



# **MM3D software User Manual**

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# MM3D 3.90

## General Introductions

## Index

<b>1. Menu Bar .....</b>	<b>8</b>
<b>1.1 File Menu .....</b>	<b>9</b>
1.1.1 New.....	10
1.1.2 Open .....	10
1.1.3 Close .....	11
1.1.4 Save .....	11
1.1.5 Save As.....	12
1.1.6 Load EZM File .....	12
1.1.7 Option.....	13
1.1.8 Import .....	69
1.1.9 Export DXF .....	71
1.1.10 Select TWAIN Device.....	71
1.1.11 TWAIN Acquire .....	71
1.1.12 Configuration Import/Export .....	72
1.1.13 Change Language .....	74
1.1.14 Print .....	74
1.1.15 Preview .....	76
1.1.16 Printer setting.....	76
1.1.17 MRU File.....	77
1.1.18 Exit .....	77
<b>1.2 Edit Menu .....</b>	<b>78</b>
1.2.1 Redo.....	80
1.2.2 Undo .....	80
1.2.3 Cut .....	80
1.2.4 Copy .....	80
1.2.5 Paste.....	81
1.2.6 Delete.....	81
1.2.7 Select All .....	81
1.2.8 Select Invert.....	81
1.2.9 Replace .....	81
1.2.10 Combine .....	82
1.2.11 Break.....	82
1.2.12 Group.....	82
1.2.13 UnGroup.....	83
1.2.14 Move to New Layer.....	83
1.2.15 Sort .....	83

## MM3D 3.90

1.2.16 Reverse .....	85
1.2.17 Mirror Horizontal .....	87
1.2.18 Mirror Vertical.....	88
1.2.19 Move to Center .....	88
1.2.20 Baseline .....	89
1.2.21 Split.....	89
1.2.22 Trans-Curve .....	90
1.2.23Nudge .....	91
1.2.24 Jump Cross .....	91
1.2.25 Welding .....	92
1.2.26 Contour.....	93
1.2.27 Transfer to Image .....	94
1.2.28 Align .....	94
1.2.29 Distribute .....	95
1.2.30 Mold Out Line .....	95
<b>1.3 Draw Menu .....</b>	<b>96</b>
1.3.1 Vertex .....	97
1.3.2 Line.....	97
1.3.3 Arc .....	98
1.3.4 Circle .....	99
1.3.5 Rectangle .....	99
1.3.6 Curve .....	100
1.3.7 Curve Brush.....	100
1.3.8 Spiral.....	100
1.3.9 Text.....	101
1.3.10 Arc Text.....	101
1.3.11 Rectangle Text.....	103
1.3.12 1D Barcode .....	103
1.3.13 2D Barcode .....	104
1.3.14 Control Object .....	104
<b>1.4 Image Menu .....</b>	<b>105</b>
1.4.1 Effects.....	106
1.4.2 Special Filters .....	116
<b>1.5 Color Menu .....</b>	<b>122</b>
1.5.1 Gray Scale .....	123
1.5.2 Color Resolution.....	123
1.5.3 Brightness .....	125
1.5.4 Contrast.....	126

## MM3D 3.90

1.5.5 Hue .....	127
1.5.6 Saturation.....	128
1.5.7 Gamma .....	129
1.5.8 Intensity .....	130
1.5.9 Histogram .....	131
1.5.10 Invert.....	133
1.5.11 Solarize.....	134
<b>1.6 Execute Menu .....</b>	<b>135</b>
1.6.1 Marking .....	136
1.6.2 Multi Document Process .....	140
1.6.3 Remote control .....	140
1.6.4 Estimate process time .....	141
1.6.5 Align Test.....	141
1.6.6 Preview .....	143
1.6.7 Mark Sample(s) .....	146
1.6.8 User Level .....	146
1.6.9Mark Parameter List.....	148
1.6.10 Auto Text Manager.....	150
1.6.11 Rotary Marking .....	151
1.6.12 Altimetry.....	151
<b>1.7 View Menu .....</b>	<b>152</b>
1.7.1 Standard Bar .....	154
1.7.2 Zoom Bar.....	155
1.7.3 Drawing Bar .....	156
1.7.4 Layer Bar .....	158
1.7.5 Object Browser.....	159
1.7.6 Modify Bar .....	160
1.7.7 Dimension Bar.....	161
1.7.8 Object Property Bar.....	162
1.7.9 Mold Bar.....	164
1.7.10 Mark Sample Bar.....	164
1.7.11 Data Wizard.....	165
1.7.12 Make Font Bar.....	166
1.7.13 Text Tool Bar .....	166
1.7.14 Vector Box.....	168
1.7.15 Property Table .....	169
1.7.16 Manual Split Bar.....	170
1.7.17 3D View Control Panel.....	171

## MM3D 3.90

1.7.18 3D panel.....	172
1.7.19 Import Mold.....	173
1.7.20 Slicer Bar .....	173
1.7.21 3D Mold Toolbar .....	175
1.7.22 Control Object Tool Bar .....	175
1.7.23 Mark Panel.....	176
1.7.24 Status Bar.....	188
1.7.25 Desktop Mode .....	188
1.7.26 Composing Setting .....	188
1.7.27 Zoom In .....	189
1.7.28 Zoom Out.....	189
1.7.29 Zoom Previous.....	189
1.7.30 Zoom All .....	189
1.7.31 Zoom Extend .....	189
1.7.32 Zoom Select Object .....	189
<b>1.8 Window Menu .....</b>	<b>190</b>
1.8.1 New.....	190
1.8.2 Cascade.....	190
1.8.3 Tile.....	191
1.8.4 Arrange .....	191
1.8.5 Close All.....	191
<b>1.9 Help Menu .....</b>	<b>192</b>
<b>2. Objects.....</b>	<b>194</b>
<b>2.1 Common Settings .....</b>	<b>194</b>
2.1.1 Property Table .....	194
2.1.2 Popup Menu.....	195
<b>2.2 Create Objects .....</b>	<b>198</b>
<b>3. Property Table.....</b>	<b>198</b>
<b>3.1 System-Related Property Table .....</b>	<b>200</b>
3.1.1 Work Area .....	200
3.1.2 Driver.....	201
3.1.3 Global .....	203
3.1.4 Power Test .....	212
<b>3.2 Mark Property Table .....</b>	<b>215</b>
3.2.1 Mark Parameter .....	215
3.2.2 Frame/Fill .....	232
3.2.3 Delay.....	234
3.2.4 Array Copy .....	238

## MM3D 3.90

3.2.5 Rotary .....	239
3.2.6 3D property page .....	240
<b>3.3 Object-related Property Table .....</b>	<b>252</b>
3.3.1 Curve .....	252
3.3.2 Arc .....	252
3.3.3 Circle .....	253
3.3.4 Rectangle .....	253
3.3.5 1D Barcode.....	254
3.3.6 1D Marking .....	255
3.3.7 2D Barcode.....	256
3.3.8 2D Marking .....	257
3.3.9 Image .....	260
3.3.10 Image Mark .....	260
3.3.11 Text.....	263
3.3.12 Arc Text.....	265
3.3.13 Rectangle Text.....	266
3.3.14 Baseline .....	267
3.3.15 Graphic .....	268
3.3.16 Spiral.....	269
3.3.17 Deep carving.....	270
<b>3.4 Control Object-related Property Table.....</b>	<b>274</b>
3.4.1 Digital In.....	274
3.4.2 Digital Out .....	274
3.4.3 Do Pause.....	275
3.4.4 Delay Time .....	275
3.4.5 Motion .....	275
3.4.6 Set Position.....	276
3.4.7 Loop.....	276
3.4.8 Ring .....	277
3.4.9 Homing .....	277
3.4.10 Comm Out .....	278
3.4.11 Comm In.....	278
<b>3.5 Layer-related Property Table .....</b>	<b>278</b>
3.5.1 Layer.....	279
3.5.2 Input.....	280
3.5.3 Output.....	280
3.5.4 Mark Parameter .....	281
3.5.5 Delay.....	281

## MM3D 3.90

3.5.6 XY(/Z) Table .....	282
3.5.7 Rotary .....	283
3.5.8 Mark On Fly .....	286
3.5.9 3D Param .....	289
<b>3.6 Manual-split Property Table.....</b>	<b>290</b>
3.6.1 Band.....	290
3.6.2 Template .....	291
<b>4. Popup Menu.....</b>	<b>292</b>
<b>4.1 General Object .....</b>	<b>292</b>
4.1.1 Reverse .....	295
4.1.2 Shortest Horizontal .....	295
4.1.3 Shortest Vertical .....	296
4.1.4 Shortest Distance .....	297
<b>4.2 Curve.....</b>	<b>298</b>
4.2.1 Add Vertex .....	299
4.2.2 Delete Vertex.....	299
4.2.3 Break Vertex.....	299
4.2.4 Edit Vertex.....	299
4.2.5 Curve to Line .....	300
4.2.6 Line to Curve .....	300
4.2.7 Arc to Curve .....	301
4.2.8 Cusp.....	301
4.2.9 Smooth.....	301
4.2.10 Symmetrical.....	301
<b>4.3 Show Mark Order of a General Object.....</b>	<b>302</b>
<b>4.4 Show Mark Order of a Curve .....</b>	<b>303</b>
<b>5. Hot Key.....</b>	<b>304</b>
<b>Appendix A: Config.ini .....</b>	<b>306</b>

## **MM3D 3.90**

### **1. Menu Bar**

“**Menu Bar**” is on the top of **MM3D** program window. It shows the main function of **MM3D**. Users can select the function they need through clicking the corresponding menu. “**Menu Bar**” includes the following 9 functions.

- **File Menu**
- **Edit Menu**
- **Draw Menu**
- **Image Menu**
- **Color Menu**
- **Execute Menu**
- **View Menu**
- **Window Menu**
- **Help Menu**



## MM3D 3.90

### 1.1 File Menu

“FileMenu” offers the following functions:


<b>New</b>	Create a new <b>MM3D</b> file.
<b>Open...</b>	Open an existing <b>MM3D</b> file (*.EZM3D).
<b>Close</b>	Close a file.
<b>Save</b>	Save the current document using its original file name(Cover the original file).
<b>Save As...</b>	Save the current document using an assigned file name
<b>Load EZM File</b>	The "Load EZM File" function of MM3D only supports opening EZM files saved by MarkingMate 2.7A.
<b>Option...</b>	Edit the program settings.
<b>Import</b>	Import an image file.
<b>Export DXF</b>	Export the file as a ‘*.DXF’ file for other applications to use.
<b>Select TWAIN Device...</b>	Select the supporting scanners.
<b>TWAIN Acquire...</b>	Scan an image.
<b>Configuration Import/Export</b>	Import or export the configuration files.
<b>Change Language...</b>	Change to different language version.
<b>Print...</b>	Print the file.
<b>Preview</b>	Preview the current document before printing.
<b>Printer setting...</b>	Select the printer and edit the printing settings.
<b>MRU File</b>	Display the last used file.
<b>Exit</b>	Exit <b>MM3D</b> .

## MM3D 3.90

### 1.1.1 New

Create a new document. Users can create several new files at the same time.


#### Method:

- Click “**File**” from “**Menu Bar**” and select “**New**”.
- Click  from the “**Standard Bar**”.
- Press [Ctrl+N] on the keyboard.

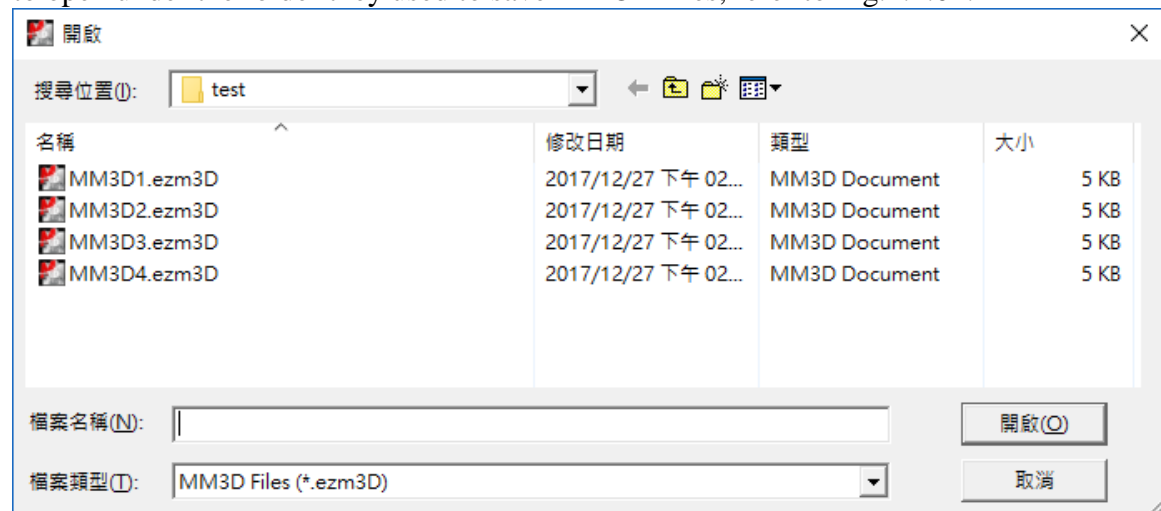
### 1.1.2 Open

Open an existing **MM3D** file. Users can open several files and switch to different document by using “**Window Menu**.”

#### Method:

- Click “**File**” from “**Menu Bar**” and select “**Open**”.
- Click  from the “**Standard Bar**”.
- Press [Ctrl+O] on the keyboard.

The default file format of **MM3D** is “\*.ezm3D”. Users can search the file they want to open under the folder they used to save **MM3D** files, refer to Fig.1.1.01.



## MM3D 3.90

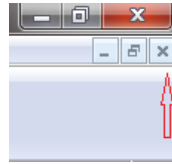
### 1.1.3 Close

When closing, the software will suggest users to save the editing file before closing it. Users will lose all the modifications they edit after the previous saving when closing the file without saving it.

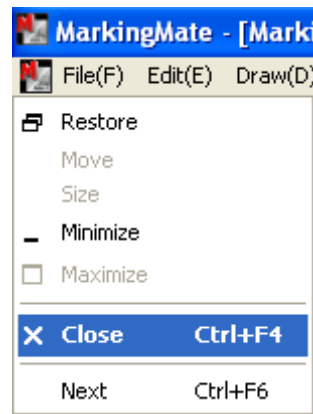
When closing an unnamed or new file, software will pop up a “**Save As**” dialog box for users to name and save that file.

#### Method:

- Click “**File**” from “**Menu Bar**” and select “**Close**”.
- Click the upper right button like Fig.1.1.02 to close the file.



- Click the upper left icon  like Fig.1.1.03 and select “**Close**” to close the file.




- Press [Ctrl + F4] on the keyboard.

### 1.1.4 Save

Save the current file with the original file name under the same folder. Software will pop up a “**Save As...**” dialog box when the file is new or unnamed or when users want to change the file’s name or folder.

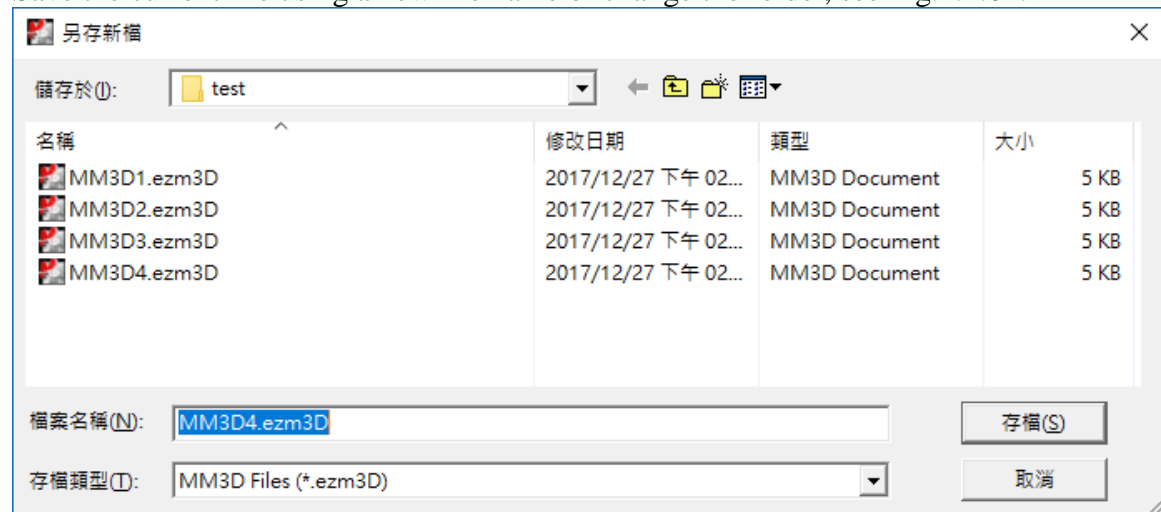
#### Method:

- Click “**File**” from “**Menu Bar**” and select “**Save**”.
- Click  from the “**Standard Bar**”.
- Press [Ctrl + S] on the keyboard.

## MM3D 3.90

### 1.1.5 Save As...

Save the current file using a new file name or change the folder, see Fig.1.1.04.



The following options are the functions users can select when using “Save As...”

**Save in:** Select the folder users want to save.

**File name:** Type or select a file name.

**Save as type:** The default file type of **MM3D** is “\*.ezm3D”

### 1.1.6 Load EZM File

The "Load EZM File" function of MM3D only supports opening EZM files saved by MarkingMate 2.7A.

## MM3D 3.90

### 1.1.7 Option

This function allows users to edit their own setting, such as ruler and grid.

#### 1.1.7.1 System

Under the “System” option, there are several settings related to software system, see Fig.1.1.05.

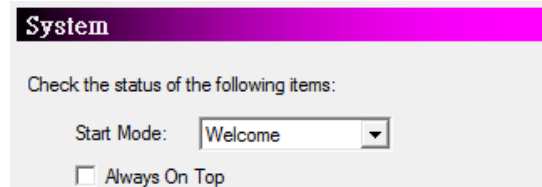


Fig. 1.1.05

#### Start Mode

Decide if show Welcome Dialog, open a new document, or open the latest file while MM3D is startup. Welcome dialog allows users to open file, open last edit file or create a new file, see Fig.1.1.06.

#### Always On Top

Make software on the top of all current using programs.

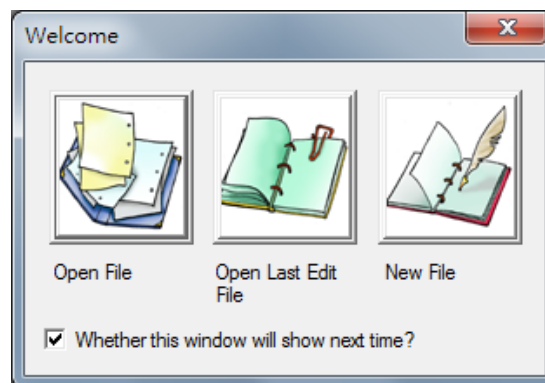


Fig. 1.1.06

## MM3D 3.90

### LogFile Setting

Enable/disable to use the log file, see Fig.1.1.07.

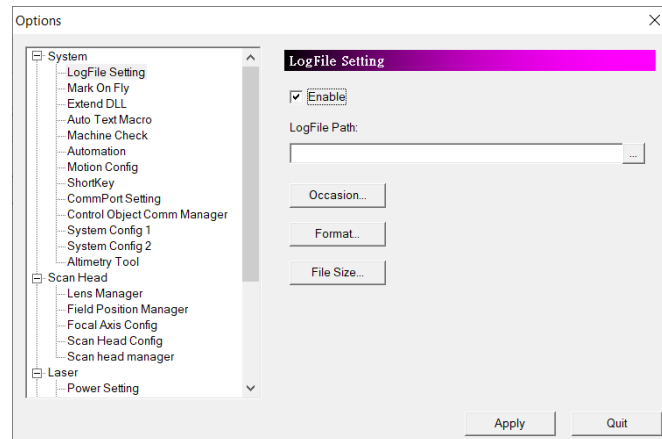



Fig. 1.1.07

### Log File Path

Select the path of log file by clicking the  button.

### Occasion

Click “**Occasion**” and a dialog box will appear as Fig.1.1.08.

Check the items users want to record.

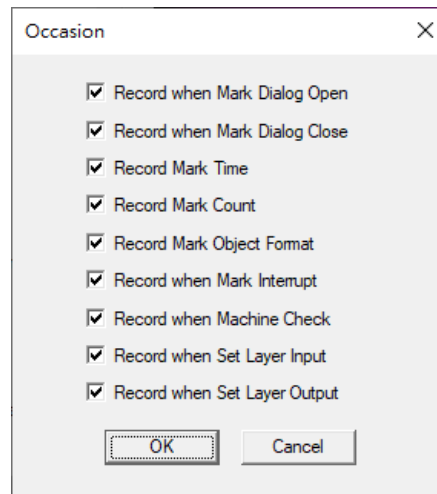


Fig. 1.1.08

### Record when Mark Dialog Open

Record the message when mark dialog opened.

### Record when Mark Dialog Close

Record the message when mark dialog closed.

### Record Mark Time

Record the marking time.

### Record Mark Count

Record the marking times.

### Record when Mark Interrupt

Record the message while interrupt happened.

### Record when Machine Check

Record the message of machine checking.

## MM3D 3.90

### Record when Set Layer Input

Record the message when Set Layer Input

### Record when Set Layer Onput

Record the message of when Layer Onput

### Format

Click “**Format**” and a dialog box will appear as Fig.1.1.09.

Format of each item in the log file can be edited here.

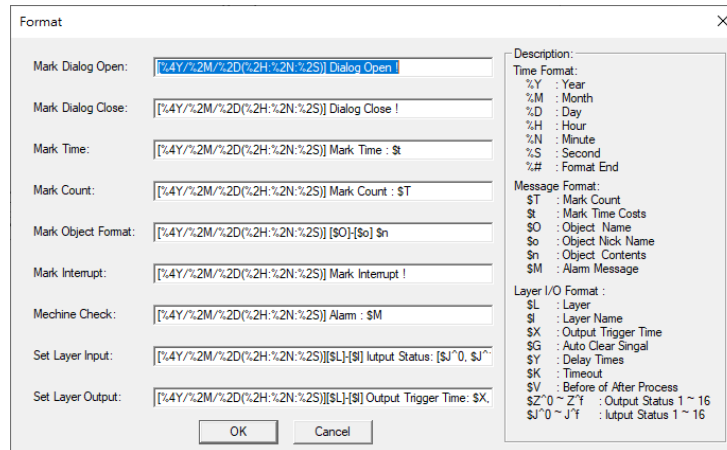


Fig. 1.1.09

### Mark Dialog Open

Log message format when mark dialog opened.

### Mark Dialog Close

Log message format when mark dialog closed.

### Mark Time

Log message format for marking time.

### Mark Count

Log message format for mark count.

### Mark Object Format

Log message format for mark object format.

### Mark Interrupt

Log message format when mark mark interrupt.

### Machine Check

Log message format when machine check.

### Record when Set Layer Input

Log message format when set layer input.

### Record when Set Layer Onput

Log message format when set layer output.

### Description:

All of the Time Format and Message Format are listed here.

### Example:

If a format of Mark Dialog Open is set as below:

```
[%4Y/%2M/%2D(%2H:%2N:%2S)] Dialog Open ! %#
```

Then the log file will be recorded as:

## MM3D 3.90

[2007/10/15(09:32:24)] Dialog Open !

Please note that Time Format can be used in every fields, however, the Message Format must be placed at the related fields. For example: the Message Format “\$T” (Mark Count) can only be used in “Mark Count” field, if it is placed in “Mark Dialog Open” field, an unexpected result may occur.

### File Size

This function is used for editing the log file’s size and division type. There are four kinds of file type settings, see the following examples.

#### Example 1: Select Maximum Size: 1000 KBytes (default).

If the file size is over 1000 Kbytes, the system will rename the original file, for example, TEST.TXT, to TEST-1.TXT and continue recording using a new file named TEST.TXT, see Fig.1.1.10.

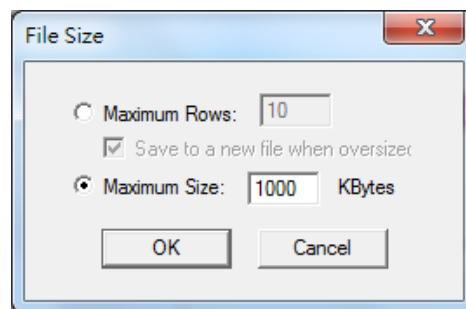


Fig. 1.1.10

#### Example 2: Select Maximum Rows: 10 and check “Save to a new file when oversized.”

If the file rows exceed 10, the system will rename the original file, for example, TEST.TXT, to TEST-1.TXT and continue recording using a new file named TEST.TXT, see Fig.1.1.11.

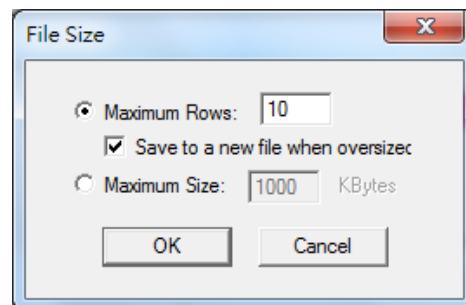


Fig. 1.1.11

#### Example 3: Select Maximum Rows: 10 without checking “Save to a new file when oversized.”

If the file rows exceed 10, the system will log the new message in the first row and delete row 11, see Fig.1.1.12.



## MM3D 3.90

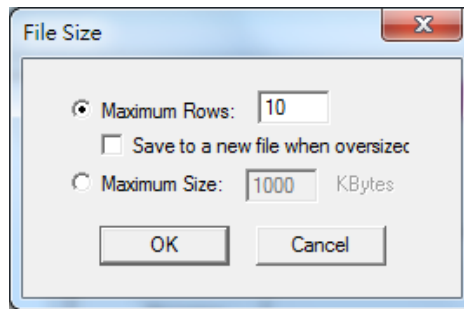


Fig. 1.1.12

**Example 4: Select Maximum Size: 0 Kbytes or Maximum Rows: 0**  
The system will not change the file during recording, see Fig.1.1.13.

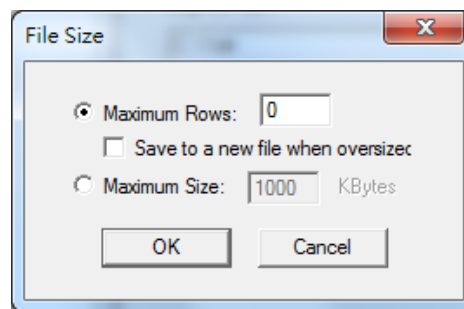


Fig. 1.1.13

## MM3D 3.90

### Mark On Fly

Without the “Mark On Fly” function, the marking result will be incorrect while the working pieces are moving. Enable this function the system will pursue the object’s position and revise it to make sure the marking result is correct, see Fig.1.1.14.

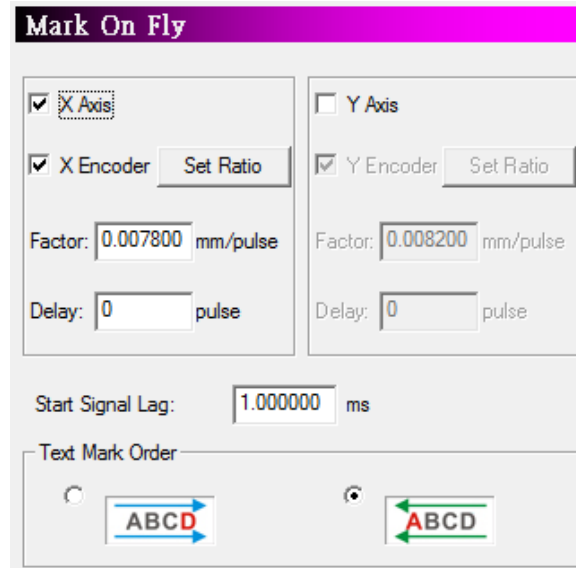


Fig. 1.1.14

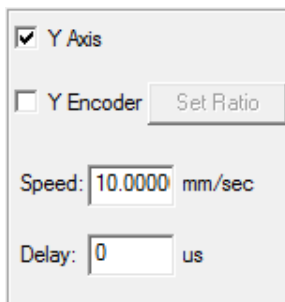


Fig. 1.1.15

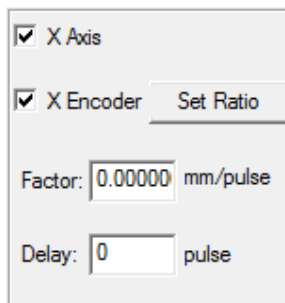


Fig. 1.1.16

#### X/Y Axis (checked)

Enable “Mark On Fly” on X/Y Axis.

#### X/Y Encoder (unchecked)

The system will use the setting value of “Speed” to pursue the object’s position, see Fig.1.1.15.

#### Speed

Theoretical speed of conveyer.

#### Delay

The time that laser needs to start marking after receive the start signal.

#### X/Y Encoder (checked)

The parameter will change from “Speed” and “Delay” to “Factor” and “Delay”, see Fig.1.1.16. The system will pursue the object’s position according to “Factor” which is the product of the encoder feedback pulse value and moving distance. When checking the encoder setting options, please make sure the encoder device is connected with the laser controller; otherwise an incorrect result will happen. As to the encoder connection method, please refer to encoder manual.

#### Factor

The moving distance of conveyer per pulse.

#### Delay

The pulses that laser needs to start marking after receive the start signal.

## MM3D 3.90

### Set Ratio

Counting the factor through the pulse from the encoder and the moving distance, see Fig.1.1.17.

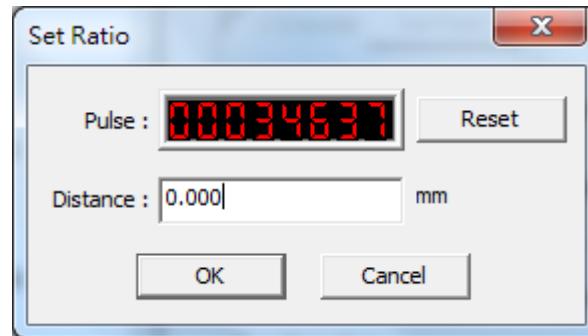


Fig. 1.1.17

### Reset

Reset the value of pulse.

### Delay application

In order to raise the accuracy of marking on the moving objects, the system will usually install a sensor instead of using an operator to measure whether the working pieces are located on the available place for marking. The sensor will trigger the start signal to mark when the working piece move through it. Since the sensor is unable to install right below the laser machine directly, users can apply the delay setting to make the laser machine wait for a period of time when it received the start signal, so the working pieces can move to the available marking position and then start marking. Besides, users can also apply “Automation Process” to “Mark on Fly.”

### Delay setting method

Users can calculate the delay time through the setting speed or factor and the distance the object move from triggering the start signal to the correct marking position.

For example, assume that the X Axis is checked, and the moving distance of object from triggering start signal to the marking position is 50mm. If X Encoder is unchecked and the setting speed is 100 mm/sec, then the delay value should set as  $(50/100)*10^6 = 5*10^5$  us. If X Encoder is checked and the setting factor is 10 mm/pulse, then the delay value should set as  $50/10=5$  pulse.

### Start Signal Lag

When using “Mark On Fly” function, users will find that the preview mark position and the real marking position are not the same, see Fig.1.1.18. This is because there will have a tiny delay time between the sensor inducts the work piece and the laser starts to mark. This delay time and the speed of conveyer will cause this status. As a result, users can fix this status by modifying “Start Signal Lag” and make the position of preview and real marking be the same, see Fig.1.1.19.

This value can be positive or negative according to the actual result. Users must satisfy the following conditions to set “Start Signal Lag.”

- I. Do not check X/Y encoder.
- II. Set an optimize speed for X/Y axis, and set “Delay” as 0.
- III. The arrangement of Mark On Fly device, working-piece and sensor must

## MM3D 3.90

be placed such as Fig.1.1.18.

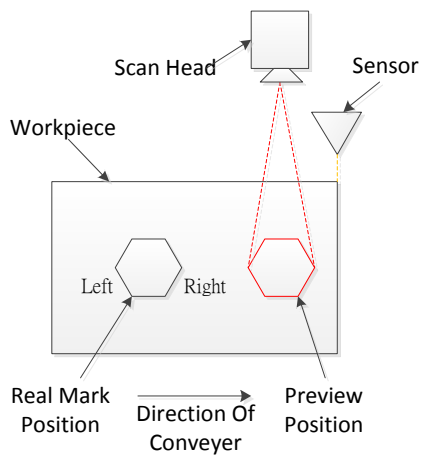


Fig. 1.1.18 Different

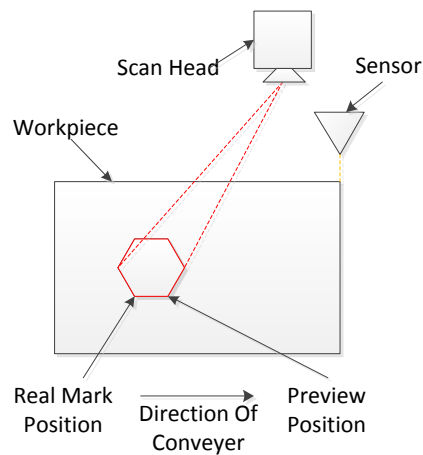


Fig. 1.1.19 Same Position

### Adjustment Description

Take Fig.1.1.18 for example. Suppose users set this value as 100. If the preview result located on the right side of real mark position, then increase the setting value. On the contrary, decrease the setting value.

### Text Mark Order

Select the marking direction. The direction of arrow represents the conveyer moving direction.



: Conveyer moving direction is right-to-left. The marking direction will be D→C→B→A.



: Conveyer moving direction is left-to-right. The marking direction will be A→B→C→D.

## MM3D 3.90

### Extend DLL

Enable this function when users need to import DLL modules, see Fig.1.1.20. Click the “Import” button, and then select the assigned DLL module and click “Open”, “Apply” button to import it.

More details please refer to “**Extend DLL User Manual**”.

Check **Enable** at Application sector will allow user call external program from software.

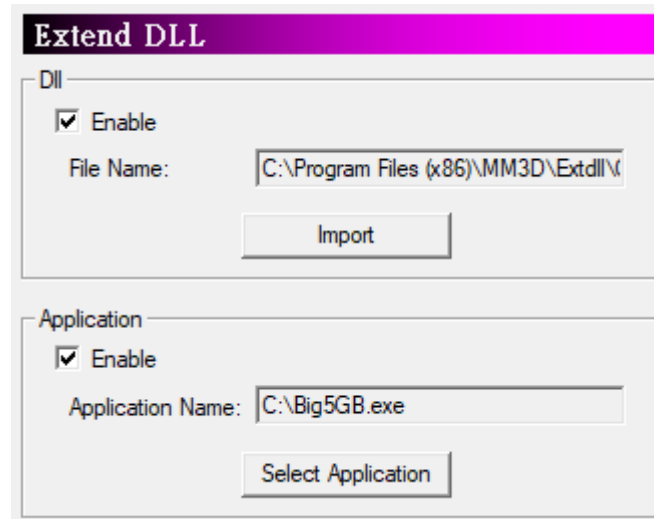


Fig. 1.1.20

### Auto Text Macro

The system provides three Auto Text DLLs, see Fig.1.1.21. If users need to add more Auto Text DLL modules, they can import the assigned DLL modules by themselves using “Import DLL” function.

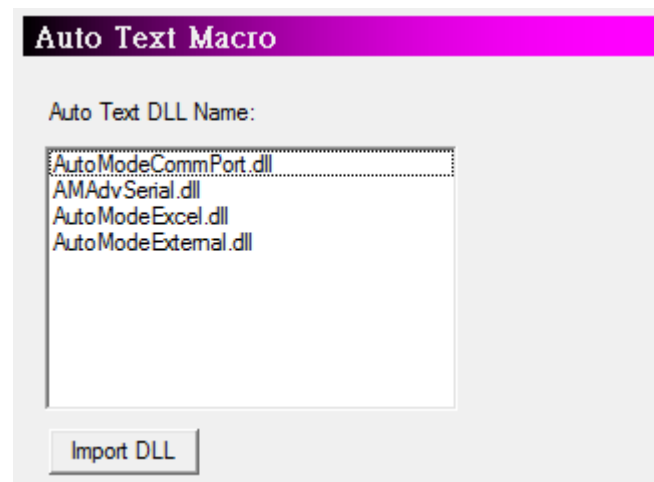


Fig. 1.1.21

## MM3D 3.90

### Machine Check

Enable this function, the assigned output signal will light up when the marking reaches the setting max mark or auto text amount, see Fig.1.1.22.

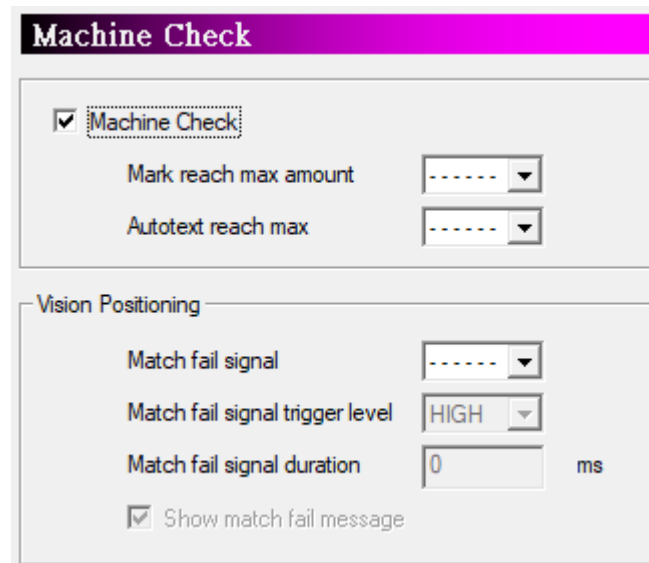


Fig. 1.1.22

### Vision Positioning

#### Match fail signal

Select output signal when fail to match target.

#### Match fail signal trigger level

Output signal level HIGH or LOW

**Match fail signal duration** Output signal duration

**Show match fail message** Appear match failure window.

### Automation

Only PMC2, PMC2e, UMC2 or PMC6 driver supports this function. See Fig.1.1.23.

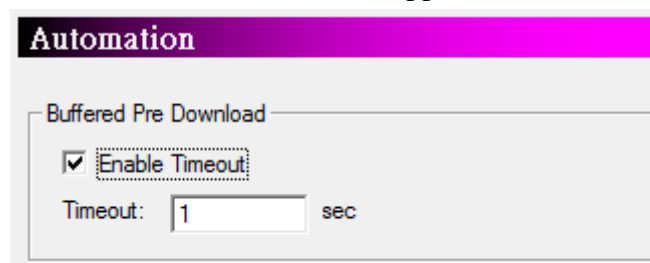


Fig. 1.1.23

### Buffered Pre Download

The system will pre download the marking data to the controller's memory buffer to fasten the marking speed. Enable timeout can make sure the buffering data will be refreshed every setting time period.

## MM3D 3.90

### Motion Config

Users can do setting for XY-Table through this option, see Fig.1.1.24.

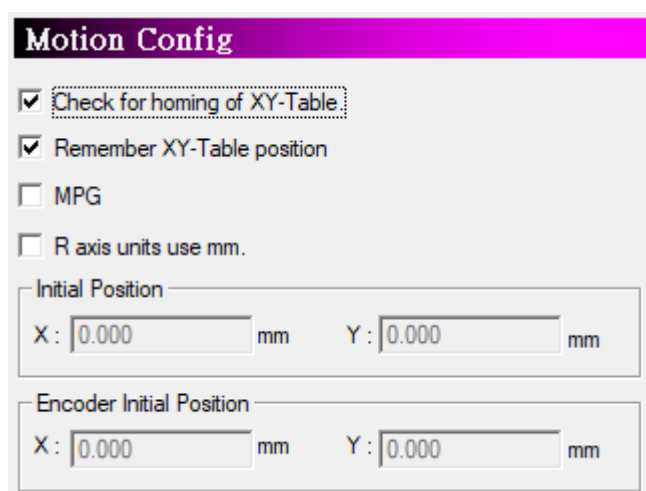


Fig1.1.24

#### Check for homing of XY-Table.

Enable this function, the system will display a warning dialog box when users want to start marking if the XY table is not yet homed, see and Fig.1.1.25.

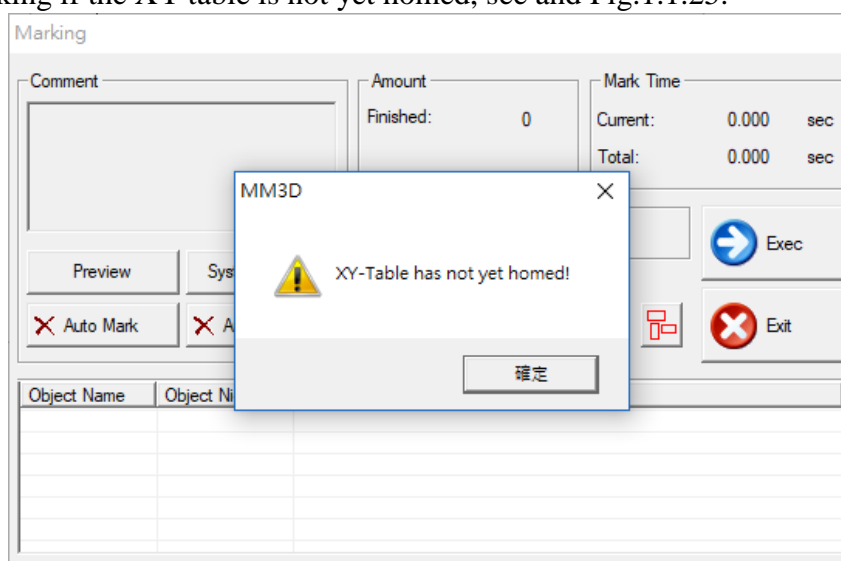


Fig1.1.25

#### Remember XY-Table position.

Save the current position of XY-Table when exiting software.

#### MPG

Enable MPG to control XY-Table

#### Raxis unit change to mm.

Degree change to mm

#### Initial Position

Set the initial position for XY-Table.

#### Encoder Initial Position

Set the initial position for encoder.

## MM3D 3.90

### ShortKey

Users can assign the short-key for each function through this option, see Fig.1.1.26.

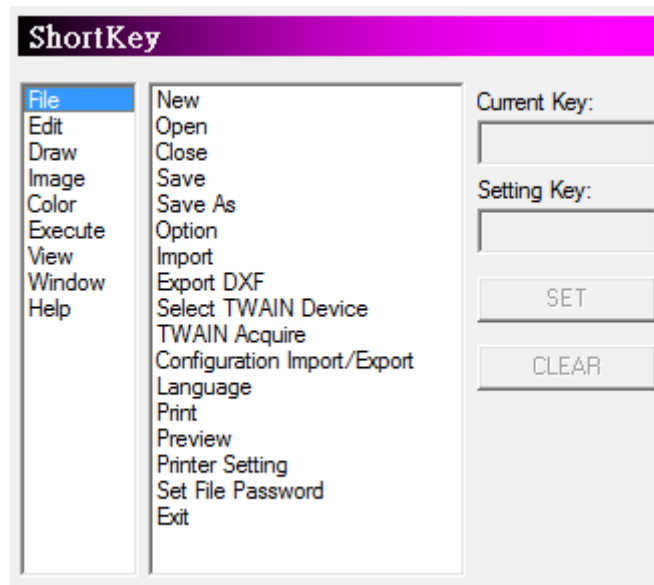


Fig.1.1.26

**Current Key** The current using short-key of selected function.

**Setting Key** Set the short-key for selected function. If the assigned key has not been used, then the “**SET**” button will be enabled for users to click and set that key as the default value. Otherwise, a warning message “Short-key is used” will pop up.

**Clear** Clear the short-key setting.



## MM3D 3.90

### CommPort Setting

The Com Port transmission of Auto Text will be effected after enabling this function and setting the Com Port parameters, see Fig.1.1.27.

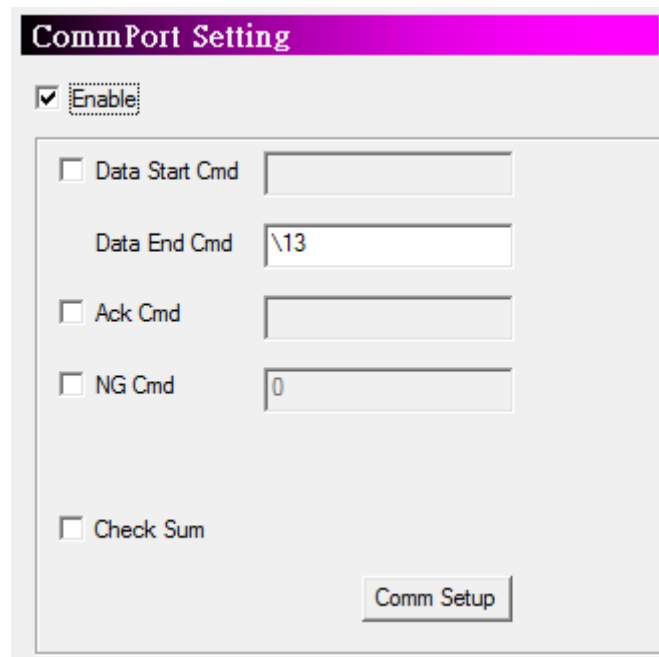


Fig1.1.27

#### **Enable**

Decide to use Com Port or not.

#### **Data Start Cmd**

When system receives this value from the host, it means that the next received character is the correct marking content. If this column is blank, the system will treat the first received character as the Auto Text content.

#### **Data End Cmd**

This is an essential setting. When the system receives this parameter, it means the transmission is finished. The default value is “\13,” the line feed symbol. This parameter cannot be blank; otherwise the system will pop up a warning dialog box like Fig.1.1.28.

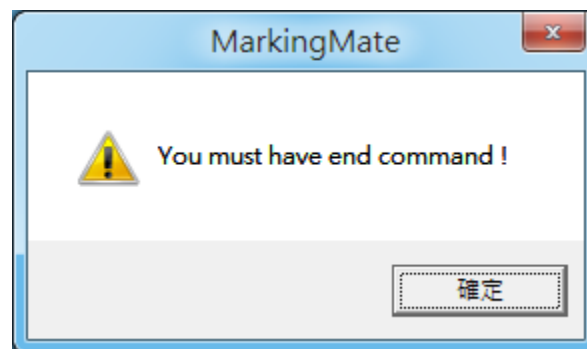


Fig1.1.28

#### **Ack Cmd**

Setting this parameter, the software will transmit this value to the host to report the

## MM3D 3.90

transmission is regular after system receives the value of “Data End Cmd” and “Check Sum” and confirms that both values are correct.

### NG Cmd

The software will report to the host that the transmission is wrong when the “Check Sum” is incorrect while using this function. The default value is “\21”.

### Check Sum

Decide to transmit the “Check Sum” or not to do the further verification of information. The operation of “Check Sum” is to convert each character of information into Hex first and then do XOR operation for each one in order. The Hex of final result is the “Check Sum.” For example, the “Check Sum” of “2578” is “8,” see Fig.1.1.29.

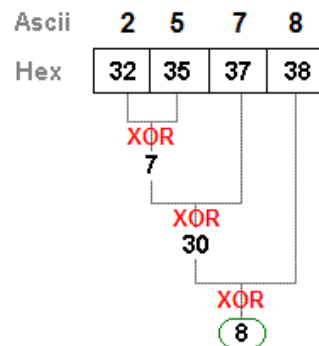


Fig1.1.29

### Comm Setup

Click “Comm Setup” bottom and enter the setting dialog box, see Fig.1.1.30.

### Com Port Use

Select the suitable Com Port basic on the host equipment.

### RS-232 Parameters Setting

Do the same setting as the information transmission source. Please do not change the parameters which are not in the red frame if unnecessary.

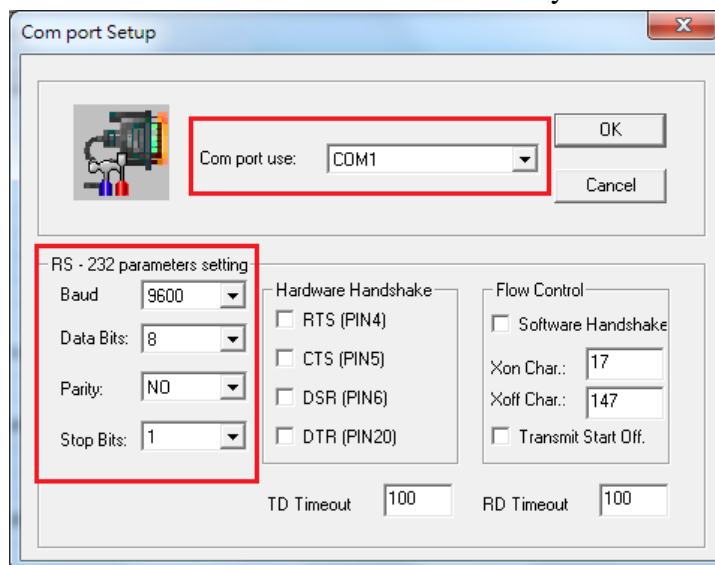


Fig1.1.30

## MM3D 3.90

### Control Object Comm Manager

Selecting the configured Commport setting can be applied when using the "Comm In" and "Comm Out" functions in the Control Tool.

### System Config 1

Allow users to adjust the config setting of system, see Fig.1.1.31.

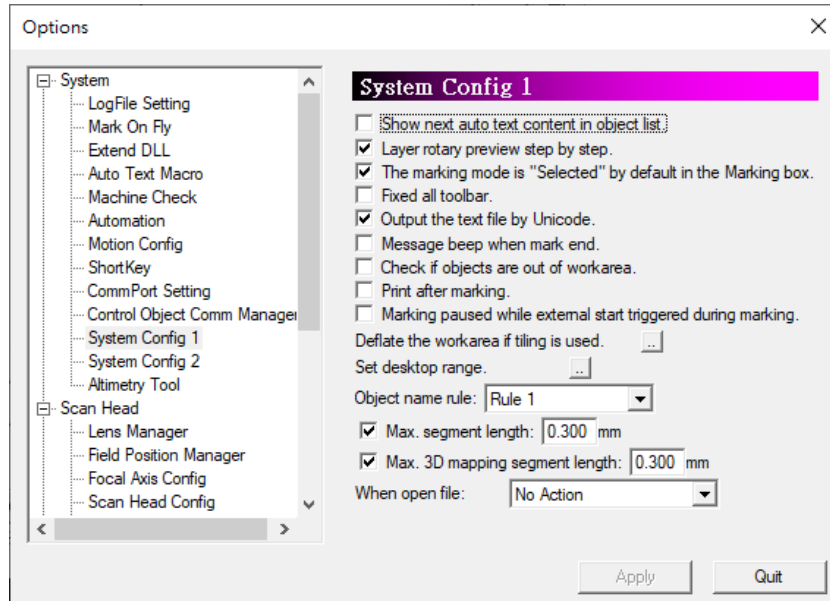


Fig1.1.31

### Show next auto text content in object list.

Checked this option, the marking object list will present the oncoming marking content of Auto Text. Otherwise, it will show the previous marking content.

### Layer rotary preview step by step

Previewing the graphics on the cylindrical object step by step.

### The marking mode is "Selected" by default in the Marking box.

Decide the default value of marking mode is "All" or "Selected," see Fig.1.1.32.

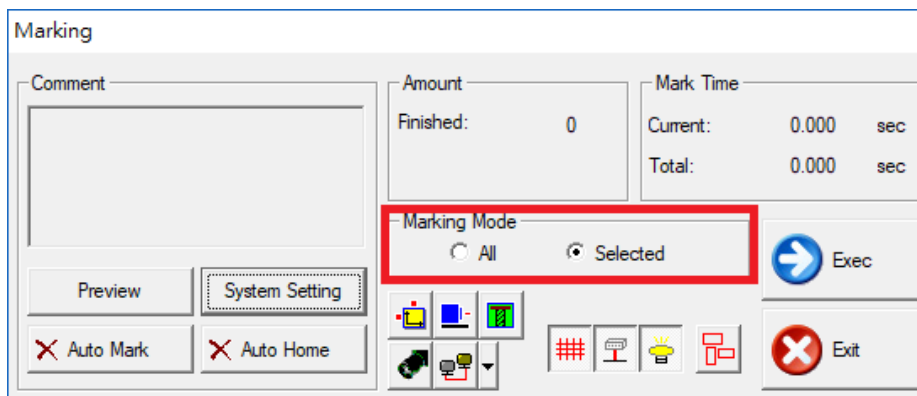


Fig1.1.32

## MM3D 3.90

### **Sort the entities of the object when marking.**

Adjust the marking order according to the position of objects to optimize the marking speed.

### **Fixed all toolbar.**

Keep all the Tool Bar at the current location and become unmovable.

### **Output the text file by Unicode.**

Decide to encode the output text file by Unicode or not.

### **Message beep when mark end.**

The system will sound a beep when mark end.

### **Check if objects are out of workarea**

If there is object exceed work area, the marking process will not start.

### **Print after marking**

Printer will print out the object after marking when this function activate.

### **Marking Paused while external start triggered during marking**

If an external "START" signal is received during engraving, marking will be suspended. If the external "START" signal is received after the marking is suspended, the marking will continue when this function activate.

### **Deflate the workarea if tiling is used.**

Set the deflate range of work area when using "Graphic Split" function. The value cannot be negative, see Fig.1.1.33.

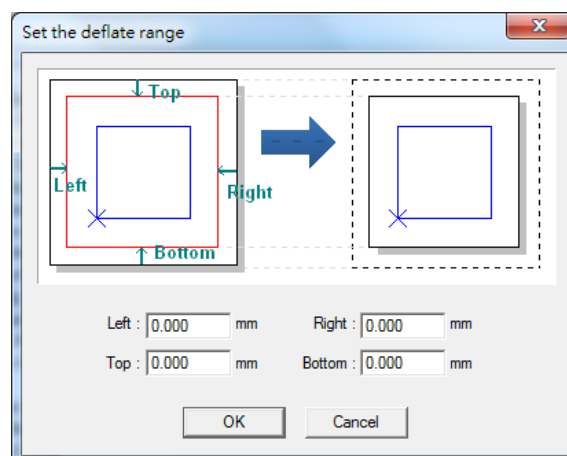


Fig1.1.33

## MM3D 3.90

### Set Desktop range.

Allow users to set a new working area range and coordinates according to their demand, see Fig.1.1.34.

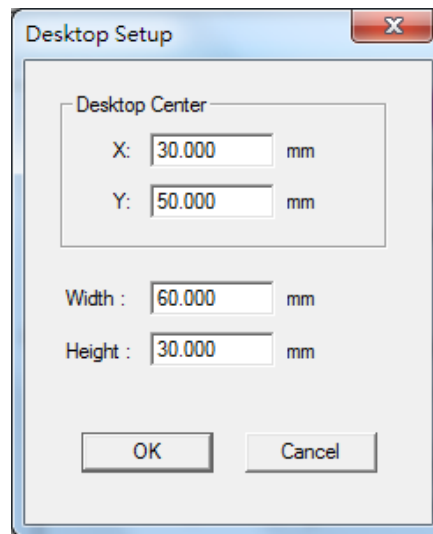


Fig1.1.34

### Object name rule.

Select the name rule of objects which are in a copy group. Fig.1.1.35 is the “Object Browser” of Rule 1, and Fig.1.1.36 is Rule 2.

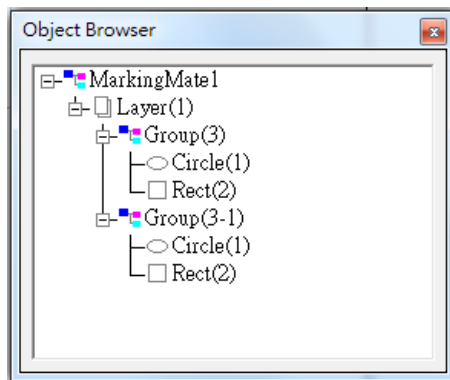


Fig1.1.35

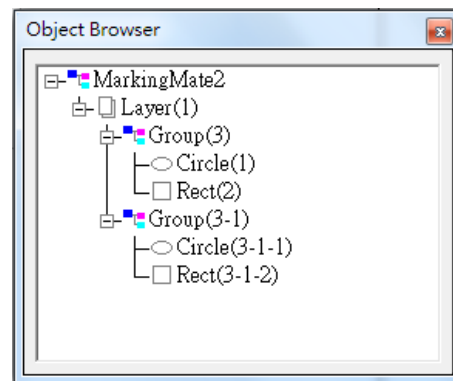


Fig1.1.36

### Max. segment length.

Set the segment length when marking. There will be no partition if users didn't check this option.

### Max. 3D mapping segment length

Set the length of the segments when engraving 3D textures. It will not be segmented if it is not enabled.

### When open file.

Choose a default action while opening a file.

## MM3D 3.90

### System Config 2

Allow users to adjust the config setting of system, see Fig.1.1.37.

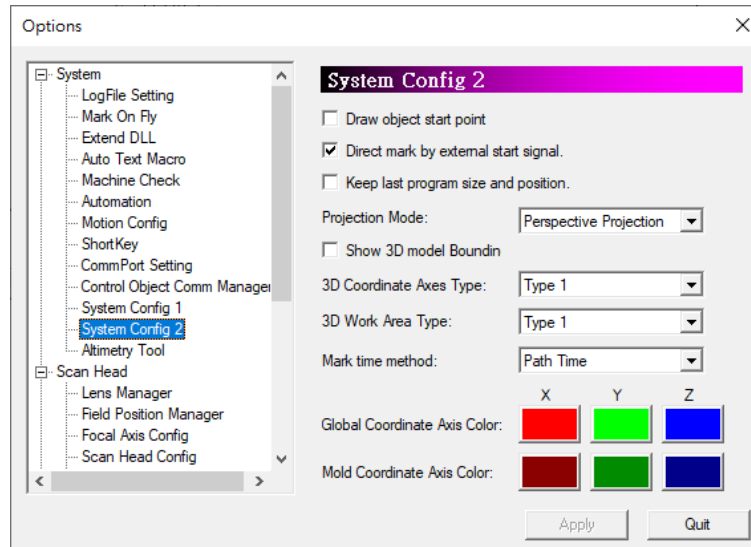


Fig1.1.37

#### **Draw object start point**

After startup, the starting point of the object is marked with a red dot.

#### **Direct mark by external start signal**

Able to receive the external "START" signal in the editing interface (without open the marking dialog), and immediately mark by the "mark sample bar" (the default is not to receive).

#### **Keep last program size and position**

The program will show the size and path of the last file will be displayed when open the program.

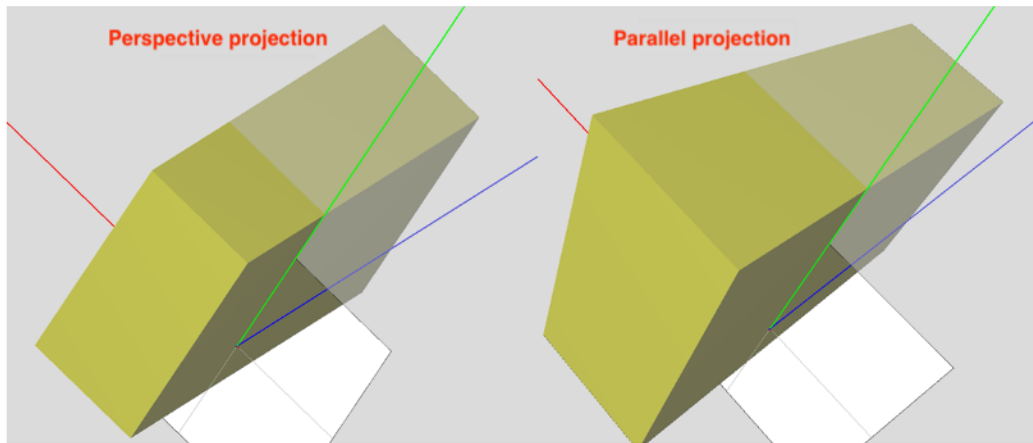
#### **Projection Mode**

The main difference is that the visual experience is not the same. The effect will be displayed when "Show 3D model Boundin" is enabled.

Please refer to the following figure.

1. Perspective projection, the object and the model are projected in perspective, and the projection lines are not parallel to each other. The size of the resulting projected figure will vary with the distance between the observer, the screen or the object. It is a default setting.
2. Parallel projection, the object and model are projected in parallel, the line to each point on the object is parallel to each other. The appearance of the object is presented on the projection surface. If absolute geometry is required For visual effects, recommended to use this mode.

## MM3D 3.90



### Show 3D model Boundin

The bounding box will be displayed on the 3D model when it's enable.

### 3D Coordinate Axes Type

1. Type 1, the coordinate axis is longer and will penetrate the model object.
2. Type 2, the coordinate axis is shorter, but it can be displayed completely without penetrating the model object.
3. The coordinate axis is not displayed.

### Mark time method

Select different marking time counting methods.

Path time: The duration since begining marking to end marking of controller.

Real time: The duration since begining marking to end marking of software.

### Global Coordinate Axis Color

The color of the axis can be customized.

### Mold Coordinate Axis Color

The color of the model's coordinate axis can be customized, and the coordinate axis will be displayed when the "show 3D " is used for the model.

## MM3D 3.90

### Altimetry Tool

Through the distance sensor and the Z-axis control platform, the user can quickly adjust the distance between the scanner and the workpiece to be processed. As shown in Figure 1.1.38.

The sensor measures the distance from the sensor to the working platform, and the software will use this as the reference distance.

When put workpieces with different height, the reference distance will be changed, and the software will output the signal to control the height of the axis.

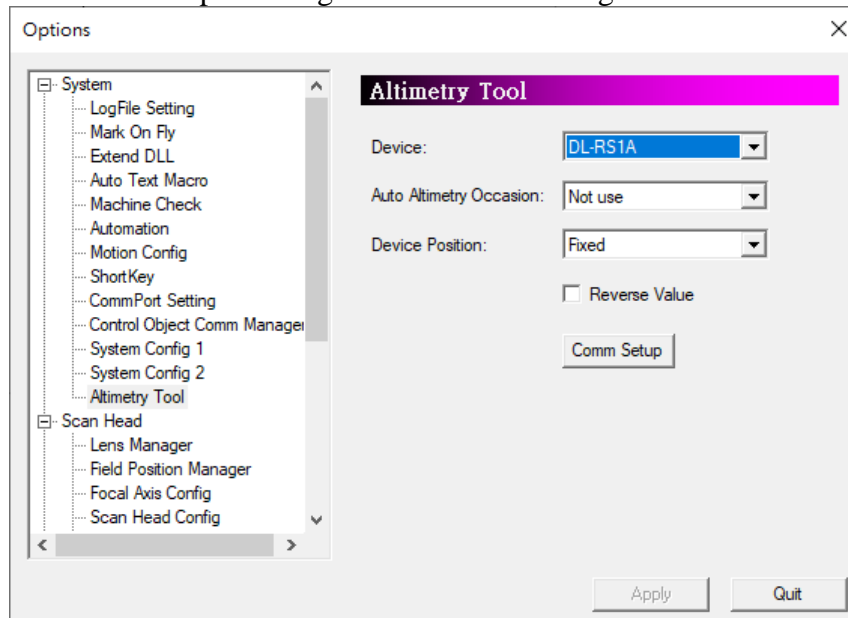


Fig 1.1.38

### Device

There are three devices support height measuring, DL-RS1A, HL-G1 and LM-Z

### Auto Altimetry Occasion

#### Not use

Disabled.

#### Always

After the height measurement function is enabled, the height will always be detected and the Z axis will be moved.

#### Before marking

The height will be detected before laser on, and the Z axis will be moved.

### Device Position

Select the fixed position of the height measuring device, or follow the Z-axis movement option.

### Reverse Value

Check this option, the measured value will be reversed

### Comm Setup

When the user presses this button, the com port setup dialog will pop up, where the user can set Com Port transmission or TCP/IP transmission.

### Com port use

Select the appropriate COM Port.



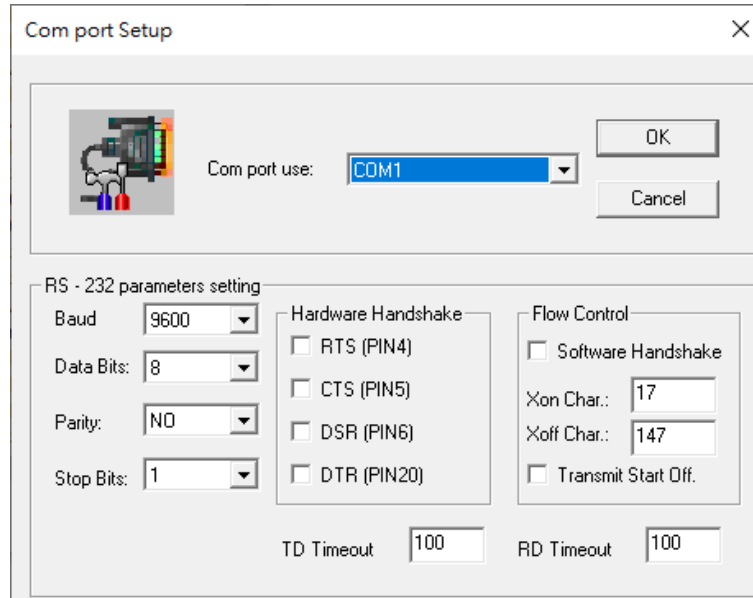
## MM3D 3.90

### RS-232 parameters setting

Please make the same settings according to the source, and do not change the items other than those in the red box if it is not necessary.

#### TD/RD timeout(ms)

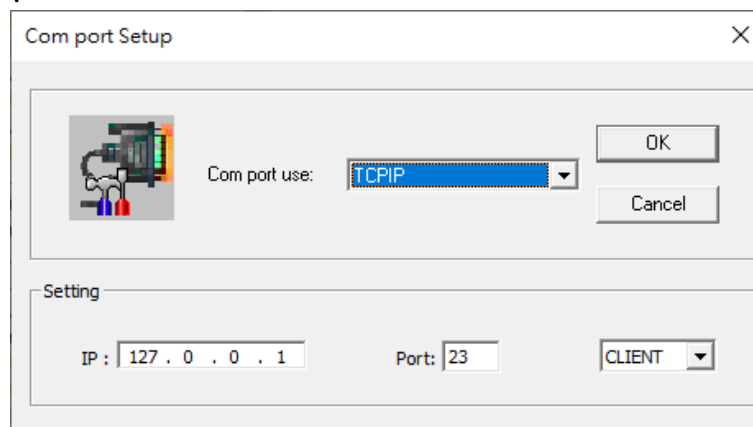
It can be used only when the NG command is activated. When the system receives a valid character, it will start counting; if it does not receive the end command within the time, it will be judged as timed out, the NG command will be returned and the currently received data will be cleared.



The screenshot shows the 'Com port Setup' dialog box. At the top, there is a 'Com port use:' dropdown menu set to 'COM1'. Below this, the 'RS - 232 parameters setting' section includes: Baud rate (9600), Data Bits (8), Parity (NO), Stop Bits (1), Hardware Handshake (RTS (PIN4), CTS (PIN5), DSR (PIN6), DTR (PIN20)), and Flow Control (Software Handshake, Xon Char.: 17, Xoff Char.: 147, Transmit Start Off.). At the bottom, there are 'TD Timeout' and 'RD Timeout' fields, both set to 100. 'OK' and 'Cancel' buttons are located at the top right.

### TCPIP

If TCPIP is selected, it means that the automatic text is transmitted in TCP/IP mode. It must be filled in with the IP address of the remote host and the port is used by the remote host to communicate with the local host. In addition, the local host must be "CLIENT".



The screenshot shows the 'Com port Setup' dialog box with 'Com port use:' set to 'TCPIP'. The 'Setting' section includes: IP address (127.0.0.1), Port (23), and a dropdown menu set to 'CLIENT'. 'OK' and 'Cancel' buttons are located at the top right.

#### Note

When opening the marking dialog box, the system will connect to the remote host. Therefore, the user must enable the service of the remote host before opening the marking dialog box, otherwise the system will fail to connect and terminate the marking.

## MM3D 3.90

### 1.1.7.2 Scanner

#### Lens Manager

All lenses users have will be listed here, see Fig.1.1.39.

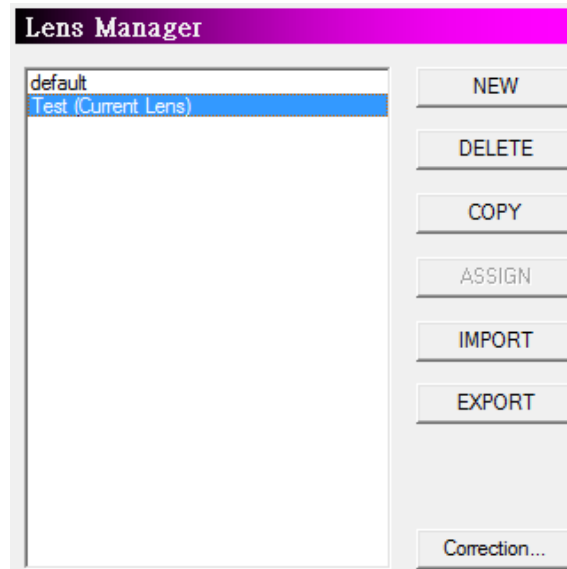


Fig1.1.39

<b>NEW</b>	Click this button to add a new lens.
<b>DELETE</b>	Click this button to delete the selected lens.
<b>COPY</b>	Click this button to copy the selected lens.
<b>Assign</b>	Click this button to set the selected lens as the default lens.
<b>Import</b>	Allow users to import lens file.
<b>Export</b>	Allow users to export selected lens file.
<b>Correction...</b>	Select the one lens and click this button to enter the Lens Correction function.

Click “**Correction...**” button and do further settings for lens.

## MM3D 3.90

### Lens Setup

The system correct the barrel distortion, trapezoid distortion, or parallelogram distortion resulted from lenses and optical devices in mathematical way. Adjust lens parameter properly will make the marking result be the same as the original design. Fig.1.1.40 shows the lens setup under normal mode. Fig.1.1.41 is the lens setup under dot mode.

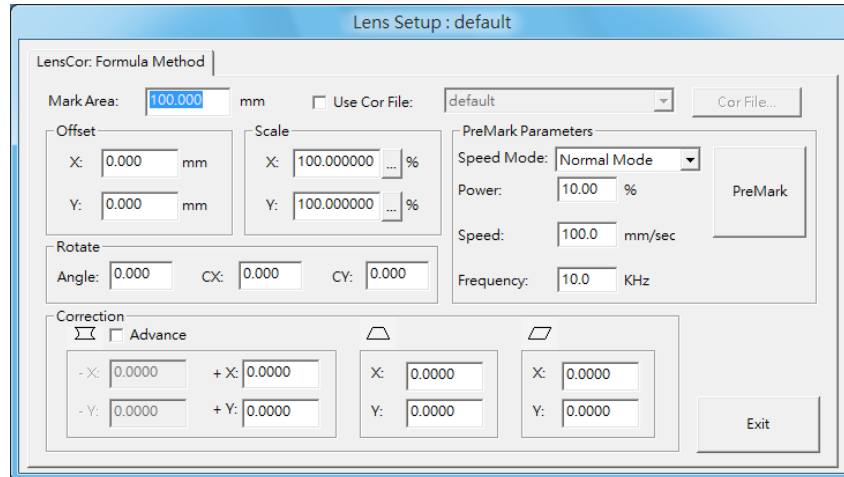


Fig. 1.1.40 Under Normal

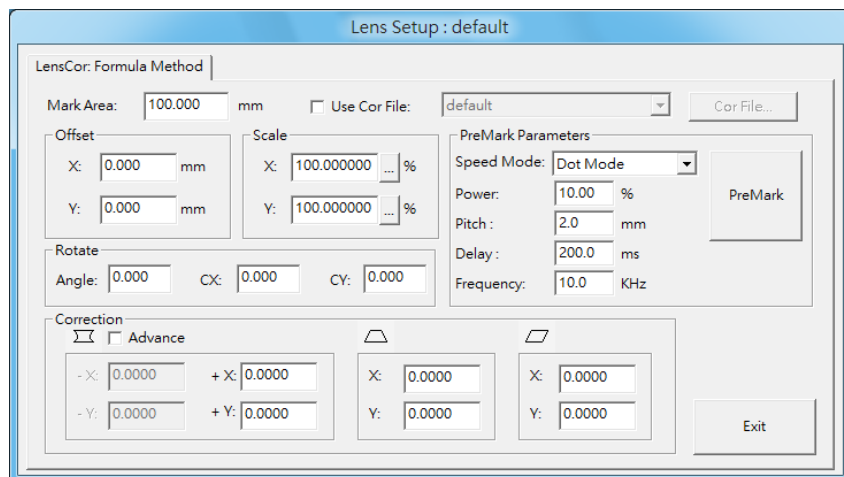


Fig. 1.1.41 Under Dot

#### Note

Dot mode needs to be enable by clicking "Menu bar" → "File" → "Options" → "Laser" → "Dot Mode".

#### Working Area

Working area of the lens.

#### Use Cor File

Use the correction files from manufacturers or use the file created by using Scale or Grid Methods and then adjust parameters.

#### Correction file

Select the file name same as the lens name from dropdown menu or select "Import..." item from the dropdown menu to import the correction file such as COR, CTB (from ScanLab), or GCD (from RayLase). If the selected correction file has the same name as the assigned lens, users are able to click "Cor File..." button and do correction through "Using Correction

## MM3D 3.90

	<b>File” function.</b>
<b>Offset</b>	If the working pieces cannot be put in an ideal position, users can modify the design or change the offset value to fix this problem. For example, if the position has 5mm deviation to the right side, then input -5mm in Offset X to correct it.
<b>Scale</b>	If the size of marking result (real size) are different from the original design (theoretical size), user can use the scale function of X and Y to fix it. The unit of scale is percentage ( <i>theoretical size / real size * 100</i> , the default value is 100). For example, if real size is smaller, this value should be larger than 100.
<b>Rotate</b>	If the working pieces cannot be put in an ideal position, users can modify the design or input suitable values in these fields to amend it.
<b>Correction</b>	When the barrel distortion, trapezoid distortion, or parallelogram distortion happen, enter the suitable X/Y values to do the correction. Please refer the following description of <b>Distortion Correction</b> .
<b>Advance</b>	Allow users to input different correction values at negative X and Y direction.
<b>PreMark Parameters</b>	Setting the parameters for PreMark.
<b>Speed Mode</b>	Select to use Normal Mode or Dot Mode to Premark.
<b>Power</b>	Laser power percentage for PreMark.
<b>Speed</b>	Laser speed (mm/sec) for PreMark.
<b>Frequency</b>	Laser frequency for PreMark.
<b>Pitch (Under Dot Mode)</b>	The distance between dot and dot on the marking route when doing PreMark.
<b>Delay (Under Dot Mode)</b>	The waiting time a lens needs to start radiating when move to a dot while doing PreMark.
<b>Pulse Width (YAG Laser)</b>	The spending time for each pulse.
<b>PreMark</b>	Click the “PreMark” button, the laser will mark according to the parameters setting above.

Please follow the steps listed below to do the correction and note that the direction of X and Y means the output port of GALVO motor:

- Step 1:** Select the lens user want to correct and adjust its focus.
- Step 2:** Input the value of lens working area.  
Input the value of scale percentage according to the output voltage ratio of lens and driver. **Attention, users need to complete this step first and then start executing PreMark, otherwise the lens would be damaged.**
- Step 3:** When barrel distortion happened, follow the rules of “Distortion Correction” as Table 1.1 to do the correction until four square sides are all straight lines.
- Step 4:** When trapezoid distortion happened, follow the rules of “Distortion Correction” as Table 1.2 to do the correction until four square sides are equal in length.
- Step 5:** When parallelogram distortion happened, follow the rules of “Distortion Correction” as Table 1.3 to do the correction until four

### MM3D 3.90


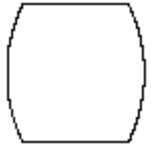

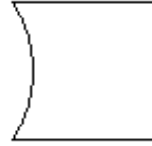
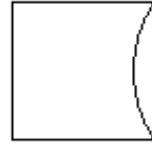


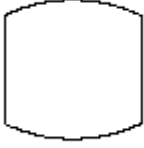
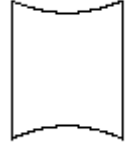
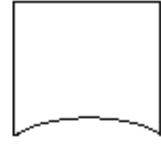
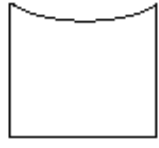


square sides are all vertical.

- Step 6:** Measure the dimension of marking result. Input the value of scale according to the formula (*theoretical size / real size \* 100*). If the real size is larger than theoretical size, then reduce its value and retry. On the contrary, increase its value and retry.
- Step 7:** Repeat Step 6 until the theoretical size and real size are equal.

# MM3D 3.90

## Distortion Correction

### Correction of barrel distortion

Original				
Mark Results				
Solutions	Increase the X value of  field	Reduce the X value of  field	Reduce the value of $-X$ (Advance)	Reduce the value of $+X$ (Advance)
Mark Results				
Solutions	Increase the Y value of  field	Reduce the Y value of  field	Reduce the value of $-Y$ (Advance)	Reduce the value of $+Y$ (Advance)

### Correction of trapezoid distortion

Table1.1


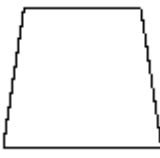
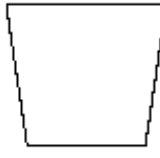


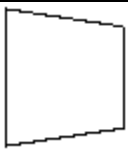
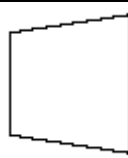


Original		
Mark Results		
Solutions	Enlarge the X value of  field	Reduce the X value of  field
Mark Results		
Solutions	Enlarge the Y value of  field	Reduce the Y value of  field

Table1.2

## MM3D 3.90

### Correction of parallelogram distortion

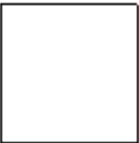
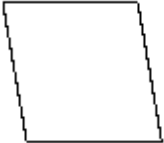
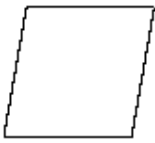


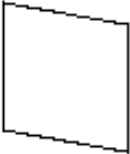
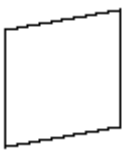


Original		
Mark Results		
Solutions	Enlarge the X value of  field	Reduce the X value of  field
Mark Results		
Solutions	Enlarge the Y value of  field	Enlarge the Y value of  field

Table1.3

# MM3D 3.90

## 1. Using Correction File

Correction files are provided by lens manufacturers such as SCANLAB and RayLase for users to do lens correction. Mostly, the results of using these files are acceptable. Users only need to adjust some of the scale parameters.

If require more accurate result or the correction files from lens manufacturers are unable to meet the requirement, users can do advanced correction through using the “Cor File...” function to reach the goal. Before using this function, please make all the parameters as the default values as Fig. 1.1.42.

Once finding that still need to adjust these values after finishing lens correction, users can come back to this dialog box to modify them. **But when using the grid method or Scale method to calibrate the lens, please set the parameter to the initial value to avoid confusion.**

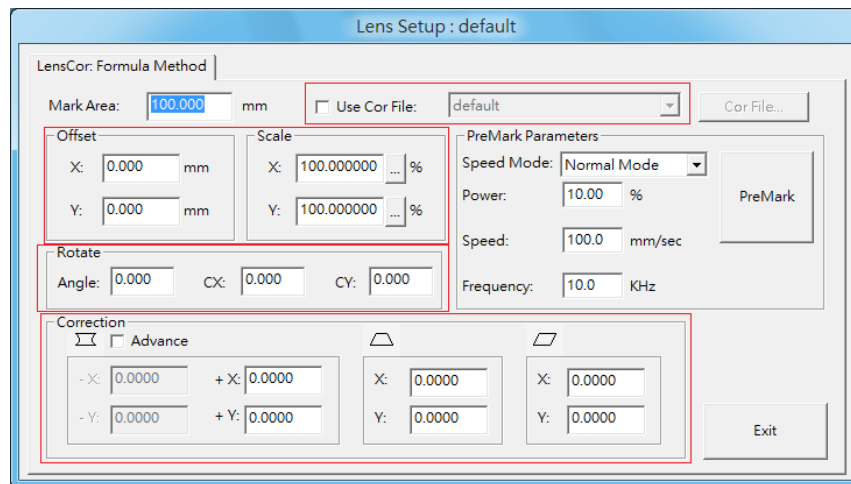


Fig. 1.1.42

## 2. New/Edit Correction File

If it's the first time entering the “Cor File...” function after creating a new lens, users will need to select one correction method from Scale Method and Grid Method, see Fig. 1.1.43. Please note that each lens can only choose one method.

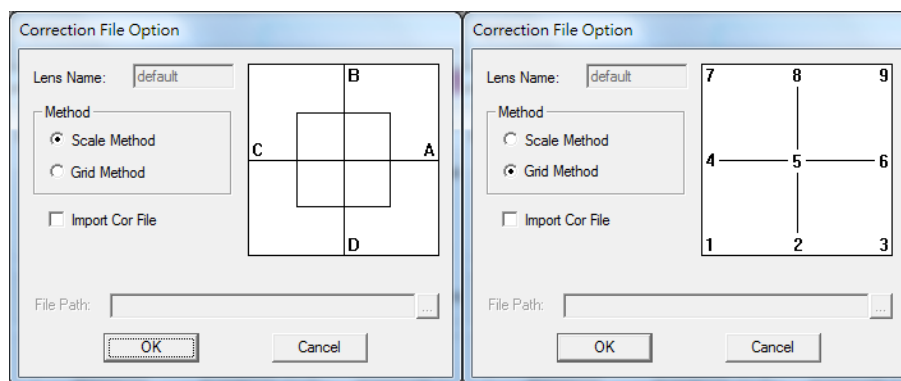


Fig. 1.1.43

### Method

Select Scale Method or Grid Method. Please refer to the following description.

### Import Cor File

Import an existing correction file and do advanced correction. There are three usable file types: COR, CTB, and GCD.

### File Path

The path of the imported correction files.

## 3. Scale Method



## MM3D 3.90

The traditional lens correction method is using linear way to correct the distortion. However, some of distortions are not completely linear. In this situation, users can use the Scale Method to divide the lens into several areas and adjust each area by different percentage, see Fig.1.1.44.

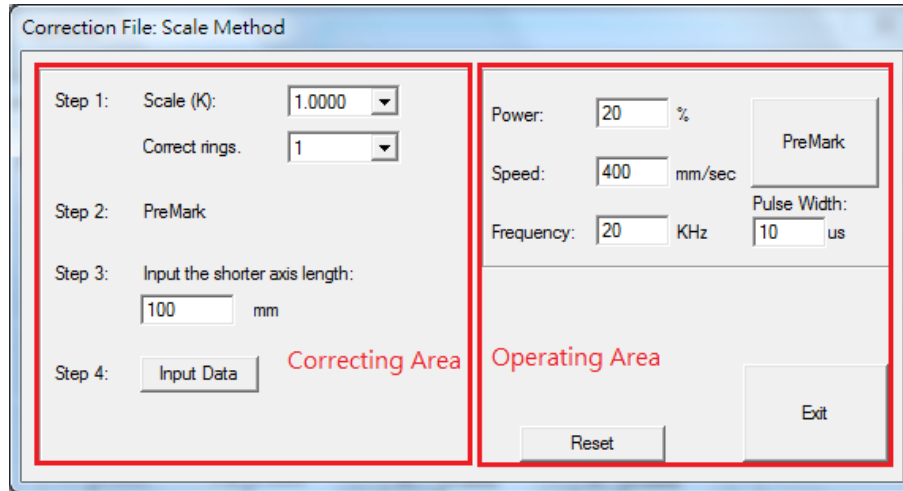


Fig. 1.1.44

The left side of Scale Method window is correcting area for users to enter values to get a correction file. The right side is operating area; users can measure the result according to settings of left side or reset the settings of correcting area.

### Operating Area

On the top of this area is the Premark parameters (refer to p.32)

### Reset

The purpose of this function is to reset the setting of correcting area, or import a correction file to do correction, see Fig.1.1.45.

### Import Cor File

Import the correction file provided by the manufacturers for correcting area. The value of correcting area will be reset if press “OK” without clicking “Import Cor File”.

### File Path

The path of correction file.

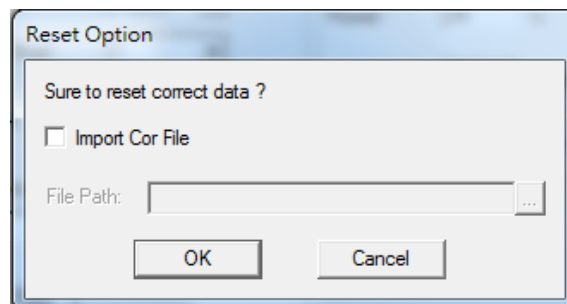


Fig. 1.1.45

### Correcting Step

**Step 1** Select a Scale(K) value which is close to the voltage ratio of lens and

## MM3D 3.90

driver. Then select correct rings from the list. The difference of the Scale value(K) will cause different size of working area of step 2, the smaller the K, the smaller the correcting range. When starting to calibrate, choose a smaller scale(K) value. If the center line of the figure is shorter than the size of the working area, increase the scale(K) value before marking. This step may need to be performed many times until the shortest center line of the marking figure is slightly larger than the working range of the lens. The more correct rings users select the better accuracy they will get.

**Note:** If you are using an analog lens, and the maximum voltage of the analog signal that the lens can accept is 5V instead of 10V, you should adjust the Jumper on the controller (board) so that the maximum output is 5V instead of adjusting the K value to 0.5.

- Step 2** Click the “PreMark” button to execute marking.
- Step 3** Measure the axis length and then enter the value in the field. (Since the value of X-axis and Y-axis may be different, please enter the shorter one.) If the real value is 109.11mm, it will be better to enter 110mm.
- Step 4** Click the “Input Data” button for next step, see Fig.1.1.46.

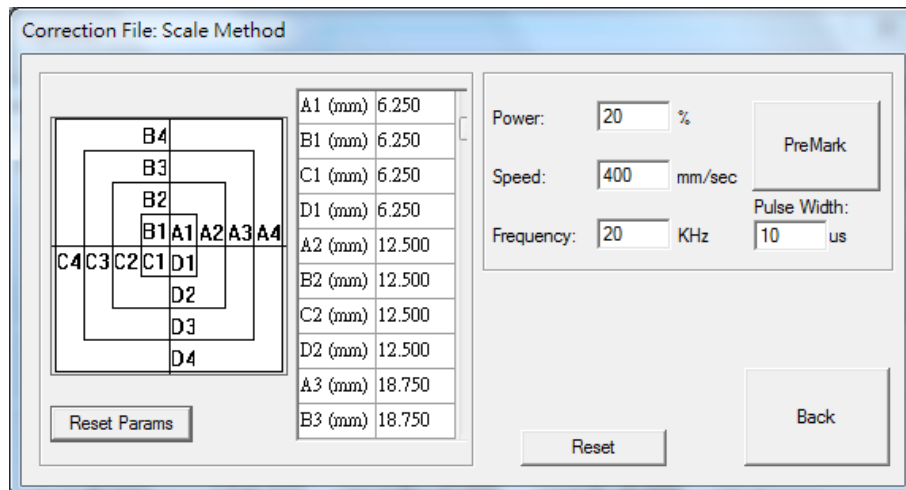


Fig. 1.1.46

- Step 5** Click the “PreMark” button to see the mark result
- Step 6** Edit the values of A, B, C, and D in the fields separately and then click the “PreMark” button again to see the mark result. If necessary, repeat these steps until achieving the goal. Click “Back” button and then “Exit” button to save the file and exit.

**Reset Params** Reset all correction data as the default values.

# MM3D 3.90

## 4. Grid Method

Instead of using a formula, this method measures the real position of correct dots directly. More correct dots will get more accurate result, see Fig 1.1.47.

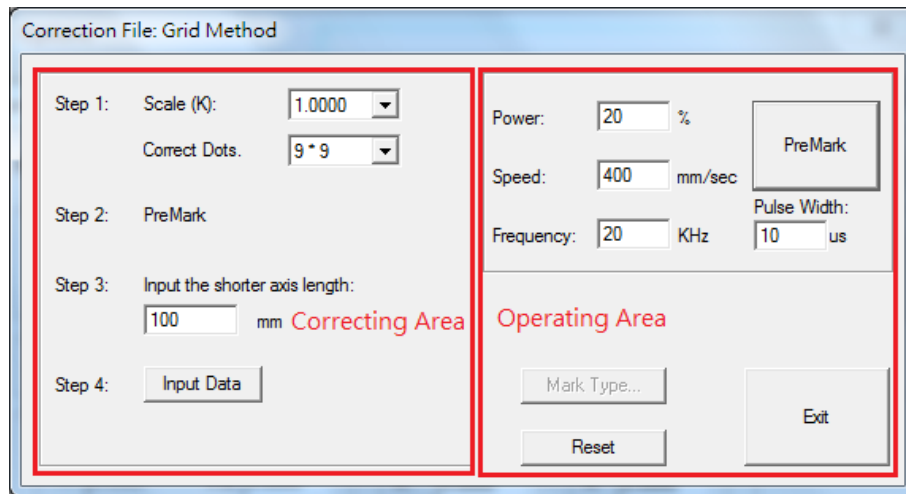


Fig. 1.1.47

### Operating Area

On the top of this area is the Premark parameters (refer to p.32)

### Mark Type

To use the function, users must click “Input Data” at “Correcting Area” first, see Fig.1.1.48.

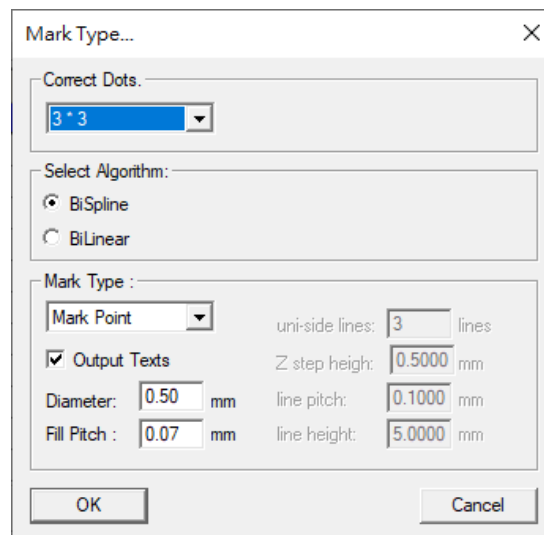


Fig. 1.1.48

### Correct Dots

Select correct dots from the list. More correct dots will get more accurate result.

### Select Algorithm

Select “BiSpline” or “BiLinear” algorithm.

### Mark Line

The laser will mark grid line when choosing “Mark Line”.

### Mark Point

The laser will mark grid point when choosing “Mark Point”. Users can also

## MM3D 3.90

set the diameter and fill pitch of the grid point from the field below.

### Mark Cross

During the “**PreMark**”, the laser will mark a cross. At this time, you can enter the desired grid point size in the “**uni-side lines**”.

### Mark Z axis Step

During the “**PreMark**”, The laser will mark the step line. At this time, you can enter the desired number of lines in the “**uni-side lines**”.

### Output Texts

If checked the “Output Texts” checkbox, the representing numbers will appear next to the grid point or line, see Fig.1.1.49.

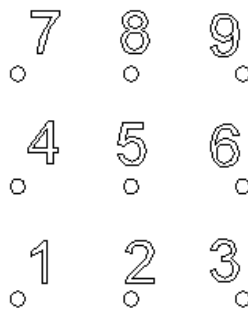


Fig. 11.49

### Reset

Please refer to page 35.

### Correcting Step

- Step 1** Select a Scale(K) value which is close to the voltage ratio of lens and driver. Then select correct rings from the list. The difference of the Scale value(K) will cause different size of working area of step 2, the smaller the K, the smaller the correcting range. When starting to calibrate, choose a smaller scale(K) value. If the center line of the figure is shorter than the size of the working area, increase the scale(K) value before marking. This step may need to be performed many times until the shortest center line of the marking figure is slightly larger than the working range of the lens. Then select the correct dots. More correct dots will get more accurate result.

**Note:** If you are using an analog lens, and the maximum voltage of the analog signal that the lens can accept is 5V instead of 10V, you should adjust the Jumper on the controller (board) so that the maximum output is 5V instead of adjusting the K value to 0.5.

- Step 2** Click the “PreMark” button to execute marking.
- Step 3** Measure the axis length and then enter the value in the field. (Since the value of X-axis and Y-axis may be different, please enter the shorter one.) If the real value is 109.11mm, it will be better to enter 110mm.
- Step 4** Click the “Input Data” button for next step, see Fig.1.1.50.

## MM3D 3.90

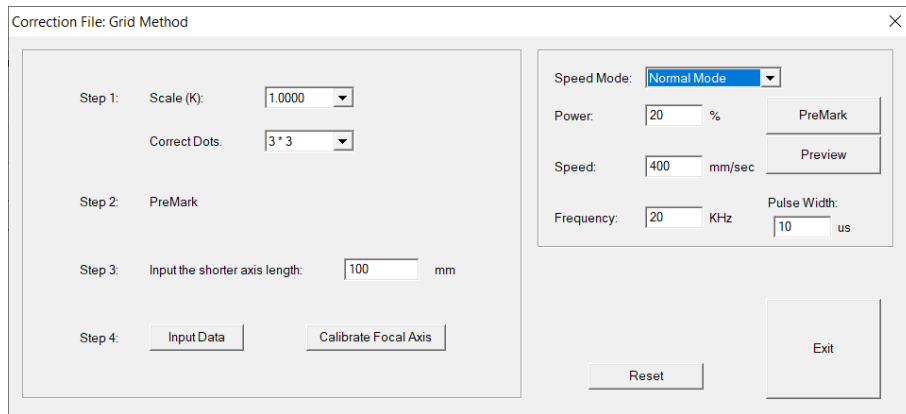


Fig. 1.1.50

- Step 5** Click the “PreMark” button to see the mark result. Select from the drop down menu to set correct dots. More correct dots will get better accuracy.
- Step 6** Edit the positions of X and Y in the fields separately and then click the “PreMark” button again to see the mark result. If necessary, repeat these steps until achieving the goal. Click “Back” button and then “Exit” button to save the file and exit.

**From File...** Users can create a \*.txt file as a correction file and using this function to import that file as the coordinates of X and Y, see Fig.1.1.51.

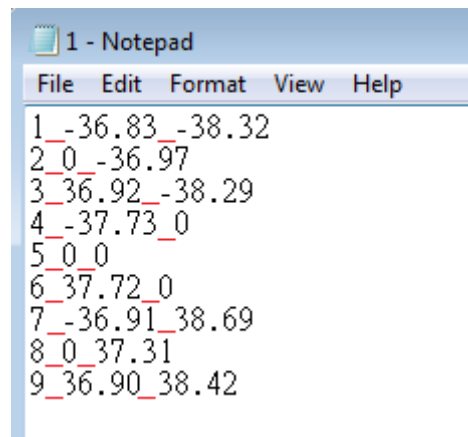


Fig. 1.1.51

## MM3D 3.90

**Reset Params.** Reset all correction data as the default values.

**Mark All** Mark all dots when PreMark

**Mark Selected** Mark selected dots when PreMark

### Focal Lens Correction

Both of Grid and Scale methods support focal lens correction. The focal lens correction function of grid method maybe optional. The purpose of correcting focal lens is marking on any point within the space on the focal plane. The real operation when correct lens is correcting z axis when  $Z = 0$ .

**If using the scanner without coming with a f-theta lens, before making scale or grid method correction, user should complete focal lens correction first.**

The screen is as following figure 1.1.52 :

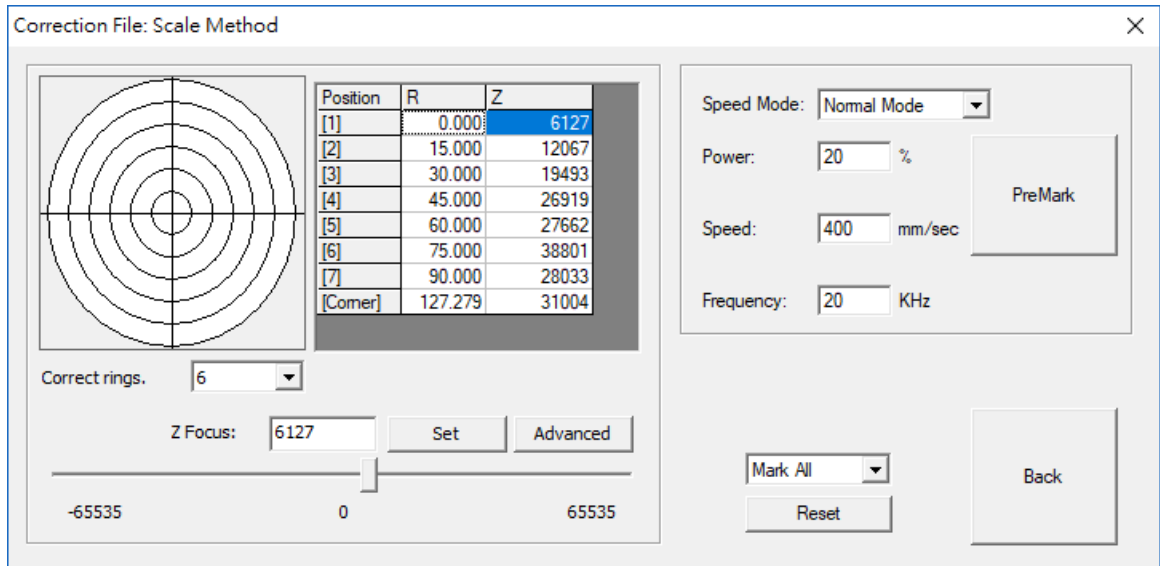


Fig.1.1.52

**Correct rings** The more rings, the less defocusing on the XY plane.

**Position** [1] The center cross line.

[2] Indicates the concentric circles of each circle, the first circle outward, if the number of correction circles increases, then [3] will be the second circle outward, and so on.

[Corner] The frame.

**Z** Premark at that Z value can get the clearest result. Z value typically are variable at different positions. The correct value has to be determined by actual marking. It could be negative or positive.

**R** Concentric circle radius. Generated automatically after choosing rings.

## MM3D 3.90

<b>Z Focus</b>	Input a Z value. Press Set button to set the value.
<b>Set</b>	Set Z Focus value into the list above.
<b>Advanced</b>	Open 3D param advance dialog.
<b>Slider</b>	Move slider to set value. User has to choose a position first.

**Mark All** Mark all dots when PreMark

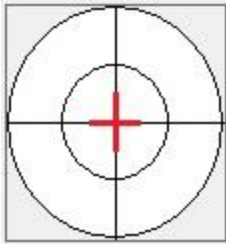
**Mark Selected** Mark selected dots when PreMark

### Features

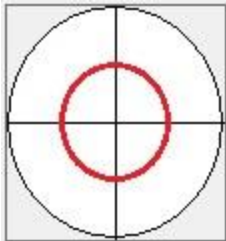
Taking the second concentric circle as an example, there are three positions for inputting [1] the center of the galvo, [2] the first circle outward, [3] the second circle outward, and so on.

You can change the focus axis of each position by dragging the slider at the bottom after you select the corresponding cell in the Z column; or you can directly modify the value and then press the "Set" button to change the position.

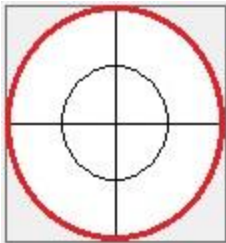
When performing PreMark, different figure will be marked according to the selected position. If you click [1], a cross shape will be marked, as shown in the red area as below figure:



If you click [2], a circle shape will be marked, as shown in the red area as below figure:



If you click [3], a circle shape will also be marked, but the position is different, as shown in the red area as below figure:



### Steps

- Step 1** Adjust the mechanism focus position and select [1] to PreMark the center cross line before any corrections.
- Step 2** Click [2] and PreMark. The system will mark a circle based on the selected position, and then adjust the "**Z Focus**" value. After adjustment, PreMark again until the result is focused.

## MM3D 3.90

- Step 3** Perform step 2 for each circle, until every circles are focused, that is, the Focal Lens Correction is complete.

### Field Position Manager

The user can manipulate the size of the field position and specify the position of the Z axis with this setting. This function can switch the field position of the large field scanner to match the calibration files of different sized working area.

The field position set by the user is the position of the Z axis, which can be used for large field marking operations in accordance with the lens working area and correction file set by the user.

#### Steps

1. Set the marking range and calibration file in the "Field Position Manager" as shown in Figure 1.1.53.

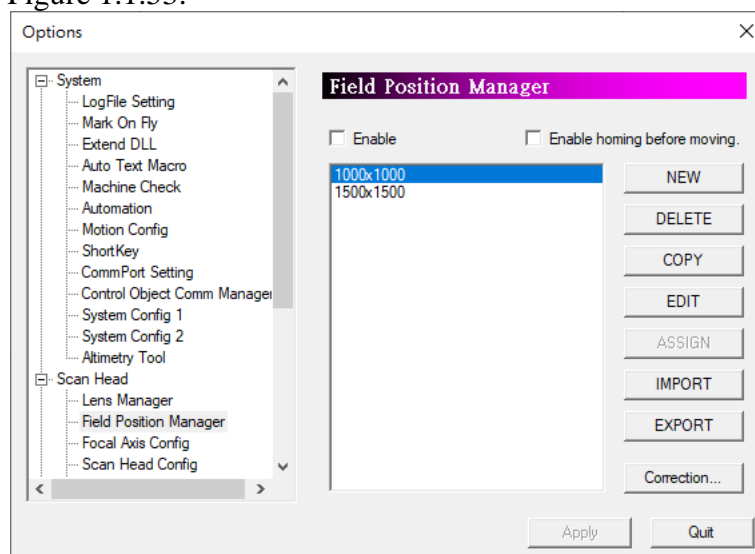
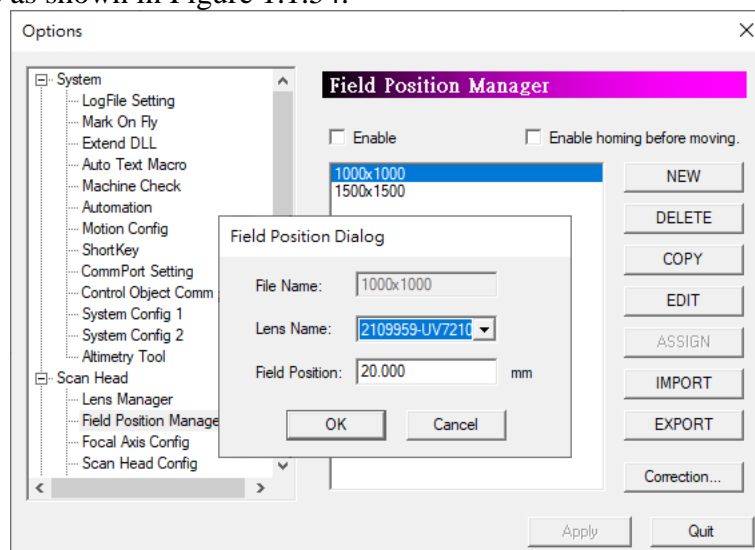


Fig.1.1.53

2. Click "NEW" in the "Field Position Manager", the "Field Position Dialog" will pop up, and you can set the specified field position with the desired lens file and file name as shown in Figure 1.1.54.





## MM3D 3.90

Fig.1.1.54

3. Click "Assign" to check "Enable" to use the Field position function.

### Features

**Enable** Check to activate "Field Position Manager"

**Enable homing before moving.** Check it to start the axis control return to origin before moving.

**NEW** Click to pop up the "Field Position Dialog", you can create a file name, select the "Lens Name" previously set in the "Lens Manager", and set the "Field Position" (mm).

**DELETE** Delete the selected filed position file.

**COPY** Copy the selected filed position file.

**EDIT** Edit the selected filed position file.

**ASSIGN** After selecting the field position file, press "ASSIGN" to perform "Correction..." to the corresponded lens file.

**IMPORT** Import "\*.fps" file

**EXPORT** Export "\*.fps" file

**Correction** Assign the field position file to be correct and press "Correction..." to enter the lens setup.

**Apply** Click to apply all the settings.

**Quit** Leave Field Position Manager

## MM3D 3.90

### Focal Axis Config

Users can enable focal axis for 3D marking application. See fig. 1.1.55



Fig. 1.1.55

**Enable 3D mode** Allow user use 3D marking.

**Enable 3D correction mode** Allow user tune 3D marking detail option.

### Scan Head Config

Users can set the home position of the scanner, see Fig.1.1.56.

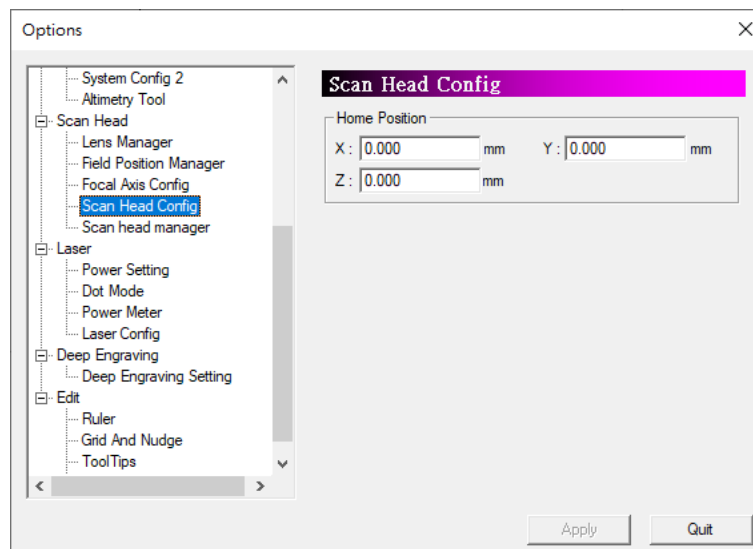


Fig. 1.1.56

**Home Position** Set home position in X and Y direction.

## MM3D 3.90

### Scan head manager

Refer to the concept of "lens manager" to manage PSO related parameters. The "Scan Head Manager" specifies the currently used scan head file. When the user operates the "vPSO Parameter Setting", the scan head file will be referenced, see Fig. 1.1.57

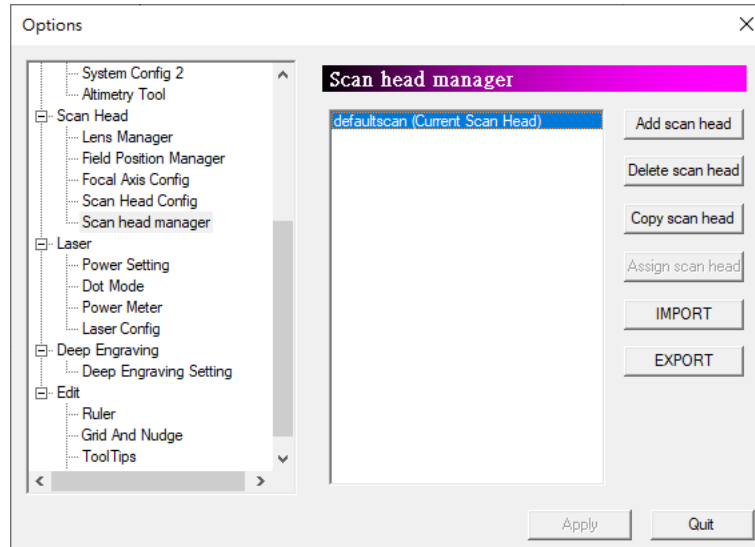


Fig. 1.1.57

### PSO Setting

Users can enable PSO, vPSO function and related settings from here. Refer to Fig.1.1.58 & 1.1.59.

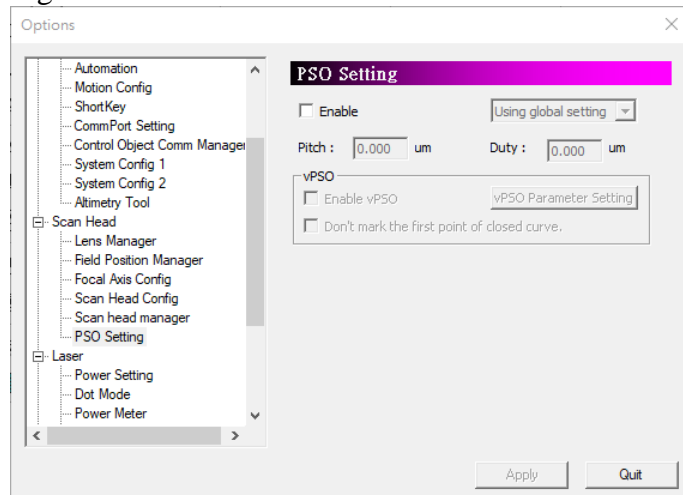


Fig. 1.1.58

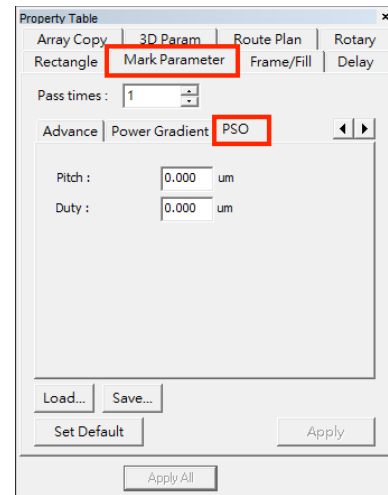


Fig. 1.1.59

### PSO

PSO (Position Synchronized output position synchronous output) function, according to the marking head feedback signal. The system can adjust the laser source output immediately after knowing the current position to achieve the same distance between each laser point effect.

#### Enable

## MM3D 3.90

Enable the PSO function. It needs to be paired with PMC6 card, and the version of IP must be over 1.3.31. Under the program installation directory “**Drivers**”, in the PMC6 folder, HWConfig.exe setting the Scanner Type and please select “**Me-link**”, otherwise the function will not start.

### **Using global setting**

When select “Using global setting”, set the “**Pitch**” and “**Duty**” directly below. The parameters are valid for all new objects.

### **Using object setting**

Select “**Using object setting**”, the “**Pitch**” and “**Duty**” setting field will be anti-gray. If the user needs to do the relevant parameter settings, after selecting objects to the “**Object**” property sheet, “**PSO**” parameter setting page in the “**Marking Parameter**” can be modify or set.

### **Pitch**

The distance between each laser point.

### **Duty**

Open the Laser trigger time, that is the duration of the signal

**Note:** When the settings are complete, press “**apply**” to allow the system to store the settings.

## MM3D 3.90

### vPSO

When marking objects, if the laser is used is the type of light out at a fixed frequency. The galvo will have the problem of laser point spacing too close in the area of the deceleration. With the vPSO function, users can guess the actual path of the galvo, then control the output position of laser, so that each laser point will be the same spacing.

The advantage of this is that it does not require reference to the actual encoder, so that most galvo heads can support this function.

#### Enable vPSO

Enable the vPSO function.

#### vPSO Parameter Setting

Click will appear the set step window, refer to Fig 1.1.60, step-by-step trial adjustment of the best vPSO effect.

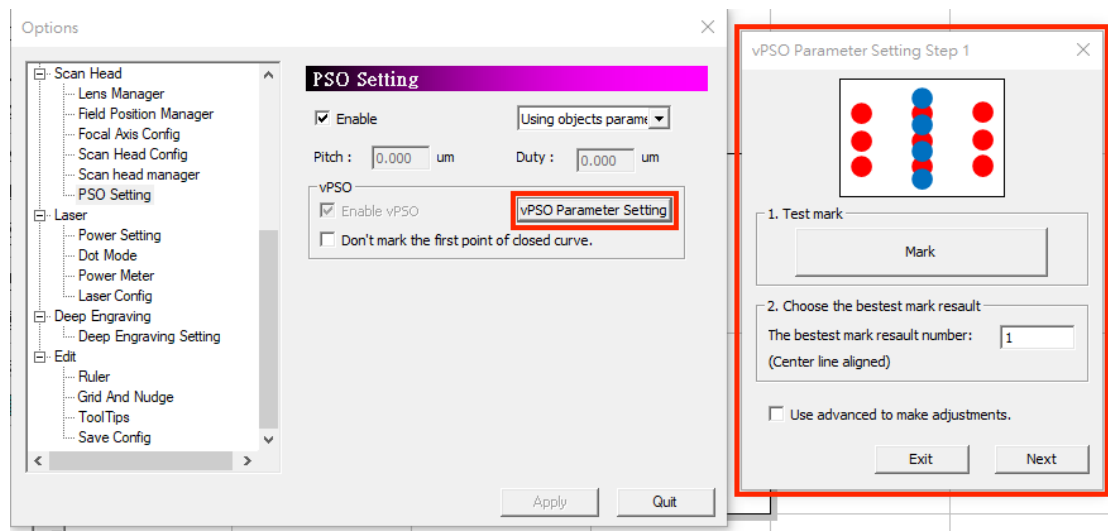
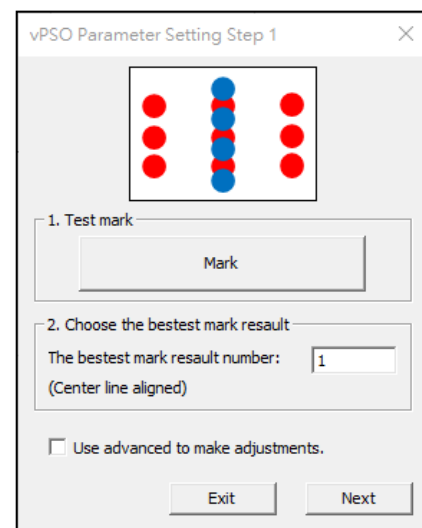


Fig. 1.1.60

Step one, refer to the picture on the right.

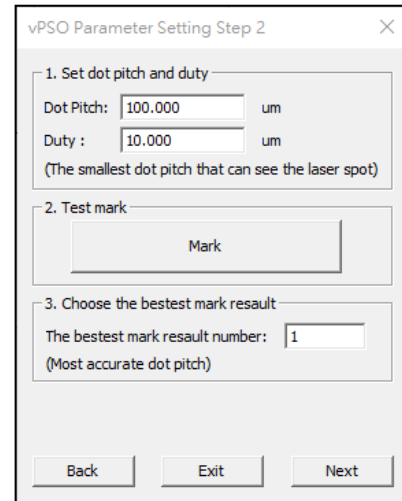
1. Place the marking object and press the "Mark" button.
2. Enter the minimum laser point spacing where the spot can be seen.
3. If you are satisfied with the marking result, press the "Next" button.
4. If you are not satisfied with the results and still need to make adjustments, check "Use advanced to make adjustments" and click the "Next" button.



## MM3D 3.90

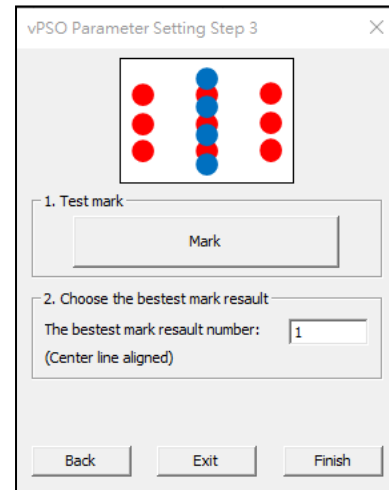
Step two, refer to the picture on the right.

1. Enter the minimum dot pitch at which the spot can be seen.
2. Adjust the pulse width (the default value is 50% duty cycle).
3. Place the marking object and click the "Mark" button.
4. Enter the best marking result number (the point spacing is the most evenly distributed).
5. Press "Next".



Step three, refer to the picture on the right.

1. Place the engraving object and click the "Mark" button.
2. Enter the best marking result number (the point spacing is the most evenly distributed).
3. If you are satisfied with the marking result, press the "Finish" button.



Note: This function only available for 2.7D-3.2, 2.7A-34.38 or later, and PMC6 which need to be IP1.3.65 or above. Laser resource is required to have frequency conversion feature, it means, laser source can emit same power of laser spot while receiving a rising edge. If power of each laser spot will be changing by frequency change, it is not suitable to work with this function.

## MM3D 3.90

### 1.1.7.3 Laser Setting

#### Power Setting

Enable/disable the power settings, see Fig 1.1.61

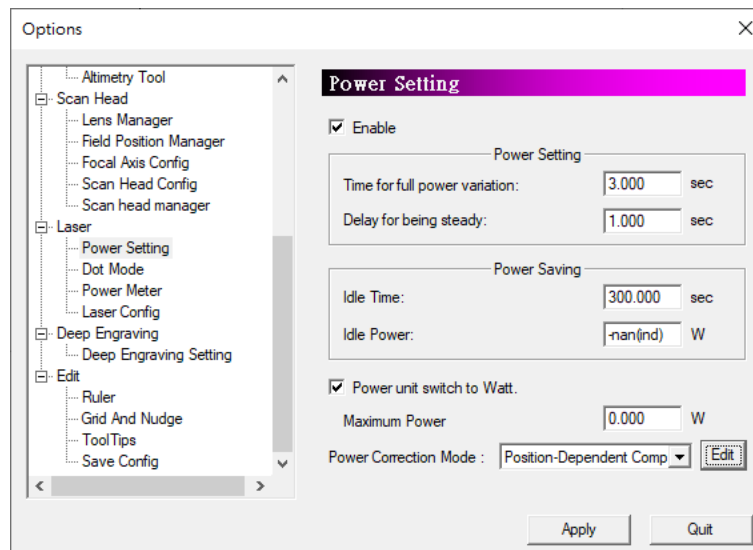


Fig. 1.1.61

#### Power Setting

##### Time for full power variation

Time period from zero to full power

##### Delay for being steady

The time it takes for the power to become steady when the power is full.

#### Power Saving

##### Idle Time

The system will enter to Power Saving Mode after this setting time when the system is idle.

##### Idle Power

Set the power under Power Saving mode.

##### Power unit switch to Watt

Switch the power unit to watts, and all power units will be displayed in watts after applying.

##### Maximum Power

Enter the current wattage of the laser used.

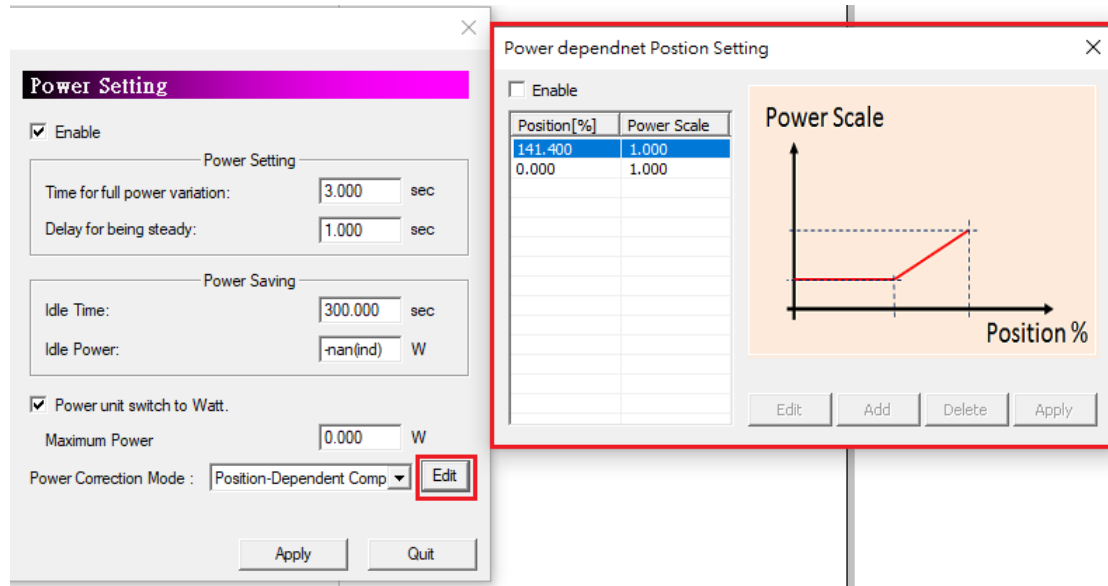
##### Power Correction Mode

**Disable** Disable power correction mode

**Position-Dependent Comp.** According to different processing positions, the laser source power can be adjusted in real time to compensate for the problem of different processing energy in different positions within the marking area. After selecting this option, the "Edit" button will appear next to the option. Click "Edit" and the "Power dependnet Position Setting" window will pop up. Users can edit according to their needs. After the setting is completed, it needs to be applied, as shown in the figure below.

## MM3D 3.90

Note: Only when PMC2e and PMC6 drivers are selected, the "Power Position Follow" function option is available.



### **Edit**

Edit the position value to power ratio value within the selected table.

### **Add**

Add the value for the location and power ratio values.

### **Delete**

Delete the selected value.

### **Apply**

Apply the position value and power ratio value in the table.



## MM3D 3.90

### Dot Mode

Enable this function when requiring a special dot features on the marking object, see Fig.1.1.62. For example, mark a line with dot feature, like Fig.1.1.63. The main purpose of this function is to reach the dot effect through extending the distance and laser staying time of each dot.

*Note: This setting is a global setting. After activation, all new objects drawn will be in spray mode.*

#### Step Distance

Distance between each dot.

#### Step Delay

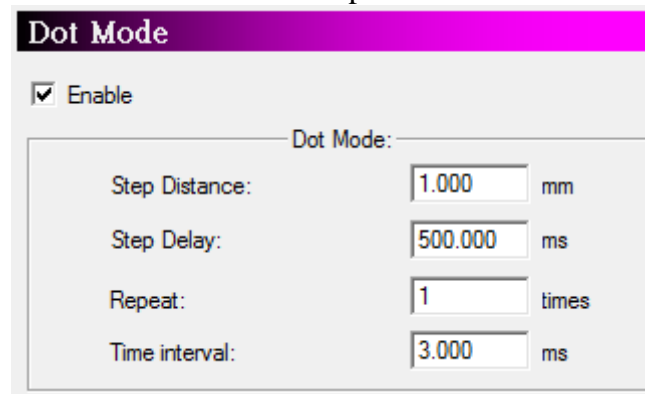
Laser staying time on each dot.

#### Repeat

Set the repeat times for each dot.

#### Time Interval

The time interval between each dot on one spot.



Dot Mode	
<input checked="" type="checkbox"/> Enable	
Dot Mode:	
Step Distance:	1.000 mm
Step Delay:	500.000 ms
Repeat:	1 times
Time interval:	3.000 ms

Fig. 1.1.62

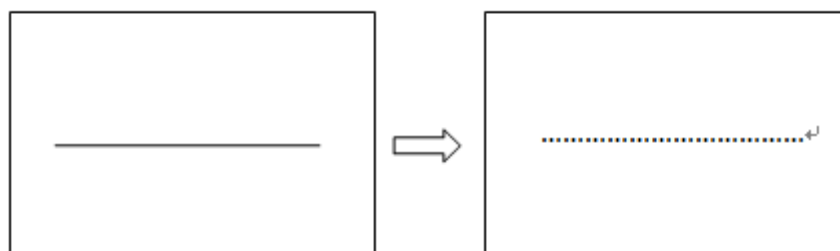


Fig. 1.1.63

## MM3D 3.90

### Power Meter

After starting and setting the power standard value, it can be set to check whether the current power has reached the standard value or correct the power to the standard value before starting each work. Check Enable will activate “Basic Setting”, “Validation”, “Regulation”, “Auto Mode” setting page. Refer to fig.1.1.64.

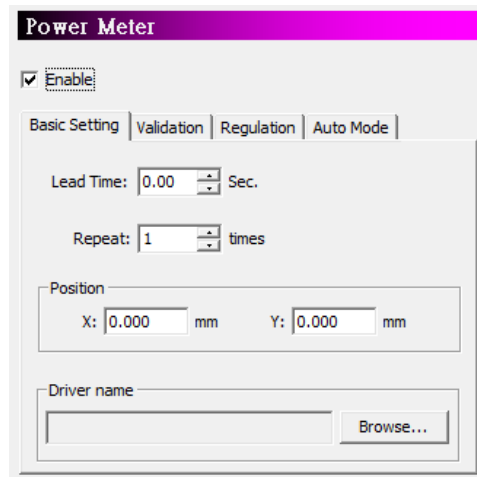


Fig. 1.1.64

#### Basic Setting

##### Lead Time

The duration before starting measuring to wait laser power steady.

##### Repeat

Repeating measurement times after lead time to prevent instability of power.

##### Position X、Y

Scanner position during power measurement.

##### Driver name

Choose a suitable driver for current power meter.

Power validation. Refer to fig.1.1.65.

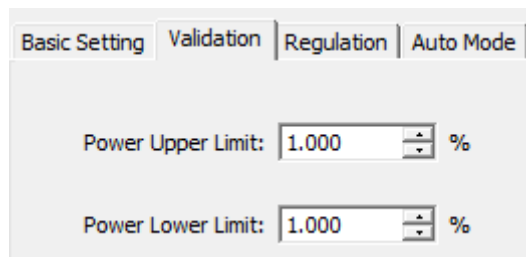


Fig. 1.1.65

#### Validation

##### Power Upper Limit

Power measurement exceed upper limit will get warning message or regulation.

##### Power Lower Limit

Power measurement exceed lower limit will get warning message or regulation.

Power regulation. Refer to fig. 1.1.66.

## MM3D 3.90

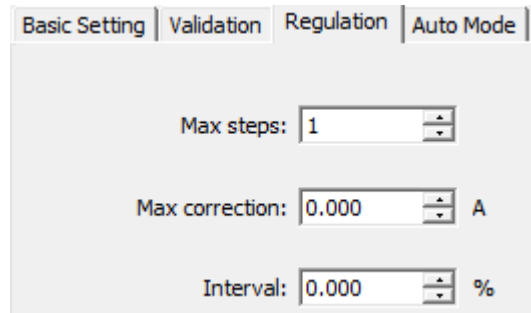


Fig. 1.1.66

### Regulation

#### Max steps

Max regulation steps setting. Exceed steps and still not reaches target power will get warning message.

#### Max correction

Max regulation range.

#### Interval

The power compensate value of each time. If it is too large, may cause compensate failure. If it is too small, may cause compensate invalid.

Auto Mode. Refer to fig.1.1.67.

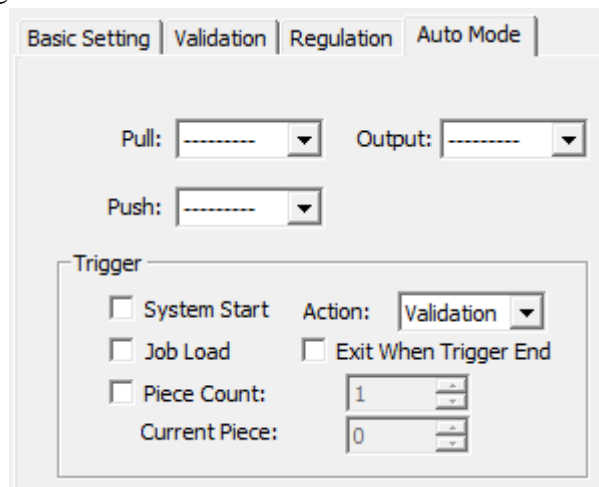


Fig. 1.1.67

### Auto Mode

#### Pull

Power meter in position signal when pull back.  
High Active.

#### Push

Power meter in position signal when push out. High Active °

#### Output

Power meter position signal. High: Push. Low: Pull.

#### Trigger

#### System Start

Check this option will active power validation or regulation when system is started.

#### Action

Select between regulation and validation when triggered.

## MM3D 3.90

- Job Load** Check this option will active power validation or regulation when open any document.
- Exit Wneh Trigger End** Check this option to turn off power meter function automatically when validation or regulation is done.
- Piece Count\ Current Piece** Check this option will active power validation or regulation during marking progress.

## MM3D 3.90

### Laser Config

Allow users to do some laser related settings, see Fig.1.1.68.

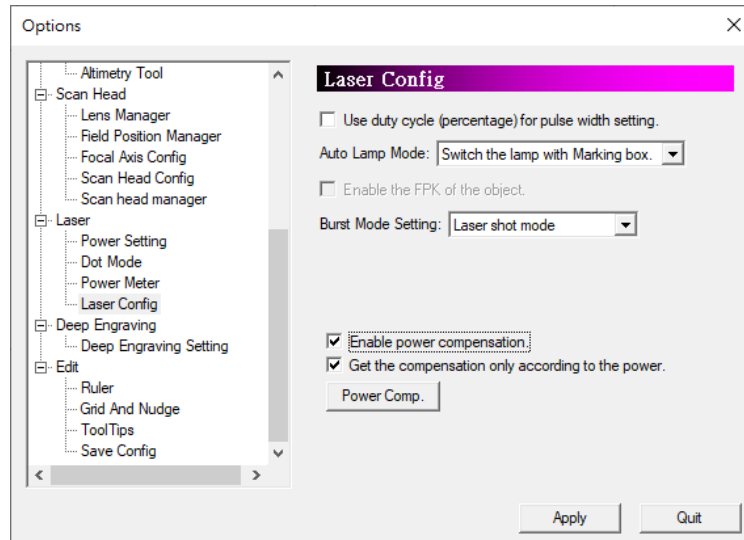


Fig. 1.1.68

#### **Use duty cycle (percentage) for pulse width setting**

Use the percentage of (pulse/oscillogram) to set the pulse width instead of setting the continuous time of pulse directly.

#### **Auto Lamp Mode**

The lamp can be selected to switch with the marking dialogue box or the marking system.

#### **Enable the FPK of the object**

Allow using different FPK for each object when marking.

#### **Burst Mode Setting**

When the marking object is vertex, image or barcode, users can select the spot marking mode.

#### **Spot delay mode**

This is the default setting. Spot delay means the time laser takes to mark a dot. Users can set the “Spot Delay” time in the ‘Mark Parameter’ page of the Property Table while select this mode, see Fig.1.1.69.

#### **Laser shot mode**

This option controls the amount of laser shot on each dot. Users can set the “Laser Shot” count in the “Mark Parameter” page of the Property Table while select this mode, see Fig.1.1.70.

## MM3D 3.90

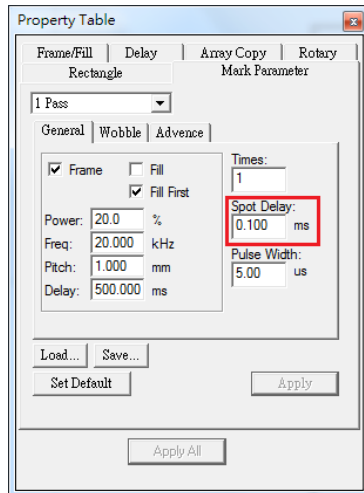


Fig. 1.1.69

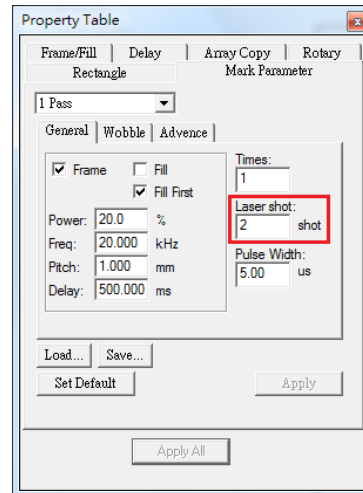


Fig. 1.1.70

### Enable power compensation

When marking an object, if a compensation record that matches the object's "power", "frequency", and "pulse width" is found from the power calibration table, the system will perform power compensation by multiplying the object's power by the ratio of the record.

If there is no record that matches the "power", "frequency", and "pulse width" of the object, no power compensation will be performed.

### Get the compensation only according to the power

When marking an object, the system will find a record that matches the "power" of the object from the power calibration table, and multiply the object power by the ratio of the record for power compensation.

If there is no record for interpolation calculation in the item list, the system will use the preset "power 0%, ratio of 1.0" and "power 100%, ratio of 1.0" for interpolation calculation.

### Power Comp.

The user can modify and set the compensation value, as shown in the figure 1.1.71..

# MM3D 3.90

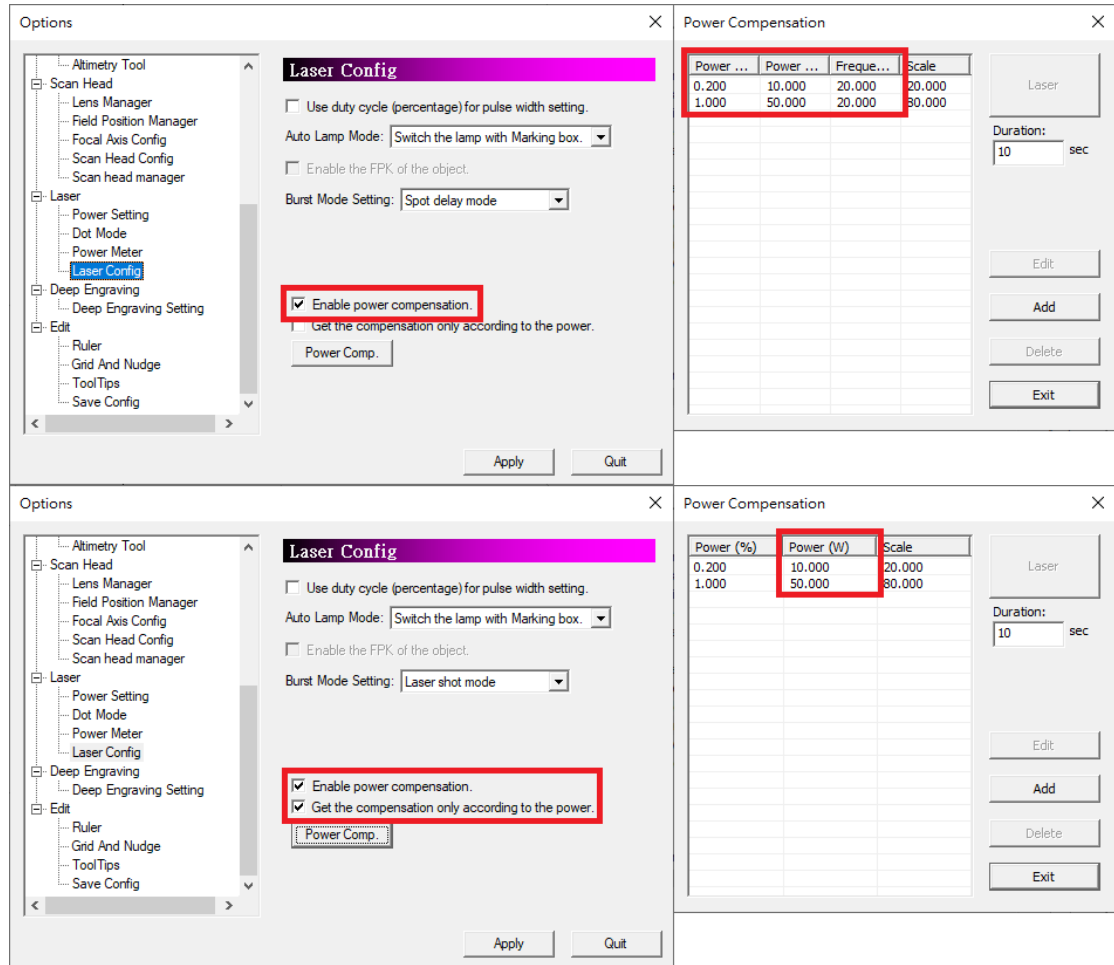


Fig. 1.1.71

# MM3D 3.90

## 1.1.7.4 Deep Engraving

### Deep Engraving Setting

Allow user select which part move to control Z altitude. Refer to fig.1.1.72.

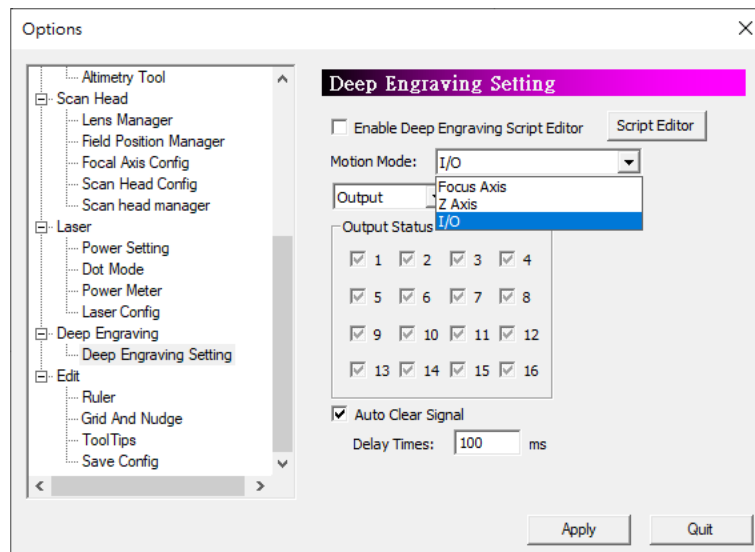


Fig. 1.1.72

#### Motion Mode

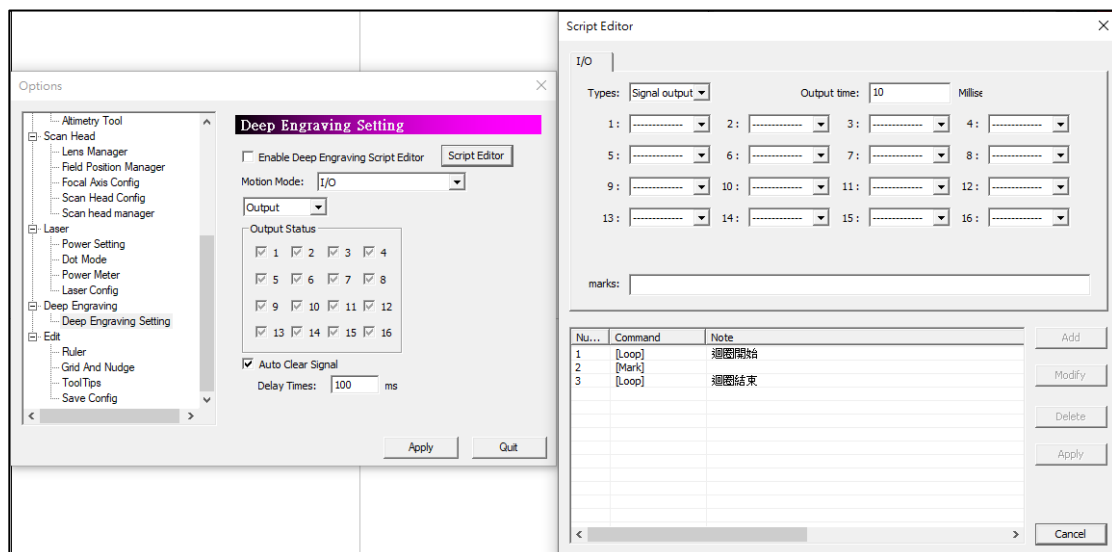
Select a method between focus axis, Z axis table move or I/O signal.

#### Enable Deep Engraving Script Editor

Tick it to start the script editor function; set the I/O signals for each layer of deep carving.

#### Script editor

The script editor setting window will pop up by clicking the button, as shown in the figure below.



#### Slice Mark Direction Reverse

After checking this box, you can switch



## MM3D 3.90

to start processing from the bottom layer to the top layer

### Slice motor reverse

After checking this box, the motor will move in reverse

### 1.1.7.5 Edit

Set the edit function of the system, such as display the ruler and grid or dot. The checked options will be the default value. See Fig.1.1.73.

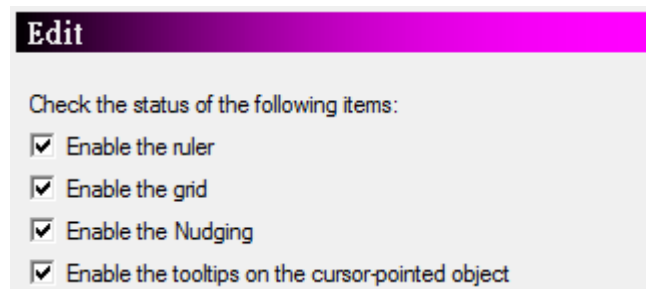


Fig. 1.1.73

### Ruler

Enable/disable the ruler to appear on the work area, see Fig.1.1.74. Use ruler can help user measure the actual size of the object.

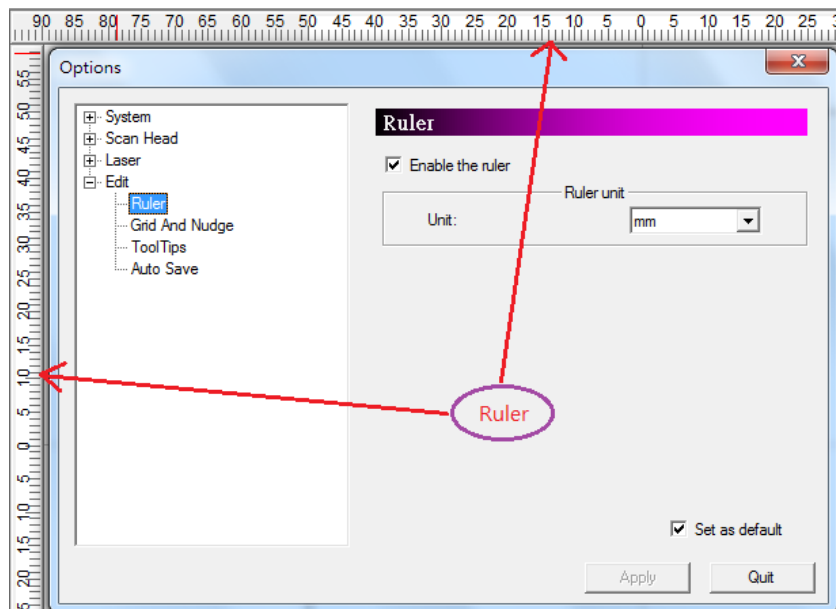


Fig. 1.1.74

**Enable the ruler** Display the ruler

**Ruler Unit:** mm or inch

# MM3D 3.90

## Grid and Nudge

Enable/disable the grid and nudging, see Fig.1.1.75.

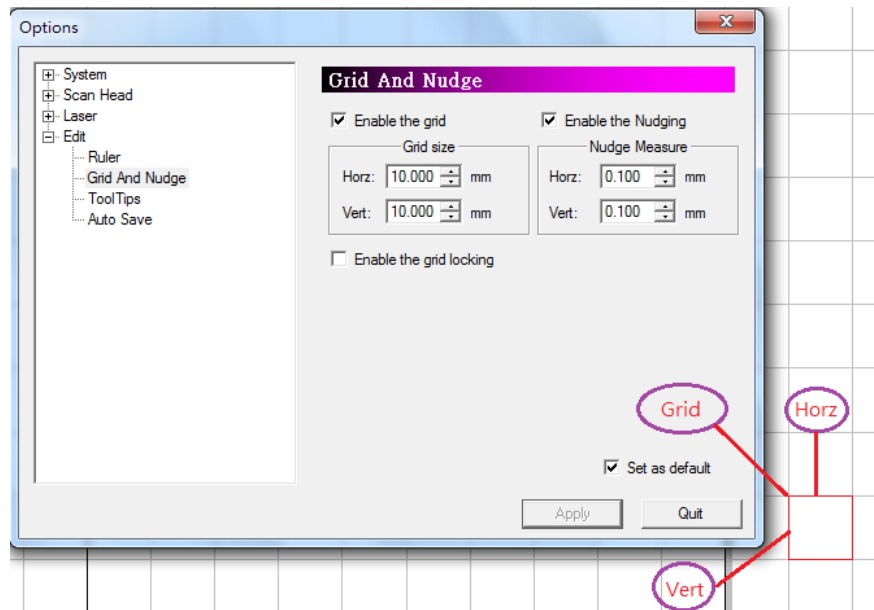


Fig. 1.1.75

Grid is used to help users measure the actual size of the object.

**Enable the grid/Nudging** Enable the grid/ Nudging function

### Grid Size / Nudge Measure

**Horz** Horizontal width

**Vert** Vertical width

### Enable the grid locking

Enable/disable the grid locking function. Enable this function allows users to adjust the size and position of selected object more accurate. The system will automatically lock a grid if the mouse pointer is close to that grid when users create or move an object.

# MM3D 3.90

## ToolTips

Settings about tips of objects, see Fig.1.1.76.

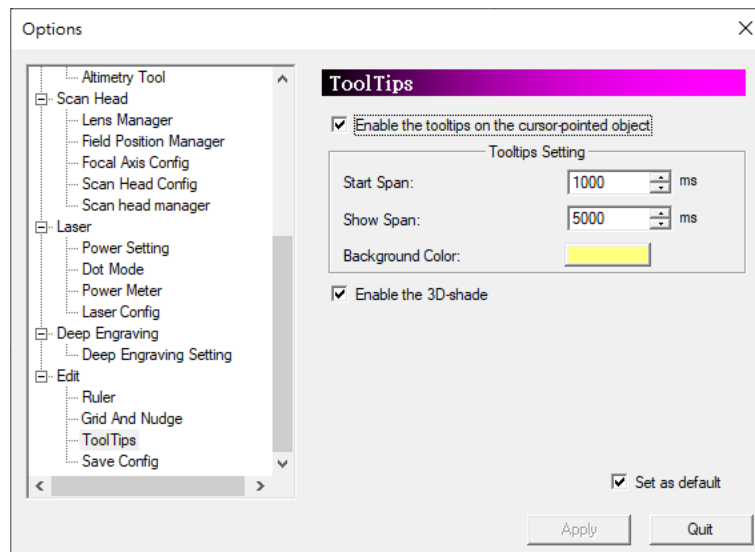


Fig. 1.1.76

### Enable the ToolTips on the cursor-pointed object

ToolTips shows the info of the selected objects, see Fig.1.1.77.

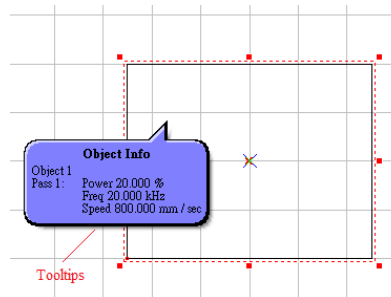


Fig.1.1.77

### ToolTips Setting

**Start Span** Span for ToolTips to appear.

**Show Span** ToolTips continue time.

**Background Color** Background color of ToolTips.

**Enable the 3D-shade** Enable/disable the 3D-shade.

## MM3D 3.90

### Save Config

Enable auto save document every certain duration of time passed. Refer to fig.1.1.78.

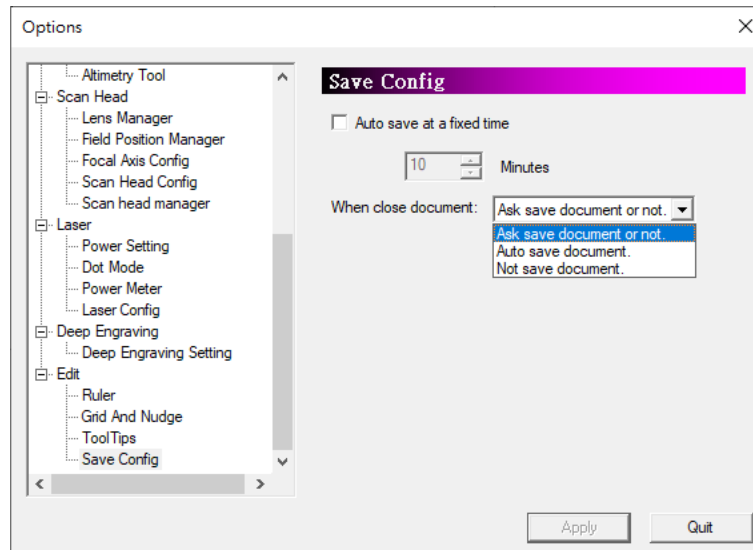


Fig.1.1.78

#### **Auto save at a fixed time**

Auto save document every certain duration of time is passed

#### **When close document**

Before a document is closed, system will ask user to save file, auto save without asking, or close without saving.

## MM3D 3.90

### 1.1.8 Import

This function allows user to import an image file that was not originally created by MM3D, such as \*.bmp or \*.dxf. The system will automatically convert that file into a format supported by MM3D after using import function, see Fig.1.1.79. If the import object is a group or combine object, users can use “Ungroup” or “Break” function to break that object into several individual objects.

Import the required files and graphics and display them in the files in use. The system will pop up the "Import Graphics" dialog box

After the graphics are imported, a dialog box will appear for the user to set the position of the graphics

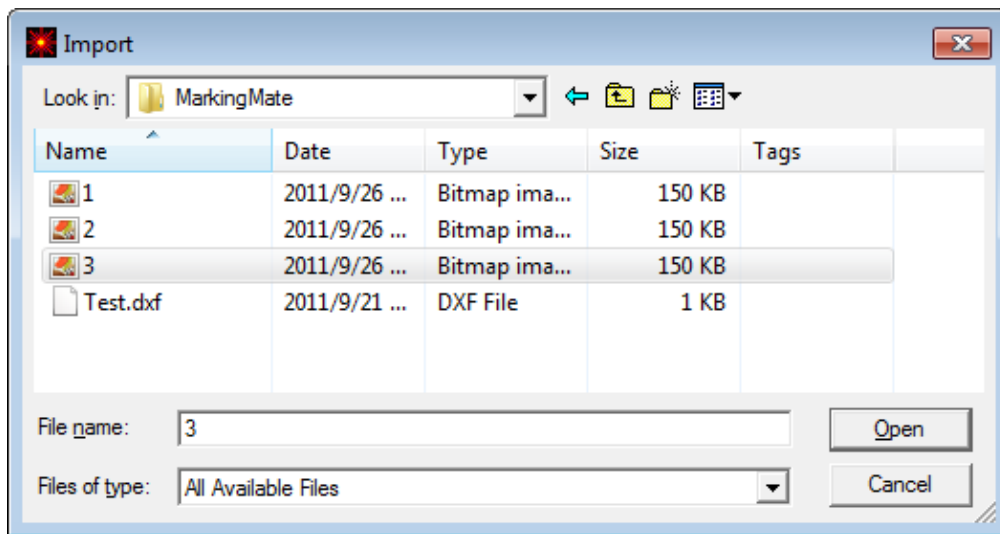


Fig. 1.1.79

#### Method(Choose one of three):

5. Click “File” from Menu Bar and select “Import” function.

6. Click the  button from the Toolbar

7. Press the [Ctrl+I] key from keyboard.

**Look in** Select the directory of the file.

**File name** Type or select the file name to import.

**Files of type** **MM3D** allows users to import various file types such as:  
DWG/DXF/PLT/CNC/GBR/DST/AI/BMP/EMF/PNG/PCX/CMP/FPX/CAL/ICO/JPG/XML/EPS/CLP/WMF/TIF/CUR/PSD/TGA/TIFF.

## MM3D 3.90

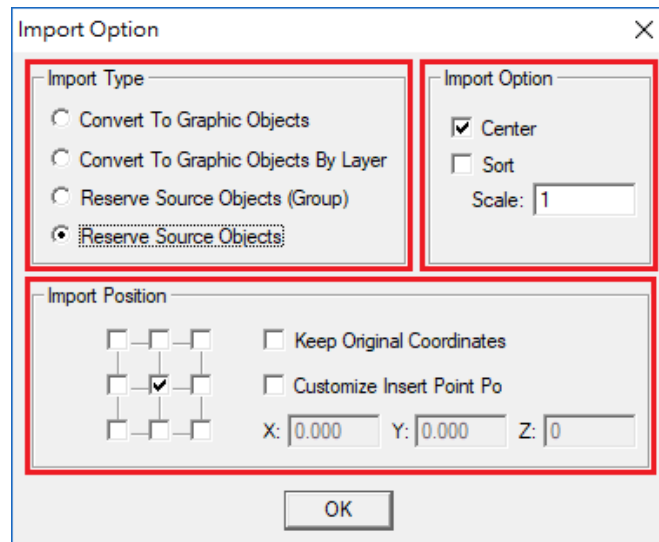


Fig. 1.1.80

### Import Type

#### Convert to Graphic Obj

When import “\*.DXF” file, these options are usable.

Convert all objects in DXF into one Graphic object.

#### Convert to Graphic Obj By Layer

Convert all objects under one layer into one Graphic object.

#### Reserve Source Obj

Keep all objects type from DXF.

#### Reserve Source Obj(Group)

Keep all objects type from DXF and combine all objects into one group.

### Import Option

#### Center

Put imported objects at center.

#### Sort

Automatically sort imported objects to improve marking efficiency.

#### Scale

Change imported objects size with scale ratio.

### Import Position

#### Keep Original Coordinates

Import objects at relative 3 by 3 grid.

Import objects at the original coordinates.

#### Customize Insert Point Po

User define import position.

## MM3D 3.90

### 1.1.9 Export DXF

This allows users to transfer the current document into .dxf file format for AutoCAD or other applications which can use this type of file.

Click “File” from Menu Bar and select “Export DXF” function, a dialogue box as Fig.1.1.81 will appear.

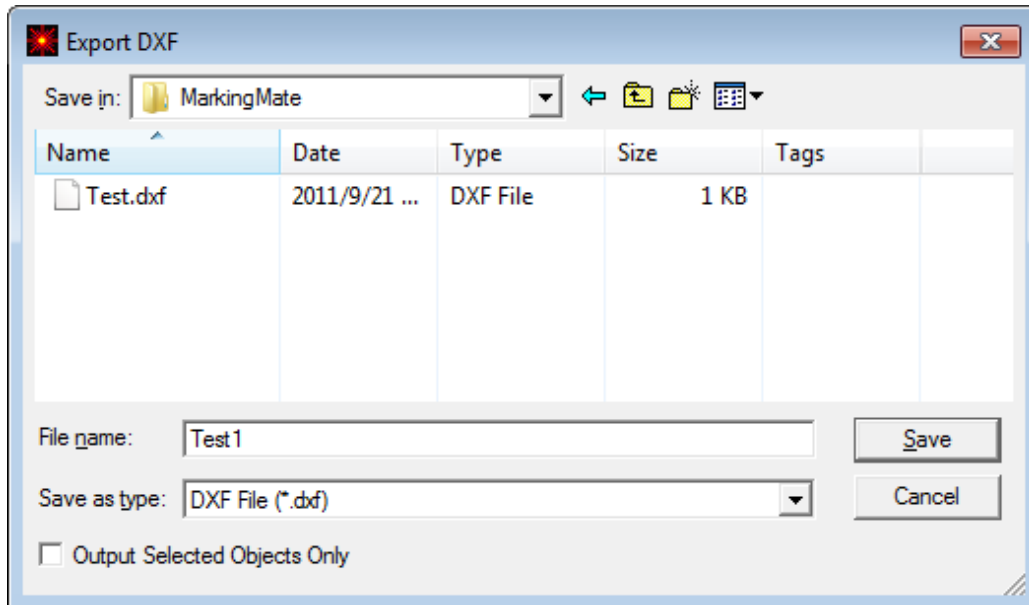


Fig. 1.1.81

- File Name** Input file name or select from the list.
- Save as type** DXF File (\*.dxf)
- Output Selected Objects only** Choose to output the selected object only or not.

### 1.1.10 Select TWAIN Device

Select a supported scanner, see Fig.1.1.82.

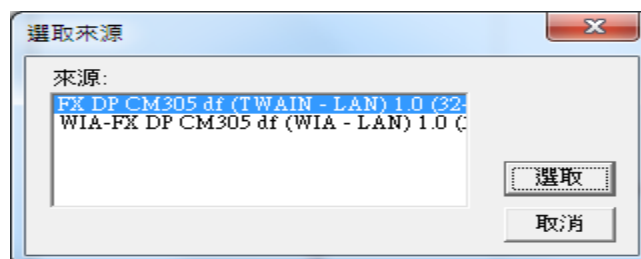


Fig.1.1.82

### 1.1.11 TWAIN Acquire

Use this function to set image parameters such as size and resolution, the interface is provided from the scanner’s manufacturer.

## MM3D 3.90

### 1.1.12 Configuration Import/Export

Using this function to back-up or restore current configuration, such as application configuration, object default setting, driver configuration, CVP, Scan head settings, lens setting, machine check configuration, Auto Text Config and lens correction file.

#### Method:

##### Export:

1. Click on “File”→“Configuration Import/Export” to bring out dialog seen as fig. 1.1.83.
2. Check the options desire to export then choose a folder by clicking on “...” button or enter the folder directly. After that click on the “**Export**” button. Please notice that “\*.len (Lens cor. file)” is only supported in version 2.4., thus this option is for import only.

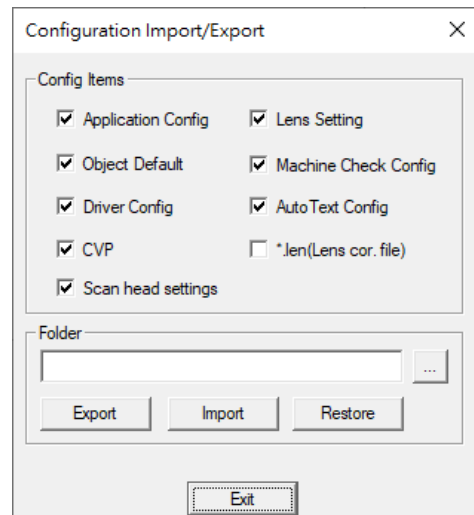


Fig. 1.1.83

3. When a file name is repeated, a dialog box will appear, asking for confirmation to overwrite, ignore, or rename seen as fig. 1.1.84.
4. After the export is completed, the system will request a restart. At this time, click "OK" to restart the software, and the export will be completed.

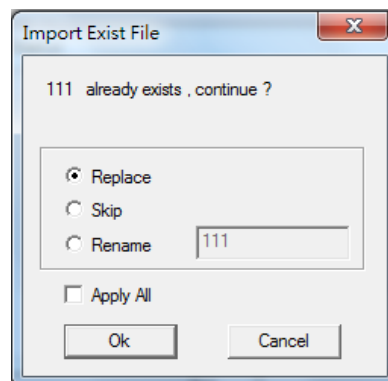


Fig. 1.1.84



## MM3D 3.90

### Import:

1. Click on “File” → “Configuration Import/Export” to bring out dialog seen as fig. 1.1.83..
2. Check the options desire to import then choose a folder by clicking on “...” button or enter the folder directly. After that click on the “**Import**” button.
3. If a same file name is already existed, will pop-up a dialog to confirm to replace, skip, or rename the file. See fig. 1.1.85.
4. After import is completed, click on “**Yes**” when asking to restart the software.

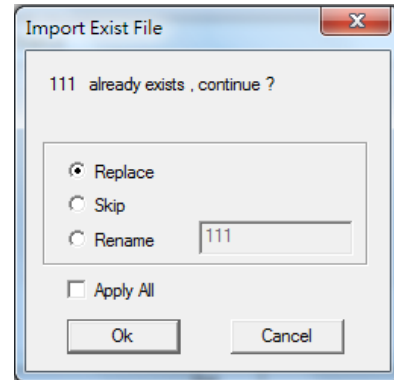
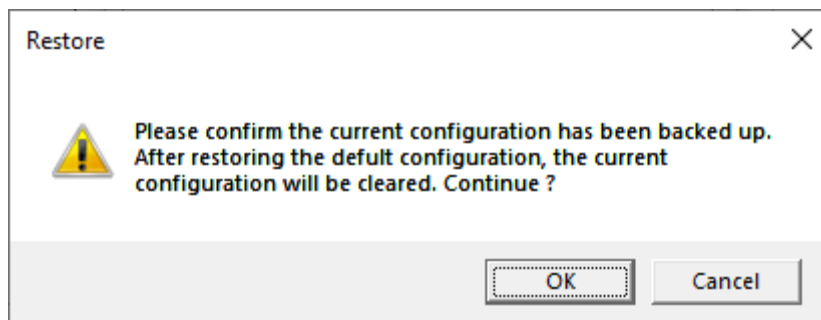


Fig. 1.1.85

### Restore

Use this function to restore the system's default configuration settings. After clicking restore, the system will pop up a window to remind you whether the currently set configuration parameters have been exported and backed up. If you perform a restore action, the current configuration will be cleared, as shown in the figure below.



## MM3D 3.90

### 1.1.13 Change Language

This function allows user to change the system to different language version. There are now five language versions for user to select: English, Simplified Chinese, Deutsch, Japanese and Traditional Chinese, see Fig.1.1.86.

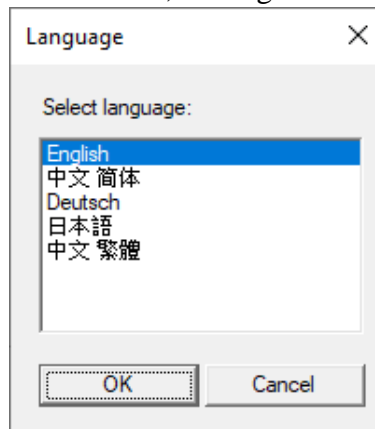


Fig. 1.1.86

### 1.1.14 Print

Using this function, the system will output all the data in the current file to the designated printer and print it. As shown in Figure, see Fig.1.1.87.

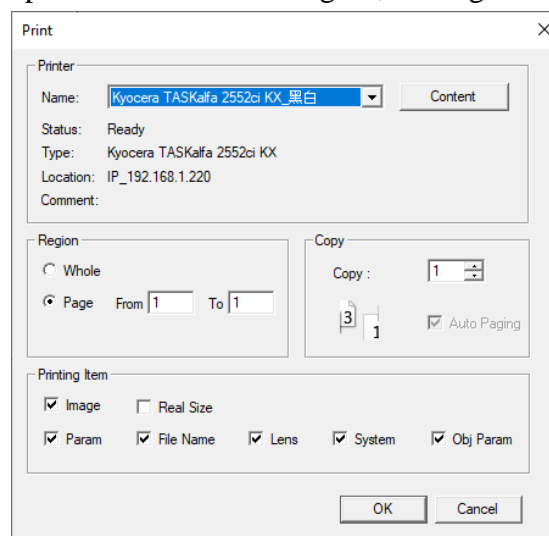


Fig. 1.1.87

#### **Method:**

Click "File" from Menu Bar and select "Print" function or press the [Ctrl+P] key from keyboard

#### **Printer**

**Name** Select the printer

**Content** Further setting for printer. The settings are different from the manufacture of the printer.

## MM3D 3.90

**Region** Select the region user want to print

**Whole** Print all of the data in the work area

**Page** Print the selected page(s).

**Copy** Select the number of copies user want to print

**Printing Item** Select the items users want to print (image, real size, parameter, file name, lens, system, or object parameter)

## MM3D 3.90

### 1.1.15 Preview

When this function is used, the "Print Preview" window will pop up to display the printed results. You can view the files that need to be printed by using the function buttons on the bar. The function bar is shown in Figure 1.1.88. You can click "Print" to activate the printing function, or select "Close" to return to the program to continue editing.

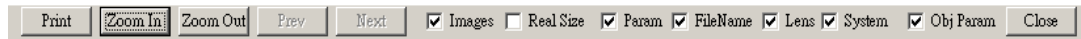


Fig. 1.1.88

**Print** – Go directly to the Print menu and start printing

**Zoom In** – Magnify the current image.

**Zoom Out** – Minify the current image.

**Prev/Next** – Allow users to go back and forth between pages of the document in this mode

**Images, Real size, Param, File Name, Lens, System, Obj Param** – Select the parameters users want to display while printing.

**Close** – Return to the edit menu

### 1.1.16 Printer setting

Further setting about the printer, see Fig.1.1.89.

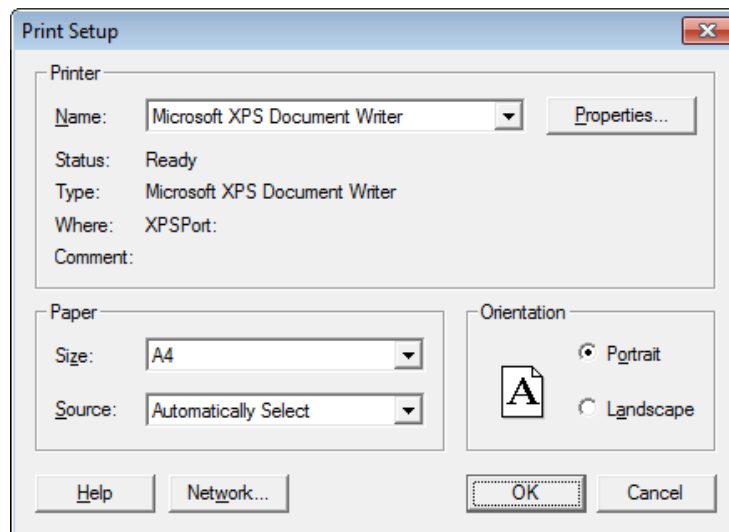


Fig. 1.1.89

**Printer**

Select the printer

**Paper**

Select the paper source

**Direction**

Select horizontal or vertical print

**Content**

Detail printer setting

## MM3D 3.90

### 1.1.17 MRU File

It will show “MRU File” if it’s the user’s to run software, see Fig.1.1.90. Otherwise, it will display the previous used files (maximum 4 files), see Fig.1.1.91.



Fig. 1.1.90

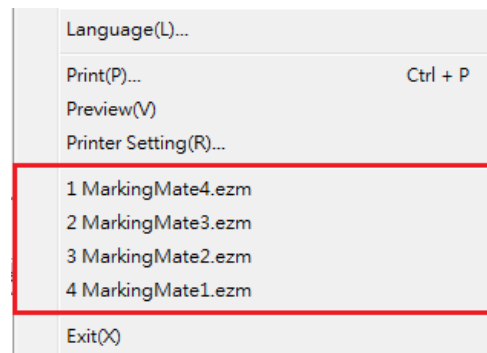


Fig. 1.1.91

### 1.1.18 Exit

Exit software system.

#### Method:

- Click “File” from Menu Bar and select “Exit” function.
- Click the upper right button, see Fig.1.1.92.

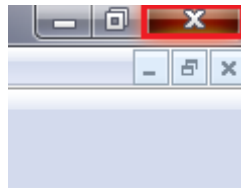


Fig. 1.1.92

- Click the upper left icon  to exit the system, see Fig.1.1.93.

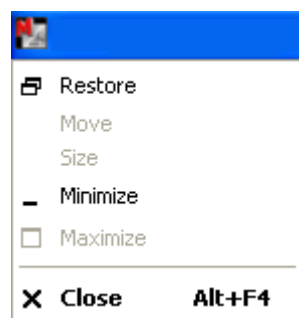


Fig. 1.1.93

- Press the [Alt + F4] key from keyboard.

## MM3D 3.90

### 1.2 Edit Menu

“Edit” menu offers the following functions:

<b>Redo</b>	Cancel the “Undo” action
<b>Undo</b>	Cancel the last time edit
<b>Cut</b>	Remove selected data and store it in the clipboard for another use
<b>Copy</b>	Duplicate selected data and store it in the clipboard for another use
<b>Paste</b>	Attach data from the clipboard to an assigned document
<b>Delete</b>	Delete and remove the selected data
<b>Select All</b>	Select all objects, including objects which are not located in working area.
<b>Select Invert</b>	Select the objects which are un-selected, including objects which are not located in working area and cancel the selected ones.
<b>Replace...</b>	Substitute the selected object by importing assigned object.
<b>Combine</b>	Combine two or more objects into one. This function allows several objects to share the same property settings
<b>Break</b>	Break on object into several objects.
<b>Group</b>	Combine two or more objects into one group.
<b>UnGroup</b>	Do the inversion of Group function
<b>Move to New Layer</b>	System will create a new layer and move the selected object to that new layer.
<b>Sort</b>	Sort the connected parts of the selected object
<b>Reverse</b>	Set the object’s start point as end point and the end point become the start point.
<b>Mirror Horz</b>	Invert an image on its horizontal axis. Left will become right and vice-versa
<b>Mirror Vert</b>	Invert an image on its vertical axis. Up will become down and vice-versa
<b>Move to Center</b>	Move the object to the center of working area.
<b>Baseline</b>	Align selected text along a designated path
<b>Split</b>	Do the inversion of baseline function
<b>Trans-Curve</b>	Transfer an object in to a curve line.
<b>Nudge</b>	Set the nudge measure of an object when using the direction key of keyboard to move that object.
<b>Jump Cross</b>	Make the intersects of two objects turn into two objects without crossing
<b>Welding</b>	Make the selected objects do vector combination.

## MM3D 3.90


<b>Contour</b>	This function will create an outline from a selected bitmap image
<b>Transfer to Image</b>	Transfer the selected objects into an image
<b>Align</b>	Adjust the selected objects' position according to the assigned alignment.
<b>Distribute</b>	Adjust the selected objects' position according to the assigned distribution.
<b>Mold Out Line</b>	Get a frame for a model.

## MM3D 3.90

### 1.2.1 Redo

Cancel the “Undo” action. If this function was grayed, it means it is disable to use. The maximum times of “Redo” are 20.

#### Method:


8. Click “Edit” from Menu Bar and select “Redo” function.
9. Click  button from Standard Bar.
10. Press [Ctrl+Y] from keyboard.

### 1.2.2 Undo

Back to the previous edit action. If this function was grayed, it means it is disable to use.

The maximum times of “Undo” are 20.


#### Method:

- Click “Edit” from Menu Bar and select “Undo” function.
- Click  button from Standard Bar.
- Press [Ctrl+Z] from keyboard.

### 1.2.3 Cut

Remove selected data and store it in the clipboard for another use. If no data or object is selected, this function will be disabled.


#### Method:

- Click “Edit” from Menu Bar and select “Cut” function.
- Click  button from Standard Bar.
- Press [Ctrl+X] from keyboard.

### 1.2.4 Copy

Duplicate selected data and store it in the clipboard for another use. If no data or object being selected, this function will be disabled.

#### Method:

- Click “Edit” from Menu Bar and select “Copy” function.
- Click  button from Standard Bar.
- Press [Ctrl+C] from keyboard.




## MM3D 3.90

### 1.2.5 Paste

Attach data from the clipboard to the current document. If there is nothing stored in clipboard, this function will be disabled.

#### Method:

- Click “Edit” from Menu Bar and select “Paste” function.
- Click  button from Standard Bar.
- Press [Ctrl + V] from keyboard.

### 1.2.6 Delete

Delete the selected data, and the data will not be stored in the clipboard.

#### Method:

- Click “Edit” from Menu Bar and select “Delete” function.
- Press [Del] from keyboard.

### 1.2.7 Select All

Select all objects, including objects which are not located in working area.

#### Method

- Click “Edit” from Menu Bar and select “Select All” function.
- Press [Ctrl + A] from keyboard.

### 1.2.8 Select Invert

Select the objects which are un-selected, including objects which are not located in working area and cancel the selected ones.


#### Method

- Click “Edit” from “Menu Bar” and select “Select Invert” function.

### 1.2.9 Replace

Substitute the selected object by importing assigned object.

#### Method


- Click “Edit” from Menu Bar and select “Replace...” function.
- Click  button from Standard Bar.

## MM3D 3.90

### 1.2.10 Combine

Combine two or more objects into one. This function will allow several objects to share the same property settings. Under the fill situation, the odd number overlapping parts of objects will be filled in color, while the even numbers parts will not, see Fig.1.2.01.

#### Method:

- Click “Edit” from Menu Bar and select “Combine” function.
- Click  button from Standard Bar.
- Press [Ctrl+K] from keyboard.

Example:

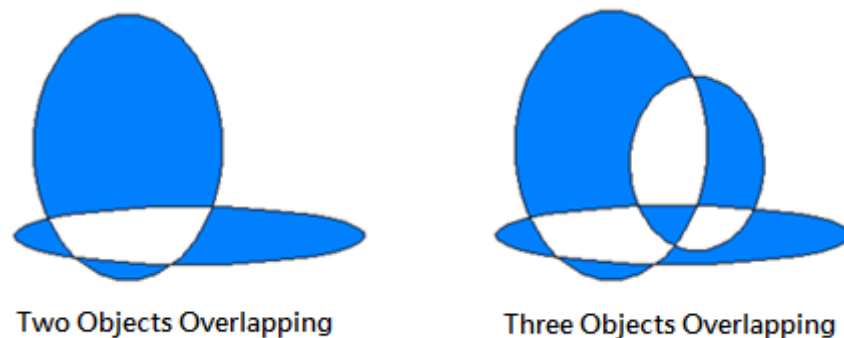



Fig. 1.2.01

### 1.2.11 Break

Divide a combined object into several individual objects.


#### Method:

- Click “Edit” from Menu Bar and select “Break” function.
- Click  button from Standard Bar.
- Press [Ctrl+B] from keyboard.

### 1.2.12 Group

Classify two or more objects into one group. This function will allow several objects to move together while allowing their individual property settings to remain intact. Notice: the maximum amount of group’s layer is 15.

#### Method:


- Click “Edit” from Menu Bar and select “Group” function.
- Click  button from Standard Bar.
- Press the [Ctrl+M] from keyboard.

## MM3D 3.90

### 1.2.13 UnGroup

Cancel the group effect of an object.

#### Method:

- Click “Edit” from Menu Bar and select “UnGroup” function.
- Click  button from Standard Bar.
- Press the [Ctrl+Q] from keyboard.

### 1.2.14 Move to New Layer

System will create a new layer and move the selected object to that new layer.

#### Method

- Click “Edit” from Menu Bar and select “Move to New Layer” function.

### 1.2.15 Sort

Sort the segments or objects which are not arranged in order, see Fig.1.2.02 and Fig.1.2.03. Please note that the objects users want to sort must be combined first. The arrow in the image is the start point of the object.

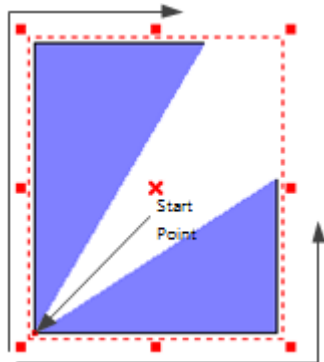


Fig. 1.2.02

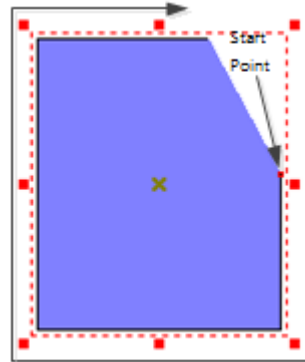

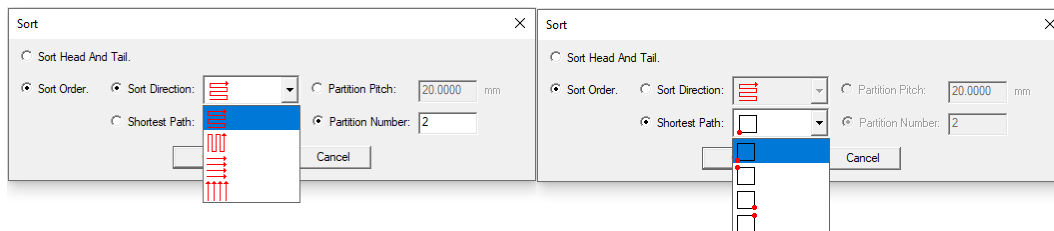



Fig. 1.2.03

#### Method:


- Click “Edit” from Menu Bar and select “Sort” function.
- Click  button from Standard Bar.

The sorting function interface is as shown in the figure below.



**Sort Direction**  Choose the sort order direction of the objects, there are four orders to choose from.

## MM3D 3.90

**Shortest Path**  Choose the starting point for the shortest path

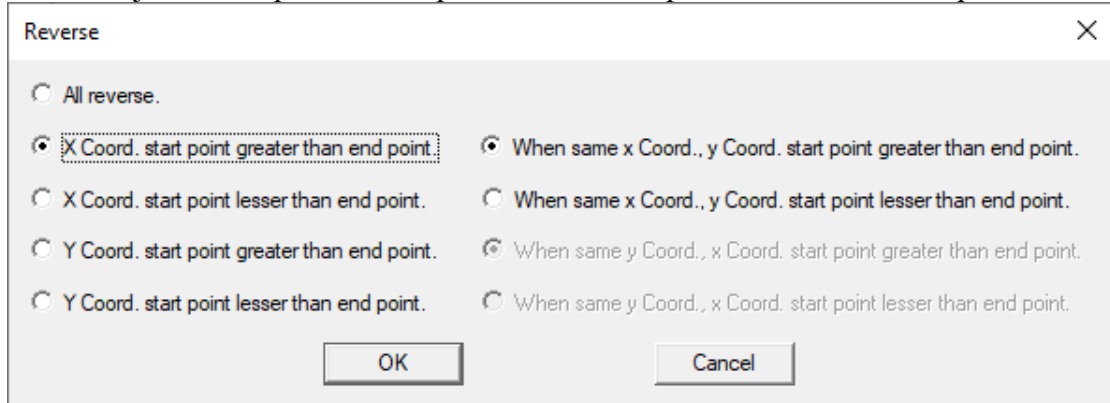
**Partition Pitch** Set the size of the sort partition in the composite object.

**Partition Number** Set the number of partitions in the composite object.

# MM3D 3.90

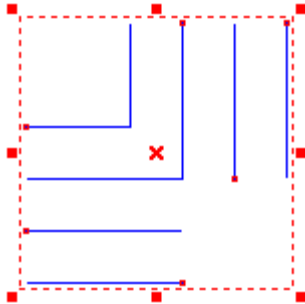
## 1.2.16 Reverse

Set the object's start point as end point and the end point become the start point.

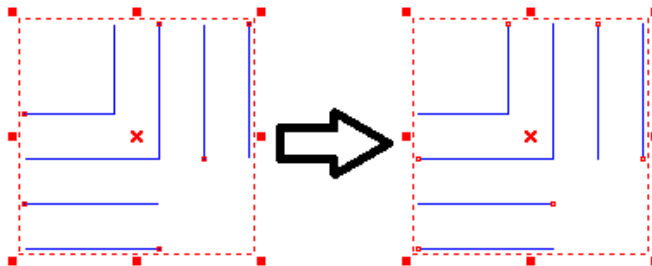


### Method:

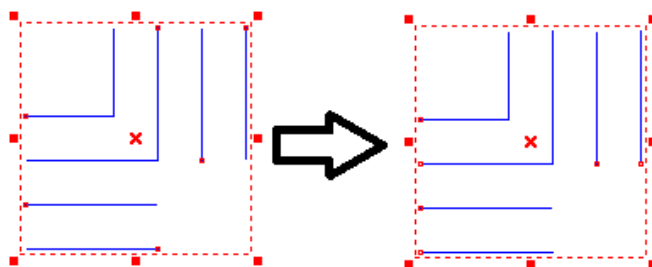
Click "Edit" from Menu Bar and select "Reverse" function. Each function shown as following graphs:



### All Reverse

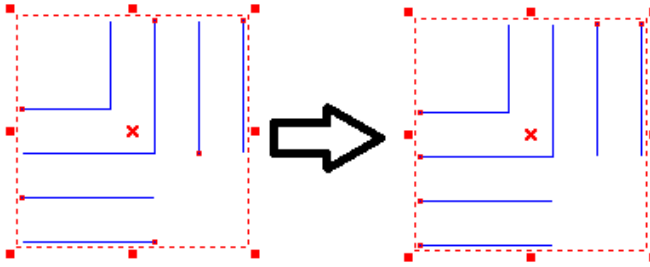


**X Coord. start point greater than end point. When same X Coord., Y Coord. start point greater than end point.**

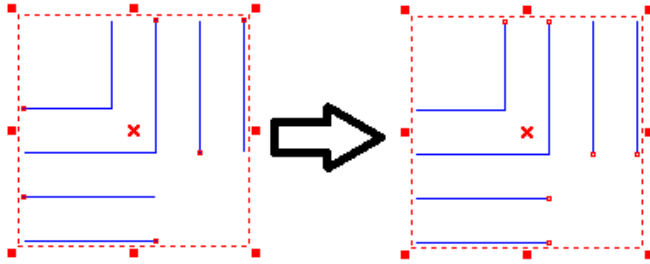


**X Coord. start point greater than end point. When same x Corrd., Y Coord. start point lesser than end point.**

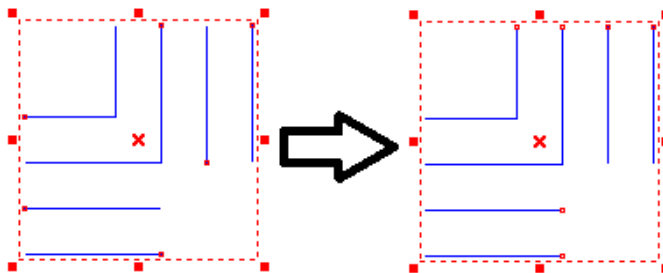
### MM3D 3.90



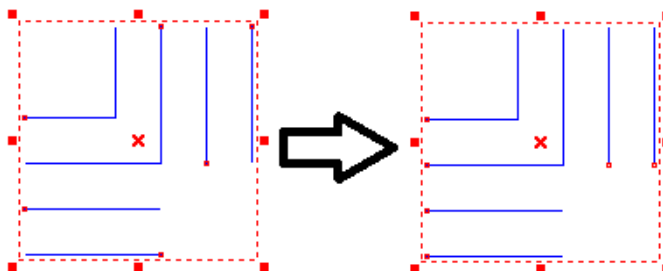
**X Coord. start point lesser than end point. When same X Coord., Y Coord. start point greater than end point.**



**X Coord. start point lesser than end point. When same X Coord., Y Coord. start point lesser than end point.**

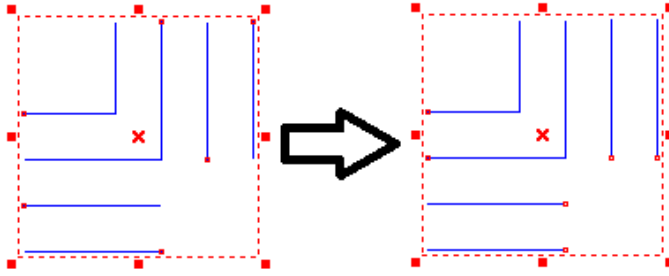


**Y Coord. start point greater than end point. When same Y Coord., X Coord. start point greater than end point.**

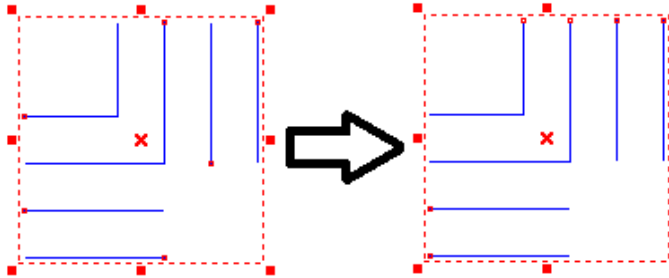


**Y Coord. start point greater than end point. When same Y Coord., X Coord. start point lesser than end point.**

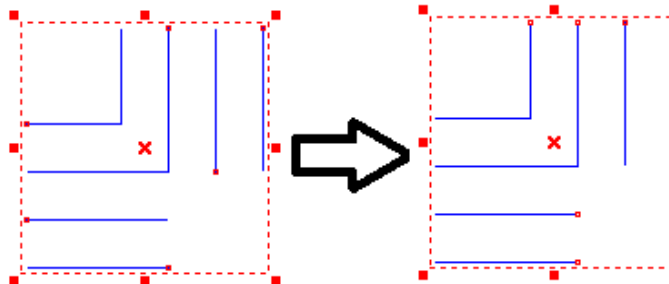
## MM3D 3.90



**Y Coord. start point lesser than end point. When same Y Coord., X Coord. start point greater than end point.**




**Y Coord. start point lesser than end point. When same Y Coord., X Coord. start point lesser than end point.**



### 1.2.17 Mirror Horizontal

Invert an object on its horizontal axis. Left will become right and vice-versa, see Fig.1.2.04.

#### Method:

- Click "Edit" from Menu Bar and select "Mirror Horizontal" function.
- Click  button from Standard Bar.
- Press [Ctrl+H] from keyboard.

Example:

## MM3D 3.90

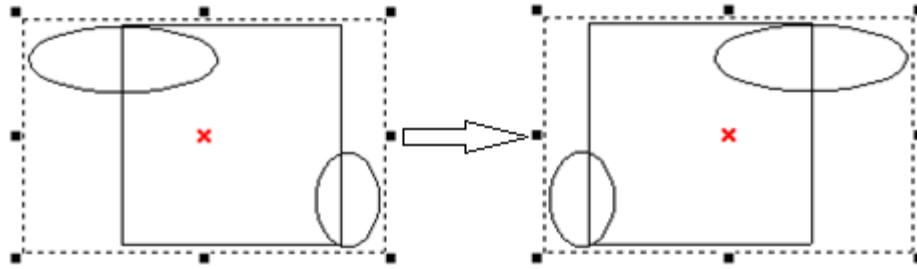



Fig. 1.2.04

### 1.2.18 Mirror Vertical

Invert an image on its vertical axis. Up will become down and vice-versa, see Fig.1.2.05.

#### Method:

- Click “Edit” from Menu Bar and select “Mirror Vertical” function.
- Click the  button from Standard Bar.
- Press [Ctrl+L] from keyboard.

Example:

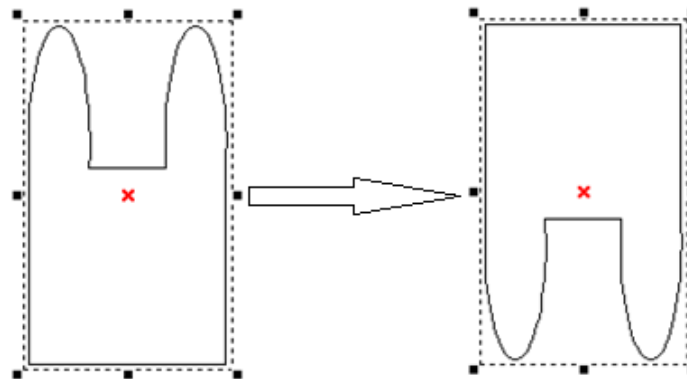



Fig. 1.2.05

### 1.2.19 Move to Center

Move the selected object(s) to the center of working area.


#### Method:

- Click “Edit” from Menu Bar and select “Move to Center” function.
- Click the  button from Standard Bar or Modify Bar.
- Press [F8] from keyboard.



## MM3D 3.90

### 1.2.20 Baseline

Align selected text along with a designate path. First select the text, then click “Edit – Baseline” from Menu Bar, the mouse pointer will become as , and then select the path such as line, arc, or curve, see Fig.1.2.06.

#### Method:

- Click “Edit” from Menu Bar and select “Baseline” function.
- Press the [Ctrl+E] key from keyboard.

Example:

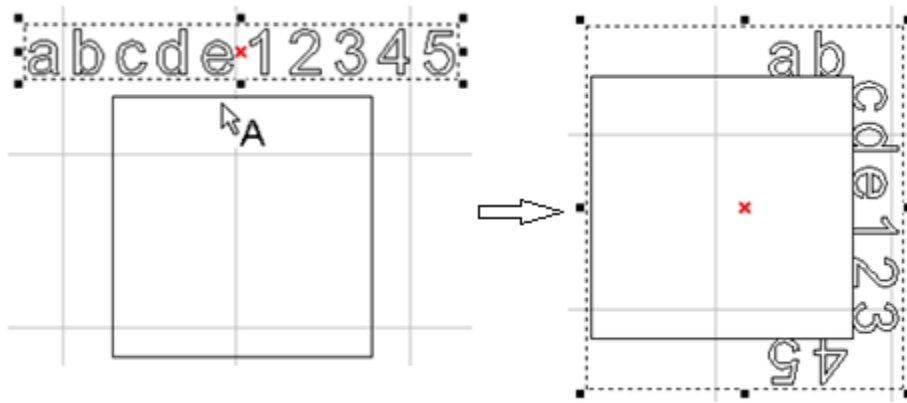


Fig. 1.2.06

### 1.2.21 Split

Cancel the baseline function, see Fig.1.2.07.

#### Method:

- Click “Edit” from Menu Bar and select “Split” function.
- Press [Ctrl+D] from keyboard.

Example:

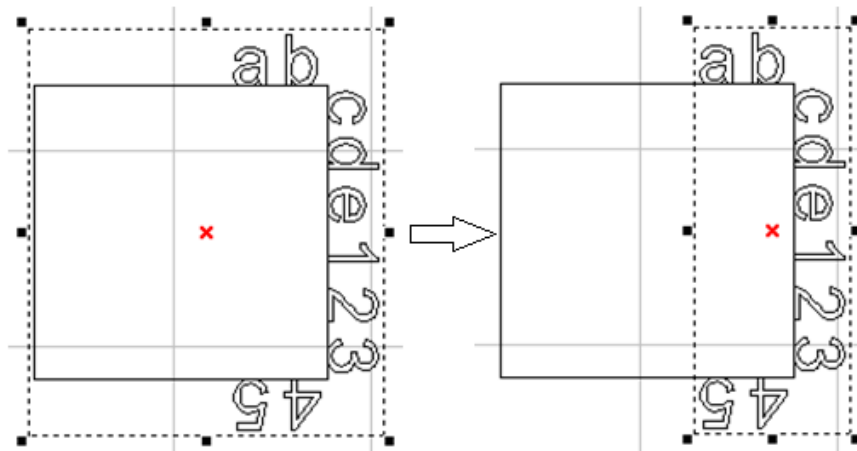


Fig. 1.2.07

## MM3D 3.90

### 1.2.22 Trans-Curve

Transfer a curved line into a series of individual lines. Allow these single lines to be manipulated individually such as using “Edit Vertex” function to change the object’s shape, see Fig1.2.08 to Fig.1.2.10.

- \* Only curve objects are able to use “Add Vertex” and “Edit Vertex” functions.
- \* This function can only be used on non-image objects.

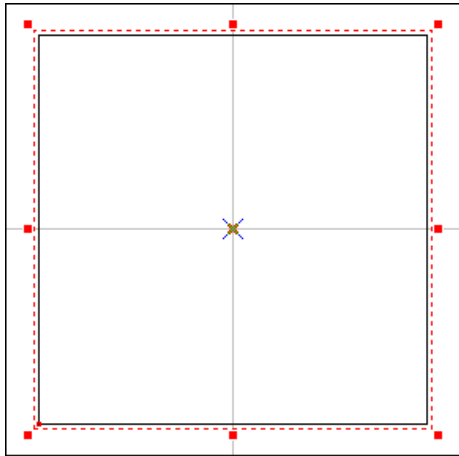


Fig. 1.2.08 Turn the Rectangle into

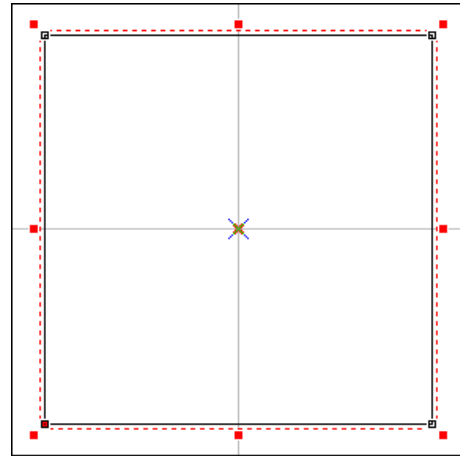


Fig. 1.2.09 Edit Vertex (White Square is

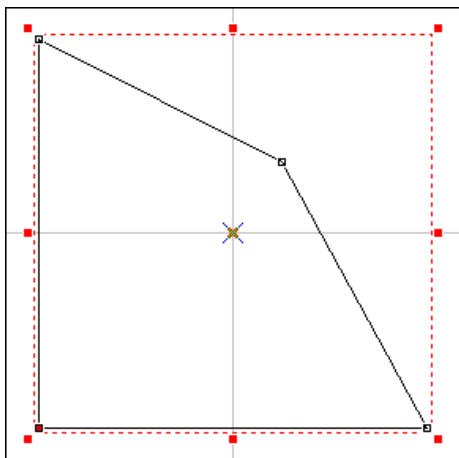



Fig. 1.2.10 Change the Shape by Drag

#### Method:

- Click “Edit” from Menu Bar and select “Trans-curve” function.
- Click  button from Obj Property Bar.
- Press [Ctrl + U] from keyboard.

## MM3D 3.90

### 1.2.23Nudge

Set the nudge measure of an object when using the direction key of keyboard to move that object, see Fig.1.2.11.

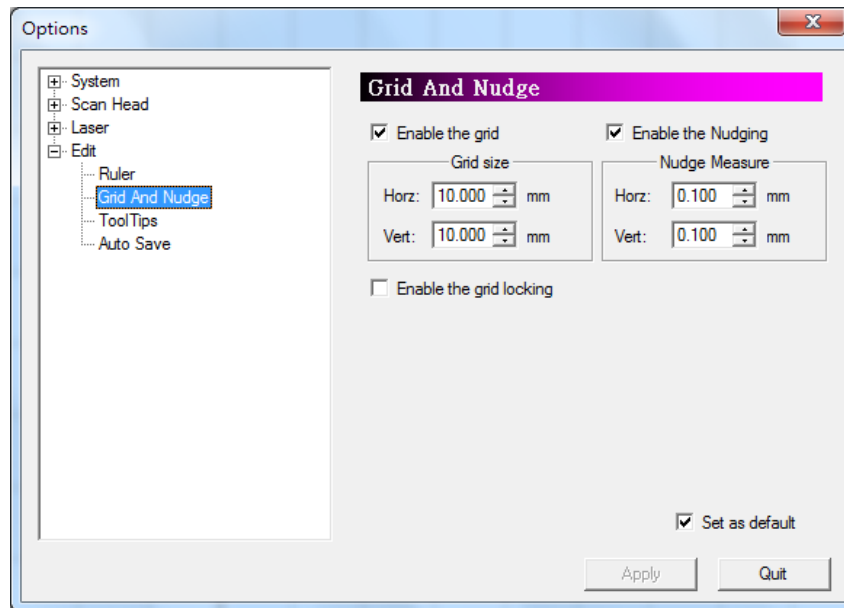


Fig. 1.2.11

#### Method:

- Click “Edit” from Menu Bar and select “Nudge” function.

### 1.2.24 Jump Cross

Make two figures with the line intersecting turn to be no crossing. The cross size is best to be set as between 0.008mm and 0.1mm, see Fig.1.2.12 and Fig.1.2.13.

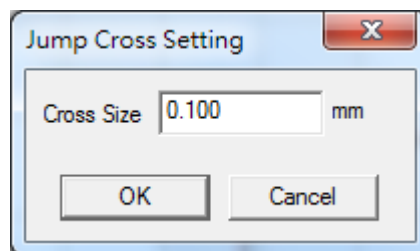


Fig. 1.2.12

#### Method:

- Click “Edit” from Menu Bar and select “Jump Cross” function. Enter the value of cross size in the dialog box and click “OK” button.

## MM3D 3.90

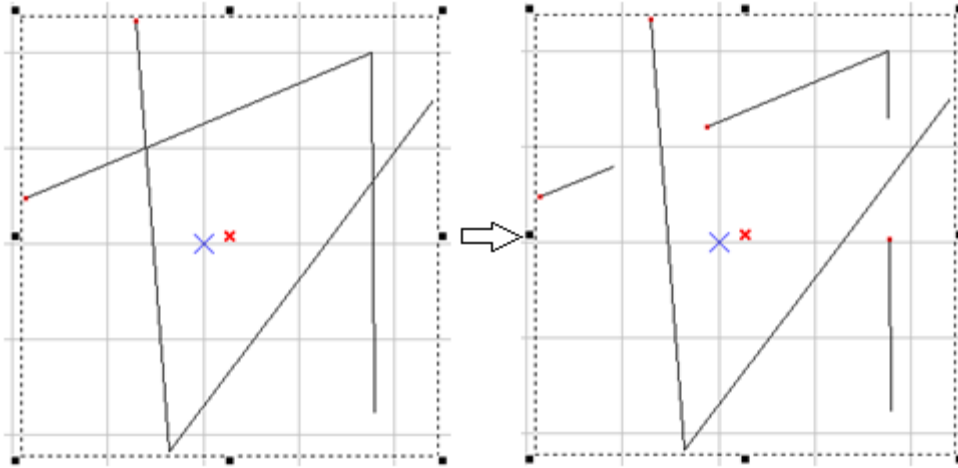



Fig. 1.2.13

### 1.2.25 Welding

Combine two or more objects and eliminate the overlapping lines, see Fig.1.2.14.

\* This function is only work for the none-text and none-image objects. If users want to use this function for texts, they have to break the text into several segments first.

#### Method:

- Click “Edit” from Menu Bar and select “Welding” function.
- Click  button from Obj Property Bar.
- Press [Ctrl+G] from keyboard.

Example:

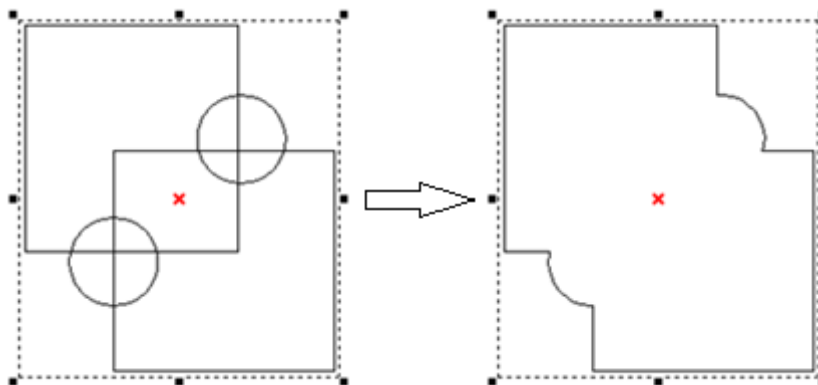


Fig. 1.2.14

## MM3D 3.90

### 1.2.26 Contour

This function can derive the frame of a selected bitmap image. Before executing this function, users have to set the contour filter first, see Fig.1.2.15.

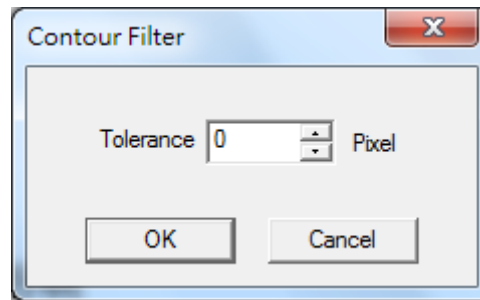


Fig. 1.2.15

Users have to input the tolerance value (maximum is 0) to get the correct figure. And then the image will become an ordinary figure. Users will see a lot of segments on the screen. They have to use “break” function if users want to use these segments, see Fig.1.2.16.

#### Method:

- Click “Edit” from Menu Bar and select “Contour” function.
- Press [Ctrl + W] from keyboard.

Example:

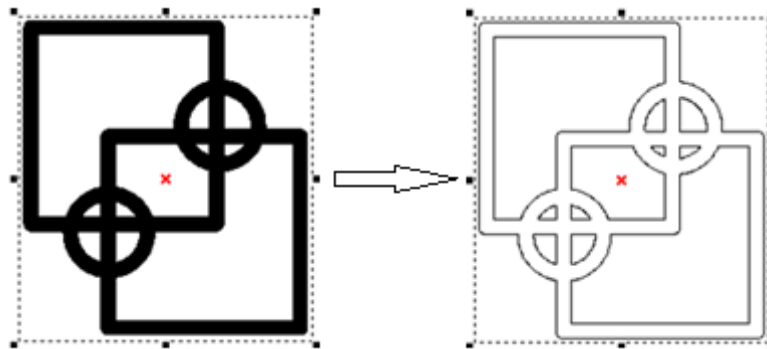


Fig. 1.2.16

## MM3D 3.90

### 1.2.27 Transfer to Image

Transfer the selected objects into an image. The dialogue box show as Fig.1.2.17 can change the resolution, color, and dithering mode.

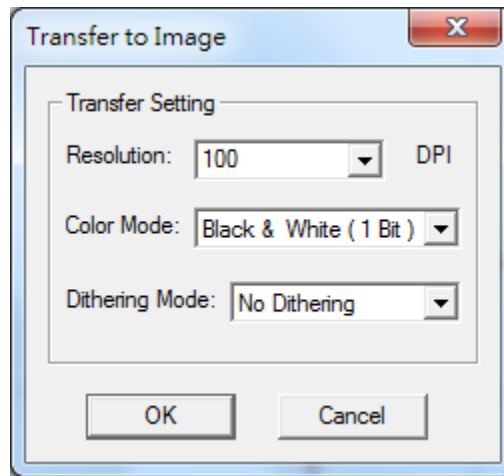


Fig. 1.2.17

#### Method:

- Click “Edit” from Menu Bar and select “Trans to Image” function.
- Press [Ctrl+T] from keyboard.

### 1.2.28 Align

Use this function to align the selected objects, see Fig.1.2.18.

**Left** – align to the left

**Middle** – align to the middle

**Right** – align to the right

**Top** – align to the top

**Center** – align to the center

**Bottom** – align to the bottom

#### Align to:

**Last Select Object** – align to the last selected object

**Paper Edge** – align to the paper edge

**Paper Center** – align to the paper center

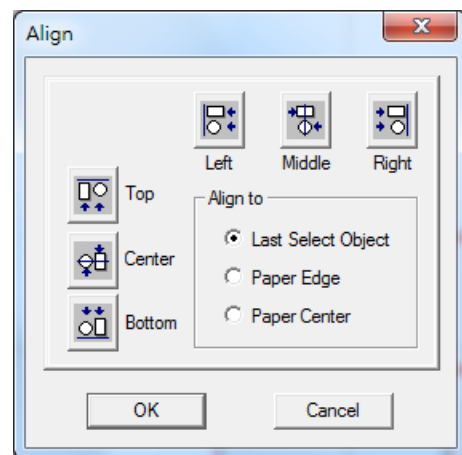



Fig. 1.2.18

#### Method:

- Click “Edit” from Menu Bar and select “Align” function.
- Click  button from Obj Property Bar.

## MM3D 3.90

### 1.2.29 Distribute

Adjust the selected objects' position according to the assigned distribution, see Fig.1.2.19.

- Left** – adjust the distance between the left-edge of each object
- Middle** – adjust the distance between the middle of each object
- Distance** – adjust the distance between the space of each object
- Right** – adjust the distance between the right-edge of each object
- Top** – adjust the distance between the top of each object
- Center** – adjust the distance between the center of each object
- Distance** – adjust the distance between the space of each object
- Bottom** – adjust the distance between the bottom of each object
- Total Area** - The distribute area is according to a selected area, paper Size, or Bounding area.

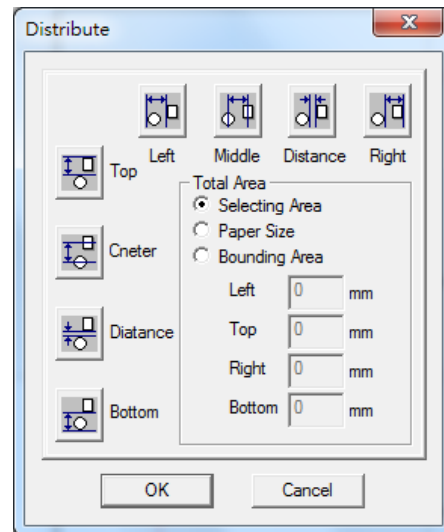



Fig. 1.2.19

#### Method:

- Click “Edit” from Menu Bar and select “Distribute” function.
- Click  button from Obj Property Bar.

### 1.2.30 Mold Out Line

To obtain a frame for a model, the model must first be set to "Show 3D" mode.

## MM3D 3.90

### 1.3 Draw Menu

“Draw” menu offers the following functions:

<b>Vertex</b>	Draw a vertex.
<b>Line</b>	Draw a straight line.
<b>Arc</b>	Draw an arc.
<b>Circle</b>	Draw a circle or oval.
<b>Rectangle</b>	Draw a square or rectangle.
<b>Curve</b>	Draw a curve.
<b>Curve Brush</b>	Draw a freehand line using the mouse.
<b>Spiral</b>	Draw a spiral object.
<b>Text</b>	Insert a text object.
<b>Arc Text</b>	Insert an arc-text object.
<b>Rectangle Text</b>	Insert a rectangle text object.
<b>1D Barcode</b>	Create a 1D barcode.
<b>2D Barcode</b>	Create a 2D barcode.
<b>Control Object</b>	Insert control objects.




## MM3D 3.90

### 1.3.1 Vertex

Insert a vertex object in the Working Area.

#### Method:

- Click “Draw” from Menu Bar and select “Vertex” function.
- Click  button from Draw Tool Bar.


#### Marking Way:

There are two ways for vertex marking. One is “Spot Delay” mode and the other is “Laser Shot” mode. Please refer to P.61 Burst Mode Setting.

### 1.3.2 Line

To draw a line, first click the “Line” function. The next step is to select a start point and click the left button of mouse, and then move the mouse to the end point and click the left button again. Click left button at third point to draw another line or click right button to end this function. Or press “C” to make the line become a close path and end function.

#### Method:

- Click “Draw” from Menu Bar and select “Line” function.
- Click  button from Draw Tool Bar.


## MM3D 3.90

### 1.3.3 Arc

#### 1.3.3.1 SME

Press the left button of mouse to set the start point of arc & move then mouse to the second point and press left button again. And then move to the third point and click the button to set the end point. Users can press the right button of mouse to end this function or press “C” to make the curve become a close path and end the function.


**Method:**

1. Click “Draw” from Menu Bar and select “Arc” function.
2. Click  button from Draw Tool Bar.

#### 1.3.3.2 SEM

Press the left button of mouse to set the start point of arc, then move the mouse to the end point and press left button again. And then move to the middle point and click the button to set the end point. Users can press the right button of mouse to end this function or press “C” to make the curve become a close path and end the function.

**Method:**


1. Click “Draw” from Menu Bar and select “Arc” function.
2. Click  button from Draw Tool Bar.

## MM3D 3.90

### 1.3.4 Circle

Create circles or ovals. Select a start point on the working area. Press the left mouse button and move the mouse to decide the size and shape and then click the left button again to finish drawing. Press the right button to stop this function. Press “Ctrl” when drawing will get a circle.

#### Method:

- Click “Draw” from Menu Bar and select “Circle” function.
- Click  button from Draw Tool Bar.

#### Marking Way:

**No Fill**  
Marking starts from 0 degree following levorotary direction, see Fig.1.3.01.

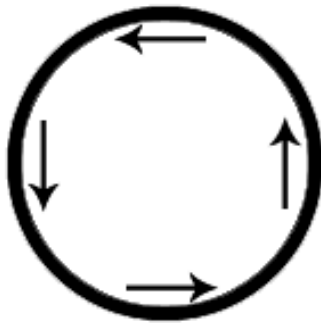


Fig. 1.3.01

**Fill**  
Marking starts from left to right internal and then marks external frame, see Fig.1.3.02.

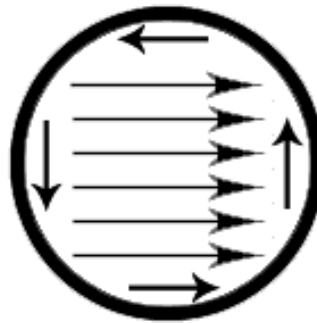



Fig. 1.3.02

### 1.3.5 Rectangle

Create squares and rectangles. Select a start point on the working area. Press the left mouse button and move the mouse to decide the size and shape and then click the left button again to finish drawing. Press the right button to stop this function. Press “Ctrl” when drawing will get a square.

#### Method:

- Click “Draw” from Menu Bar and select “Rectangle” function.
- Click  button from Draw Tool Bar.

#### Marking Way:

**No Fill**  
Marking starts from upper left side following clockwisedirection, see Fig.1.3.03.

**Fill**  
Marking starts from left to right internal and then marks external frame, see Fig.1.3.04.

## MM3D 3.90

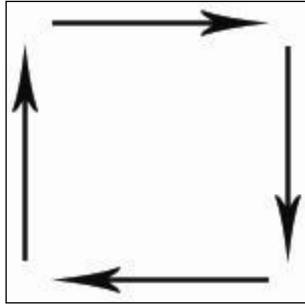


Fig. 1.3.03

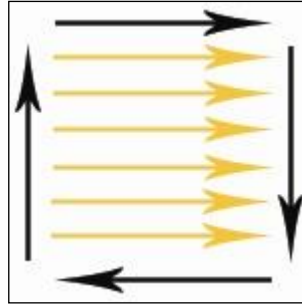



Fig. 1.3.04

### 1.3.6 Curve

Select the start point of the curve, holding the mouse left button and decide the direction of tangent line of that point. Then move to another point and decide the direction of tangent line again and complete a curve. Users can continue drawing the curve through moving the mouse; press “C” to make that curve become a closed path curve or press the right button to end this function.


#### Method:

- Click “Draw” from Menu Bar and select “Curve” function.
- Click  button from Draw Tool Bar.

### 1.3.7 Curve Brush

Holding the left button of mouse and moving the mouse. A curve will display on the working area according to the move path of mouse. Release the left button to complete drawing and press right button to end this function.


#### Method:

- Click “Draw” from Menu Bar and select “Curve Brush” function.
- Click  button from Draw Tool Bar.

### 1.3.8 Spiral

Press the left button of the mouse to set the center position of the spiral. The spiral will be drawn according to the preset properties. Release the left button to complete the drawing. To stop, click the right button of the mouse to cancel the spiral line function.

#### Method:

- Click “Draw” from Menu Bar and select “Spiral” function.
- Click  button from Draw Tool Bar.

## MM3D 3.90

### 1.3.9 Text

Select this function. Decide the position of the text and a dialog box will be displayed, see the red area in Fig.1.3.05. Input the content of the text. Press “Enter” to do line feed or click the right button of mouse to end this function.

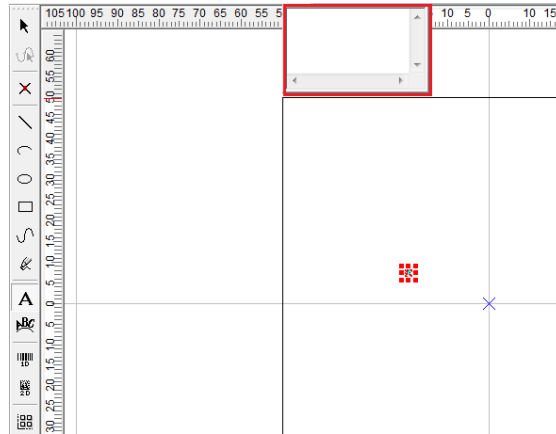


Fig. 1.3.05

#### Method:

- Click “Draw” from Menu Bar and select “Text” function.
- Click **A** button from Draw Tool Bar.

#### Marking Way:

If a text object has several characters, the laser will mark the characters one by one. If users need to mark the whole text at the same time, then the text must be transferred to a curve.

### 1.3.10 Arc Text

Using this function, the system will show a window like Fig.1.3.06. Input the content and click “OK” to end this function.

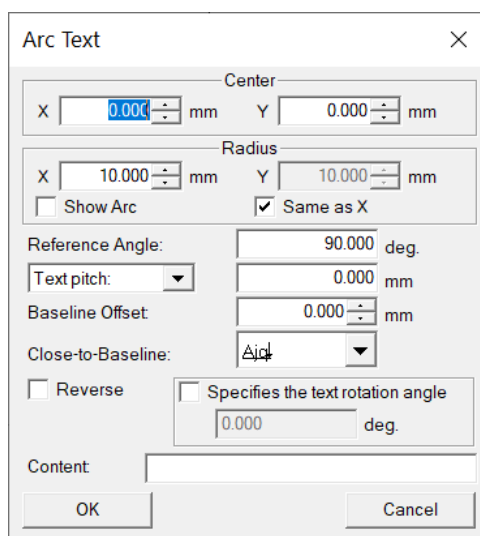



Fig. 1.3.06



Fig. 1.3.07

#### Method:

## MM3D 3.90

- Click “Draw” from Menu Bar and select “Arc Text” function.
- Click  button from Draw Tool Bar.

## MM3D 3.90

### 1.3.11 Rectangle Text

Users can input the text within a specified rectangle, see Fig.1.3.08. The font size of text will be changed according to the amount of characters.

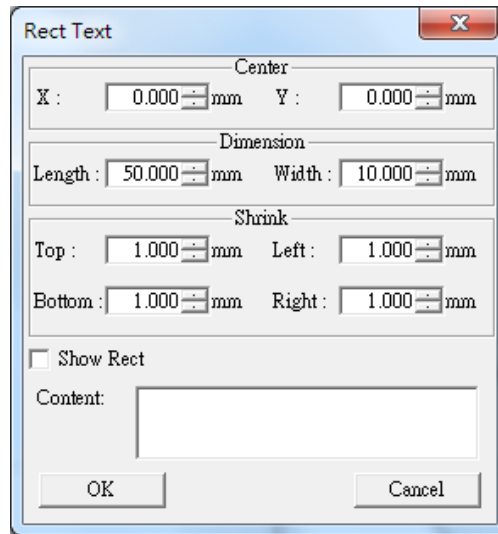



Fig. 1.3.08

#### Method:

- Click “Draw” from Menu Bar and select “Rectangle Text” function.
- Click  button from Draw Tool Bar.

### 1.3.12 1D Barcode

Select this function and a dialog box will open for user to choose code type and enter code data, see Fig.1.3.09. Click “OK” when finish entering all information to close this dialog box and insert the 1D Barcode on working area.

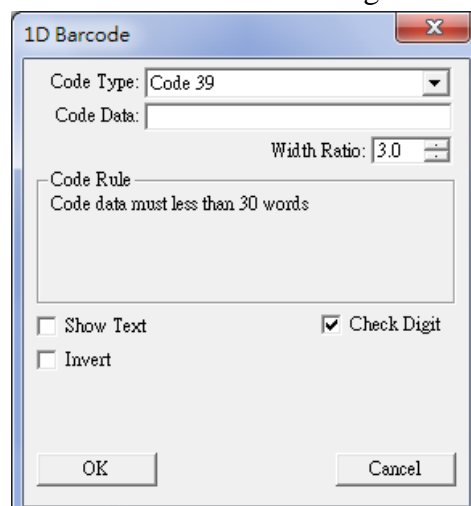



Fig. 1.3.09

#### Method:

- Click “Draw” from Menu Bar and select “1D Barcode” function.
- Click  button from Draw Tool Bar.

## MM3D 3.90

### 1.3.13 2D Barcode

Select this function and a dialog box will open for user to choose code type and enter code data, see Fig.1.3.10. Click “OK” when finish entering all information to close this dialog box and insert the 1D Barcode on working area.

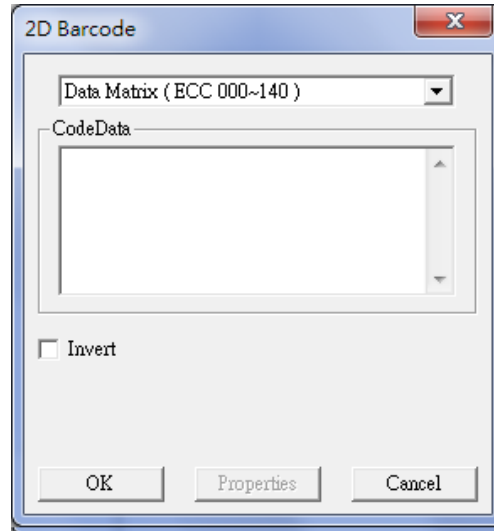














Fig. 1.3.10

#### Method:

- Click “Draw” from Menu Bar and select “2D Barcode” function.
- Click  button from Draw Tool Bar.

### 1.3.14 Control Object

There are eleven control objects: Digital In , Digital Out , Do Pause , Delay Time , Motion , Set Position , Loop , Ring , Homing , Com Port output  & Com Port Input .

Select one function and insert it and the function will display on object browser. The marking order will follow the objects’ order under layer. ([Refer CH3.4](#))

#### Method:

1. Click “Draw” from Menu Bar and select “Control Object” function.
2. Click function users want to use from Control Object Tool Bar.



## MM3D 3.90

### 1.4 Image Menu

“Image” menu offers the following functions:

<b>Effects</b>	Modify the image effects Posterize Mosaic Average Median Sharpen Add Noise Emboss Edge Enhance Oilify
<b>Spatial Filters</b>	Use different filters Gradient Laplacian Sobel Prewitt Shift & Difference Line Segment

# MM3D 3.90

## 1.4.1 Effects

### Posterize

Click “Image – Effects - Posterize”

This function allows user to adjust the color levels for an image, refer to the following examples.

Fig.1.4.01 is the original image:



Fig. 1.4.01

When Levels per color plane is 2, see Fig.1.4.02.

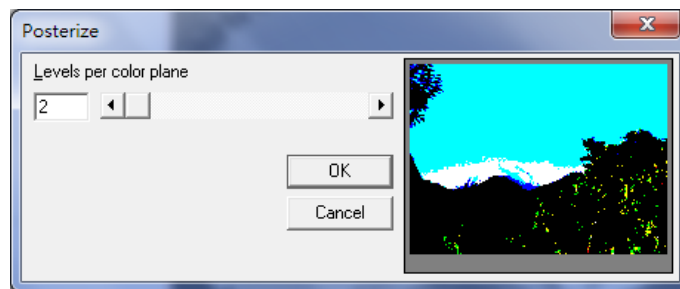


Fig. 1.4.02

When Levels per color plane is 20, see Fig.1.4.03.

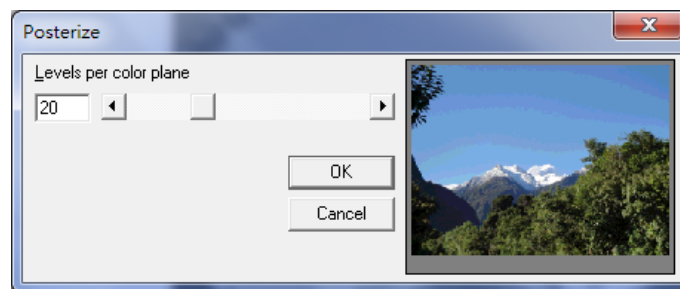


Fig. 1.4.03

When Levels per color plane is 64, see Fig.1.4.04.

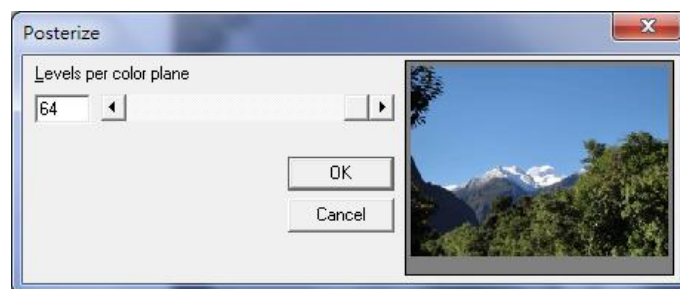


Fig. 1.4.04

## MM3D 3.90

### Mosaic

This function will cause a blurred by magnifying the pixel size of the image, refer to the following examples.

Fig.1.4.05 is the original image:



Fig. 1.4.05

When Tile size is 2, see Fig.1.4.06.

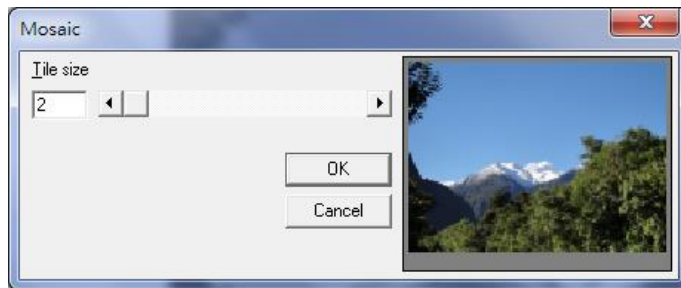


Fig. 1.4.06

When Tile size is 20, see Fig.1.4.07.

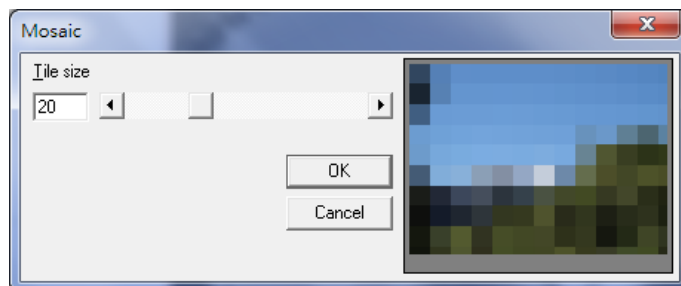


Fig. 1.4.07

When Tile size is 64, see Fig.1.4.08.

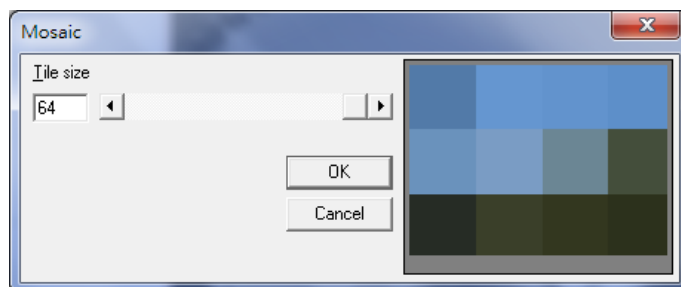


Fig. 1.4.08

## MM3D 3.90

### Average

Click “Image – Effects - Average”

This function will cause a blurred by adjusting the average sample size of the image, refer to the following examples.

Fig.1.4.09 is the original image:



Fig. 1.4.09

When Sample size is 3, see Fig.1.4.10.

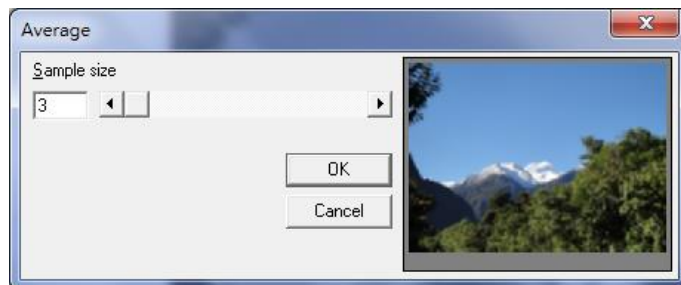


Fig. 1.4.10

When Sample size is 7, see Fig.1.4.11.

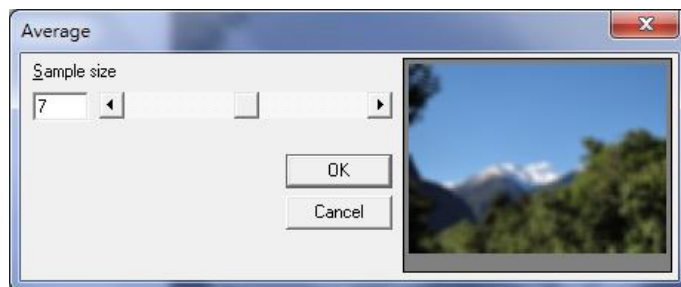


Fig. 1.4.11

When Sample size is 11, see Fig.1.4.12.

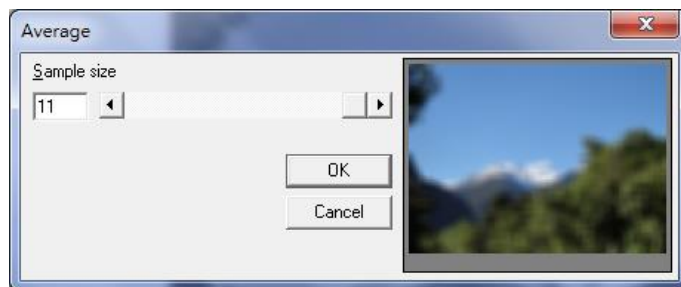


Fig. 1.4.12

## MM3D 3.90

### Median

Click “Image – Effects - Median”

Adjust the sample size of image to cause the median effect and make the image become blurred, refer to the following examples.

Fig.1.4.13 is the original image:



Fig. 1.4.13

When Sample size is 3, see Fig.1.4.14.

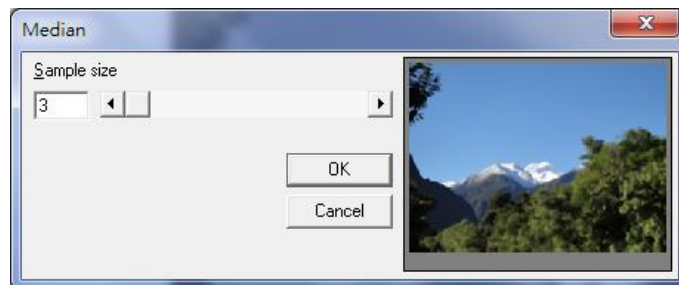


Fig. 1.4.14

When Sample size is 7, see Fig.1.4.15.

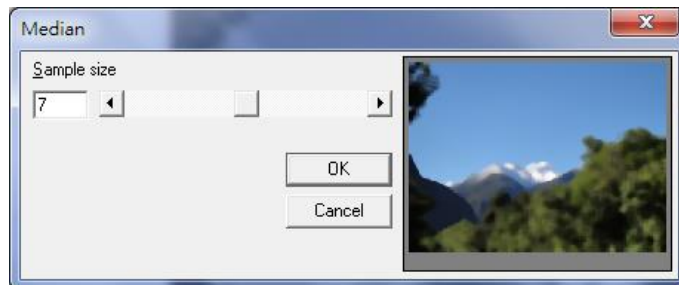


Fig. 1.4.15

When Sample size is 11, see Fig.1.4.16.

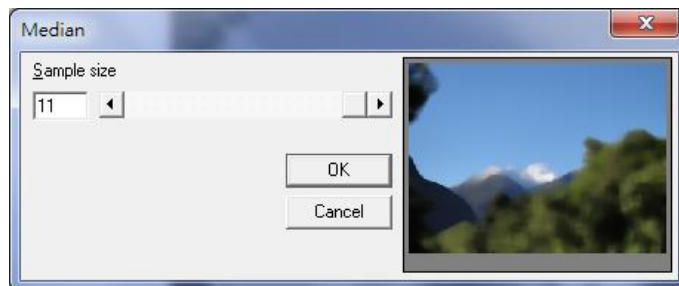


Fig. 1.4.16

## MM3D 3.90

### Sharpen

Click “Image – Effects - Sharpen”

Adjust to percentage of image to increase the resolution and emphasize the contrast, refer to the following examples.

Fig.1.4.17 is the original image:



Fig. 1.4.17

When  
Percentage is 0,  
see Fig.1.4.18.



Fig. 1.4.18

When Percentage  
is -100, see  
Fig.1.4.19.

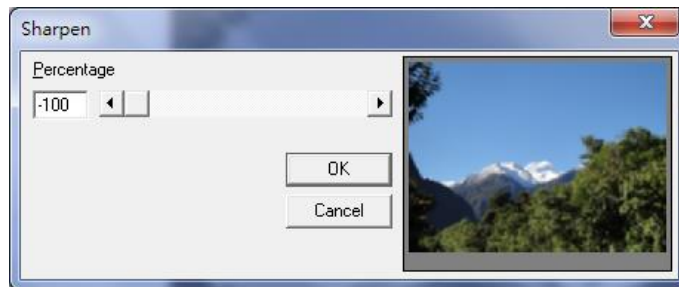


Fig. 1.4.19

When Percentage  
is 100, see  
Fig.1.4.20.

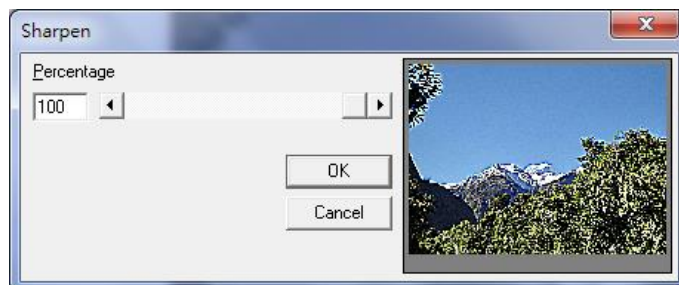


Fig. 1.4.20

## MM3D 3.90

### Add Noise

#### Click “Image – Effects – Add Noise”

Add white noise to the image according to the noise level and channel. There are four types of channel to choose: Master, Red, Green and Blue, refer to the following examples.

Fig.1.4.21 is the original image:



Fig. 1.4.21

When Noise Level is 50 and Level is Master, see Fig.1.4.22.

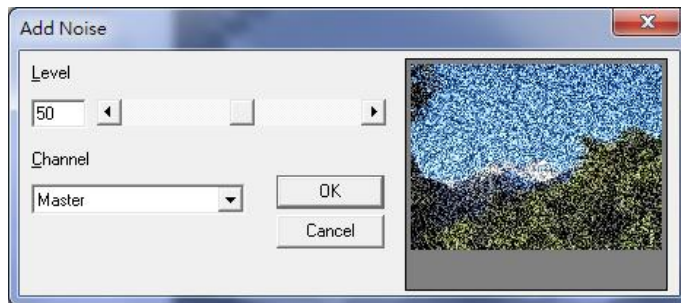


Fig. 1.4.22

When Noise Level is 50 and Level is Red, see Fig.1.4.23.

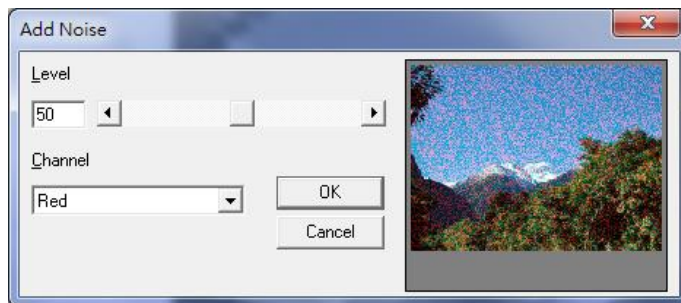


Fig. 1.4.23

When Noise Level is 50 and Level is Green, see Fig.1.4.24.

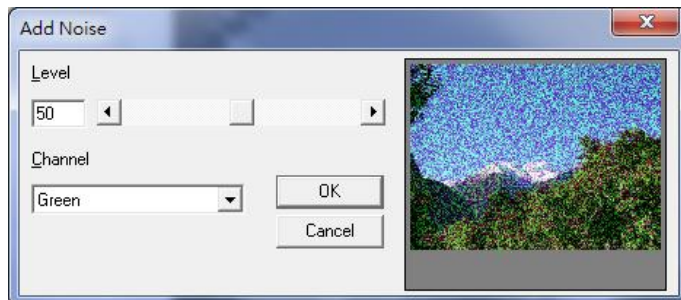


Fig. 1.4.24

## MM3D 3.90

When Noise Level is 50 and Level is Blue, see Fig.1.4.25.

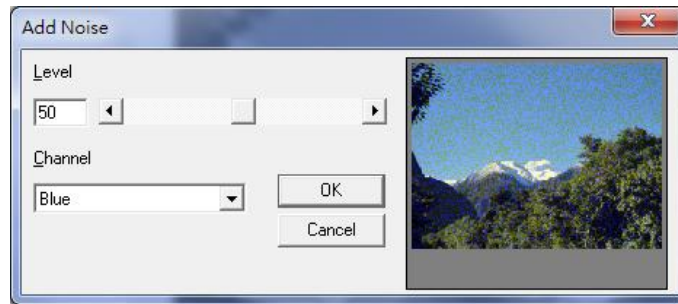


Fig. 1.4.25

### Emboss

Click “Image – Effects - Emboss”

Create an embossed effect for the image by adjusting the direction and depth, refer to the following examples.

Fig.1.4.26 is the original image:



Fig. 1.4.26

Choose the direction as North and the Depth as 50, see Fig.1.4.27.

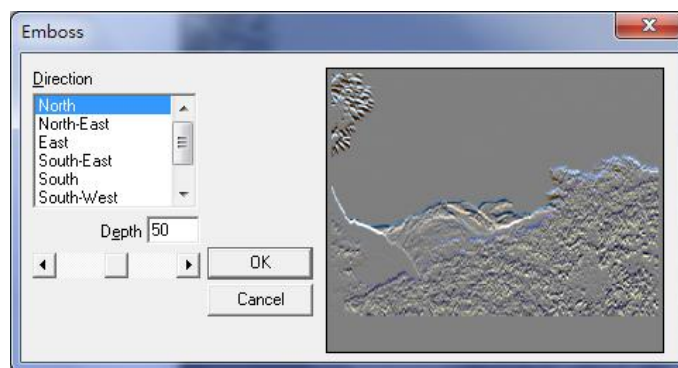


Fig. 1.4.27



## MM3D 3.90

Choose the direction as South-West and the Depth as 75, see Fig.1.4.28.

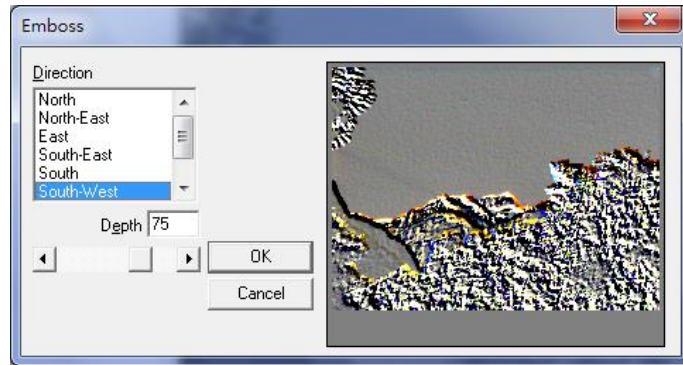


Fig. 1.4.28

## MM3D 3.90

### Edge Enhance

Click “Image –Effects – Edge Enhance”

Enhance the edge of image, refer to the following examples.



Fig.1.4.29 Original Image



Fig.1.4.30 Edge-Enhance Image

### Oilify

Click “Image – Effects - Oilify”

Adjust the sample size to create an oil painting effect for the image, refer to the following examples.

Fig.1.4.31 is the original image:



Fig. 1.4.31

When Sample size is 3, see Fig.1.4.32.

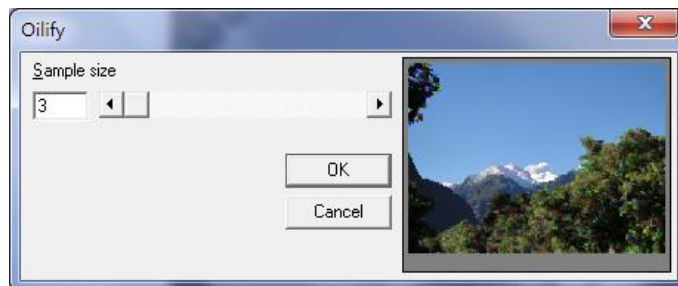


Fig. 1.4.32

When Sample size is 7, see Fig.1.4.33.

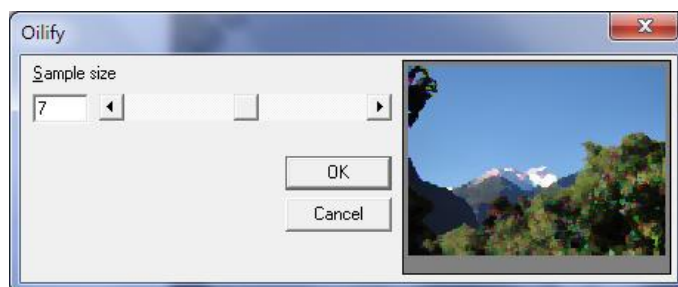


Fig. 1.4.33

## MM3D 3.90

When Sample size is 11, see Fig.1.4.34.

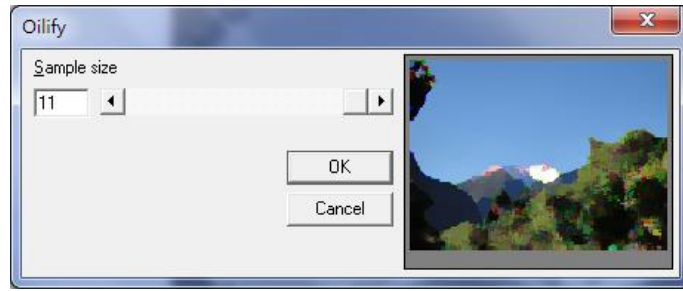


Fig. 1.4.34

# MM3D 3.90

## 1.4.2 Special Filters

### Gradient

Click “Image – Special Filters - Gradient”

Adjust the Filter Value according to the direction, refer to the following examples.

Fig.1.4.35 is the original image:



Fig. 1.4.35

Direction: North,  
see Fig.1.4.36.

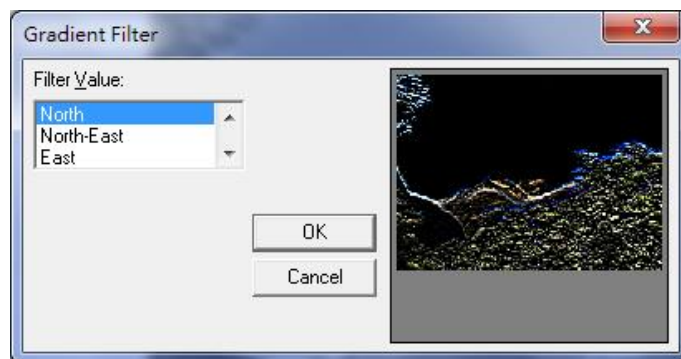


Fig. 1.4.36

Direction: South-  
East, see  
Fig.1.4.37.

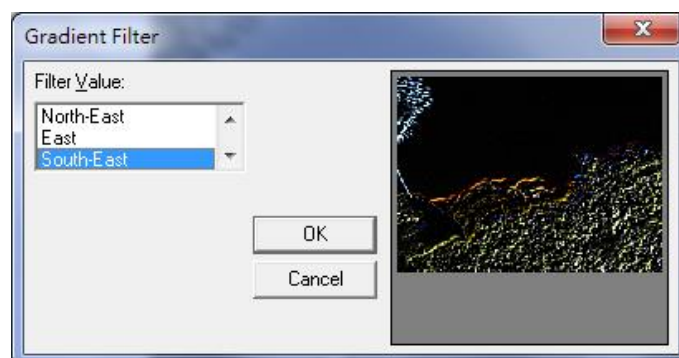


Fig. 1.4.37

## MM3D 3.90

### Laplacian

Click “Image – Special Filters - Laplacian”

Select Filter from Filter Value list to adjust the image, refer to the following examples.

Fig.1.4.38 is the original image:



Fig. 1.4.38

When select  
Filter 1, see  
Fig.1.4.39.

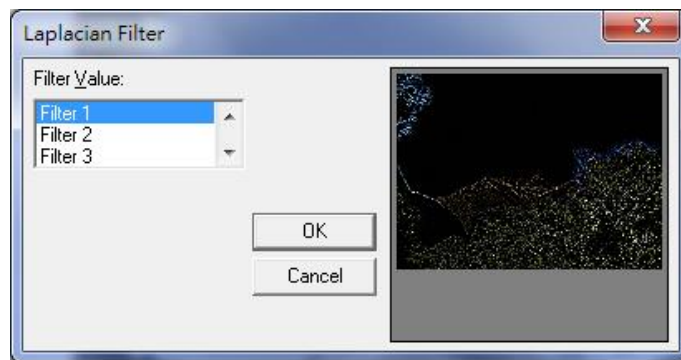


Fig. 1.4.39

When select  
Filter 2, see  
Fig.1.4.40.

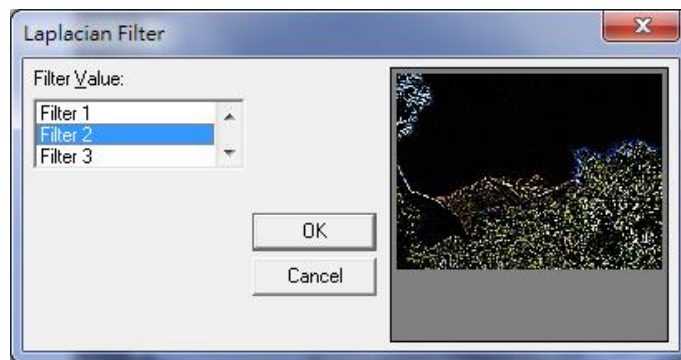


Fig. 1.4.40

When select  
Diagonal,  
see  
Fig.1.4.41.

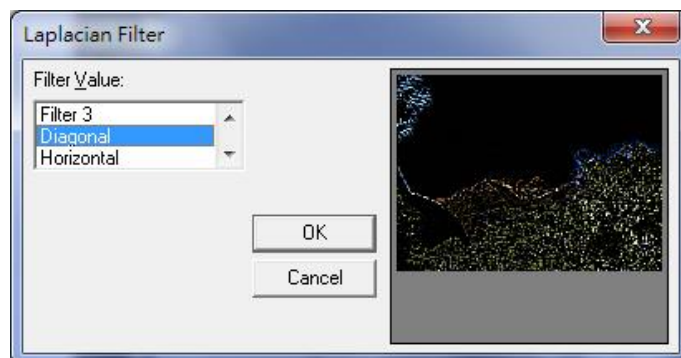


Fig. 1.4.41

## MM3D 3.90

### Sobel

Click “Image – Special Filters - Sobel”

Adjust the image by selecting the Filter Value to get Sobel effect, refer to the following examples.

Fig.1.4.42 is the original image:



Fig. 1.4.42

When the value is Horizontal, see Fig.1.4.43.

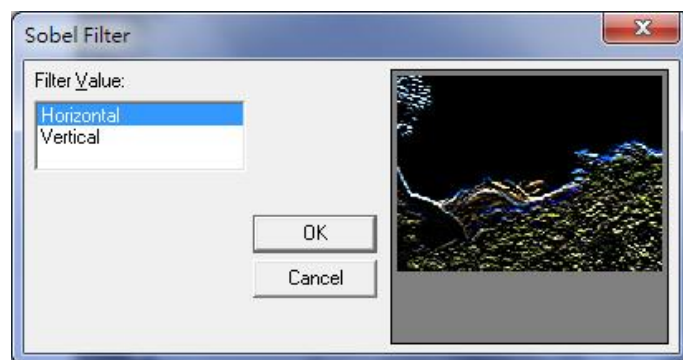


Fig. 1.4.43

When the value is Vertical, see Fig.1.4.44.

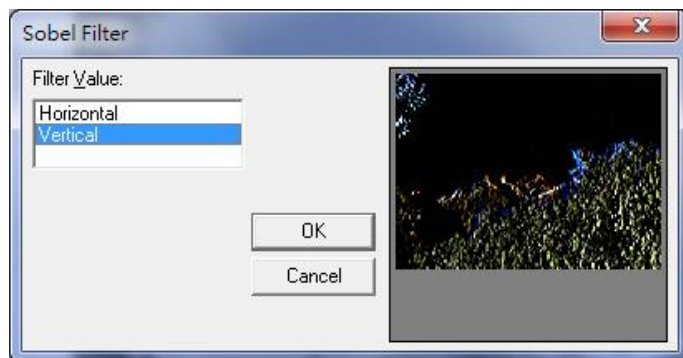


Fig. 1.4.44

## MM3D 3.90

### Prewitt

#### Click “Image – Special Filters - Prewitt”

Adjust the image by selecting the Filter Value to get Prewitt effect, refer to the following examples.

Fig.1.4.45 is the original image:



Fig. 1.4.45

When the value is Horizontal, see Fig.1.4.46.

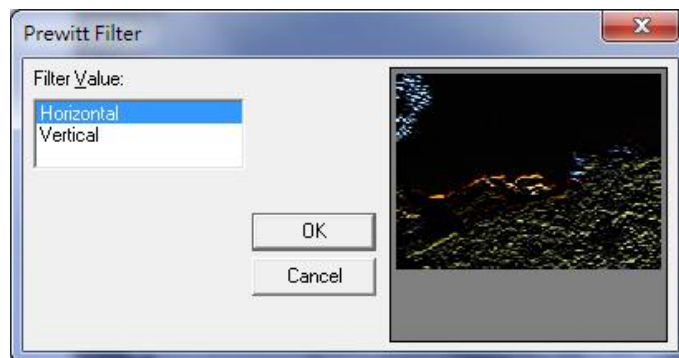


Fig. 1.4.46

When the value is Vertical, see Fig.1.4.47.

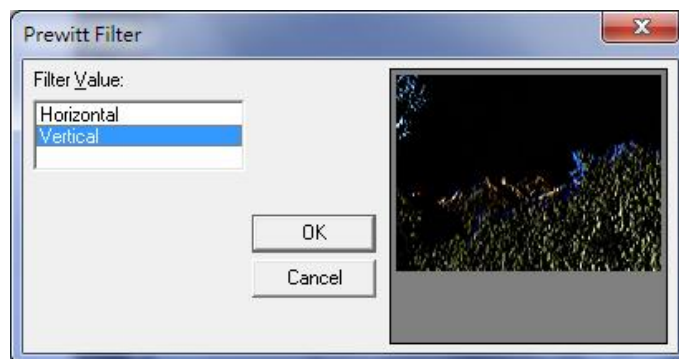


Fig. 1.4.47

## MM3D 3.90

### Shift Difference

Click “Image – Special Filters – Shift Difference”

Adjust the image effect by selecting the Filter Value, refer to the following examples.

Fig.1.4.48 is the original image:



Fig. 1.4.48

When the value is Diagonal, see Fig.1.4.49.

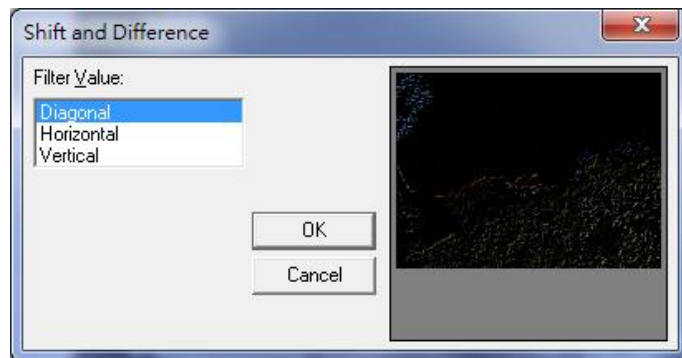


Fig. 1.4.49

When the value is Horizontal, see Fig.1.4.50.

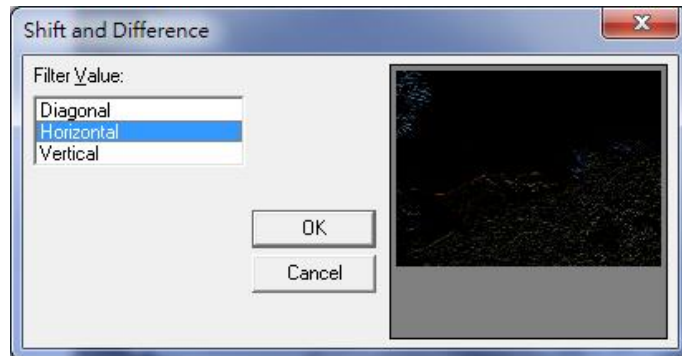


Fig. 1.4.50

When the value is Vertical, see Fig.1.4.51.

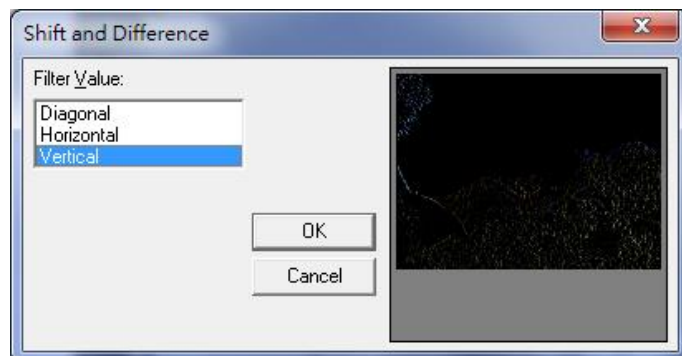


Fig. 1.4.51



## MM3D 3.90

### Line Segment

Click “Image – Special Filters – Line Segment”

Adjust the image effect by selecting the Filter Value, refer to the following examples.

Fig.1.4.52 is the original image:



Fig. 1.4.52

When the value is Horizontal, see Fig.1.4.53.

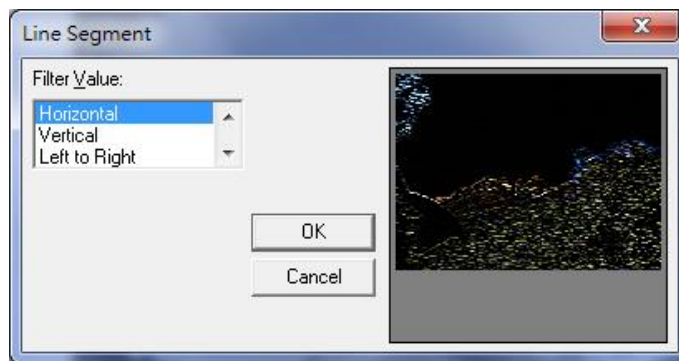


Fig. 1.4.53

When the value is Vertical, see Fig.1.4.54.

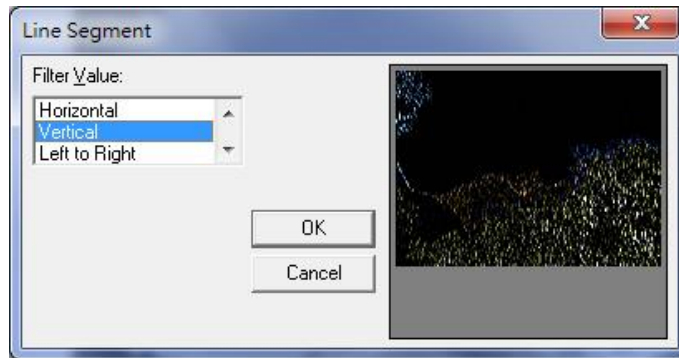


Fig. 1.4.54

When the value is Left to Right, see Fig.1.4.55.

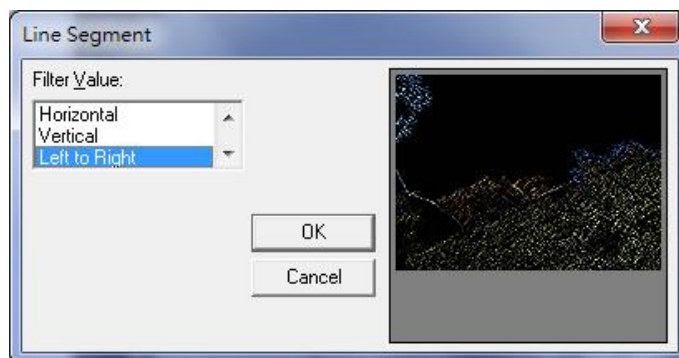


Fig. 1.4.55

## **MM3D 3.90**

### **1.5 Color Menu**

“Color” menu offers the following functions:

- **Gray Scale**
- **Color Resolution**
- **Brightness**
- **Contrast**
- **Hue**
- **Saturation**
- **Gamma**
- **Intensity**
- **Histogram**
- **Invert**
- **Solarize**

## MM3D 3.90

### 1.5.1 Gray Scale

Click “Color – Gray Scale”

Transform a colored image into an 8-bit grayscale image, refer to Fig.1.5.01 and 1.5.02.



Fig. 1.5.01 Original



Fig. 1.5.02 Gray Scale

### 1.5.2 Color Resolution

Click “Color – Color Resolution”

Change the image resolution by adjusting the Bits Per Pixel and the Color Order or Dither Method and Palette (Dither Method and Palette must be under 8-bit mode), refer to the following examples.

Fig.1.5.03 is the original image:



Fig. 1.5.03

Fig.1.5.04  
Bits Per Pixel: 16-bit  
Color Order: Blue-Green-  
Red

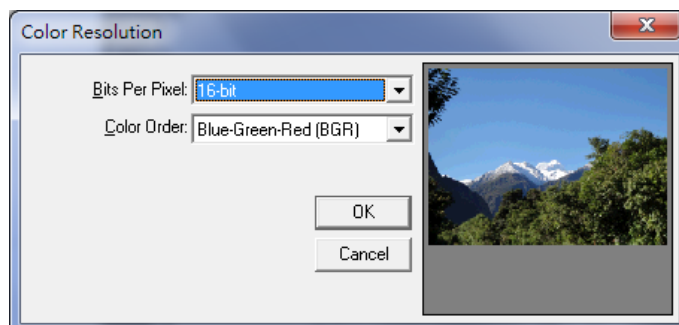


Fig. 1.5.04

# MM3D 3.90

Fig.1.5.05  
Bits Per Pixel: 16-bit  
Color Order: Red-Green-Blue

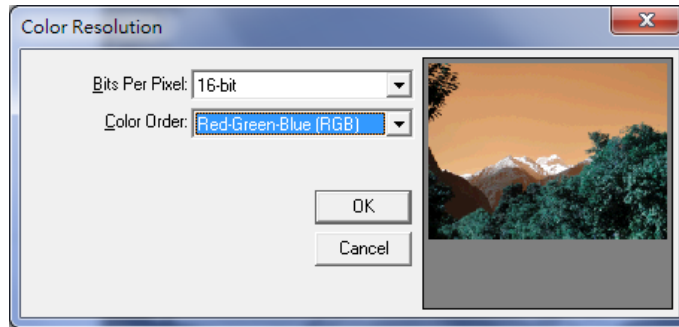


Fig. 1.5.05

Fig.1.5.06  
Bits Per Pixel: 8-bit  
Dither Method: None  
Palette: Fixed Palette

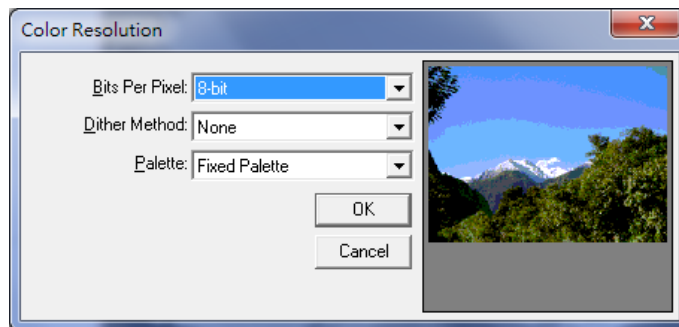


Fig. 1.5.06

Fig.1.5.07  
Bits Per Pixel: 8-bit  
Dither Method: Ordered  
Palette: Netscape Fixed Palette

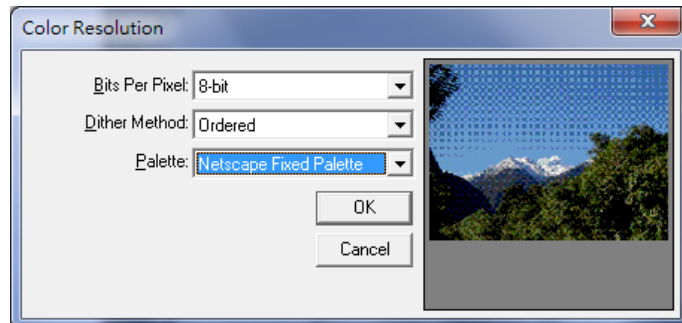


Fig. 1.5.07

## MM3D 3.90

### 1.5.3 Brightness

#### Click “Color - Brightness”

Change the brightness of image by adjusting the Percentage, refer to the following examples.

Fig.1.5.08 is the original image:



Fig. 1.5.08

When  
Percentage is 0,  
see Fig.1.5.09.

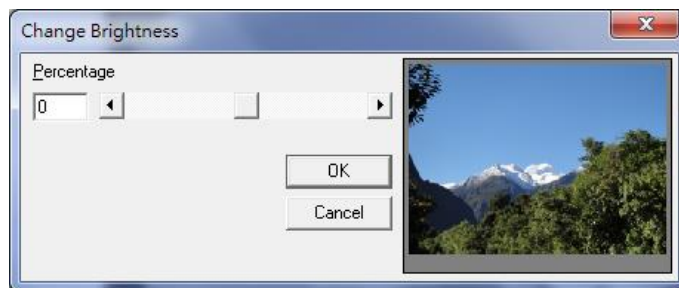


Fig. 1.5.09

When  
Percentage is -  
30, see  
Fig.1.5.10.

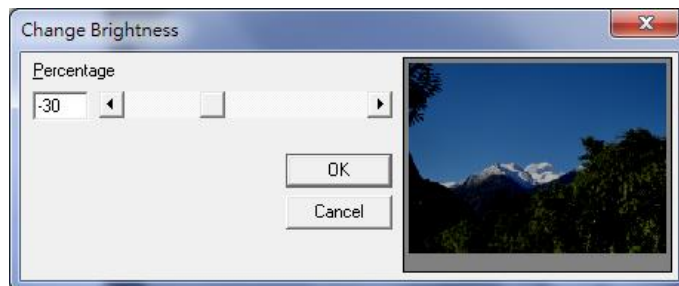


Fig. 1.5.10

When  
Percentage is  
30, see  
Fig.1.5.11.

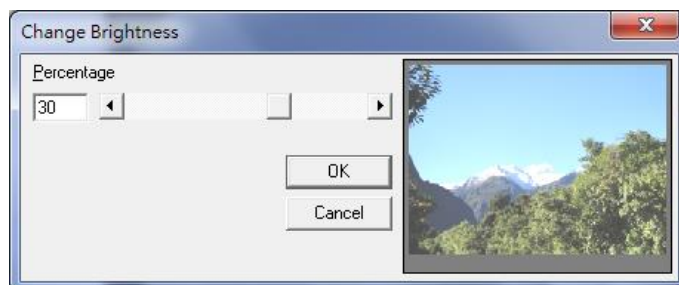


Fig. 1.5.11

## MM3D 3.90

### 1.5.4 Contrast

Click “Color - Contrast”

Change the contrast of image by adjusting the Percentage, refer to the following examples.

Fig.1.5.12 is the original image:



Fig. 1.5.12

When  
Percentage is 0,  
see Fig.1.5.13.

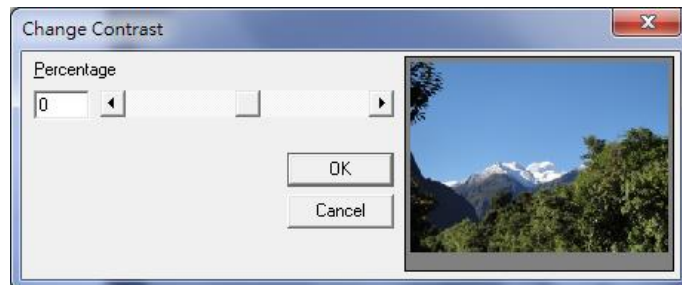


Fig. 1.5.13

When  
Percentage is -  
100, see  
Fig.1.5.14.

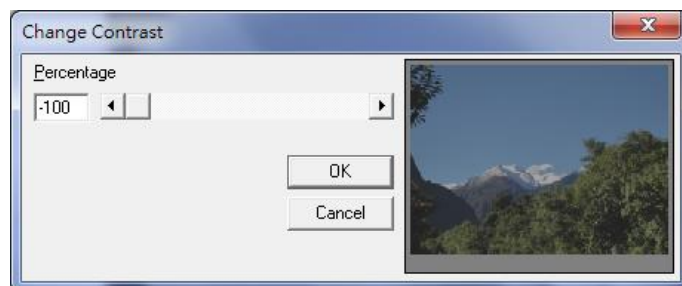


Fig. 1.5.14

When  
Percentage is  
100, see  
Fig.1.5.15.

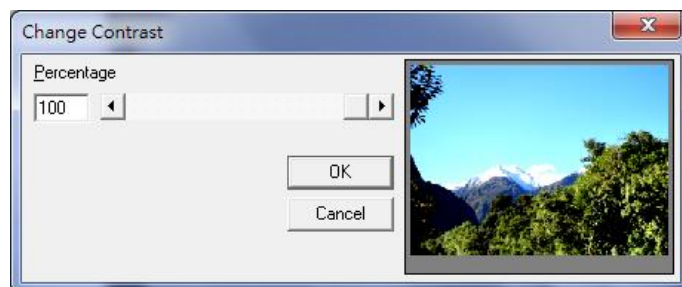


Fig. 1.5.15

## MM3D 3.90

### 1.5.5 Hue

Click “Color - Hue”

Adjusting the degrees to change the hue of image, refer to the following examples.  
Fig.1.5.16 is the original image:



Fig. 1.5.16

When Angle (degrees) is 0, see Fig.1.5.17.

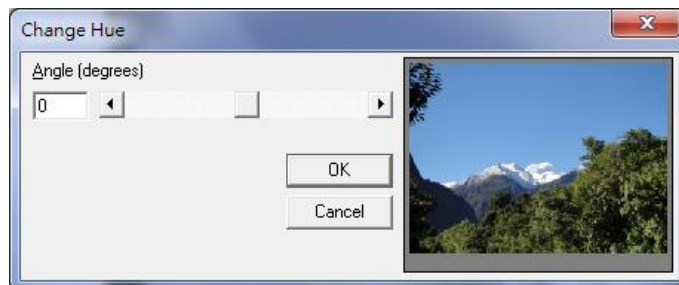


Fig. 1.5.17

When Angle (degrees) is -280, see Fig.1.5.18.

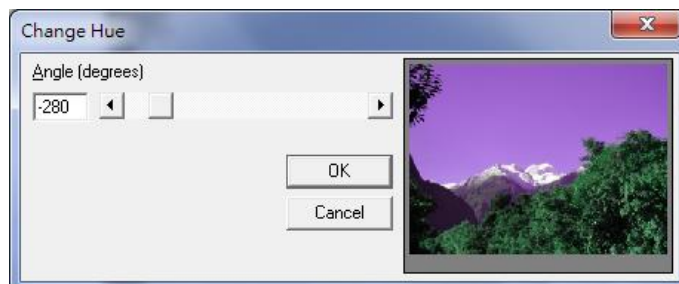


Fig. 1.5.18

When Angle (degrees) is 280, see Fig.1.5.19.

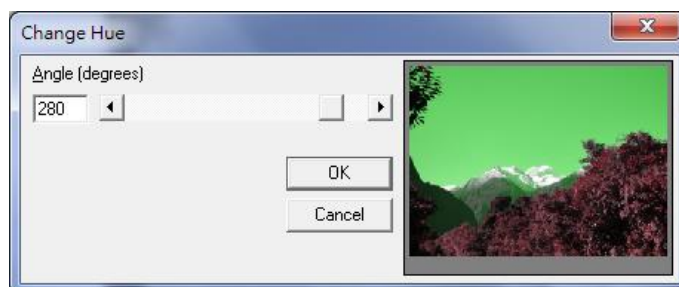


Fig. 1.5.19

## MM3D 3.90

### 1.5.6 Saturation

#### Click “Color - Saturation”

Change the contrast of image by adjusting the Percentage, refer to the following examples.

Fig.1.5.20 is the original image:



Fig. 1.5.20

When Percentage is 0, see Fig.1.5.21.

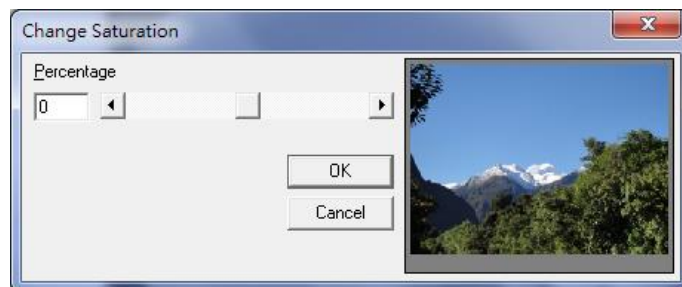


Fig. 1.5.21

When Percentage is -100, see Fig.1.5.22.

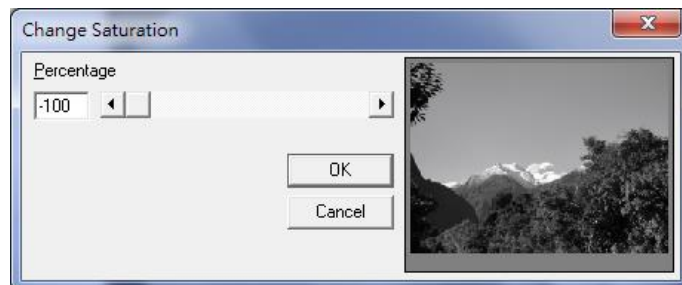


Fig. 1.5.22

When Percentage is 100, see Fig.1.5.23.

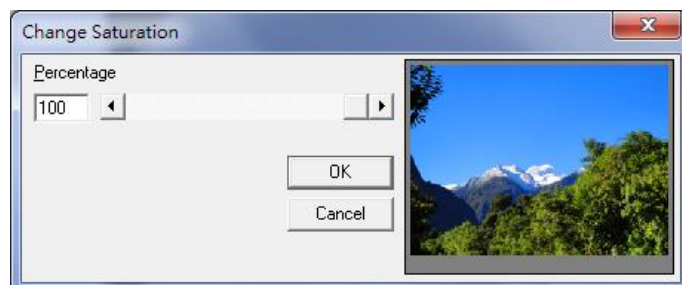


Fig. 1.5.23



## MM3D 3.90

### 1.5.7 Gamma

#### Click “Color – Gamma”

Change the image color by adjusting the Gamma value, refer to the following examples.

Fig.1.5.24 is the original image:



Fig. 1.5.24

When Gamma Value is 1.00, see Fig.1.5.25.

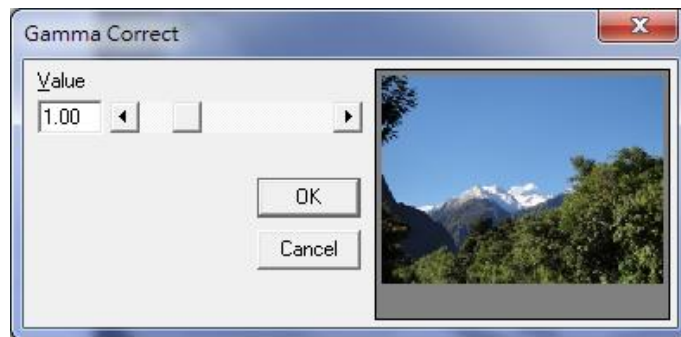


Fig. 1.5.25

When Gamma Value is 0.30, see Fig.1.5.26.

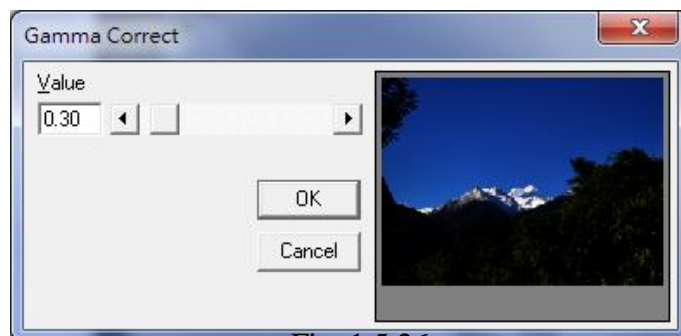


Fig. 1.5.26

When Gamma Value is 4.99, see Fig.1.5.27.

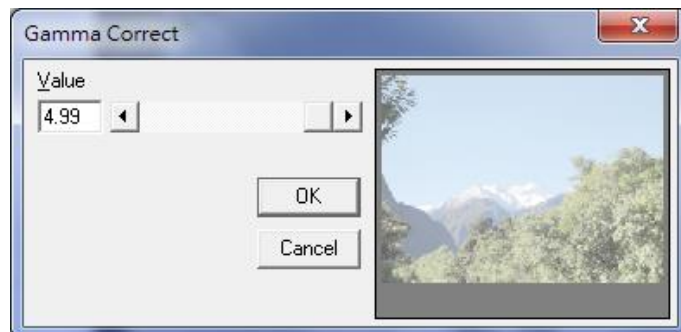


Fig. 1.5.27

## MM3D 3.90

### 1.5.8 Intensity

Click “Color - Intensity”

#### 1.5.8.1 Detect

Adjust image intensity according to the Low and High value, refer to the following examples.

Fig.1.5.28 is the original image:



Fig. 1.5.28

When Low Value is 43, High Value is 186, see Fig.1.5.29.

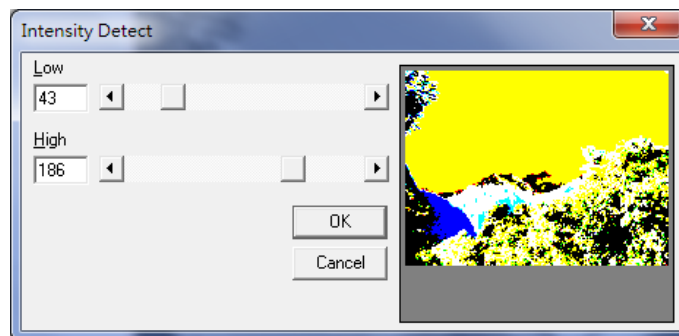


Fig. 1.5.29

When Low Value is 130, High Value is 150, see Fig.1.5.30.

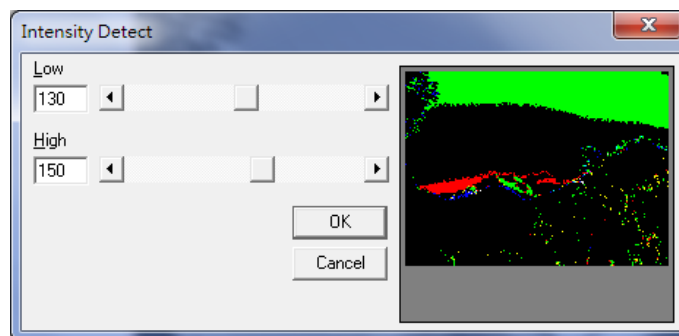


Fig. 1.5.30

#### 1.5.8.2 Stretch

Change the image intensity according to the previous settings.

## MM3D 3.90

### 1.5.9 Histogram

Click “Color - Histogram”

**Equalize**

Equalize the image automatically, refer to Fig.1.5.31 and 1.5.32.



Fig. 1.5.31 Original



Fig. 1.5.32 After

## MM3D 3.90

### Contrast

Change the image contrast by adjusting the percentage.

Fig.1.5.33 is the original image:



Fig. 1.5.33

When Percentage is 0, see Fig.1.5.34.



Fig. 1.5.34

When Percentage is -100, see Fig.1.5.35.

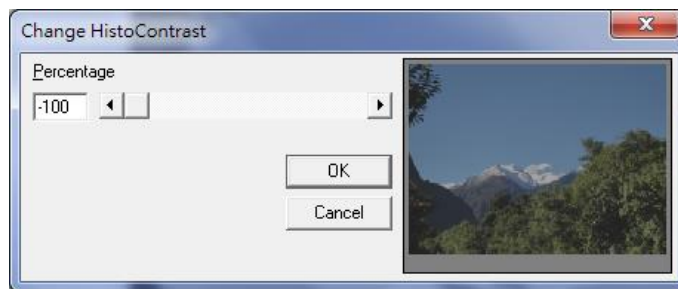


Fig. 1.5.35

When Percentage is 100, see Fig.1.5.36.

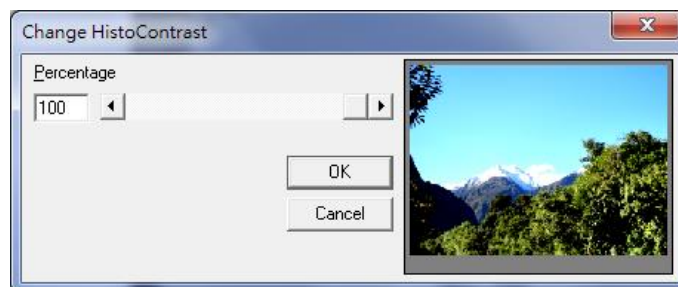


Fig. 1.5.36

## MM3D 3.90

### 1.5.10 Invert

Click “Color - Invert”

Invert the color of the image, refer to Fig.1.5.37 and 1.5.38.



Fig. 1.5.37

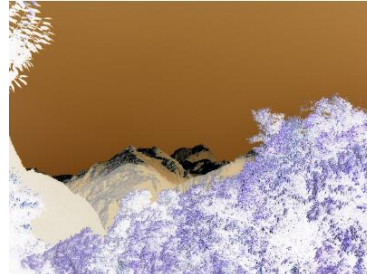


Fig. 1.5.38

## MM3D 3.90

### 1.5.11 Solarize

#### Click “Color - Solarize”

Create an exposure effect for the image by adjusting threshold value.  
Fig.1.5.39 is the original image:



Fig. 1.5.39

When Threshold is 30, see Fig.1.5.40.

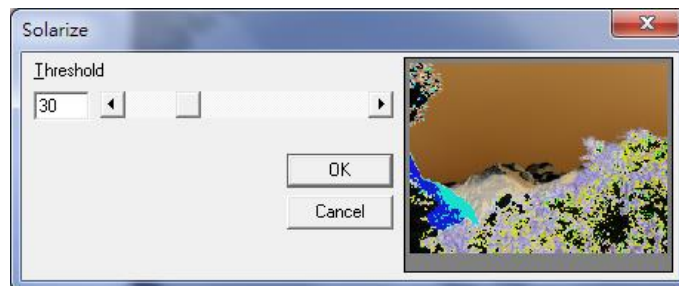


Fig. 1.5.40

When Threshold is 80, see Fig.1.5.41.

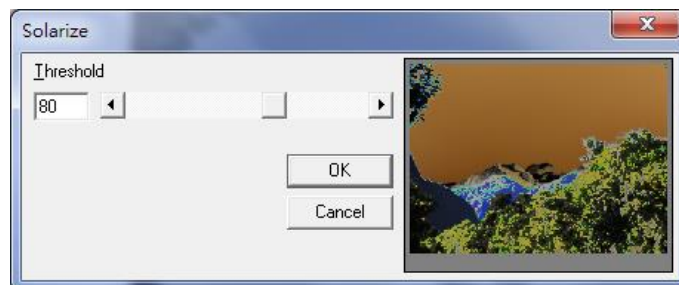


Fig. 1.5.41

When Threshold is 128, see Fig.1.5.42.

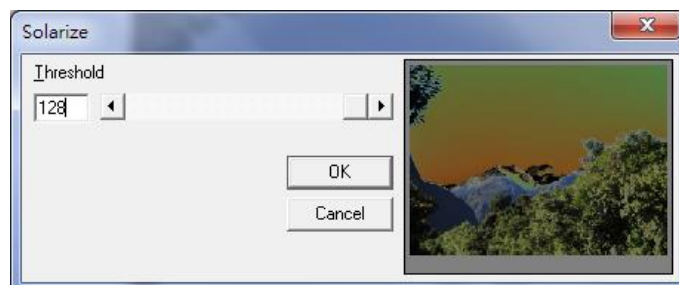


Fig. 1.5.42

## MM3D 3.90

### 1.6 Execute Menu

“Execute” menu offers the following function:

<b>Marking</b>	Set the marking related parameters and execute marking.
<b>Multi Document Process</b>	Open the interface of multi-document processing.
<b>Remote Control</b>	Send commands from another host to control the local host to perform editing and marking.
<b>Estimated Time of Process</b>	Estimate elapsed time during marking.
<b>Align Test</b>	Allow users to examine the mark position is correct or not.
<b>Preview</b>	Using align light to preview the marking path.
<b>Mark Sample(s)</b>	Mark the selected objects once as a sample for user to adjust the parameters.
<b>User Level</b>	User Level is divided into Operator, Programmer, and Administrator to separate user’s authorities.
<b>Mark Parameter List</b>	Allow users to name, save, and load the marking parameters.
<b>Auto Text Manager</b>	Activate the auto text manager for users to edit auto text object.
<b>Rotary Marking</b>	Provide common used rotary marking functions.
<b>Altimetry</b>	Enable altimetry function.

## MM3D 3.90

### 1.6.1 Marking

Mark the selected objects and adjust the marking related settings, see Fig.1.6.01.

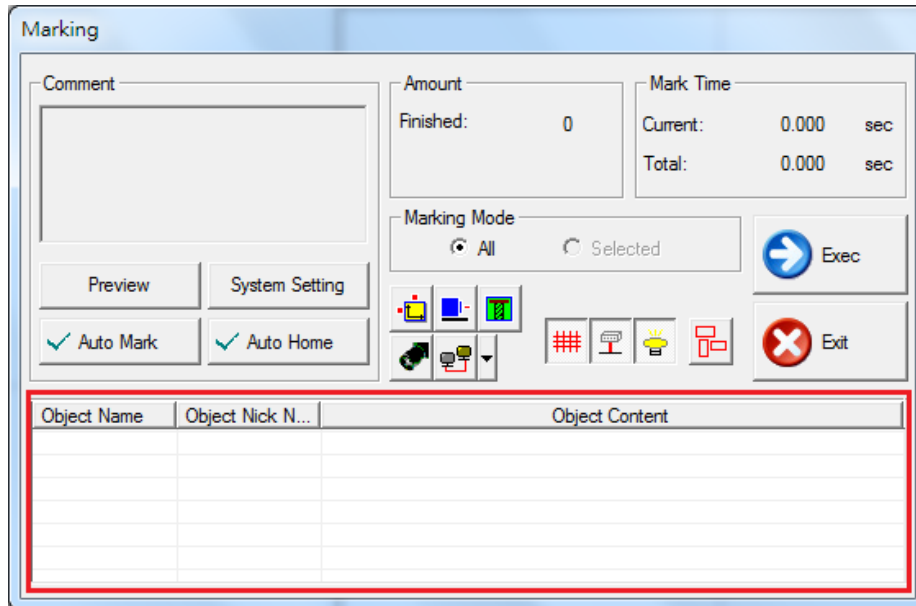


Fig. 1.6.01

**Comment:** Display the notation of the marking file. It shows the function and the notes of that file.

**Preview:** Preview marking. ([Refer to 1.6.6](#))

**System Setting:** Set the marking related parameters, see Fig.1.6.02. Some parameters are the same as parameters of System Property Table ([Refer to 3.1.3](#)), in this case, the followings only introduce the different parameters (red flames of Fig.1.6.02).

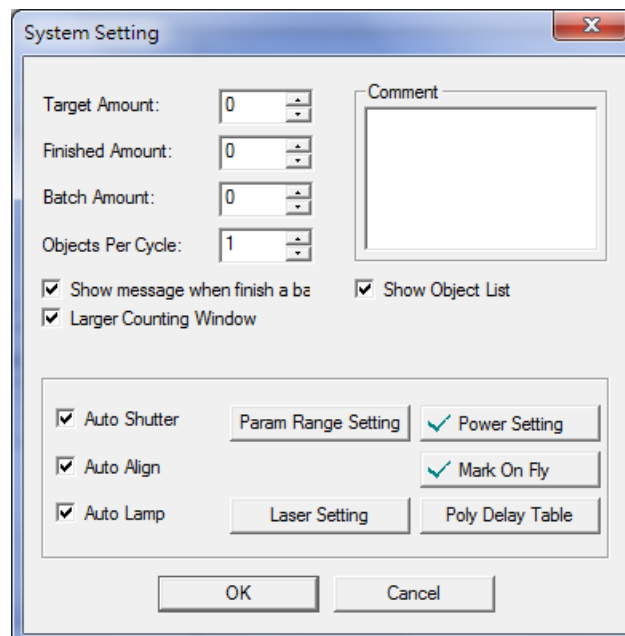


Fig. 1.6.02

**Show Object List:** Enable this function, all object's names and contents will be displayed in the red frame of "Marking" dialogue like Fig.1.6.01 shows.



## MM3D 3.90

**Auto Shutter/Auto Align/Auto Lamp:** Enable to allow system to do the auto setting of these three functions. (Default is checked.)

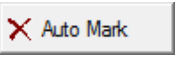
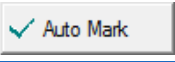
### Param Range Setting

Set Max mark speed, power range and frequency range.

### Laser Setting:

Set the parameters of some specific laser controllers, such as SPI laser. This button will display only when choosing the laser which support this function. As to how to set the parameters, please refer to the laser's manual.

**Auto Mark:** Click this button and a dialog box will appear like Fig. 1.6.03. Check the "Enable" box to allow users to mark continuously. If enable this function, then the figure

 will become .

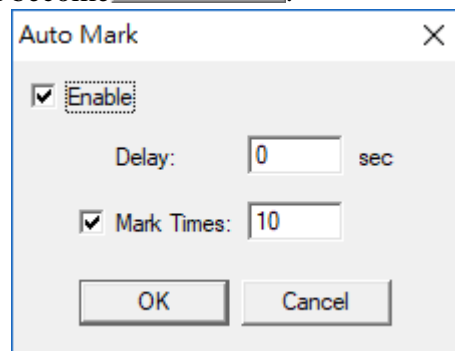
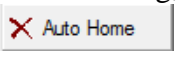
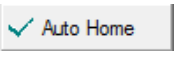


Fig. 1.6.03

**Delay:** The waiting time between each marking.

**Mark Times:** Repeat marking counts. Reach counts will stop marking.

**Auto Home:** Click this button and a dialog box will appear like Fig. 1.6.04. Check the "Enable" box to allow users to select the axis which is using and set "C" value. C means that the selected axis will do home automatically after marking specific times. Take C=3 for example, the system will do home at the beginning of marking and then after 3 times of marking, the system will do home again. If enable this function, then the figure

 will become .

## MM3D 3.90

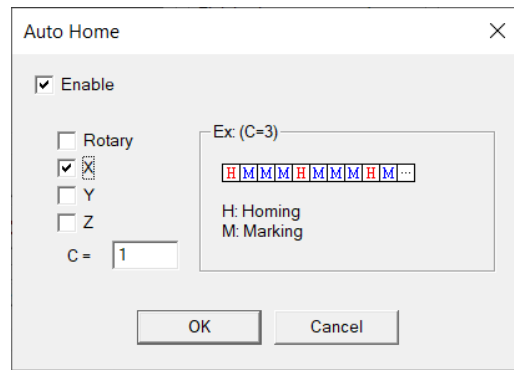


Fig. 1.6.04

### Amount

**Finished:** Display the completed marking amount.

**Expected:** Display the expected marking amount. (This will be display only when setting the Target Amount value in “System Setting,” see Fig.1.6.02)

**Total:** Display the completed marking amount since MM3D installed.

### Mark Time

**Current:** The spending time of current marking.

**Total** – The total spend time of marking.

### Marking Mode

**All:** Mark all the objects (default).

**Selected:** Only mark the selected objects.



**XY-Table Control Panel** (please [refer to section 1.7.23.1](#))



**Rotary Control Panel** (please [refer to section 1.7.23.2](#))



**Z Axis Control Panel** (please [refer to section 1.7.23.3](#))



**CCD Panel** (please refer to CCD Panel user manual.)



**Altimetry** (Please refer to Altimetry to section 1.1.7)



**Enable Automation Process:** Click this button, the “Exec” button cannot be clicked and the marking can only be controlled by external signal. Click the arrow button will and a dialogue box of Automation option will be displayed (refer to section 1.1.6.12).



**Shutter ON/OFF:** Control the on/off of the shutter (default is on).



**Align ON/OFF:** Control the on/off of the align (default is on).

## MM3D 3.90



**Lamp ON/OFF:** Control the on/off of the lamp (default is on).



**Preview:** Preview the marking route.



Exec

Start marking. Press “Esc” to stop or “Space” to pause.



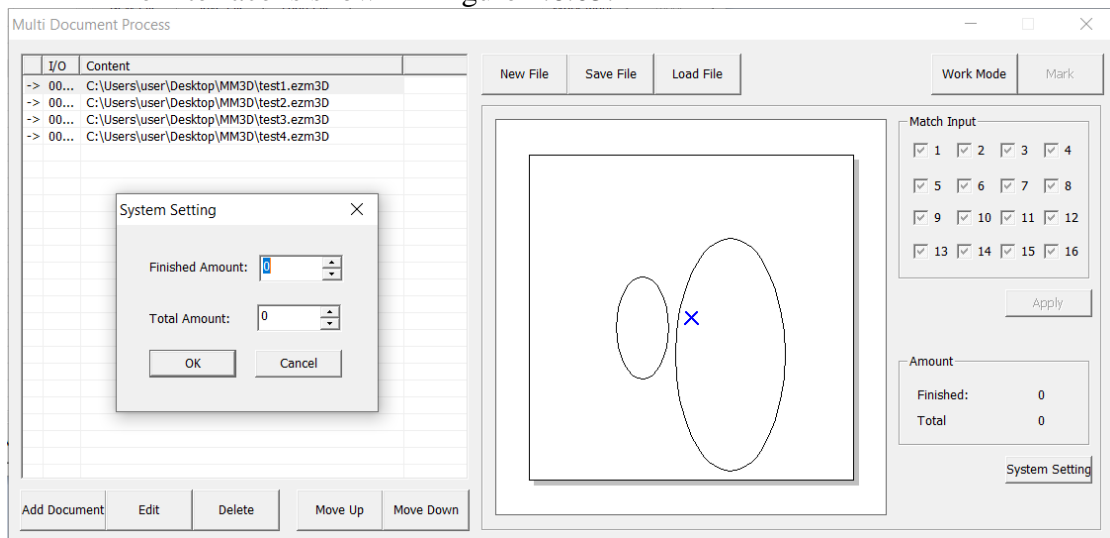
Exit

Stop marking or exit marking dialog box.

# MM3D 3.90

## 1.6.2 Multi Document Process

Multiple \*ezm.3D files can be set for processing flow based on I/O settings. The interface is shown in Figure 1.6.05.



<b>Add Document</b>	Add desired *ezm.3D file.
<b>Edit</b>	Edit *ezm.3D file.
<b>Delete</b>	Delete *ezm.3D file.
<b>Move Up</b>	Click the *ezm.3D file in the Content list to "move up" the order.
<b>Move Down</b>	Click the *ezm.3D file in the Content list to "move down" the order.
<b>New File</b>	Create a new *.MDF file.
<b>Save File</b>	Save a *.MDF file.
<b>Load File</b>	Load a *.MDF file.
<b>Work Mode</b>	Enable work mode before marking.
<b>Mark</b>	Mark according to the I/O signal.
<b>Finished</b>	Display finished amount.
<b>Total</b>	Display total amount.
<b>System Setting</b>	Able to edit "Completed Amount" and "Total Amount Completed" in the system setting window, shown in Figure 1.6.05.

## 1.6.3 Remote control

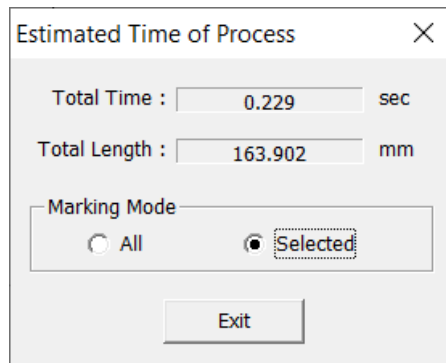
Send commands from another host to control the local host to perform graphic editing and marking.

**Please refer to [Remote Control Manual] for the description of remote control commands and error codes.**

## MM3D 3.90

### 1.6.4 Estimate process time

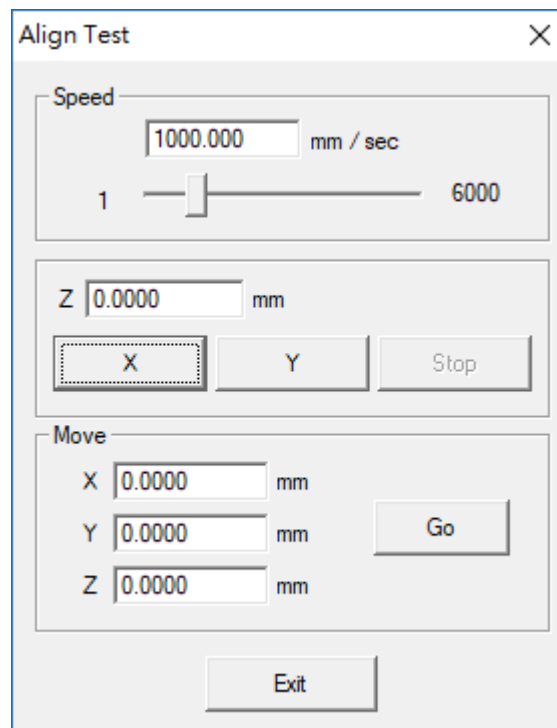
Estimate the time elapsed during processing as shown in Figure 1.6.06.



<b>Total Time</b>	Estimate the processing time of marking.
<b>Total Length</b>	Estimate the total length of the processing path of the marking.
<b>Mark Mode</b>	Click "All" to estimate all content. Click "Selected" to estimate the selected content.
<b>Exit</b>	Leave the interface of estimated processing time.

### 1.6.5 Align Test

Set the parameters for align light, see Fig.1.6.07.



#### **Speed**

Adjust the speed of the align light. Modify it by key in the value or move the scrollbar

## **MM3D 3.90**

directly. The maximum speed is 6000 mm/sec.

**Z:** Input Z position. Co-work with X and Y button.

**X:** Click “X” button, the align light will shift toward the X direction.

**Y:** Click “Y” button, the align light will shift toward the Y direction.

**Stop:** Click “Stop” button and the align light will stop.

### **Move**

**X:** Set the shift distance of X direction (unit: mm).

**Y:** Set the shift distance of Y direction (unit: mm).


**Z:** Set the shift distance of Z direction (unit: mm).

**Go:** Click the button and the align light will adjust the X/Y position according to the X/Y value.

## MM3D 3.90

### 1.6.6 Preview

This function is used to position the marking object. The interface shows as Fig.1.6.06. It uses align light instead of laser to display marking route on work piece. Users can adjust the position of work piece to fit the marking area through this function. To exit

preview, click  on the upper right of the interface.

**Speed:** Movingspeed of align light.

**Position: Unit(mm)**

Set the offset amount of each action. Use the output preview to place the workpiece.

There are two ways to do it:

1. Turn on the red light for preview, and then slowly move the workpiece to the proper position.
2. First put the workpiece on the roughly correct position, and then offset the marking figure by the function of displacement adjustment, so that the figure can be mark on the workpiece.

The software has a joystick for up, down, left, and right to allow users to adjust the position of the red light. The red light will move by a fine-offset unit with the joystick. The user can also change the “**unit**” value anytime according to their need.

**Preview Mode**

**Bounding:** The preview only shows the marking frame.

**Full Path:** The preview shows the whole marking path.

**Selected Only:** Preview the selected object only.

**Mark On Fly:** Preview the marking position under “**Mark On Fly**” mode.

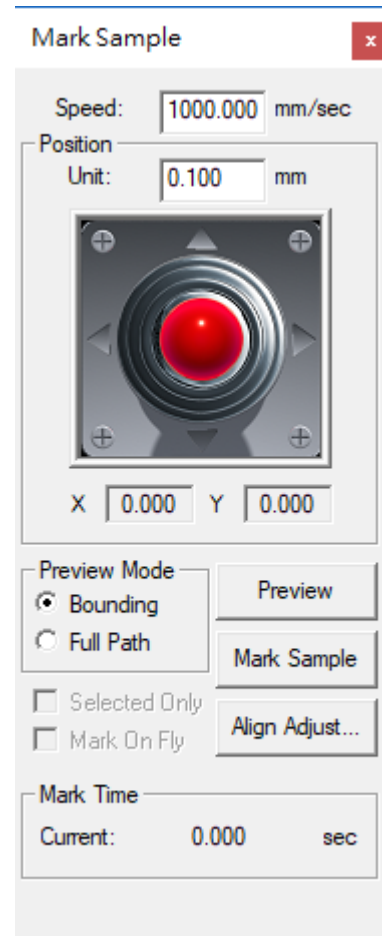
**Preview:** Start preview.

**Mark Sample:** Execute marking directly.

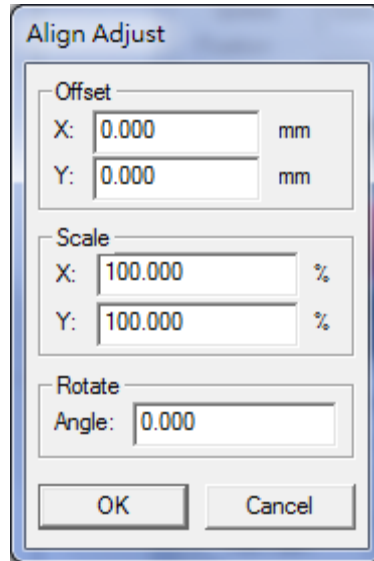
**Mark Time:** Time cost of mark sample.

**Align Adjust**

If the position of laser does not match with align light, users can use this function to adjust the offset, scale, and rotate angle of the align light, see Fig.1.6.09.



## MM3D 3.90



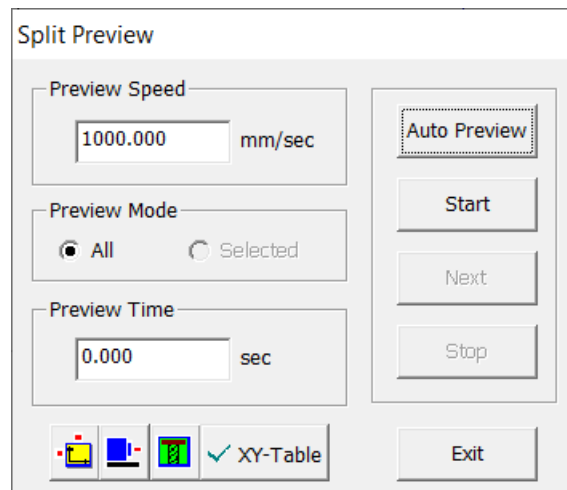
**Offset:** Adjust the align light's offset of X or Y direction.

**Scale:** Adjust the align light's scale of X or Y.

**Rotate:** Adjust the angle of align light.

### Split Preview

After activating the "Tiling" function, the setting of "Split preview" will appear when pressing "Preview". As shown in Figure 1.6.10.



**Preview Speed**

**Preview Mode**

**Preview Time**

**Auto Preview**

**Start**

**Next**

Set the preview speed in millimeters/seconds

You can choose to preview "All" or only "Selected" objects.

The preview time of each partition when using automatic preview.

After pressing the button, it is in automatic preview mode.

To start the Split preview.

Click "Next" to preview the next partition when the preview is not automatic.



## MM3D 3.90

<b>Stop</b>	Stop preview.
<b>XY-Table Control Panel</b>	Turn on the control settings of the XY table.
<b>Rotarty Control Panel</b>	Turn on the control settings of the Rotary.
<b>Z Axis Control Panel</b>	Turn on the control settings of the Z Axis.
<b>XY-Table</b>	Click to enable/disable the XY-table movement when split preview.
<b>Exit</b>	Exit “split preview” panel.

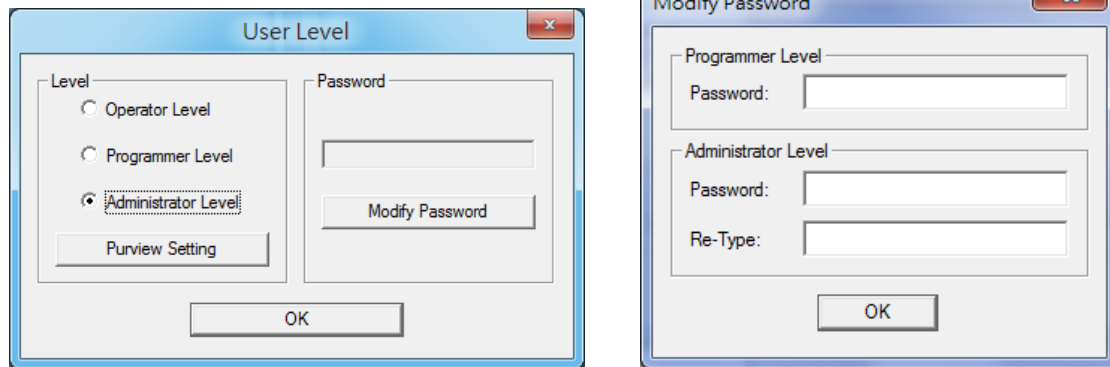
## MM3D 3.90

### 1.6.7 Mark Sample(s)

Select this function and enter the preview mode to do “Mark Sample.”

### 1.6.8 User Level

Users are allowed to execute different functions according to their authorities, see Fig.1.6.11.



**Operator:** The available functions for "Operator Level" according to the authority setting.

**Programmer:** The available function for "Programmer Level" according to the authority setting.

**Administrator:** The available function for "Administrator Level" according to the authority setting. Administrators is able to add/modify/delete account information to achieve management.

**Purview Setting:** Special functions for system administrators. The system administrator can specify the operating authority of the users at all levels. See Figure 1.6.11. It can manage the use of each function (file, editing, drawing, image, color, execution, viewing, property table, dragger) for each level of users.

## MM3D 3.90

Purview Setting ×

Category : Draw ▾

User Level	Administrator	Programmer	Operator Level	
Edit	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Vertex	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Line	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Arc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Circle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Rectangle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Curve	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Curve Brush	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Text	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Arc Text	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Rectangle Text	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1D Barcode	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2D Barcode	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Spiral	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Control Object	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Deep Carving	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Exit

The authority setting for specific function operations can be divided into three states, refer to Figure 1.6.13

**No Check**

The functional interface is hidden and cannot be used.

**Checked(with white back ground)**

The function interface is displayed and the function can be used.

**Checked(With gray back ground)**

The function interface is displayed, but the function is grayed out and cannot be used.

Purview Setting ×

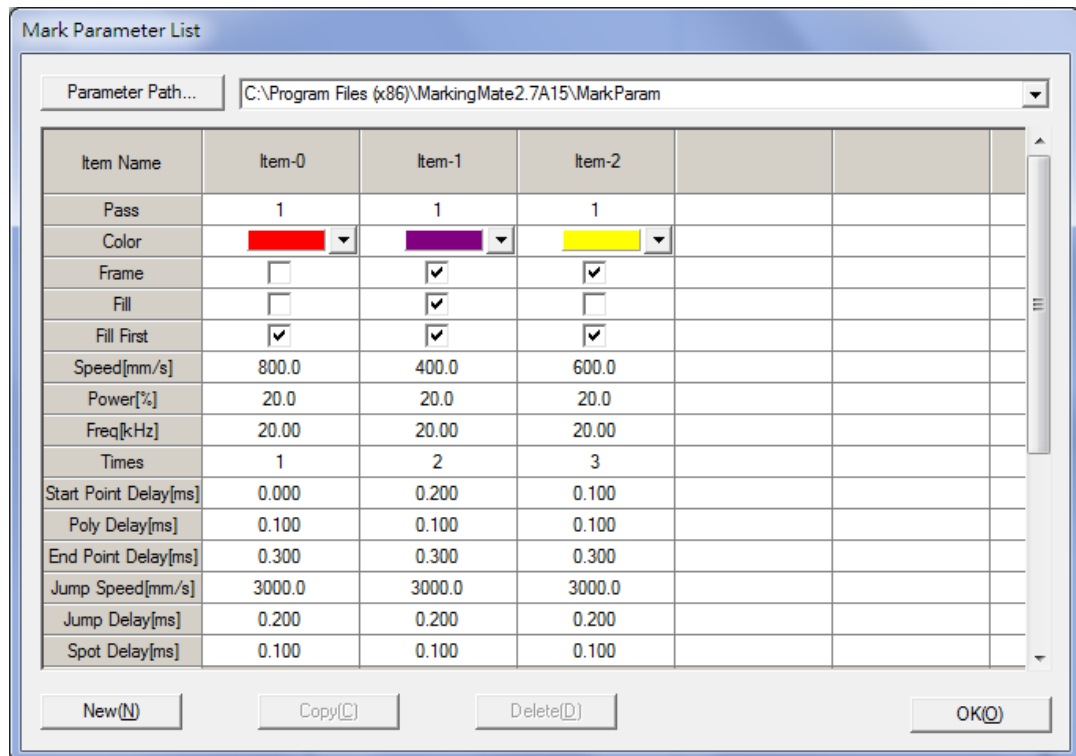
Category : Draw ▾

User Level	Administrator	Programmer	Operator Level	
Edit	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Vertex	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Line	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Arc	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

## MM3D 3.90

### 1.6.9 Mark Parameter List

This list shows all the marking parameters users set themselves. Users can name, sort, and save these parameters for future use, see Fig.1.6.15.



<b>Parameter Path</b>	The saving folder of the parameter list.
<b>Item Name</b>	The name of the item.
<b>Pass</b>	The marking passes of Mark Parameter Table.
<b>Color</b>	Set the frame and fill color.
<b>Frame</b>	Decide to mark frame or not.
<b>Fill</b>	Decide to fill or not when marking.
<b>Fill First</b>	Decide to fill first or not when marking.
<b>Speed [mm/s]</b>	Marking speed.
<b>Power [%]</b>	Marking power (maximum 100).
<b>Freq [KHz]</b>	Marking frequency.
<b>Times</b>	Repeat marking times.
<b>Start Point Delay [ms]</b>	The time difference between start laser order and laser hit time. This value will affect the quality of start point.
<b>Poly Delay[ms]</b>	This value will affect the quality of joins.
<b>End Point Delay [ms]</b>	This value will affect the quality of end point.
<b>Mark Delay[ms]</b>	This value will affect the quality of end point. Mark Delay must equal or larger than End Point Delay.
<b>Jump Speed [mm/s]</b>	The speed of laser.
<b>Jump Delay [ms]</b>	When laser move to the assigned position, it will shoot after this delay time.

## MM3D 3.90

<b>Spot Delay [ms]</b>	The spending time for laser to mark one spot or pixel.
<b>Laser Shot</b>	The amount of laser shots for marking a dot (only when choose “Laser Shot Mode” in “Burst Mode Setting”).
<b>FPK Width</b>	Set the width of FPK.
<b>Pulse Width [μs]</b>	Set the width of pulse (only for YAG).
<b>Duty Cycle[%]</b>	Set the pulse width by setting the proportion of the pulse to the entire waveform instead of directly setting the duration of the pulse.
<b>Waveform No.</b>	There are 64 waveforms for users to choose(only for SPI).
<b>CW Mode</b>	Mark using continuous wave mode (only for SPI).
<b>Wobble</b>	Mark by spiral type and make the line segment become thicker.
<b>Wobble mode</b>	Select the wobble mode.
<b>Wobble Thick (W)</b>	The diameter of the circle for wobble.
<b>Wobble Length</b>	It can be set when using "infinite" and "8-character" mode.
<b>Wobble Speed</b>	The system calculates the actual marking speed according to the width and overlap rate set by the user.
<b>Wobble Freq</b>	Set the frequency of wobble during marking. The higher the frequency, the denser the engraving result.
<b>Wobble Overlap</b>	Frequency of wobble. When the speed becomes quicker and the frequency become higher, the line segment will be denser.
<b>Wob Rect Width</b>	The width of the rectangle for wobble.
<b>Wob Rect Length</b>	The length of the rectangle for wobble.
<b>Step Distance</b>	The distance between each dot (under Dot Mode).
<b>Step Delay</b>	The staying time for laser on each dot (under Dot Mode).
<b>Fill Pitch</b>	The distance between fill lines.
<b>Internal freq</b>	The frequency of laser when marking fill lines.
<b>Fill times</b>	Times of fill lines.
<b>Fill Angle Start</b>	Initial fill line angle.
<b>Fill Angle Step</b>	Next time fill line angle difference to last times.
<b>New</b>	Create a new item.
<b>Copy</b>	Copy the selected item as a new item.
<b>Delete</b>	Delete the selected item.
<b>OK</b>	Save the data.

### Application: How to use the created mark parameters?

- i. Select an object.
- ii. Go to the Mark Parameter of the Property Table and then click “Load...” button to enter the Mark Parameter List.
- iii. Select the mark parameter user need and click “Apply” button, and the object will be marked as the mark parameter setting.

## MM3D 3.90

### 1.6.10 Auto Text Manager

This is used to activate the Auto Text Manager for auto text setting, see Fig.1.6.16. For more details, please refer to **Practical Functions Chapter 11 – Auto Text.**

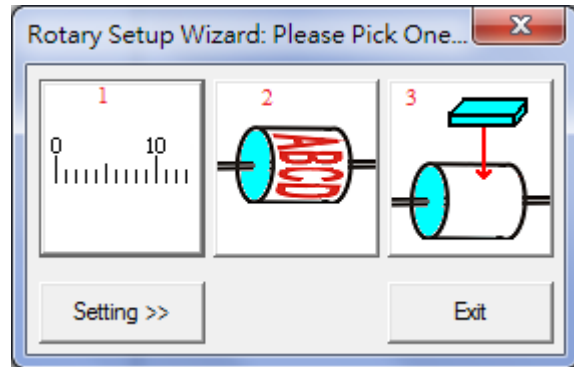
The screenshot shows the 'Auto Text Manager' dialog box. It has a title bar with a close button (X). The main content is organized into several sections:

- Top Section:** 'Auto Text Item:' dropdown menu showing 'Engine Item 1'. Below it is a 'Rename:' text box containing 'Engine Item 1' and an 'OK' button. At the bottom of this section are 'Delete Item' and 'Create Item' buttons.
- Auto Text Item Setting Section:** A section header followed by 'Auto Text Mode:' dropdown menu showing 'Serial No.'. Below this is a 'Serial No.' section containing:
  - 'Prefix:' text box (empty)
  - 'Content' section with:
    - 'Start:' spinner box (0) and 'Digit:' spinner box (3)
    - 'Step:' spinner box (1) and 'Lead:' text box (empty)
    - 'End:' spinner box (100) and a checked 'Recycle' checkbox
    - 'Repeat:' spinner box (1) and a 'Special carry' button
    - 'Base:' dropdown menu (Decimal)
  - 'Postfix:' text box (empty)
- Bottom Section:** A 'Close' button.

## MM3D 3.90

### 1.6.11 Rotary Marking

The system provides three common used rotary marking functions for users to select, see Fig.1.6.17. Moreover, it also allows users to set the motor. If users click “Setting>>,” then the “Rotary Control Panel” will display as Fig.1.6.18. Please refer to **Practical Functions – Rotary Library** for more details.

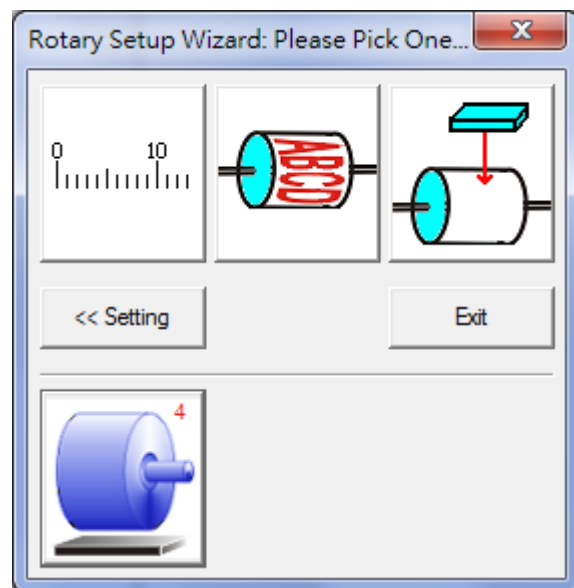


#### 1. Calibration Marking

#### 2. Ring Text Marking

#### 3. Cylinder Marking

#### 4. Rotary Control Panel



### 1.6.12 Altimetry

Turn on the "Altimetry Module" function. (Please refer to P.32)

## MM3D 3.90

### 1.7 View Menu

“View” menu offers the following functions:

<b>Standard Bar</b>	Enable/disable Standard Bar
<b>Zoom Bar</b>	Enable/disable Zoom Bar
<b>Draw Bar</b>	Enable/disable Draw Bar
<b>Layer Bar</b>	Enable/disable Layer Bar
<b>Object Browser</b>	Enable/disable Object Browser
<b>Modify Bar</b>	Enable/disable Modify Bar
<b>Dimension Bar</b>	Enable/disable Dimension Bar
<b>Obj Property Bar</b>	Enable/disable Object Property Bar
<b>Mold Bar</b>	Enable/disable Mold Bar
<b>Mark Sample Bar</b>	Enable/disable Mark Sample Bar
<b>Data Wizard</b>	Enable/disable Data Wizard
<b>Make Font Bar</b>	Enable/disable Make Font Bar
<b>Text Property Bar</b>	Enable/disable Text Property Bar
<b>Vector Box</b>	Enable/disable Vector Box
<b>Property Table</b>	Enable/disable Property Table
<b>Manual Split Bar</b>	Enable/disable Manual Split Bar
<b>3D View Control Panel</b>	Enable/disable 3D View Control Panel
<b>3D Panel</b>	Enable/disable 3D Panel
<b>Import Mold Panel</b>	Enable/disable Import Mold Panel
<b>Slice Bar</b>	Enable/disable Slice Bar
<b>3D Mold Bar</b>	Enable/disable 3D Mold Bar
<b>3D Mold Lock Toolbar</b>	Enable/disable 3D Mold Lock Toolbar
<b>3D Mold Browser</b>	Enable/disable 3D Mold Browser
<b>Control Tool</b>	Enable/disable Control Tool
<b>Mark Panel</b>	Enable/disable Mark Panel
<b>Status Bar</b>	Enable/disable Status Bar
<b>Desktop Mode</b>	Enter Desktop Mode or not
<b>Composing</b>	Composing Settings



## MM3D 3.90

<b>Show Order</b>	Show the mark order
<b>Tooltips</b>	Enable/disable Tooltips
<b>Tooltips Setting</b>	Go to the Tooltips setting page of Options
<b>Ruler</b>	Enable/disable Ruler
<b>Ruler Setting</b>	Go to the ruler setting page of Options
<b>Grid</b>	Enable/disable Grid
<b>Grid Lock</b>	Enable/disable Grid Locking
<b>Grid Parameter</b>	Grid Parameter setting
<b>Zoom In</b>	Enlarge a specific area
<b>Zoom Out</b>	Shrink a specific area
<b>Zoom Previous</b>	Go back to the previous view
<b>Zoom All</b>	Show the whole Working Area
<b>Zoom Extend</b>	Show all objects.
<b>Zoom Select Object</b>	Zoom in or zoom out the selected object to fit the entire page











Tool Bars allow users to execute some specific functions more quickly. Users can activate the tool bar they need at View Menu and the image of that tool bar, for example, Standard Bar, will become  Standard Bar(T) . Users can also place the tool bar to any position by dragging it.

## MM3D 3.90

### 1.7.1 Standard Bar

The function of the toolbar is to allow users to use frequently used functions more conveniently and quickly. Click and drag the area around the toolbar to move the toolbar to any position on the system screen. The toolbar will float on the working range with double click. Drag the toolbar to near the border, it will be fixed on the border and become a part of the border. If the toolbar is currently open, a "V" mark will appear in front of the option in the "View menu" list.

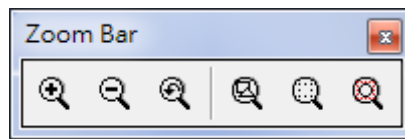








<b>New</b>		Create a new document.
<b>Open</b>		Load files.
<b>Save</b>		Save the current document using the existing file name.
<b>Undo</b>		Back to the previous action.
<b>Redo</b>		Cancel the Undo action.
<b>Import</b>		Import a graphic file and convert it into the marking format.
<b>Replace</b>		Replace the selected object by a new one.
<b>Cut</b>		Remove selected data and store it in the clipboard for another use.
<b>Copy</b>		Duplicate selected data and store it in the clipboard for another use.
<b>Paste</b>		Attach data from the clipboard to an assigned document.

## MM3D 3.90

### 1.7.2 Zoom Bar

View the objects by zooming them, see Fig.1.7.02.

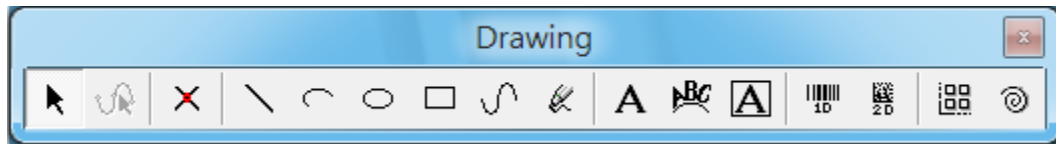


<b>Zoom in</b>		Enlarge a specific area.
<b>Zoom out</b>		Shrink a specific area.
<b>Zoom previous</b>		Go back to the previous view.
<b>Zoom all</b>		Show the whole Work Area.
<b>Zoom extend</b>		Show all objects.
<b>Zoom Selected Objects</b>		Zoom the selected objects to fit the whole editing area.

## MM3D 3.90




### 1.7.3 Drawing Bar

The Drawing Bar provides the drawing functions, see Fig.1.7.03.



Selection		Select objects.
Edit Vertex		Edit the vertexes of curve objects.
Vertex		Draw a dot.
Line		Draw a line.
Arc		Draw an arc.
Circle		Draw a circle or oval.
Rectangle		Draw a square or rectangle.
Curve		Draw a curve.
Curve Brush		Draw a freehand line using the mouse.
Text		Insert a text object.
Arc Text		Insert an arc text object.
Rect Text		Insert a rect text object.
1D Barcode		Create a 1D barcode.

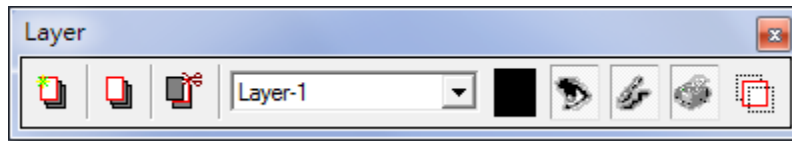
### MM3D 3.90










2D Barcode		Create a 2D barcode.
Spiral		Draw a spiral object
Deep Carving		Create a deep carving object. (Need license supports)

## MM3D 3.90

### 1.7.4 Layer Bar

The Layer Bar allows users to edit the layers, see Fig.1.7.04.

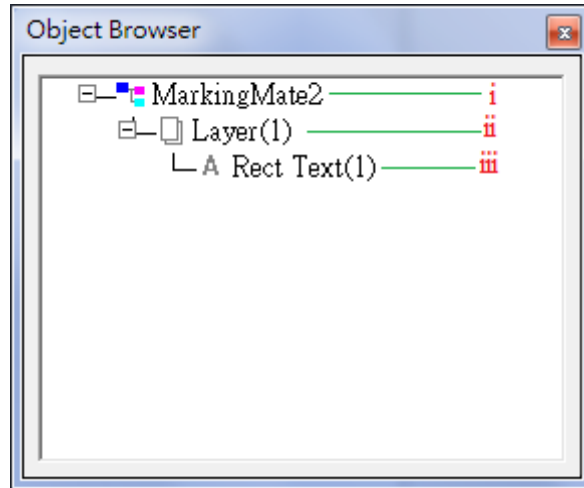


<b>Layer Manager</b>		The layer page of Property Table will show up for editing.
<b>New Layer</b>		Create a new layer.
<b>Delete the Active Layer</b>		Delete the selected layer.
<b>Current Layer</b>		Select the layer.
<b>Layer Color</b>		Set the layer color.
<b>View Layer</b>		Enable or disable to view the selected layer.
<b>Edit Layer</b>		Enable or disable to edit the selected layer.
<b>Output Layer</b>		Enable or disable to output the selected layer.
<b>Show the Selected Layer</b>		Show the selected layer only.

## MM3D 3.90

### 1.7.5 Object Browser

The Object Browser allows users to edit the parameters of layer, see Fig.1.7.05. Object Browser can not only view the whole layers and objects but can also change the order or rename the layer and object.

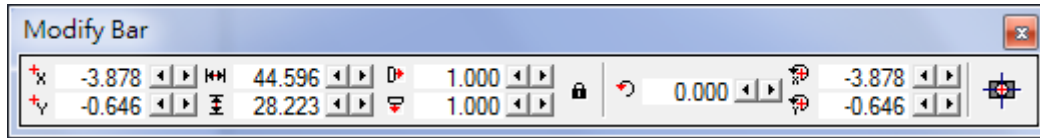


- i. Select the file:** When click the file, like **MM3D1**, all the layers and objects will also be selected and users can edit the parameters of System-Related Property Table.
- ii. Select the layer:** When click the layer, all the objects under this layer will also be selected and users can edit the layer's parameters at Layer Page of Property Table.
- iii. Select the object:** Users can edit the object's parameters when clicking the object's name.

## MM3D 3.90

### 1.7.6 Modify Bar

The Modify Bar is for users to modify the object's parameters such as length and width, see Fig.1.7.06. Please notice that "Enter" must be pressed after input the value so that the modification will be effective.



<b>X of Center</b>		The X-axis value of the object's center.
<b>Y of Center</b>		The Y-axis value of the object's center.
<b>Length</b>		The length of the selected object.
<b>Width</b>		The width of the selected object.
<b>X of Scale</b>		The scale of the selected object's length.
<b>Y of Scale</b>		The scale of the selected object's width.
<b>Lock to Same Ratio</b>		Enable this function, the length and width will be adjusted with the same ratio at the same time.
<b>Angle of Rotating</b>		The rotary angle of the selected object.
<b>X of Rotating Center</b>		Set the X-axis value of rotating center.
<b>Y of Rotating Center</b>		Set the Y-axis value of rotating center.
<b>Move to the Center</b>		Move the object to the center of working area.



## MM3D 3.90

### 1.7.7 Dimension Bar

The Dimension Bar allows users to set the object's datum point, shift the object or change the object's dimension and shape, see Fig.1.7.07.



**Move**

Set the absolute or relative position.



**Rotate**

Set the rotary angle and rotary center position.



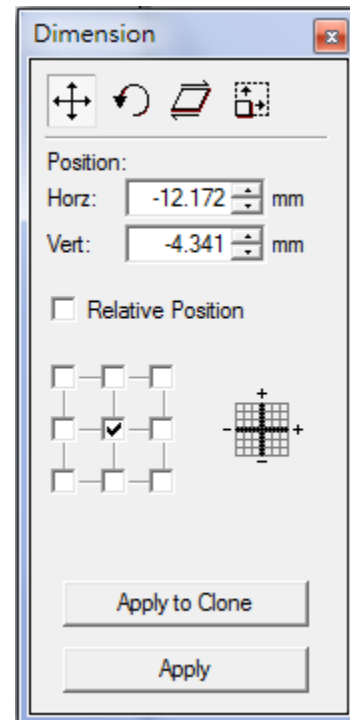
**Aslope**

Set the aslope angle



**Scale**

Set the scale of the object



## MM3D 3.90

### 1.7.8 Object Property Bar

The followings are the introductions of Object Property Bar.

#### Page Tool Bar

The Page Tool Bar will be shown on screen when there is no object been selected, see Fig.1.7.08.



Fig. 1.7.08

<b>Origin X</b>		The X-axis value of start point of working area.
<b>Origin Y</b>		The Y-axis value of start point of working area.
<b>Page Length</b>		The length of working area.
<b>Page Width</b>		The width of working area.
<b>Change the Unit</b>		The unit of the ruler (mm or inch).
<b>Nudge X</b>		The moving distance of each horizontal fine-tuning
<b>Nudge Y</b>		The moving distance of each vertical fine-tuning
<b>Grid X</b>		Edit the X grid line.
<b>Grid Y</b>		Edit the Y grid line.
<b>Open the Options Dialogue</b>		Click this button to enter the Options page.
<b>Show or Hide the Property Table</b>		Click this button to show or hide the Property Table.

## MM3D 3.90

### General Tool Bar

The General Tool Bar will be shown on screen when select a non-text object, see Fig.1.7.09.

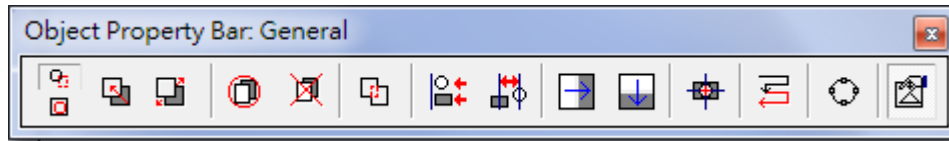

















Fig. 1.7.09

<b>General Selection</b>		The selected object is in general situation.
<b>Transparent Selection</b>		The selected object is been grouped.
<b>Combine</b>		Combine two or more objects into one. This function allows several objects to share the same property settings.
<b>Break</b>		Divide a combined object into several individual objects.
<b>Group</b>		Classify two or more objects into one group. This function allowseach object to have its own property settings.
<b>UnGroup</b>		Cancel the group effect of an object.
<b>Welding</b>		Combine two or more objects and eliminate the overlapping lines.
<b>Alignment</b>		Align the selected objects to the assigned position.
<b>Distribute</b>		Distribute the selected objects (at least 2) based on the assigned setting.
<b>Mirror Horizontally</b>		Invert an object on its horizontal axis.
<b>Mirror Vertically</b>		Invert an image on its vertical axis.
<b>Move to the Center</b>		Move the selected object to the center of working area.
<b>Sort</b>		Combine the objects which vertex are not connect to each other first, and then using this function to sort these confused objects
<b>Transfer to Curve</b>		Transfer anun-curved object into a curve.
<b>Show or Hide the Property Table</b>		Click this button to show or hide the Property Table.

## MM3D 3.90

### 1.7.9 Mold Bar

Display and set the position and size of the model, as shown in Figure 1.7.10

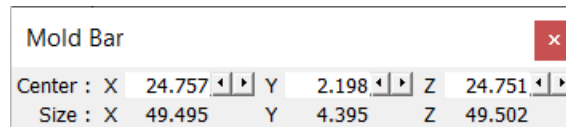


Fig. 1.7.10

### 1.7.10 Mark Sample Bar

Open the Mark Preview function ([Refer to 1.6.6](#)).

## MM3D 3.90

### 1.7.11 Data Wizard

Using this function to adjust the selected object(s), see Fig.1.7.11 and 1.7.12.

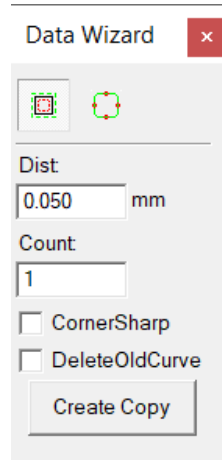


Fig. 1.7.11

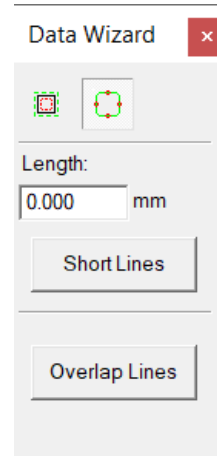



Fig. 1.7.12

<b>Beam Compensation</b> 	Create (a) shrink or dilate object(s) from a closed path object according to the dist and count, see Fig.1.7.12.
<b>Dist</b>	The shrink or dilate distance (+value: shrink; -value: dilate).
<b>Count</b>	The amount of new created object(s)
<b>CornerSharp</b>	After checking, the four corners of the generated graph will be sharp corners.
<b>DeleteOldCurve</b>	After checking, the old curve will be deleted when a new graph is generated.
<b>Create Copy</b>	Create new objects.

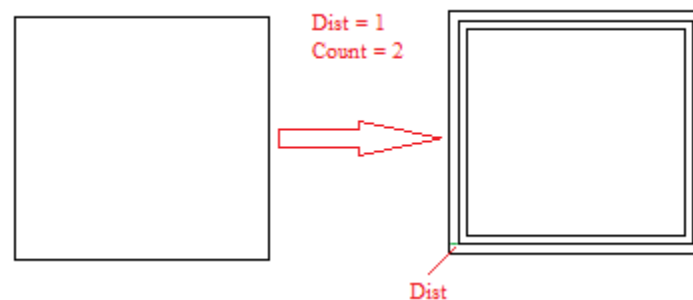



Fig. 1.7.13

<b>Data Reduction</b> 	Optimize the selected objects by eliminating the short or overlapping lines.
<b>Length</b>	Set the length of short lines user wants to eliminate.
<b>Short Lines</b>	Eliminate the set short lines.
<b>Overlap Lines</b>	Eliminate the overlapping lines.

## MM3D 3.90

### 1.7.12 Make Font Bar

Allow users to create a new font type, see Fig.1.7.14.

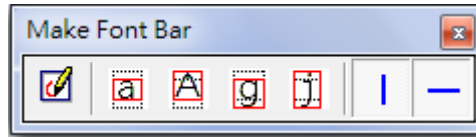


Fig. 1.7.14

	Enter or Exit Make Font mode.
	Using the default edge to set the new font.
	Adjust the right and up edge of the font.

### 1.7.13 Text Tool Bar

When select a text object, the Text Tool Bar will also be shown on the screen, see Fig.1.7.15.

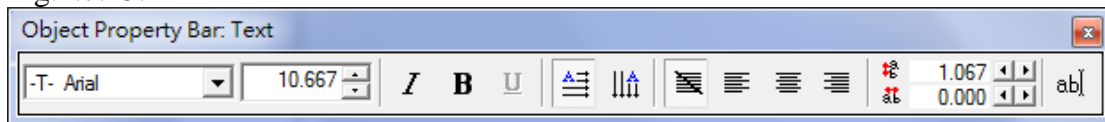
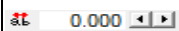



Fig. 1.7.15

<b>Font</b>		Select font.
<b>Size</b>		Adjust font size.
<b>Italic Style</b>		<i>Italic.</i>
<b>Bold Style</b>		<b>Bold Style.</b>
<b>Underline</b>		<u>Underline.</u>
<b>Hori. Arrangement</b>		Horizontal text.
<b>Vert. Arrangement</b>		Vertical text.
<b>None alignment</b>		None alignment.
<b>Left alignment</b>		Left alignment.
<b>Center alignment</b>		Center alignment.
<b>Right alignment</b>		Right alignment.
<b>Line Pitch</b>		Space between each line.

## MM3D 3.90

<b>Text Pitch</b>		Space between each character.
<b>Edit Text</b>		Set up the content of the text.

## MM3D 3.90

### 1.7.14 Vector Box

Provide several welding choices for users to apply, see Fig.1.7.16.

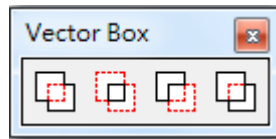


Fig. 1.7.16

#### Application

Fig.1.7.17 is the original appearance. The first object in the “Object Browser” is the main object. Take Fig.1.7.18 for example, the circle is the main object. If users want to change the objects’ order, please use “Reverse” function.

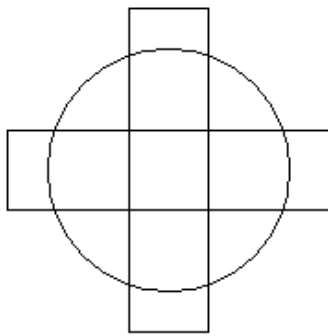


Fig. 1.7.17

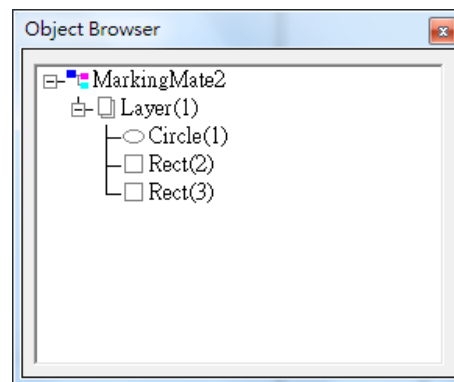


Fig. 1.7.18



**Or:** Retain the none-overlapping part of the objects, see Fig.1.7.19.

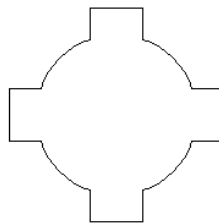


Fig. 1.7.19



**And:** Retain the overlapping part of objects, see Fig.1.7.20.



Fig. 1.7.20



## MM3D 3.90



**Subtract:** Retain the none-overlapping part of main object, see Fig.1.7.21.

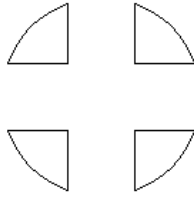


Fig. 1.7.21



**Main:** Retain the main object and the none-overlapping parts of the other objects, see Fig.1.7.22.

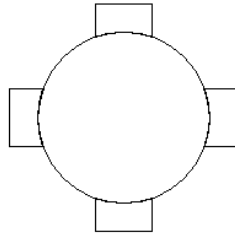


Fig. 1.7.22

### 1.7.15 Property Table

Click to open property table.










## MM3D 3.90

### 1.7.16 Manual Split Bar

In the manual split mode, open the manual split bar to adjust the split settings, see Figure 1.7.23. For more detailed of the split function, please refer to the split setting.



Fig. 1.7.23

 <b>Edit Split Bands</b>	Enter or exit manual sub-picture mode.
Layer-1 ▾ <b>Layer selecting</b>	Select the layer that is currently editing. Use with the function of splitting images by layer.
 <b>Auto Create bands</b>	Create split area for all objects
 <b>Clear all bands</b>	Clear all areas.
 <b>New a band</b>	Create an area.
 <b>Delete bands</b>	Delete an area.
 <b>Order the Bands</b>	Move created area.
 <b>Adjust size of bands</b>	Adjust the size of each area.
 <b>Arrange Order</b>	Manual arrange the order of every area.
 <b>Tiling Setting</b>	Open the “Tiling setting” dialog box.

## MM3D 3.90

### 1.7.17 3D View Control Panel

Edit mold position and size. Refer to fig.1.7.24.

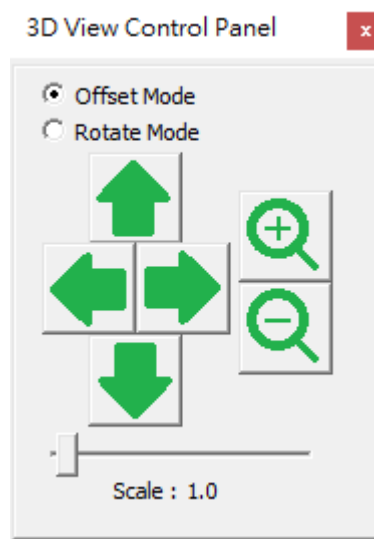


Fig.1.7.24

Offset ,mode Use arrow key will move mold.

Rotate mode Use arrow key will rotate mold.



Move or rotate mold according to mode.



Zoom in/out mold.

Scale(0.5~20.0)

Adjust amplitude of changing. Change will be larger if scale is large.


## MM3D 3.90


### 1.7.18 3D panel


Enable global view in 3D mode. Refer to fig.1.7.25.





Fig.1.7.25


**Select mode**  Allow user move across a mold and click left mouse button to select the mold.

**Rotate mode**  Allow user move across a mold then press left mouse button and move mouse to rotate the mold.

**Move mode**  Allow user move across a mold then pres left mouse button and move mouse to move the mold.

**Lock mold**  When select Move mode, if Lock Mold is enabled, the pasted 2D graphic will keep fixed relative position to mold during moving mold.

**View**  Select following button to change view.


**View top**  Show the top view.


**View below**  Show the below view.

**View front**  View the front view.


**View back**  View the back view.


**View left**  View the left view.


**View right**  View the right view.


**Show frame mode**  Show unpasted 2D graphic in frame mode.

**Set face reverse**  Exchange model inner and outer side.

**Scale model**  Scale mold according to the specified ratio.

**Move model**  Move model to the specified position.

**Rotate model**  Move model to the specified angle.

**Show 3D**  Enable global view in 3D mode. Click again to leave 3D mode.

## MM3D 3.90

### 1.7.19 Import Mold

Manage model adding, deleting, replacement, and selection. MM3D supports user import STLformat file. Refer to fig.1.7.26.



Fig.1.7.26

<b>Show</b>		Specific a model.
<b>Edit</b>		Edit model name.
<b>Add</b>		Import a model from *.STL file.
<b>Replace</b>		Import a model to replace the current one.
<b>Delete</b>		Delete the specified model.
<b>Triangulation</b>		Repair model function.
<b>Setting</b>		Set the rotation angle and moving distance when pressing the arrow keys on the keyboard, as shown in Figure 1.7.27.

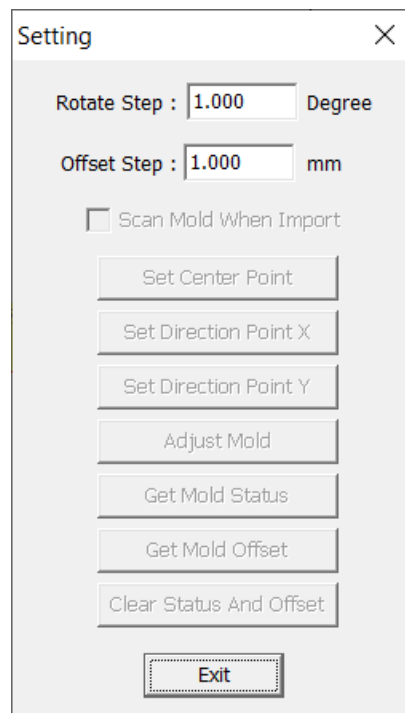


Fig.1.7.27

## MM3D 3.90

### 1.7.20 Slicer Bar

User drag slicer to confirm each slice shape.



Fig.1.7.28

## MM3D 3.90

### 1.7.21 3D Mold Toolbar

Open the simple 3D model toolbar, as shown in Figure 1.7.29. The user can select and insert the required 3D model.

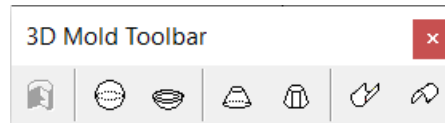









Fig.1.7.29










<b>Generate Revolution Mold</b>		Generate a revolution Mold
<b>Insert Sphere Mold</b>		Insert a Sphere Mold
<b>Insert Hemispherical Mold</b>		Insert a Hemispherical Mold
<b>Insert Cone Frustum Mold</b>		Insert a Cone Frustum Mold
<b>Insert Polygonal Frustum Mold</b>		Insert a Polygonal Frustum Mold
<b>Insert Concave Shell Mold</b>		Insert a Concave Shell Mold
<b>Insert Convex Mold</b>		Insert a Convex Mold

### 1.7.22 Control Object Tool Bar

The Control Object Tool Bar allows user to insert control objects, see Fig.1.7.30. For more detail descriptions, please refer to section 3.4.



Fig. 1.7.30

<b>Digital In</b>		Set digital in signals.
<b>Digital Out</b>		Set digital out signals.
<b>Do Pause</b>		Insert a pause object into the marking sequence.
<b>Delay Time</b>		Insert a delay time object into the marking sequence.
<b>Motion</b>		Move the object to an assigned position.
<b>Set Position</b>		Set the current position as the assigned position.
<b>Loop</b>		Create a loop path in the marking sequence.
<b>Ring</b>		Insert a ring object into the marking sequence.
<b>Homing</b>		Insert an auto-home object.












## MM3D 3.90

### 1.7.23 Mark Panel

The Mark Panel offers users to quickly execute some marking related functions, see Fig.1.7.31.




Fig. 1.7.31

<b>Marking</b>		Execute the marking function, please refer to section 1.6.1.
<b>Multi Document Process</b>		Perform multi document processing. See section 1.6.2
<b>Remote Control</b>		Use remote control function to connect two computers to mark, please refer to Practical Introduction.
<b>Preview</b>		Enter the Preview mode, please refer to section 1.6.2.
<b>Mark Sample</b>		Enter the Mark Sample mode, please refer to section 1.6.2.
<b>X-Y Table</b>		Allow users to adjust X-Y Table settings, please refer to section 1.7.16.1.
<b>Rotary Control Panel</b>		Allow users to adjust rotary axis settings, please refer to section 1.7.16.2.
<b>Z Axis Control Panel</b>		Allow users to adjust Z axis settings, please refer to section 1.7.16.3.
<b>CCD Panel</b>		CCD control setting, please refer to CCD Panel User Manual.
<b>Laser Setting</b>		This button will only work for a specific laser profile. You can also open this setting from the "Laser Power Test" page of the system property sheet.
<b>Altimetry Tool</b>		Turn on Altimetry panel



## MM3D 3.90

### 1.7.23.1 XY-Table Control Panel

To control the XY Table, users must first activate the XY table function by clicking the layer object in Object Browser and then go to the XY Table page of Property Table and enable this function. After doing this, click  button and do the further setting, see Fig.1.7.32.

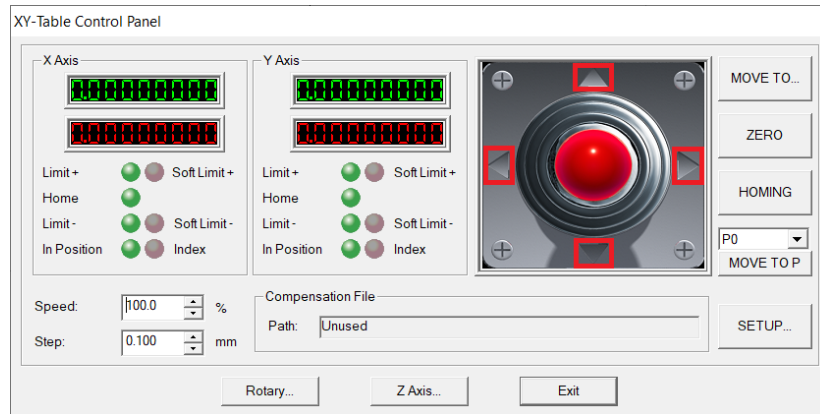


Fig. 1.7.32

1. Click “MOVE TO...” button and then input the X and Y values in the dialog box like Fig.1.7.33 and click “GO,” the XY Table will move to that specific position. The moving speed can be adjusted from “Speed” parameter.

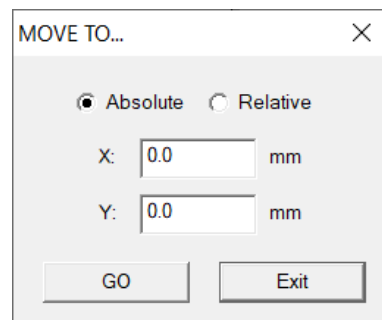


Fig. 1.7.33

2. Click “ZERO” and the program will set the present position as (0,0).
3. Click “HOMING” and the XY Table will move to program origin.
4. Click “MOVE TO P”, the XY Table will directly move to the setting position (P0~P9). Users can click “SETUP...” button to set the value of these points.
5. Set "Step" value, you can set the distance of each step of XY axis movement.
6. Click “SETUP...” and do more detail settings, see Fig.1.7.34.
7. Click “Rotary...” button can do Rotary control setting, please refer to section 1.7.16.2.
8. Click “Z-Axis...” button can do Z-Axis control setting, please refer to section 1.7.16.3.
9. “Load Compensation File” shows the compensation file users loaded.

## MM3D 3.90

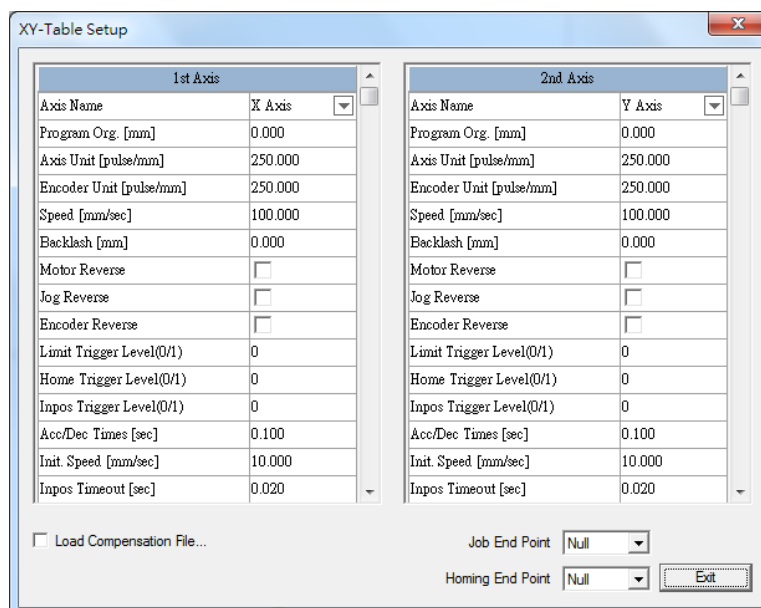


Fig. 1.7.34

### Axis Name

Users can set the 1<sup>st</sup> Axis as X or Y, and the 2<sup>nd</sup> Axis as Y or X.

### Program Org. [mm]

The program will consider this point as the program origin.

### Axis Unit [pulse/mm]

The pulse needed for X/Y Axis to move 1 millimeter (must refer to the motor's specification).

### Encoder Unit [pulse/mm]

The pulse the encoder releases when moving 1 millimeter (must refer to the encoder's specification).

### Speed [mm/sec]

The moving speed of X/Y Axis.

### Backlash [mm]

The transmission deviation between motor and axis.

### Motor Reverse

Reverse the motor moving direction.

### Jog Reverse

There are two situations:

1. Scanner moves, but the workpiece does not move:

Normally, when jogging **right**, the scanner must move to the **right**, and the position display must also be a **positive** value.

If the table moves **left** while jogging **right** with a **positive** value displayed, then **motor reverse** is needed.

2. Scanner does not move, but the workpiece moves:

Normally, when jogging **right**, the workpiece must move to the **right**, and the position display must also be a **negative** value.

If the workpiece moves **right** while jogging **right** with a **positive** value displayed, then **motor reverse** is needed.

If the workpiece moves **left** while jogging **right** with a **positive** value displayed, then **motor reverse** is needed.

Reverse the direction of the encoder.

### Encoder Reverse

### Limit Trigger Level (0/1)

0: active low; 1: active high

### Home Trigger Level (0/1)

0: active low; 1: active high

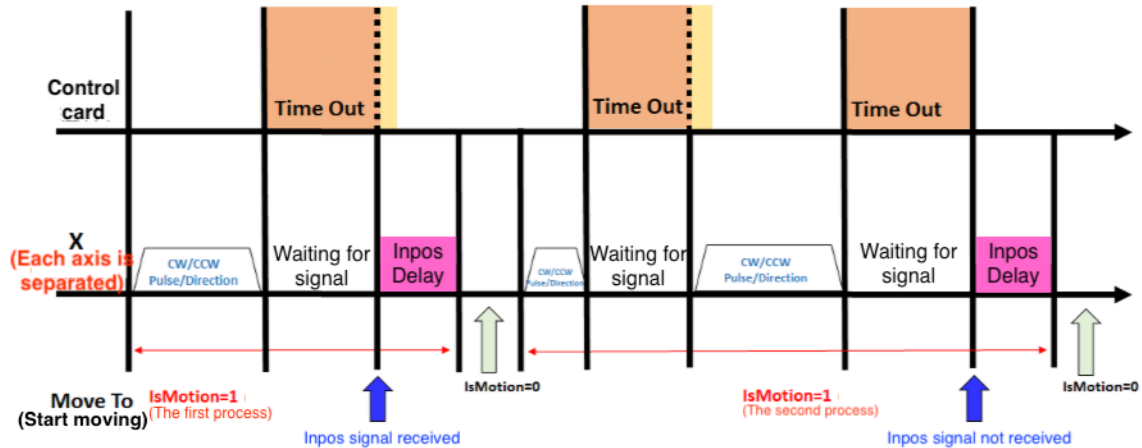
### InPos Trigger Level (0/1)

0: active low; 1: active high

## MM3D 3.90

<b>Acc/Dec Times [sec]</b>	The time motor needs to reach the setting speed.
<b>Init. Speed [mm/sec]</b>	The initial speed of motor.
<b>Inpos Timeout [sec]</b>	The program will consider X/Y axis completed position after passing the time setting here.
<b>Inpos Delay [sec]</b>	The program will wait for the setting time here to execute the next command.

### Inpos Timeout, Inpos Delay timing diagram



<b>Index Delay [sec]</b>	When indexing, the program will wait for the set time before executing the next command.
<b>Ext I/O Home</b>	Using external controller (I/O) to do homing.
<b>Ext I/O Jog+</b>	Using external controller (I/O) to do positive shift.
<b>Ext I/O Jog-</b>	Using external controller (I/O) to do negative shift.
<b>Home Speed [mm/sec]</b>	The homing speed of the motor.
<b>Home Back Speed [mm/sec]</b>	The speed motor needs to move from home position to the edge of home sensor after reaching the home position.
<b>Home Reverse</b>	Reverse the direction of homing.
<b>Home Mode (0/1)</b>	Decide that XY-Table will stop or do home in reverse direction when touching the limit sensor during homing. 0 is stop, and 1 is homing reversely.
<b>Index direction</b>	Set the index direction. (Need motor Z phase support)
<b>Limit Stop Mode</b>	Decide the motor stop rapidly (0) or slowly (1) when moving to limit sensor.
<b>Home Offset [mm]</b>	After completing the home return movement, move to the off-position position.
<b>Use Software Limit</b>	Whether to use mechanical software limits. The home position return operation ignores this setting.
<b>Positive Limit [mm]</b>	If the mechanical position exceeds this position, it cannot move in the positive direction, but can only move in the negative direction.
<b>Negative Limit [mm]</b>	If the mechanical position exceeds this position, it cannot move in the negative direction, but can only move in the positive direction.
<b>Distance of Travel [mm]</b>	The maximum available travel distance X/Y Axis can reach.
<b>P0~P9 [mm]</b>	Set the position of P0~P9.

## MM3D 3.90

### Job End Point

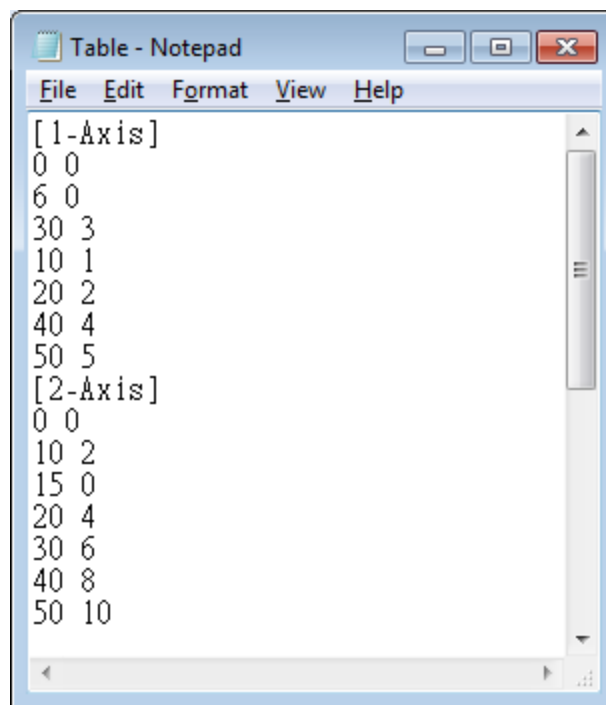
XY-Table will move to the assigned position (P0~P9) after marking is completed.

### Homing End Point

XY-Table will move to the assigned position (P0~P9) after homing.

### Load Compensation File

Click “Load Compensation File” to load the compensation file. Fig.1.7.35 is an example of the compensation file.



```
Table - Notepad
File Edit Format View Help
[1-Axis]
0 0
6 0
30 3
10 1
20 2
40 4
50 5
[2-Axis]
0 0
10 2
15 0
20 4
30 6
40 8
50 10
```


Fig. 1.7.35

In this text file, [1-Axis] represents the compensation value of the first axis, while [2-Axis] means the second one. Take the line “30 3” for example. When the program makes a command of moving 30mm but the actual movement was only 27mm, users can add the value “30 3” in the compensation file. As a result, when get an order of moving 30mm, the program will change to 33mm automatically to do compensation.

It is no need to sort the position of compensation values; the program will automatically do the sorting. And there is no limitation for numbers. If the position is not in the file, the program will calculate the compensation automatically using interpolation method. If the value of position is larger than the maximum compensation value, the program will set the maximum compensation value as the compensation of that position. And the minimum compensation value will be the compensation value when the position is smaller than it.

## MM3D 3.90

### 1.7.23.2 Rotary Control Panel

To control the Rotary Axis, users must first activate the Rotary function by clicking the layer object in Object Browser and then go to the Rotary page of Property Table and enable this function. After doing this, click  button and do the further setting, see Fig.1.7.36.

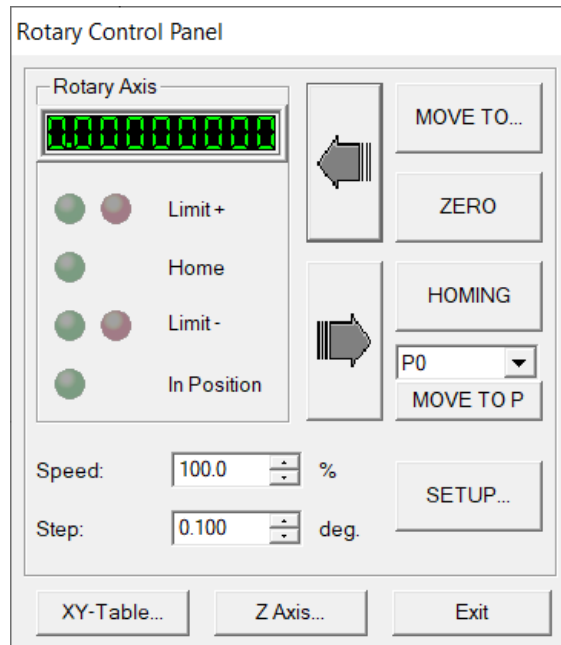


Fig. 1.7.36

1. Click “MOVE TO...” button and input the degree value in the dialog box like Fig.1.7.37 and click “GO,” the rotary axis will rotate to that specific angle. The rotating speed can be adjusted from “Speed” parameter.

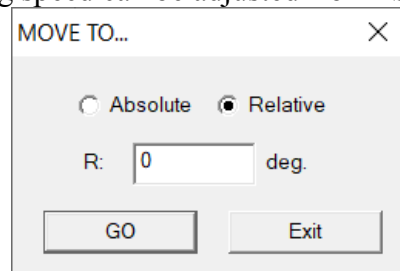


Fig. 1.7.37

2. Click the two direction buttons to move the rotary axis.
3. Click “ZERO” and the program will set the present position as (0,0).
4. Click “HOMING” and the rotary will move to program origin.
5. Click “MOVE TO P”, the rotary axis will directly move to the setting position (P0~P9). Users can click “SETUP...” button to set the value of these points.
6. Set “Step” can set the degree of each rotation of the rotary.
7. Click “SETUP...” and do more detail settings, see Fig.1.7.38.
8. Click “XY-Table...” button can do X/Y Table control setting, please refer to section 1.7.16.1.

## MM3D 3.90

- Click “Z-Axis...” button can do Z-Axis control setting, please refer to section 1.7.16.3.

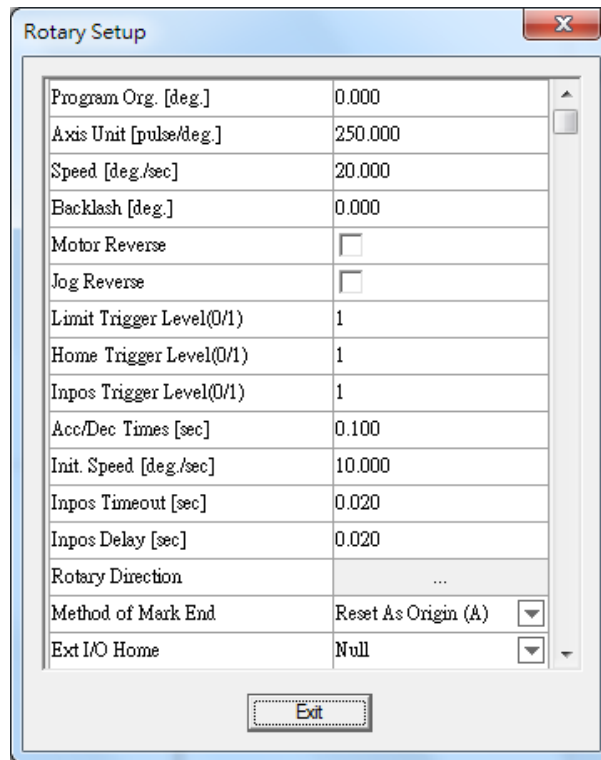


Fig. 1.7.38

### Rotation Axis Unit

Select the rotation axis unit, which can be set to "degree" or "mm".

### Program Org. [deg]

The program will consider this point as the program origin.

### Axis Unit [Pulse/deg]

The pulse needed for rotary to move 1 millimeter (must refer to the motor's specification).

### Speed [deg/sec]

The rotating speed of the rotary axis.

### Backlash [deg.]

The transmission deviation between motor and axis.

### Motor Reverse

Reverse the motor rotating direction.

### Jog Reverse

When rotary axis is placed in the different direction with the software's control panel, this parameter can make it rotate following the right direction.

### Limit Trigger Level (0/1)

0: active low; 1: active high

### Home Trigger Level (0/1)

0: active low; 1: active high

### InPos Trigger Level (0/1)

0: active low; 1: active high

### Acc/Dec Time [sec]

The time motor needs to reach the setting speed.

### Init. Speed [mm/sec]

The initial speed of motor.

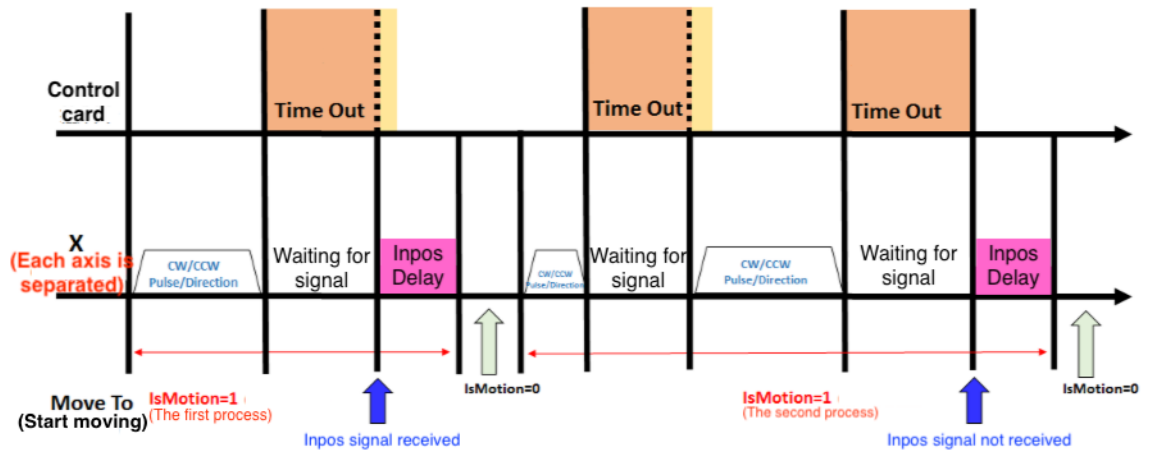
### Inpos Timeout [sec]

The program will consider rotary axis completed position after passing the time setting here.

### Inpos Delay [sec]

The program will wait for the setting time here to execute the next command.

**Inpos Timeout, Inpos Delay timing diagram**



**Rotary Direction**

Click to do further settings for the rotating direction of the rotary axis, see Fig.1.7.39.

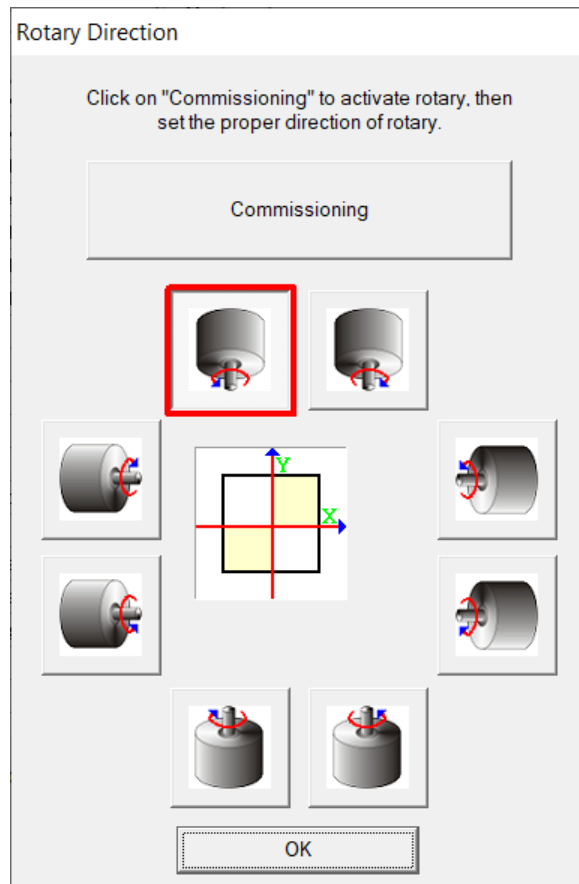


Fig. 1.7.39

**Method of Mark End**

Five ways for laser to go back to the origin after finishing marking job.

- ◆ Reverse Direction: go back to the origin by backward direction.
- ◆ Shortest Path: go back to the origin by the shortest path.
- ◆ Reset As Origin A: set the mark end point as the new

## MM3D 3.90

	origin and the start point for the next marking.
	◆ Reset As Origin B: set the mark end point as the new origin, but the rotary will move some distance (based on the distance of the object and the upper edge of software's working area) and then start the next marking.
	◆ Forward Direction: go back to the origin by forward direction.
	Please note that the origin represent different position according to the method of mark end. Only "Reset As Origin" method will consider the latest point as the origin, the other methods will treat the left-top corner of the work area as the origin.
<b>Ext I/O Home</b>	Using external controller (I/O) to do homing.
<b>Ext I/O Jog+</b>	Using external controller (I/O) to do positive shift.
<b>Ext I/O Jog-</b>	Using external controller (I/O) to do negative shift.
<b>Home Speed [deg/sec]</b>	The homing speed of rotary axis.
<b>Home Back Speed [deg/sec]</b>	The speed motor needs to move from home position to the edge of home sensor after reaching the home position (only for PMC2 & PCMark).
<b>Home Reverse</b>	Reverse the direction of homing.
<b>Home Mode (0/1)</b>	Decide that rotary axis will stop or do home in reverse direction when touching the limit sensor during homing. 0 is stop, and 1 is homing reversely.
<b>Home End Point</b>	Rotary axis will move to the assigned position (P0~P9) after homing.
<b>Limit Stop Mode</b>	Decide the motor stop rapidly (0) or slowly (1) when moving to limit sensor.
<b>Home Offset [deg,]</b>	After completing the home return movement, move to the off-position position.
<b>Use Software Limit</b>	Whether to use mechanical software limits. The home position return operation ignores this setting.
<b>Positive Limit [deg.]</b>	If the software position exceeds this position, it cannot move in the positive direction, but can only move in the negative direction.
<b>Negative Limit [deg.]</b>	If the mechanical position exceeds this position, it cannot move in the negative direction, but can only move in the positive direction.
<b>P0~P9 [deg.]</b>	Set the position of P0~P9.



## MM3D 3.90

### 1.7.23.3 Z Axis Control Panel

Please note that only PMC2 driver supports Z Axis control. Click  button and do the further setting, see Fig.1.7.40.

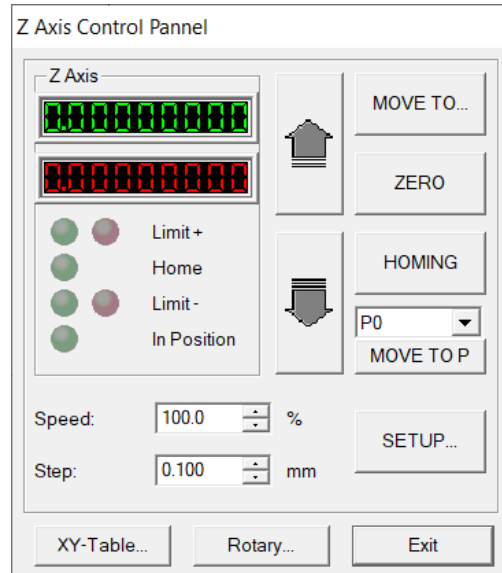


Fig. 1.7.40

1. Click “MOVE TO...” button and input the value in the dialog box like Fig.1.7.41 and click “GO,” the Z Axis will move to that specific position. The moving speed can be adjusted from “Speed” parameter.

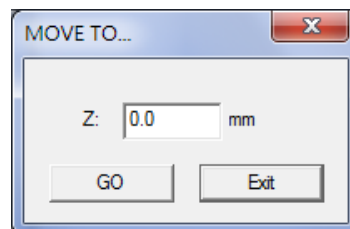


Fig. 1.7.41

2. Click the two direction buttons to move the Z axis.
3. Click “ZERO” and the program will set the present position as the program origin. Users can also click “SETUP...” button to set the program origin.
4. Click “HOMING” and the Z axis will move to program origin.
5. Click “MOVE TO P”, the Z axis will directly move to the setting position (P0~P9). Users can click “SETUP...” button to set the value of these points.
6. Click “SETUP...” and do more detail settings, see Fig.1.7.42.
7. Click “XY-Table...” button can do X/Y Table control setting, please refer to section 1.7.16.1.
8. Click “Rotary...” button can do Rotary control setting, please refer to section 1.7.16.1.

## MM3D 3.90

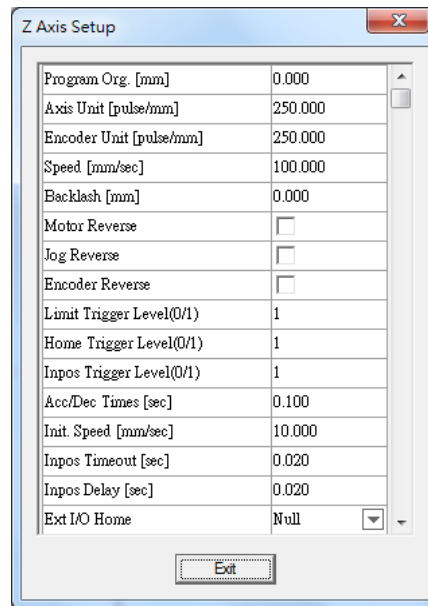
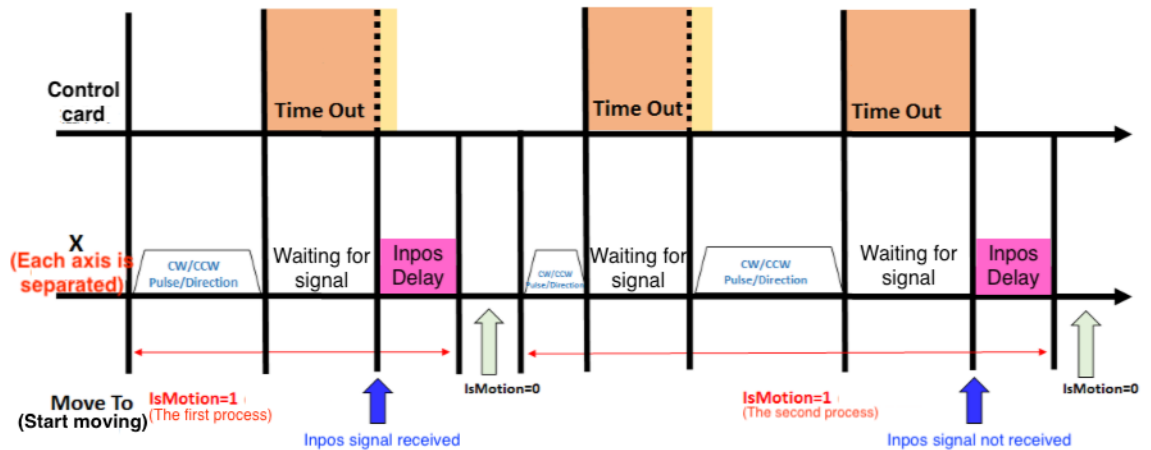


Fig. 1.7.42

<b>Program Org. [mm]</b>	The program will consider this point as the program origin.
<b>Axis Unit [pulse/mm]</b>	The pulse needed for Z Axis to move 1 millimeter (must refer to the motor's specification).
<b>Encoder Unit [pulse/mm]</b>	The pulse the encoder releases when moving 1 millimeter (refer to the encoder's specification).
<b>Speed [mm/sec]</b>	The moving speed of the Z axis
<b>Backlash [mm]</b>	The transmission deviation between motor and axis.
<b>Motor Reverse</b>	Reverse the motor moving direction.
<b>Jog Reverse</b>	When Z Table is placed in a different direction with the software's control panel, this parameter can make the Z axis move following the right direction.
<b>Encoder Reverse</b>	Reverse the direction of the encoder.
<b>Limit Trigger Level (0/1)</b>	0: active low; 1: active high
<b>Home Trigger Level (0/1)</b>	0: active low; 1: active high
<b>InPos Trigger Level (0/1)</b>	0: active low; 1: active high
<b>Acc/Dec Times [sec]</b>	The time motor needs to reach the setting speed.
<b>Init. Speed [mm/sec]</b>	The initial speed of motor.
<b>Inpos Timeout [sec]</b>	The program will consider Z axis completed position after passing the time setting here.
<b>Inpos Delay [sec]</b>	The program will wait for the setting time here to execute the next command.

**Inpos Timeout, Inpos Delay timing diagram**



- Index Delay [sec]** When indexing, the program will wait for the set time before executing the next command.
- Ext I/O Home** Using external controller (I/O) to do homing.
- Ext I/O Jog+** Using external controller (I/O) to do positive shift.
- Ext I/O Jog-** Using external controller (I/O) to do negative shift.
- Home Speed [mm/sec]** The homing speed of the motor.
- Home Back Speed [mm/sec]** The speed motor needs to move from home position to the edge of home sensor after reaching the home position (only for PMC2 & PCMark).
- Home Reverse** Reverse the direction of homing.
- Home Sensor Touching Mode (0/1)** Decide that Z axis will stop or do home in reverse direction when touching the limit sensor during homing. 0 is stop, and 1 is homing reversely.
- Home End Point** Rotary axis will move to the assigned position (P0~P9) after homing.
- Limit Stop Mode** Decide the motor stop rapidly (0) or slowly (1) when moving to limit sensor.
- Distance of Travel [mm]** The maximum available travel distance Z Axis can reach.
- P0~P9 [mm]** Set the position of P0~P9.

## MM3D 3.90

### 1.7.24 Status Bar

Enable or disable the Status Bar which display on the bottom of the software, see Fig.1.7.43.

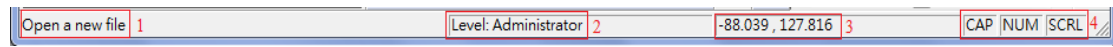


Fig. 1.7.43

1. Display the function description positioned by the mouse.
2. Show the user level.
3. The X, Y-axis value of the mouse position
4. When press the Caps Lock key, the CAP will appear.  
When press the Num Lock key, the NUM will appear.  
When press the Scroll Lock key, the SCRL will appear.

### 1.7.25 Desktop Mode

Change the setting Desktop Mode.

### 1.7.26 Composing Setting

Include Show Order, Tooltips, Tooltips setting, Ruler, Ruler Setting, Grid, Grid Lock, Grid Parameter. The toolbar with a  mark means that function has been opened.

#### Show Order

Use this function can see the mark order of each object, see Fig.1.7.44.

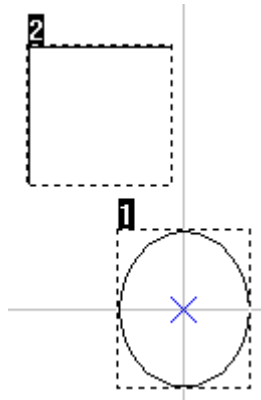


Fig. 1.7.44

#### Tooltips / Tooltips Setting

The tooltips setting descriptions please refer to [Page. 67.](#)

#### Ruler / Ruler Setting

The ruler setting descriptions please refer to [Page. 65.](#)

#### Grid / Grid Lock / Grid Parameter

The grid setting descriptions please refer to [Page. 66.](#)

## **MM3D 3.90**

### **1.7.27 Zoom In**

Enlarge a specific area.

### **1.7.28 Zoom Out**

Shrink a specific area.

### **1.7.29 Zoom Previous**

Go back to the previous view.

### **1.7.30 Zoom All**

Show the whole Work Area.

### **1.7.31 Zoom Extend**

Show all objects.

### **1.7.32 Zoom Select Object**

Zoom the selected objects to fit the whole editing area.

# MM3D 3.90

## 1.8 Window Menu

“Window” menu offers the following functions:

<b>New</b>	Create new window
<b>Cascade</b>	Allow all open windows overlapping
<b>Tile</b>	Show all open windows without overlapping
<b>Arrange</b>	Rearrange the windows
<b>Close All</b>	Close all windows

### 1.8.1 New

Create new window, and the content of the new window will be the same with the one user is using. Users can create multiple windows to view the different parts of the content. The modifications in any one of the window will also be displayed in other windows.

### 1.8.2 Cascade

Display all open windows in an overlapping way, see Fig.1.8.01.

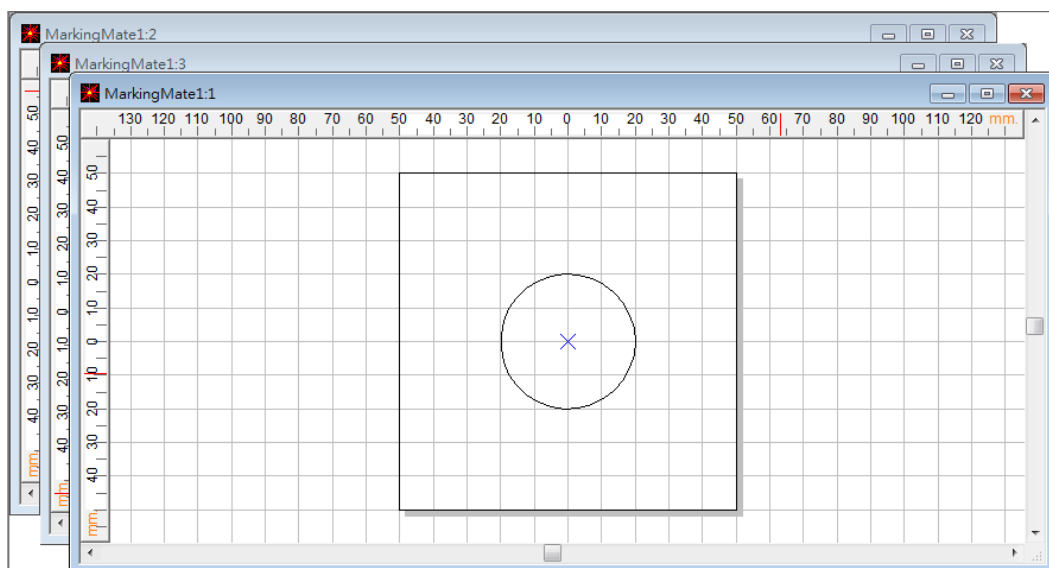


Fig. 1.8.01

# MM3D 3.90

## 1.8.3 Tile

Show all open windows side by side, see Fig.1.8.02.

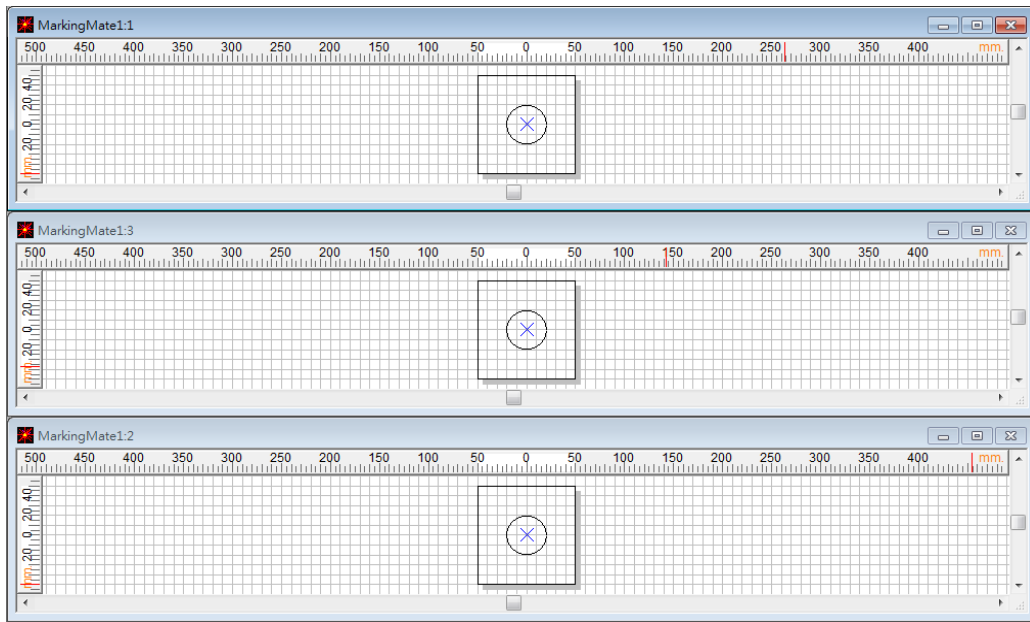


Fig. 1.8.02

## 1.8.4 Arrange

Rearrange the windows. The shrink window will be list at the bottom of MM3D, see Fig.1.8.03.



Fig. 1.8.03

## 1.8.5 Close All

Close all opened windows.

## MM3D 3.90

### 1.9 Help Menu

“Help” menu will assist you to use this software

**Help Topics** Offers the manuals of the software.

**Key Information** The key version and content, see Fig.1.9.01.

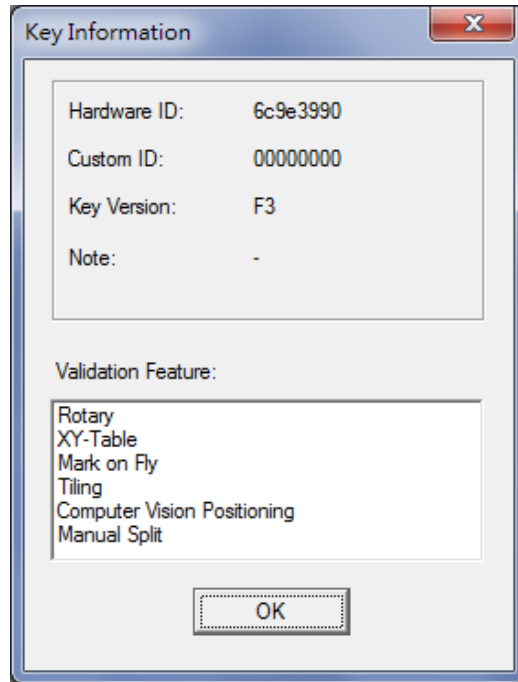


Fig. 1.9.01

**Machine Information** Show the information of the laser machine, see Fig.1.9.02.

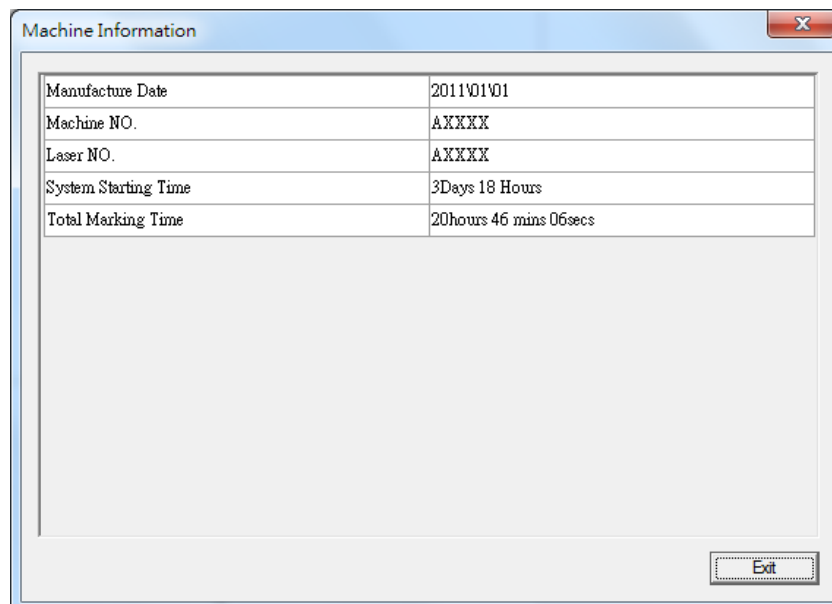


Fig. 1.9.02



## MM3D 3.90

- Reset Toolbar (System Default)** Restore the default position of the MM3D toolbar. After confirming, the system will prompt that the program needs to be restarted. The screen is shown in Figure 1.9.03.
- Reset Toolbar (Cutom Defined)** Restore the user define toobar position of the MM3D.
- Save Custom Defined Toolbar** Save the current toolbar location of the MM3D set by the user

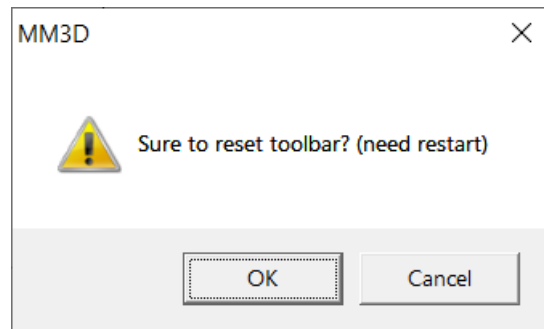


Fig. 1.9.03

**About MM3D** Show the current using version and driver of MM3D, see Fig.1.9.04.

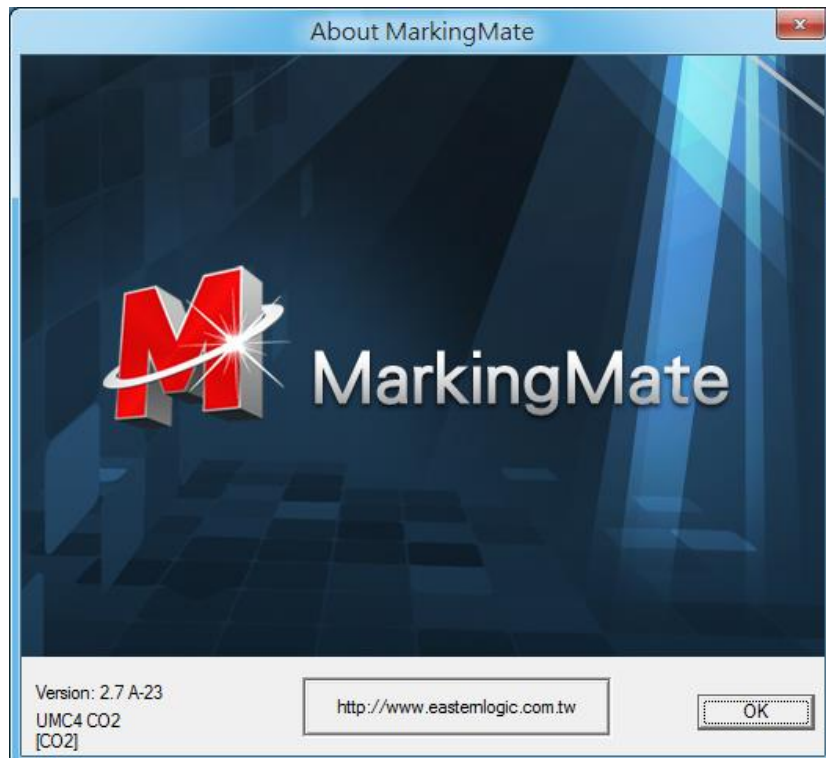


Fig. 1.9.04

## MM3D 3.90

### 2. Objects

MM3D offers “Object Function” for users to draw graphics, texts, and barcodes. These functions include dot, line, arc, circle, rectangle, curve, curve brush, text, arc text, rect text, 1D barcode, 2D barcode, matrix, and spiral. Whatever an object being selected, its related property table will be displayed for setting.

Besides, click the right button of mouse after selecting an object will display a popup menu providing the normal use functions and additional functions. For example, select a curve, click right mouse button, a function of edit vertex will be added in the popup menu.

Select the Curve object.

The property table of the Curve object will be displayed as the left side of the picture below.

Click the mouse right button will see the popup menu include the “Add Vertex” function.

#### 2.1 Common Settings

This section will discuss the common setting page of the Property Table that includes Frame/Fill, Output Parameter, CAM Parameter, and the Popup Menu.

##### 2.1.1 Property Table

When an object in the Work Area being selected, the property table of this object will be displayed. Users can set up some marking related parameters over the dialogue box; mainly include the object’s frame/fill, marking parameter, and delay.

#### Common pages

<b>Frame/Fill</b>	Adjust the color of the border and interior shading of a selected object.
<b>Mark Parameter</b>	This menu in the Property Table will allow you to edit the assigned speed, power, and frequency output of the laser machine.
<b>Delay</b>	Setting some parameters about marking speed and quality.

## MM3D 3.90

### 2.1.2 Popup Menu

In the 2D mode, the main function list for mouse right-click. Also the same function list of each object, see Fig.2.1.01.

Cut(T)	Ctrl + X
Copy(C)	Ctrl + C
Paste(P)	Ctrl + V
Delete(D)	Del
Reverse(R)	
Shortest Horizontal(H)	
Shortest Vertical(V)	
Shortest Distance(I)	
Array Copy(A)...	
Property Table(P)...	
Dimension Bar(B)	F3
<input checked="" type="checkbox"/> Object Browser(O)	F2
Group(M)	Ctrl+M
UnGroup(N)	Ctrl+Q
Combine(K)	Ctrl+K
Break(B)	Ctrl+B
Move To New Layer(L)	

Fig. 2.1.01

<b>Cut</b>	Remove selected data and store it in the clipboard for future use
<b>Copy</b>	Duplicate selected data and store it in the clipboard for future use
<b>Paste</b>	Attach data from the clipboard to the current document
<b>Delete</b>	Delete and remove the selected data
<b>Reverse</b>	Reverse sorting mark order
<b>Shortest Horizontal</b>	Sorting mark order by the shortest horizontal direction
<b>Shortest Vertical</b>	Sorting mark order by the shortest vertical direction
<b>Shortest Distance</b>	Sorting mark order by the shortest distance of object center
<b>Same Radius</b>	Make the circle become the same radius
<b>Array Copy</b>	Execute the array copy function

## **MM3D 3.90**

<b>Property Table</b>	Show the Property Table of the object
<b>Dimension Bar</b>	Enable/disable Dimension bar
<b>Object Browser</b>	Enable/disable Object Browser
<b>Group</b>	Group selected object
<b>Ungroup</b>	Ungroup selected group
<b>Combine</b>	Combine several objects into one object
<b>Break</b>	Break one object into several objects
<b>Move To New Layer</b>	Move selected objects to new layer

## MM3D 3.90

In the 3D mode, the main function list for mouse right-click.

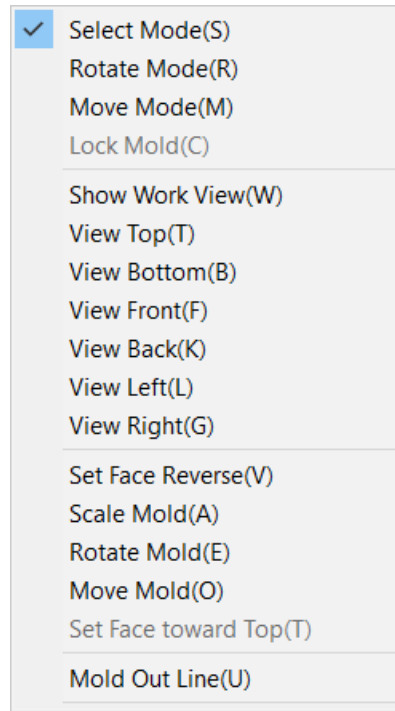


Fig. 2.1.02

<b>Select Mode</b>	Choose the model by the left mouse button click.
<b>Rotate Mode</b>	Rotate the selected model by holding the left mouse button & drag.
<b>Move Mode</b>	Move the selected model by holding the left mouse button & drag.
<b>Lock Mold</b>	When using Move mode, "Lock Mold" can maintain the relative position of the object and the model.
<b>Show Work View</b>	Display the face side of the working area.
<b>View Top</b>	Display the top view.
<b>View Bottom</b>	Display the bottom view.
<b>View Front</b>	Display the front view.
<b>View Back</b>	Display the back view.
<b>View Left</b>	Display the left view.
<b>View Right</b>	Display the right view.
<b>Set Face Reverse</b>	Display the inside of the mold.
<b>Scale Mold</b>	Scale the mold according to the three-axis setting.
<b>Rotate Mold</b>	Set rotation angle value of the mold.
<b>Move Mold</b>	Set the specified location value of the mold.
<b>Mold Out Line</b>	Get the frame for the mold.

## MM3D 3.90

### 2.2 Create Objects

Create objects such as line, arc, circle, rectangle, curve, curve brush, text, arc text, Rectangle Text, 1D barcode, or 2D barcode.

<b>Vector</b>	Draw a point.
<b>Line</b>	Draw a straight line.
<b>Arc</b>	Draw an arc.
<b>Circle</b>	Draw a circle or oval.
<b>Rectangle</b>	Draw a square or rectangle.
<b>Curve</b>	Draw a curve.
<b>Curve Brush</b>	Draw a freehand line using the mouse.
<b>Text</b>	Insert a text object.
<b>Arc Text</b>	Insert an arc text object.
<b>Rectangle Text</b>	Insert a rectangle text object.
<b>1D Barcode</b>	Create a 1D barcode.
<b>2D Barcode</b>	Create a 2D barcode.
<b>Matrix</b>	Create a matrix object.
<b>Spiral</b>	Draw a spiral object.

Example:

When drawing a line object, press the "Ctrl" key at the same time, there will be a fixed angle of movement (15 degree). As shown in figure 2.2.01.

However, when drawing a circle object, use the "Ctrl" key at the same time, and the circle will be fixed to enlarge or shrink with a constant radius to achieve a perfect circle. As shown in figure 2.2.02.

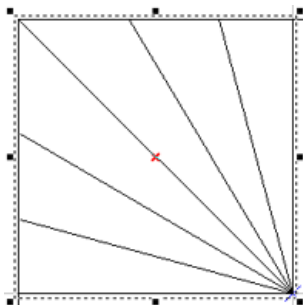


Figure 2.2.01 The distance of each line segment is 15 degrees.

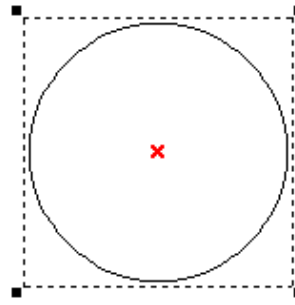


Figure 2.2.02 Circle of equal radius

## MM3D 3.90

### 3. Property Table

All objects have their own unique properties. These properties define how each specific object or each group of objects be displayed or how they will be marked.

**NOTE:** Any modification of the property will take effect after users click “Apply” button. Users can also click “Apply All” after modify several property pages to make sure all the changes are effective.

The Property Table contains the following five portions.

<b>System</b>	Adjust system-related parameters. Including: working range, driver, system parameters, laser energy test and system.
<b>Mark Parameter</b>	Adjust mark-related parameters. Including: mark parameters, frame/fill, delay parameters, array copy, 2.5D parameters, and rotation axis.
<b>Object</b>	Adjust general object-related parameters. Including: curve, arc, circle, rectangle, one-dimensional bar code, two-dimensional bar code, dot matrix, text, arc text, baseline, graphics, array copy, spiral.
<b>Control Object</b>	Adjust settings of control objects. Including: signal input, signal output, pause, delay time, motion, set position, loop, ring and homing.
<b>Layer</b>	Set the layer-related functions. Including: layer, inpu, outpu, mark parameter, delay parameter, XY table, rotary, mark on fly and 3D param, etc.

## MM3D 3.90

### 3.1 System-Related Property Table

Users can edit the system-related property table when there has no object been selected. There are five setting pages under system-related property table.

#### 3.1.1 Work Area

The size of f-theta lens will affect the working area. If it is not properly adjusted, center drifting and distortion might be caused. Adjust the parameters carefully, and the marking result will be extremely similar to the users' design, see Fig.3.1.01.

#### Lens

Users can select the lens they want to use from here.

#### Correction/ Lens Manager

This button is used for lens correction or lens management.

#### Scale X/Y

If the scale is too small, please enter a number larger than 100 (because unit is percentage); on the contrary, please enter a value smaller than 100.

#### X Offset / Y Offset

If the position of marking result has 5mm shift to the right side, users can enter -5mm in the X column. The other situations are the same.

#### Rotate

Set the angle of the marking result to fit the marking platform when the platform or work piece cannot be placed appropriately.

#### Galvo Direction:

#### X reverse / Y reverse / XY exchange

Provides X reverse, Y reverse, and XY exchange for users to apply when they need to adjust the axis' direction of working area.

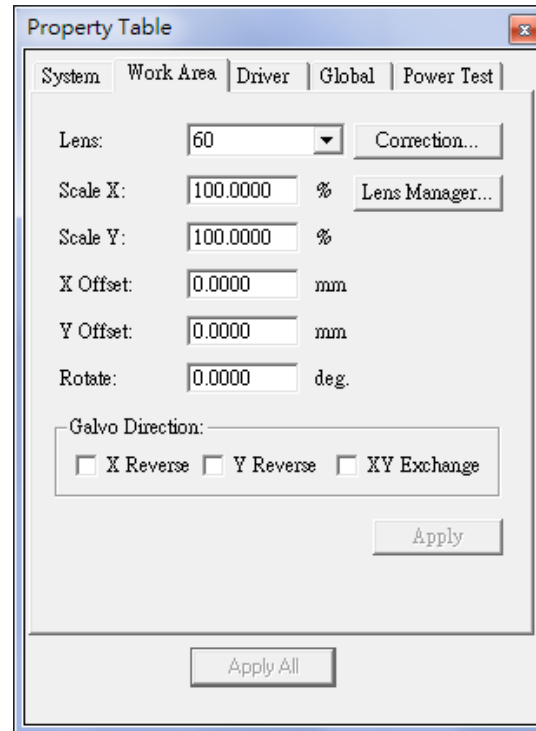


Fig. 3.1.01



## MM3D 3.90

### 3.1.2 Driver

The page displays the driver's name and version, see Fig.3.1.02.

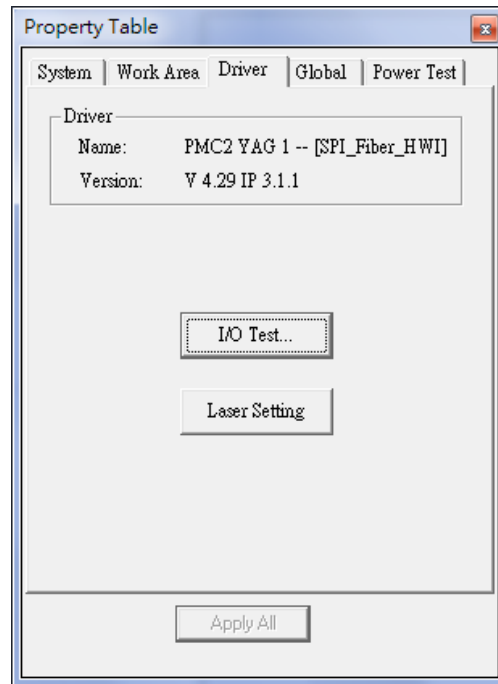


Fig. 3.1.02

### I/O Test

Press the button of "I/O Test", a dialogue box like Fig.3.1.03 will be displayed to show the input and output status. The name of the I/O point can be assigned by the user. Please refer to Appendix A for more details.

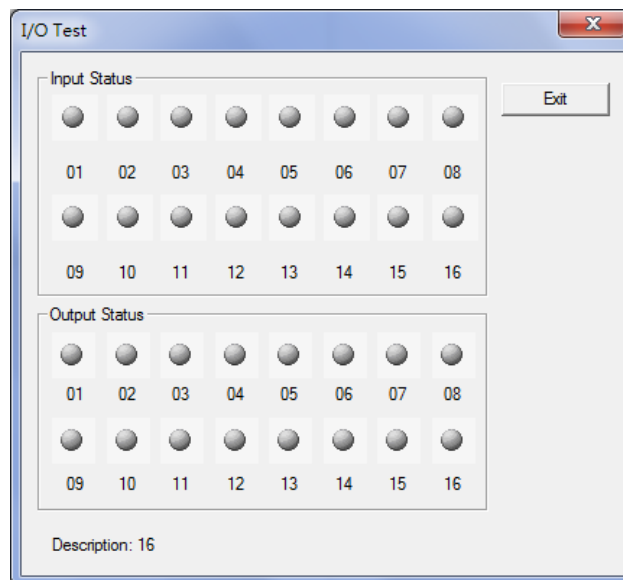
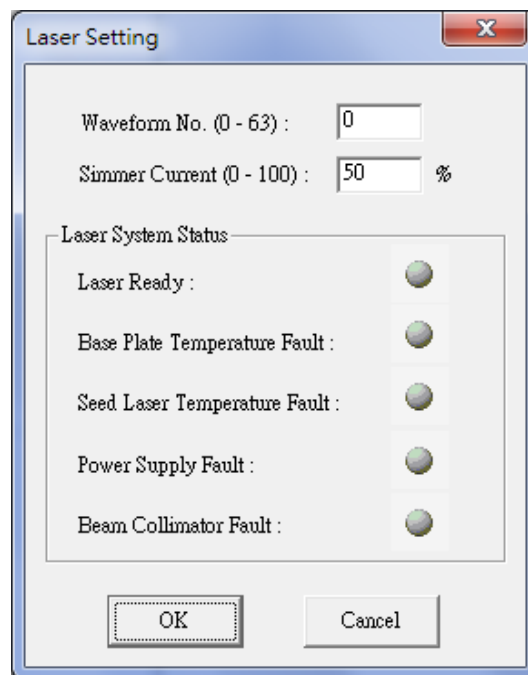


Fig. 3.1.03

## MM3D 3.90

### Laser Setting:

Only when use SPI laser can active the dialog box, see Fig.3.1.04.As to the setting of this part, please refer to the user manual of SPI Laser.



## MM3D 3.90

### 3.1.3 Global

The Global Property Page shows like Fig.3.1.05.

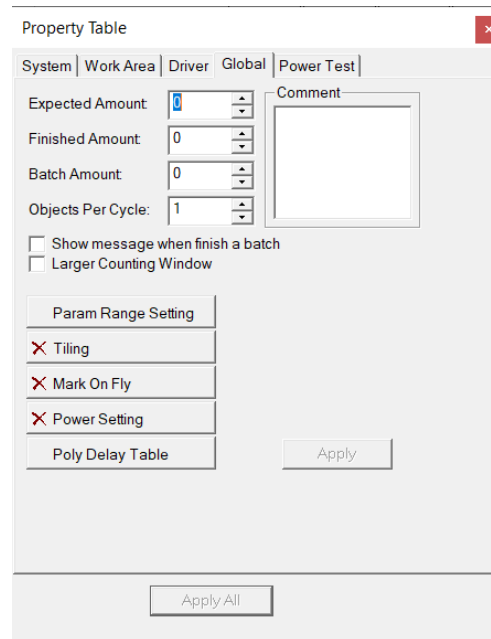


Fig. 3.1.05

**Expected Amount:** Set the expected marking amount. If the marking reach the setting value, the system will pop up a warning box like Fig.3.1.06.

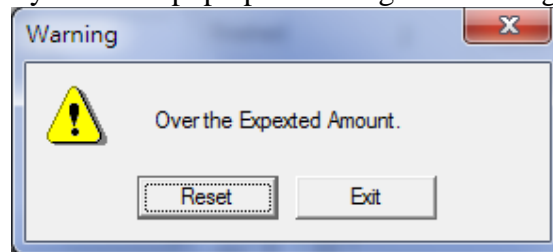


Fig. 3.1.06

In the actual process, in order to adjust the laser to achieve the best marking state, there are often several trials of marking. The user should set the target amount after the trial marking is completed and determined the parameters to avoid trouble.

**Finished Amount:** Enable users to record how many work pieces they have already marked.

**Batch Amount:** Set the marking amount of each batch.

**Objects Per Cycle:** Set the marking times of one marking cycle. For example, suppose this value is 5, then it will automatically mark 5 times when execute marking. If execute marking again, it will also mark 5 time in this cycle, and the finished amount will shows 10 when this cycle complete.

**Show message when finish a batch:** The system will pop up a warning dialog box like Fig.3.1.07 when reach the value of Batch Amount if the option has been checked.

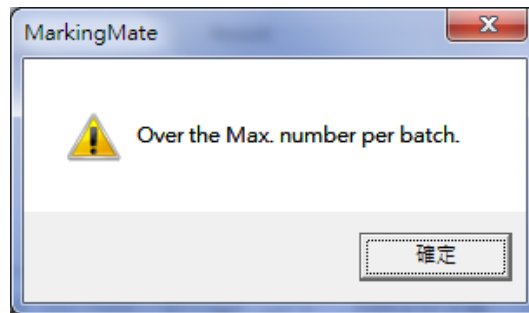


Fig. 3.1.07

**Larger Counting Window:** If users activate this option, then the system will display a large window to show the information of marking amount, see Fig.3.1.08.

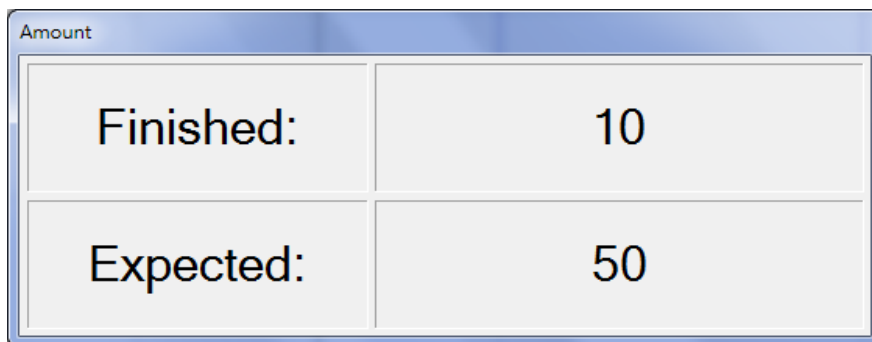


Fig. 3.1.08

**Comment:** Display the notation of the marking file. It shows the function and the notes of that file.

## MM3D 3.90

**Param Range Setting:** Set the range of speed, power and frequency, see Fig.3.1.09.

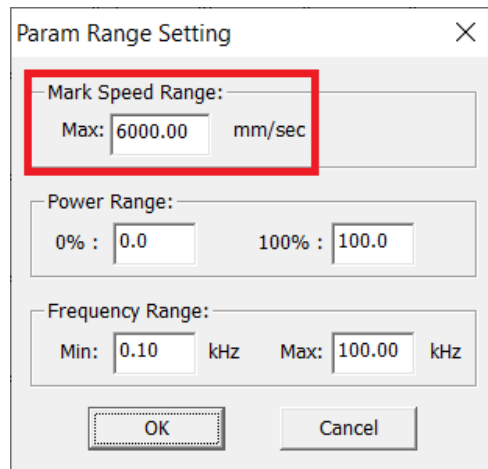
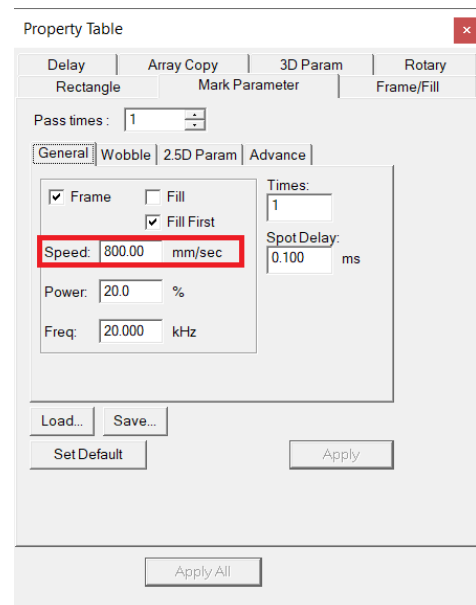


Fig. 3.1.09

The default maximum value of the MM3D marking speed range is 6000 (mm/sec). When the user sets the "Speed" (as shown in Figure 3.1.09) in the "Mark Parameter" of the object "Property Table" to be greater than the preset maximum value of the "Speed Range", the "Valid Speed value is 0-60000.00, and can't equal to 0 !" error message.

If you need to adjust the maximum value of the marking speed range, please go to the "Global" page of the system "Property Table", click "Param Range Setting", and adjust the maximum value in the "Mark Speed Range". As shown in Figure 3.1.08.

Please consider the maximum speed setting that the engraving head can withstand.



**Note :**

If you use Demo Driver, there is no such setting adjustment.

### Tiling

This function is used to divide an object into several parts when the object's size is larger than the working area or is used to fit the users special demands. It is default disabled. Users need to click the "Tiling" button to activate this function, see Fig.3.1.10.

## MM3D 3.90

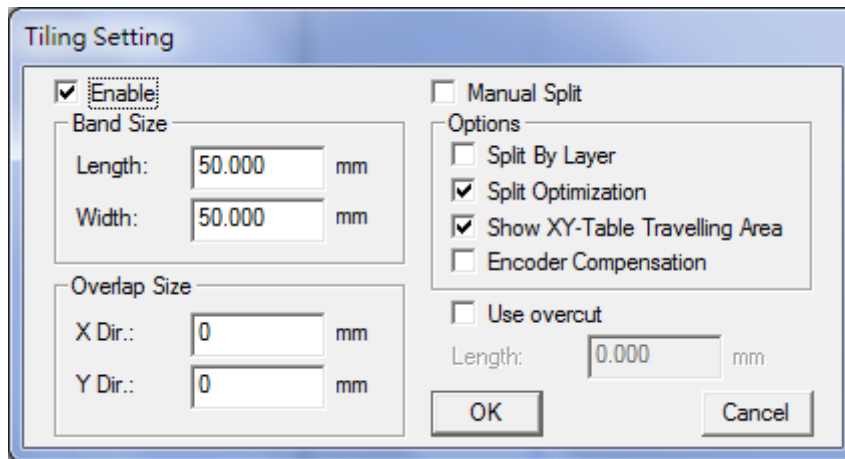


Fig. 3.1.10

<b>Enable</b>	Enable this function
<b>Manual Split</b>	Enable manual split function, and the manual split bar will be activated.
<b>Band Size</b>	<b>Length:</b> Length of each divided part. <b>Width:</b> Width of each divided part.
<b>Overlap Size</b>	<b>X Dir.:</b> Length of the allowed overlap part. <b>Y Dir.:</b> Width of the allowed overlap part.

### Use Overcut

Set the overcut length. This value must follow the rule of lens area is equal to or greater than the sum of tiling size and twice overcut length, see Fig.3.1.11. The difference between overlap and overcut is that the overlapping area will be marked twice but overcut won't, see Fig.3.1.12 and Fig.3.1.13. Overlap and overcut cannot be used at the same time.

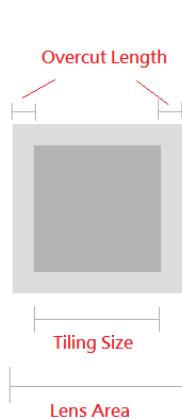


Fig. 3.1.11

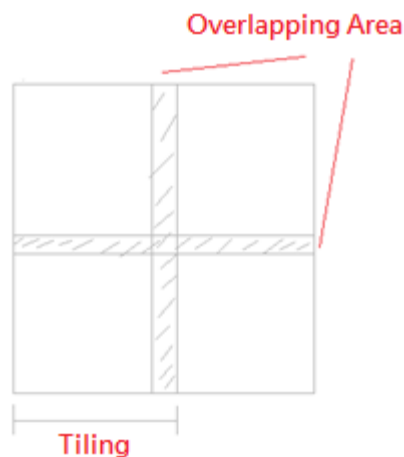


Fig. 3.1.12

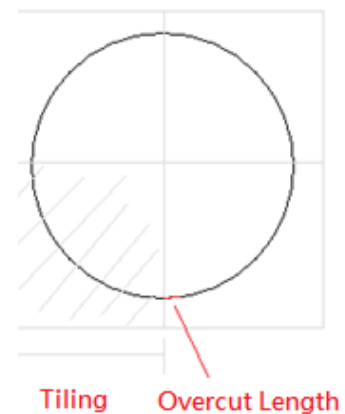


Fig. 3.1.13

## MM3D 3.90

### Options

**Split By Layer:** Split graphic by layer.

**Split Optimization:** Optimize the split path. If a graphic is smaller than the Band Size, this option will ensure it to be marked at one time. Please note that this option will be disabled under manual split mode.

**Show XY-Table Traveling Area:** Decide to show the traveling area of XY-Table or not.

**Show the bands:** Show the bands while not in the band edit mode.

**Avoid duplicate marking:** Make sure will not mark same object twice. See fig. 3.1.14.

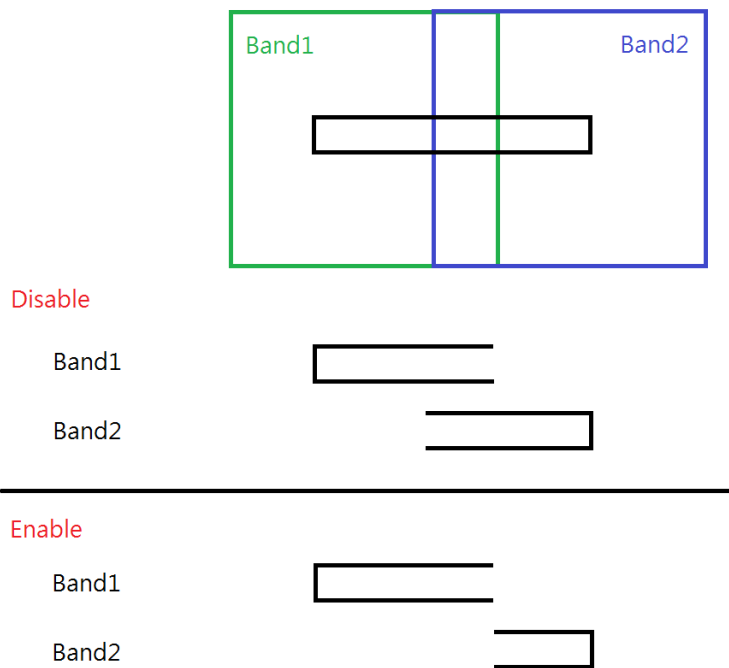


Fig. 3.1.14

**Encoder Compensation:** Decide to use encoder to do compensation

When Tiling function is activated, the workingarea will be changed according to the settings of XY Table area and lens area as Fig.3.1.15.

## MM3D 3.90

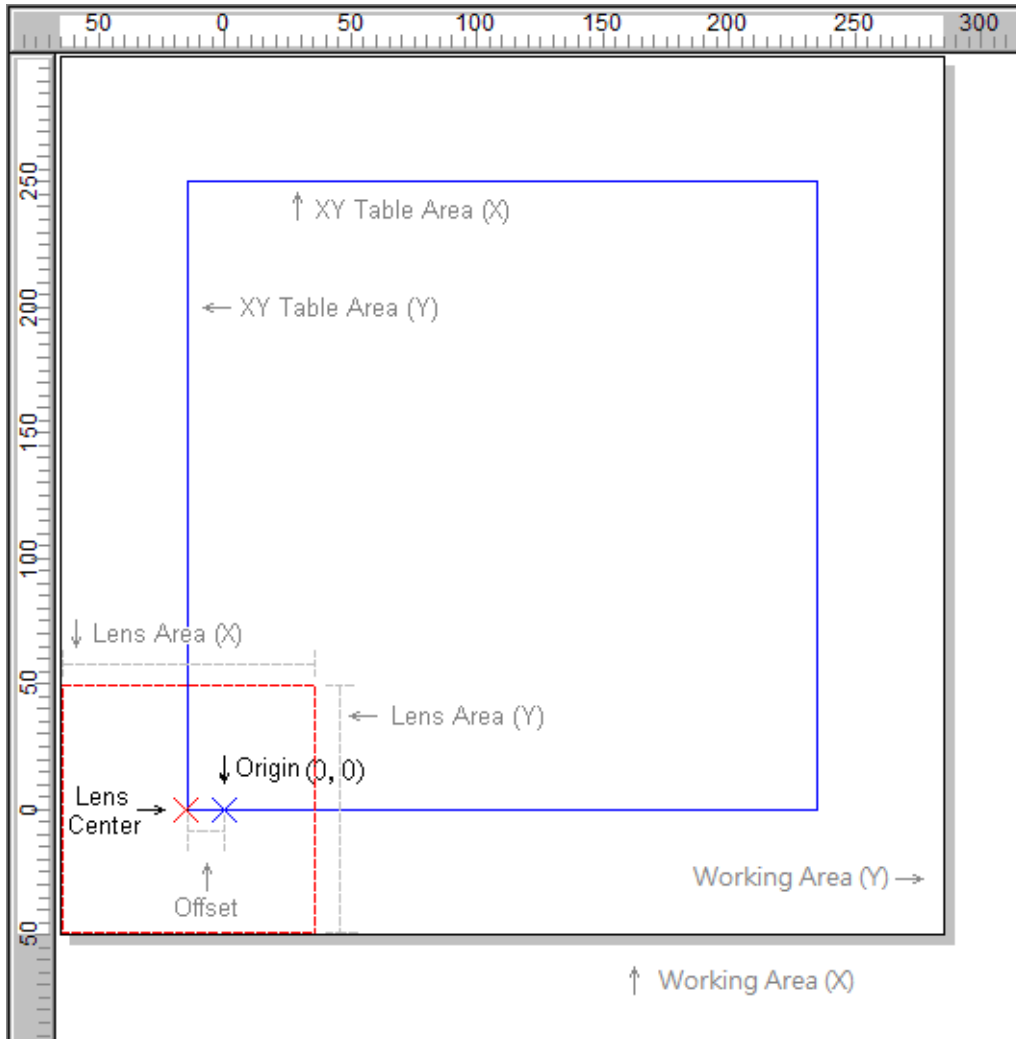

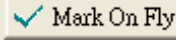


Fig. 3.1.15

<b>Working Area</b>	The Working Area for graphic split is the sum of XY Table Area and the half of Lens Area.
<b>XY Table Area</b>	When the lens center moves along with the edge of XY Table Area, the marking area will be the same as Working Area. About the setting method please refer to section 1.7.16.1 XY Table Control Panel.
<b>Lens Area</b>	About the setting method please refer to Lens Manager.
<b>Offset</b>	The distance between origin (0, 0) and the program origin. About original setting method please refer to section 1.7.16.1 XY Table Control Panel.

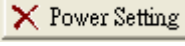
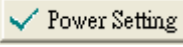
### Mark On Fly

The button  means this function is disabled. When it is enabled, the button will become to this . Please refer to the description of section 1.1.7.1 Mark On Fly.



## MM3D 3.90

### Power Setting

The button  means this function is disabled. When it is enable, the button will become to this . Please refer to the description of section **1.1.7.3 Power Setting**.



## MM3D 3.90

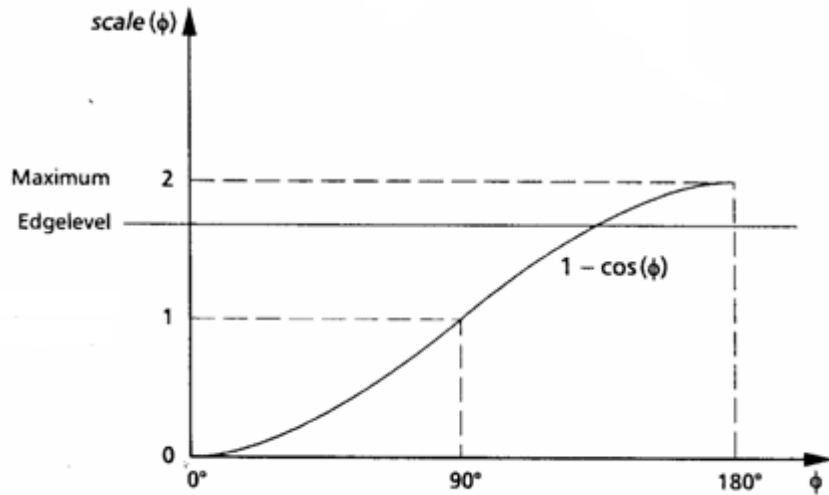


Fig. 3.1.19

Click “Add” button and a dialogue box “Poly Delay Table Editor” will pop up, see Fig.3.1.20 for users to enter the new value of angle and scale. Besides, users can select a angle and click “Edit” to edit that angle.

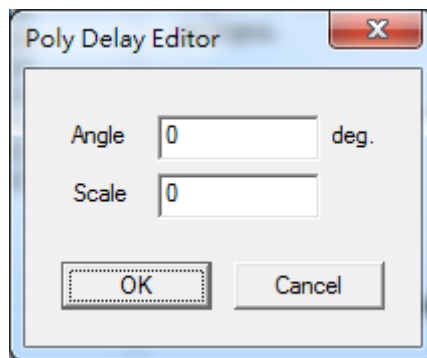


Fig. 3.1.20

## MM3D 3.90

### 3.1.4 Power Test

This function is for users to realize the difference between the setting power and real power output through opening the laser for a period of time for users to measure the power, see Fig.3.1.21.

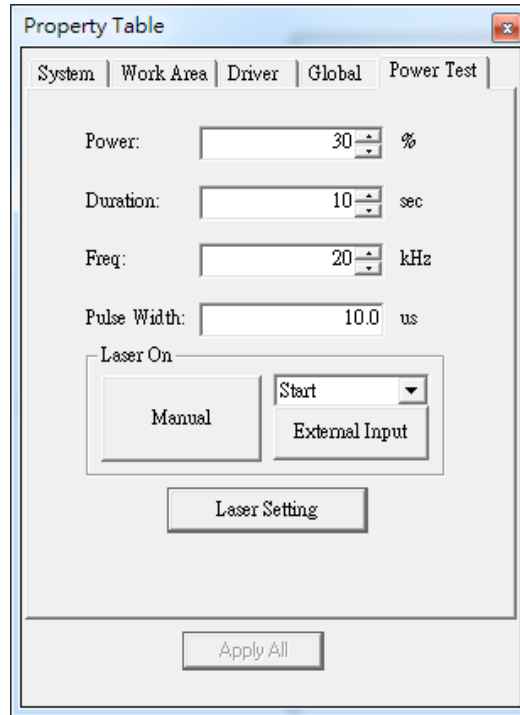


Fig. 3.1.21

#### **Power**

For CO<sub>2</sub> laser, this value means the ratio of power. For example, if the maximum power of CO<sub>2</sub> laser is 10W and the value is 30%, then the output power should be 3W. As to YAG laser, this value means the electric current of laser. For instance, suppose the electric current range is 0~10V, then the output value will be 3V when users set 30%.

#### **Duration**

The beam out duration of laser. Unless users shut down the laser, the laser will keep opening till the setting duration.

#### **Freq.**

Set the frequency of laser.

#### **Pulse Width**

Set the pulse width when using YAG laser or SPI laser.

#### **Laser On**

Click the “**Manual**” button or select an external signal input from the list and then click “**External Input**” button to start the laser.

#### **Laser Setting:**

To set the specified laser controller parameters, such as: SPI laser system. This

## **MM3D 3.90**

button shows when the SPI\_Fiber driver is selected. Press the button for further SPI\_Fiber laser settings(refer to the manual of SPI laser for this part).

## MM3D 3.90

### 3.1.5 System

This page shows the total objects of the selected layer, see Fig.3.1.22.

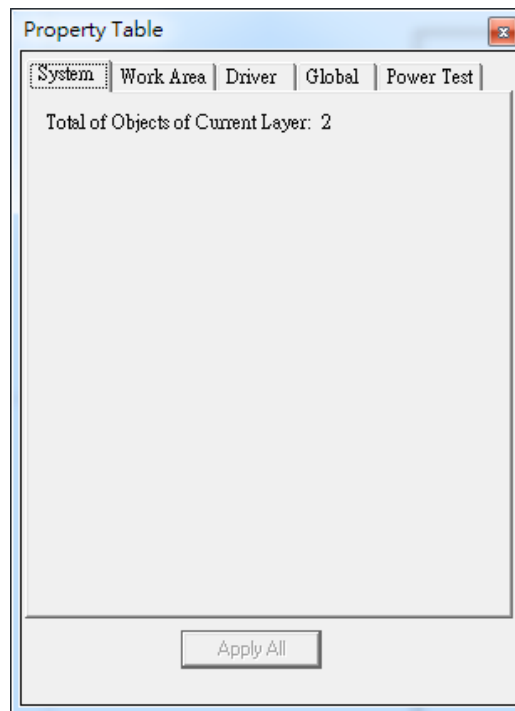


Fig. 3.1.22

# MM3D 3.90

## 3.2 Mark Property Table

When an object in the Working Area is being selected, the property table of this object will be displayed. Users can set up some marking related parameters such as the object's frame/fill, mark parameter, delay, array copy, and motion setup.

### 3.2.1 Mark Parameter

Provide maximum five marking passes for users to set. Users can edit different marking parameters for each pass. Fig.3.2.01 shows the Mark Parameter Page when using CO2 or YAG driver (without Dot Mode). Fig.3.2.02 is the Mark Parameter Page using SPI driver under Dot Mode.

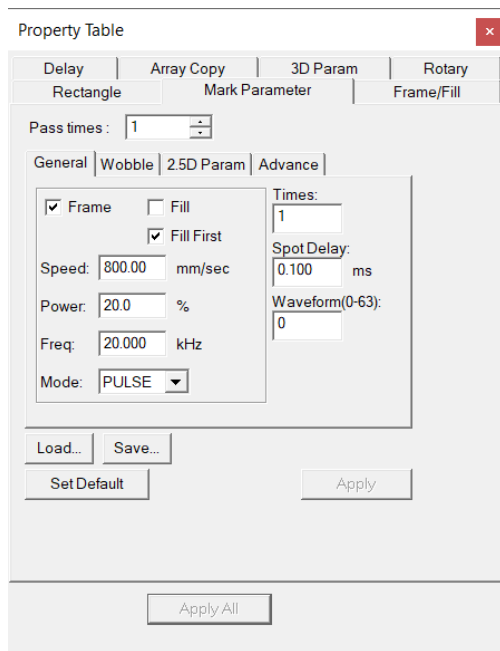


Fig. 3.2.01

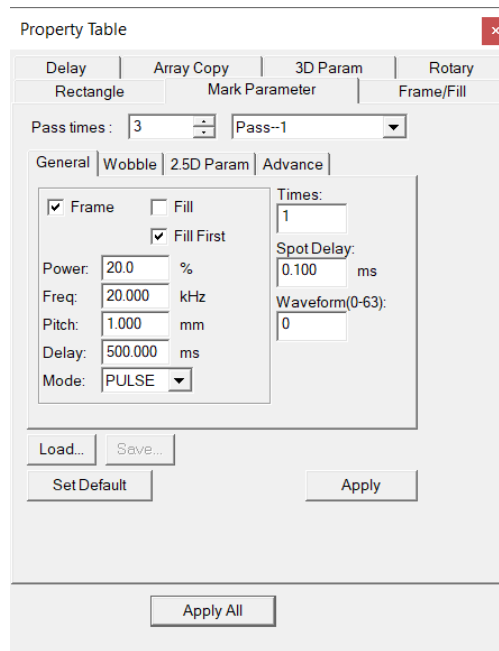


Fig. 3.2.02

### Pass times

For example: set 2 pass times, check "Frame" and uncheck "Fill" in Pass--1, uncheck "Frame" and check "Fill" in Pass--2. Set different parameters for Pass--1 & 2, then you can get different marking effects for the outer frame and filling.

### General

#### Frame/ Fill

Decide whether to mark the object's frame or fill the object at each pass.

#### Fill First

Do filling first when marking.

#### Speed

Set the marking speed. This value cannot exceed the maximum speed of the system.

### Power

Current percentage (YAG) or percentage of PWM high signal (CO2).

### Frequency

The cycle of laser's trigger. This item is useless in some CO2 system controlled

## MM3D 3.90

by voltage.

### Pitch (Under Dot Mode)

The gap between each dot.

### Delay (Under Dot Mode)

The waiting time laser needs to start marking after moving to next dot.

### Mode

Select "PULSE," "MCW" or "CW" mode to mark (SPI driver only).

### Times

Set the marking times for a work piece using the same marking parameters. If this value is 3, the object will be marked on the work piece three times at one process. If the value is 0, the object won't be marked.

### Spot delay

The required time for laser to mark a spot or the marking time for each pixel **when marking image objects. If this value is 0.5ms that means each spot will be marked for 0.5ms.**

### Waveform No. (0-63)

Set the Waveform Number (SPI driver only). Each waveform has its default frequency. For more details, please contact to SPI laser providers.

### Pulse Width

Set the pulse width (YAG driver only).

### Wobble

Check "Enable" to mark with the wobble function to make the line segment thicker. The default mode is circular shape.

There will be 5 more modes available to choose: "Infinite", "8-shaped", "Sin Wave", "Linear" and "Customized" when using PMC2e or PMC6, and with "Welding Module", see Fig.3.2.03.

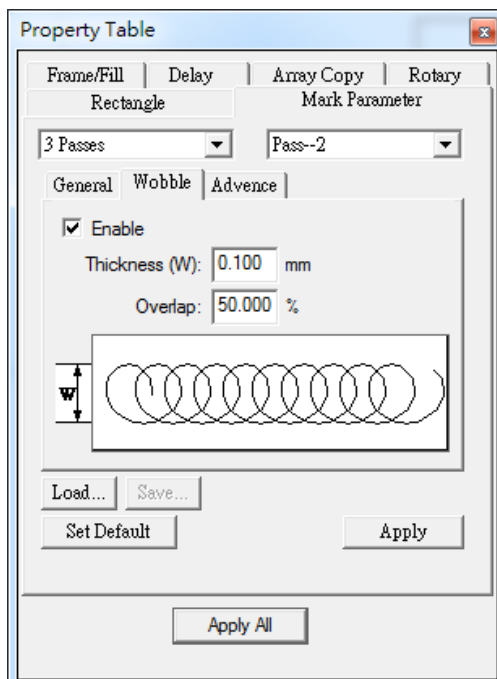


Fig. 3.2.03



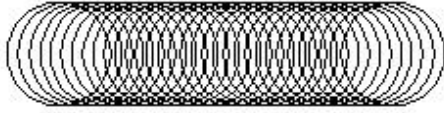
## MM3D 3.90

### Thick(W)

The diameter of the circle.

### Overlap

Higher overlap percentage will get thicker line segment, see Fig.3.2.04.



### Frequency

Set the frequency of the spiral when marking. The higher the frequency, the denser the marking result.

### Length

The system converts the actual marking length according to the width and overlap rate set by the user. It can be set when using "infinite" and "8-character" mode.

### Mm (L)

Set the length of the rectangle when selecting the "Rectangle" mode.

### Mm (W)

Set the width of the rectangle when selecting the "Rectangle" mode.

### Customize parameters

Users can set up to 16 sets of custom wobble parameters. After choosing the option & select the group, the "Custom mode parameter" window will pop up, as shown in Figure 3.2.04.

Custom Wobble graphics can be imported, but only for 2D DXF files.

Set "Frequency" and "Apply" to use.

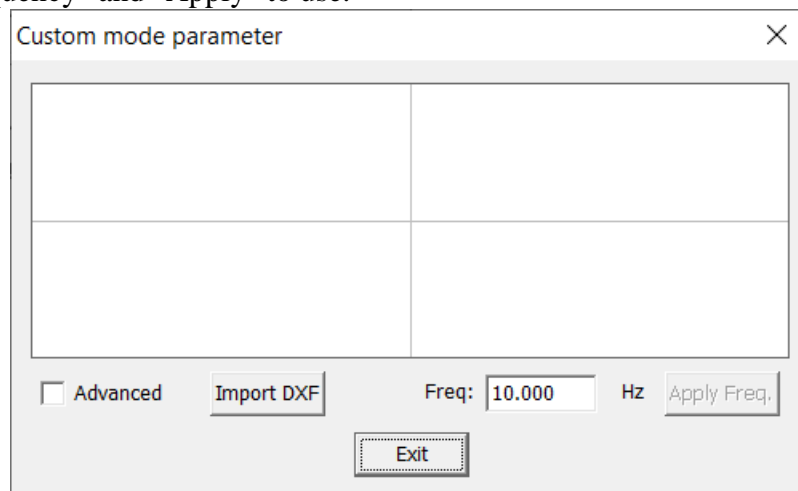


Fig. 3.2.04

### Advance

Click "Advanced" and an advanced setting window will appear. You can add and edit custom mode parameters by yourself, and set the X and Y positions, as shown in Figure 3.2.05.

## MM3D 3.90

Custom mode parameter

X Position(mm)	Y Position(mm)

Advanced    Import DXF    Freq: 10.000 Hz    Apply Freq.

Advanced(Time)    Add    Edit    Delete    Delete All

Exit

Fig. 3.2.05

Note :

The other 4 types will be available only when using PMC2e or PMC6 control card with "welding module".

"Infinite", "8-shaped", "Sin Wave" and "Linear".

Rectangular mode is only applicable to PMC2 control card.

## MM3D 3.90

### 2.5D Parameter

If you check "Enable 3D Mode" in the program "File"→"Options"→"Scan Head"→"Focal Axis Config", this page will be displayed on the Marking Parameter page, and you can set the Focal Axis position. Checking "Enable 3D Correction Mode" will display the Z compensation and XY ratio setting screen. The interface is shown in Figure 3.2.06

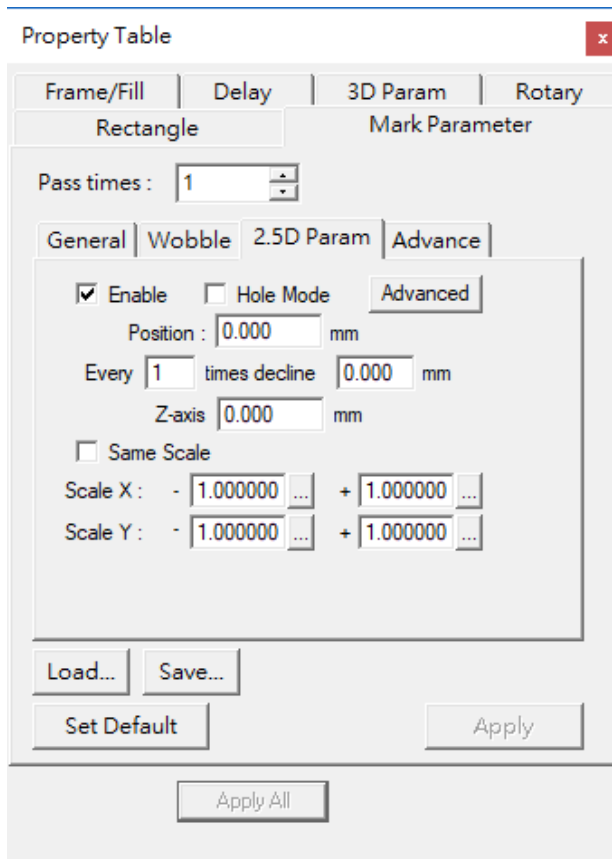


Fig.3.2.06

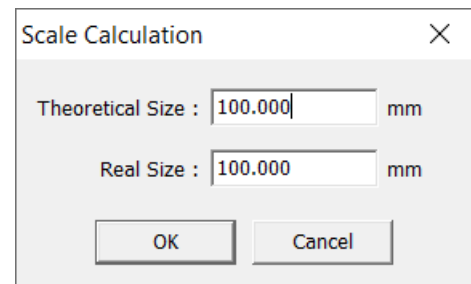


Fig.3.2.07

<b>Enable</b>	Enable 2.5D marking
<b>Hole Mode</b>	Altitude constantly decline when use 2.5D marking.
<b>Position</b>	Initial marking altitude.
<b>Every times decline mm</b>	Altitude decline distance after certain times marking.
<b>Z-axis</b>	Z-axis compensation at certain altitude.
<b>Same Scale</b>	Scale keep + and – the same value.
<b>Scale X</b>	X axis scale rate at current position.
<b>Scale Y</b>	Y axis scale rate at current position.
<b>Advanced</b>	Click Advanced button to open Advance setting window. Refer to fig.3.2.07.

## MM3D 3.90

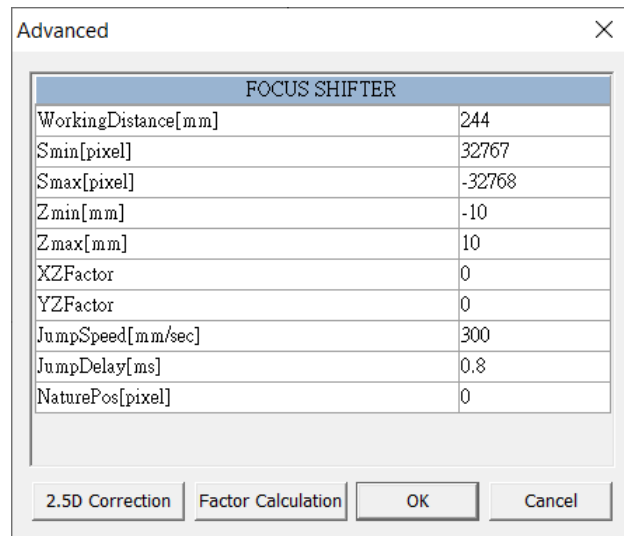


Fig.3.2.08

<b>Working Distance</b>	Working distance of the laser.
<b>Smin</b>	Limitation of 3 <sup>rd</sup> axis min value.
<b>Smax</b>	Limitation of 3 <sup>rd</sup> axis max value.
<b>Zmin</b>	The lowest position of marking.
<b>Zmax</b>	The highest position of marking.
<b>XZFactor</b>	Do not change if unnecessary.
<b>YZFactor</b>	Do not change if unnecessary.
<b>JumpSpeed</b>	Moving speed of the 3 <sup>rd</sup> axis.
<b>JumpDelay</b>	Moving delay of the 3 <sup>rd</sup> axis.
<b>NaturePos</b>	Initial position of the 3 <sup>rd</sup> axis.

### Note :

When the system reads the stf file, please check whether the positive and negative of the XY ratio are the same.

If they are inconsistent, the system will pop up a warning message, as shown in Figure 3.2.09.

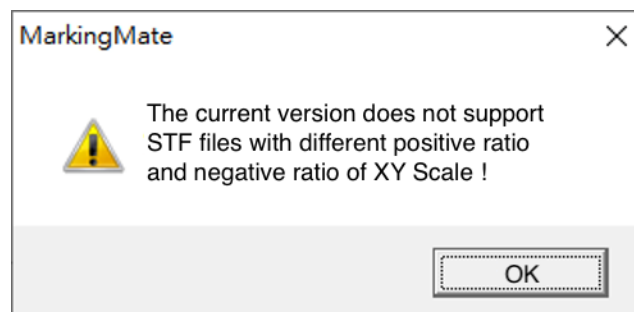


Fig.3.2.09

<b>2.5D Correction</b>	After pressing 2.5D correction, the correction dialog box will pop up.
<b>Factor Calculation</b>	After clicking Factor Calculation, the setting window will pop up. Enter all the parameter, and the system will

## MM3D 3.90

calculate the Factor value, which can be changed and applied to the original default XFactor or YFactor, as shown in Figure 3.2.10.

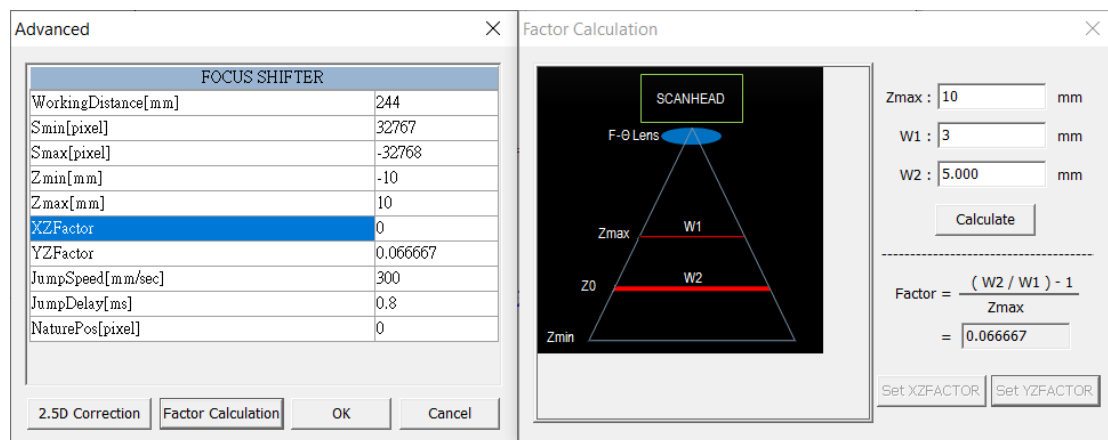


Fig.3.2.10

### 2.5D calibration operation process:

#### A. Enter the 2.5D calibration dialog box

1. "File" → "Options" → "Scan head" → "Focus axis configuration settings" → check "Enable 3D mode" and "Enable 3D calibration mode" to apply.

2. Create two objects, which are used to find the focal length of the Z axis and the ratio of X and Y respectively. The object for finding the focal length of the Z axis should be named "\_\_Mark1"; the object for correcting the X and Y scale should be named "\_\_Mark2".

Or you can use the sample file from the MM3D installation directory “..\MM3D\2.5D Correction\2.5D\_Correction\_Sample.ezm3D”, as shown in Figure 3.2.11.

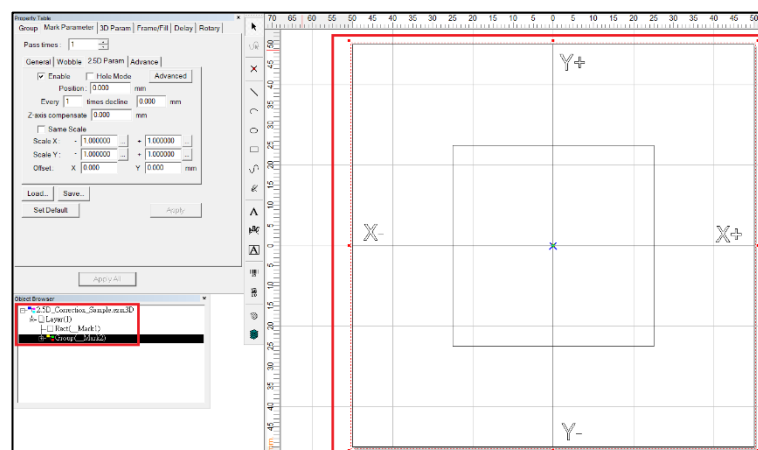


Fig.3.2.11

3. Go to the object "Property table" → "Mark Parameter" → "2.5D Param" page → click "Advanced", as shown in Figure 3.2.12.

## MM3D 3.90

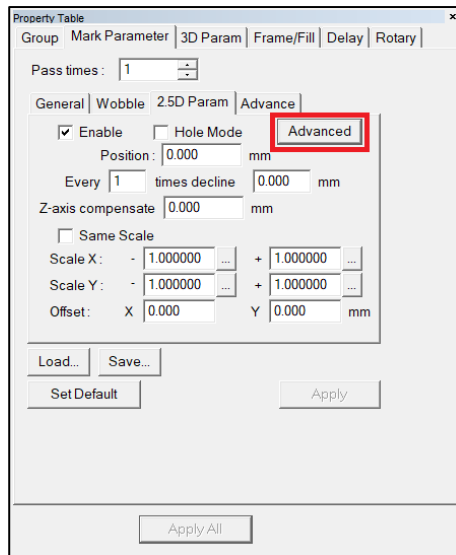


Fig.3.2.12

4. After the "Advanced" dialog box appears, click "2.5D Correction", as shown in Figure 3.2.13, to start the correction function.

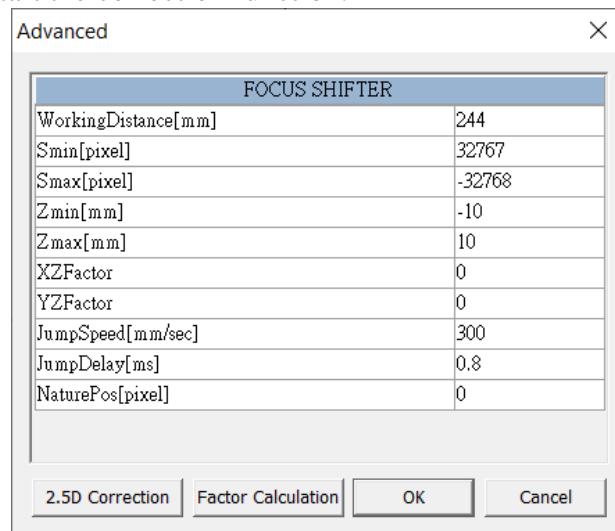


Fig.3.2.13

### B. Use 2.5D Correction

1. Select "Mode", as shown in Figure 3.2.14, the neutral position of "Huge Work Area" will be set to -32768; the neutral position of "None Large Field mode" will be set to 0; the neutral position of "Customize NaturePos" can be set by yourself.

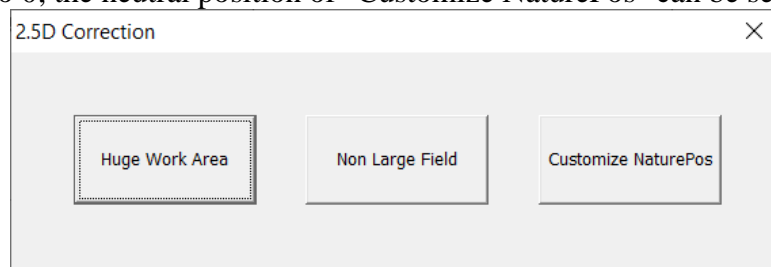


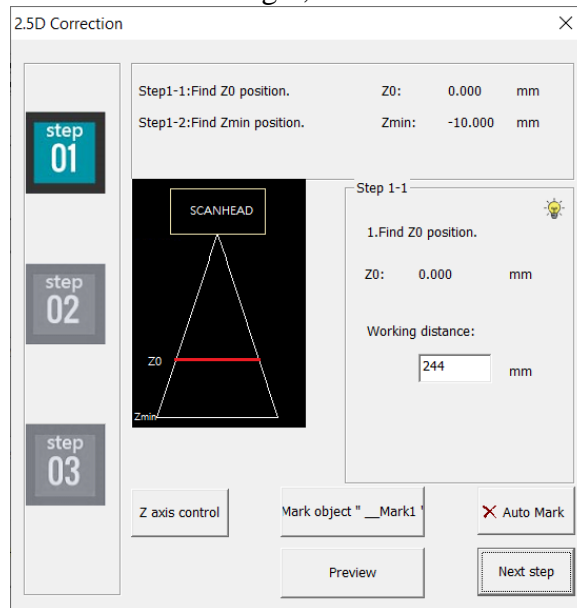
Fig.3.2.14

## MM3D 3.90

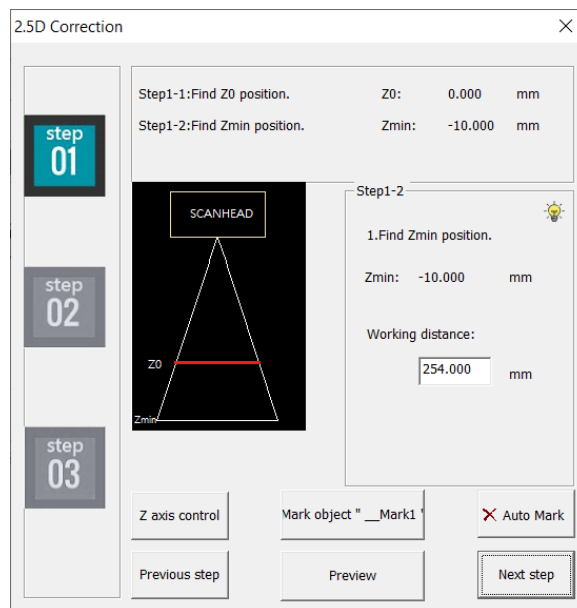
### 2. Find the Z-axis focal length position

(1) Large Field(Because the  $Z_{max} = Z_0$  in large field mode. So there's only  $Z_{min}$  needs to be set.)

Step 1. Find  $Z_0$  & enter the focal length, hit next as shown in the figure below:



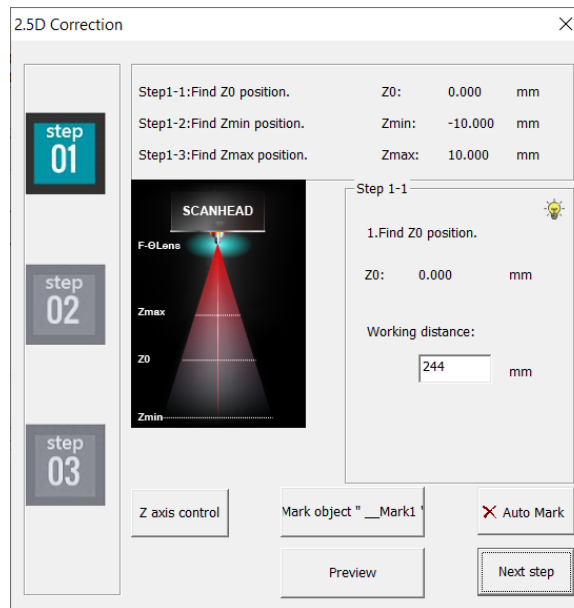
Step 2. Move the focal to default position (-10) before any setting. Fill in the focal length value after  $Z_{min}$  is found. The system will calculate the  $Z_{min}$  automatically.



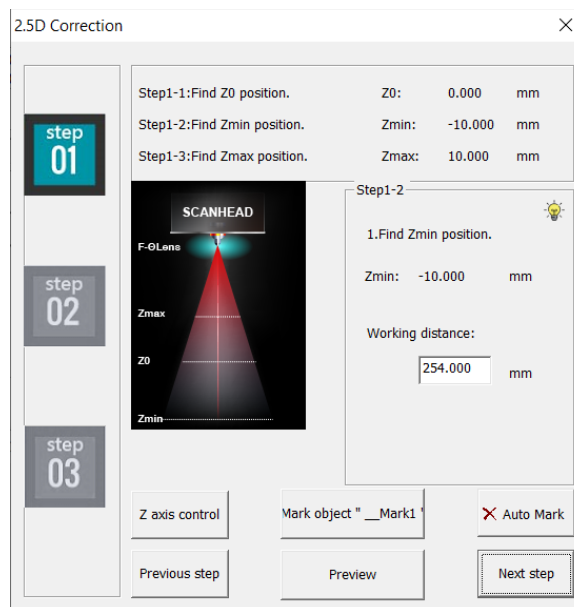
(2) Non Large Field

Step 1. Find  $Z_0$  & enter the focal length, hit next as shown in the figure below:

## MM3D 3.90



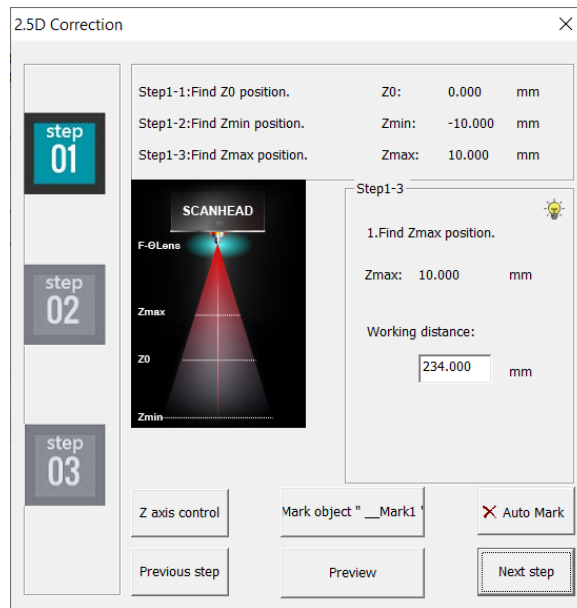
Step 2. Move the focal to default position (-10) before any setting. Fill in the focal length value after Zmin is found. The system will calculate the Zmin automatically.



Step 3. Move the focal to default position (+10) before any setting. Fill in the focal length value after Zmax is found. The system will calculate the Zmax automatically.

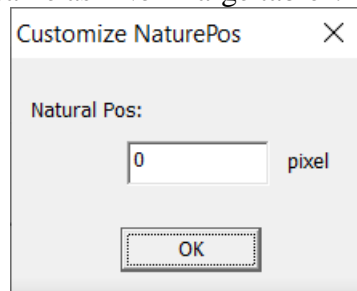


## MM3D 3.90



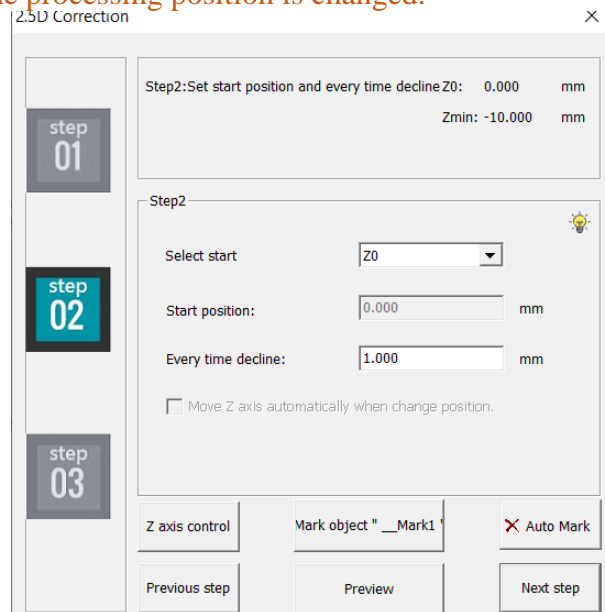
### (3) Customize NaturePos

Press the “Custom naturePos”, the dialog box shown on the right will pop up, enter the nature Pos you want to set, and click OK to start the calibration. The calibration steps are the same as "Non Large table".

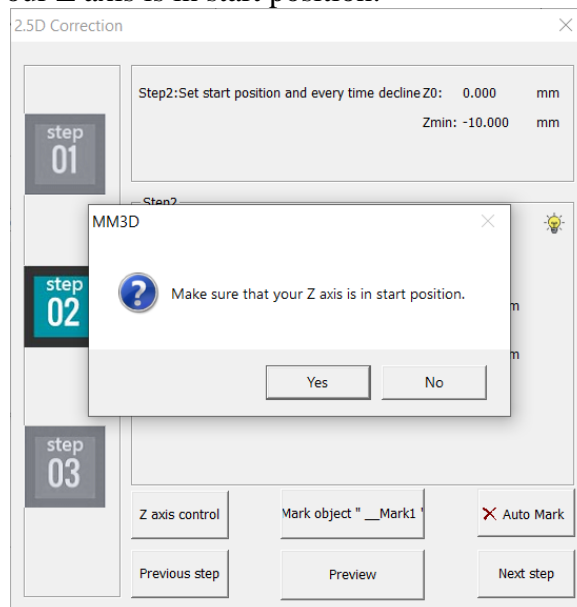


## MM3D 3.90

3. Set the start position of processing and the height of every time declines.  
If there is a dongle and control card, the Z axis can be set to automatically moved when the processing position is changed.



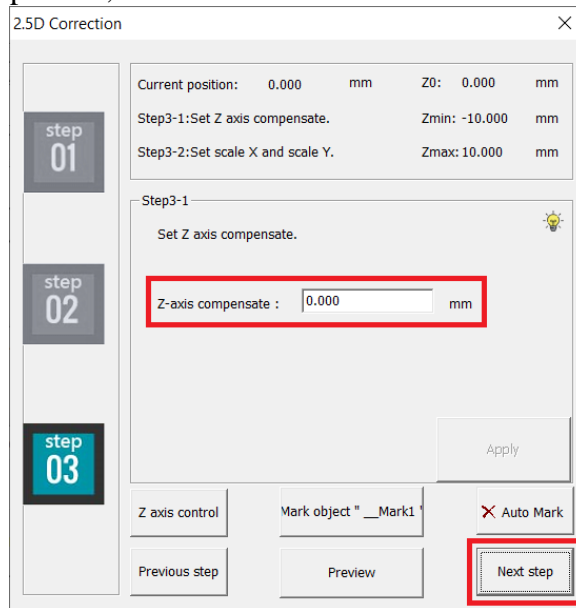
When the setting is complete, press "Next" and a message will pop up. Please Make sure that your Z axis is in start position.



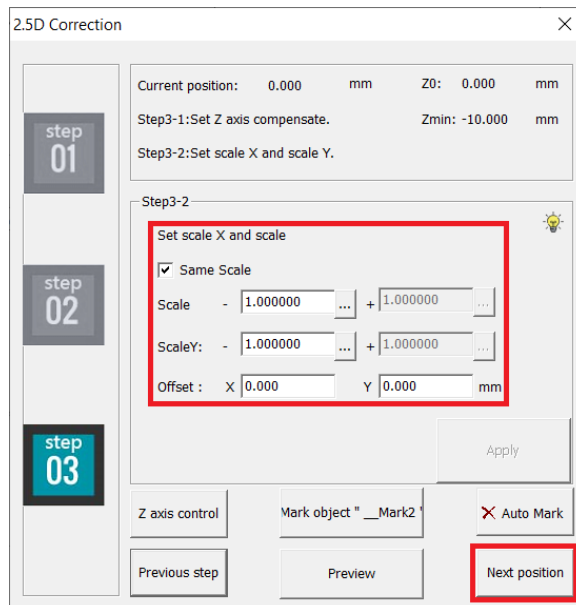
# MM3D 3.90

## 4. Start Correction

(1) Enter Z axis compensate, trial mark until the result is correct then click “next”.

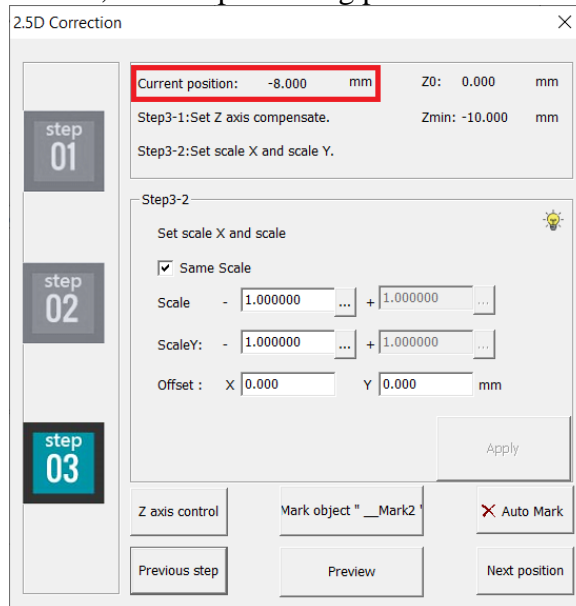


(2) Enter X scale & Y scale, trial mark until the result is correct then click “next position”.

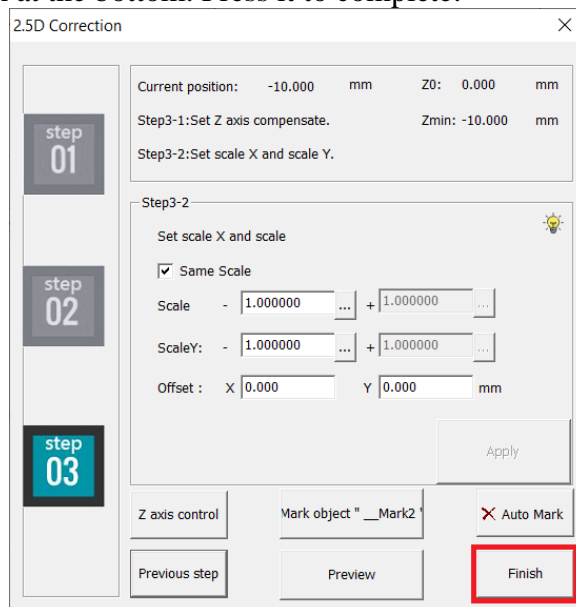


## MM3D 3.90

- (3) If you check Move Z axis automatically when change position in the second step after pressing "Next Position", the Z axis will move according to the distance of each descent, and the processing position will move accordingly.

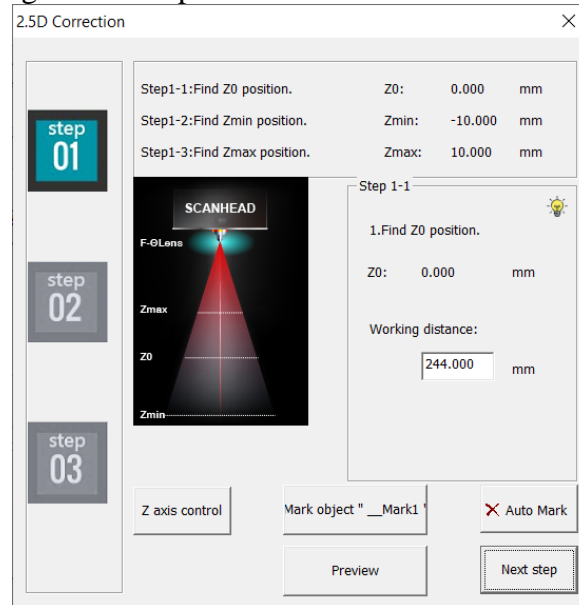


Until the processing position reaches the Zmax or Zmin position, there will be a "Finish" button at the bottom. Press it to complete.



## MM3D 3.90

### 2.5D correction dialog box description



Z axis control	Open Z axis Control Pannel
Mark object ”_Mark1”	Mark the object named " __Mark1". (Except for step 3-2 to find the X and Y ratios, the other steps are all marking objects named " __Mark1").
Mark object ”_Mark2”	Mark an object named " __Mark2". (Only in step 3-2 to find the X, Y ratio, the marking object is named " __Mark2").
Preview	Turn on the preview function, usable in every step.
Auto Mark	Set to use automatic engraving, usable in every step.
Previous step	Back to previous step.
Next step	Go to the next step.
Previous position	Move the Z axis to the previous position according to the decline height of the movement set in step 2. (Only in step 3-1, and the processing position is not the starting position set in step 2, it will be displayed).
Next Position	Move the Z axis to the next position according to the decline height of the movement set in step 2. (Only in step 3-1, and the processing position is not the starting position set in step 2, it will be displayed).
Finish	Close the correction box when finish the correction
Step01, 02, 03	Move to the corresponding step by clicking the image.

### Advance

Provide users some further mark settings, see Fig.3.2.15 and Fig.3.2.16.

## MM3D 3.90

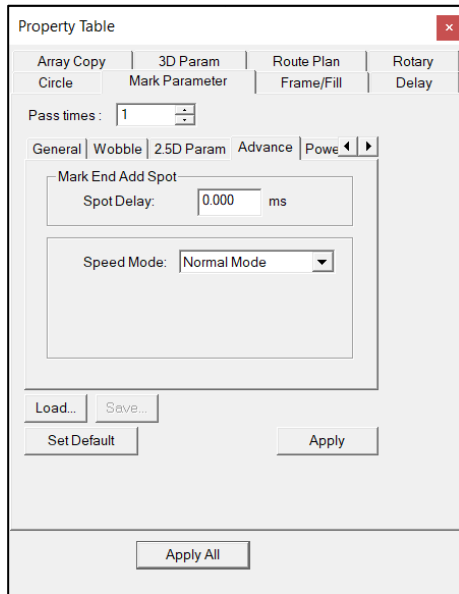


Fig.3.2.15

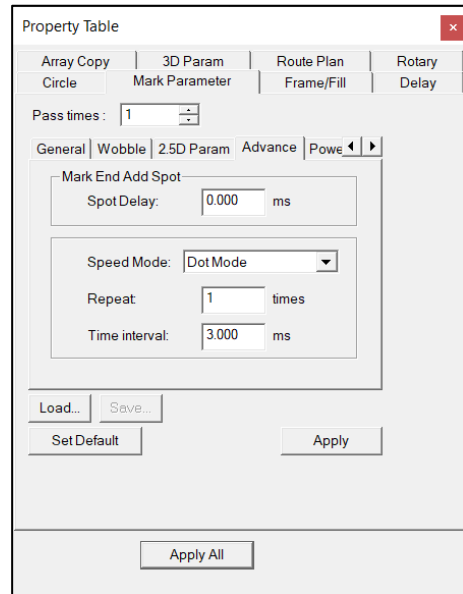


Fig.3.2.16

### Mark End Add Spot

Set the Spot Delay to mark a spot again at the mark end position.

### Speed Mode

Users can select to use Dot Mode or Normal Mode when marking.

### Repeat

Set the repeat times for each dot.

### Time Interval

The time interval between each dot on one spot.

### Load

Load the previous saved parameter setting.

### Save

Save the current setting.

### Set Default

Set the current setting as the default setting.

## MM3D 3.90

### Power Gradient

In order to apply the welding function, add the power gradient parameter in the Mark parameter page (only valid for the first processing in multiple processing), available after MM3D version 3.57. See Figure 3.2.17.

<b>Enable</b>	To enable Power Gradient function
<b>Start Power Scale</b>	Set the Start Power Scale
<b>Start Power length</b>	Set the length of the power conversion from the starting point.
<b>End Power Scale</b>	Set the End Power Scale
<b>End Power length</b>	Set the length of the power conversion from the end point.

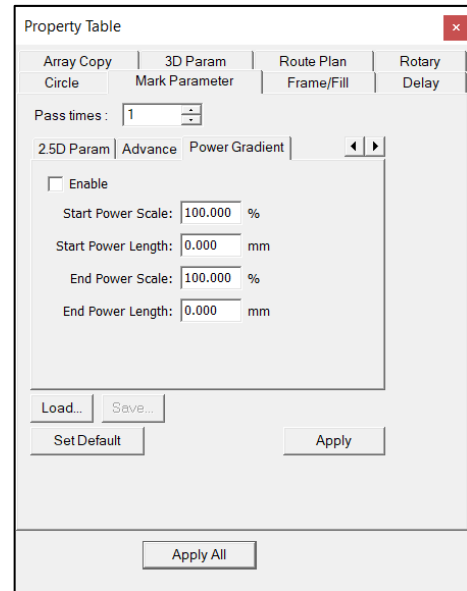


Fig.3.2.17

#### Power scale calculation instructions:

"Power" multiplied by "Starting Power Scale" is the starting point power.  
for example :  
Power (100%)\*Starting Power Scale (50%), then the starting power is 50%.

"Power" multiplied by "End Power Scale" is the End point power.  
for example :  
Power (100%) \* End Power Scale (50%), then the End point power is 50%.

## MM3D 3.90

### 3.2.2 Frame/Fill

Set the frame color, fill color and fill style, see Fig.3.2.18. The parameter set on this page are only related to the display in the software. In the final processing, the number of marking times and output the frame or fill the effect should be set on the "General" page in the "Marking Parameters" page.

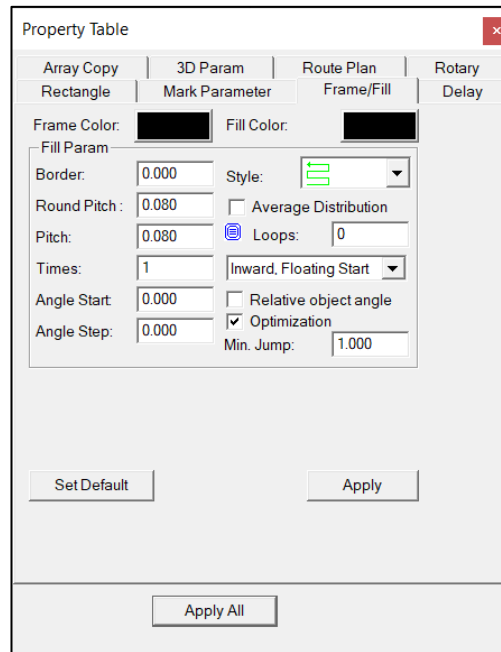




Fig. 3.2.18

- |   |  |
|---|--|
| <b>Fill Param:</b>  | Modify the related parameters when fill.   |
| <b>Border:</b>  | The distance between hatch line and the frame.   |
| <b>Round Pitch:</b>   | Setting the distance between the inner rings   |
| <b>Pitch:</b>   | The distance between each hatch line   |
| <b>Times:</b>   | The fill repetition times.   |
| <b>Angle Start:</b>   | The start angle of each hatch line   |
| <b>Angle Step:</b>  | The progressive angle of each hatch line.  |
| <b>Style:</b>   | Decide the traveling path mode of laser when fill. There are seven styles for users to select. There are "two-way filling", "one-way filling", "island filling", "continuous two-way filling", "hollow island filling", "continuous island filling" and "inner contour filling". |
|   |    |
| <b>Average Distribution:</b>  | Distribute the hatch line averagely based on the pitch and the frame.  |
| <b>Relative object angle:</b>   | When rotating an object, the filling effect will be rotated according to the angle of the object.  |
|  <b>Loops:</b> | Decide the amount of loop created inside the object according to the pitch. The hatch line will be filled in the loop.   |
| <b>Inward, Fixing Start</b>   | According to the selected filling form, fill the   |



## MM3D 3.90

object from the fixed starting point from the outside to the inside.

### Outward, Fixing Start

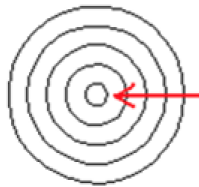
According to the selected filling form, fill the object from the fixed starting point from the inside to the outside.

### Inward, Floating Start

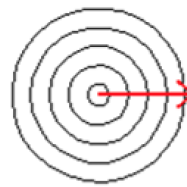
According to the selected filling mode, the object will be filled from the outside to the inside, and the system will set the offset of the starting point of each circle by itself.

### Outward, Floating Start

According to the selected filling mode, the object is filled from the inside to the outside, and the system will set the offset of the starting point of each circle by itself.



Fill Inward



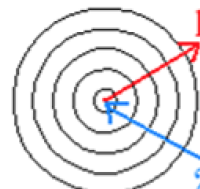
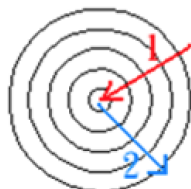
Fill Outward

### In-Out, Floating Start

According to the selected filling form, fill the object from the outside to the inside, and then from the inside to the outside. The system will automatically set the starting point offset of each circle.


### Out-In, Floating Start

According to the selected filling mode, fill the object from the inside to the outside, and then from the outside to the inside. The system will automatically set the starting point offset of each circle.








Fill Inward and then Outward Fill Outward and then Inward

### Optimization:

When you select the  fill mode, check this option to start the optimization of the fill path.

### Min. Jump:

It can be set when the  fill form is selected. If the distance between the end point of the filled line and the start point is greater than the set minimum jump distance, the start and end points of the filled line will not be connected.

If the form    is selected, only the parameter "Round Pitch" can be set for the above filling parameters. Select the  form, there will be an option of "outer to inner", you can check the box to mark from outside to inside.

# MM3D 3.90

## 3.2.3 Delay

Set the gap between the theoretical speed and the actual speed and the appropriate timing to switch the laser when the galvanometer motor is moving. The setting of these values will directly affect the quality of the marking results. The user can set the delay parameter on the property sheet page after clicking the object. The interface is shown in Figure 3.2.19.

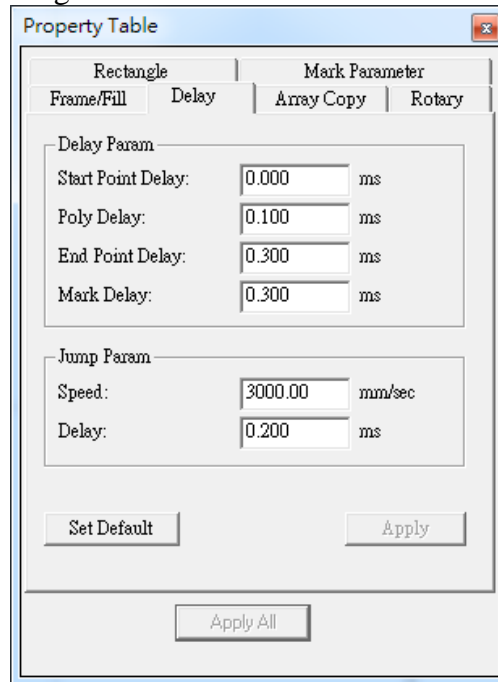
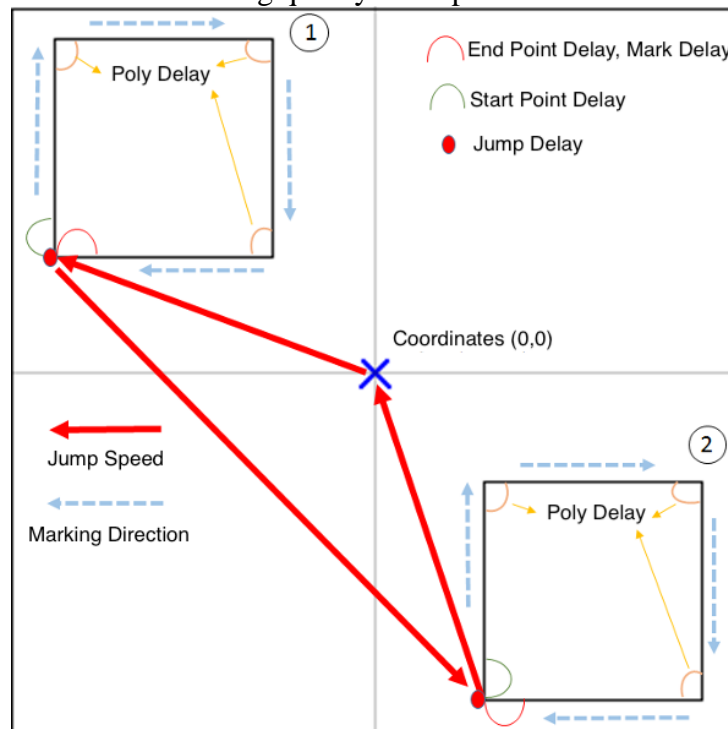


Fig. 3.2.19

**Delay Param:** The **Start Point Delay**, **Poly Delay**, **End Point Delay** and **Mark delay** time can be set, please refer to the following diagram. Proper adjustment of the values will make the marking quality more perfect.



## MM3D 3.90

### Start Point Delay:

The time difference between the lens starts moving and the laser starts hitting. The default value is 0. It can be set depending on users needs. This value can also be negative, and it means the lens will start moving after the laser hitting through the setting time. Table 3.1 shows the different result under different Start Point Delay Time.

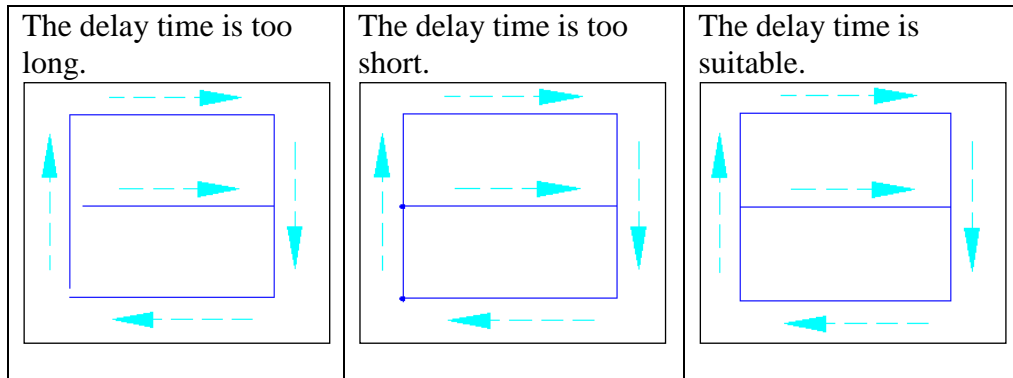


Table 3.1

### Start Point Dealy

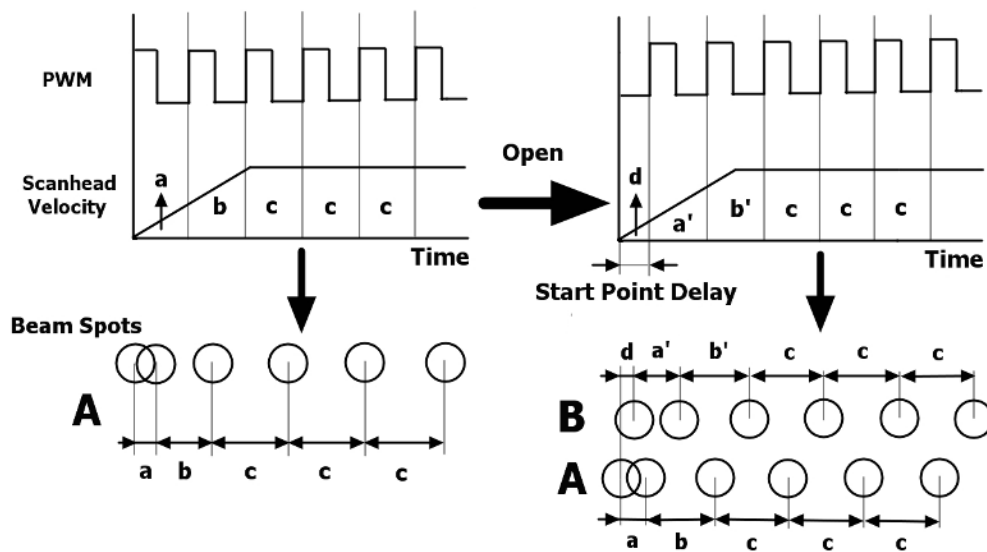


Fig. 3.2.20

## MM3D 3.90

### End Point Delay:

The time value will affect the accuracy on the ending of the object. Table 3.3 shows the mark result under different settings.

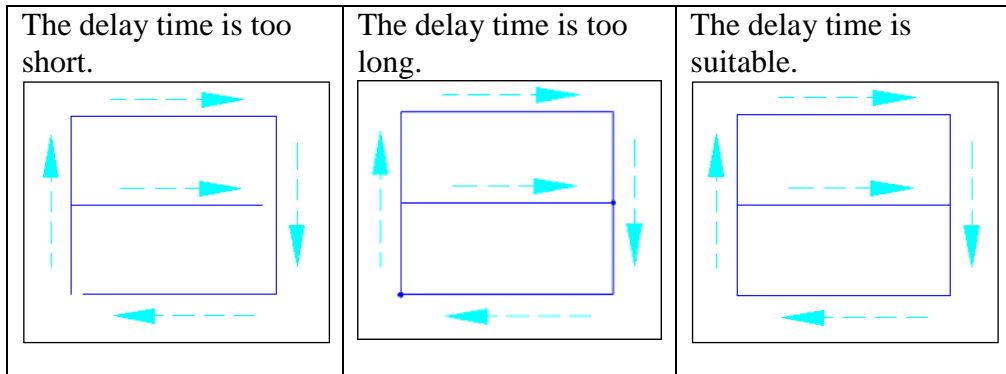


Table 3.3

### Poly Delay:

The time value will affect the mark quality of the connection part of two segments. Table 3.2 shows the mark result under different settings.

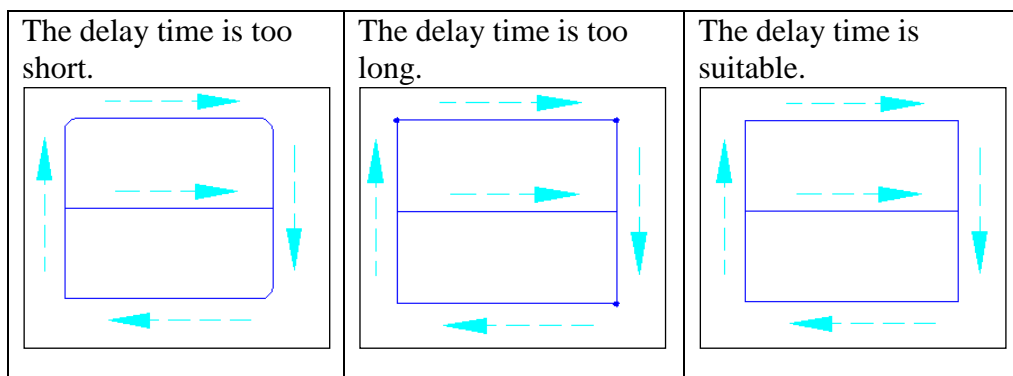


Table 3.2

### Mark Delay:

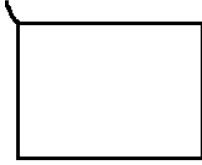
Make sure that galvo waits for the delay time for the laser to completely turn off at the End point before the next command (marking or galvo displacement) starts.

Due to the characteristics of the laser, it may not be able to completely turn off immediately after the program sends out a stop signal. Adjusting the marking delay parameter will allow galvo to have enough time to reach the end point to complete the marking. If the laser light-off signal has been sent, but the laser is not completely turned off immediately, and there is still laser leakage, Galvo will wait for a period of time at the End point until the laser is completely turned off. **This delay time includes the End point delay time.**

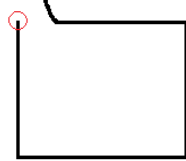
## MM3D 3.90

### End Point Delay and Mark Delay

If there is no tail marking at the marking end stage, end point delay and mark delay are totally equal. On the other hand, if there is a tail seen as the figure below:



User will need to adjust mark delay. First of all, set both end point delay and mark delay to 0. This time the result will be seen as below:



Then enlarge the mark delay until the tail is disappeared. Seen as below:



At this moment synchronously add end point delay and mark delay. Until rectangle start point and end point is the same point. See as below:



**Jump Param:** Set the parameters about the moving of lens.

**Speed:** The moving speed of lens. The maximum value must refer to the manual of the lens.

**Delay:** The waiting time laser needs to start hitting after the lens moves to the mark position.

## MM3D 3.90

### 3.2.4 Array Copy

The Array Copy function of the property page takes only one object as the main body, and uses virtual copy to copy multiple objects. So that it can speed up its use. There are three copy modes: By Matrix (Figure 3.2.21), By Circle (Figure 3.2.22) and By Custom.

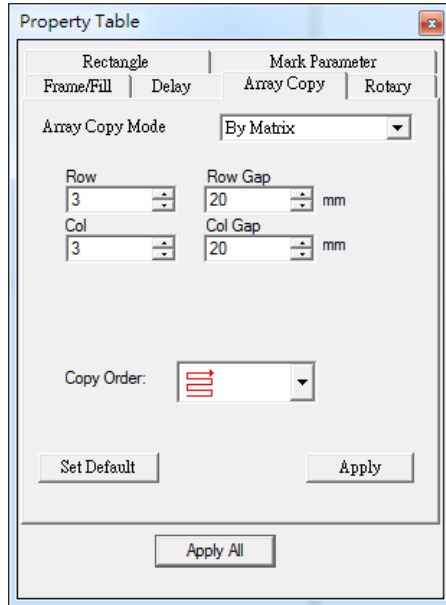


Fig. 3.2.21

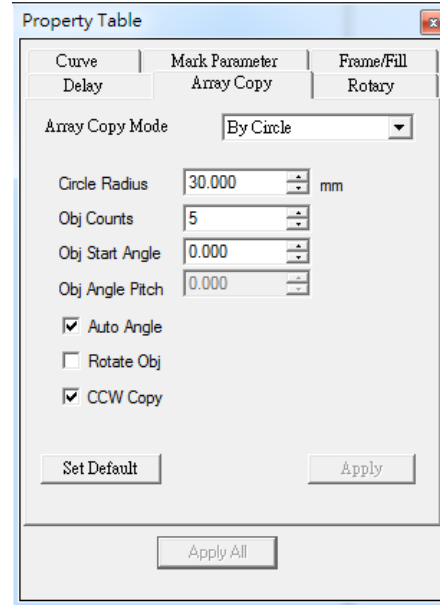


Fig. 3.2.22

#### By Matrix

- Row:** Total number of objects in each row.
- Row Gap:** The spacing between each row.
- Col:** The total number of objects in each col.
- Col Gap:** The spacing between each col.
- Copy Order:** Select the direction of the object copy order.

There are four types of order



#### By Circle

- Circle Radius:** The radius of the copy circle center.
- Obj Counts:** The number of copies.
- Obj Start Angle:** Set the angular position of the first object based on the set circle center.
- Obj Angle Pitch:** The angle between the objects.
- Auto Angle:** Distribute the distance and angle between objects equally.
- Rotate Obj:** The object rotates proportionally according to the circle.
- CCW Copy:** Display the copying objects in a counterclockwise direction.

#### By Custom

- Reload when open XEZM file** You can check to enable this feature.
- Load File** Can load the txt. file that has set the coordinates.

## MM3D 3.90

### 3.2.5 Rotary

This page allows users to enable rotary marking for individual object. Fig.3.2.23 is the property page when selecting a general object.

#### Enable

Allow users to enable or disable the rotary axis function.

#### Start Position

The initial angle of the rotary.

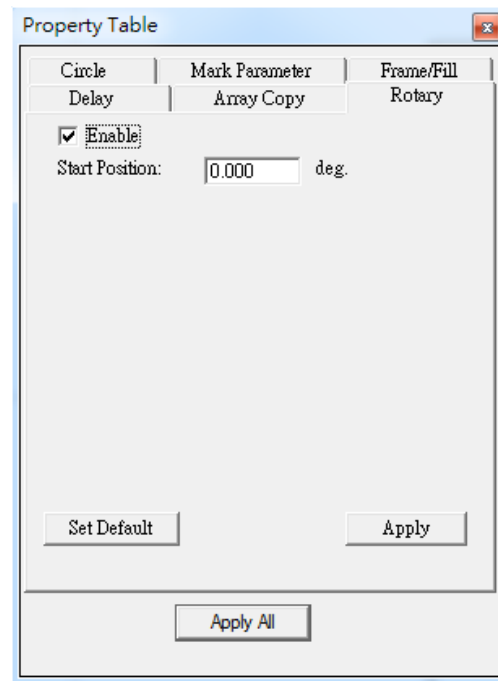


Fig. 3.2.23

#### Text Object

When a general text object has being selected, the Rotary Page has some particular options, like Fig.3.2.24.

#### Text option

##### Separate To Character

Separate the selected text into individual characters.

##### Pitch

The distance between each character.

**Center:** Calculate the pitch based on the center of the character, see Fig.3.2.25.

**Edge:** Calculate the pitch based on the edge of the character, see Fig.3.2.26.

**Diameter:** The software needs the diameter of the working-piece to calculate the pitch when select Edge mode.

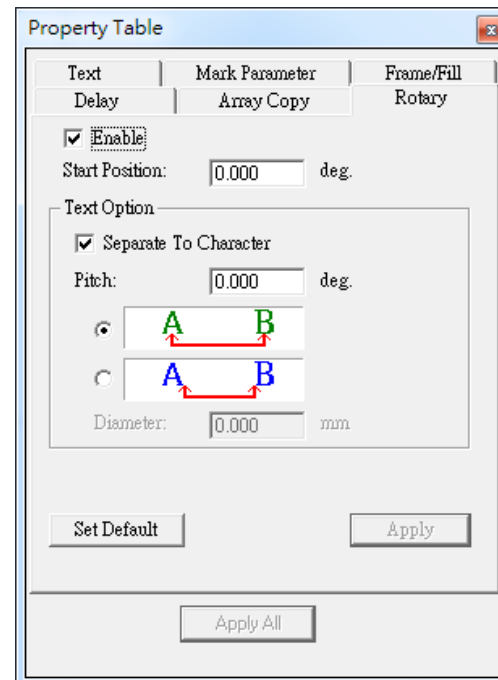


Fig. 3.2.24

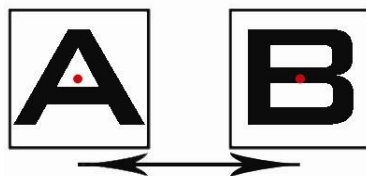


Fig. 3.2.25



Fig. 3.2.26

## MM3D 3.90

### 3.2.6 3D property page

Set the 3D parameters of marking, the interface is shown in Figure 3.2.27. Manage selected object 3D parameter. Please check “Option”→ “Focal axis config” → “Enable 3D mode” and “Enable 3D correction mode” to enable this page.

When outputting the layer primitives after the 3D parameters are set and enabled, the position of the drawing surface to be output in the actual marking will be adjusted according to the set workpiece type and its radius and focal length.

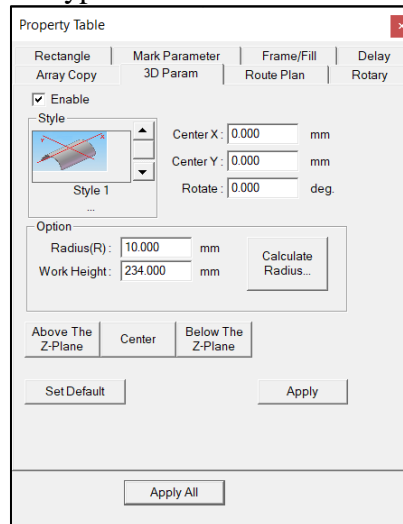
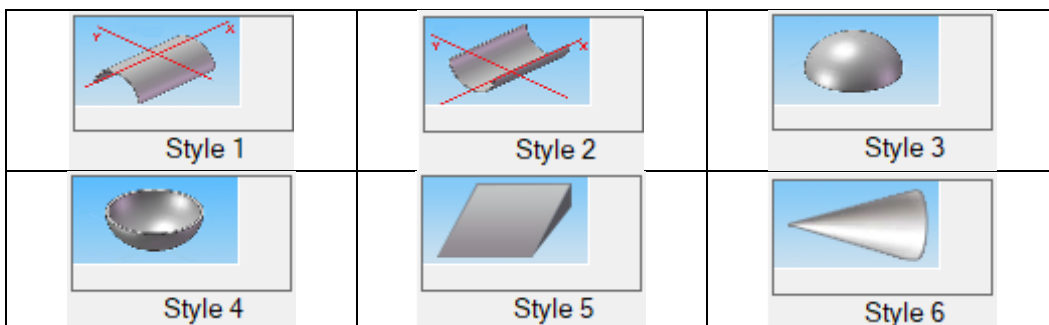


Fig.3.2.27

**Enable**            Activate 3D marking. Check to enable style selection  
**Style**             Select a model style



The gray object represents the workpiece. The red XY axis coordinate system represents the direction of the worktable.

**Workpiece type:**

**Type 1-2 is a cylindrical (cylindrical) object; Type 3-4 is a spherical object; Type 5 is an inclined surface; Type 6 is a conical object.**

**CenterX**            Center position at X direction.  
**CenterY**            Center position at Y direction.  
**Rotate**             Model rotate angle.



## MM3D 3.90

### Options

#### Radius

Curve radius. This could be calculated by “Calculate curve radius”.

#### Work Height

Distance from center position to lens.

#### Slope Angle

The angle between slop and horizon plane. This could be calculated by “Calculate Bevel”.

**Calculate Radius** Calculate radius. Refer to fig.3.2.28.

#### Width

The distance between two end points

#### Height

The chord height

Press the "OK" button to update the radius value of the surface.

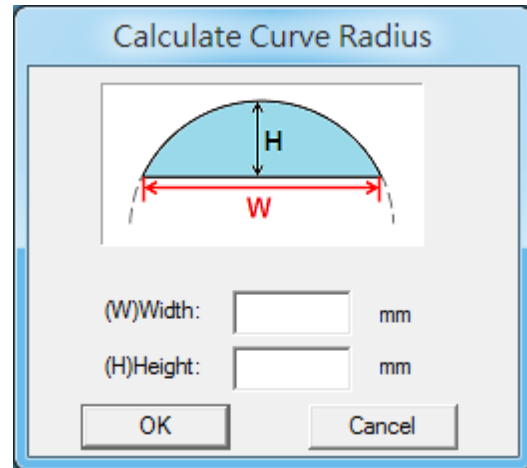


Fig.3.2.28

**Calculate Bevel** Input the parameter to calculate the slopr angle. Refer to fig.3.2.29

**W** Underside width.

**H1** Distance from upper side of slop to underside

**H2** Distance from lower side of slop to underside

Press the "OK" button to update the slope angle value.

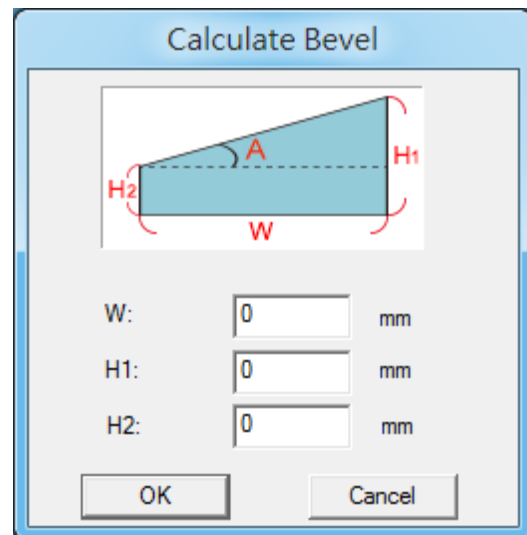


Fig.3.2.29

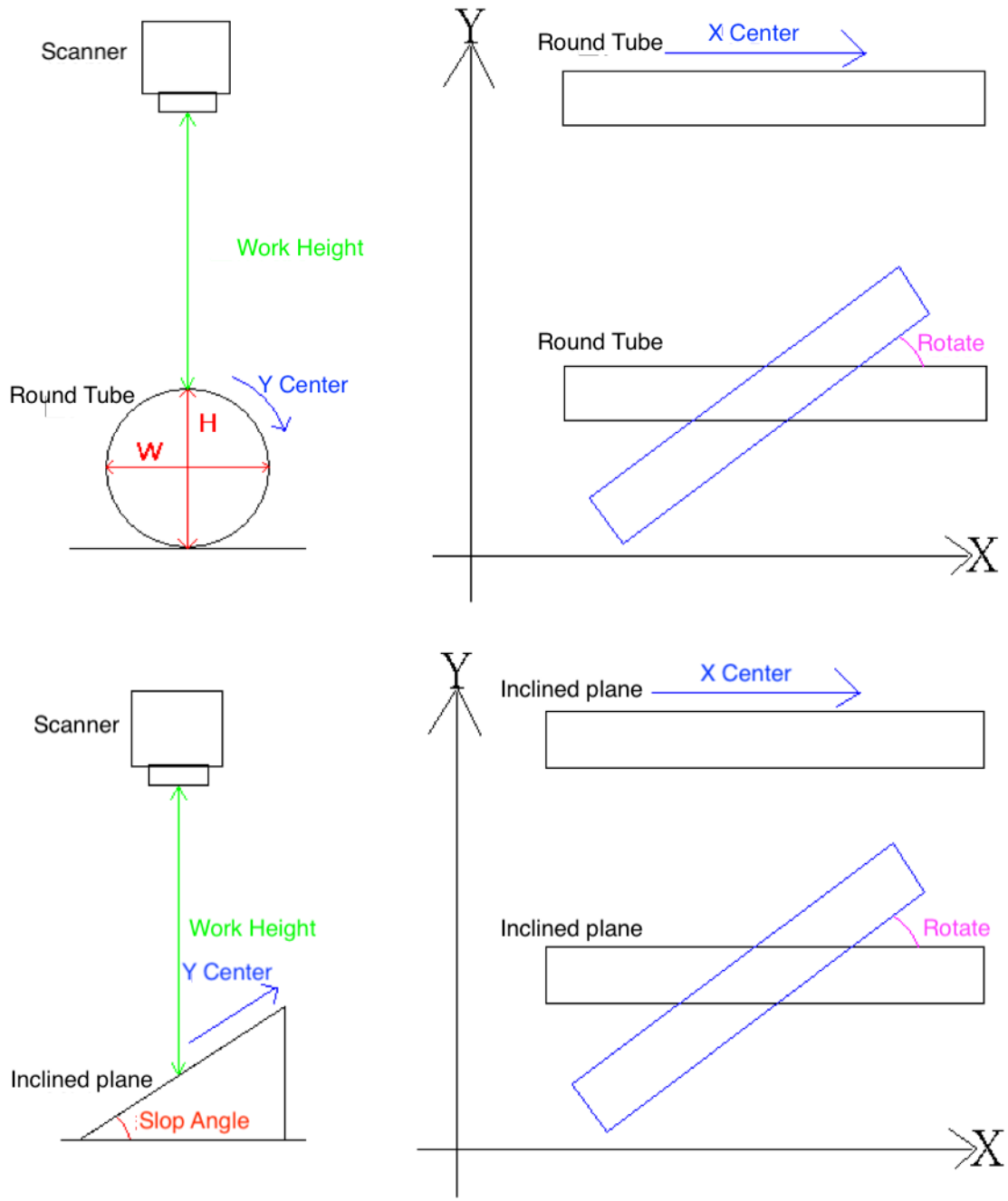
**Above the Z-Plane** Set the position of the model above the Z0 plane.

**Center** Set the model to the center of the plane.

**Below The Z-Plane** Set the position of the model below the Z0 plane.

### Model and working position schematic

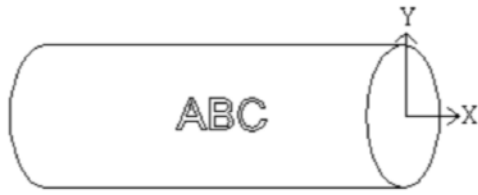
# MM3D 3.90



# MM3D 3.90

## Example diagram

### 1. Round tube (tube)

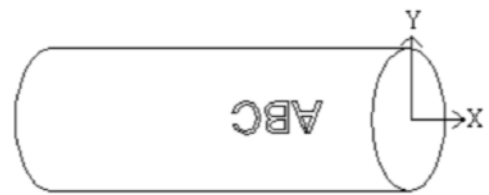


Model      Text

Center X: 0      Rotate: 0

Center Y: 0

Rotate: 0

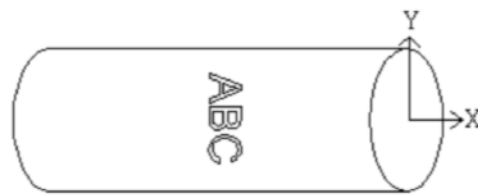


Model      Text

Center X: 10      Rotate: 180

Center Y: 0

Rotate: 0

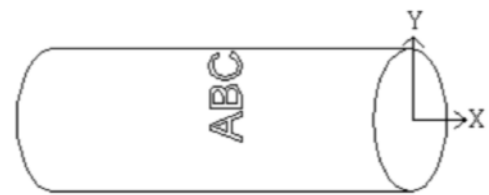


Model      Text

Center X: 0      Rotate: 270

Center Y: 0

Rotate: 0



Model      Text

Center X: 0      Rotate: 90

Center Y: 10

Rotate: 0



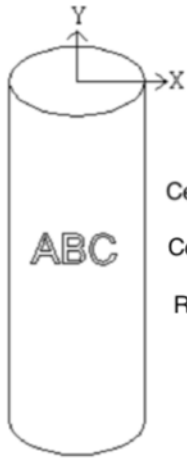
Model      Text

Center X: 0      Rotate: 315

Center Y: 0

Rotate: 0

# MM3D 3.90



Model	Text
Center X: 0	Rotate: 270
Center Y: 0	
Rotate: 90	



Model	Text
Center X: 10	Rotate: 90
Center Y: 0	
Rotate: 90	



Model	Text
Center X: 0	Rotate: 180
Center Y: 0	
Rotate: 90	

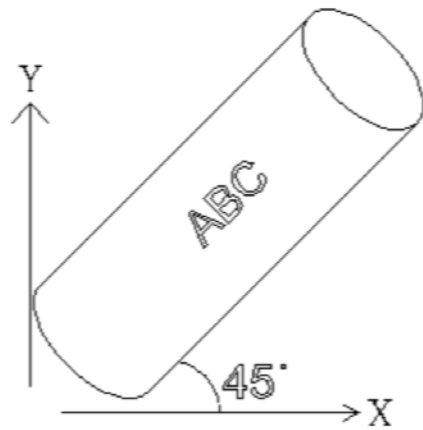


Model	Text
Center X: 0	Rotate: 0
Center Y: 10	
Rotate: 90	

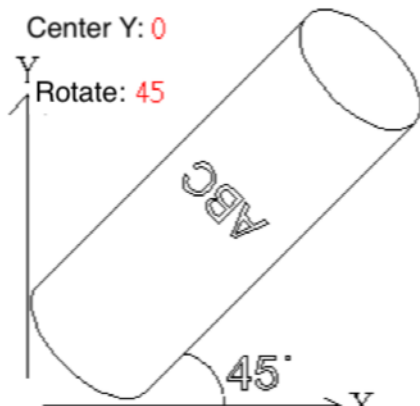


Model	Text
Center X: 0	Rotate: 315
Center Y: 0	
Rotate: 90	

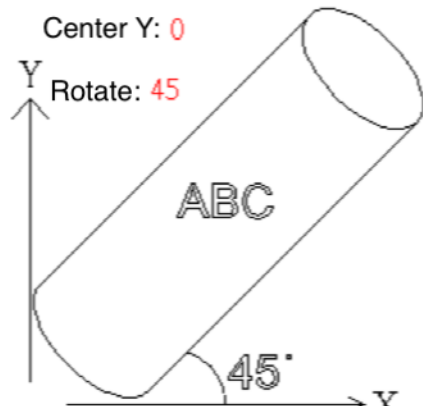
### MM3D 3.90



Model Text  
Center X: 0 Rotate: 0



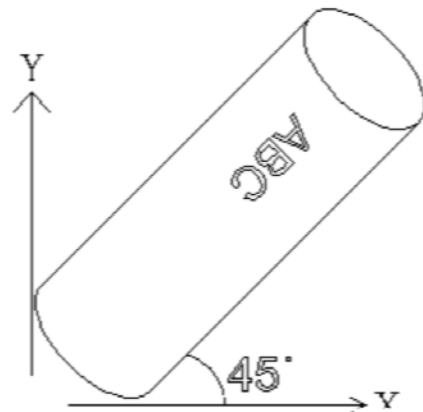
Model Text  
Center X: 0 Rotate: 90



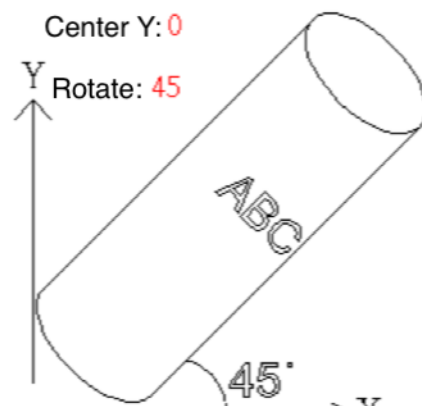
Model Text  
Center X: 0 Rotate: 315

Center Y: 0

Rotate: 45



Model Text  
Center X: 10 Rotate: 180



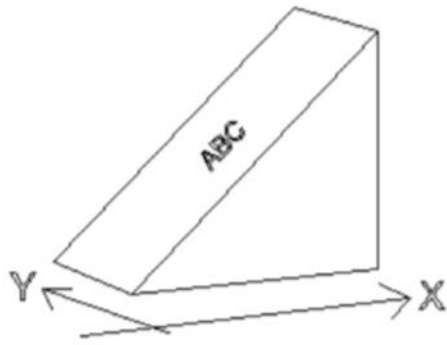
Model Text  
Center X: 0 Rotate: 270

Center Y: -10

Rotate: 45

## MM3D 3.90

### 2. Inclined plane

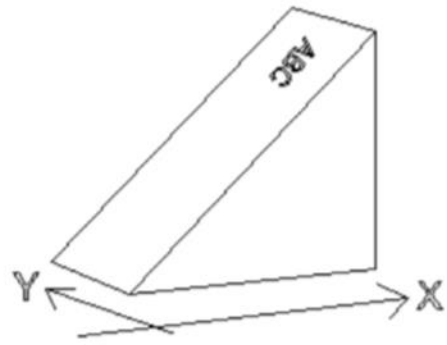


Model Text

Center X: 0 Rotate: 0

Center Y: 0

Rotate: 0

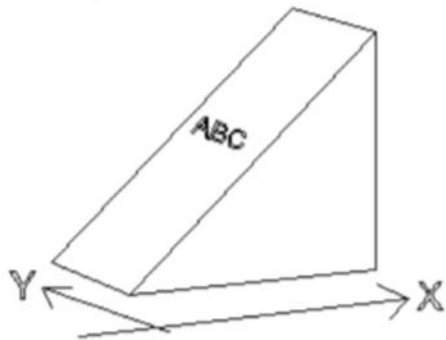


Model Text

Center X: 10 Rotate: 180

Center Y: 0

Rotate: 0

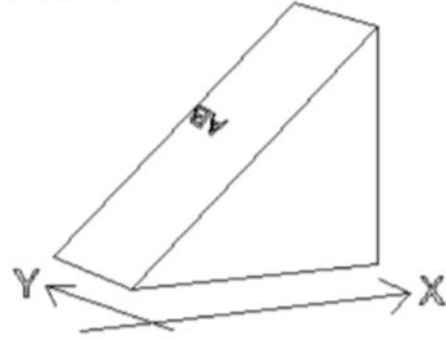


Model Text

Center X: 0 Rotate: 270

Center Y: 0

Rotate: 0

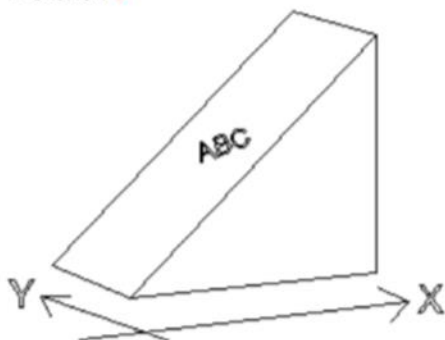


Model Text

Center X: 0 Rotate: 90

Center Y: 10

Rotate: 0



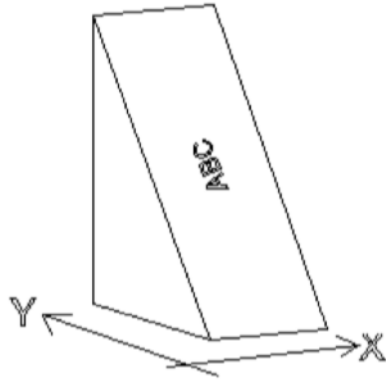
Model Text

Center X: 0 Rotate: 315

Center Y: 0

Rotate: 0

# MM3D 3.90

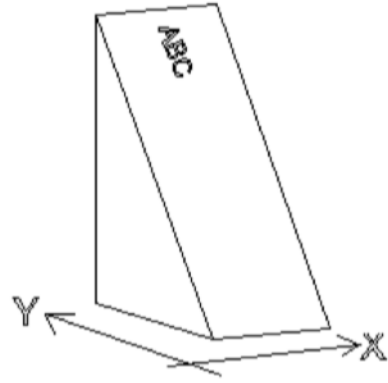


Model      Text

Center X: 0      Rotate: 0

Center Y: 0

Rotate: 90

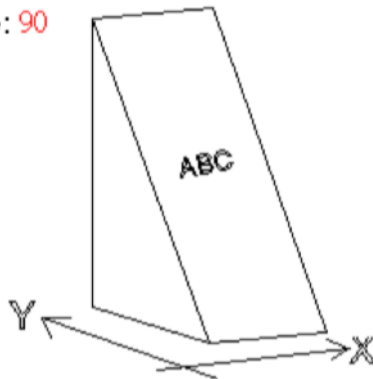


Model      Text

Center X: 10      Rotate: 180

Center Y: 0

Rotate: 90

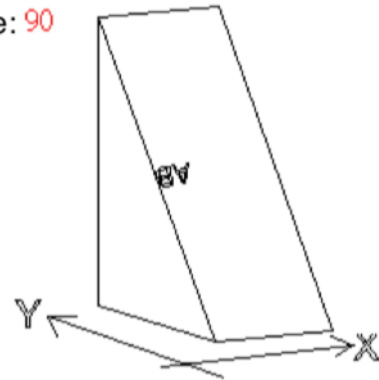


Model      Text

Center X: 0      Rotate: 270

Center Y: 0

Rotate: 90

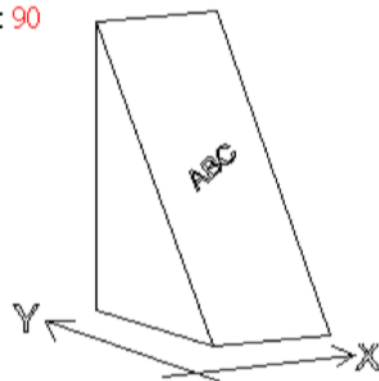


Model      Text

Center X: 0      Rotate: 90

Center Y: 10

Rotate: 90



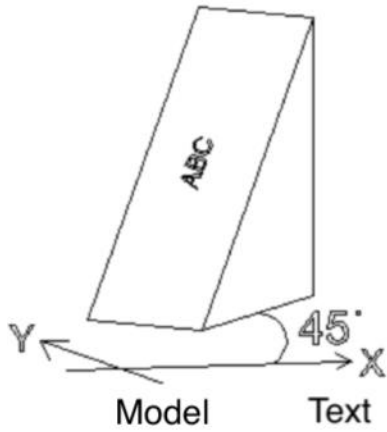
Model      Text

Center X: 0      Rotate: 315

Center Y: 0

Rotate: 90

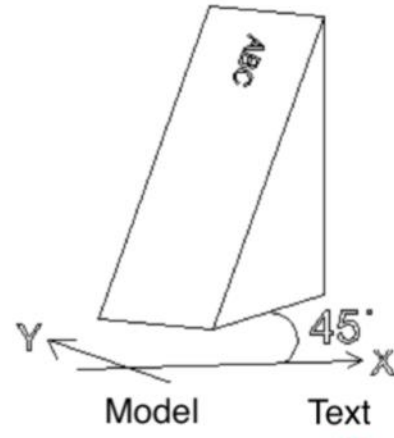
# MM3D 3.90



Center X: 0 Rotate: 0

Center Y: 0

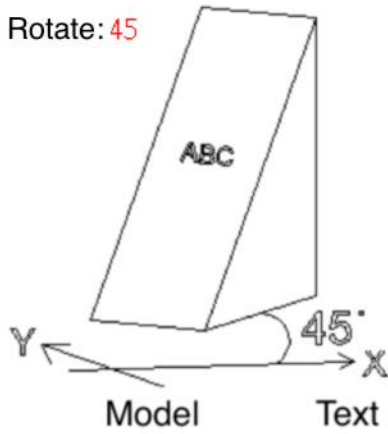
Rotate: 45



Center X: 10 Rotate: 180

Center Y: 0

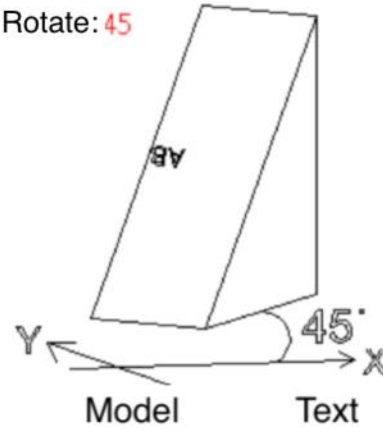
Rotate: 45



Center X: 0 Rotate: 270

Center Y: 0

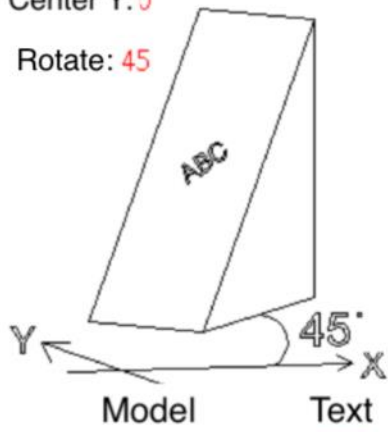
Rotate: 45



Center X: 0 Rotate: 90

Center Y: 10

Rotate: 45



Center X: 0 Rotate: 315

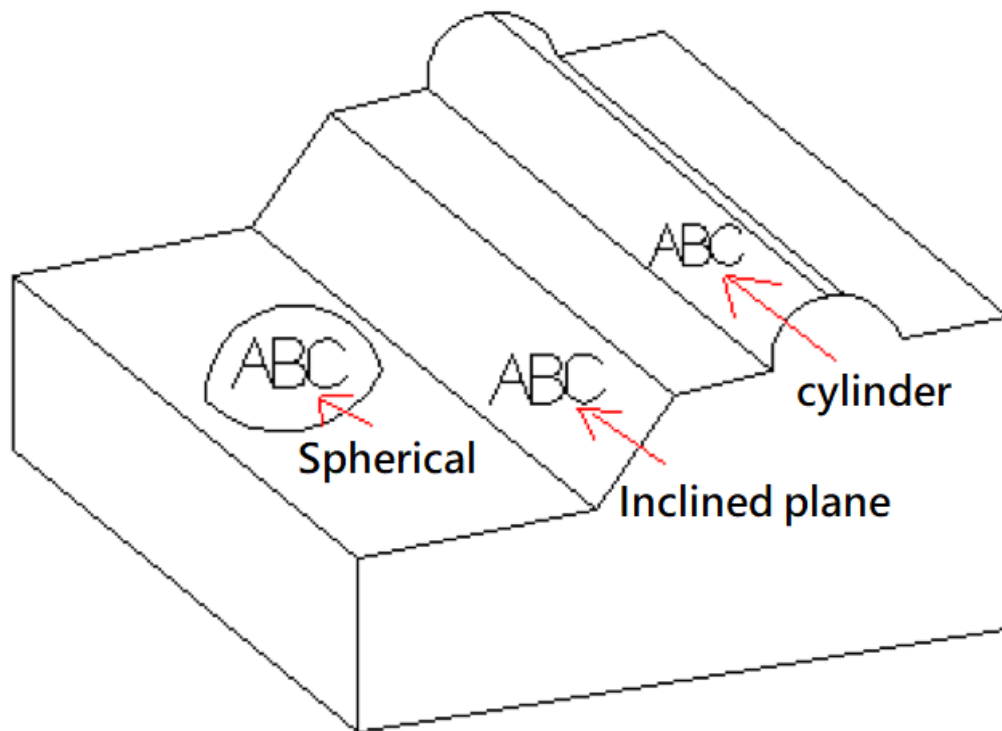
Center Y: 0

Rotate: 45



## MM3D 3.90

### 3. Irregular plane



The built-in models provided by MM3D have covered most of the 3D marking applications.

For example, in the picture above, marking on an irregular plane can actually be regarded as marking on a spherical, inclined and cylindrical surface.

Just set the 3D parameter type of the object to type 1, type 3 and type 5, and set the required parameters to meet the marking requirements.

## MM3D 3.90

If the user has imported a self-made model or loaded the software's built-in model, can also set the texture mode on this page.

After importing the model, click on the graphic object you want to paste on the model, go to the "3D Parameters" page, find the imported model in the "Type" menu, check the "Enable" above, and select the desired "Texture Method" , as shown in Figure 3.2.30.

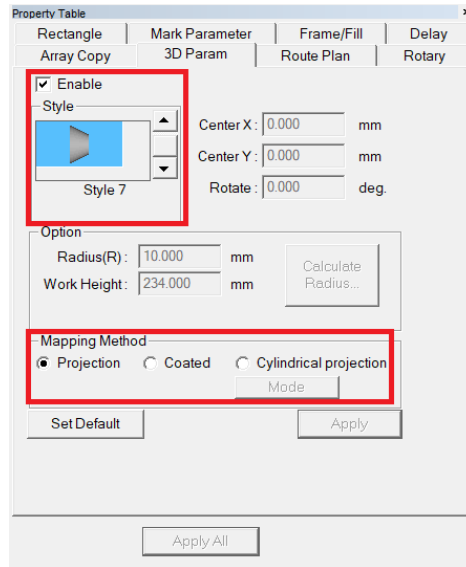


Fig 3.2.30

### Mapping Method Projection

Project the selected graphics object onto the specified model, as shown in Figure 3.2.31.

The original object & the mold

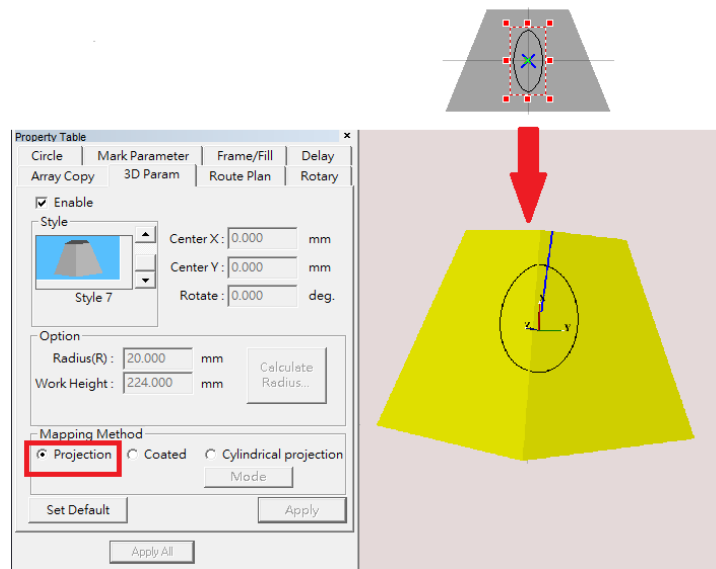


Fig 3.2.31

# MM3D 3.90

## Coated

Wrap the selected graphics object onto the specified model, as shown in Figure 3.2.32.

The original object & the mold

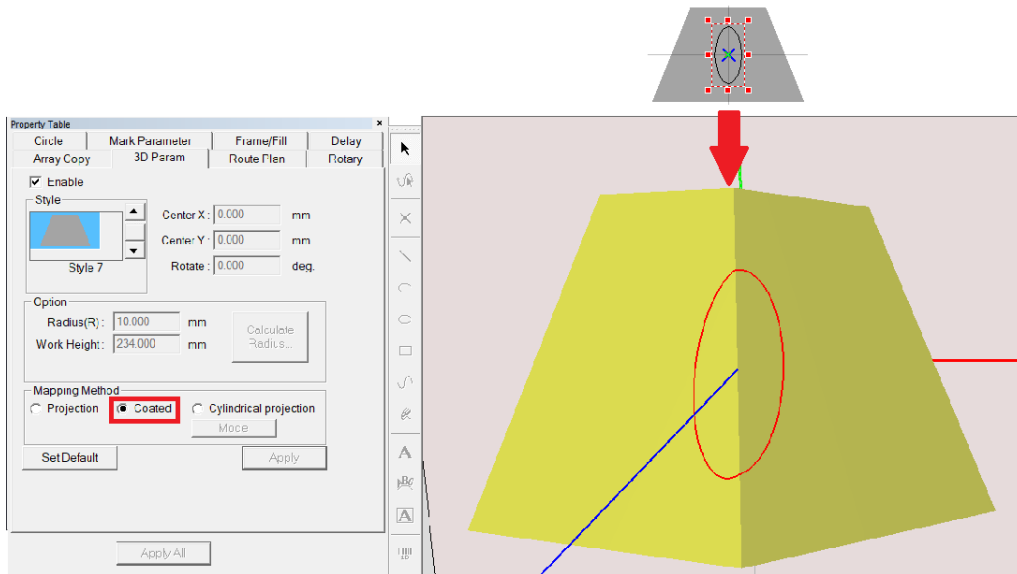


Fig 3.2.32

## Cylindrical projection

Paste the selected graphics onto the designated model in circular projection. If this type is selected, press the "Mode" button to select the "Cylindrical projection" mode, as shown in Figure 3.2.33.

The original object & the mold

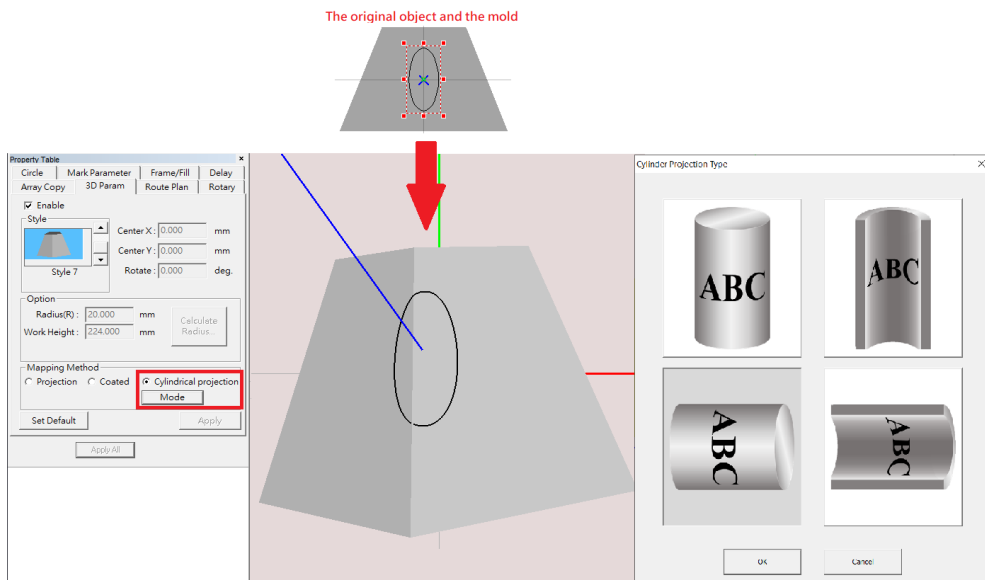


Fig 3.2.33

## MM3D 3.90

### 3.3 Object-related Property Table

When an object in Work Area has being selected, the Property Table of this object will be displayed. Users are allowed to edit the parameters of this object through its own property page.

#### 3.3.1 Curve

When create a curve which is not closed path, such as line, curve and curve brush, users can transform that curve into a closed path curve, see Fig.3.3.01.

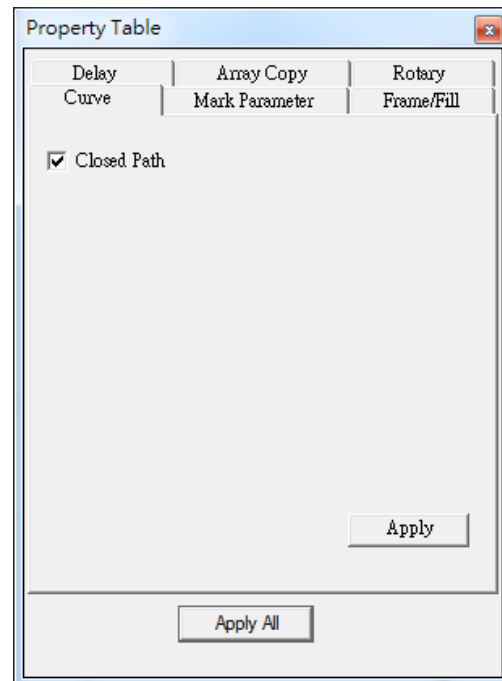


Fig. 3.3.01

#### 3.3.2 Arc

Create an arc object, and its parameter page will show like Fig.3.3.02.

**Center:** Adjust the center position of the arc.

**Radius:** Adjust the radius of the arc.

**Same as X:** Make the radius of Y same as X.

**Start Dot:** Set the start point angle of the arc. X and Y value will change automatically following the angle.

**End Dot:** Set the end point angle of the arc. X and Y value will change automatically following the angle.

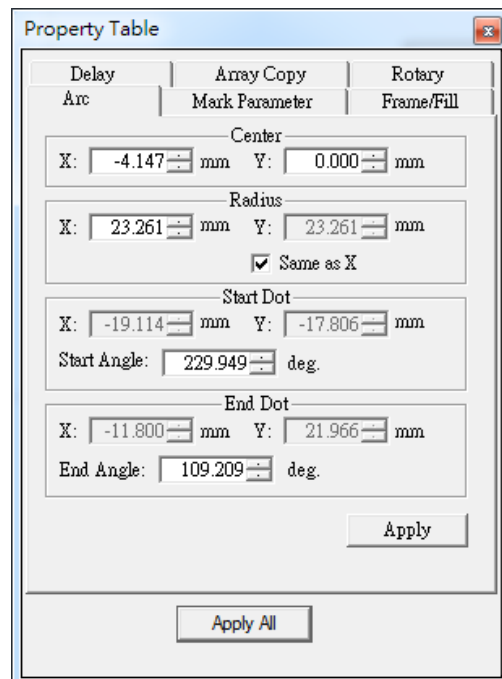


Fig. 3.3.02

## MM3D 3.90

### 3.3.3 Circle

Create a circle object and the parameter page will show like Fig.3.3.03.

**Center:** Adjust the center position of the arc.

**Radius:** Adjust the radius of the arc.

**Same as X:** Make the radius of Y same as X.

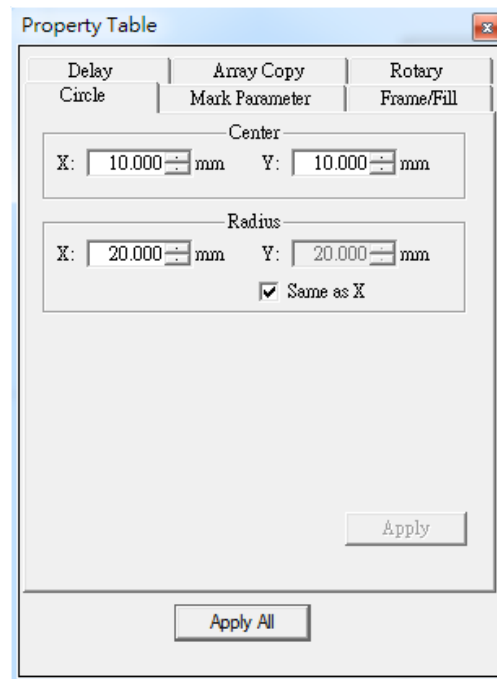


Fig. 3.3.03

### 3.3.4 Rectangle

Create a rectangle object and the parameter page will show like Fig.3.3.04. Users can set the four corners of rectangle as circle cape. The radius of circle cape can be set individually or set as same radius.

**Set the four corners as same radius:**

Corner radius is the radian of the rectangle's four angles. The radius is set according to the percentage of the rectangle's short side or the square's side, see Fig.3.3.05.

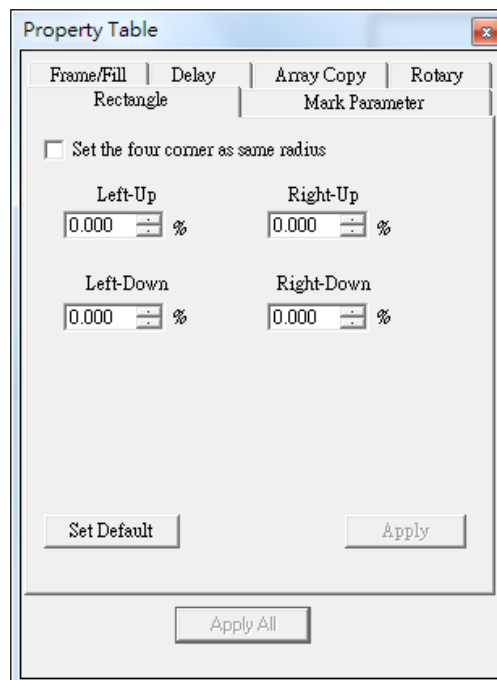
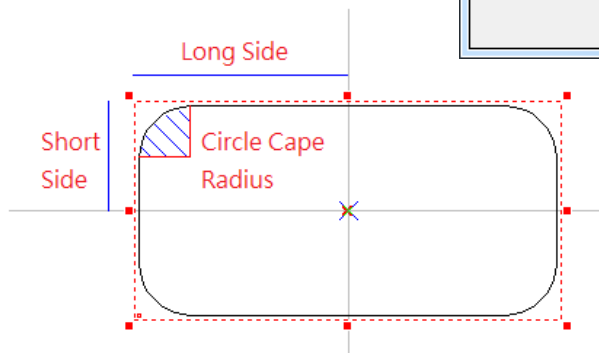


Fig. 3.3.04



## MM3D 3.90

### 3.3.5 1D Barcode

Create a 1D Barcode object and the parameter page will show like Fig.3.3.06.

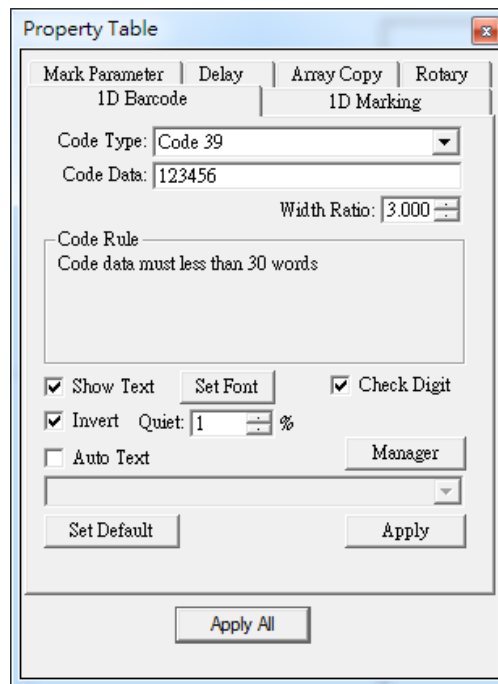


Fig. 3.3.06

#### Code Type

There are several code types for users to select: Code 39, Code 128, Code 128A, Code 128B, Code 128C, Code 93, Code Bar, ITF, MSI Code, Us PosNet, UPC-A, UPC-E, EAN 8, EAN 13, UCC 128, EAN 128, FIM, Code 25 or ITF 25.

#### Code Data

Input the code data here.

#### Width Ratio

Set the ratio of narrow bar to wide bar. This value is between 2.0~3.0.

#### Code Rule

Display the special rule of selected code type.

#### Show Text

Decide to show the code data under barcode or not.

#### Set Font

Change the font, font style and font size of code data.

#### Invert

Invert the bar and space of the bar code. This application is when the work piece is black, see Fig.3.3.07.

#### Quiet

The size of quiet area when using Invert function, see Fig.3.3.07.

#### Check Digit

A check digit is calculated automatically and added.

#### Auto Text

Use auto text as the content of code data.

#### Manager

Manage the Auto Text.

## MM3D 3.90

### 3.3.6 1D Marking

Some marking-related settings, see Fig.3.3.07.

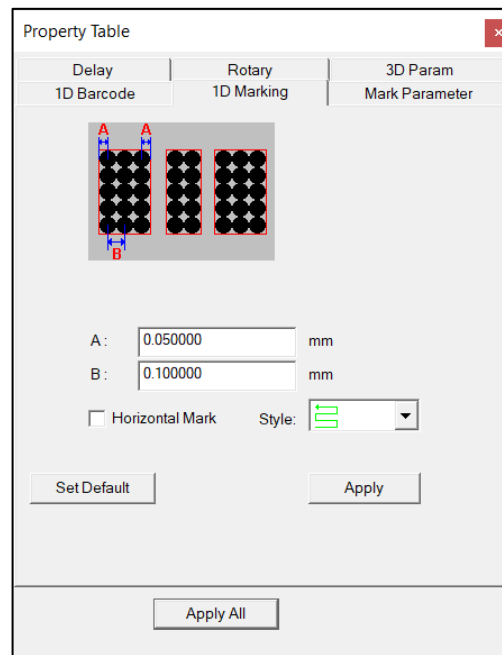


Fig. 3.3.07

#### **A**

The distance between laser spot center and the edge of barcode.

#### **B**

The distance between two laser spots (according to the spot center).

#### **Horizontal Mark**

Mark the bar code in horizontal way (generally is in vertical way).

#### **Style**

There are three options 

## MM3D 3.90

### 3.3.7 2D Barcode

Create a 2D Barcode object and the parameter page will show like Fig.3.3.08.

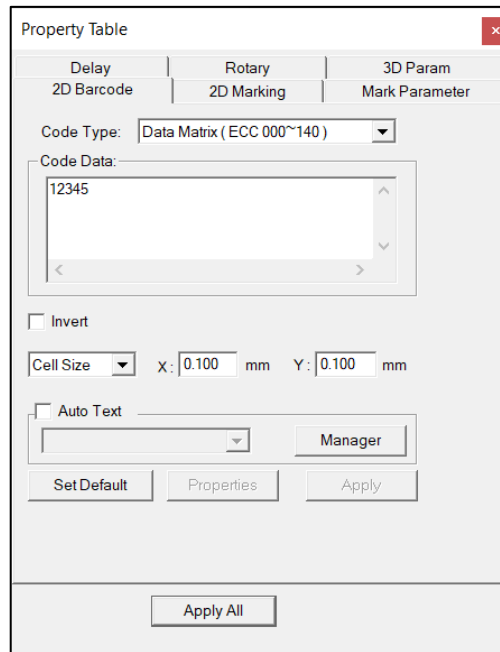


Fig. 3.3.08

#### Code Type

There are several code types for users to select: Data Matrix (ECC 000~140), Data Matrix (ECC 200), PDF417, QR Code, and Maxi Code, PDF417 Truncated 、Micro PDF417 、Micro QR Code.

#### Invert

Invert the bar and space of the bar code. This application is when the work piece is black, see Fig.3.3.10.

#### Border

The size of quiet area when using Invert function, see Fig.3.3.09.

#### Auto Text

Use auto text as the content of code data.

#### Manager

Manage the auto text.

#### Properties

Select the rectangular size and format of 2D Barcode.

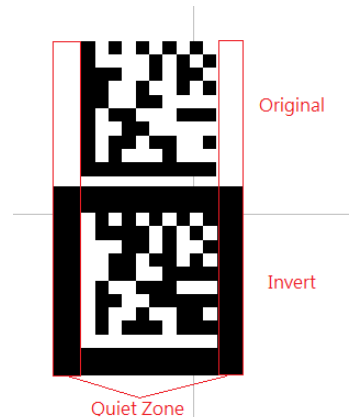


Fig. 3.3.09



# MM3D 3.90

## 3.3.8 2D Marking

Some marking-related options, see Fig.3.3.10.

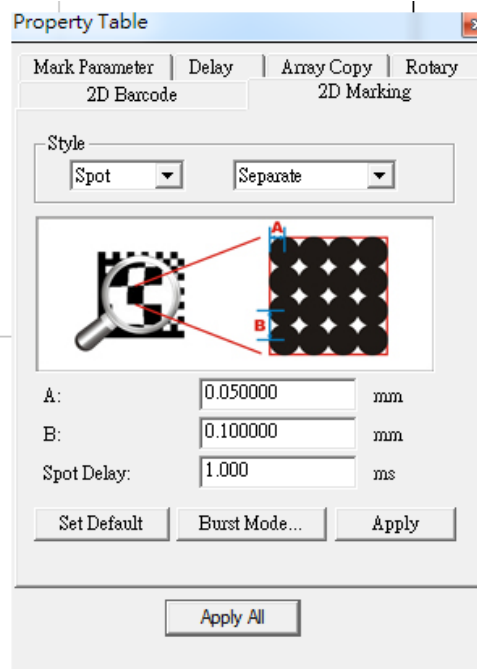


Fig. 3.3.10

### Style

2D barcode is divided into many cells and has three mark style to mark each cell. Besides, in order to make the instruction more lucid, we consider that 2D Barcode has two parts: cell and row, see Fig.3.3.13.







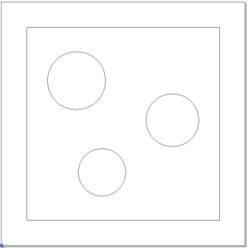

	<p><b>Spot:</b> Mark each cell in spot manner.</p>
	<p><b>Line:</b> Mark each cell in line manner.</p>
	<p><b>Rectangle:</b> Mark each cell as a rectangle.</p>
	<p><b>Spiral:</b> Mark each cell as a spiral.</p>
<p>Custom</p>	<p><b>Custom:</b> After user choosing Custom and press on Apply, will appear 2D Barcode toolbar . Clicking on  to enter edit mode.</p> <div style="text-align: center;">  </div>

Fig. 3.3.11

If we draw as fig 3.3.11, after clicking on  to leave edit mode, 2D barcode will be seen as like fig 3.3.12.

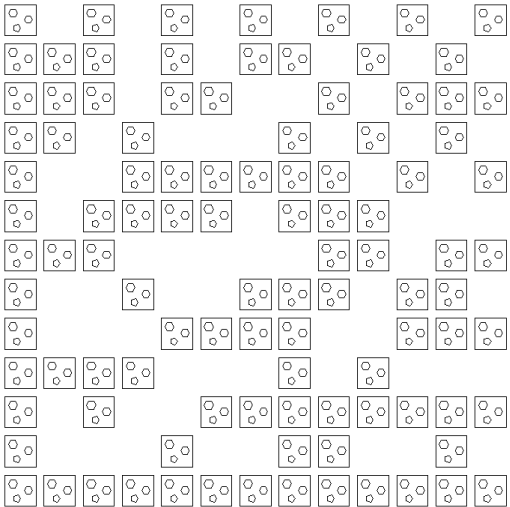


Fig. 3.3.12

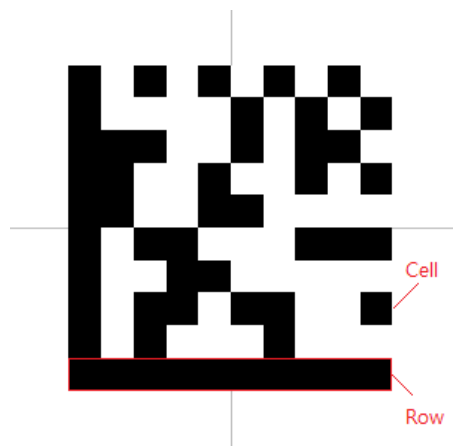


Fig. 3.3.13

Each style has two mark modes.

**Spot and Rectangle Style**

**Orderly:** Mark following the cell's and row's order.

**Separate:** Mark without following the cell's order. This method can avoid the blurred result caused thermal effects.

**Line Style**

**Continuous:** Consider all the cells on the same row as one unit and mark.

**By Cell:** Mark all the cells one by one and follow the row's order.

**A:** The distance between laser spot center and the edge of barcode.

**B:** The distance between two laser spots (according to the spot center).


**Spot Style**

**Spot Delay:** The required time for laser to mark a spot.

**Burst Mode:** Click "Burst Mode..." button the dialogue box of options will appear to set up the Burst Mode settings (please refer to 1.1.6.8).

## MM3D 3.90

### Line Style

**Non-Stop:** Mark all the cells (By Cell) or each row (Continuous) by  style.

**Alternate Lines:** Mark without following the row's order to avoid the blurred result caused thermal effects.

**Bidirectional fill:** This is an exclusive feature for line marking. The filling line in each cell will be marked in the back and forth direction.

Rectangle Style.

**Angle Start:** Set the angle of each fill line in each cell.

**Angle Step:** When the "number of times" of the filling line is set to more than 2 times, the angle of the filling line will accumulate the set value each time.

For example: the number of times is set to 3.

The starting angle is 0 degrees, and the progressive angle is 30 degrees.

Then the angle of the first fill line is 0,

The second fill line angle is 30,

The third fill line angle is 60.

**Poly Delay:** Set the poly delay. For more details about Poly Delay, please refer to Section 3.2.3.

### Spiral Style

**Out ring circle:** Mark an outer ring after each spiral is marking completed.

**Outer to inner:** Setting spiral marking direction is from outer to inner.

**CCW:** Setting spiral marking direction is counter clockwise.

## MM3D 3.90

### 3.3.9 Image

Import an image, and the property table will show the related information of this image, see Fig.3.3.14.

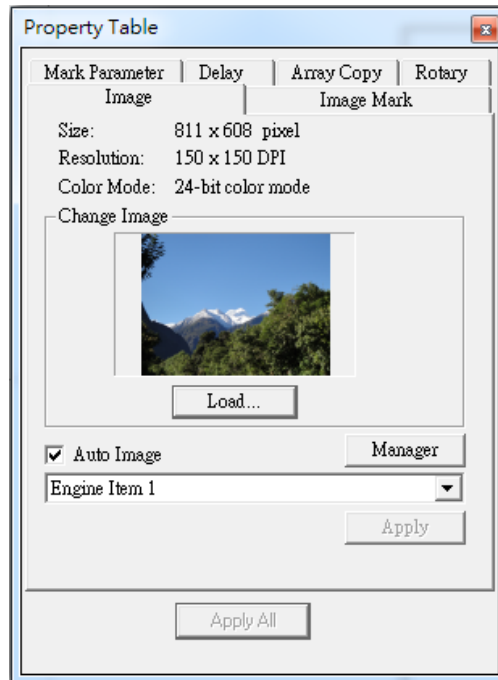


Fig. 3.3.14

**Auto Image:** Mark the image based on the application of Auto Text when there has a series of images to mark.

### 3.3.10 Image Mark

Adjust the mark settings of the image, see Fig.3.3.15.

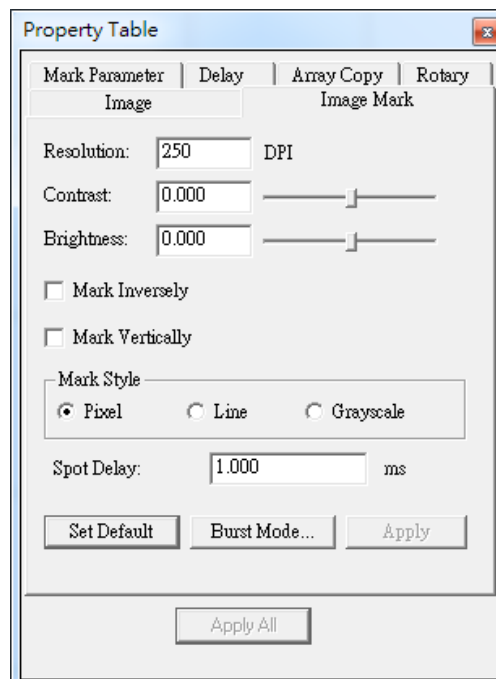


Fig. 3.3.15

## MM3D 3.90

### Resolution

The resolution of the image. DPI means “Dots Per Inch.”

### Contrast/ Brightness

Adjust the contrast/ brightness of the image.

### Mark Inversely

This function is used when the color of work piece is black.

### Mark Vertically

Mark the image in vertical way.

**Mark Style:** An image is composed by pixels which are according to the size of the image. For example, if the size of the image is 600×800, then the amount of pixels of that image will be 480,000.

**Pixel:** Mark the image as dots.

**Spot Delay:** The required time for laser to mark a spot.

**Burst Mode:** Click “Burst Mode...” button the dialogue box of options will appear to set up the Burst Mode settings (please refer to 1.1.6.8).

**Line:** Connect the pixels on the same row as a line and mark the image.

**Grayscale:** Transfer the image into a black-and-white color image. Each point has 8bit (0~255) image points. For example, if the marking energy is 50%, and an image point is 128, the point will be marked with  $50*(128/255)=25\%$  energy.

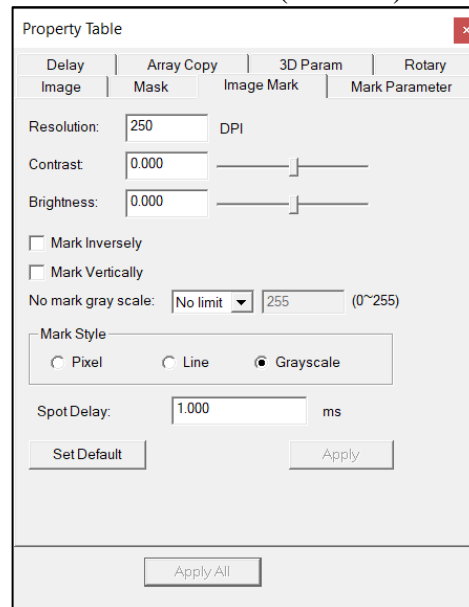


Fig. 3.3.16

<b>No mark gray scale</b>	In the gray scale marking mode, the "No mark gray scale" function is provided, as shown in Figure 3.3.16, which can filter unnecessary noise in the picture, or enhance the original color that is not dark enough to make the black more prominent.
<b>No Limit</b>	The default value is “No limit”, which means that no output limitation or enhancement is made to the graphics.
<b>Higher</b>	Select "Higher" and enter a number from 0 to 255 in the space. The part of the graph will not be output if the grayscale value is greater than or equal to this value.
<b>Lower</b>	Select "Lower" and enter a number from 0 to 255 in the space. The part of the graph will not be output if the

### MM3D 3.90

	grayscale value is greater than or equal to this value.
<b>Spot Delay</b>	<p>The marking time of each point; the longer the time, the heavy marking result.</p> <p>If used to set the image object, this value is the marking time for each pixel in the image. For example, if the marking time is 0.5 milliseconds, then each pixel will be marked 0.5 milliseconds. If you set the "Spot" Mode, the time unit will be changed to "number of spot".</p>

## MM3D 3.90

### 3.3.11 Text

Create a Text object, and the Text Property Page will display like Fig.3.3.17.

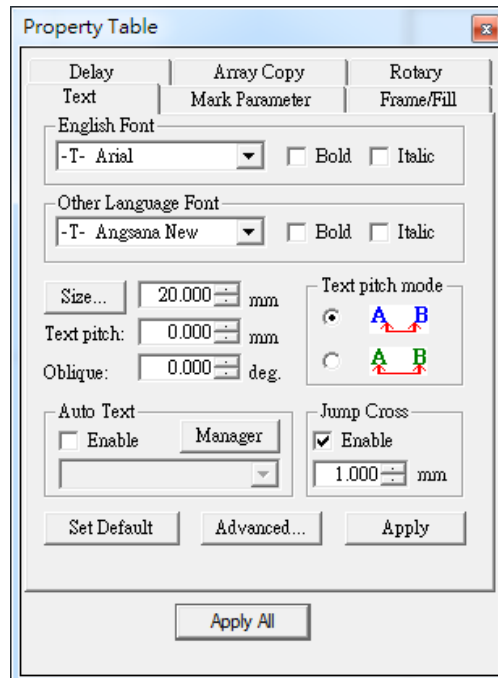


Fig. 3.3.17

**English Font:** Select the font for letters of the alphabet and numerals.



**Other Language Font:** Select the font for other language characters.

**Bold/ Italic:** Select the font type as bold, italic or both.

**Size:** Adjust the font size.

**Text Pitch:** Adjust the spacing between two characters.

**Oblique:** Adjust the tilt angle of the text.

**Text Pitch Mode:** Select the text pitch base. There are two modes for users to apply: based on the edge of characters  or based on the center .

**Auto Text:** Apply the Auto Text function.

**Jump Cross:** Enable or disable the jump cross function. [Refer to 1.2.24.](#)

**Advance:** Offer further settings for text, see Fig.3.3.18.

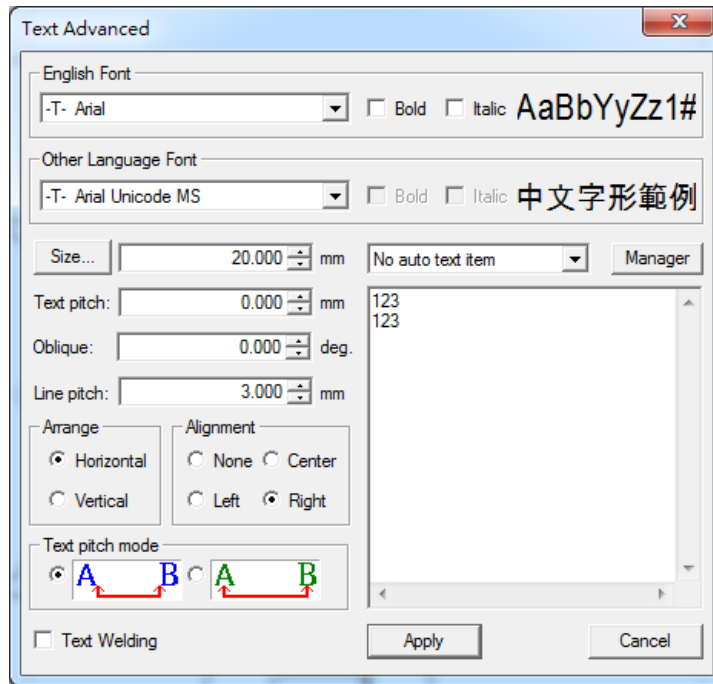
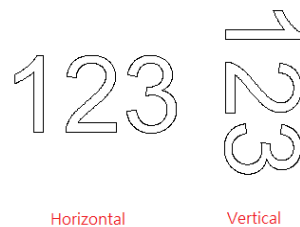


Fig. 3.3.18

**Line Pitch:** Adjust the spacing between each line.

**Arrange:** Select the character arrange style, see Fig.3.3.19.

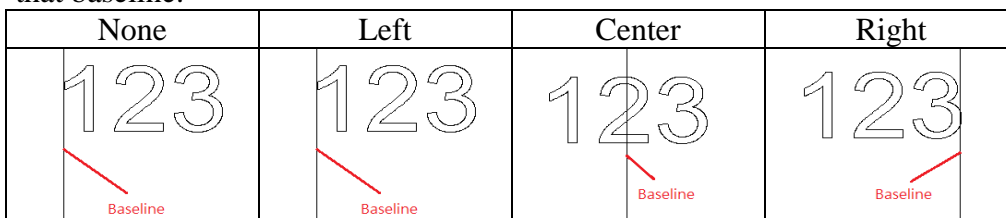


Horizontal

Vertical

Fig. 3.3.19

**Alignment:** Use the insert position as the baseline, and align the text object along that baseline.



**Text Welding:** Use to avoid the overlapping part of character's strokes.

**Insert auto text item:** If there are multiple auto text items, choose to insert them here, all the text will be displayed in the blank area below, or you can re-enter the desired text in the blank area.



## MM3D 3.2

### 3.3.12 Arc Text

Create an Arc Text object, and the Arc Text Property Page will be displayed like Fig.3.3.20.. Regarding the distance between texts, there are two options: Text pitch and Spread Angle

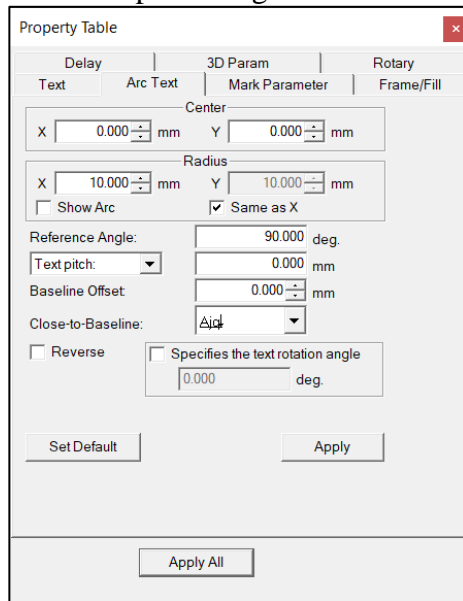


Fig. 3.3.20

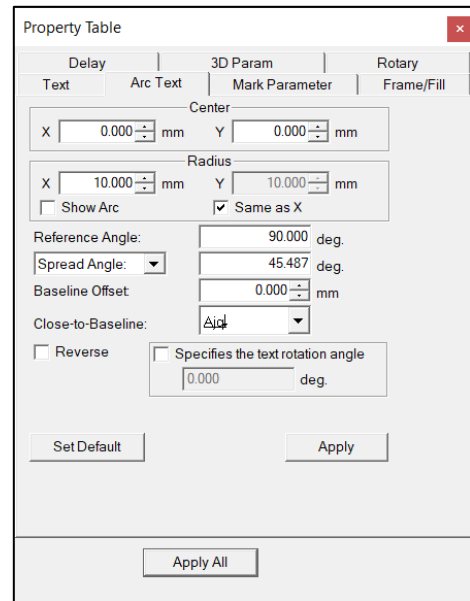


Fig. 3.3.21

**Center:** Set the center position of the arc.

**Radius:** Set the arc's radius.

**Show Arc:** Show the arc path, see Fig.3.3.21.

**Same as X:** Make the arc has the same radius (becomes a circle).

**Reference Angle:** Set the angle between 0° line and reference line. Users can adjust the text's alignment from Text Tool Bar or Text Property Table – Advance. Please note that the system will suppose the reference line as the alignment baseline when using Arc Text.

**Text pitch:** Adjust the spacing between characters.

**Spread Angle:** Set the spread angle and the characters will distribute averagely in this range.

**Baseline Offset:** Set the spacing between the text and the baseline.

**Close-to-Baseline:** Select the position of text based on the baseline.

**Reverse:** Reverse the text part of the art text, see Fig.3.3.22.

**Specifies the text rotation angle:** Set the rotation angle of a single text.

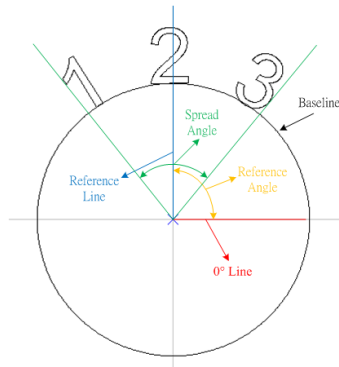


Fig. 3.3.21

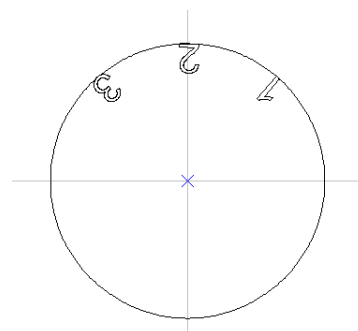


Fig. 3.3.22

## MM3D 3.90

### 3.3.13 Rectangle Text

Create a Rectangle Text object, and the Rectangle Text Property Page will be displayed like Fig.3.3.22.

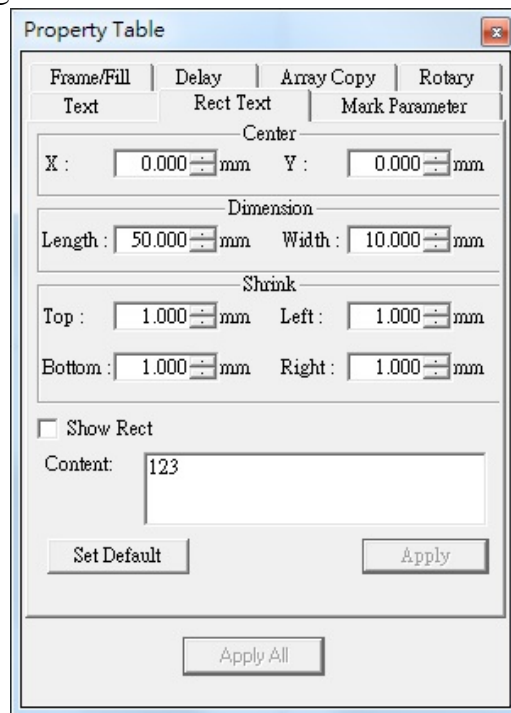


Fig. 3.3.22

**Center:** Set the center position of the Rectangle.

**Dimension:** Set the rectangle width and height.

**Shrink:** Set the gap between text and rectangle edge.

**Show Rect:** Reveal rectangle.

**Content:** Text content.

## MM3D 3.90

### 3.3.14 Baseline

The Baseline Property Page will be displayed when using “Baseline” function. There are two different positions according to the baseline-type, see Fig.3.3.23 and Fig.3.3.24.

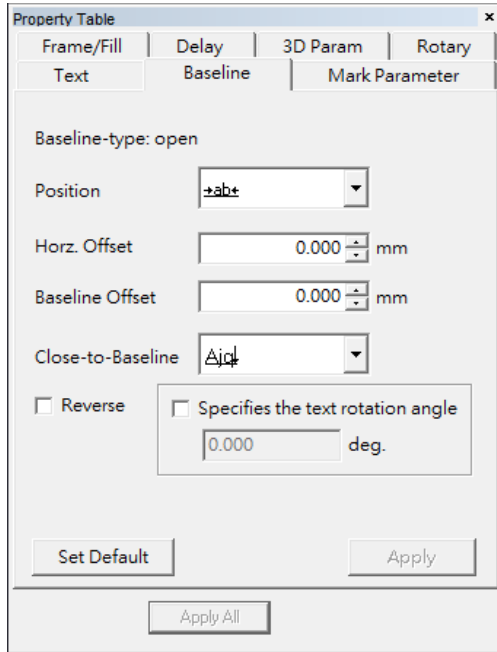


Fig. 3.3.23

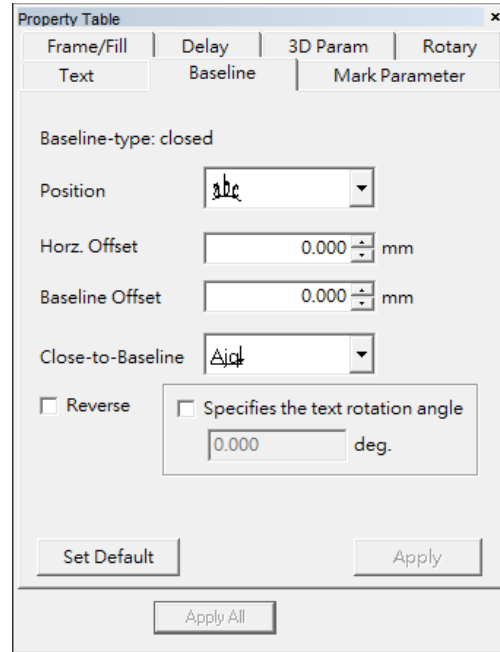


Fig. 3.3.24

**Baseline-type:** The baseline-type is based on the curve types (closed or open) users used.

**Position:** Decide the text position. For example, when the baseline is an open curve, the position can be chosen to align center (default), left or right.

**Horz. Offset:** The horizontal offset between the text and the selected position.

**Baseline Offset:** The space between the text and baseline.

**Close-To-Baseline:** Select the position of text based on the baseline.

**Reverse:** Reverse the text, see Fig.3.3.25.

**Specifies the text rotation angle:** Set the rotation angle of a single text.

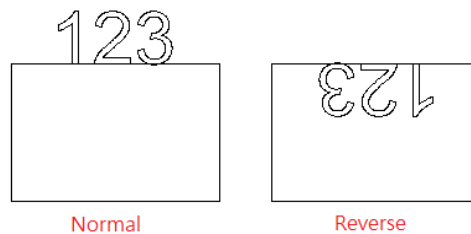


Fig. 3.3.25

## MM3D 3.90

### 3.3.15 Graphic

When users import a “\*.dxf” file, the Graphic Property Page will be display like Fig.3.3.26.

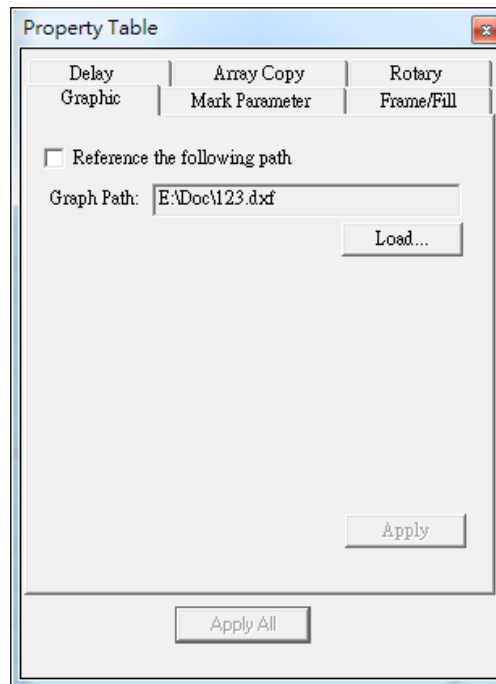


Fig. 3.3.26

**Reference The Following Path:** Suppose that users click this option and import a “\*.dxf” file and then save it as a “\*.ezm” file. If the graphic of the assigned Graph Path has been modified, the graphic of the “\*.ezm” file will update automatically when users load that “\*.ezm” file next time.

**Graph Path:** After the graphics are imported, the system will memorize the path of the current imported file. The system will check that there is an imported graphic file under this path next time if the "EZM3D" file is saved, and if the file exists, the graphic object will be reloaded again.

**Load...**

This option can only import a “\*.dxf” file.

## MM3D 3.90

### 3.3.16 Spiral

While a spiral object has been created, spiral property table will show as fig 3.3.27.

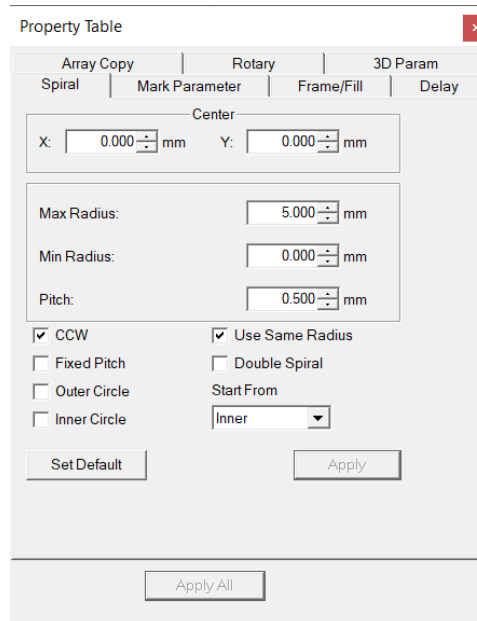


Fig. 3.3.27

**Center:** The center position of the spiral.

**Max. Radius:** The spiral outer ring radius.

**Min. Radius:** The spiral inner ring radius.

**Pitch:** The interval distance between two spiral lines.

**CCW:** Spiral is generated as counter-clockwise direction.

**Use Same Radius:** Let spiral could fit into a perfect circle.

**Fixed Pitch:** After checking, the distance between each spiral can be fixed.

**Double Spiral:** Copy the original one-way spiral, rotate it 180 degrees, and combine it with the original one-way spiral.

**Outer Circle:** Set a circle drawn with the largest radius on the outermost periphery of the spiral.

**Inner Circle:** Set a circle drawn with the smallest radius at the center of the spiral.

**Start From:** It can be set to mark from the inside to the outside or the outside to the inside of the spiral when marking. If you check the Double Spiral option, there are four directions to choose from inside-outside, inside-inside, outside-inside, and outside-outside.

## MM3D 3.90

### 3.3.17 Deep carving

User plans deep engraving method within this page. Refer to fig.3.3.28.

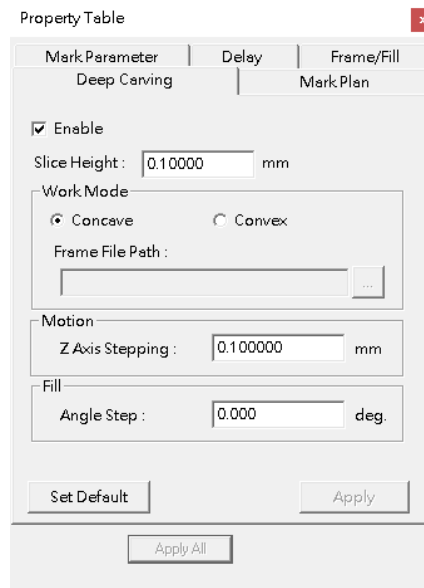


Fig.3.3.28

#### **Enable**

Active 3D marking. Check to enable style selection.

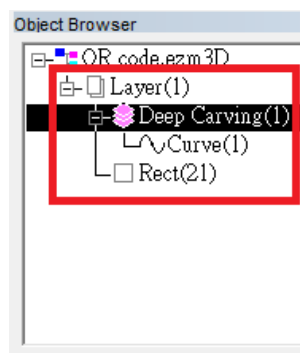
#### **Slice Height**

Thickness for each slice.

#### **Add Polish**

Increase the smoothness of the workpiece surface through the “polish” function.

Select the object and click "Add polish", a "curve" object will appear under the deep carved object in the object browser.



When performing marking, if you select "All" in the "Marking" dialog box in the "Marking" dialog box, all objects will be processed, and the "Deep Engraving" objects will be "polished" after completion.

If you select the "curve" object under the specified "deep carving" object in the "Object Browser", MM3D will only "polish" the object.

#### **Work Mode**

**Concave**

**Convex**

#### **Frame File Path**

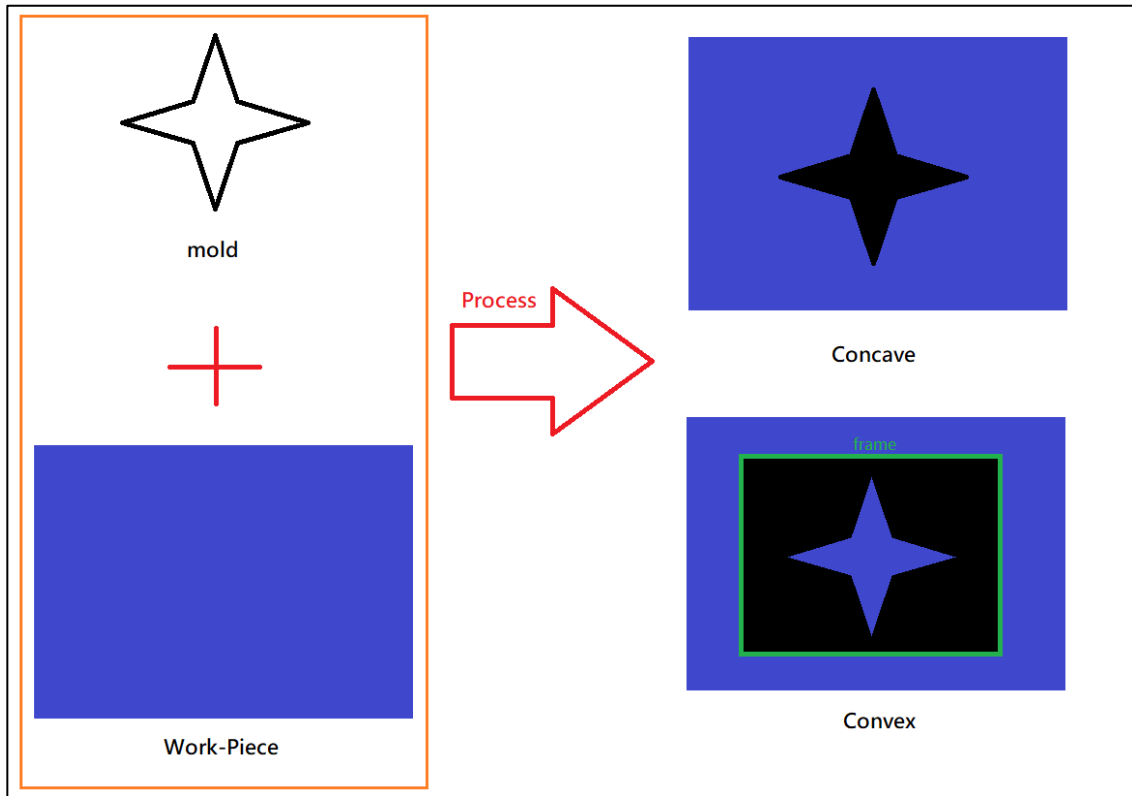
Slice method. Refer to the figure below.

Erase mold part from work-piece.

Keep mold part and erase other parts from work-piece.

User has to provide a frame shape of outer ring of erased part. File format is DXF.

# MM3D 3.90



**Motion**  
**Z Axis Stepping**

**Fill**  
**Angle Step**

Z axis table moving distance.  
 If Z axis stepping is larger than slice height, Z axis will move only after total distance of slice height is greater than this value. Such as Slice Height is 0.1mm, and Z axis Stepping is 1mm. Z axis will move 1mm after mark 10 slices because  $10 \times 0.1\text{mm} = 1\text{mm}$ .  
 Parameter for fill.  
 Filling angle difference between each side.

# MM3D 3.90

## Mark Plan

Set slice and mark parameter. Refer to fig.3.3.29.

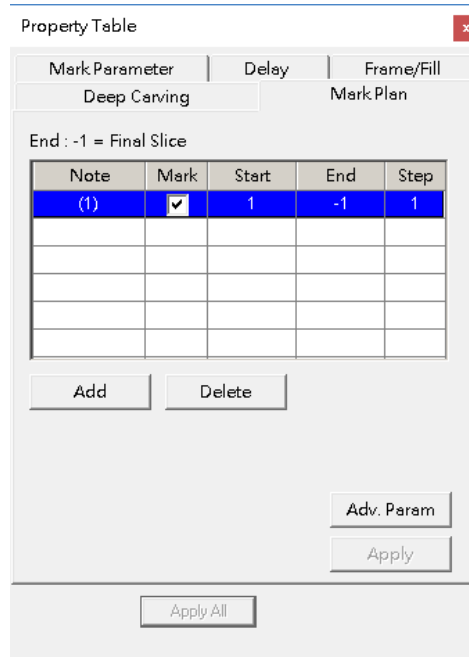


Fig.3.3.29

### Plan List

- Note**
- Mark**
- Start**
- End**
- Step**

### Add

### Delete

### Adv. Param

The list of mark plan.

The entry index.

Check to mark this entry.

The entry starting slice.

The entry ending slice.

The effective order of slice.

Add a new entry.

Delete the selected entry.

Add an advanced parameter set. After clicking, the "Adv. Param" object will appear under the deep carving object, as shown in Figure 3.2.30, and the "Adv. Param" page will appear for users to set after selecting this object, as shown in Figure 3.3.30.

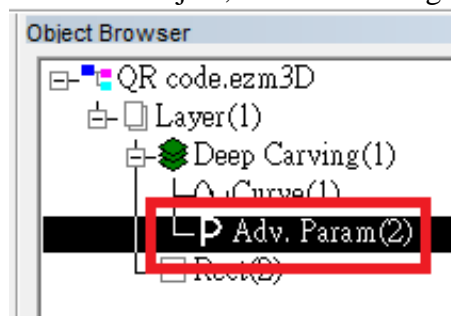


Fig.3.3.30



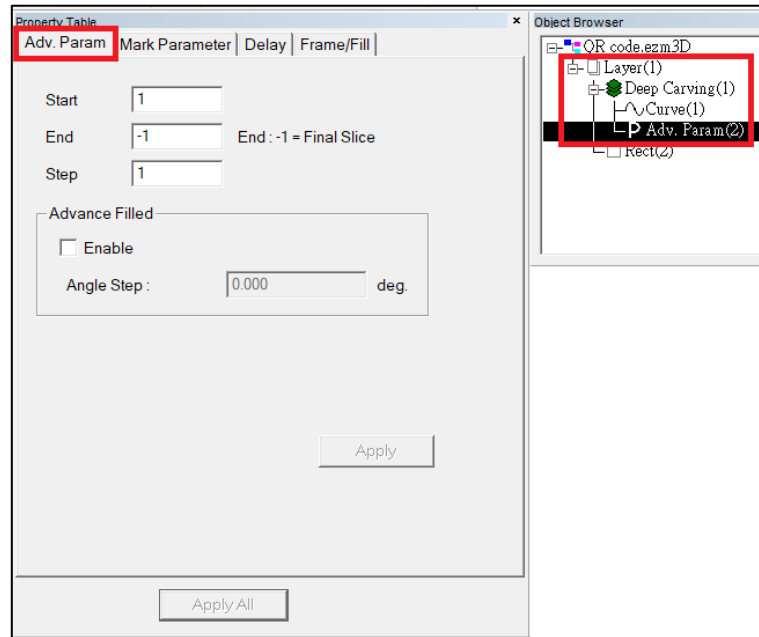


Fig.3.3.31

**Adv. Param**

You can specify the range of deep carving and set the carving parameters output from this range.

The range of influence of advanced parameters is limited to the effect from the beginning of the slice to the end of the slice. Other slices will refer to other "processing plan" or "deep carving parameters".

Multiple advanced parameters can be added. If the advanced parameters (1) and the advanced parameters (2) are duplicated, the repetitive part will refer to the newly created parameters

**Advanced Filled**

After enabling, the filling angle of each layer within the set deep engraving range will be different according to the set progressive angle.

For example, if the progressive angle is set to 10 degrees, the first layer will be filled with 0 degrees, the second layer will be filled with 10 degrees, the third layer will be filled with 20 degrees, and so on.

## MM3D 3.90

### 3.4 Control Object-related Property Table

When insert a control object in Work Area, or select the control object in the Object Browser, the Property Table of this object will be displayed. Users are allowed to edit the parameters of this object.

#### 3.4.1 Digital In

##### Digital\_In

“Digital In” is used to check the input potential signal is correct or not when marking. Users can set potential signal (high or low) at IN 1~8, see Fig.3.4.01. If the input signal is correct, then the system will do the next step.

**SET:** High potential.

**CLEAR:** Low potential.

-----: Ignore.

**Time Out:** The time that system needs to wait for the input signal.

**Example:** Suppose that this value is 10ms. If there is no signal input within 10ms, then the system will start to mark the next object.

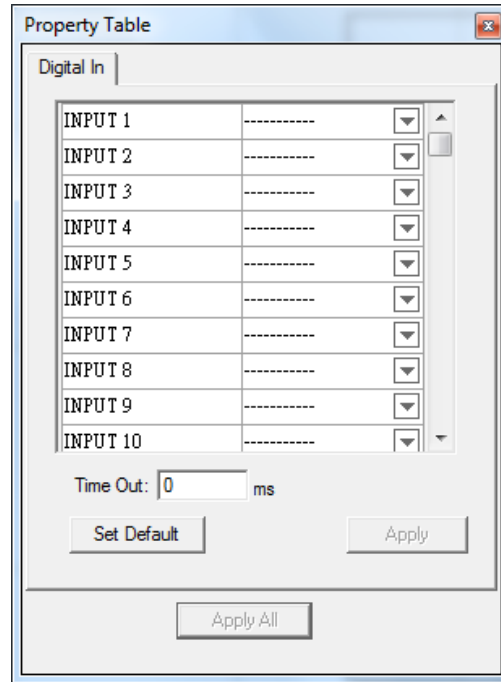


Fig. 3.4.01

#### 3.4.2 Digital Out

##### Digital\_Out

Set the output potential signal (high or low) at OUT 1~8, see Fig.3.4.02. When the mark process execute to “Digital Out” object, the system will follow the settings on this page and do the next step.

**SET:** High potential.

**CLEAR:** Low potential.

-----: Ignore.

**Clear Signal:** Activate this function and then users can set the Wait Time. The system will change the high potential signal (SET) to low potential signal (CLEAR) after passing the Wait Time.

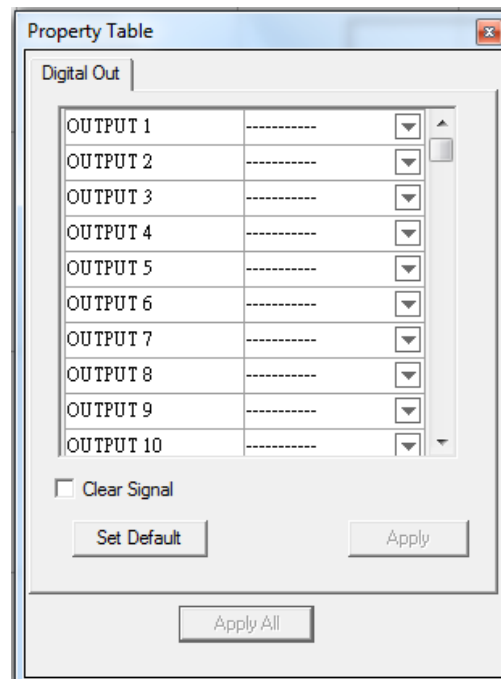


Fig. 3.4.02

## MM3D 3.90

### 3.4.3 Do Pause

#### Do Pause

Stop marking and wait for the Start signal.

### 3.4.4 Delay Time

#### Delay\_Time

Suppose a mark process order is “Object A”→“Delay Time Object”→“Object B.” After Object A has been marked, the system will wait for the setting delay time and then start to mark Object B. The Delay Time can be set at Delay Time Property Table, see Fig.3.4.03.

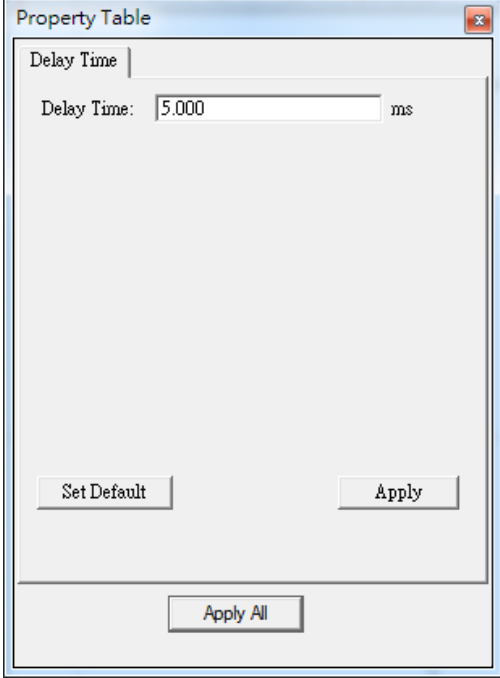


Fig. 3.4.03

### 3.4.5 Motion

#### Motion

When the mark process execute to “Motion” object, the axis will move to the assigned position or angle (Only PMC2 driver supports Z axis control), see Fig.3.4.04.

#### **Relative**

If check the box, the assigned position will be considered as a relative position, otherwise, it will be considered as an absolute position.

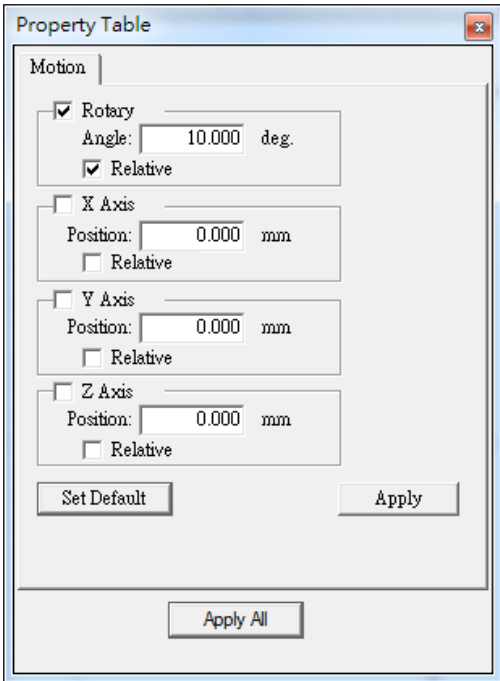


Fig. 3.4.04

## MM3D 3.90

### 3.4.6 Set Position

#### Set Position

The system will consider the current position as the assigned position when the mark process execute to “Set Position” object (Only PMC2 driver supports Z axis control). Users can assign the position at Set Position Property Table, see Fig.3.4.05.

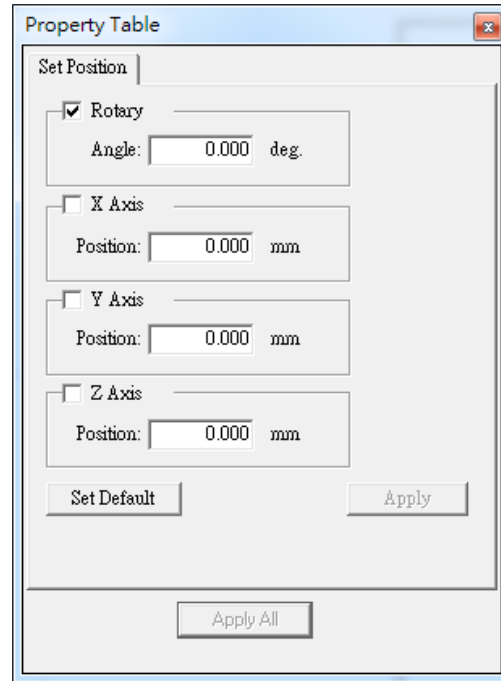


Fig. 3.4.05

### 3.4.7 Loop

#### Loop

“Loop” is used to mark the selected objects repeatedly. Users can set the repeated time at Loop Property Table, see Fig.3.4.06. When insert this object, users will see two sub-objects (Loop Begin and Loop End) in the Object Browser and thendrag the objects users want to repeated mark into the loop, like Fig.3.4.07.

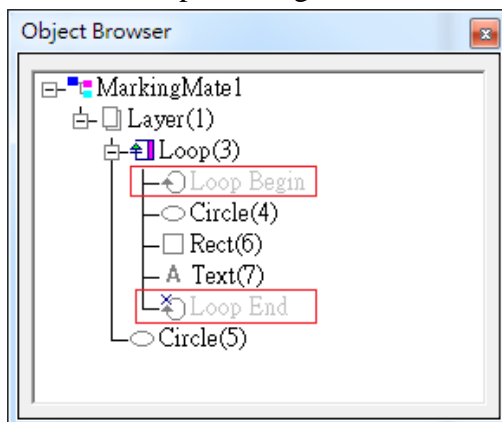


Fig. 3.4.07

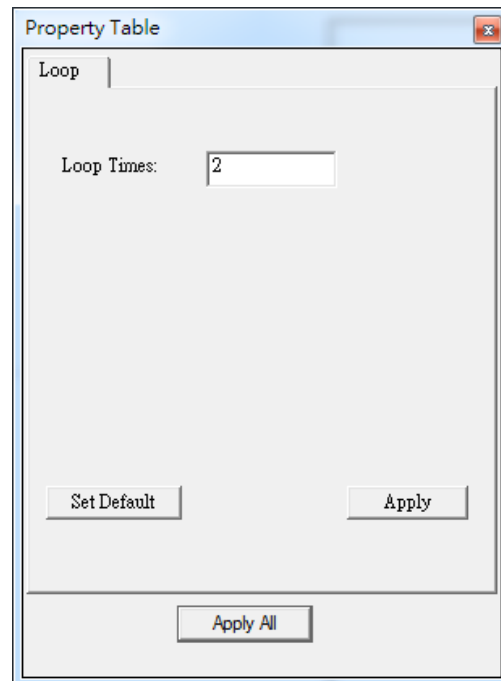


Fig. 3.4.06

## MM3D 3.90

### 3.4.8 Ring



“Ring” object must be used accompanied with rotary axis.

When the mark process executes to “Ring” object, the Galvo will move to the X/Y position users set at Property Table (see Fig.3.4.09) first and the laser will start to hit. When the rotary axis rotate to the assigned angle, the laser will be turned off. Please note that the “Position” here means the Galvo’s position, not X/Y Table.

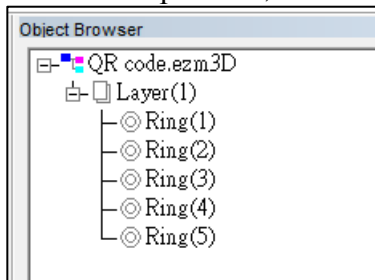


Fig. 3.4.08

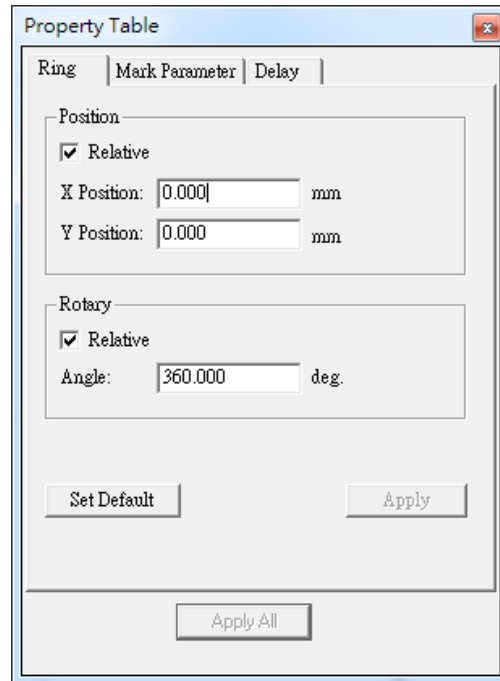


Fig. 3.4.09

### 3.4.9 Homing



When the mark process execute to “Home” object, the axis users select at Property Table (see Fig.3.4.10) will go back to origin.

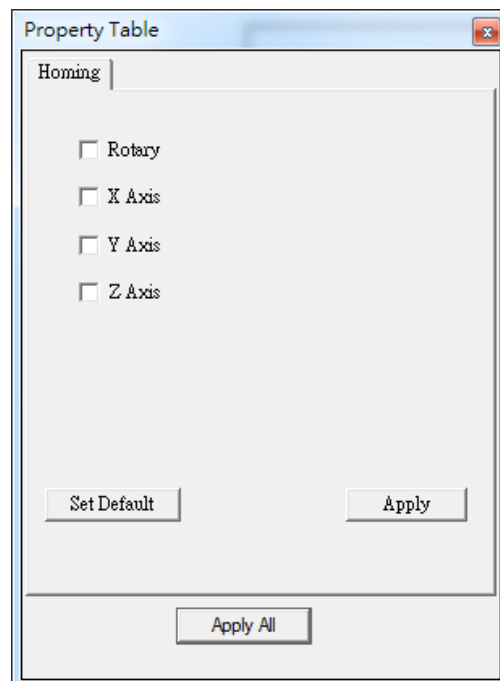


Fig. 3.4.10

## MM3D 3.90

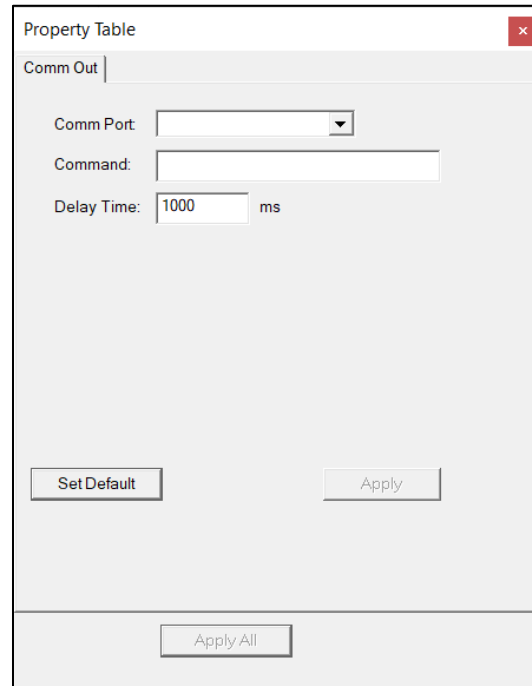
### 3.4.10 Comm Out

#### **COM OUT** Comm Out

To use "**Comm Out**", you must first go to the Control Object port manager to set the Comm Port, and then select the Comm Port file that has been set here. See figure 3.4.11.

**Command:** Set the ASCII command that needs to be output.

**Delay time:** Set the waiting time after outputting ASCII commands.



The screenshot shows a window titled "Property Table" with a tab labeled "Comm Out". It contains three input fields: "Comm Port" (a dropdown menu), "Command:" (a text box), and "Delay Time:" (a text box with "1000" and "ms" next to it). At the bottom, there are three buttons: "Set Default", "Apply", and "Apply All".

Fig. 3.4.11

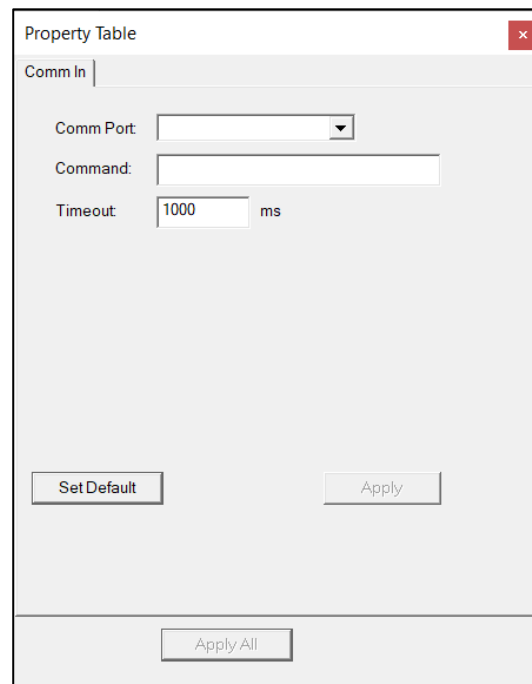
### 3.4.11 Comm In

#### **COM IN** Comm In

To use "**Comm In**", you must first go to the Control Object port manager to set the Comm Port, and then select the Comm Port file that has been set here. See figure 3.4.12.

**Command:** Set the ASCII command that needs to be output.

**Delay time:** Set the waiting time after outputting ASCII commands.



The screenshot shows a window titled "Property Table" with a tab labeled "Comm In". It contains three input fields: "Comm Port" (a dropdown menu), "Command:" (a text box), and "Timeout:" (a text box with "1000" and "ms" next to it). At the bottom, there are three buttons: "Set Default", "Apply", and "Apply All".

Fig. 3.4.12

## MM3D 3.90

### 3.5 Layer-related Property Table

When a layer object in the Object Browser has been selected, the Property Table will display the layer-related property page for users to edit.

#### 3.5.1 Layer

The Layer Property Page allows users to set the parameters of the selected layer, see Fig.3.5.01.

**Processing Method:** Marking or cutting this layer.

**Name:** Edit the layer's name.

**Color:** Edit the layer's color.

**View:** Enable or disable to view the layer.

**Edit:** Enable or disable to edit the layer.

**Output:** Enable or disable to output the layer.

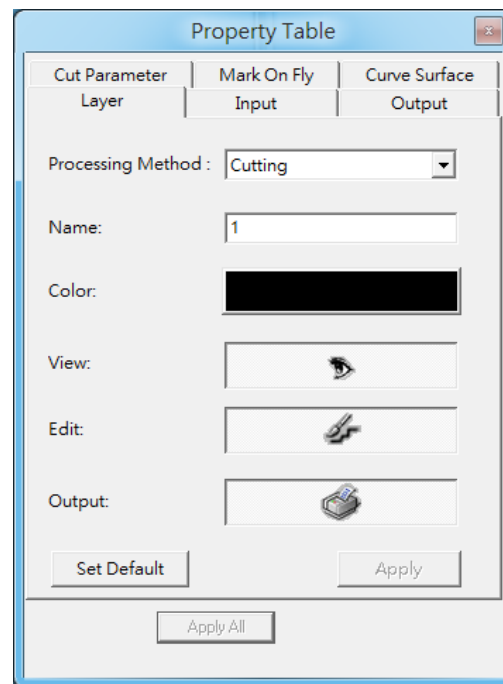


Fig. 3.5.01

## MM3D 3.90

### 3.5.2 Input

The Input Property Page allows users to set up the input status of the layer, see Fig.3.5.02. The system will first check the Input Status settings and then start to mark the layer's objects.

#### Input Status

Set the potential (high or low) of the input points.

- High Potential.
- Low Potential.
- Ignore.

#### Timeout

The time system needs to wait for the input signal. The default is -1.

#### Wait Input

Wait until all input status exist, otherwise wait for Timeout

#### Match Input

Wait until all input status exist, otherwise skip the layer.

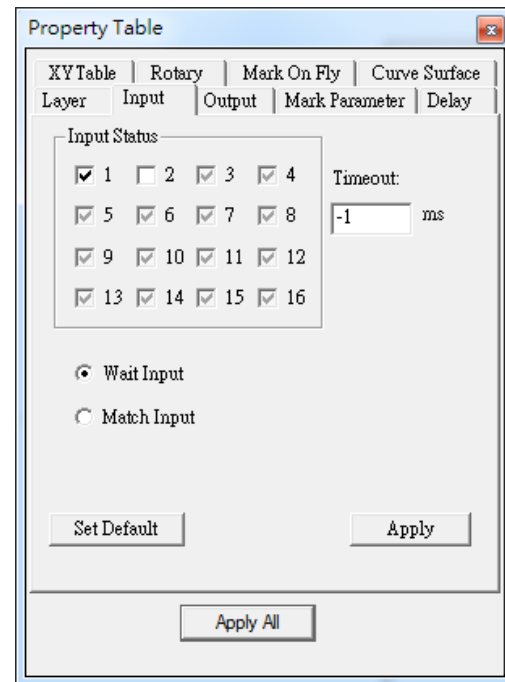


Fig. 3.5.02

### 3.5.3 Output

Use this function to set up the output status of the layer.

The system will first handle the graph and then the output status.

#### Trigger Time:

Choose the trigger time

#### Before processing

This layer will output the set signal before marking.

#### After processing

This layer will output the set signal after marking.

#### Output Status

High or low voltage of the output points

For example:

- 1 Point 1: high
- 5 Point 5: low
- 9 Point 9: don't care

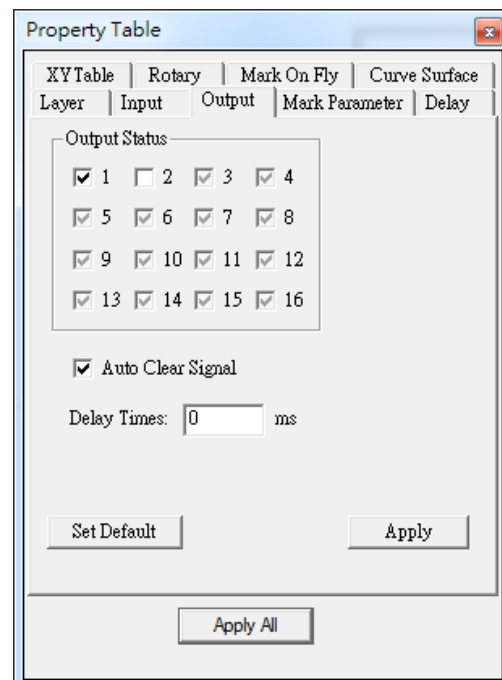


Fig. 3.5.03

#### Auto Clear Signal

Wait for Delay Time and auto clear signal after the voltage settings are done

#### Delay Times:

To set the delay time for "Auto Clear Signal.



## MM3D 3.90

### 3.5.4 Mark Parameter

The Mark Parameter Property Page here is for the selected layer, see Fig.3.5.04. Its setting method is the same with the individual object. Please [refer to the section 3.2.1 Mark Parameter](#).

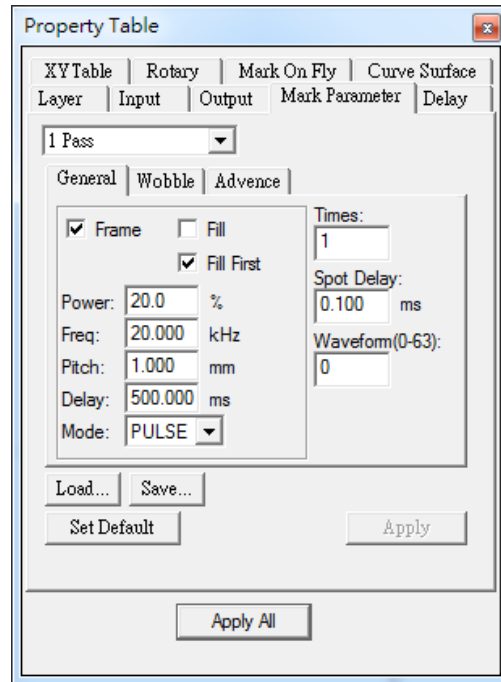


Fig. 3.5.04

### 3.5.5 Delay

The Delay Parameter Property Page here is for the selected layer. Its setting method is the same with the individual object. Please refer to the section 3.2.3 Delay.

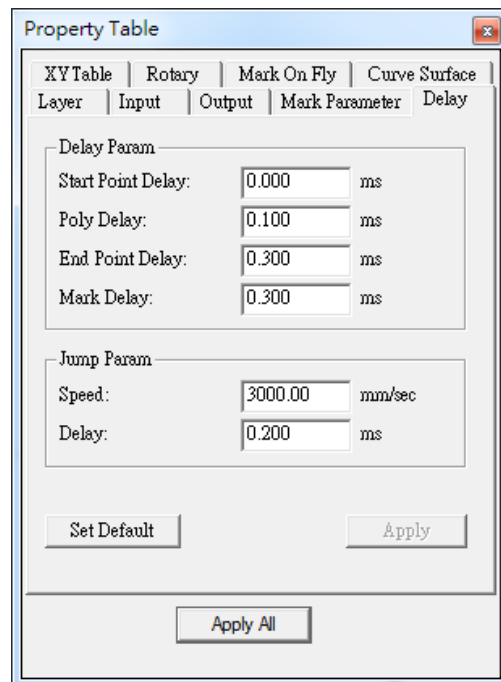


Fig. 3.5.05

## MM3D 3.90

### 3.5.6 XY(/Z) Table

Allow users to enable XY (/Z) Table. Users can add coordinates and then the XY(/Z) axis will move to the assigned positions in order, see Fig.3.5.06.

#### Enable

Choose to use the XY(/Z) slide stage. If you activate this option, you can add/edit each coordinate of the XYZ axis.

#### Computer Vision Positioning(CVP)

It supports moving to each XY coordinate to perform computer vision positioning before marking starting from version 3.78,

#### XYZ axis coordinate display area

Display the coordinates of the table positioning point.

#### Add From File

Users can use self-made txt. format coordinate files, import the XY slide coordinate by layer from the file. For the correct file format of the coordinate file, please refer to Figure 3.5.05.

The system only recognizes the first three sets of coordinates, And each coordinate must be separated by a blank key, The value will be rounded to the third decimal place.

#### Add/Edit

Add or edit the XY (/Z) position, see Fig.3.5.07.

#### Delete/Delete All

Delete the selected position or delete all setting positions.

#### Move Up/ Move Down

Move up/down the selected position to change its order.

#### Array Copy

Create several positions at one time based on array principle, see Fig.3.5.08.

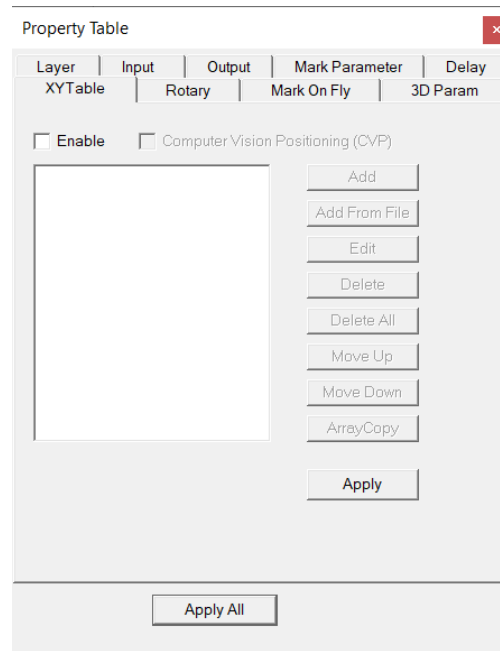


Fig. 3.5.06

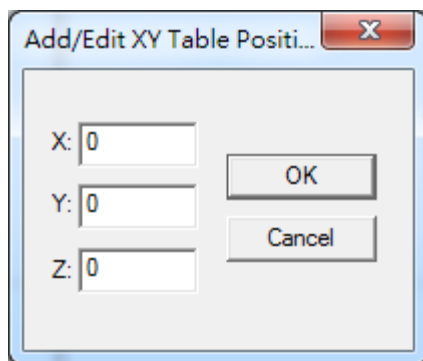


Fig. 3.5.07

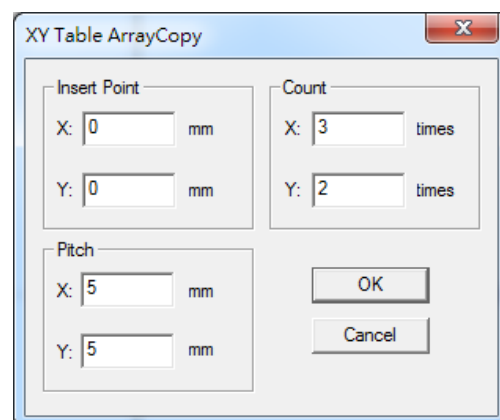


Fig. 3.5.08

**Insert Point:** Set the start point.

**Count:** The duplicate amount.

**Pitch:** The interval of each point.

## MM3D 3.90

### 3.5.7 Rotary

To use the Rotary function, you must first go to the "**Enable Rotary**" function on the "**Rotary**" page in the "**Layer Property Table**".

Or click on the object and set it to start marking on a single object on the "**object property table**" "**Rotary**" page.

Start and set the Rotary function on the Rotary page of the layer property table.

According to the shape of the rotation axis, it is divided into "cylinder", "disc", and "cylinder (inner circle)"

Or use "Custom outline" to import and edit the outline file.

**Layer Rotary marking and object rotary marking are mutually exclusive.**

Go to the Rotary page of the Layer property table to activate and set the Rotary function, as shown in Figure 3.5.09.

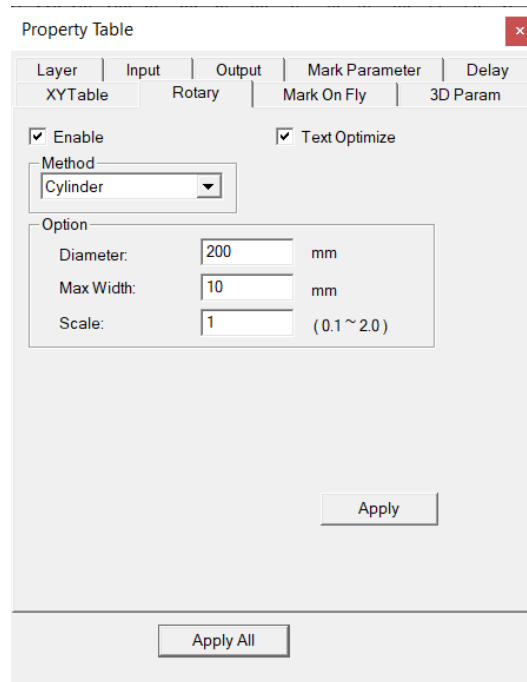


Fig. 3.5.09

#### Cylinder Mode

##### Enable:

Enable the Rotary

##### Text Optimize:

When performing Rotary Layer split, if a text object is split, but the original object does not exceed the "maximum width" range, you can activate this function to make the text object take characters as the unit and not split.

##### Option

**Diameter:** The diameter of the object.

**Max Width:** The ideal section width when marking. This value is based on the radius of axle.

**Scale:** Adjust the ratio of radius to reach the optimum marking effect. The default value is 1. Please refer to the following example and figures.

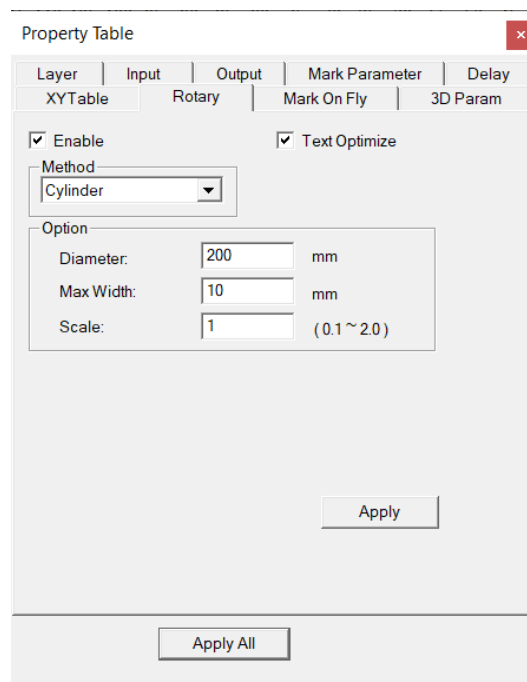


Fig. 3.5.10

## MM3D 3.90

### Disc Mode

#### Enable:

Enable the Rotary

#### Text Optimize:

When performing Rotary Layer split, if a text object is split, but the original object does not exceed the "maximum width" range, you can activate this function to make the text object take characters as the unit and not split.

#### Option

**Step Angle:** Set the rotary angle for each step of marking.

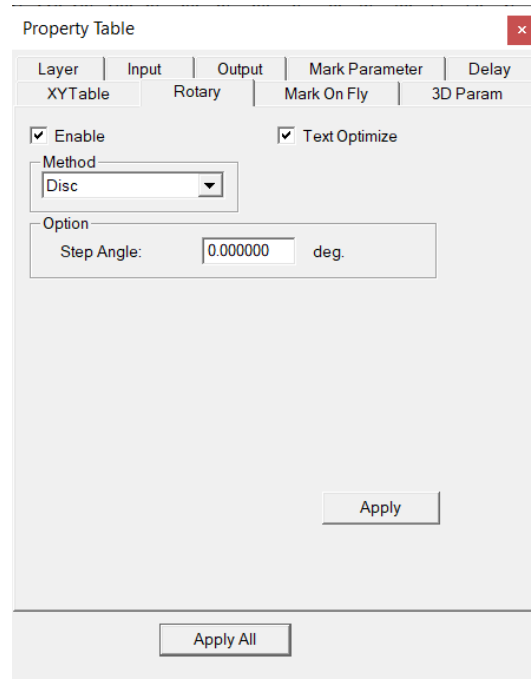


Fig. 3.5.11

### Cylinder Mode(Inner circle), please refer to the cylinder mode. (Figure 3.5.12)

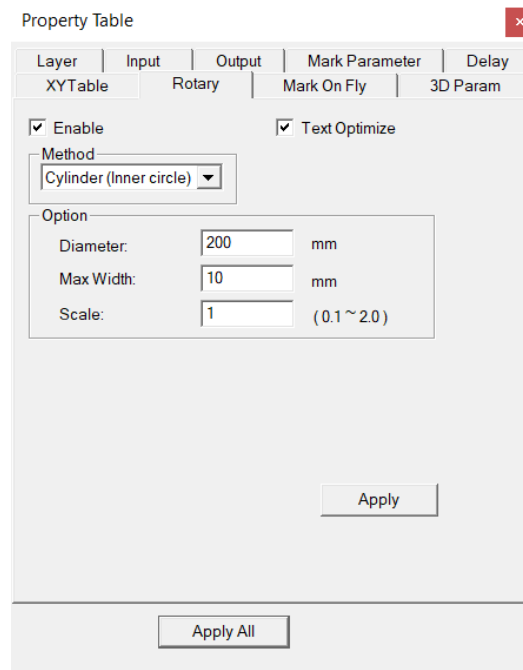


Fig. 3.5.12

## MM3D 3.90

### Custom Outline

#### Enable:

Enable the Rotary

#### Text Optimize:

When performing Rotary Layer split, if a text object is split, but the original object does not exceed the "maximum width" range, you can activate this function to make the text object take characters as the unit and not split.

#### Option

**Diameter:** The diameter of the object.

**Scale:** Adjust the ratio of radius to reach the optimum marking effect. The default value is 1. Please refer to the following example and figures.

#### Custom Outline Parameter

**Select File:** Load the outline file

**EDIT:** When the laser center is not aligned with the model center, the outline position can be fine-tuned. In the editing mode, the outline size cannot be changed, and the working area can only be moved by the mouse or keyboard in the relative vertical direction of Rotary.

**File Path:** The file path of the outline file

**Offset of Z axis pos.:** Set the offset distance of the axis height.

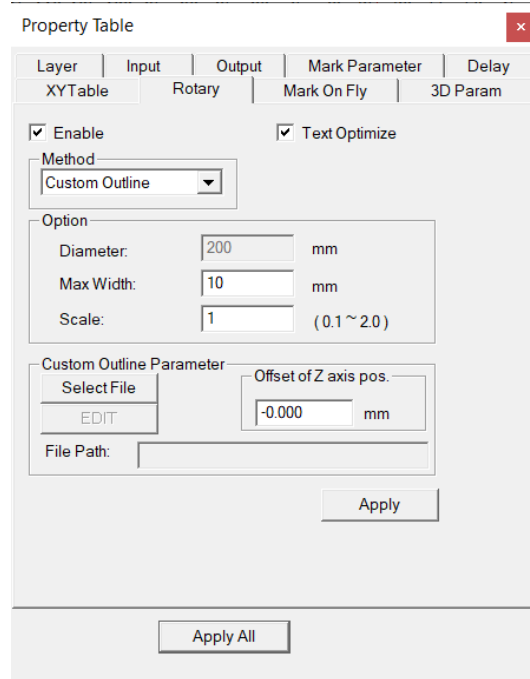


Fig. 3.5.13

## MM3D 3.90

### 3.5.8 Mark On Fly

This function is set up when using “Mark on Fly” function for marking, enable or disable the delay marking between layers, see Fig.3.5.14.

Enable this function, the system will mark the first layer and then wait for conveyer moving this setting distance, and then continue the next layer’s marking. The distance between layers is the calculation of encoder factor multiplied by encoder feedback value. Encoder factor is set up at the page of “Mark on Fly” setting on Options dialogue box (please refer to section 1.1.6.3).

The following lists are conditions for enable this function:

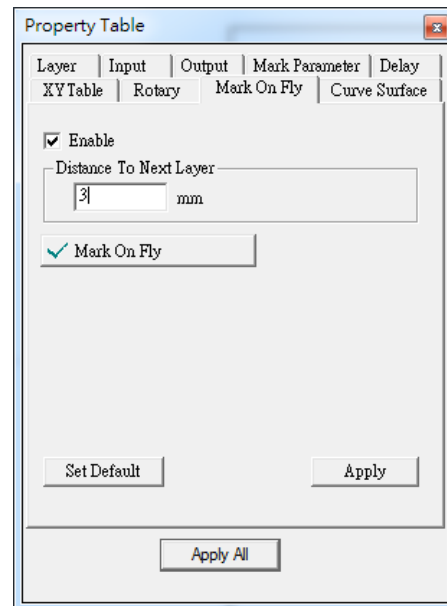


Fig. 3.5.14

1. Diver need to support encoder function, and make sure encoder have connected to controller. About encoder connection method, please refer to encoder manual.
2. Need to enable the “Mark on Fly” function, and checked the “Encoder” options, in addition, input the rational value at “Factor” section. About the Mark on Fly Settings, please refer to [section 1.1.6.6](#).
3. Input a rational value for “Distance to Next Layer” option. This value need larger than the distance which conveyer has moved while marking this layer. When system has finished marking this layer’s objects, will wait until conveyer has moved this distance, and then start marking next layer’s objects. If the setting value is less than the distance conveyer has moved when marking this layer, it will cause incorrect result.

For example:

Suppose the EZM file has a circle object and a text object like Fig.3.5.15, and the “Mark on Fly” function is enabled and the “Encoder” option is checked:

## MM3D 3.90

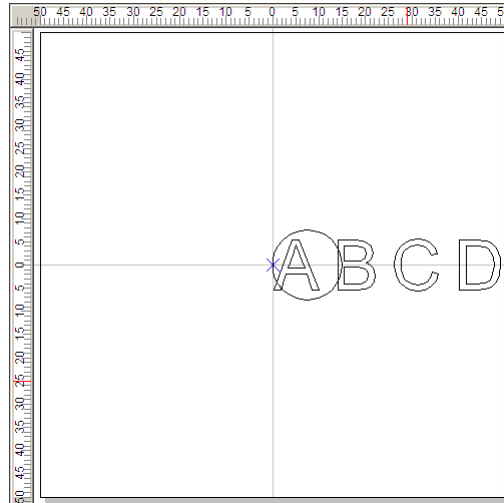


Fig. 3.5.15

1. If two objects are in the same layer, the result of marking will like Fig.3.5.16.



Fig. 3.5.16

2.If in different layer which the circle object is in layer 1, and the text object is in Layer 2, and the moving direction of objects is right-to-left, the system will reset encoder position, and consider the current position as the origin point while marking different layers.

(a) If Layer 1 (circle object) disable the encoder delay function, the marking result will like Fig.3.5.17.



Fig. 3.5.17

Distance between red arrows pointed means which conveyer has moved while executing Layer 1 marking process. Because of disable the layer encoder delay function, so the system will reset encoder position after finishing marking Layer 1, and then consider the current position as the origin point to mark Layer 2. This distance will be changed depends on the marking speed.

## MM3D 3.90

(b) If Layer 1 (circle object) enable the encoder delay function, the marking result will like Fig.3.5.18.



Fig. 3.5.18

Distance between red arrows pointed means the setting value of “Distance to Next Layer” at Encoder page. This value cannot be less than the distance which conveyer has moved when marking this layer. Otherwise, it will cause incorrect result.

Suppose when finishing marking Layer 1, conveyer has moved 30 mm, just as triangle position as the figure. Because of enable the layer delay function, so after system finishing marking Layer 1, the system will wait until conveyer has moved 50 mm as settings. In this example, conveyer only moved 30 mm after finish marking Layer 1, so the system will wait for conveyer to continue moving 20 mm, such as distance between orange arrows pointed. After conveyer has moved 50 mm, the system will reset encoder position, and consider the current position as origin point to execute marking Layer 2.



## **MM3D 3.90**

### **3.5.9 3D Param**

When Curve Surface function is enabled, the objects of this layer will be marked according to the setting parameters.

If you cannot see this page, please make sure that the "Enable 3D mode" and "Enable 3D Correction Mode" are checked in the "Focal Axis Settings" in the "Option".

When the 3D parameters are set and enabled, when outputting the layer primitives, the position of the drawing surface to be output in the actual marking will be adjusted according to the set workpiece type and its radius and focal length.

## MM3D 3.90

### 3.6 Manual-split Property Table

#### 3.6.1 Band

Select a band which is generated by Auto create bands or New a band will appear band property page in the property table. See Fig 3.6.01.

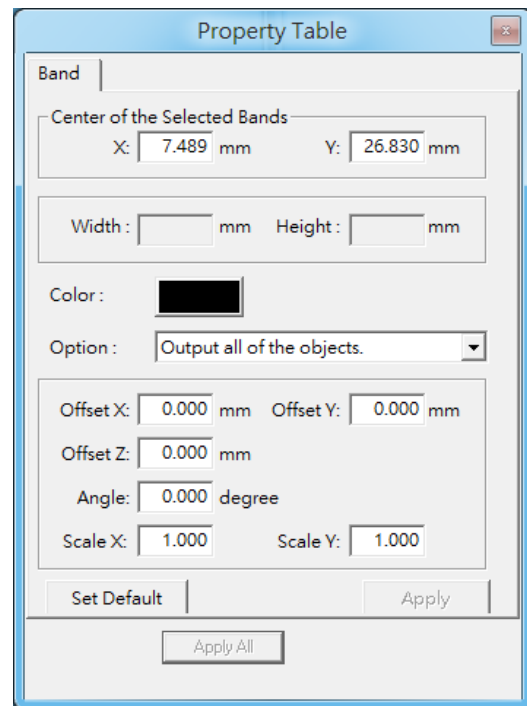


Fig3.6.01

**Center of the Selected Bands** Band center position.

**Width** Band width.

**Height** Band height.

**Color** Band color.

**Option** Band output option.

**Output complete objects only** Output the graphic which is completely belong to the band.

**Output all of objects** Output every graphic belong to the band.

**Offset X** Band output offset at X-axis direction.

**Offset Y** Band output offset at Y-axis direction.

**Offset Z** Z-axis motion distance while band is outputting.

**Angle** Band output rotate angle.

**Scale X** Band output scale at X-axis direction.

**Scale Y** Band output scale at Y-axis direction.

## MM3D 3.90

### 3.6.2 Template

Set the using split band template at this layer.  
This function is depended on Split by Layer.  
See Fig 3.6.02

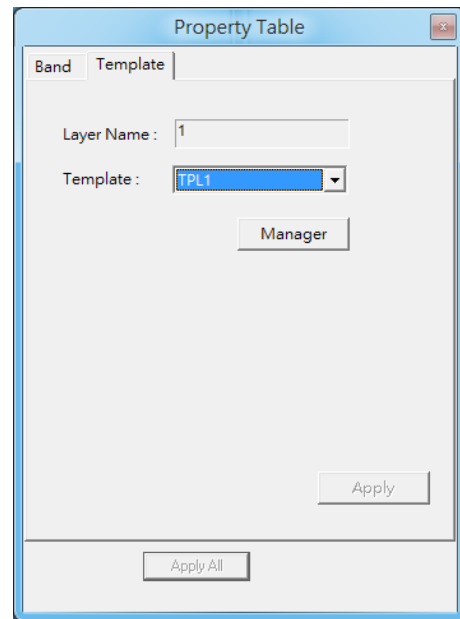


Fig3.6.02

<b>Layer Name</b>	Current editing layer.
<b>Template</b>	Current using template. One template applied to multiple layers is allowed.
<b>Manager</b>	The manager is allowed to add, delete and rename template. See Fig 3.6.03.
<b>Add</b>	Add a template.
<b>Delete</b>	Delete a selected template. A using template could not be deleted.
<b>Rename</b>	Rename a template.

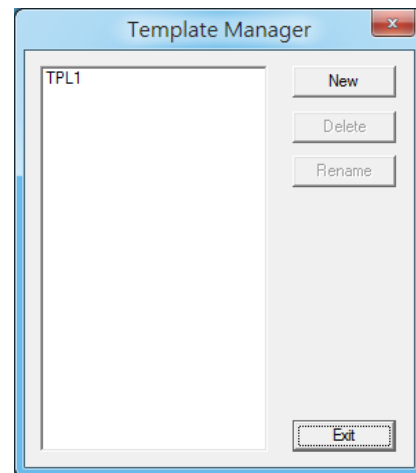


Fig3.6.03

## MM3D 3.90

### 4. Popup Menu

Click the right button of the mouse will display a quick view menu. When Show Order in View Menu is activated, users can change the mark order. And when the object has been transferred to curve (in Edit Menu), user is able to Add Vertex to the object.

**The popup menu is different when users select different objects.**

#### 4.1 General Object

Select a general object and click the right button of the mouse, users will see the popup menu like Fig.4.1.01.

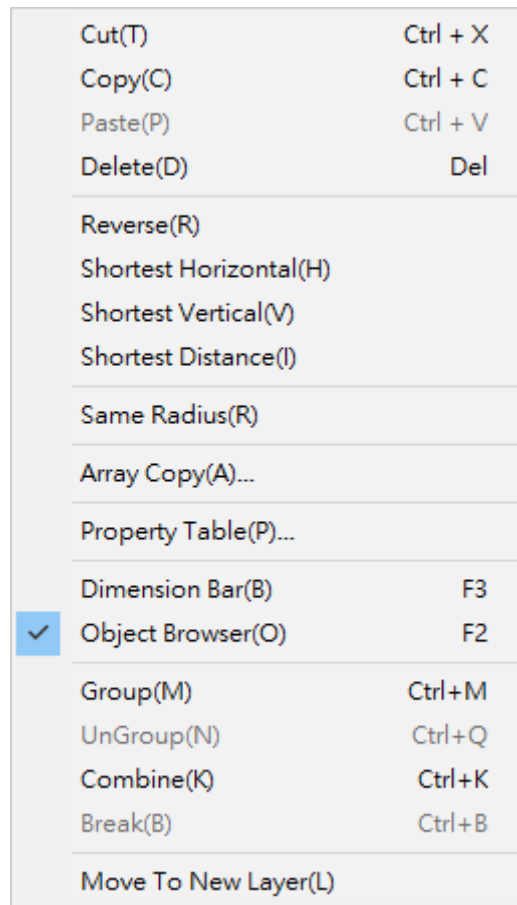


Fig. 4.1.01

<b>Cut</b>	Remove selected data and store it in the clipboard for future use
<b>Copy</b>	Duplicate selected data and store it in the clipboard for future use
<b>Paste</b>	Attach data from the clipboard to the current document
<b>Delete</b>	Delete and remove the selected data

## MM3D 3.90

<b>Reverse</b>	Reverse sorting mark order
<b>Shortest Horizontal</b>	Sorting mark order by the shortest horizontal direction
<b>Shortest Vertical</b>	Sorting mark order by the shortest vertical direction
<b>Shortest Distance</b>	Sorting mark order by the shortest distance of object center
<b>Same Radius</b>	Make the circle object become the same radius
<b>Array Copy</b>	Copy multiple objects in a physical copy mode. The copy mode can be set to "By Matrix" or "By Circle". If you click the "Use Advanced" button, the setting window will expand and you can set "Speed", "Power" and "Frequency" parameter. The interface is shown in Figure 4.1.02.

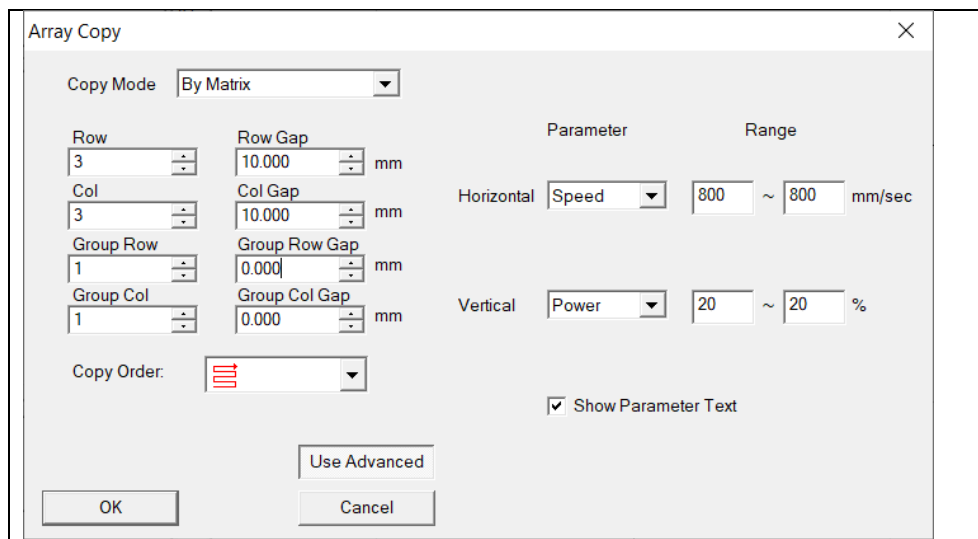


Fig. 4.1.02

<b>By Matrix</b>	
<b>Row</b>	Set the total number of objects in each row
<b>Row Gap</b>	Set the distance of each object's center point in a row.
<b>Col</b>	Set the total number of objects in each column
<b>Col Gap</b>	Set the distance of each object's center point in a column.
<b>Group Row</b>	Set the number of groups per row
<b>Group Row Gap</b>	Set the distance of each group's center point in a row.
<b>Group Col</b>	Set the number of groups per column
<b>Group Col Gap</b>	Set the distance of each group's center point in a column.
<b>Copy Order</b>	Select the copy direction of the object. There are four directions.

## MM3D 3.90

**4 Objects per Row, 4 Objects per Column**

**Divide each column of objects into two groups**

**Divide each row of objects into two groups**

**Spacing is the distance from the center point of the object to the center point**

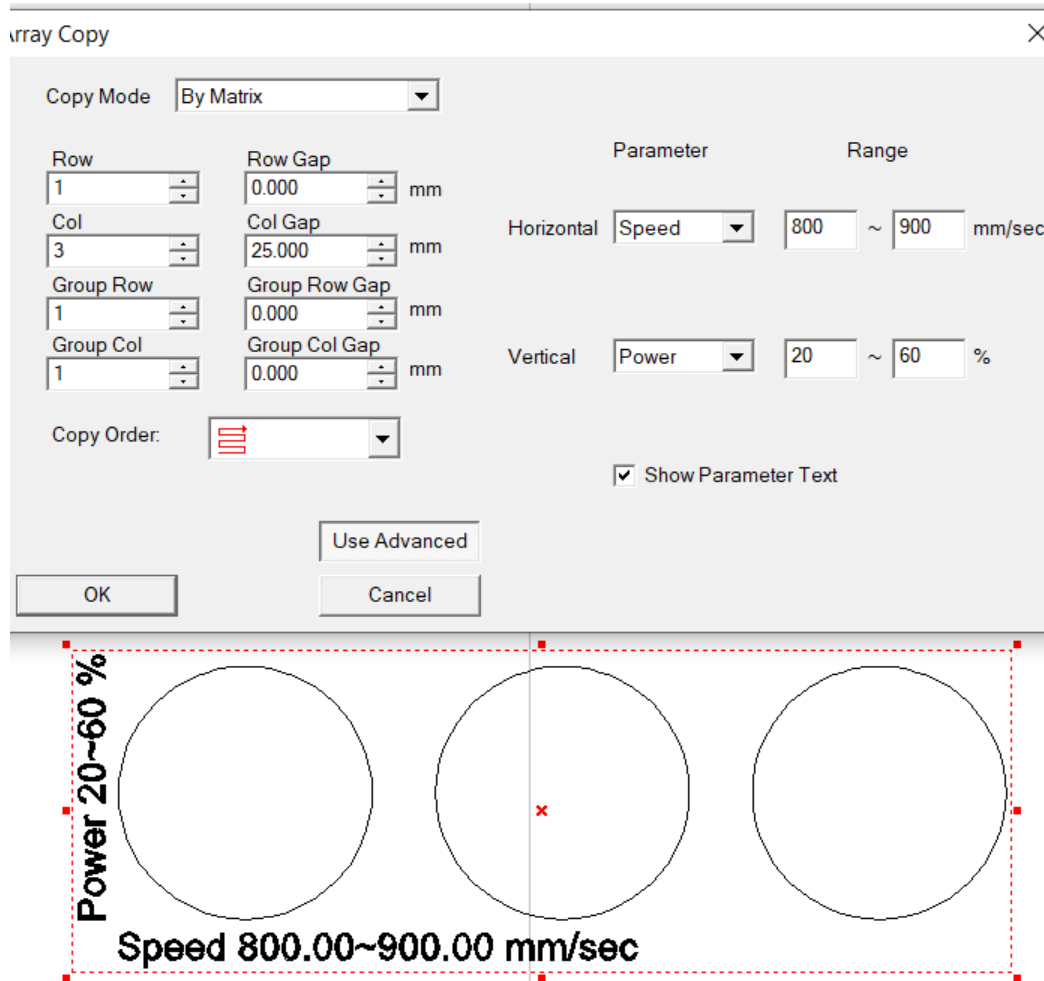
Use Advanced	
<b>Horizontal</b>	Set the parameters and range of objects copied in a horizontal arrangement.
<b>Vertical</b>	Set the parameters and range of objects copied in a vertical arrangement.
<b>Show Parameter Text</b>	Check it to display the parameters in the matrix copy group object

### Parameter setting description:

Draw an object to copy by matrix, and set the speed range of the horizontal object to be 800~900 mm/sec, and the power range of the vertical object to be 20~60%, as shown in Figure 4.1.03; the graphs from left to right are respectively Circle 1, Circle 2, Circle 3.

The system will evenly distribute the set object speed, starting from 800 mm and increasing to a maximum of 900 mm/sec, that is, circle 1: 800 mm/sec, circle 2: 850 mm/sec, circle 3: 900 mm/sec, And so on for the rest of the settings. After copying "By Matrix", a single object will be converted into a group object. Right-click on the group object and select "Ungroup", it will return to the state of individual single object, and the user can set the marking parameters of each object separately.

## MM3D 3.90



<b>Property Table</b>	Show the Property Table of the object
<b>Dimensional Bar</b>	Enable/disable Dimension bar
<b>ObjView Bar</b>	Enable/disable Object Browser
<b>Group</b>	Group selected object
<b>Ungroup</b>	Ungroup selected group
<b>Combine</b>	Combine several objects into one object
<b>Break</b>	Break one object into several objects
<b>Set Circle Object Radius</b>	Modify circle that radius same as original radius to modified radius.
<b>Move To New Layer</b>	Move selected objects to new layer

### 4.1.1 Reverse

This function is used to reverse sorting marking order.

For example: the original marking order 1-2-3-4-5-6 will be changed to be 6-5-4-3-2-1.

### 4.1.2 Shortest Horizontal

## MM3D 3.90

This function is used to sort mark order by the shortest horizontal direction. Input the partition count number in the box like Fig.4.1.03. The work area will be divided into several partitions in vertical direction. The mark order will be sorted from left to right first as Fig.4.1.04. If the checkbox of “Reverse” is checked, the mark order will then changed to be sorted from right to left first.

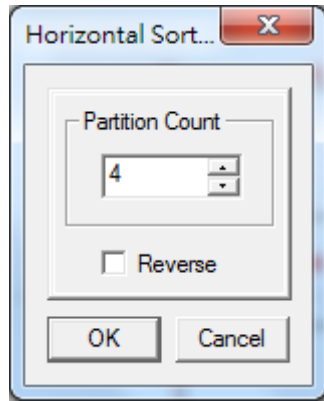


Fig. 4.1.03

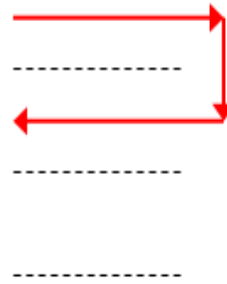


Fig. 4.1.04

### 4.1.3 Shortest Vertical

This function is used to sort mark order by the shortest vertical direction. Input the partition count number in the box like Fig.4.1.05. The work area will be divided into several partitions in horizontal direction. The mark order will be sorted from bottom to top first as Fig.4.1.06. If the checkbox of “Reverse” is checked, the mark order will then changed to be sorted from top to bottom first.

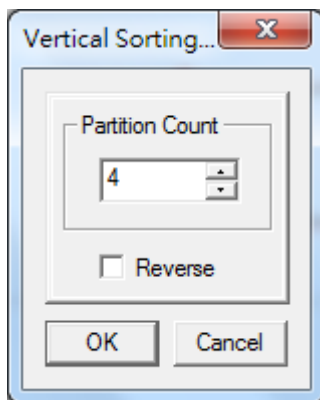


Fig. 4.1.05

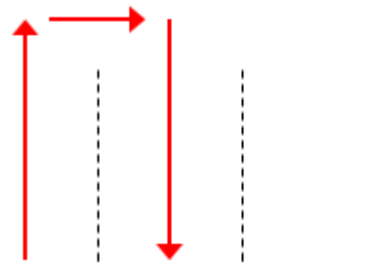


Fig. 4.1.06



## MM3D 3.90

### 4.1.4 Shortest Distance

This function is used to sort mark order by the shortest distance of object center. Select all objects in the work area, a red box as below will appear. The mark order will be sorted by the shortest distance between the left-bottom of the red box and the center of each object like Fig.4.1.07.

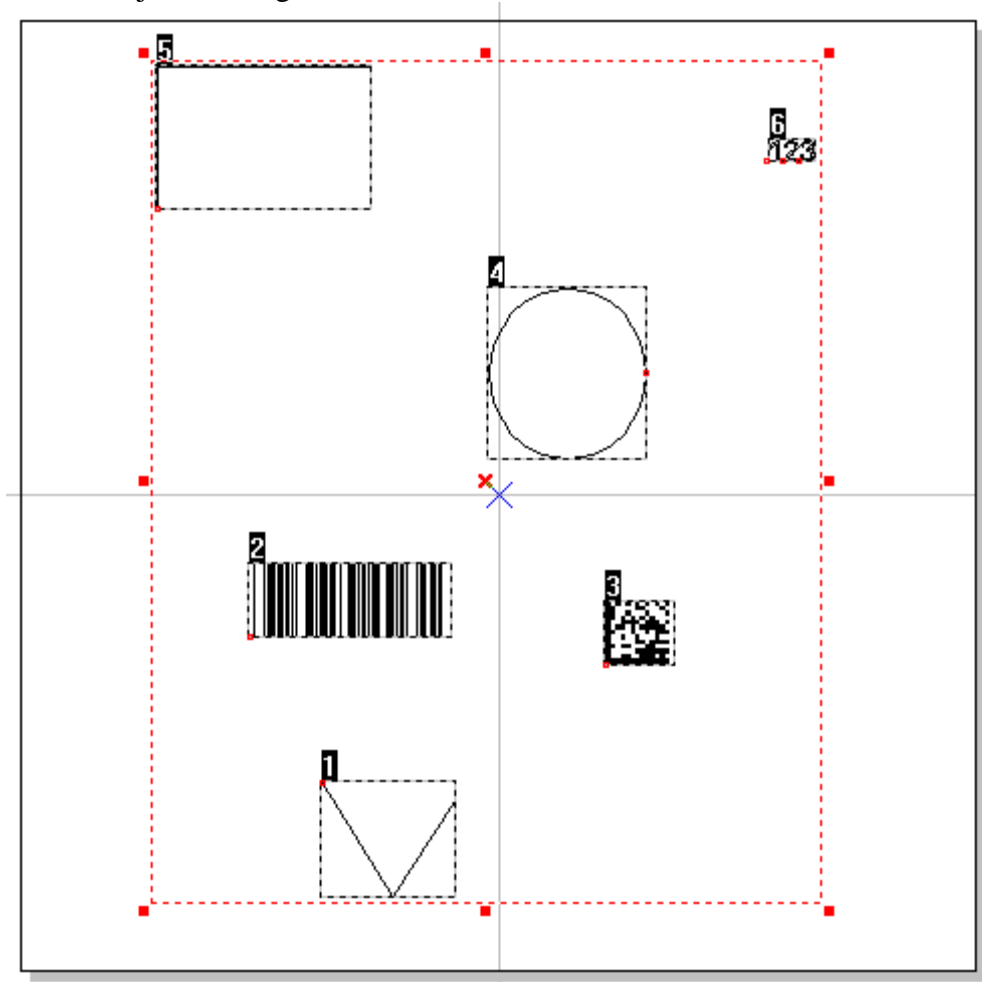


Fig. 4.1.07

## MM3D 3.90

### 4.2 Curve

Select a curve users drew or the curve transferred from objects, and click the right button of the mouse, users will see the popup menu like Fig.4.2.01.



Fig. 4.2.01

## MM3D 3.90

### 4.2.1 Add Vertex

This function allows users to modify a curve object; more vertices will be more convenient to change the shape of the curve, see Fig.4.2.02.

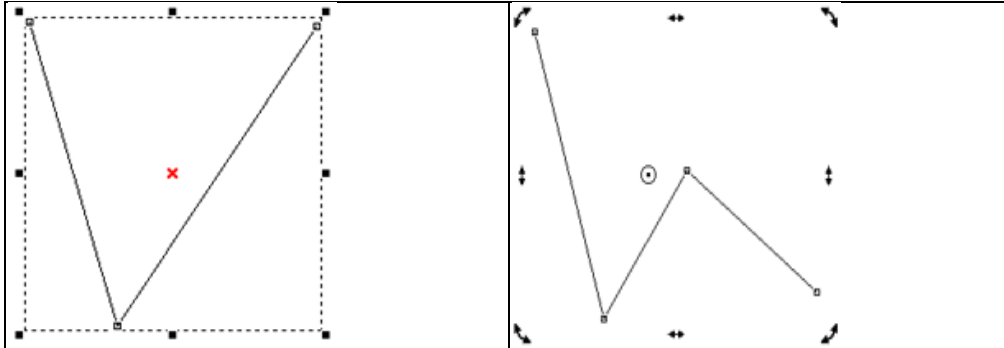


Fig. 4.2.02

### 4.2.2 Delete Vertex

Using “Delete Vertex” function will decrease the control points like Fig.4.2.03.

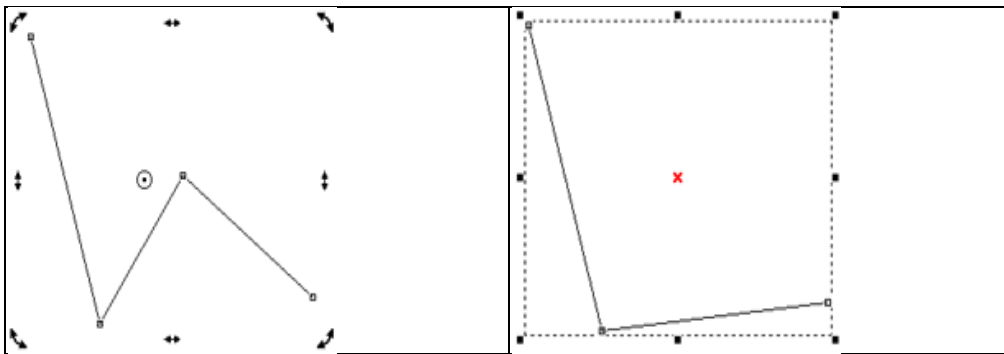


Fig. 4.2.03

### 4.2.3 Break Vertex

Click right mouse button on vertex will pop-up menu, and select Break Vetex. This function can break one line into two lines as the vertex is the break point. Refer to Fig.4.2.04.

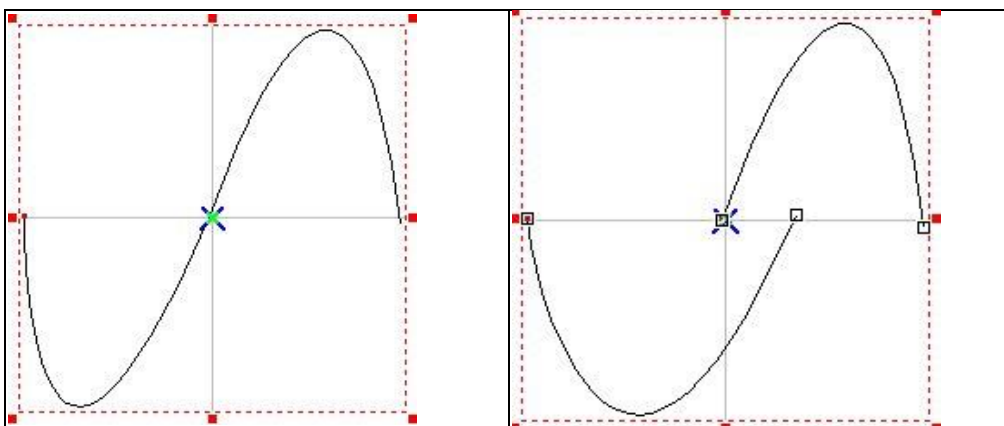


Fig. 4.2.04

## MM3D 3.90

### 4.2.4 Edit Vertex

Click right mouse button on vertex will pop-up menu, and select Edit Vertex. User can assign a new coordinates in X, Y, and Z axis direction. Fig.4.2.05.

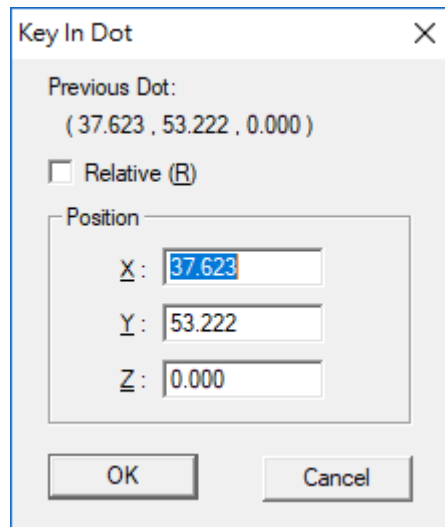


Fig. 4.2.05

### 4.2.5 Curve to Line

Select "Curve to Line" function; the curve has been transferred to a line segment and lost its control points like Fig.4.2.06.

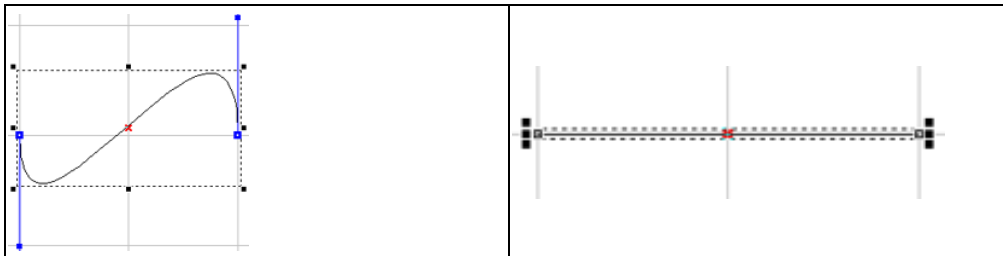


Fig. 4.2.06

### 4.2.6 Line to Curve

Select "Line to Curve" function; the line segment has been transferred to a curve and its control points appeared like 4.2.07.

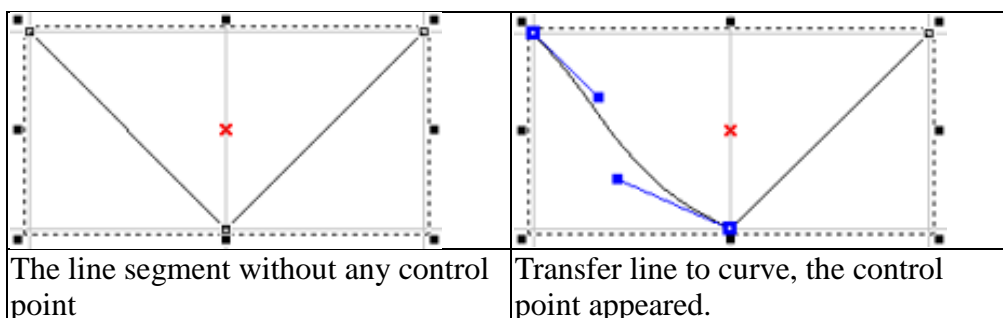
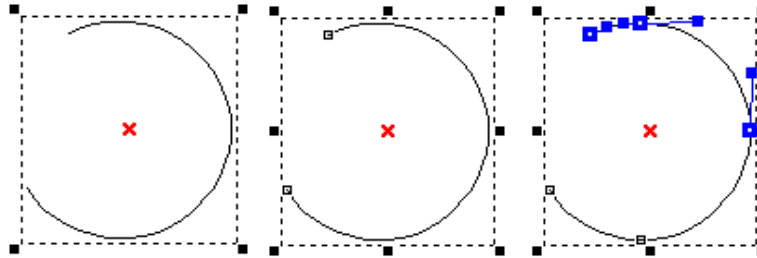


Fig. 4.2.07

## MM3D 3.90

### 4.2.7 Arc to Curve

To use this function, users must first create an object and transfer the object to curve, and then click right button of the mouse to select the “Arc to Curve” function. This function allows users to add more vertexes to the curve like Fig.4.2.08.



Arc Trans-Curve Arc to Curve

Fig. 4.2.08

### 4.2.8 Cusp

The control points of the curve were smooth at the beginning; select “Cusp” function on the popup menu; the two sides of control points become independent like Fig.4.2.09.

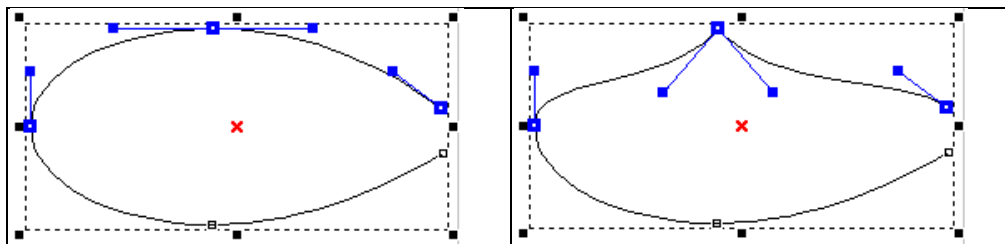


Fig. 4.2.09

### 4.2.9 Smooth

The control points of the curve were cusp at the beginning; select “Smooth” function on the popup menu; the two sides of control points become smooth and dependent on each other like Fig.4.2.10.

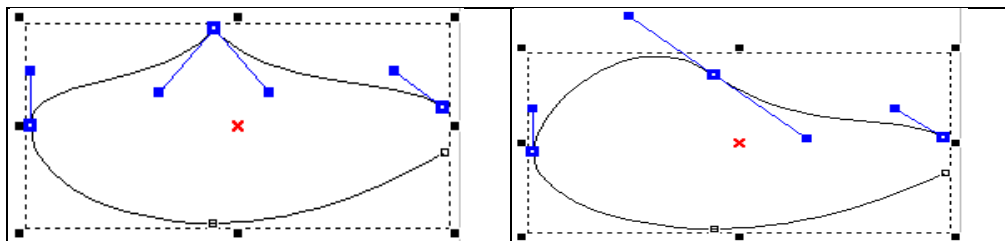


Fig. 4.2.10

### 4.2.10 Symmetrical

The control point was smooth but not symmetrical; select “Symmetrical” function on the popup menu and move one of the control point; the other side of control point will move symmetrically like Fig.4.2.11.

## MM3D 3.90

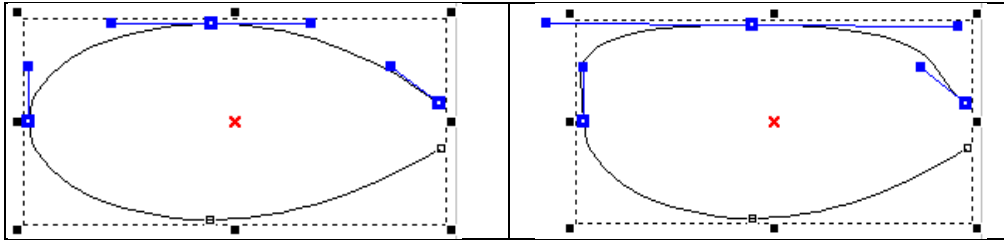


Fig. 4.2.11

### 4.3 Show Mark Order of a General Object

If the “Show Order” function in View Menu is activated, select a general object, and click the right button of the mouse, users will see a popup menu like Fig.4.3.01.

Cut(T)	Ctrl+X
Copy(C)	Ctrl+C
Paste(P)	Ctrl+V
Delete(D)	Del
Top(T)	
Undermost(U)	
Upper(U)	
Lower(L)	
In Front Of(I)...	
In Back Of(B)...	
Reverse(R)	
Shortest Horizontal(H)	
Shortest Vertical(V)	
Shortest Distance(I)	
Array Copy(A)...	
Property Table(P)...	
Dimension Bar(B)	F3
✓ Object Browser(O)	F2

Fig. 4.3.01

## MM3D 3.90

### 4.4 Show Mark Order of a Curve

If the “Show Order” function in View Menu is activated, select a curve users drew or the curve transferred from objects, and users will see the popup menu like Fig.4.4.01 when clicking the right button of the mouse.

Cut(T)	Ctrl+X
Copy(C)	Ctrl+C
Paste(P)	Ctrl+V
Delete(D)	Del
Top(T)	
Undermost(U)	
Upper(U)	
Lower(L)	
In Front Of(I)...	
In Back Of(B)...	
Reverse(R)	
Shortest Horizontal(H)	
Shortest Vertical(V)	
Shortest Distance(I)	
Add Vertex(A)	
Del Vertex(X)	
Curve To Line(L)	
Line To Curve(I)	
Arc To Curve(R)	
Cusp(U)	
Smooth(S)	
Symmetrical(Y)	
Array Copy(A)...	
Property Table(P)...	
Dimension Bar(B)	F3
✓ Object Browser(O)	F2

Fig. 4.4.01

## MM3D 3.90

### 5. Hot Key

<b>File Menu</b>	
<b>Ctrl + N</b>	Create a new document
<b>Ctrl + O</b>	Open an existing document
<b>Ctrl + S</b>	Save the current document using the existing file name
<b>Ctrl + I</b>	Import
<b>Ctrl + P</b>	Print
<b>Edit Menu</b>	
<b>Ctrl + Y</b>	Replace a cancelled action
<b>Ctrl + Z</b>	Cancel un unwanted action
<b>Ctrl + X</b>	Remove the selected object and place it in the clipboard
<b>Ctrl + C</b>	Duplicate the selected object and place it in the clipboard
<b>Ctrl + V</b>	Place the data on the clipboard on to the document
<b>DEL</b>	Delete the selected object
<b>Ctrl + K</b>	Combine
<b>Ctrl + B</b>	Break
<b>Ctrl + M</b>	Group
<b>Ctrl + Q</b>	UnGroup
<b>Ctrl + H</b>	Mirror Horizontal
<b>Ctrl + L</b>	Mirror Vertical
<b>Ctrl + E</b>	Baseline
<b>Ctrl + D</b>	Split
<b>Ctrl + U</b>	Transfer to a curve
<b>Ctrl + A</b>	Trimming
<b>Ctrl + G</b>	Welding
<b>Ctrl + W</b>	Contour
<b>Execute Menu</b>	
<b>F5</b>	Marking
<b>F6</b>	Quick Mark
<b>F7</b>	Dry Run
<b>F10</b>	Close Dialogue Box of Marking, Quick Mark, and Dry Run
<b>Others</b>	



## MM3D 3.90

<b>F1</b>	Open HELP
<b>F2</b>	Open the Object Browser
<b>Shift+F2</b>	Move the Object Browser to the lower left corner
<b>F3</b>	Open the Dimension Bar
<b>F4</b>	Open the User Level dialogue box
<b>Ctrl + F4</b>	Close the current file
<b>Ctrl + F6</b>	Switch to another opened file
<b>Ctrl</b>	1. Force the angle of a line segment to be 15° when drawing a line, and force the width equal to the height when drawing an arc, circle, or rectangle. 2. The XY axis of the object will be adjusted simultaneously
<b>Ctrl + T</b>	Open the Property Table
<b>Shift</b>	The center of a circle or rectangle will be the center of the initial axis The XY axis of the object will be adjusted simultaneously
<b>Tab</b>	Select object by marking order
<b>C</b>	When you are drawing lines, arcs, and curves, press C key will make the continuous segments become a closed loop.
<b>X/Y</b>	Set the start point or end point of the object

## MM3D 3.90

### Appendix A: Config.ini

Config.ini is a setting file in the directory of C:\Program Files\MM3D. In general situation, user does not have to modify this file unless some special cases. If you need to modify this file, just simply open the file, change the settings, save the file, and then restart the MM3D program. The more detail description will be listed as below:

<b>[ENV]</b>	System Environment Parameters
MachineChk= 0	Automation (0:Disable, 1:Enable)
MachineChk_ShowMessage=1	Show error message (0: Disable, 1: Enable)
VariablePolyDelay= 0	The Mid Point Delay time will be changed in accordance with angle (0: Disable, 1: Enable)
AutoTextMode=1	Auto Text Mode (0: Disable, 1: Enable)
Jump_Min_Delay=0.0	Delay time for Jump (ms)
Jump_Limit_Length=0	Limited movement (mm)
MarkThreadEnable=1	Enable the Mark Thread (0: Disable, 1: Enable)
<b>[Rotary]</b>	Rotary Axis Parameters
Enable=1	Enable (0: Disable, 1: Enable)
Calibration=1	Calibration (0: Disable, 1: Enable)
Ring=1	Ring Text (0: Disable, 1: Enable)
Cylinder=1	Cylinder (0: Disable, 1: Enable)
MotorSetup=1	Motor Setup (0: Disable, 1: Enable)
<b>[MultiMarking]</b>	Auto Marking Parameters
Enable=1	Enable (0: Disable, 1: Enable)
Delay=0	Delay Time (sec)
<b>[LogFile]</b>	Log File Parameters
Enable=0	Enable (0: Disable, 1: Enable)
KeepRow=10	Log Rows
LogMarkDialog=1	Log Mark Dialogue (0: Disable, 1: Enable)
StartTime=0	Log Start Time (0: Disable, 1: Enable)
Path=	Log Path
<b>[Application]</b>	Application related parameters
ShowLaserPanel=0	Show Laser Panel (0: Disable, 1: Enable) 
ShowHatch=1	Show Hatch function (0: Disable, 1: Enable)
<b>[SEGMENT]</b>	Break a circle into lines
CHORDPXL	Setting how a circle will be broken into multiple lines. The smaller the value, the shorter the line. On the other hand, will take longer time to process a circle. Arc-Text will not be affected by this value. Default value is 10000.
<b>[IO_INPUT]</b>	Input point related parameters

## MM3D 3.90

INPUT01= 01,01	Input No.= Display Name, Description (See below figure)
INPUT16= 16,16	Input No.= Display Name, Description (See below figure)
<b>[IO_OUTPUT]</b>	Output point related parameters
OUTPUT01= 01, 01	Output No.= Display Name, Description (See below figure)
OUTPUT15= ME, Mark End	Output No.= Display Name, Description (See below figure)
<b>[MarkAndPrint]</b>	Mark & Print Parameters
Enable=0	Enable (0: Disable, 1: Enable)
FeedUp=0	Rows for moving ahead
FeedDown=10	Rows for moving follow-up
BarcodeHeight=130	Barcode Height (cm)
PrintAndCut=0	Print & Cut (0: Disable, 1: Enable)
<b>[SignalRule]</b>	Signal Parameters (refer to section 2.2.1)
Active_PR_MR=1	Program Ready/Mark Ready signal (0: Active Low, 1: Active High)
Active_ReadyStart=1	Ready for Start signal (0: Active Low, 1: Active High)
Active_ME=1	Mark End Signal (0: Active Low, 1: Active High)
Active_Shutter=1	Shutter Signal (0: Active Low, 1: Active High)
Active_Lamp=1	Lamp Signal (0: Active Low, 1: Active High)
Active_Align=1	Align Signal (0: Active Low, 1: Active High)
PR2MR=0	Change Program Ready Signal to Mark Ready Signal (0: Program Ready, 1: Mark Ready)
MarkEndPulseTime = 0	MarkEnd Signal keep high (sec) (0: default setting, means no pulse)
<b>[MarkParmList]</b>	Mark Parameters List
CurPath=E:\Program Files\MM3D\MarkParam	Current Path
<b>[VERSION]</b>	Version Parameters
Version=1000	Version

### The Planning of Input/Output Point:

Open the MM3D software, go to the Property Table and select “Driver” label and then click the “I/O Test” button will see the figure as below:

## MM3D 3.90

The default setting about IO in Config.ini:

[IO\_INPUT]

INPUT01= 01,01

INPUT02= 02,02

.....

INPUT15= 15,15

INPUT16= 16,16

[IO\_OUTPUT]

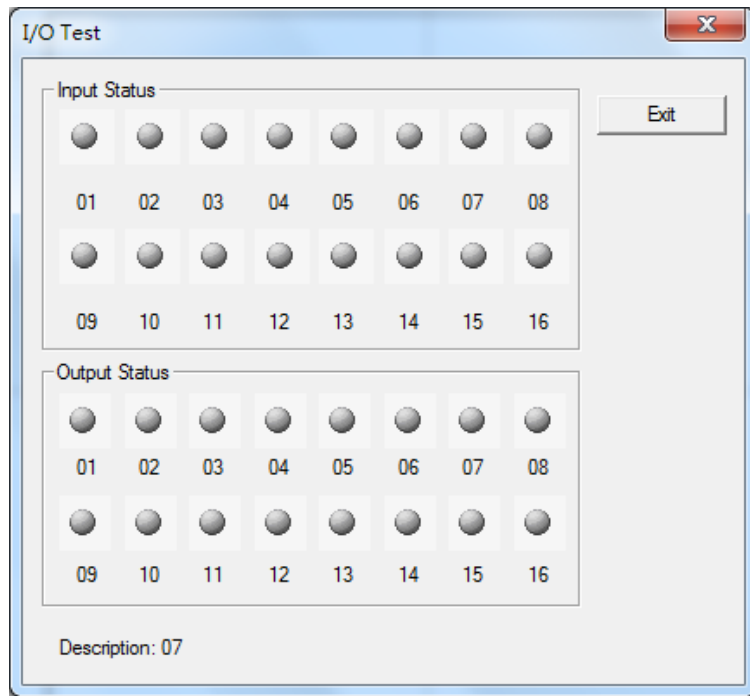
OUTPUT01= 01,01

OUTPUT02= 02,02

.....

OUTPUT15= 15,15

OUTPUT16= 16,16



Change the setting as below in Config.ini will see the right figure:

[IO\_INPUT]

INPUT01= 01,01

.....

INPUT15= Start,Start

INPUT16= Stop,Stop

[IO\_OUTPUT]

OUTPUT01= 01,01

.....

OUTPUT14=

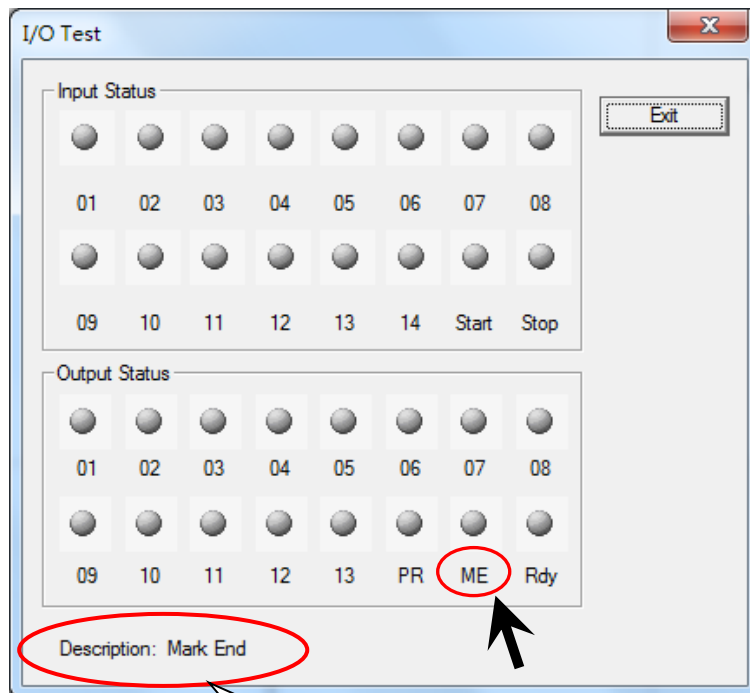
PR,Program Ready

OUTPUT15=

ME,Mark End

OUTPUT16=

RdySt,Ready for Start



When mouse move to the position of I/O name (see arrow point), its description