select a file and click a right-side button.

File extension for parameter is *.fpt and for Input/output setting is *.fit.
File extension for position table data is *.txt.

# 4. I/O Monitoring

The user can set and check control I/O signals related to operation control through CN1 connecter. The next window is the sample setting of I/O Monitoring status.

I/O Monitoring window




### 1) Input Signal : ①

There are 16 definable input signals. However, just 8 signals of them can be connected to CN3 connecter physically at one time.

The first three signals are fixed to '***LIMIT+*** ', '***LIMIT-*** 'and '***ORIGIN*** 'sensors. Therefore, other signals cannot be connected and used with these pins. The user can set up to 5 signals to Input 5 pins at one time. '***IN1*** '~'***IN5*** 'indicators are displayed to current setting signals.

For signals set to '***IN1*** '~'***IN5*** ', when the signal is turned [ON] through the connector of CN1,the icon will change to ***'Green'*** and when the signal is turned [OFF], it will return to '***white'***.

### 2) Virtual Input Function : ②

Even though the input pin is not assigned to 'IN1'~'IN5' at all, the user can click each button and virtually change the signal into [ON]/[OFF]. For instance, click 'Pause' button, and the stop function will be operated temporarily.

### 3) Output Signal : ③

There are 5 definable output signals. However, just 4 signals of them can be connected to CN3 connecter physically at one time.
The first signal '***COMP***' is used to specific purpose only. Therefore, other signals cannot be connected and used with this pin. The user can set up to 3 signals to Output 3 pins at one time. '***OUT1***'~'***OUT3***' indicators are displayed to current setting signals.

When each signal is [ON] through CN3 connecter, icon is changed into '**green**'. When the signal is [OFF], it returns to 'white' to the original state.

### 4) Virtual Output Function:

After assigning the 'User OUT 0' ~ 'User OUT 2'signals to OUT1' ~ 'OUT3', when click that button the signal changed [ON]/[OFF] through that pin.

### 5) I/O Logic Setting button : ④

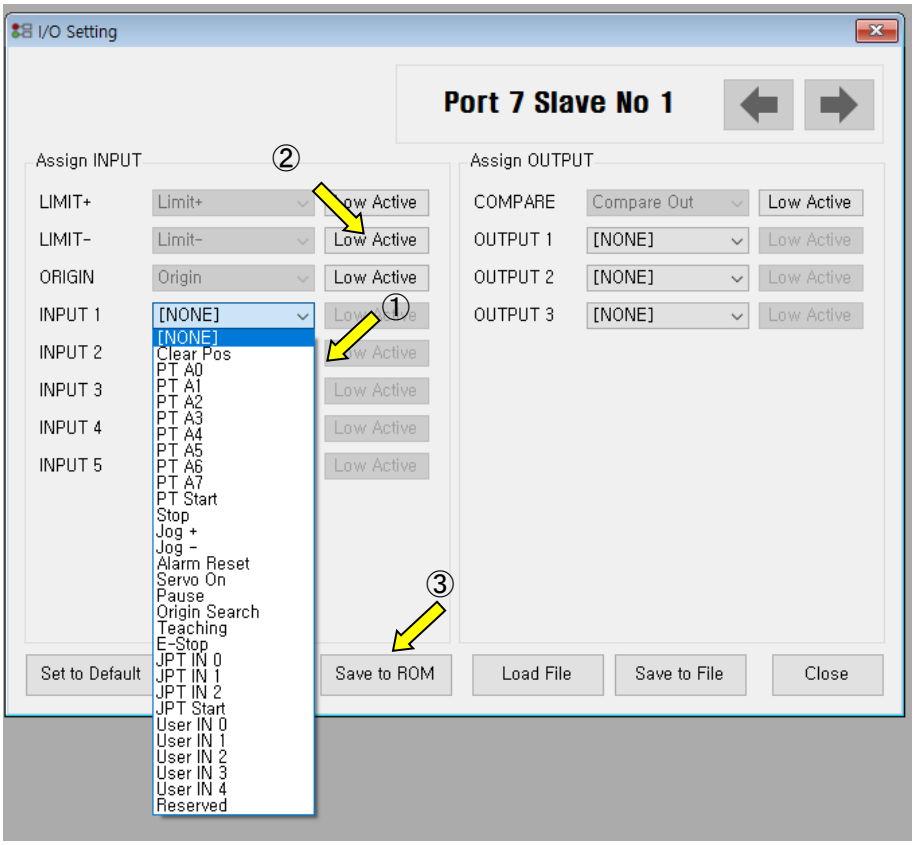
The screen to assign the desired signal to the physical pin of the CN3 connector and specify the 'Active Level' of the signal is displayed.

*

# 5. I/O Setting

Click 'I/O Logic Setting' icon at the I/O Monitor window, and the following window will be

displayed.




The assignment method is same in input and output.

### 1) Signal Assignment : ①

To change pin assignment of CN1 connecter, click ▼ button to the right of the corresponding signal name as showed above, and select signals will be displayed at the drop-down menu.

### 2) Signal Level Assignment : ②

These buttons provide the user with functions that he can select the active level of signal for the signal to be recognized to [ON]. He can click the button to the right of the signal name and set the signal.

* Low Active : when the signal is set[ON] to 0 volt
* High Active : when the signal is set[ON] to 24 volt

### 3) Save : ③

Output pin of CN3 can be set described same as input. All changed signals are temporarily saved to the RAM area. To save them to the ROM area, the user must click 'Save to ROM' button. At this time, current parameter values are saved to the ROM area as well.

For more information of 'I/O Monitoring' and 'I/O Logic Setting' windows, refer to 「User

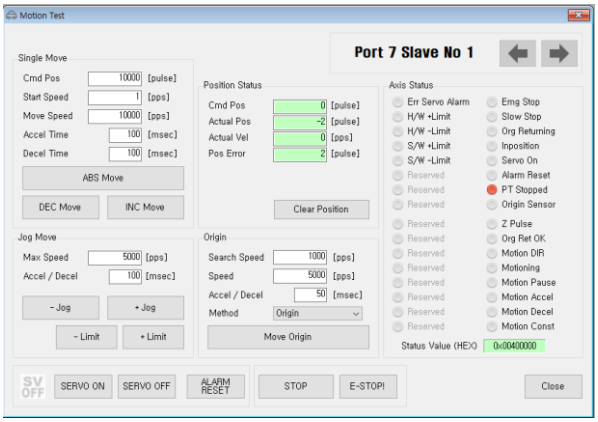
Manual-Text, 5. Control Input and Output Signal」.

# 6. Motion Test

To test the motor connected with the controller drive. The user can test motion for one axis. He can test that the motor moves to the given position, and simply transfer the motor to one direction. The user can move the motor to the origin or the limit and then test its sensor. At the position status and the axis status, the user can check the position, speed, and status of the current axis.

## 6 - 1 . Initial Movement

1) Click 'Motion Test' at the manin menu.

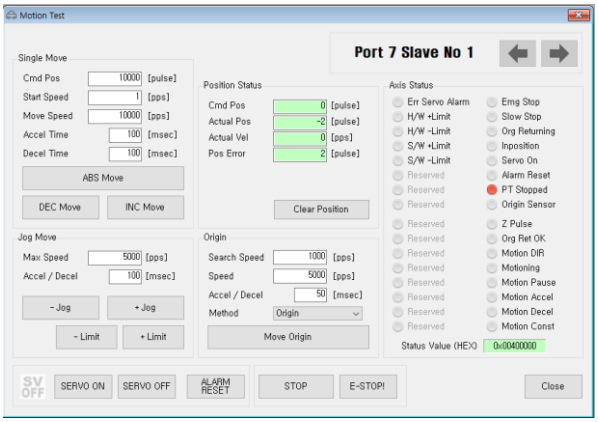



2) The window as shown to the right is displayed.

3) Click SERVO ON and the motor will be Servo ON and the icon will be changed in SV ON . At this time, the motor starts to be electrified and the motor becomes 'lock' status.

4) **Jog Operation**

After setting jog related parameters, click -Jog +Jog and press it for a while, and the motor will be operated to the setting direction.




5) According to the motion of motor, the user can check its position and operation status. For more information, refer to 「User Manual-Text, 7. Other Operation Functions」.

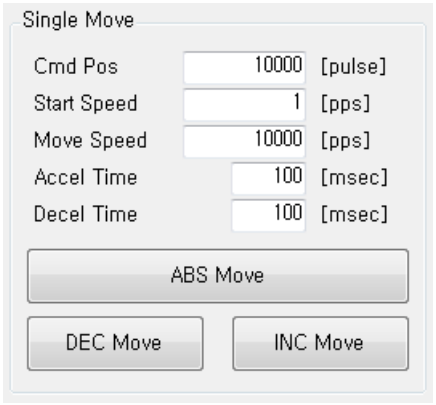
6) **Origin Return Operation**.

Click 'Origin', and origin return motion will be operated. The motion type may be different subject to how origin return type(parameter) is selected.

7) When origin return is finished, the red LED is displayed to ON like at the Origin Search OK 'Axis Status' window. For more information, refer to 「User Manual-Text, 7. Other Operation

Functions」.

## 6 - 2 . Single Move Operation

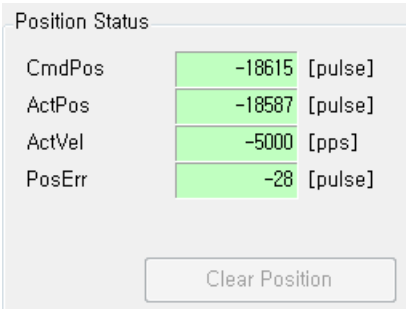



The user can test straight-line move command for one axis. 'Abs Move' button finds and moves to the absolute position, and 'DEC Move' and 'INC Move' find and move to the relative position.

* Cmd Pos : Indicates target position value. The unit is [pulse]. When 'Abs Move' is executed, this displays the absolute position. When 'DEC Move' or 'INC Move' is executed, this displays the relative position.
* Start Speed : To set AxisStartSpeed at the second item in parameter lists. 'Start Speed' should be smaller than 'Move Speed'.
* Move Speed : To set the moving speed when Abs Move, DEC Move, or INC Move is executed. 'Move Speed' should be larger than 'Start Speed'.
* Accel Time, Decel Time : To set AxisAccel and AxisDecelTime in parameter lists.

## 6 - 3 . Position Status

To displays the current position of axis. Click Clear Position button, and Cmd Pos value and Actual Pos value will be initialized to '0(zero)'.

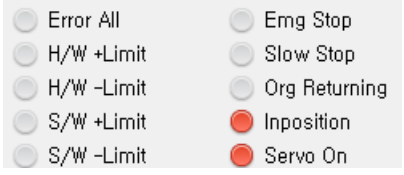



* Cmd Pos : displays target position value while the motor is operating.
* Actual Pos : displays current position value while the motor is operating.
* Actual Vel : displays the actual operation speed of motor.
* Pos Error : displays the difference between Cmd Pos value and Actual Pos value. By this value, the user can check how much the current target position is tracked correctly.

## 6 - 4 . Axis Status and Alarm

To display the current axis status. Each status is displayed to On/Off. 'On' indicates in red and 'Off' indicates in gray.

1) When the motor stops operation and Inposition is finished, the corresponding LED at the right figure is displayed in red.
2) When an alarm occurs during operation, the corresponding






LED is displayed in red. For more information of alarm types, refer to 「User Manual-Text, 12.5 Output Signal」.

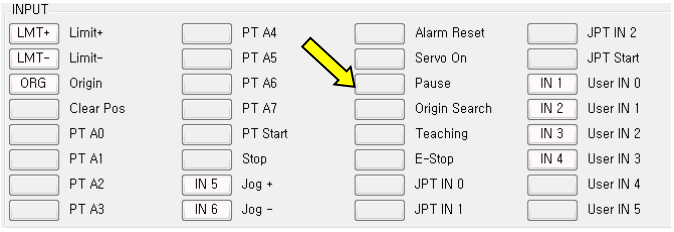
3) After removing the alarm cause, click 'ALARM RESET' to check that the alarm is released. Then change the LED into Servo ON again.

## 6 - 5 . Stop Operating

There are Pause, Stop, E-Stop commands for Stop operating.

1) Temporary stop (Pause)

Click 'Pause' button at the I/O Monitoring window to stop the motion temporarily. When clicking the button again, the motor restarts to operate. If 'Pause' signal is set to 'IN1~IN9', the actual external signal must be supplied to [ON] status.




2) Deceleration stop(Stop), Emergency stop(E-Stop)

When the motor needs to stop during operation, use the button as shown to the right on Motion Test window.

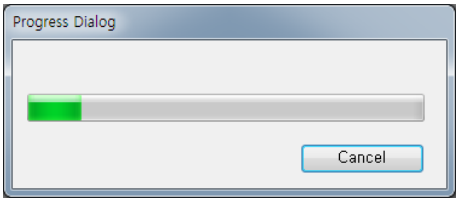

'STOP' button includes deceleration function and 'E-STOP' button does not include deceleration function.

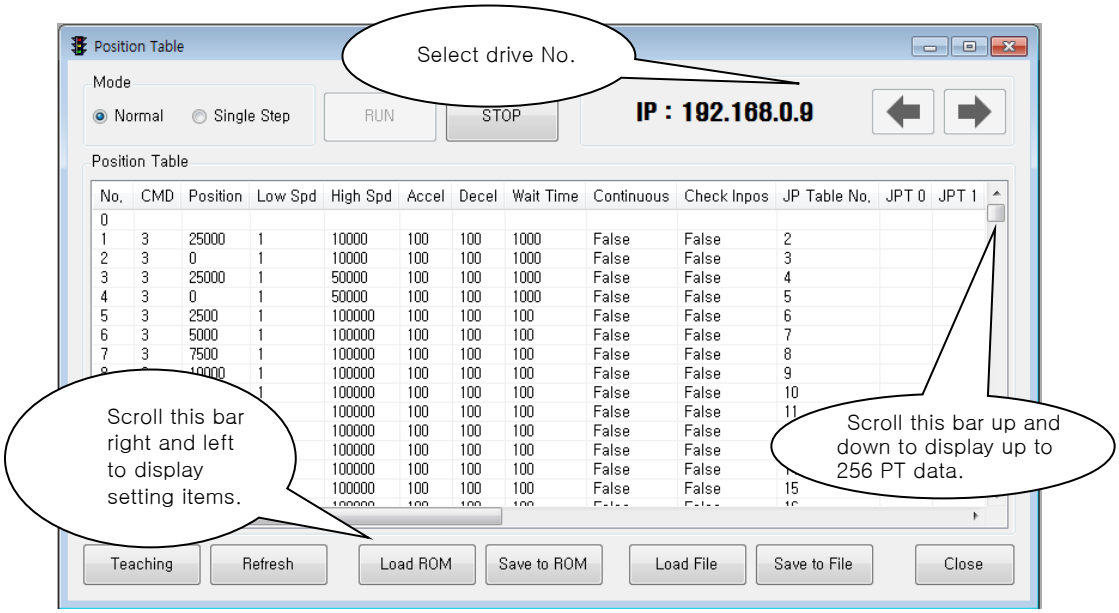
# 7 . Position Table (PT)

For more information of position table, refer to 「User Manual-Position Table Function」.
This chapter introduces its basic usage.

1) Reading position table data

Click 'Pos Table' icon at the main menu, and Data saved to the RAM area will be loaded and then the following window will be displayed.

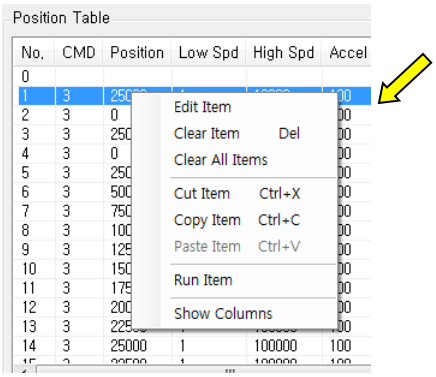


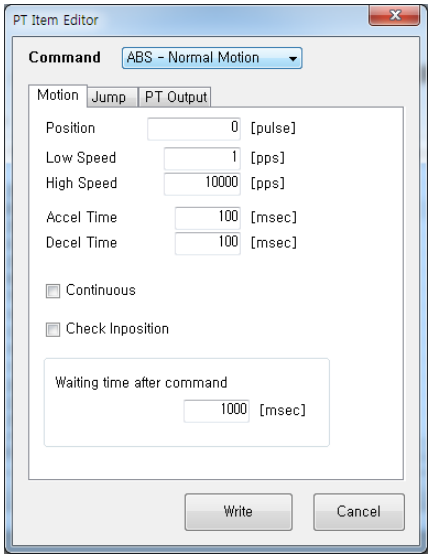

Position table data can be changed at any time.

The position table can save up to 256 step data. If the position table is used to the program area, it can be used for all point numbers without restriction. In other words, it is possible to start at a random point number and jump to other point number.

2) Put the mouse on a specific PT data line, click its right button, and the pop-up menu will be displayed as shown to the right.
All of the functions can be implemented.
Click 'Edit Item', and the user can edit data at the window like 3) below.



3) Put the mouse on a specific PT data line, double click its left key, and the right window will be displayed.

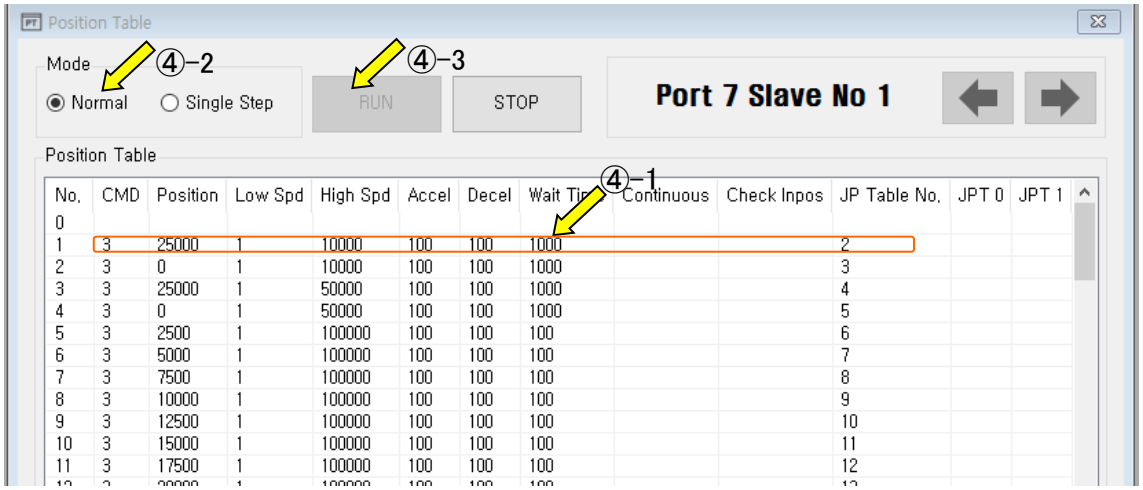



* Input the value in order from 'Command' related items according to operation modes.
* When all data of the positing table is completely input, click 'Save' button to save the data on RAM area.

* To edit the next position table, the user should use direction button.
* Refer to 「User Manual-Position Table Function」 for more detail information.

This data is saved to the RAM area. So, when power is off, data is deleted. Click 'Save to ROM' button for saving the data to the ROM area.

4) Set the motor to 'Servo ON' and select the mode 'Normal', click PT No to start motion, and then execute 'Run'.




While PT No is operated in sequence, PT lines in service are changed in grey.

FASTECH
Fast, Accurate, Smooth Motion

**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