

Ezi-SERVO[®] II Plus-E

Closed Loop Stepping System

User Manual

User Program(GUI) Function

(Rev.04)



Table of Contents

Table of Contents	2
1 . Installation and connection of the Program.....	3
1 - 1 . Installable PC environment	3
1 - 2 . User Program(GUI) installation Method.....	3
1 - 3 . Connecting PC with DriveModule.....	6
2 . Main Window.....	8
2 - 1 . Menu	8
2 - 2 . Toolbar.....	8
2 - 3 . Output	9
2 - 4 . Board List.....	10
2 - 5 . Repeat Test	11
3 . Parameter List	12
3 - 1 . IP Address	12
3 - 2 . Parameter input.....	13
3 - 3 . Parameter List Window Buttons	13
3 - 4 . Save/Read to a file	14
4 . I/O Monitoring.....	15
4 - 1 . I/O Logic Setting.....	16
5 . Motion Test	17
5 - 1 . Initial Movement.....	17
6 . Position Table (PT).....	20

This manual describes how to operate User Program(GUI).

For more information, refer to related manuals as following.

- (1) [User Manual_Text](#)
- (2) [User Manual_Communication Function](#)
- (3) [User Manual_Position Table Function](#)

1 . Installation and connection of the Program

There are two operation modes as follows in Ezi-SERVOII Plus-E.

- 1) Using of Motion Library (DLL) which is provided for the program from Windows XP/ VISTA/ 7/ 8.
- 2) Using of Position Table (PT) and external signals input by the user.

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

This chapter describes the user program(GUI) used for the installation and running test of the controller.

1 - 1 . Installable PC environment

Type : Compatible with PC/AT

Ethernet 10/100base-T/TX Lan Card

Hard disk capacity more than 10MB

Screen SVGA(1024×768 or more)

CPU Pentium4 2.0GHz or more

OS : PC which is installed Windows XP/ VISTA/ 7/ 8.1/ 10(32/64Bit)

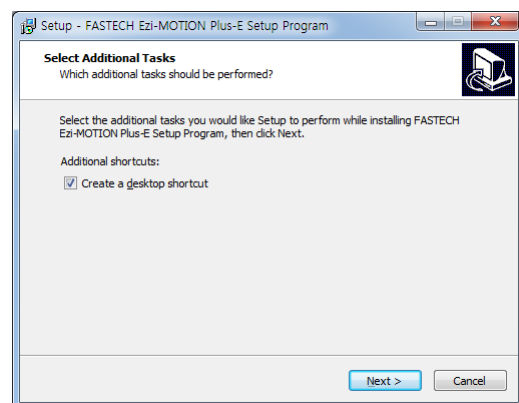
1 - 2 . User Program(GUI) installation Method

Download [Ezi-MOTION_Plus-E_SETUP] program on FASTECH website

(http://fastech.co.kr/bbs/bbs/board.php?bo_table=eng_board5) and install as shown below.

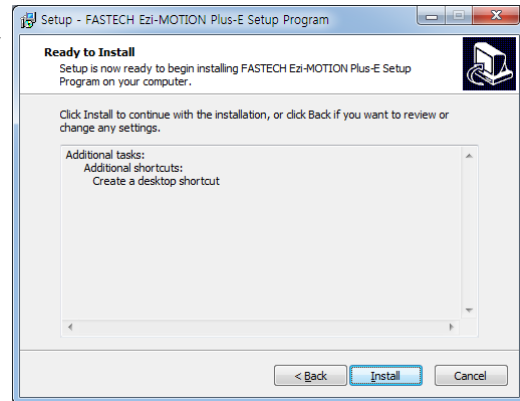
Installation Start window.

Click 'Next'.

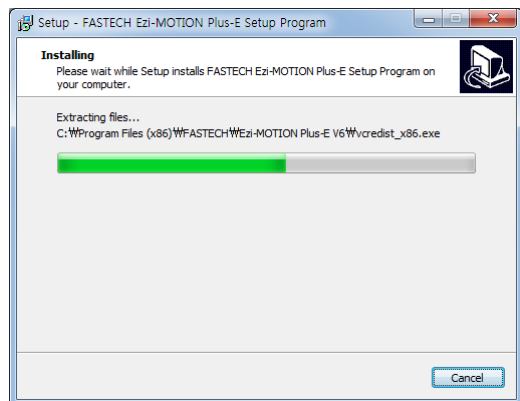


Installation and connection of the Program

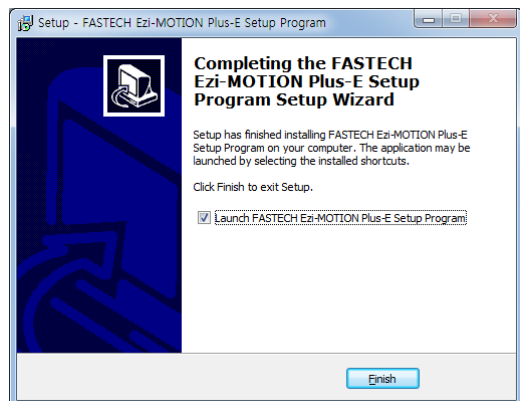
Select a folder where the program is installed,
And click 'Install'.



Installing

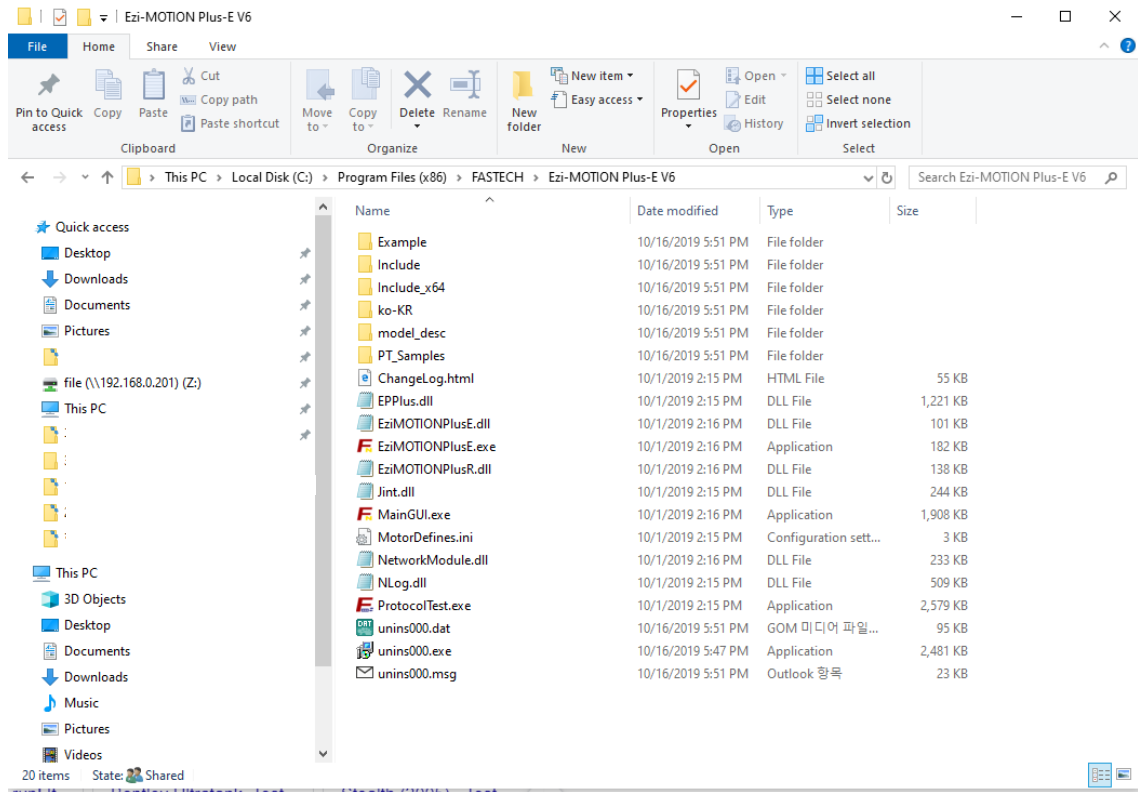


Installation is completed.



Installation and connection of the Program

When installation is completed, you can find the below files in the selected folder.



1) Include folder : *.dll, *.lib, *.h files (32bit)

Include_x64 folder : *.dll, *.lib files (64bit)

2) Example folder : source code for sample

3) PT_Samples folder : sample data files for position table

1 - 3 . Connecting PC with DriveModule


- (1) To communicate with controller module, the user should prepare Ethernet cable and connect it with the PC. For more information, refer to 「[User Manual_Text](#)」.

Execute User program(GUI) icon(Ezi-MOTION PlusE V6) and click 「Connect」. Then the following window will be displayed.



Button	Description
Add	Enter IP Address and add on List. If the item does not exist with added IP Address, List will not be added.
Broadcast Search	Search every item that can be connected to GUI and then add it to the list.
Refresh Status	Check the connection status of listed item.
Connect	Connect the listed item and execute GUI.

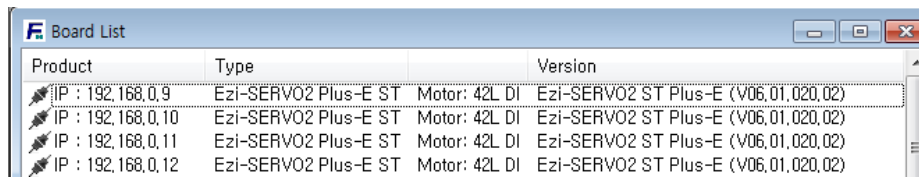
- After setting each IP Address differently, if click 'Broadcast Search' button, all products are displayed on List. At this time, if you click the 'Connect' button, all products are connected to GUI.

 Caution	<p>1. Please assign different IP Addresses of connected drives to a single network (segment).</p> <p>2. If the connection fails, please check IP conflict and IP Address of PC.</p>
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- (2) When the connection is completed, the window will appear as show below.

- 1) IP Address of Connected drives
- 2) Type of all connected motors and drives
- 3) Firmware Version

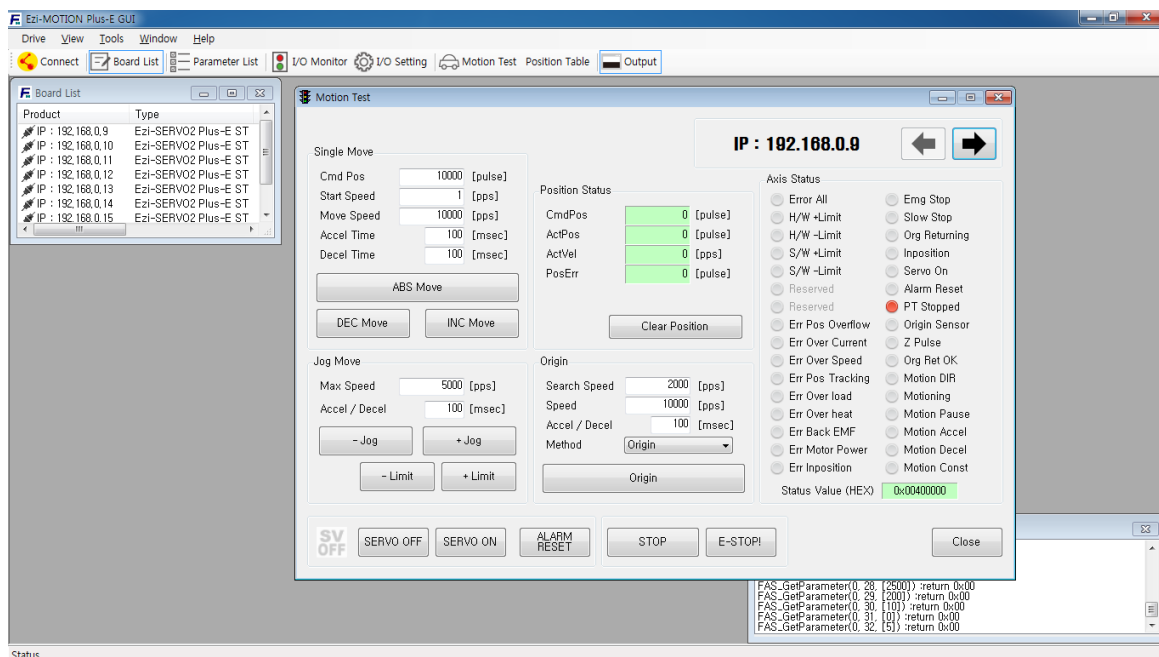
Installation and connection of the Program



The screenshot shows a window titled 'Board List' with a table containing four columns: Product, Type, Motor, and Version. There are four rows of data, each preceded by a small icon of a screwdriver. The data in the table is as follows:

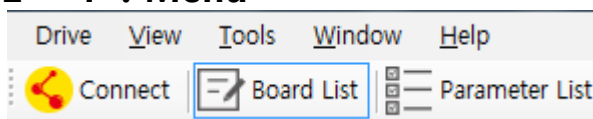
Product	Type	Motor	Version
IP : 192.168.0.9	Ezi-SERVO2 Plus-E ST	Motor: 42L DI	Ezi-SERVO2 ST Plus-E (V06.01.020.02)
IP : 192.168.0.10	Ezi-SERVO2 Plus-E ST	Motor: 42L DI	Ezi-SERVO2 ST Plus-E (V06.01.020.02)
IP : 192.168.0.11	Ezi-SERVO2 Plus-E ST	Motor: 42L DI	Ezi-SERVO2 ST Plus-E (V06.01.020.02)
IP : 192.168.0.12	Ezi-SERVO2 Plus-E ST	Motor: 42L DI	Ezi-SERVO2 ST Plus-E (V06.01.020.02)

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



Menu	Description
Drive	To connect or disconnect with the drive
View	To open each window
Tool	To select a language of GUI
Window	To change window's array

2 - 2 . Toolbar



There are various buttons to go to the next window.

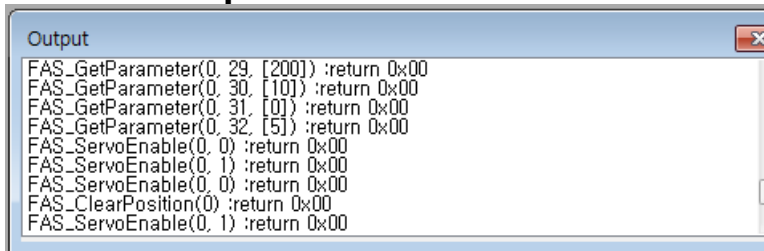
(Some buttons will be enabled or disabled according to the connected item.)

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 input and output signal of Drive CN1 connector.
I/O Setting	To set digital input and output signal of Drive CN1 connector
Motion Test	To execute motion commands such as Jog operation, Position operation, Origin return operation
Position Table	To input, modify, save, execute the data for position table
Output	To display DLL function corresponding to the command being executed

2 - 3 . Output



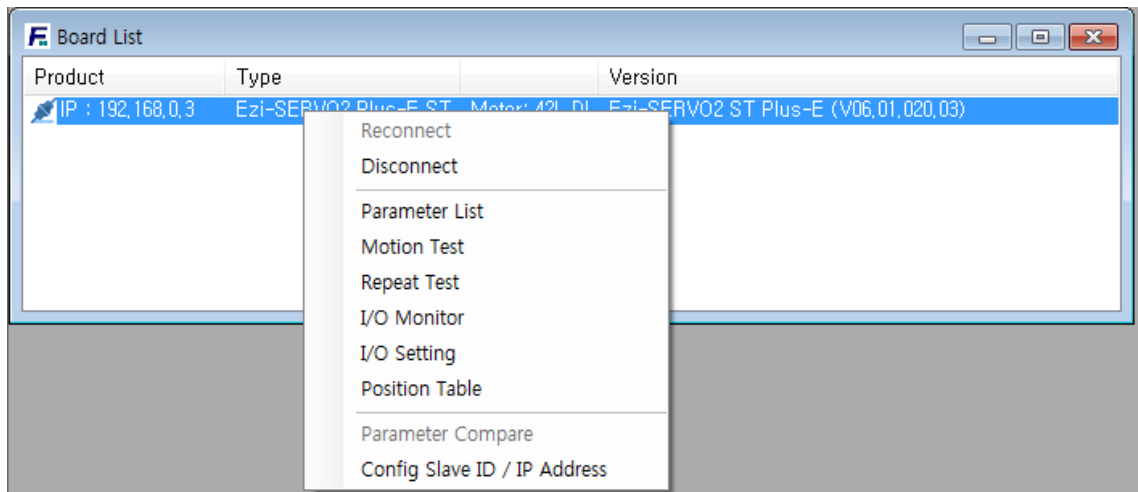
Click 'Output' at the Toolbar or check [Menu] – [View] – [Output], and the above window will be displayed.

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 the user clicks each button. For more information of commands, please refer to [「User Manual-Communication Function」](#)

2 - 4 . Board List

To check the drive list connected with communication. The user can check information of each drive. Select the connected drive and Right-click. Then there are buttons to go to windows for function setting or testing.



Type of Information :

- 1) Drive IP Address
- 2) Drive Type
- 3) Motor Type
- 4) Drive **Firmware version**

- Disconnect / Reconnect

Disconnect : Disconnect the drive

Reconnect : Reconnect the drive

- Parameter List

To display the window that the user can check, edit, and manage drive parameters

- 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

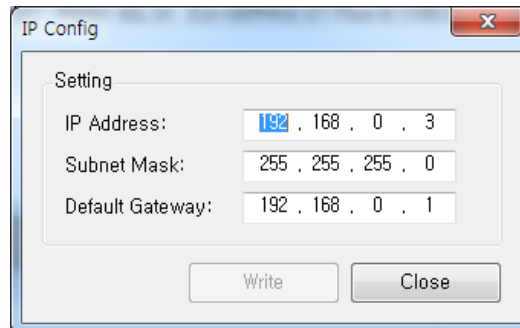
- I/O Monitor

To monitor digital I/O signals of CN1 connector

- I/O Setting

To set digital I/O signal of CN1 connector

- Position Table
To input and execute position table data
- Config Slave ID / IP Address
To change default IP Address / Subnet Mask/ Gateway setting



After clicking "Write" and Power reset, Configuration is applied.

Final number of IP Address does not change.

Final number can be **set via Switch**.

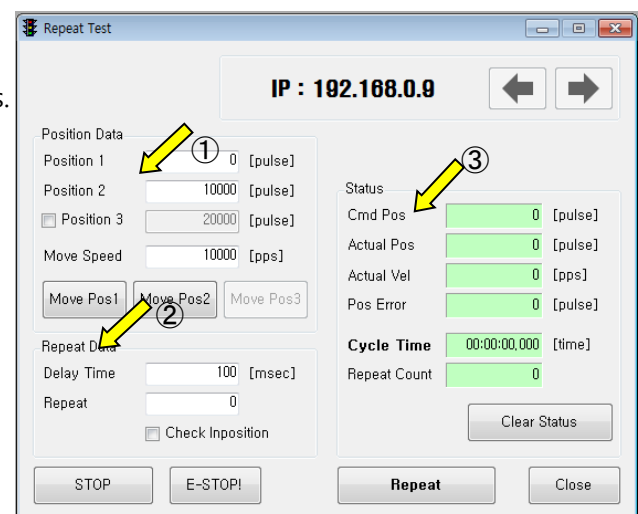
Ex) If changing IP Address : 192.168.0.3 → 192.169.10.100, then it's changed to 192.168.10.3

2 - 5 . Repeat Test

① It is possible to set for up to 3 absolute position values and execute the repeat tests.

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

- * Delay Time : Stand-by time until each Motion is ended 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.



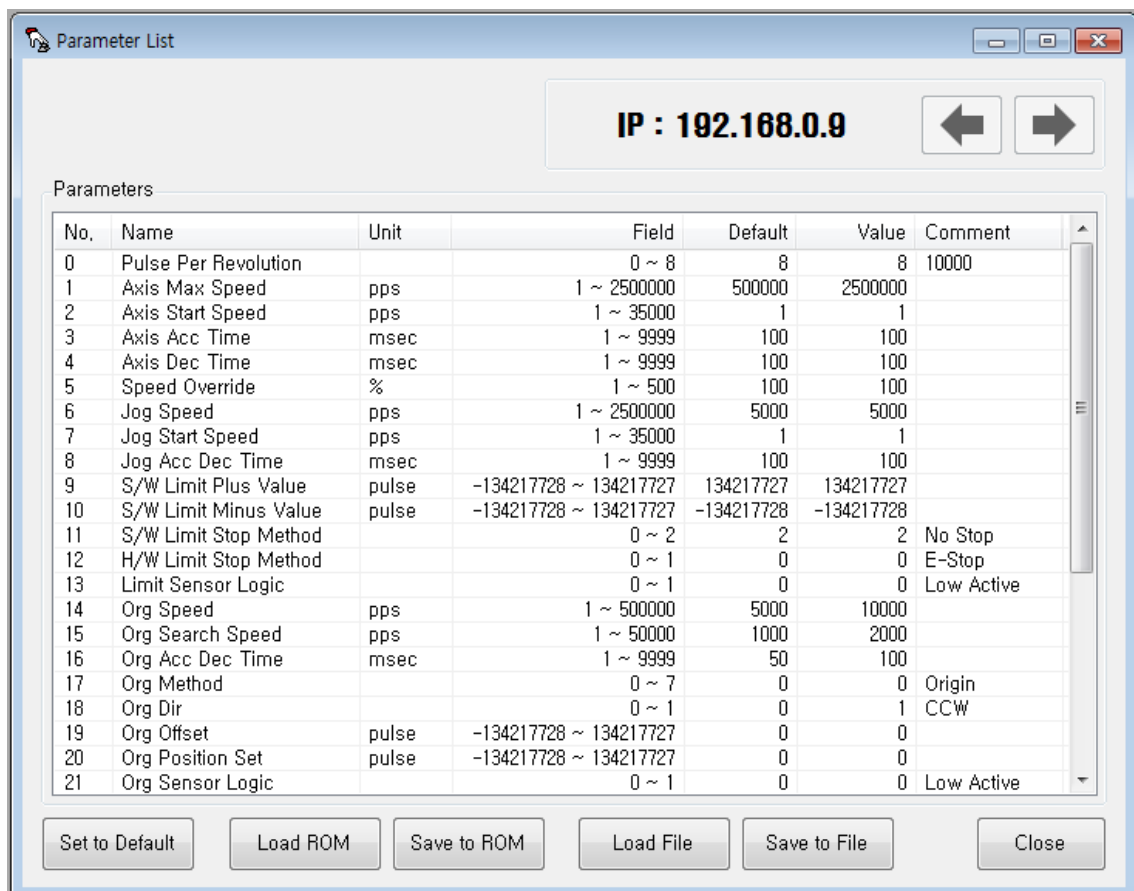
(The Motion loop is operating as following order Position1 -> Position2 -> Position1 and it is the 1 repeat when this cycle is done.)

③ Operation status and repeat count are displayed.

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

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

3 . Parameter List



Item	Description
No.	Parameter number
Name	Parameter name
Unit	Parameter unit
Field	Range that can input Parameter field
Default	Parameter default value
Value	Current parameter value
Comment	Current parameter description

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 . IP Address

IP : 192.168.0.9

To display drive's 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

No.	Name	Unit	Field	Default	Value	Comment
0	Pulse Per Revolution		0 ~ 8	8	8	10000
1	Axis Max Speed	pps	1 ~ 2500000	500000	2500000	
2	Axis Start Speed	pps	1 ~ 35000	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 will be displayed and then the user can edit parameter values. 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 'Value' items to the ROM area. (Even though the drive is powered off, they are not deleted.)
Load File	Set 'Value' items to the values saved to an external file.
Save to File	Saves the current values to an external file. (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 10.Parameter](#)」.

3 - 4 . Save/Read to a file

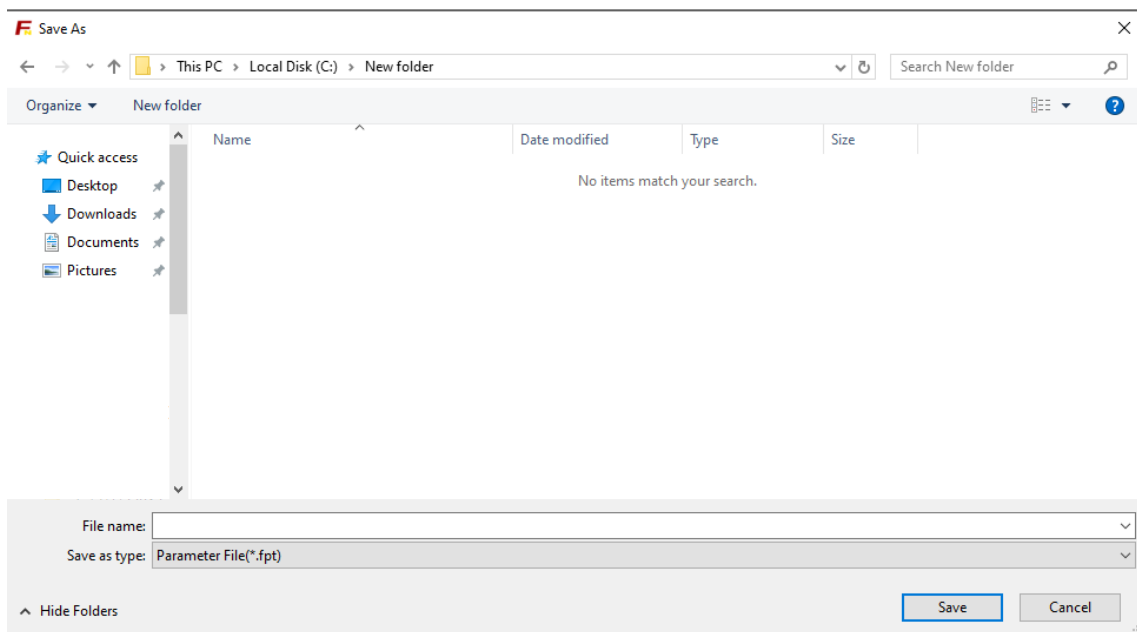
Ezi-SERVOII Plus-E can save parameters, Input/output and position table data to an external file folder and can read them if necessary.

The user can edit a name of file, click 'Save' button, and save data. Then can select a file, click 'Open' button and read data.

File extension for parameter: *.fpt

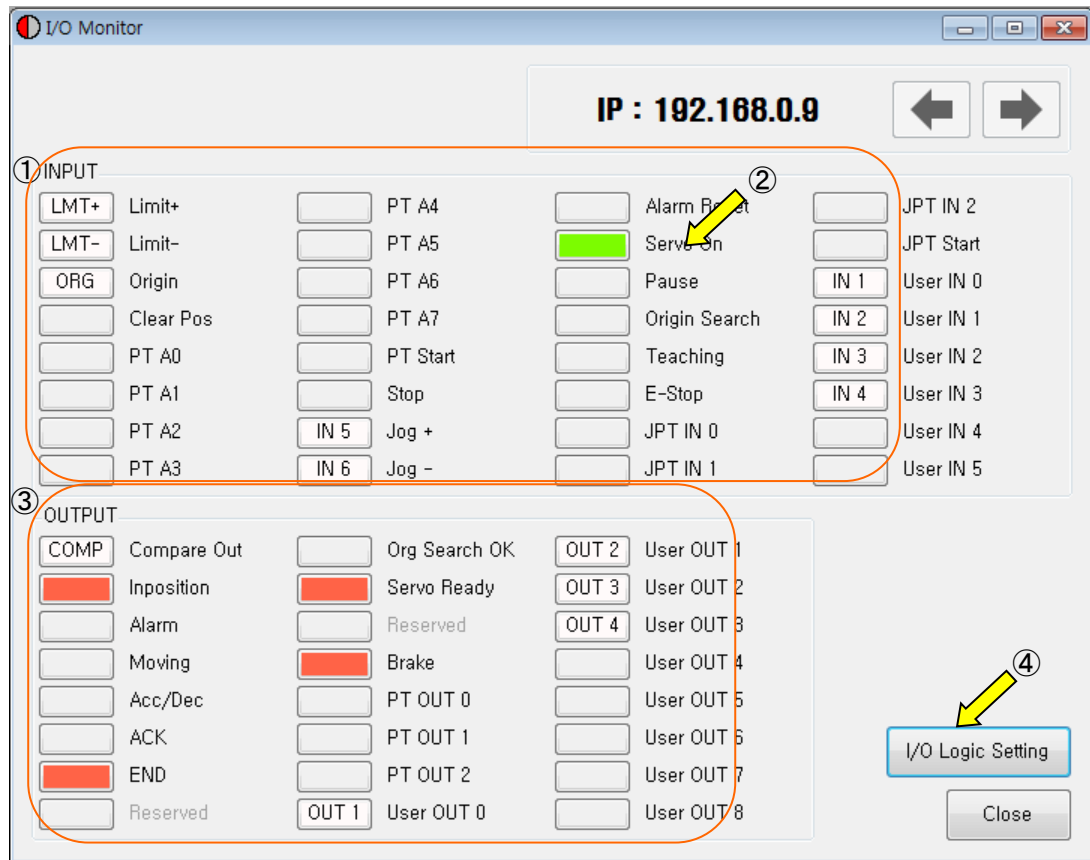
File extension for Input/output: *.fit

File extension for position table data: *.txt



4 . I/O Monitoring

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



1) Input Signal : ①

There are 32 definable input signals. However, just 12 signals of them can be connected with CN1 connector 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 9 signals to Input 9 pins at one time. '**IN1**' ~ '**IN9**' indicators are displayed to current setting signals.

When each signal for set as '**IN1**' ~ '**IN9**' is [ON] through CN1 connector, icon is changed into '**green**'. When the signal is [OFF], it returns to 'white' to the original state.

2) Virtual Input Function : ②

Even though the input pin is not assigned to '**IN1**' ~ '**IN9**' 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. But only 'PT Start' signal is exceptional.

3) Output Signal : ③

There are 24 definable output signals. However, just 10 signals of them can be connected with CN1 connector 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 9 signals to Output 9 pins at one time. '**OUT1**'~'**OUT9**' indicators are displayed to current setting signals.

When each signal is [ON] through CN1 connector, icon is changed into '**green**'. When the signal is [OFF], it returns to 'white' to the original state.

4) Virtual Output Function :

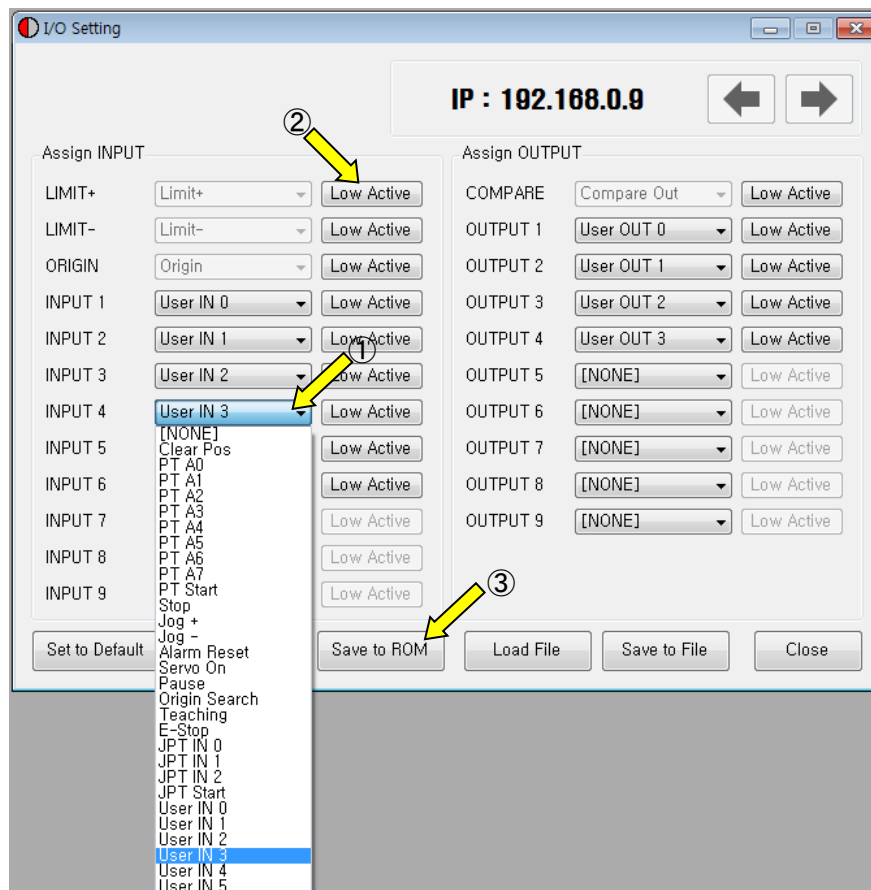
After assigning the 'User OUT 0' ~ 'User OUT 8' signals to OUT1' ~ 'OUT9', when click that button the signal changed [ON]/[OFF] through that pin.

5) I/O Logic Setting Button : ④

Assign the signal that the user wants to physical pin of CN1 connector, and display which defines 'Active Level' of that signal is executed.


4 - 1 . I/O Logic Setting

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



The assignment method of input and output is same and using as following.

1) Signal Assignment : ①

To change pin assignment of CN1 connector, 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 user can select the active level of signal for the signal to be recognized to [ON]. User 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 CN1 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.

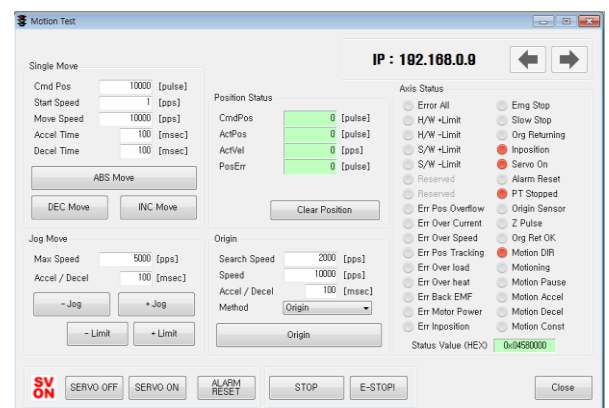
For more information of 'I/O Monitoring' and 'I/O Logic Setting' windows, refer to [「User Manual-Text 6. Control I/O Signal」](#).

5 . Motion Test

To test the motor connected with the controller drive. The user can test motion for one axis. User can test that the motor moves to the given position, and also 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.

5 - 1 . Initial Movement

- 1) Click 「Motion Test」 at the main menu.
- 2) The window as shown to the right is displayed.
- 3) Select drive for test.
- 4) Click  and the motor will be Servo ON and the icon will be changed into  .
At this time, the motor starts to be electrified and the motor becomes 'lock' status.

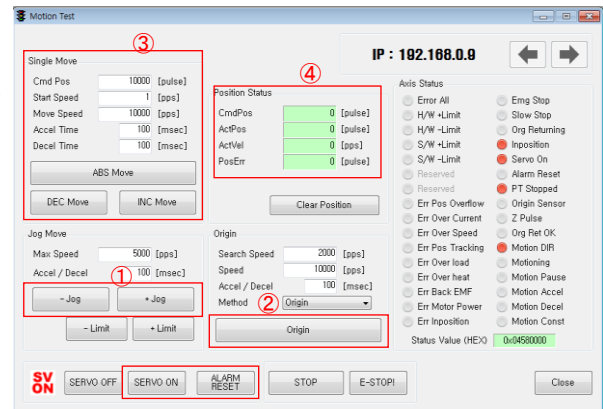


5) Jog operation(①)

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


- 6) According to the motion of motor, the user can check its position and operation status.

Refer to 「[User Manual-Text 8. Other Operation Functions](#)」.



7) Origin Return operation(②)

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

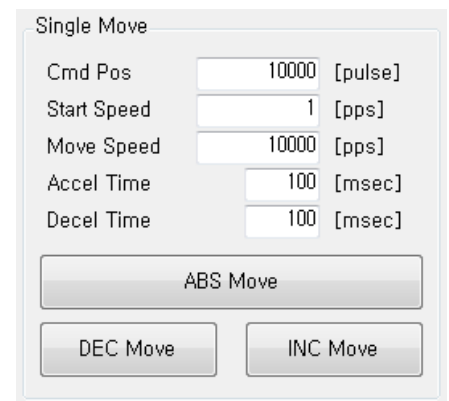
- 8) When origin return is finished, the red LED is displayed to ON like  Origin Search OK at the 'Axis Status' window. Refer to 「[User Manual-Text 8. Other Operation Functions](#)」.

9) Single Move operation(③)

The user can test straight-line move command for one axis. 'Abs Move' button moves to the absolute position, and 'DEC Move' and 'INC Move' 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 : It is linked with parameter 2 Axis Start Speed.
If it is changed, the parameter value is also changed.
'Start Speed' should be smaller than 'Move Speed'.

- * Move Speed : It is for setting the movement speed when executing Abs Move, DEC Move, INC Move. 'Move Speed' should be larger than 'Start Speed'.

- * Accel Time, Decel Time : Parameter 3 and 4 Axis Accel and Axis Decel Time are linked with each other, If it is changed, the parameter value changes as well.

10) Position Status(④)

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

- * Cmd Pos : It is the target position value during operation.
- * Actual Pos : It is the current position value during operation.
- * Actual Vel : The actual running speed of the current motor.
- * Pos Error : The difference between the Cmd Pos value and the Actual Pos value.

Position Status		
CmdPos	-18615	[pulse]
ActPos	-18587	[pulse]
ActVel	-5000	[pps]
PosErr	-28	[pulse]

Clear Position

This value allows you to see how much you are following the current target position.

11) 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.

<input type="radio"/> Error All	<input type="radio"/> Emg Stop
<input type="radio"/> H/W +Limit	<input type="radio"/> Slow Stop
<input type="radio"/> H/W -Limit	<input type="radio"/> Org Returning
<input type="radio"/> S/W +Limit	<input checked="" type="radio"/> Inposition
<input type="radio"/> S/W -Limit	<input checked="" type="radio"/> Servo On

- ② When an alarm occurs during operation, the corresponding LED is in red.

For more information of alarm types, refer to [「User Manual-Text 6.4 Output signal」](#).

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

SERVO ON ALARM RESET

12) Stop operation

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.

INPUT			
<input type="checkbox"/> LMT+	Limit+	<input type="checkbox"/> PT A4	<input type="checkbox"/> Alarm Reset
<input type="checkbox"/> LMT-	Limit-	<input type="checkbox"/> PT A5	<input type="checkbox"/> Servo On
<input type="checkbox"/> ORG	Origin	<input type="checkbox"/> PT A6	<input type="checkbox"/> Pause
<input type="checkbox"/> Clear Pos		<input type="checkbox"/> PT A7	<input type="checkbox"/> Origin Search
<input type="checkbox"/> PT A0		<input type="checkbox"/> PT Start	<input type="checkbox"/> Teaching
<input type="checkbox"/> PT A1		<input type="checkbox"/> Stop	<input type="checkbox"/> E-Stop
<input type="checkbox"/> PT A2	<input type="checkbox"/> IN 5	<input type="checkbox"/> Jog +	<input type="checkbox"/> JPT IN 0
<input type="checkbox"/> PT A3	<input type="checkbox"/> IN 6	<input type="checkbox"/> Jog -	<input type="checkbox"/> JPT IN 1

- 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.

STOP E-STOP!

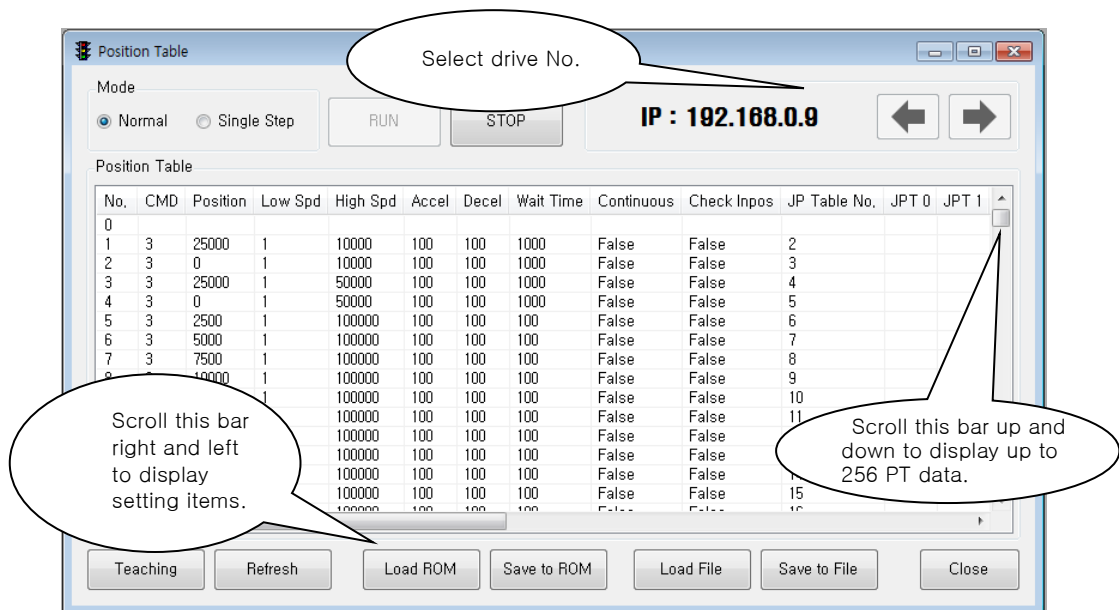
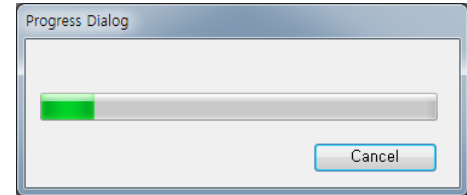
6 . Position Table (PT)

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.

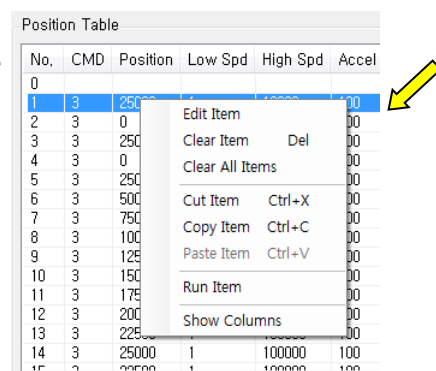
The position table can save up to 256 step data. If the position table is used to the program area, it can be used for all point numbers without restriction. In other words, it is possible to start at a random point number and jump to other point number.

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.

PT Item Editor

Command: ABS - Normal Motion

Motion: Jump PT Output

Position: 0 [pulse]

Low Speed: 1 [pps]

High Speed: 10000 [pps]

Accel Time: 100 [msec]

Decel Time: 100 [msec]

☐ Continuous

☐ Check Inposition

Waiting time after command: 1000 [msec]

Write Cancel

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'.

Position Table

Mode: ☒ Normal ☐ Single Step

RUN STOP

IP : 192.168.0.9

No.	CMD	Position	Low Spd	High Spd	Accel	Decel	Wait Time	Continuous	Check Inpos	JP Table No.	JPT 0	JPT 1
0												
1	3	25000	1	10000	100	100	1000	False	False	2		
2	3	0	1	10000	100	100	1000	False	False	3		
3	3	25000	1	50000	100	100	1000	False	False	4		
4	3	0	1	50000	100	100	1000	False	False	5		
5	3	2500	1	100000	100	100	100	False	False	6		
6	3	5000	1	100000	100	100	100	False	False	7		
7	3	7500	1	100000	100	100	100	False	False	8		
8	3	10000	1	100000	100	100	100	False	False	9		
9	3	12500	1	100000	100	100	100	False	False	10		

Teaching Refresh Load ROM Save to ROM Load File Save to File Close

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



Fast, Accurate, Smooth Motion

FASTECH Co., Ltd.

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