MECQ1 series

User Manual
User Program (GUI) Function

（ **Rev.01** ）

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Table of Contents

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This manual describes how to operate User Program (GUI) for MECQ1.

For more information, refer to related manuals as following

1 . Installation and connection of the Program

MECQ1 consists of two operation modes as follows.

1) Using of Motion Library (DLL) which is provided for the program from Windows /XP/ VISTA/Windows7/ Windows8

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 used for installation and running test of the controller. MECQ1 is associated with RS-485. So, the user needs to convert RS-232C or USB for the PC into RS-485

1 - 1 . Installable PC environment

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 :

Windows2000/XP/VISTA/Windows7(32/64Bit)/Windows8.1(32/64Bit) allows normal installation into PC
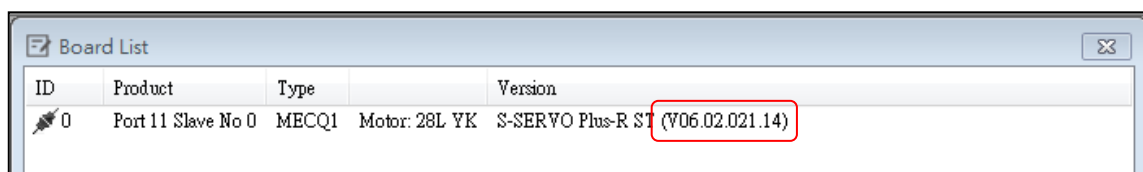
1 - 2 . User program (GUI) Version

Type of program can be classified by two version as following.

(1) Firmware program in drive:

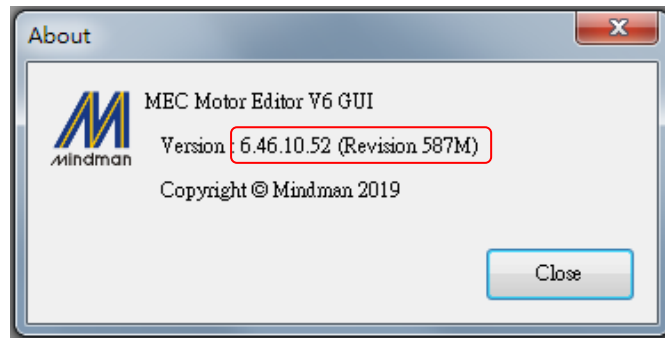After connect the User Program(GUI),

Version number can be checked in 'Board List'

Window.

ID	Product	Type		Version
0	Port 11 Slave No 0	MECQ1	Motor: 28L YK	S-SERVO Plus-R ST (V06.02.021.14)

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(2) User Program(GUI) in PC :

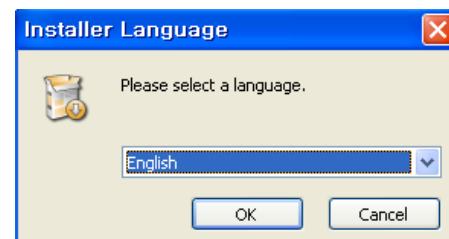After connect the User Program (GUI), version number can be checked in 'About MEC Motor Editor V6 GUI...'menu in 'Help' menu

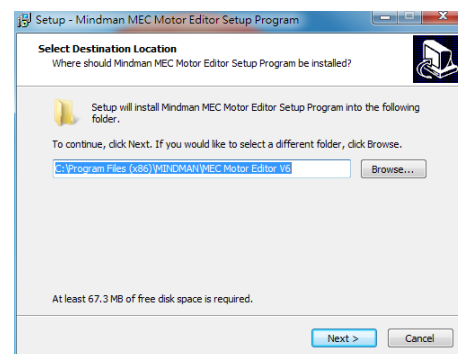## 1－3．User Program (GUI) installation Method

After download the [MECQ1_GUI] installation program from the MINDMAN on Webpage, and execute as following description.

Select a language of installation screen.

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

Click 'Install' button.
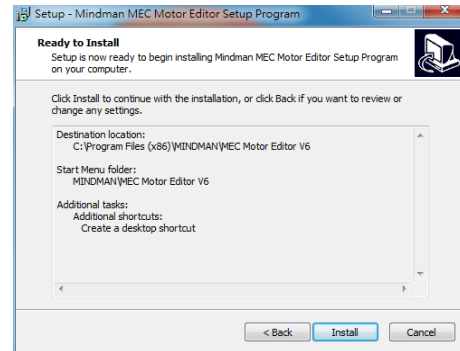
Installation is completed.
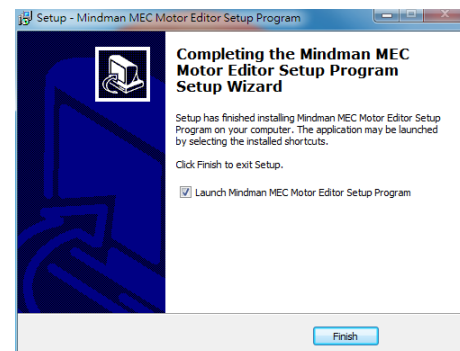
Then installation is completed at the selected folder,
'Program Files (X86)/MINDMAN/MEC Motor Editor V6
folder is created and also GUI icon and program
folders are installed.
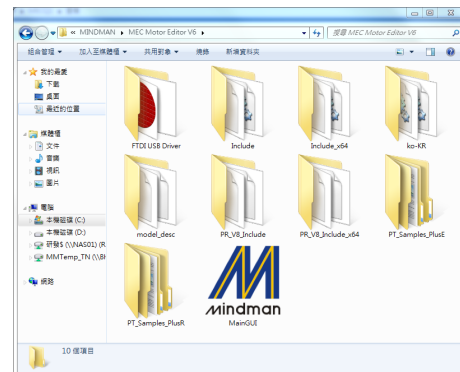
1) Include folder : *dll, *.lib, *.h   files

2) Example folder : source code for sample

3) PT_Samples folder : sample data files for position table.

4) FTDI USB Driver folder : driver program for USB converter

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

Double Click the 'CDM21218_Setup' in the 'FTDI USB Driver' folder.
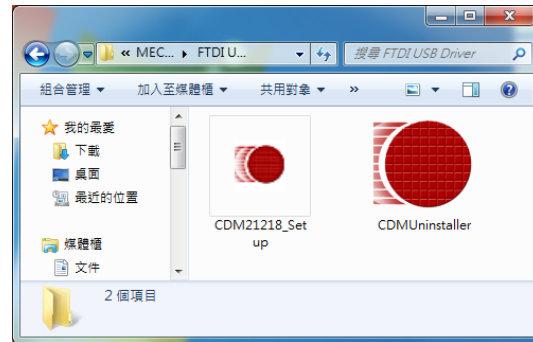
Click 'Extract' to start install.
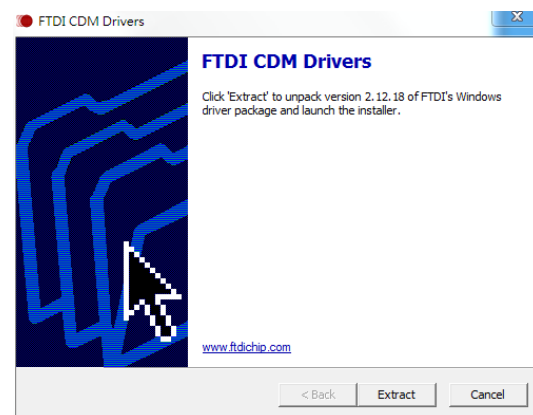
Accept the conditions and click 'Next'.

Installation is completed

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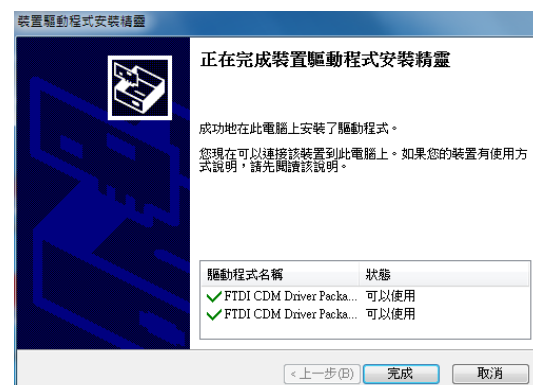
After installation completed, convertor can be checked in Device Manager window.
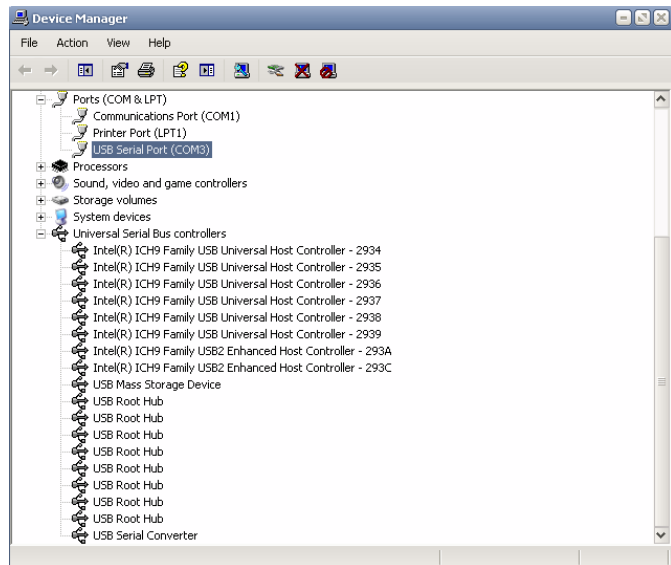
1－5．Connecting PC with Drive module

(1) To communicate with controller module, the user should prepare communication converter and cable and connect them with the PC. For more information, refer to 「User Manual-Text」.

After executing the MECQ1 which is User Program(GUI), click 'Connect' button, and then following window will be displayed.
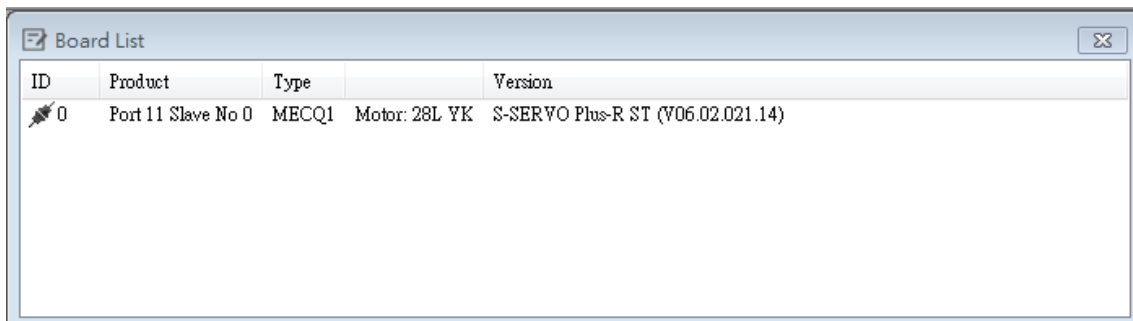
Item	Description
Port No.	To assign the port number of RS-232 or USB which is connected with drive module at the PC
Baudrate	To measure the communication speed that connects the drive to RS-485 communication. This should correspond to the switch(SW2) which sets the controller communication speed. (Drive : adjusted to 115200[bps] as default value).

After setting, click 'Connect' button, and the controller module will try to connect 16 drives from 0 to 15 (firmware of same level version) at the setting speed through appropriate communication port.

⚠ Caution	1. **The communication speed of drive modules connected with one segment must be set to the same value.** 2. **When they are not connected, the user needs to check the port or the baudrate.**

(2) After finished the connection.   It can be checked
below items from the following window.
1) Communication Speed
2) All sort of motors & drives which are connected
3) Firmware program Version

Board List
ID	Product	Type		Version
0	Port 11 Slave No 0	MECQ1	Motor: 28L YK	S-SERVO Plus-R ST (V06.02.021.14)

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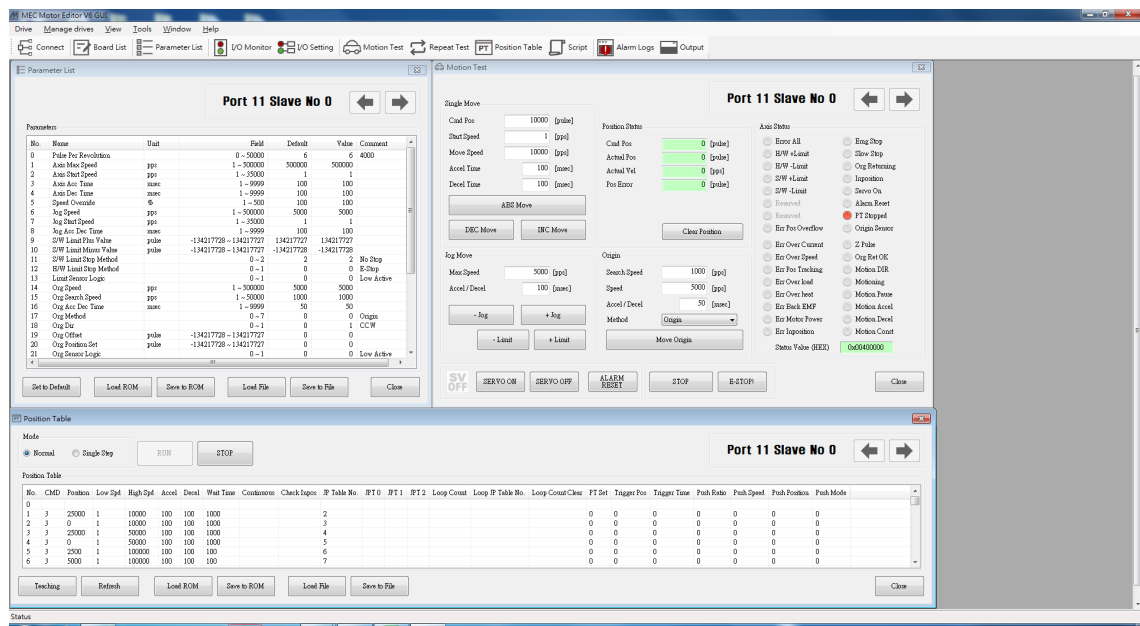
　This is the basic window to operate the program. Each window is displayed in this window. The user can open each window with a toolbar

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.

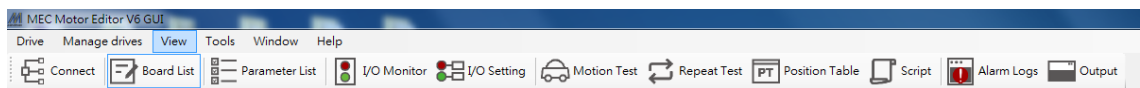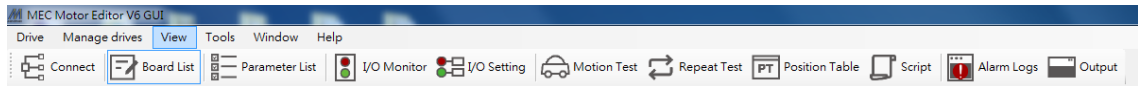| Button	Description
Connect	To connect or disconnect with the drive
Board List	To display connected module information and communication status
Parameter list	To set parameter values related to operation control like a position command
I/O Monitor	To monitor digital I/O signals of CN1 connector
I/O 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
Repeat Test	To test fixed motioning for 1 axis repeatedly
Pos Table	To input and execute position table data
Output	To display DLL function corresponding to the command being executed
Alarm Log	To display and reset the alarm log history

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 he clicks.
For more information of commands, 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.

There are buttons to go to windows for function

setting or testing.

☑ Board List				☒
ID	Product	Type		Version
⚡ 0	Port 11 Slave No 0	MECQ1	Motor: 28L YK	S-SERVO Plus-R ST (V06.02.021.14)
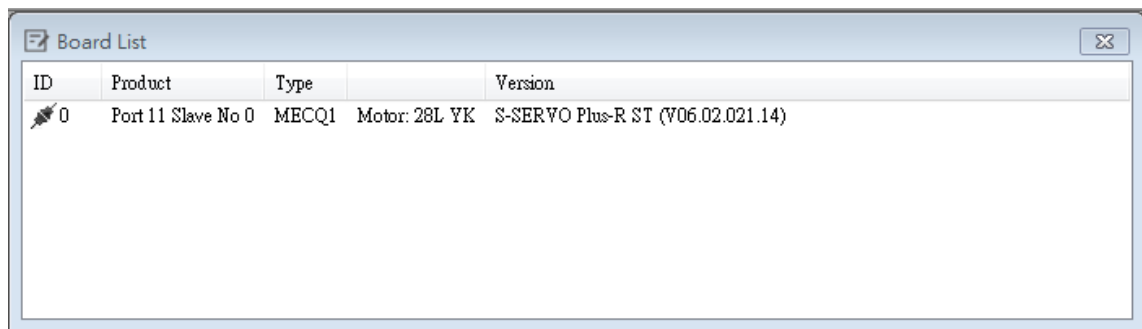
Information :

1) Slave ID number and type of drive.

2) Motor type.

3) Firmware version number of drive.

2－5 . Parameter Area

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

2－5－1 . I/O Area

Button	Function
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.

2－5－2 . 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

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2 - 6 . 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 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.

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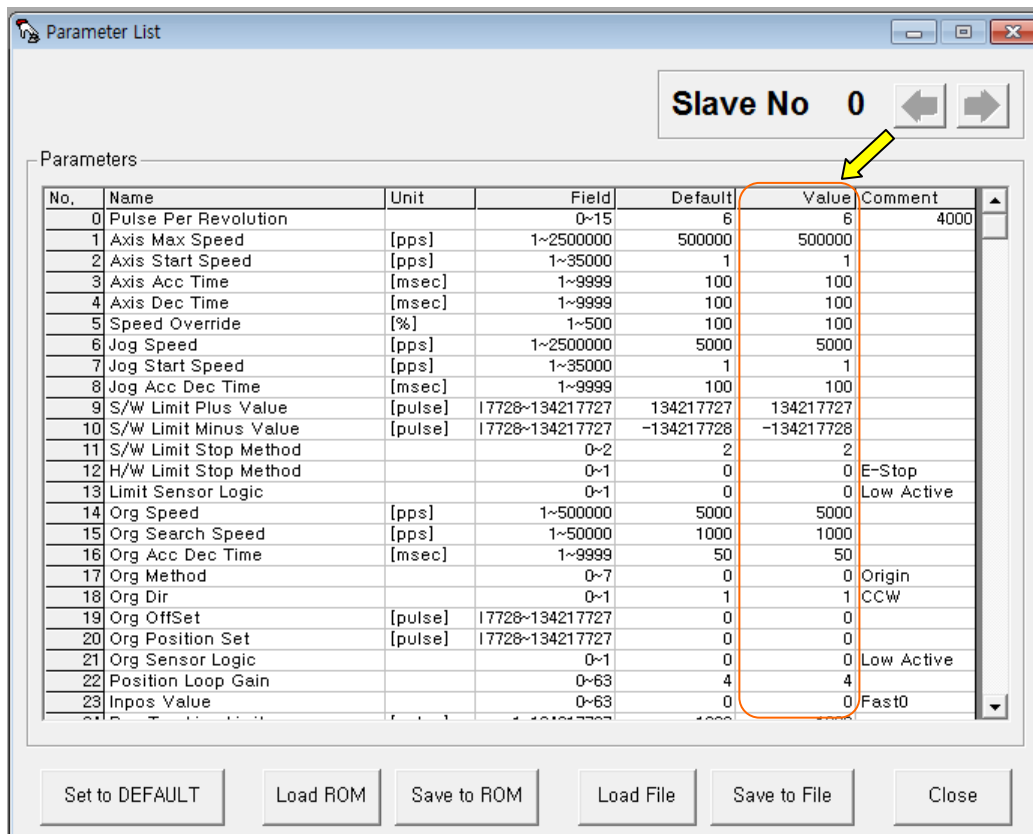
The user can set and save parameter values related to motion control by each drive module. 'Value' column displays the value applied to current motion control and can be edited

3－1．Slave No
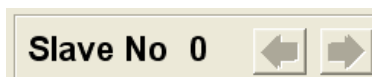
To display drive number for the current parameter list window. By using right/left arrow key, the user can select other drive.

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

No,	Name	Unit	Field	Default	Value
0	Pulse Per Revolution		0~9	9	9
1	Axis Max Speed	[pps]	1~500000	500000	500000
2	Axis Start Speed	[pps]	1~500000	1	1
3	Axis Acc Time	[msec]	1~9999	100	250
4	Axis Dec Time	[msec]	1~9999	100	100
5	Speed Override	[%]	1~500	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 buttons, 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	Sets '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. Parameters」.

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3 - 4 . Save/Read to a file

MECQ1 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.
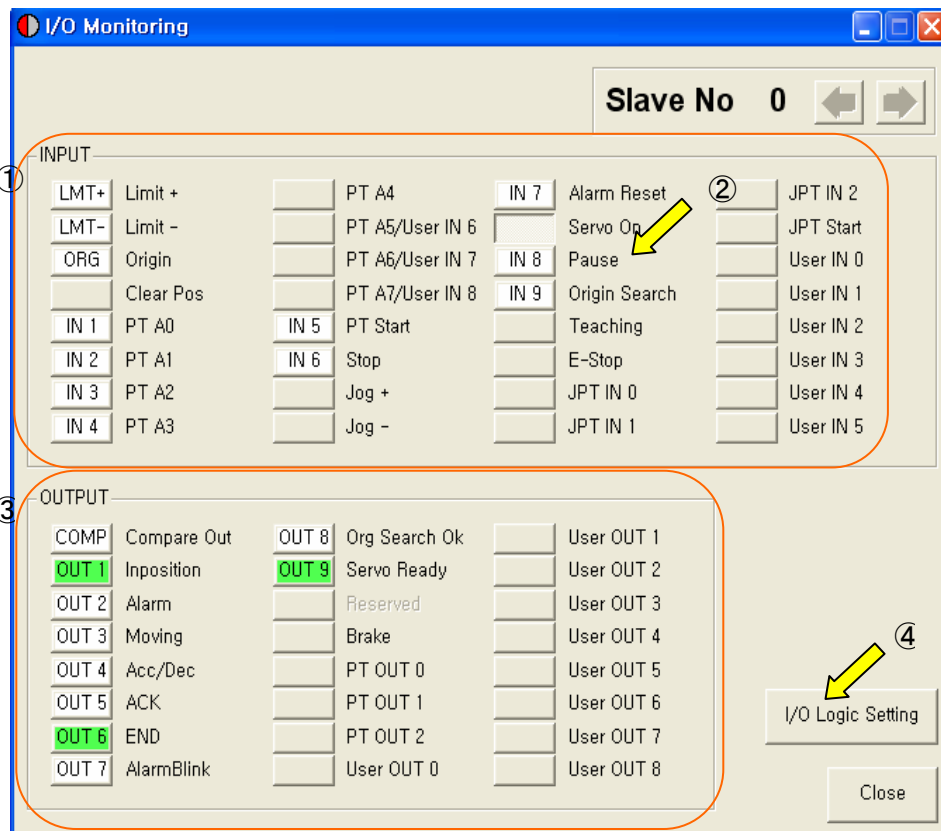
File extension for parameter: *.fpt
File extension for Input/output: *.fit
File extension for position table data: *.txt
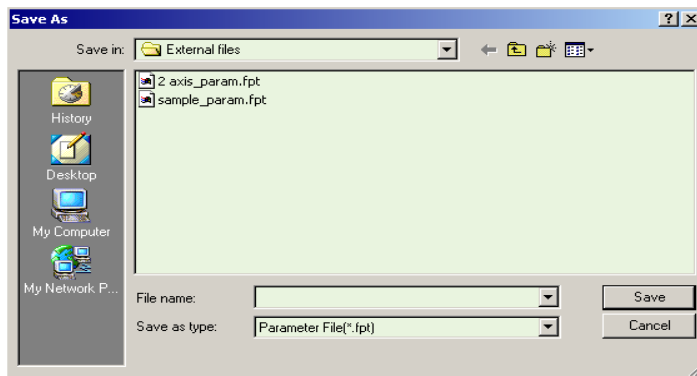
4 . I/O Monitoring

The user can set and check control I/O signals related to operation control through CN1 connecter. 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 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 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 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 8'signals to OUT1' ~ 'OUT9', when click that button the signal changed [ON]/[OFF] through that pin.

5) I/O Logic Setting Button : ④

Click this icon, and the following window will be displayed. Then he can assign a pertinent signal to the physical pin of CN1 connecter and define 'Active Level' of the signal..

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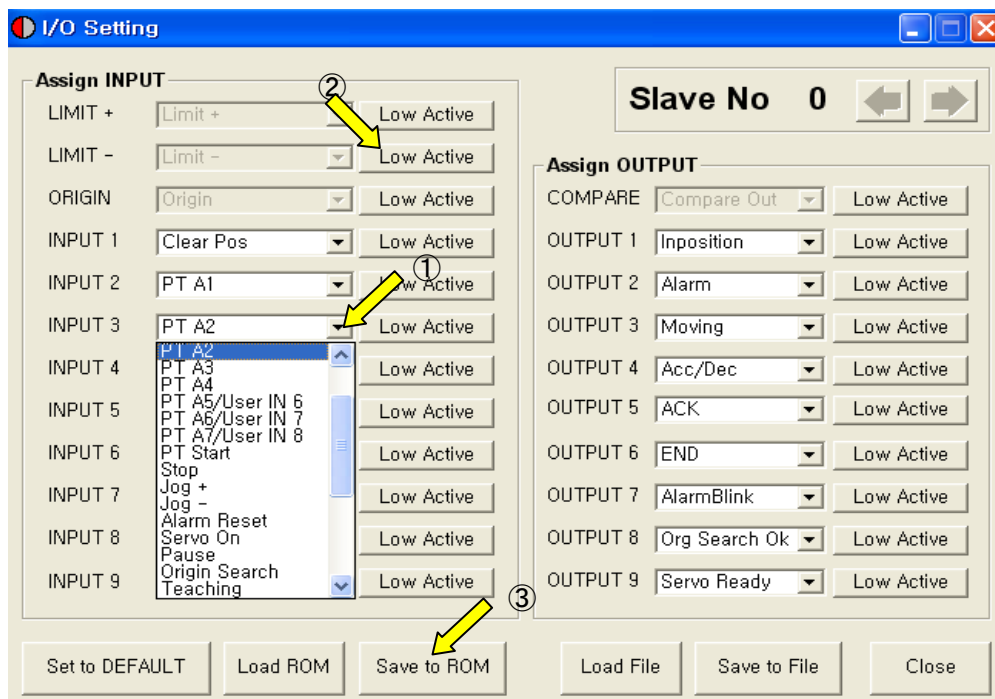
The assignment method of input and output is same and using as following

1) Signal Assignment: ①
   To change pin assignment of CN1 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 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, 7. Control Input and Output Signal」

5 . 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 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 . Test operation

1) Click 'Motion Test' at the main 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 into. SV ON   At this time, the motor starts to be electrified and the motor becomes 'lock' status.
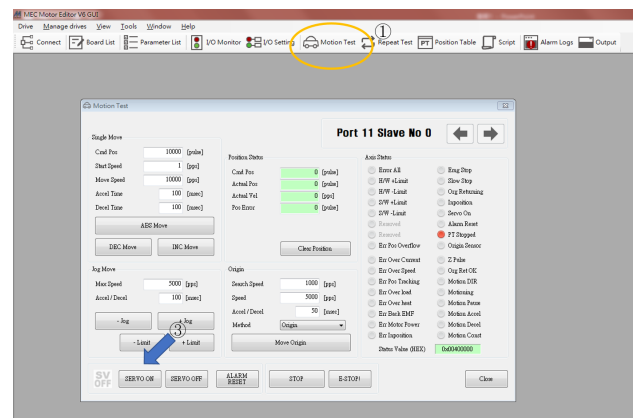
4) **Jog operation**.

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, 8. Other Operation Functions」.

6) **Origin Return operation** .

Click 'Move 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 🔴 Origin Search OK

at the 'Axis Status' window.   For more information, refer to 「User Manual-Text, 8. Other

Operation Functions」.
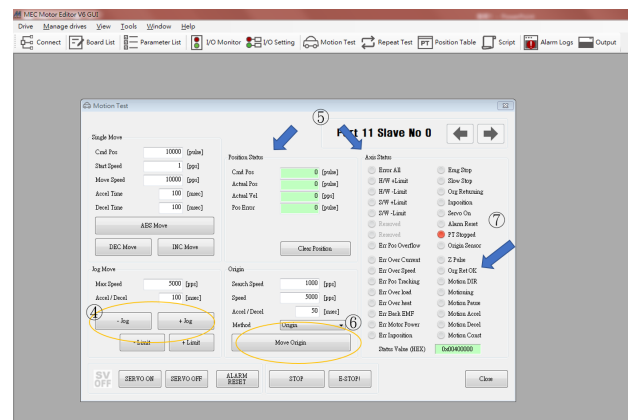
5－2．Single Move operation

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

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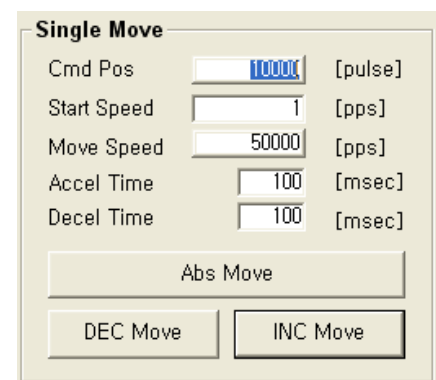
5‐3. Position Status

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 (zero)'.

Position Status

Cmd Pos	387652	[pulse]
Actual Pos	387508	[pulse]
Actual Vel	49986	[pps]
Pos Error	146	[pulse]

Clear Position

* 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.

5‐4. 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.

②

Axis Status

● Error All	Start ①
● Err Servo Alarm	Slow Stop
● INP Timeout	Zero Returning
● H/W +Limit	● Inposition
● H/W –Limit	● Servo On
● S/W +Limit	Alarm Reset ③

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, 6.4 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

SV ON   **SERVO OFF**   **ALARM RESET**

5‐5. STOP Operating

5‐5‐1. Temporary Stop

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

LMT+	Limit +		PT A4	IN 7	Alarm Reset		JPT IN 2
LMT–	Limit –		PT A5/User IN 6		Servo On		JPT Start
ORG	Origin		PT A6/User IN 7	IN 8	Pause		User IN 0
IN 1	Clear Pos		PT A7/User IN 8	IN 9	Origin Search		User IN 1
	PT A0	IN 5	PT Start		Teaching		User IN 2
IN 2	PT A1	IN 6	Stop		E-Stop		User IN 3
IN 3	PT A2		Jog +		JPT IN 0		User IN 4
IN 4	PT A3		Jog –		JPT IN 1		User IN 5

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5－5－2 . Motion Stop

When the motor needs to stop during operation,
the button as shown to the right is available.
'STOP' button includes deceleration function and
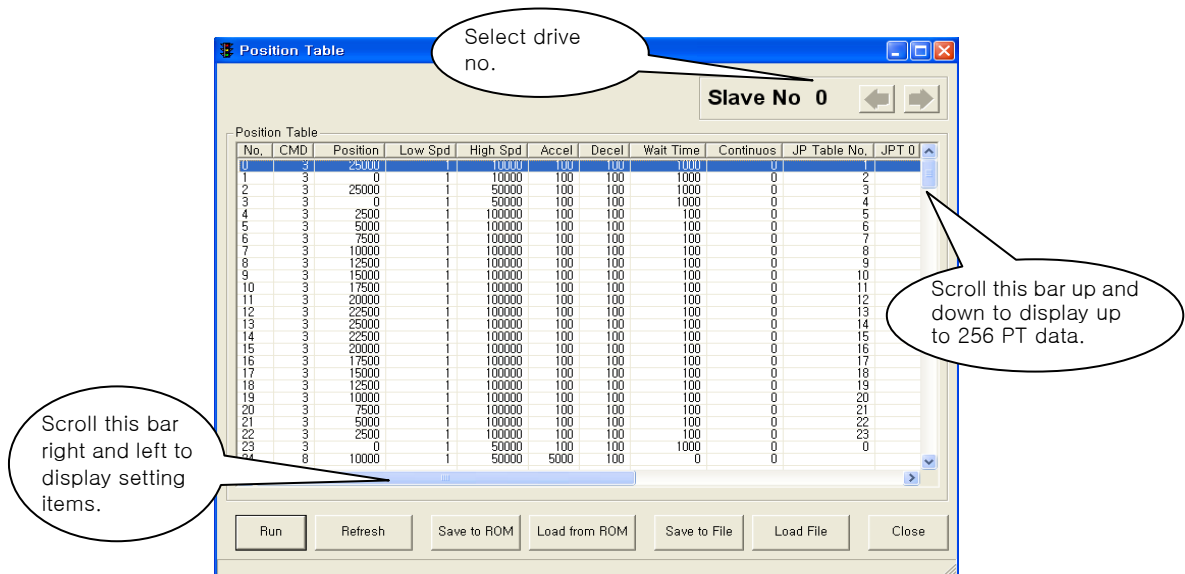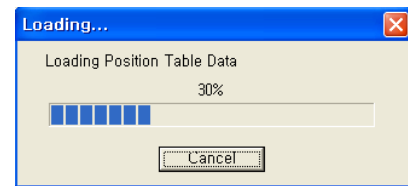'E-STOP' button does not include deceleration function.

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
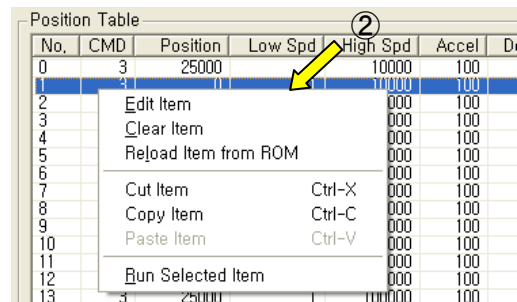the following window will be displayed..

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.
* To edit the next position table, the user should use
  PT select button
* Refer to 「User Manual_Position Table Function」
for more detail information
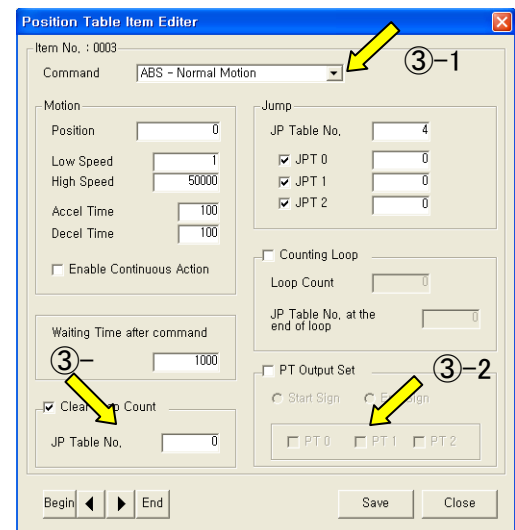
   This data is saved to the RAM area. So, when power is off, data is deleted.   Click 'Save to ROM' button, and save the data to the ROM area.

4) Set the motor to 'Servo ON' and select the mode 'Normal', click PT No to start motion,
and then execute 'Run'.
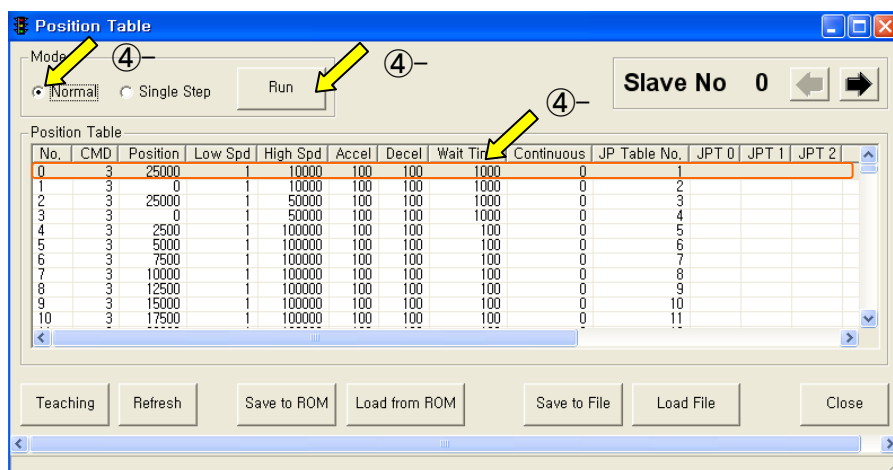
While PT No is operated in sequence, PT lines in service are changed in grey. Also, the user
may monitor the operation status as described at '7.3 Position Status' and '7.4 Axis
Status' through 'Motion Test' window,

7 . Alarm Log Function

If an alarm occurs, its log informations are saved
in nonvolatile 'ROM' area in the drive.
It can be checked later.

1) The maximum number of alarm logs are 30.
2) The inquiry of alarm log is possible only on
Servo OFF status.
3) To remove the alarm log, use the 'Reset Alarm
Logs' menu.