MarkingMate 2.7 A-24

General Introductions

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1. Menu Bar

"**Menu Bar**" is on the top of **MarkingMate** program window. It shows the main function of **MarkingMate**. 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**

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1.1 File Menu

"FileMenu" offers the following functions:

New	Create a new **MarkingMate** file.
Open…	Open an existing **MarkingMate** file (*.EZM).
Close	Close a file.
Save	Save the current document using its original file name(Cover the original file).
Save As…	Save the current document using an assigned file name
Option…	Edit the program settings.
Import	Import an image file.
Export DXF	Export the file as a '*.DXF' file for other applications to use.
Select TWAIN Device…	Select the supporting scanners.
TWAIN Acquire…	Scan an image.
Configuration Import∕Export	Import or export the configuration files.
Change Language…	Change to different language version.
Print…	Print the file.
Preview	Preview the current document before printing.
Printer setting…	Select the printer and edit the printing settings.
Set File Password	Lock the current file with password.
MRU File	Display the last used file.
Exit	Exit **MarkingMate.**

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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 **Toolbar**.
- Press [**Ctrl＋N**] on the keyboard.

1.1.2 Open

Open an existing **MarkingMate** 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 **Toolbar**.
- Press [**Ctrl＋O**]on the keyboard.

The default file format of **MarkingMate** is'*.EZM'. Users can search the file they want to open under the folder they used to save **MarkingMate** files, refer to Fig.1.1.01.

Fig.1.1.01

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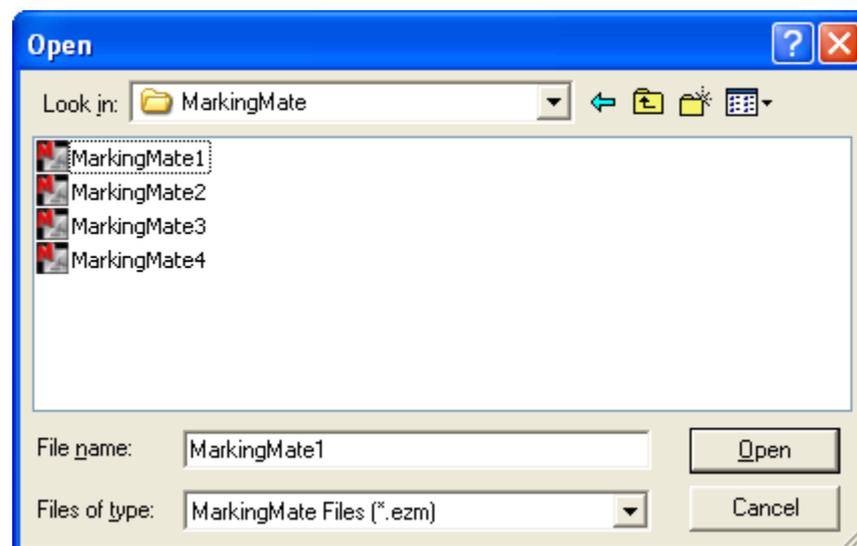
1.1.3 Close

Close the current using file. **MarkingMate** will suggest users to save the editing file before closing it. Users will lose all the modifications they edit after the pervious saving when closing the file without saving it.

When closing an unnamed or new file, **MarkingMate** 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.

Fig.1.1.02

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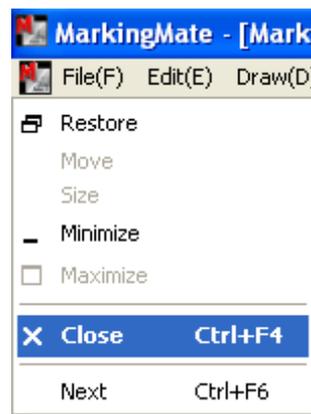
Fig.1.1.03

- Press [Ctrl＋F4] on the keyboard.

1.1.4 Save

Save the current using document with the original file name under the same folder. **MarkingMate** 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 the ꗃ from the **Toolbar.**
- Press [**Ctrl＋S**] on the keyboard.

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1.1.5 Save As…

Save the current document using a new file name or changing the saving folder, see Fig.1.1.04.
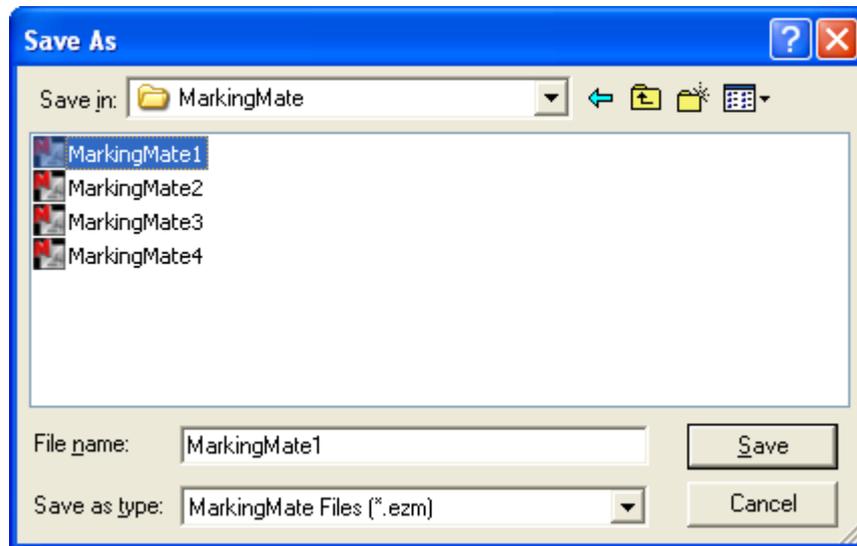
Fig.1.1.04

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 **MarkingMate** is '*.EZM.'

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1.1.6 Option

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

1.1.6.1 System

Under the "System" option, there are several settings related to **MarkingMate** system, see Fig.1.1.05.
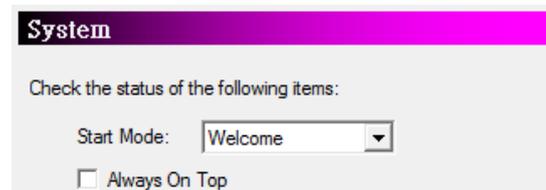
Fig. 1.1.05

Start Mode

Decide if show Welcome Dialog, open a new document, or open the latest file while markingmate 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 MarkingMate on the top of all current using programs.

Fig. 1.1.06

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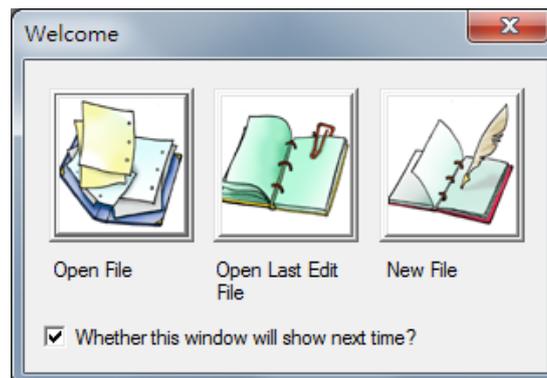
1.1.6.2 LogFile Setting

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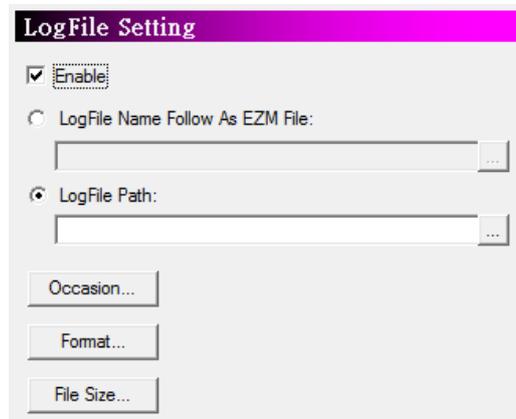
Fig. 1.1.07

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.
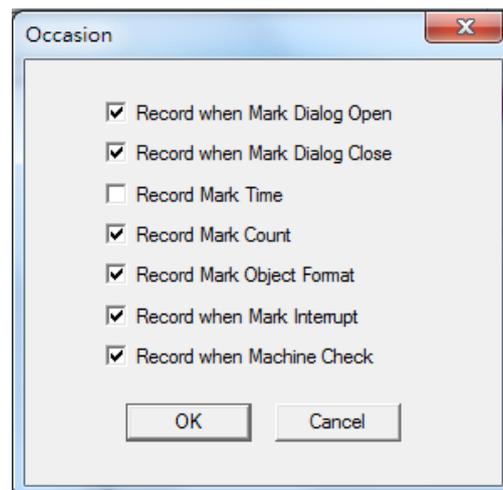
Fig. 1.1.08

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 Mark Object Format

Record the object format information.

Record when Mark Interrupt

Record the message while interrupt happened.

Record when Machine Check

Record the message of machine checking.

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Format
Click "**Format**" and a dialog box will appear asFig.1.1.09.
Format of each item in the log file can be edited here.
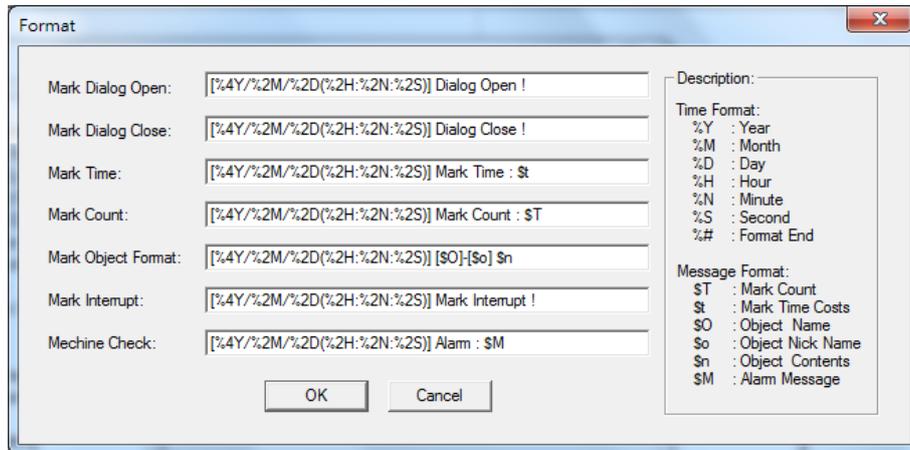
Fig. 1.1.09

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:
[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.

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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.
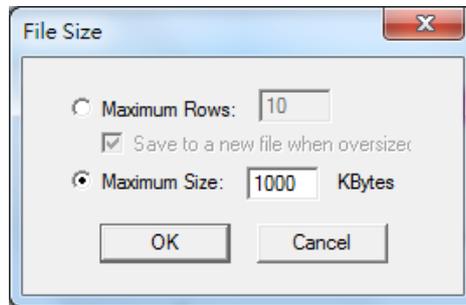
Fig. 1.1.10

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.
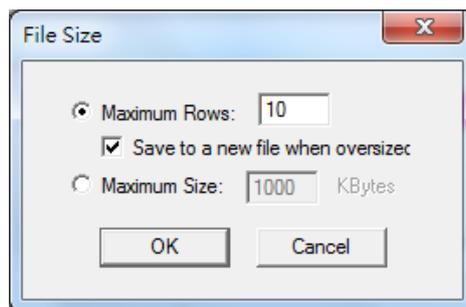
Fig. 1.1.11

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.

Fig. 1.1.12

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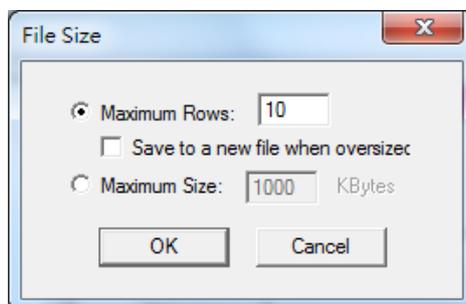
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Example 4:Select Maximum Size: 0 Kbytes or Maximum Rows: 0
The system will not change the file during recording, see Fig.1.1.13.

Fig. 1.1.13

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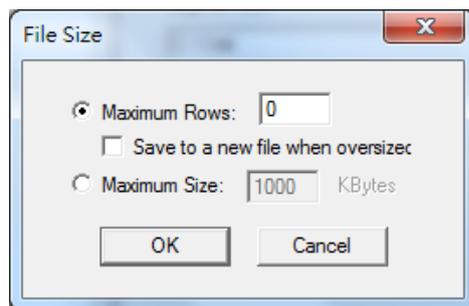
1.1.6.3 Mark On Fly

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.
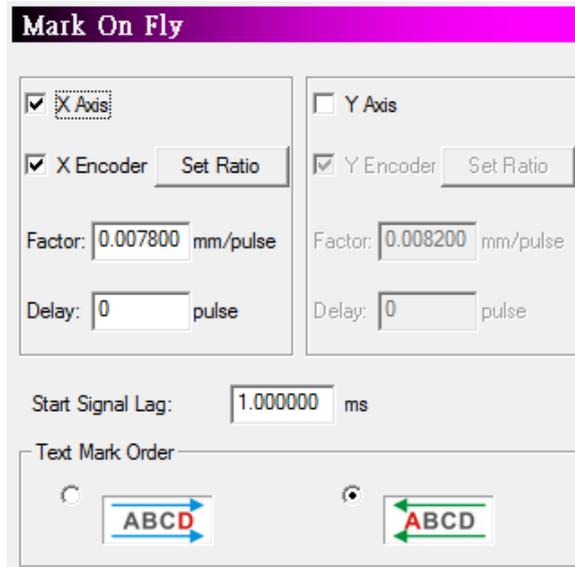
Fig. 1.1.14
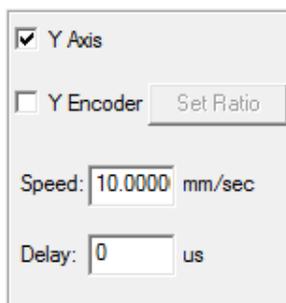
Fig. 1.1.15
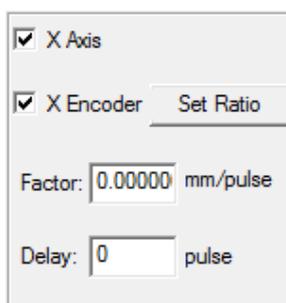
Fig. 1.1.16

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

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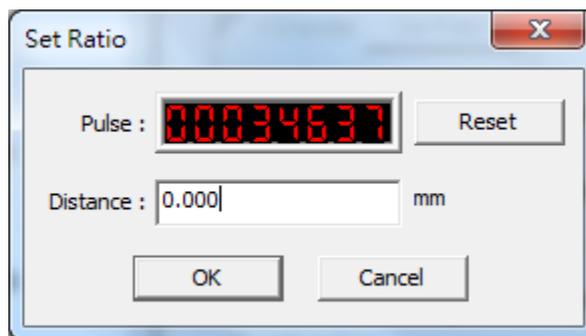
Fig. 1.1.17

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 be placed such as Fig.1.1.18.
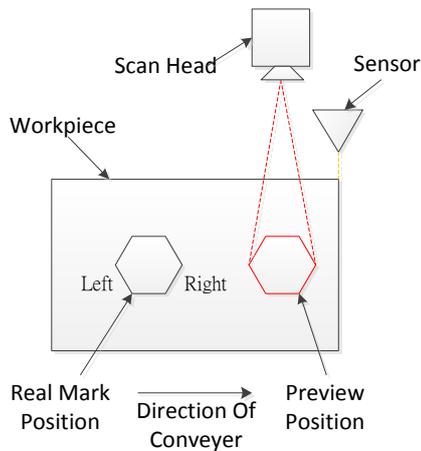
Fig. 1.1.18 Different Position   Fig. 1.1.19 Same Position
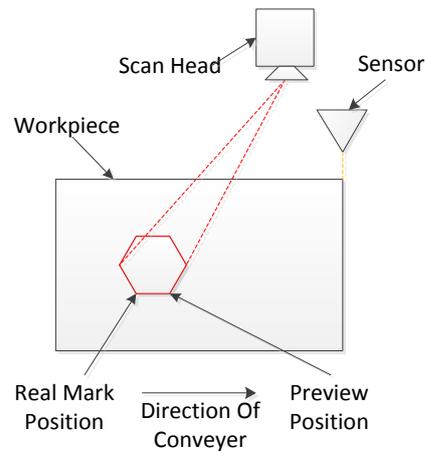
Adjustment Description

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.

1.1.6.4 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".**

Fig. 1.1.20

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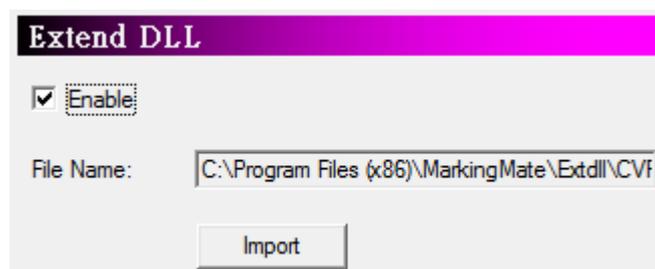
1.1.6.5 Auto Text Macro

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.

Auto Text Macro

Auto Text DLL Name:

AutoModeCommPort.dll
AMAdvSerial.dll
AutoModeExcel.dll
AutoModeExternal.dll

Import DLL
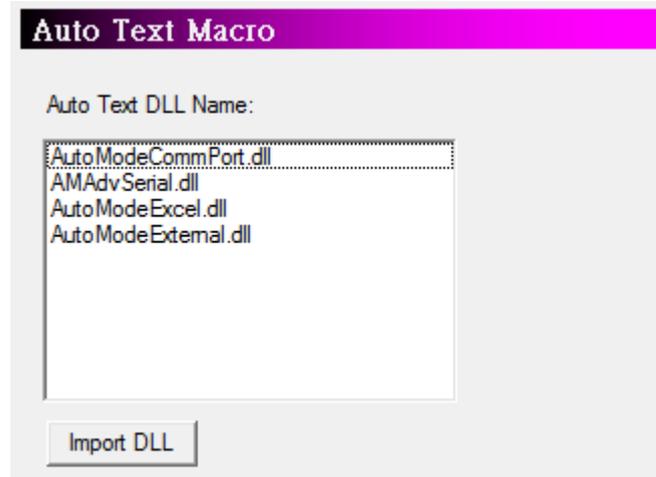
Fig. 1.1.21

1.1.6.6 Machine Check

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

Machine Check

☑ Machine Check

Mark reach max amount   OUT 2 ▼
Autotext reach max   OUT 4 ▼
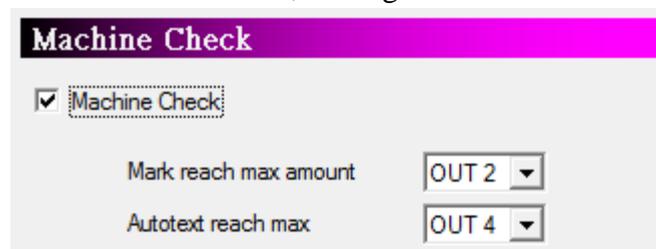
Fig. 1.1.22

1.1.6.7 Automation

Only MC-1, MC-3 and PMC2 driver supports this function.
Buffered Pre Download
The system will pre download the marking data to the controller's memory buffer to fasten the marking speed, see Fig.1.1.23. Enable timeout can make sure the buffering data will be refreshed every setting time period.

Automation

Buffered Pre Download
☑ Enable Timeout
Timeout: 1   sec

Fig. 1.1.23

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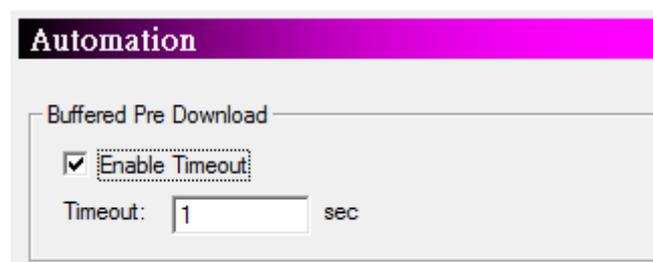
1.1.6.8 Motion Config

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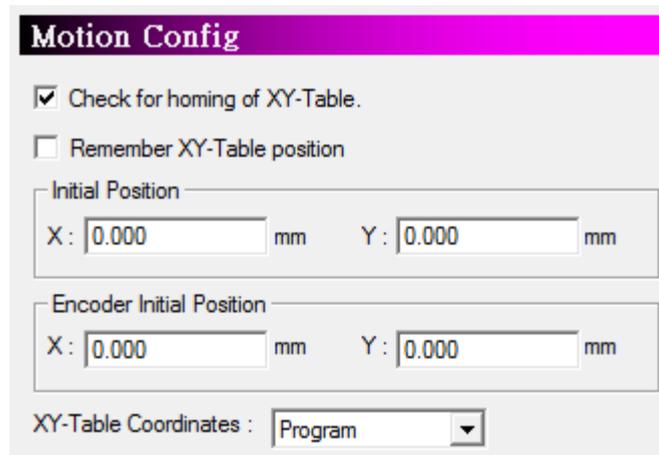
Fig. 1.1.24

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.
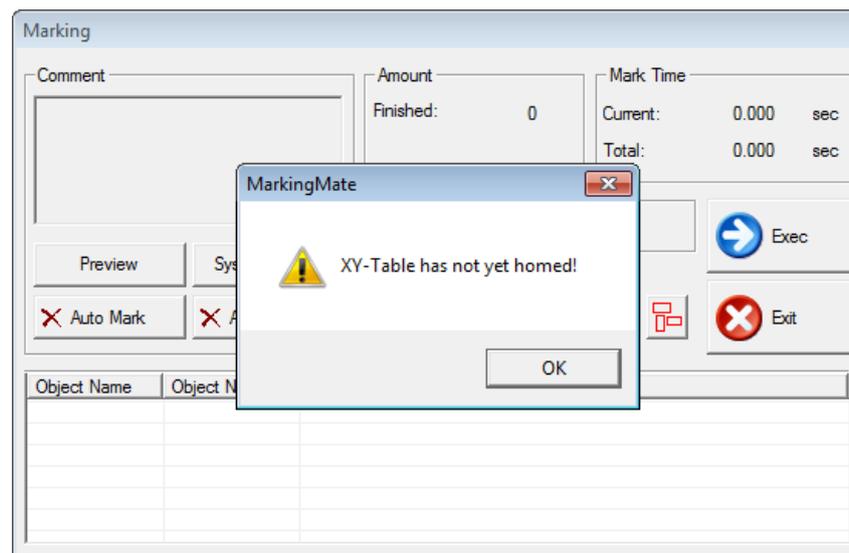
Fig. 1.1.25

Remember XY-Table position.
Save the current position of XY-Table when exiting **MarkingMate**.
Initial Position
Set the initial position for XY-Table.
Encoder Initial Position
Set the initial position for encoder.
XY-Table Coordinated
Set coordinate of XY-table is based on program or mechanical

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1.1.6.9 ShortKey

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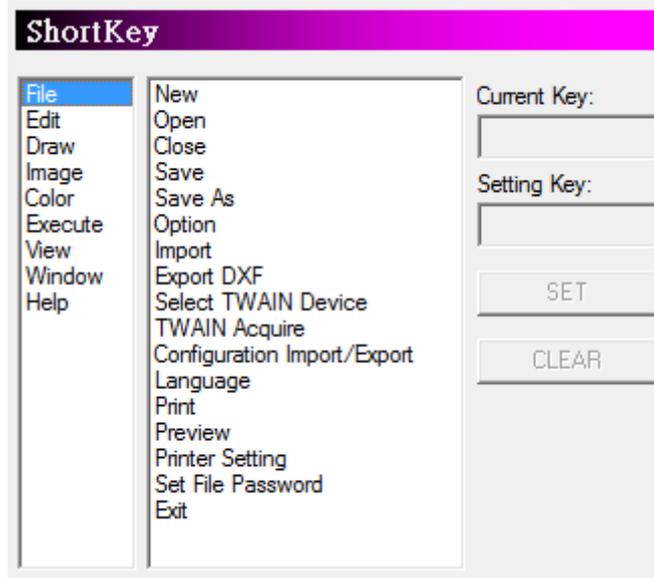
Fig. 1.1.26

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.

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1.1.6.10 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.
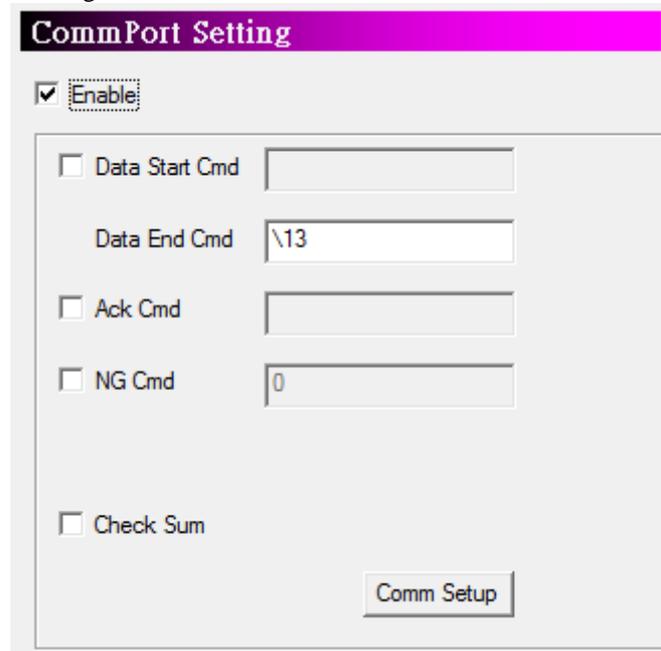
Fig. 1.1.27

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.
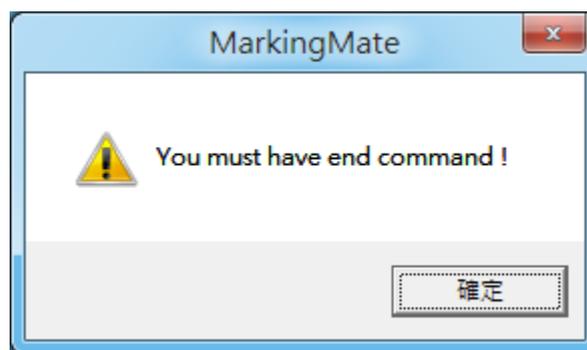
Fig. 1.1.28

Ack Cmd
Setting this parameter, the software will transmit this value to the host to report the 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.
Check Sum
Decide to transmit the "Check Sum" or not to do the further verification of information. The operation

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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.

Fig. 1.1.29

Comm Setup

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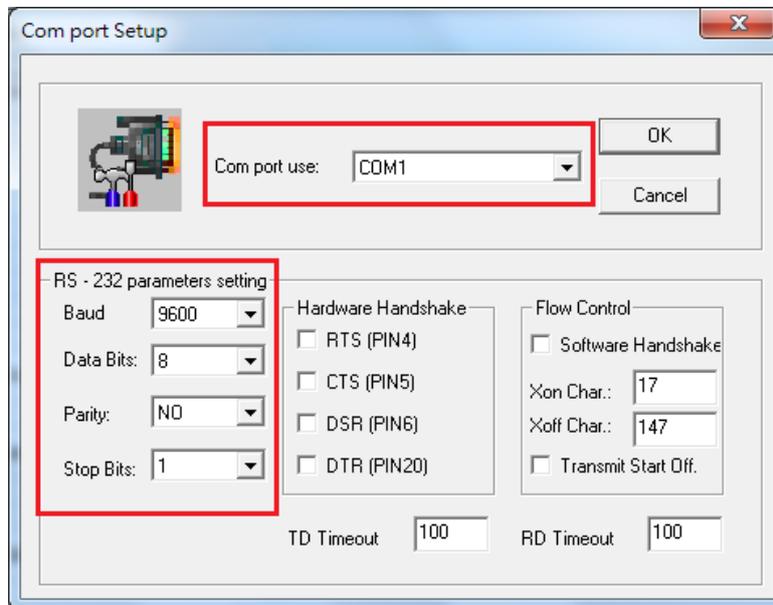
Fig. 1.1.30

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 flame of Fig.1.45 if not necessary.

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1.1.6.11 Config

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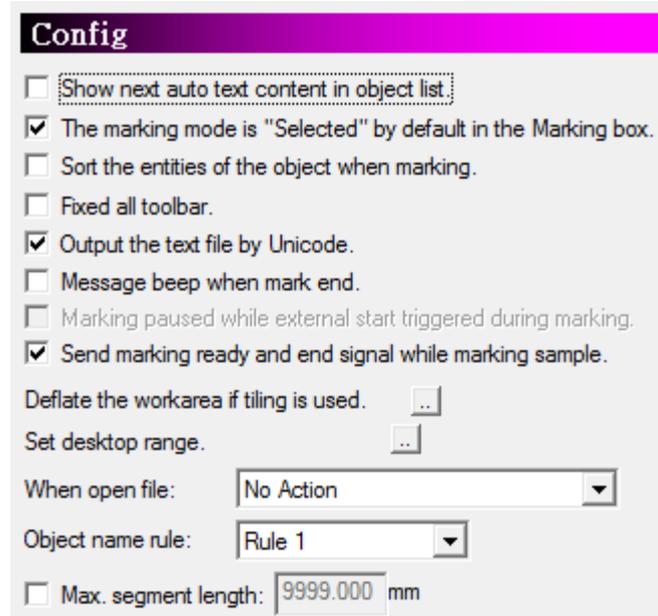
Fig. 1.1.31

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.
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.
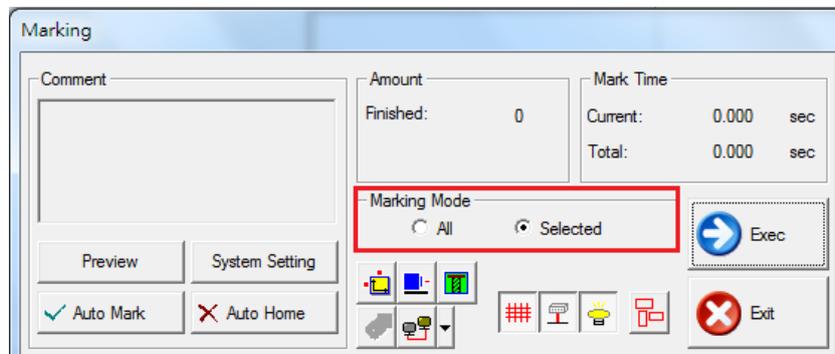
Fig. 1.1.32

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 immovable.
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.
Marking paused while external start triggered during marking.
Users could pause marking process during marking from external start.

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Send marking ready and end sample while marking sample.
After checking this box, marking ready signal will send out before marking sample, marking end signal will send out after marking sample.
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.
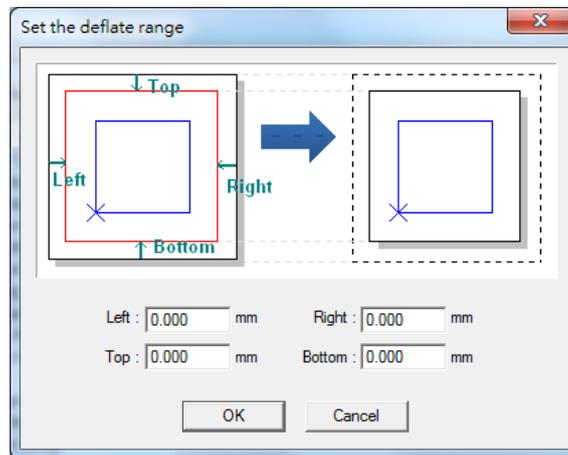
Fig. 1.1.33

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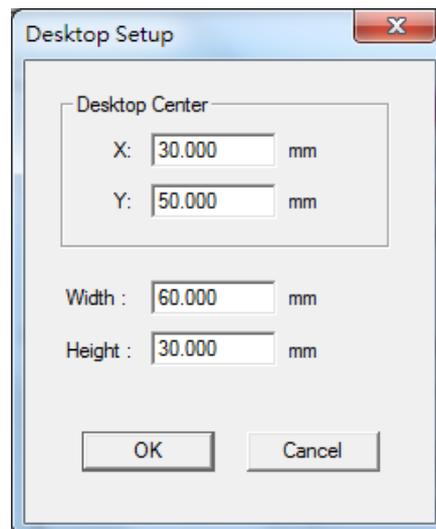
Fig. 1.1.34

When open file.
Choose a default action while opening a file.

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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.
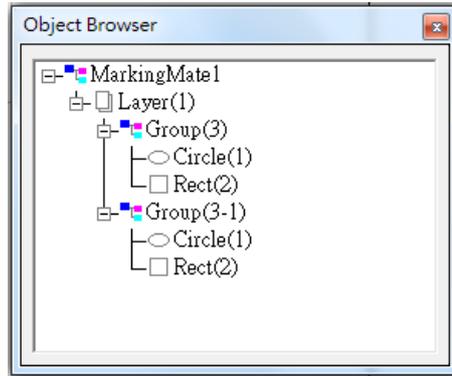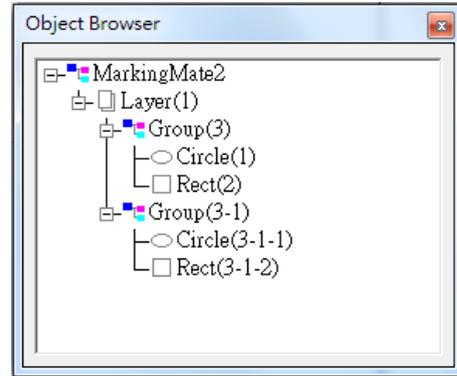
| Fig. 1.1.35 | Fig. 1.1.36 |

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

1.1.6.12 Lens Manager

All lenses users have will be listed here, see Fig.1.1.37.
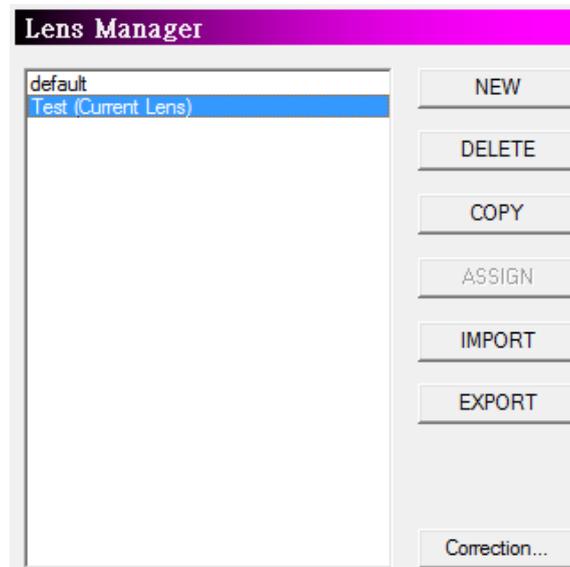
Fig. 1.1.37

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

Click "**Lens Cor…**" button and do further settings for lens.

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Lens Setup

The system will use math formula to correct the barrel distortion, trapezoid distortion, or parallelogram distortion resulted from lenses and optical devices. Adjust lens parameter properly will make the marking result be the same as the original design. Fig.1.1.38 shows the lens setup under normal mode. Fig.1.1.39 is the lens setup under dot mode.
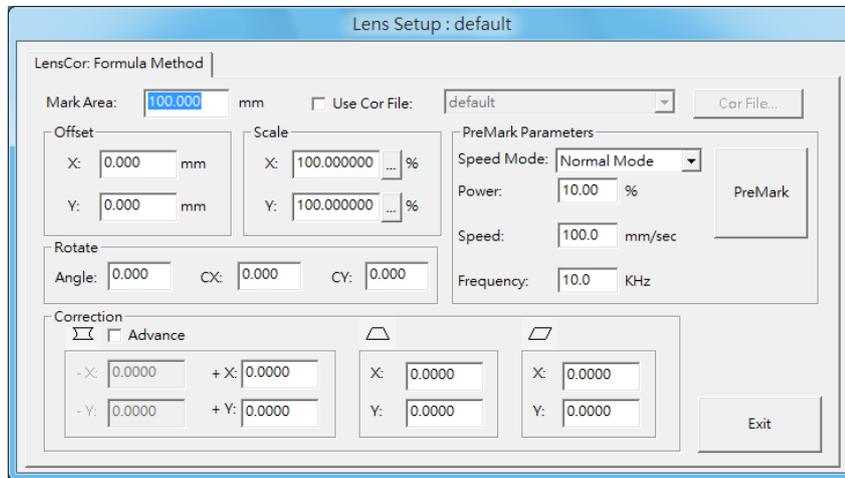
Fig. 1.1.38 Under Normal Mode

Fig. 1.1.39 Under 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 File"** function.
Offset	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.
Scale	If the size of marking result (real size) are different from the original design (theoretical size), user can use the scale function

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	of X and Y to fix it. The unit of scale is percentage (*theoretical size / real size * 100*, the default value is 100). For example, if real size is smaller, this value should be larger than 100.
Rotate	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.
Correction	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 **Distortion Correction.**
Advance	Allow users to input different correction values at negative X and Y direction.
PreMark Parameters	Setting the parameters for PreMark.
Speed Mode	Select to use Normal Mode or Dot Mode to Premark.
Power	Laser power percentage for PreMark.
Speed	Laser speed (mm/sec) for PreMark.
Frequency	Laser frequency for PreMark.
Pitch (Under Dot Mode)	The distance between dot and dot on the marking route when doing PreMark.
Delay (Under Dot Mode)	The waiting time a lens needs to start radiating when move to a dot while doing PreMark.
Pulse Width (YAG Laser)	The spending time for each pulse.
PreMark	Click the "PreMark" button, the laser will mark according to the parameters setting above.

Please follow the steps listed below to do the correctionand 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 Table1.2 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 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.

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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)
MarkResults				
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)

Table1.1

Correction of trapezoid 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	Reduce the Y value of △ field

Table1.2

General Introductions

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

● **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. 1.1.40.
Once finding that still need to adjust these values after finishing lens correction, users can come back to this dialog box to modify them.

Fig. 1.1.40

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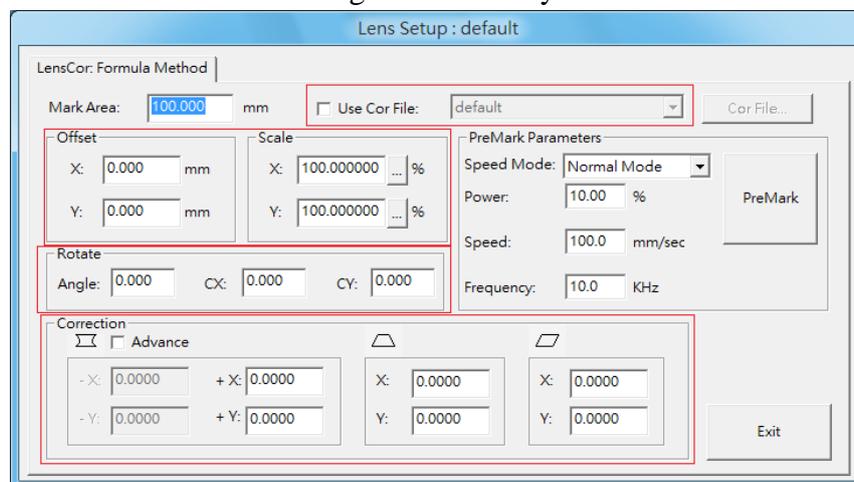
● **New/Edit Correction File**

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. 1.1.41. Please note that each lens can only choose one method.
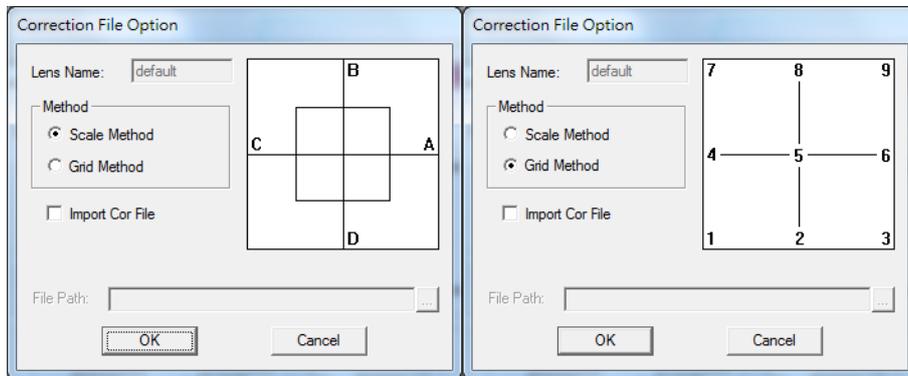
Fig. 1.1.41

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.

● **Scale Method**

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.1.1.42.
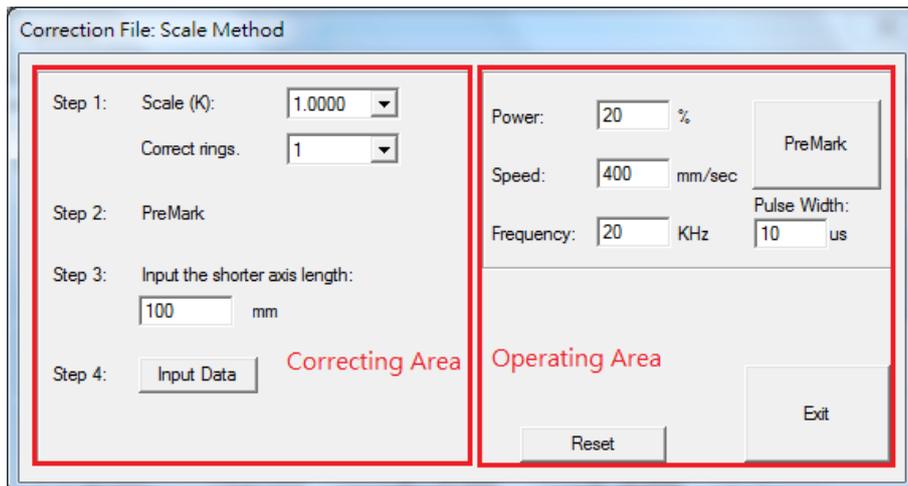
Fig. 1.1.42

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.26)

Reset

The purpose of this function is to reset the setting of correcting area, or import a correction file to do correction, see Fig.1.1.43.

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.
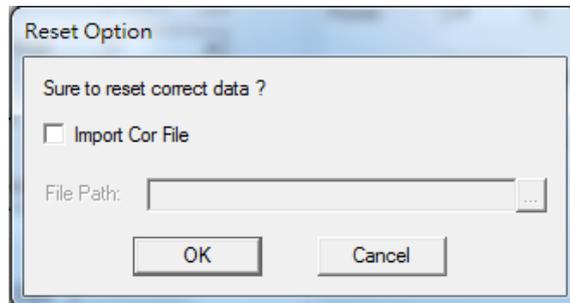
Fig. 1.1.43

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 more correct rings users select the better accuracy they will get.
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.1.1.44.
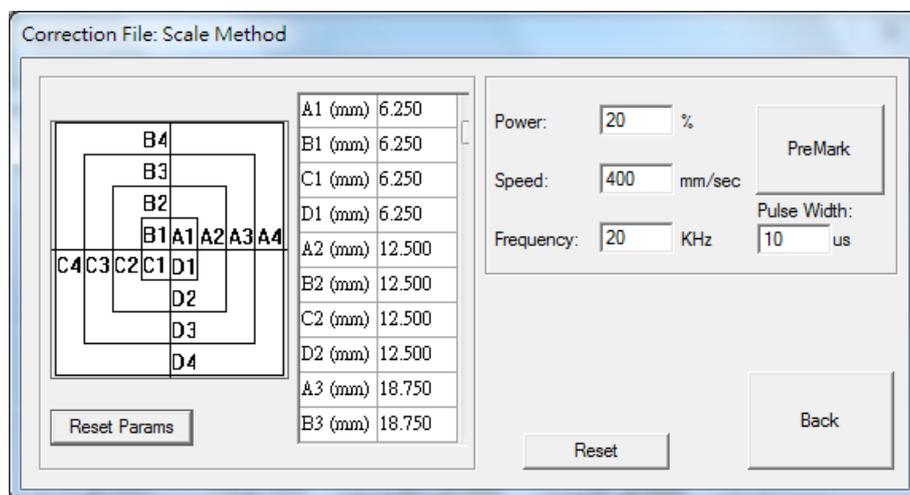
Fig. 1.1.44

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.

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● **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 1.1.45.
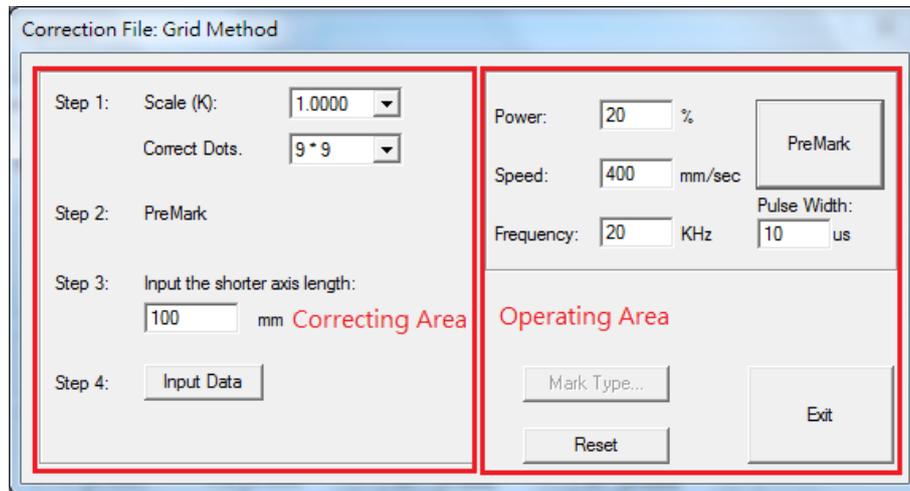
Fig. 1.1.45

Operating Area
On the top of this area is the Premark parameters (refer to p.26)

Mark Type
To use the function, users must click "Input Data" at "Correcting Area" first, see Fig.1.1.46.
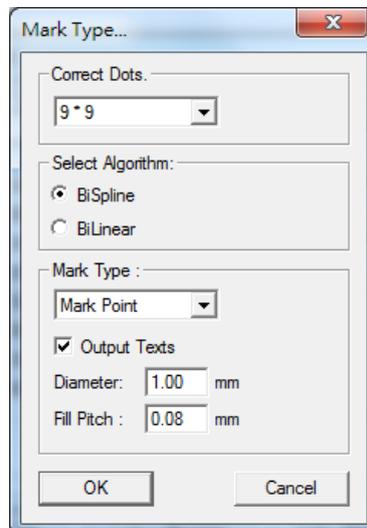
Fig. 1.1.46

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

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 set

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

Output Texts

If checked the "Output Texts" checkbox, the representing numbers will appear next to the grid point or line, see Fig.1.1.47.
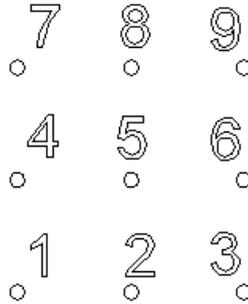
Fig. 1.1.47

Reset

Please refer to page 30.

Correcting Step

Step 1	Select the scale (K) value which is close to the voltage ratio of lens and driver output from the drop down menu. Then select the correct dots. More correct dots will get more accurate result.
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.1.1.48.
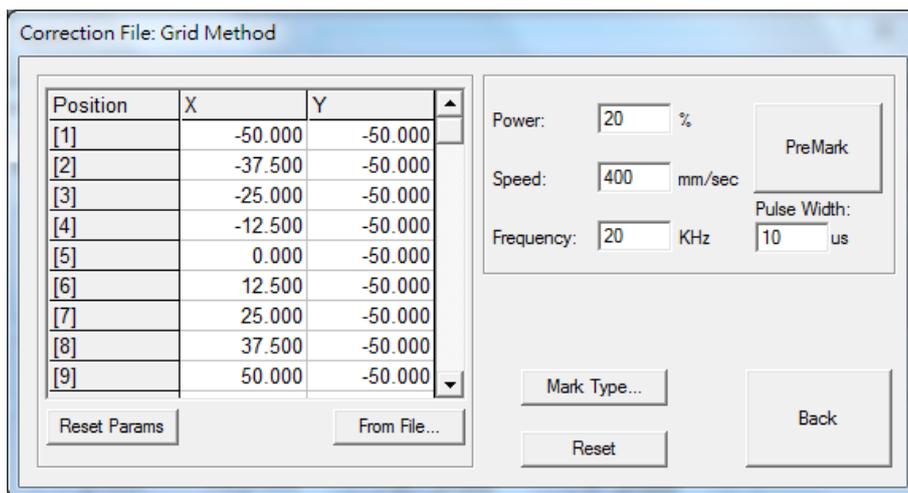
Fig. 1.1.48

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.

Reset Params.	Reset all correction data as the default values.
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.1.1.49.
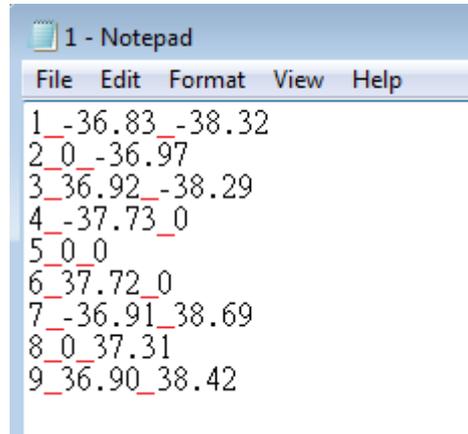
Fig. 1.1.49

1.1.6.13 Focal Axis Config

Users can enable focal axis for 3D marking application. See fig. 1.1.50
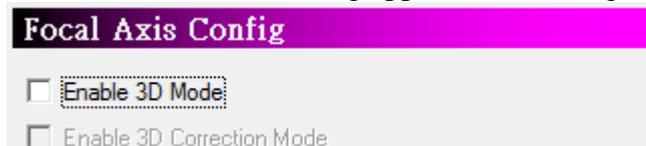
Fig. 1.1.50

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

1.1.6.14 Scan Head Config

Users can set the home position of scan head, enable multi-head, and activate sky writing from here, see Fig.1.1.51.

Fig. 1.1.51

Home Position	Setting original points position in X direction and Y direction.
MultiHead	Enable multiple scanners work simultaneously.
Enable	Enable MultiHead function.
Card Output	Setting main controller synchronize signal output. Value is between from 1 to 16.
Card Input	Setting client controller synchronize signal input. Value is between from 1 to 16.
ACC.	Enable Sky Writing function. **Sky Writing** is developed for eliminating scanner motor physical inertia caused laser spot distribution is uneven at start marking, end marking, and poly-line marking. See fig 1.1.52. Enable Sky Writing will need to clear Start point delay, Poly delay, End point delay, and mark delay to 0 at first, than rebuild delay parameters. See fig 1.1.53, and refer to sector 3.2.4 to rebuild the parameters.

Fig. 1.1.52

Fig. 1.1.53

General Introductions

Enable	Use Sky Writing function。To use Sky Writing will need controller support.
Acc. speed	Greater acc. speed will need shorter time to attend the stable marking speed. This value must more than 0.
Limit angle	Sky writing is disabled when poly-line outer corner angle is smaller than limit angle (not include equal to limit angle). See fig. 1.1.54. Value is from 0 to 180, which set to 0 means forced to use Sky Writing on whole marking process, and set to 180 means forced not to use Sky Writing during marking.
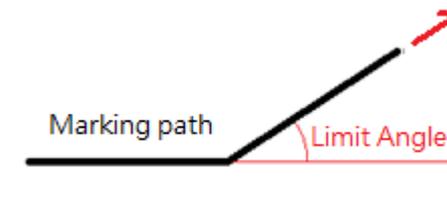
Fig.1.1.54

1.1.6.15 Power Setting

Enable/disable the power settings, see Fig 1.1.55

Fig. 1.1.55

Power Setting
Time for full power variation
Time period from zero and 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

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Set the power under Power Saving mode.

General Introductions

1.1.6.16 Dot Mode

Enable this function when requiring a special dot features on the marking object, see Fig.1.1.56. For example, mark a line with dot feature, like Fig.1.1.57. The main purpose of this function is to reach the dot effect through extending the distance and laser staying time of each dot.

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.
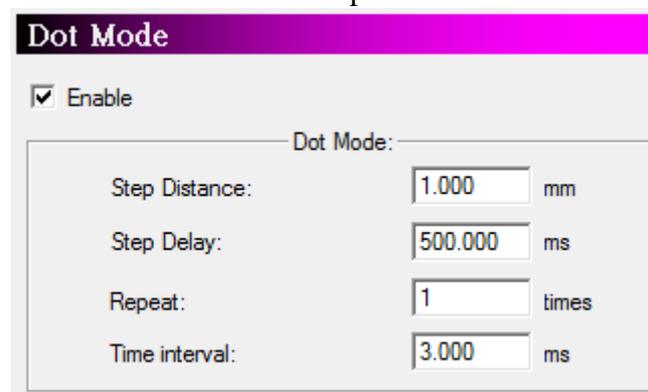
Fig. 1.1.56
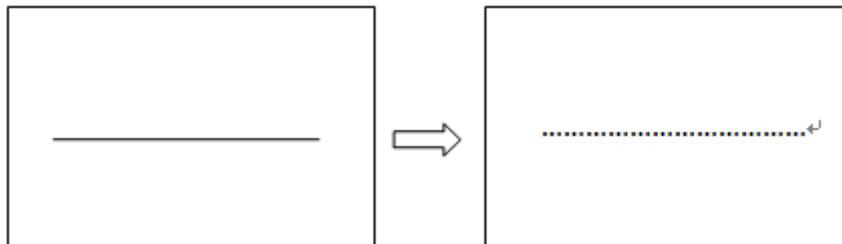
Fig. 1.1.57

1.1.6.17 Laser Config

Allow users to do some laser related settings, see Fig.1.1.58.
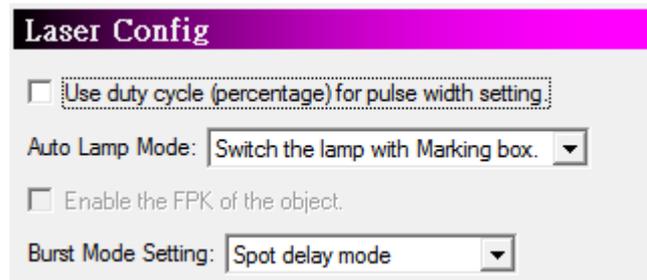
Fig. 1.1.58

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.1.1.59.

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.1.1.60.
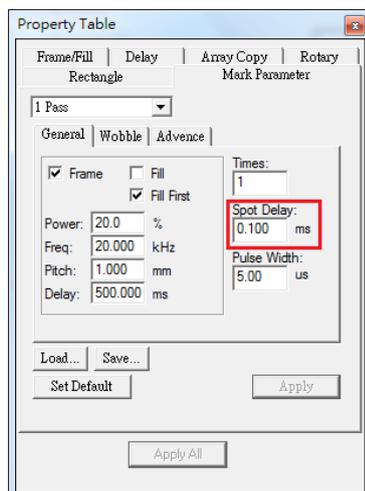
Fig. 1.1.59
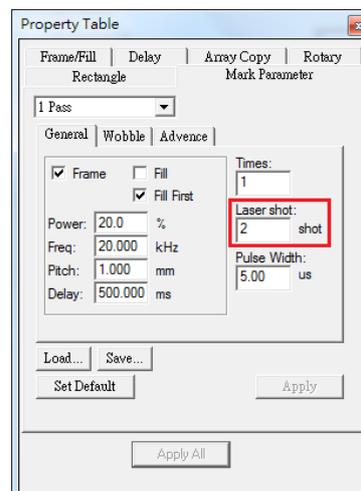
Fig. 1.1.60

1.1.6.18 Edit

Set the edit function of the system, such as display the ruler and grid or not. The checked options will be the default value. See Fig.1.1.61.
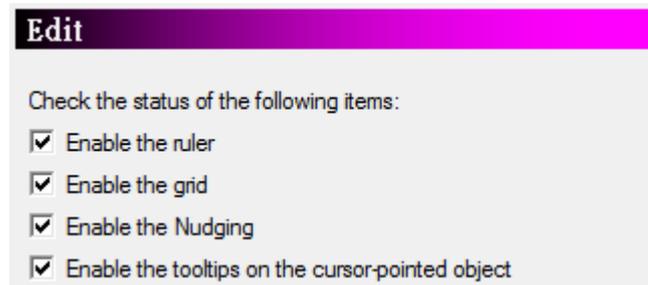
Fig. 1.1.61

1.1.6.19 Ruler

Enable/disable the ruler to appear on the work area, see Fig.1.1.62.Use ruler can help user measure the actual size of the object.
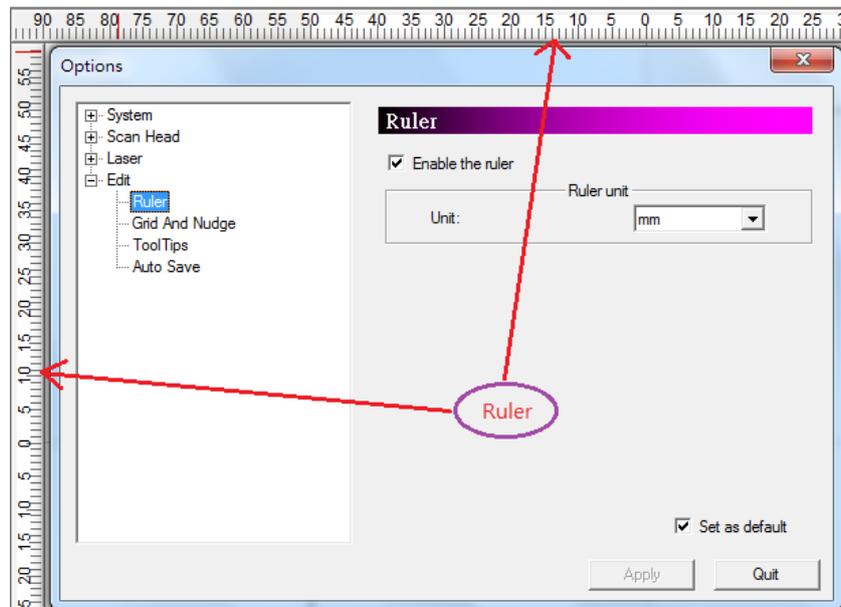
Fig. 1.1.62

Ruler Unit: mm or inch

General Introductions

1.1.6.20 Grid and Nudge

Enable/disable the grid and nudging, see Fig.1.1.63. Grid is used to help users measure the actual size of the object. Enable nudge, users can adjust the object's position through direction key according to setting nudge measure.
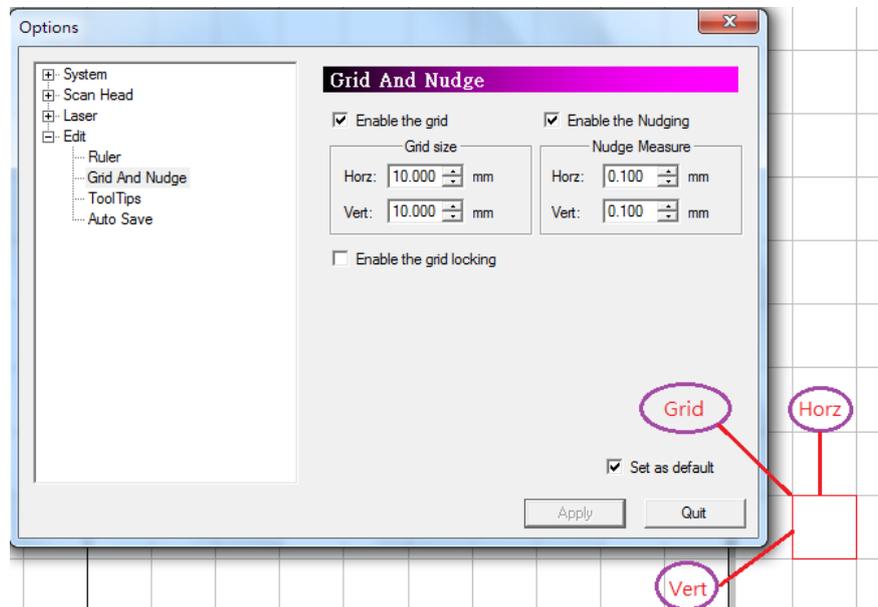
Fig. 1.1.63

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.

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1.1.6.21 ToolTips

Settings about tips of objects, see Fig.1.1.64.
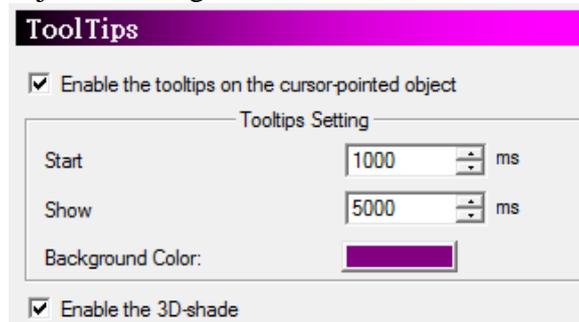
Fig. 1.1.64

Enable the ToolTips on the cursor-pointed object
ToolTips shows the info of the selected objects, see Fig.1.1.65.
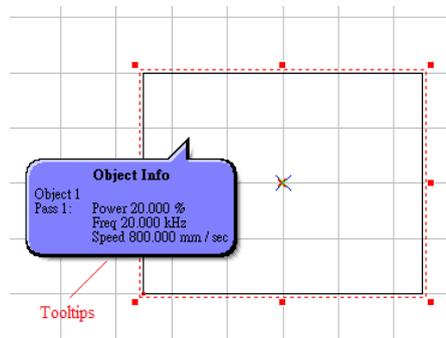
Fig.1.1.65

ToolTips Setting
Start Span   Span for ToolTips to appear.
Show Span   ToolTips continues time.
Background Color   Background color of ToolTips.
Enable the 3D-shade   Enable/disable the 3D-shade.

1.1.6.22 Auto Save

Enable/disable the Auto Save function, see Fig.1.1.66.
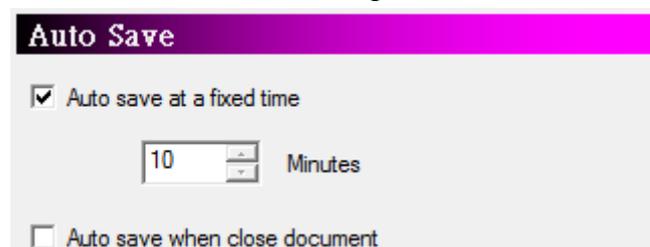
Fig. 1.1.66

Auto Save Rule
Auto save at a fixed time
The system will save the documents automatically every time period users set in the field.
Auto save when close document
Executing auto save when closing the document every time.

General Introductions

1.1.7 Import

This function allows user to import an image file that was not originally created by MarkingMate, such as *.bpm or *.dxf. The system will automatically convert that file into a format supported by MarkingMate after using import function. 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, see Fig.1.1.67.
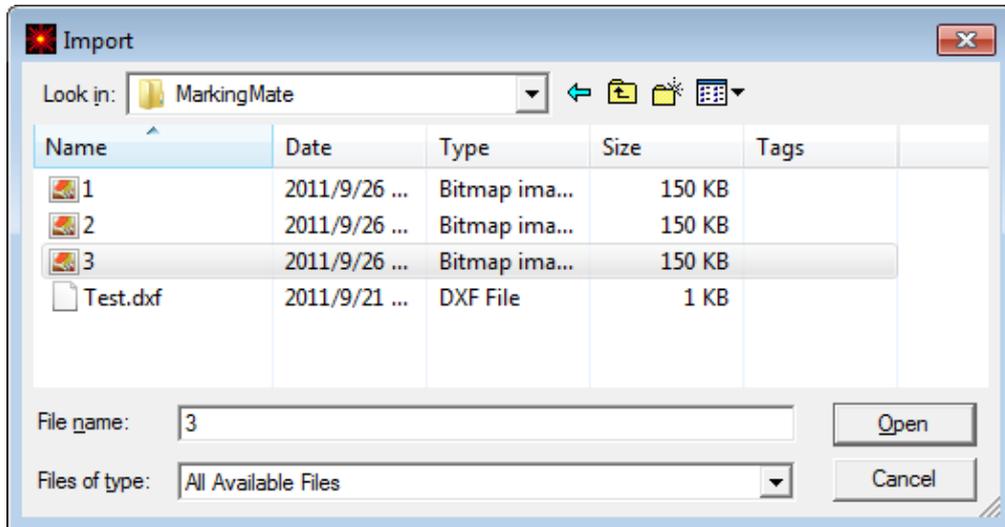
Fig. 1.1.67

Method:
- Click "File" from Menu Bar and select "Import" function.
- Click the ![icon] button from the Toolbar
- Press the [**Ctrl＋I**] key from keyboard.

Look in	Select the directory users want to import from.
File name	Type or select the file name to import.
Files of type	**MarkingMate** allows users to import various file types such as: DWG/DXF/PLT/CNC/GBR/DST/AI/BMP/EMF/PNG/PCX/CMP/FPX/PLT/CAL/ICO/JPG/PS/EPS/CLP/WMF/TIF/CUR/PSD/TGA.

1.1.8 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.1.1.68 will appear.
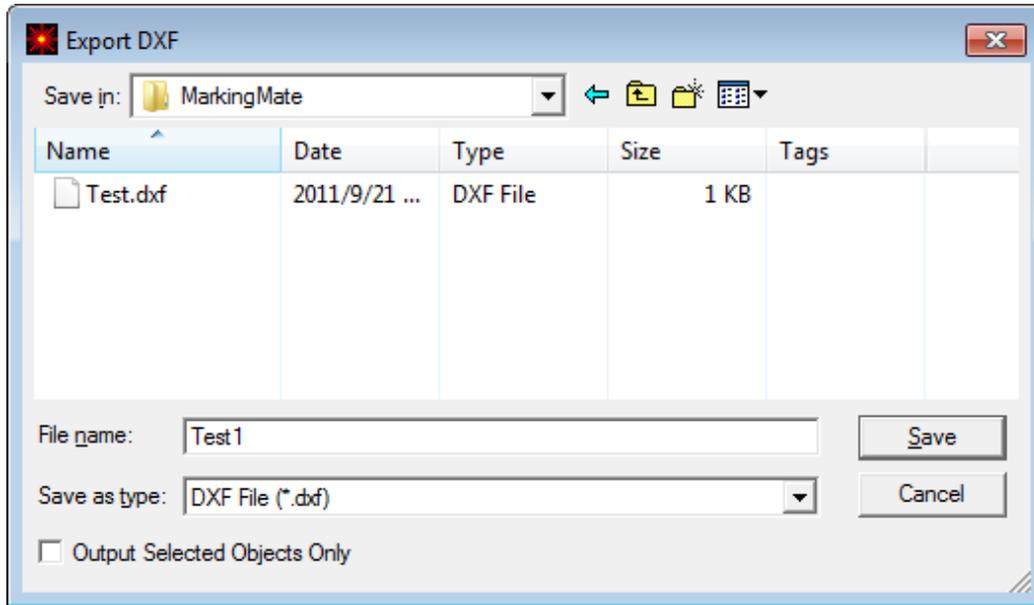
Fig. 1.1.68

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.

1.1.9 Select TWAIN Device
Select a supported scanner, see Fig.1.1.69.
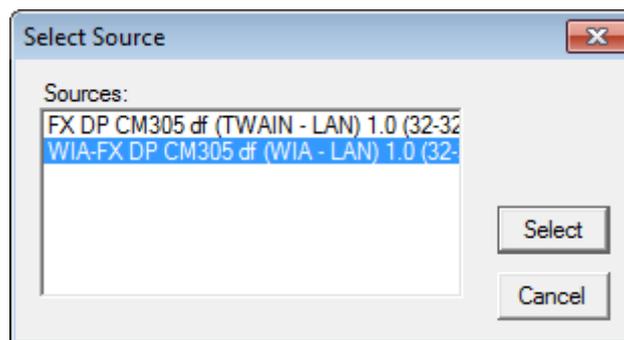
Fig. 1.1.69

1.1.10 TWAIN Acquire

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

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1.1.11 Configuration Import/Export

Use this function to back-up or restore current configuration, such as application configuration, object default setting, driver configuration, lens setting, machine check configuration and lens correction file.

Method:

Export:

1. Click on "File"➔ "Configuration Import/Export" to bring out dialog seen as fig. 1.1.70.

2. Check on any option then choose a folder by clicking on "…" button or filling the editor with path folder directly. After that click on the "**Export**" button. Please notice that "*.len (Lens cor. file)" is used at version 2.4., thus this option is for import only.
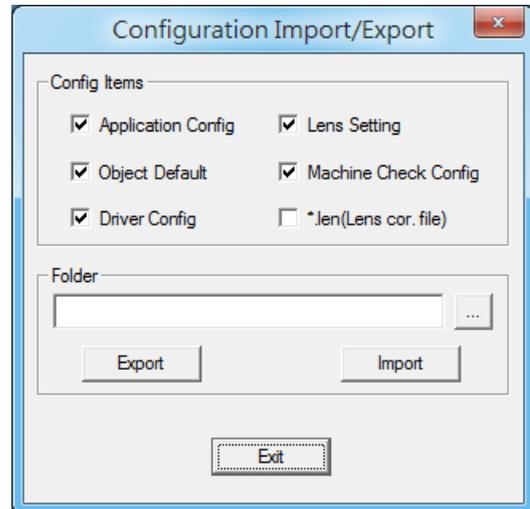
Fig. 1.1.70

Import:

1. Click on "File"➔ "Configuration Import/Export" to bring out dialog seen as fig. 1.1.71.

2. Check on any option then choose a folder by clicking on "…" button or filling the editor with path folder directly. After that click on the "**Import**" button.

3. If file is already existed, will pop-up a dialog to confirm to replace, skip, or rename the file. See fig. 1.1.70.
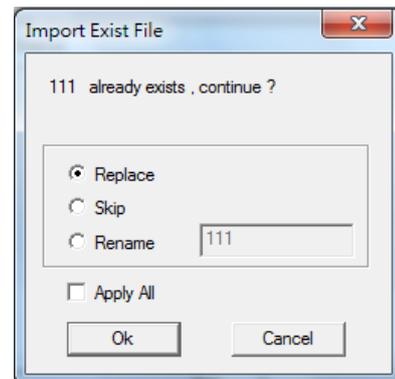
Fig. 1.1.71

4. After import is completed, click on "**Yes**" when asking to restart software.

1.1.12 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, German, Japanese, Turkish, and Traditional Chinese, see Fig.1.1.72.

Fig. 1.1.72

1.1.13 Print

Print the current document, see Fig.1.1.73.
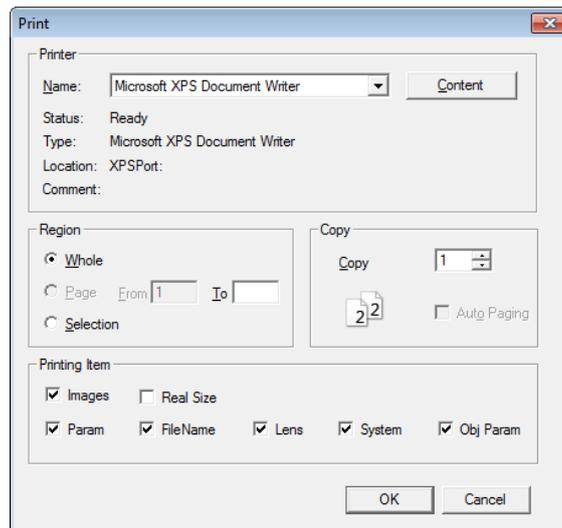
Fig. 1.1.73

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 OS and the manufacture of the printer.
Region	Select the region user want to print
Whole	Print all of the data in the work area
Page	Print the selected page(s).
Selection	Print the current used page
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)

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1.1.14 Preview

Preview the current document before printing it. Fig.1.1.74 is the function of preview.

Fig. 1.1.74

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 user to view the document more convenient.
Images, Param, File Name, Lens, System, Obj Param – Select the parameters users want to display while printing.
Close – Return to the edit menu

1.1.15 Printer setting

Further setting about the printer, see Fig.1.1.75.
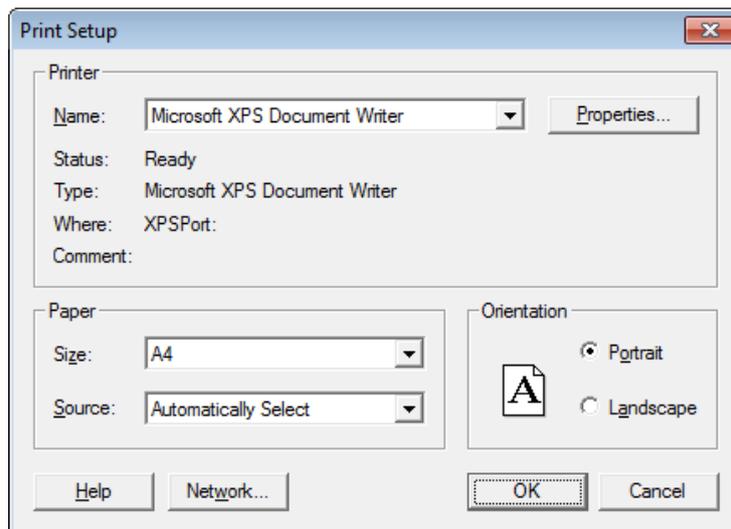
Fig. 1.1.75

Printer
  Select the printer
Paper
  Select the paper source
Direction
  Select horizontal or vertical print
Content
  Detail printer setting

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1.1.16 Set File Password

Set current file password. After setting the file password, user will be asked password for access the file.

1.1.17 MRU File

It will show "MRU File" if it's the user's to run MarkingMate, see Fig.1.1.76. Otherwise, it will display the previous used files (maximum 4 files), see Fig.1.1.77.
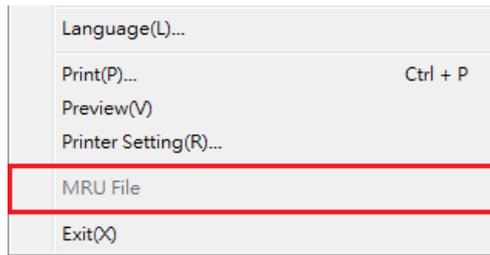
Fig. 1.1.76
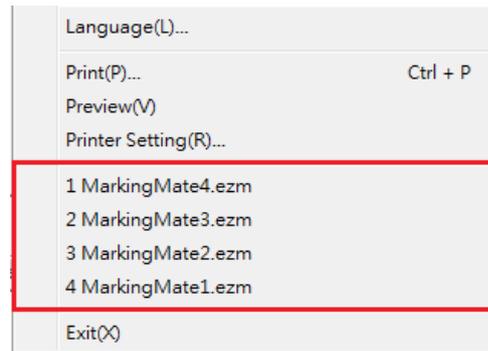
Fig. 1.1.77

1.1.18 Exit

Exit **MarkingMate** system.

Method:
Click "File" from Menu Bar and select "Exit" function.
Click the upper right button, see Fig.1.1.78.

Fig. 1.1.78

Click the upper left icon to exit the system, see Fig.1.1.79.

Fig. 1.1.79

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

General Introductions

1.2 Edit Menu

"Edit" menu offers the following functions:

Redo	Cancel the "Undo" action
Undo	Cancel the latest edition
Cut	Remove selected data and store it in the clipboard for another use
Copy	Duplicate selected data and store it in the clipboard for another use
Paste	Attach data from the clipboard to an assigned document
Delete	Delete and remove the selected data
Select All	Select all objects, including objects which are not located in working area.
Select Invert	Select the objects which are un-selected, including objects which are not located in working area and cancel the selected ones.
Replace…	Substitute the selected object by importing assigned object.
Combine	Combine two or more objects into one. This function allows several objects to share the same property settings
Break	Break on object into several objects.
Group	Combine two or more objects into one group.
UnGroup	Do the inversion of Group function
Set Circle Object Radius	Modify circle that radius same as **original radius** to **modified radius**.
Move to New Layer	System will create a new layer and move the selected object to that new layer.
Sort	Sort the connected parts of the selected object
Reverse	Set the object's start point as end point and the end point become the start point.
Mirror Horz	Invert an image on its horizontal axis. Left will become right and vice-versa
Mirror Vert	Invert an image on its vertical axis. Up will become down and vice-versa
Move to Center	Move the object to the center of working area.
Baseline	Align selected text along a designated path
Split	Do the inversion of baseline function
Trans-Curve	Transfer an object in to a curve line.
Nudge	Set the nudge measure of an object when using the direction key of keyboard to move that object.

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Jump Cross	Make the intersects of two objects turn into two objects without crossing
Welding	Make the selected objects do vector combination.
Contour	This function will create an outline from a selected bitmap image
Transfer to Image	Transfer the selected objects into an image
Align	Adjust the selected objects' position according to the assigned alignment.
Distribute	Adjust the selected objects' position according to the assigned distribution.

General Introductions

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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:
● Click "Edit" from Menu Bar and select "Redo" function.
● Click ⟳ button from Standard Bar.
● 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.

General Introductions

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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.

General Introductions

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:

Two Objects Overlapping   Three Objects Overlapping
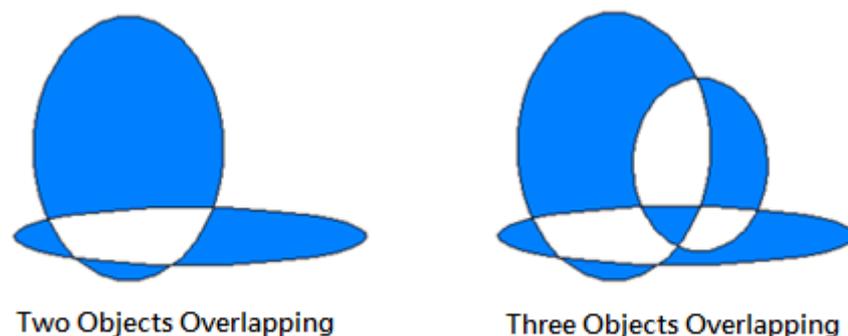
Fig. 1.2.01

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.

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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 Set Circle Object Radius

Modify circle that radius same as **original radius** to **modified radius**.
Method
● Click "Edit" from Menu Bar and select "Set Circle Object Radius" function.

1.2.15 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.

1.2.16 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.
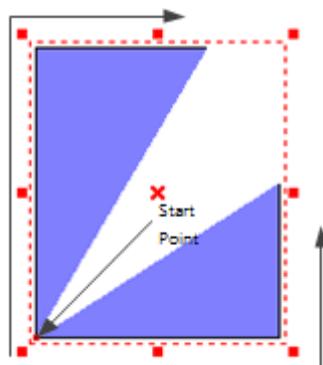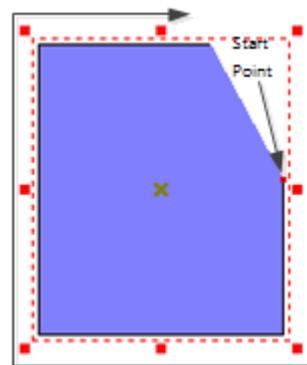
Fig. 1.2.02	Fig. 1.2.03

Method:
● Click "Edit" from Menu Bar and select "Sort" function.
● Click ⬚ button from Standard Bar.

1.2.17 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.

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1.2.18 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:
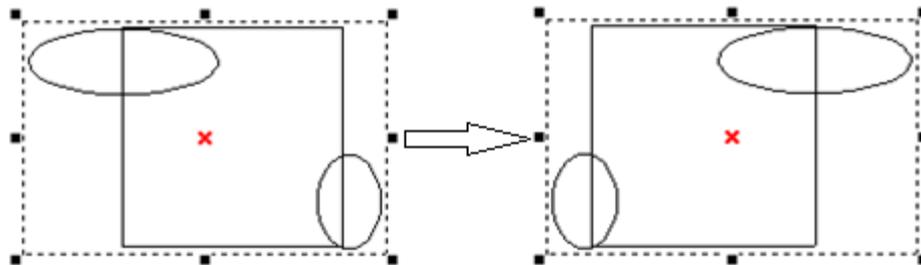
Fig. 1.2.04

1.2.19 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:
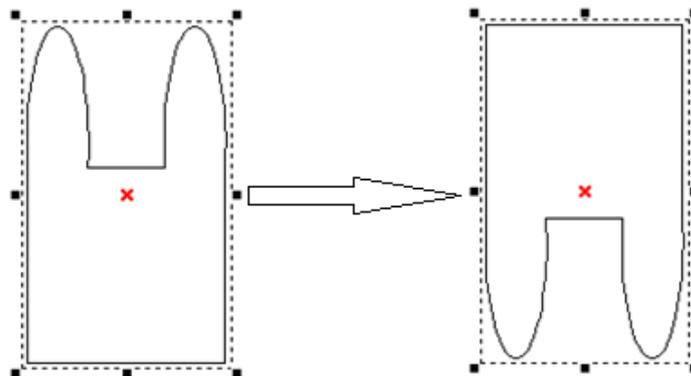
Fig. 1.2.05

1.2.20 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.

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1.2.21 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 � A, 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:
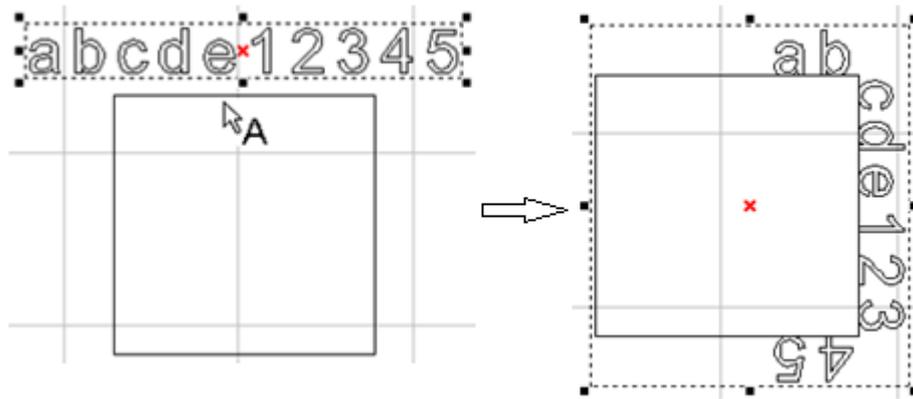
Fig. 1.2.06

1.2.22 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

General Introductions
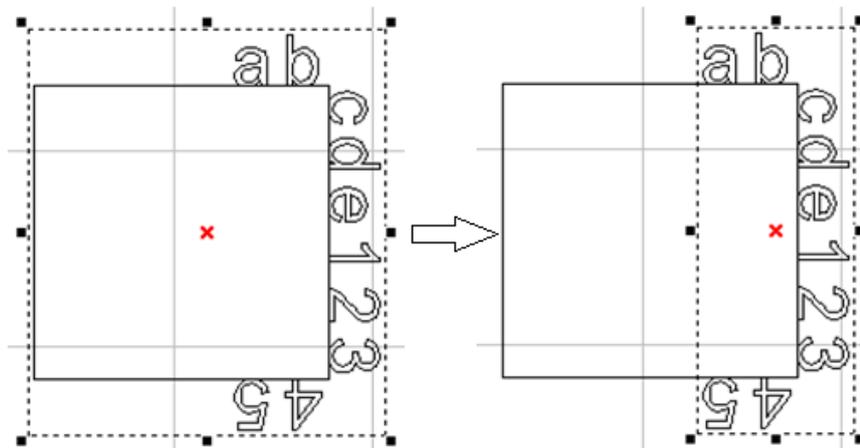
1.2.23 Trans-Curve

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.
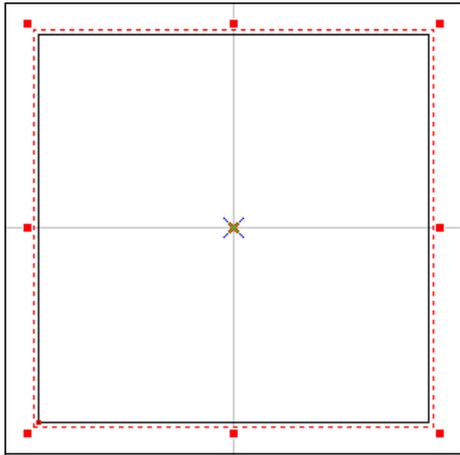
Fig. 1.2.08 Turn the Rectangle into Curve   Fig. 1.2.09 Edit Vertex (White Square is Vertex)
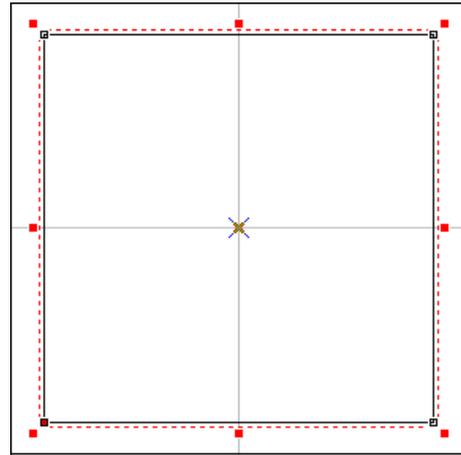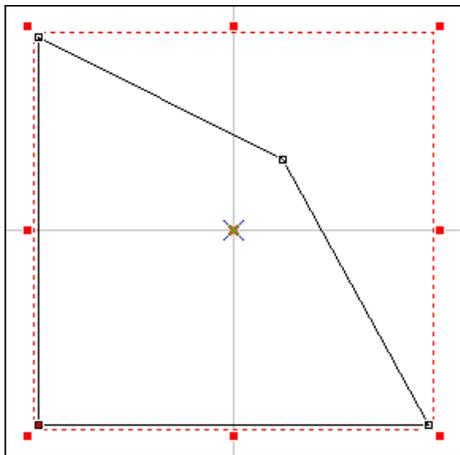
Fig. 1.2.10 Change the Shape by Drag the Vertex

Method:
● Click "Edit" from Menu Bar and select "Trans-curve" function.
● Click   button from Obj Property Bar.
● Press [**Ctrl＋U**] from keyboard.

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1.2.24 Nudge

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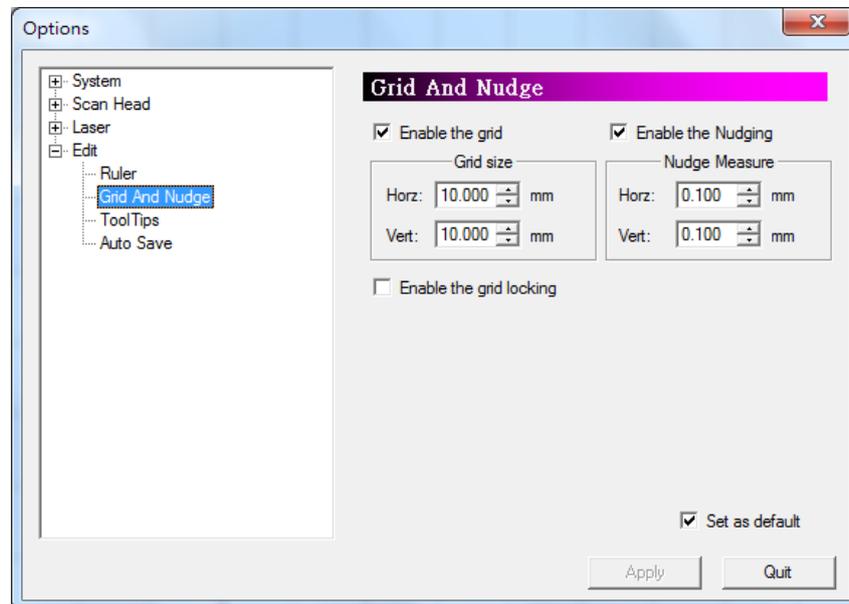
Fig. 1.2.11

Method:
- **Click "Edit" from Menu Bar and select "Nudge" function.**

1.2.25 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.
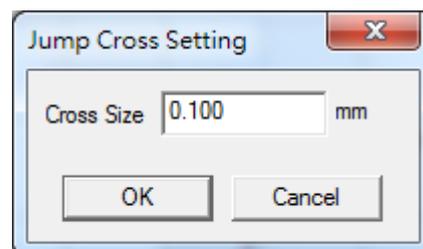
Fig. 1.2.12

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.**

General Introductions
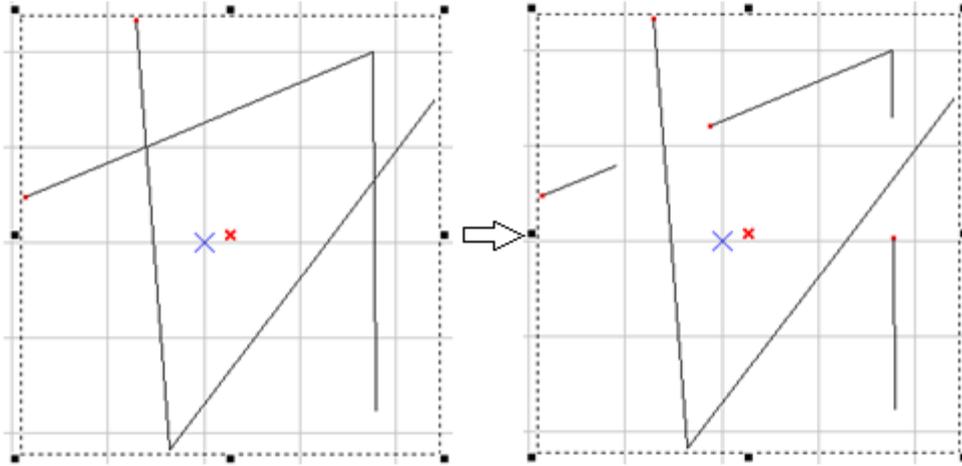
Fig. 1.2.13

1.2.26 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

General Introductions
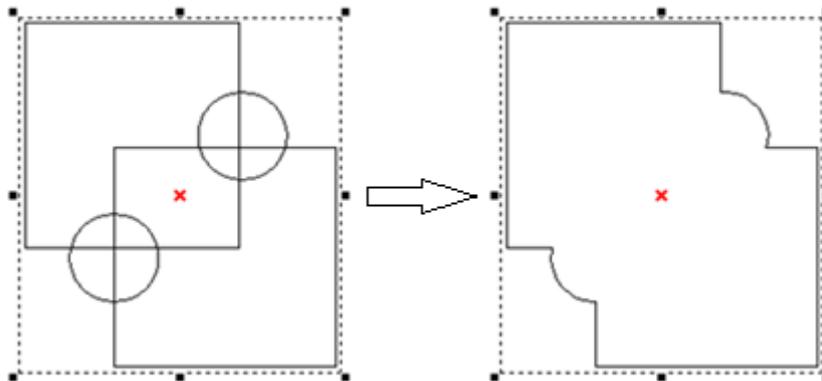
1.2.27 Contour

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.
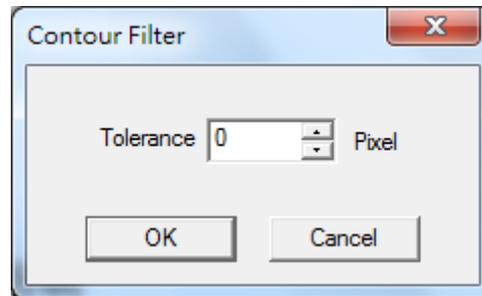
Fig. 1.2.15

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 they 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

General Introductions
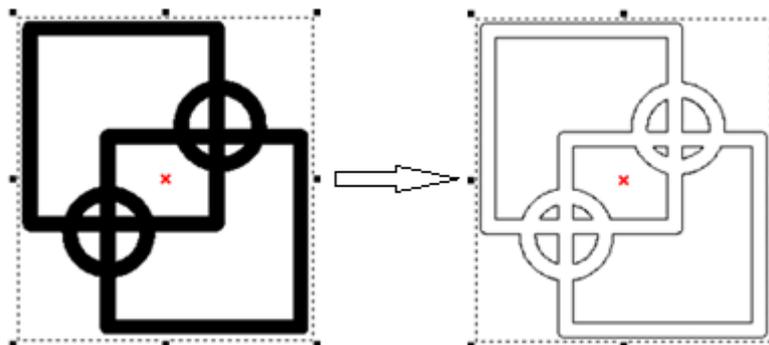
1.2.28 Transfer to Image

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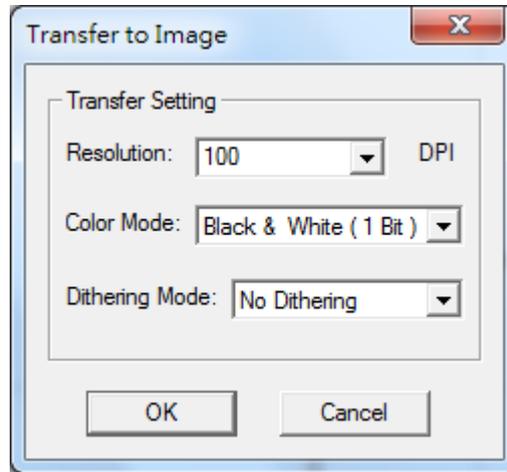
Fig. 1.2.17

Method:
- Click "Edit" from Menu Bar and select "Trans to Image" function.
- Press [**Ctrl＋T**] from keyboard.

1.2.29 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
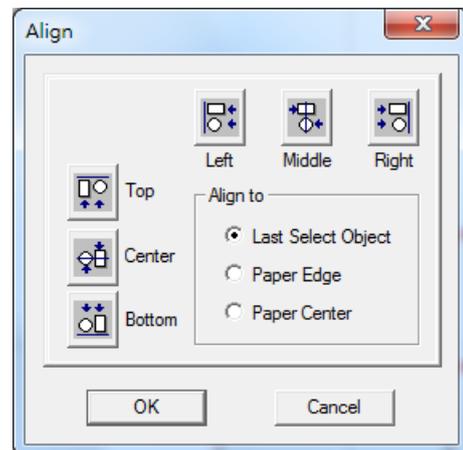
Fig. 1.2.18

Method:
- Click "Edit" from Menu Bar and select "Align" function.
- Click ⊟ button fromObj Property Bar.

General Introductions

1.2.30 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 area, or an adjustable border area.

Fig. 1.2.19

Method:

● Click "Edit" from Menu Bar and select "Distribute" function.

● Click button from Obj Property Bar.
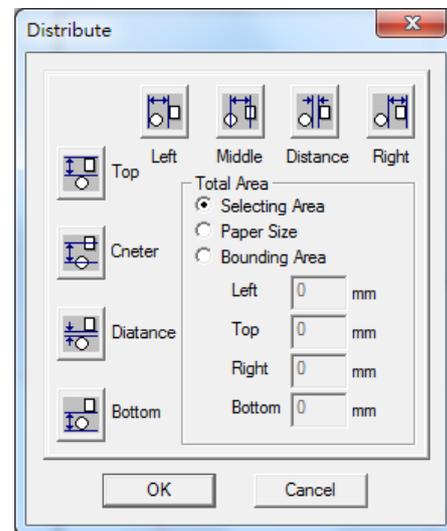
1.3 Draw Menu

"Draw" menu offers the following functions:

Vertex	Draw a vertex.
Line	Draw a straight 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.
Rectangle Text	Insert a rectangle text object.
1D Barcode	Create a 1D barcode.
2D Barcode	Create a 2D barcode.
Matrix	Create a matrix object.
Spiral	Draw a spiral object.
Control Object	Insert control objects.

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.29 1.1.6.8 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.

Marking Way:
The marking route of line or any curve object is from its start point to the end point.

1.3.3 Arc

Press the left button of mouse to set the start point of arc, the move the 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:
- Click "Draw" from Menu Bar and select "Arc" function.
- Click ⌒ button from Draw Tool Bar.

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.

General Introductions

Marking Way:

No Fill
Marking starts from
0 degree following
levorotarydirection,
see Fig.1.3.01.
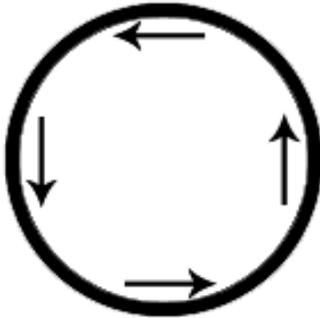
Fill
Marking starts from
left to right internal
and then marks
external frame, see
Fig.1.3.02.
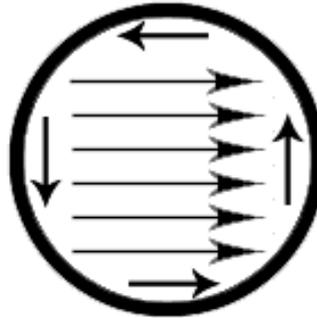
Fig. 1.3.01

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.
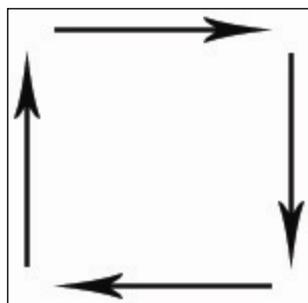
Fill
Marking starts from
left to right internal
and then marks
external frame, see
Fig.1.3.04.
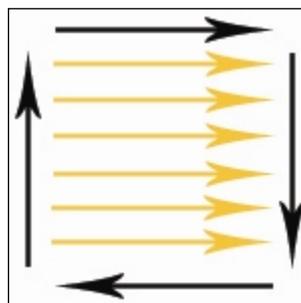
Fig. 1.3.03

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 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 right button of mouse to end this function.
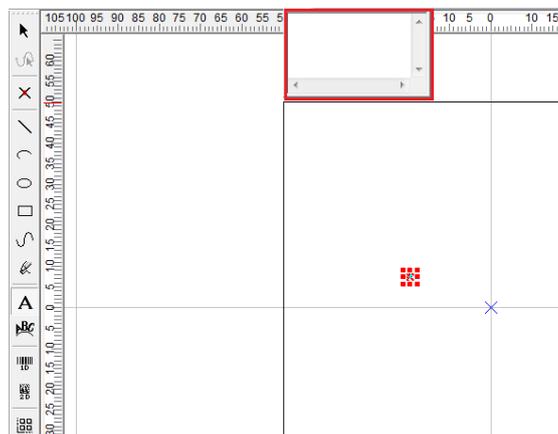
Fig. 1.3.05

Method:
● Click "Draw" from Menu Bar and select "Text" function.
● Click A button from Draw Tool Bar.
Marking Way:
If a text object hasseveral 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.

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1.3.9 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.
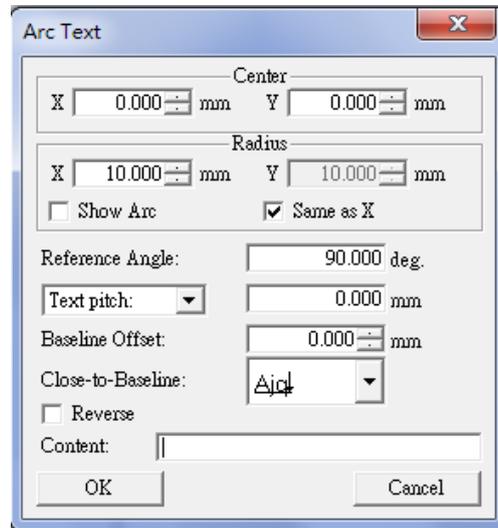
Fig. 1.3.06

Method:
- Click "Draw" from Menu Bar and select "Arc Text" function.
- Click ![BC] button from Draw Tool Bar.

1.3.10 Rectangle Text

Users can input the text within a specified rectangle, see Fig.1.3.07. The font size of text will be changed according to the amount of characters.
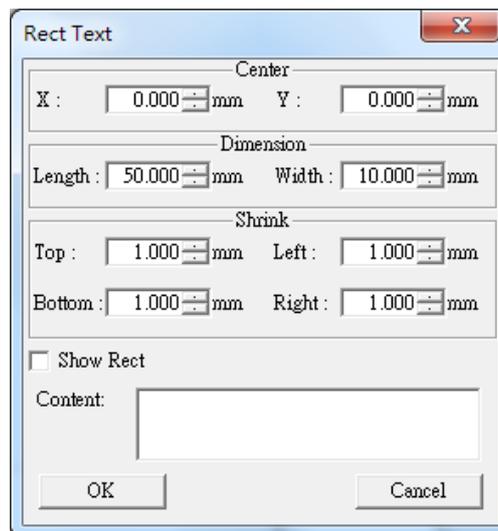
Fig. 1.3.07

Method:
- Click "Draw" from Menu Bar and select "Rectangle Text" function.
- Click ![A] button from Draw Tool Bar.

General Introductions

1.3.11 1D Barcode

Select this function and a dialog box will open foruser to choose code type and enter code data, see Fig.1.3.08. Click "OK" when finish entering all information to close this dialog box and insert the 1D Barcode on working area.
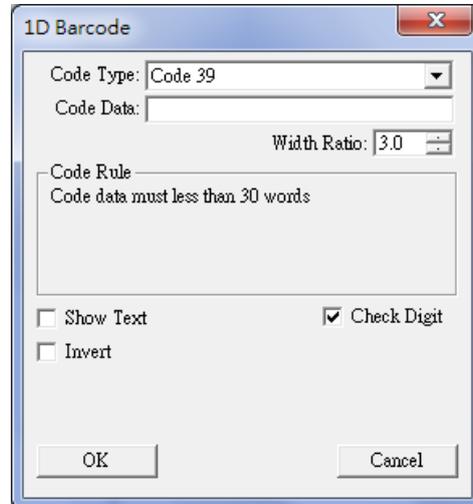
Fig. 1.3.08

Method:
- Click "Draw" from Menu Bar and select "1D Barcode" function.
- Click [1D] button from Draw Tool Bar.

1.3.12 2D Barcode

Select this function and a dialog box will open foruser to choose code type and enter code data, see Fig.1.94. Click "OK" when finish entering all information to close this dialog box and insert the 1D Barcode on working area.
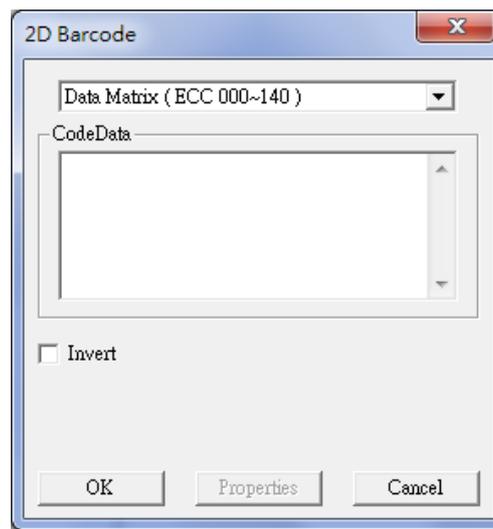
Fig. 1.3.09

Method:
- Click "Draw" from Menu Bar and select "2D Barcode" function.
- Click [2D] button from Draw Tool Bar.

1.3.13 Matrix

Matrix function uses one or more objects as a sample to create an assigned amount of objects with same parameters and figure. Executing this function, a 2x2 matrix object will be created on
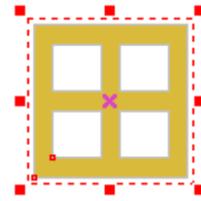
working area,see Fig.1.3.10, and a toolbar will show for users to edit the content of matrix. Decider the amount of row and column of

matrix and click button or double click the mouse left button on one cell to edit

the matrix content.Then click button to finish the editing and all cells will show the same content.

Fig. 1.3.10

Method:
- Click "Draw" from Menu Bar and select "Matrix" function.
- Click button from Draw Tool Bar.

1.3.14 Spiral

Create Spiral. Select a center point on the working area. Click the left mouse button to draw a spiral

Method:
- Click "Draw" from Menu Bar and select "Spiral" function.
- Click button from Draw Tool Bar.

General Introductions

1.3.15 Control Object

There are nine control objects: Digital In, Digital Out, Do Pause, Delay Time, Motion, Set Position, Loop, Ring and Homing, see Fig.1.3.11.
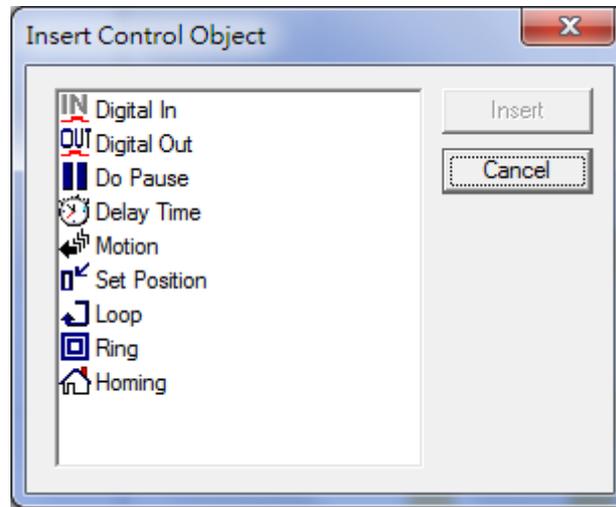
Fig. 1.3.11

Select one function and insert it and the function will display on object browser. The marking order will follow the objects' order under layer, for example, "Circle- Digital In- Rect- Do Pause- Curve- Homing," see Fig.1.3.12.
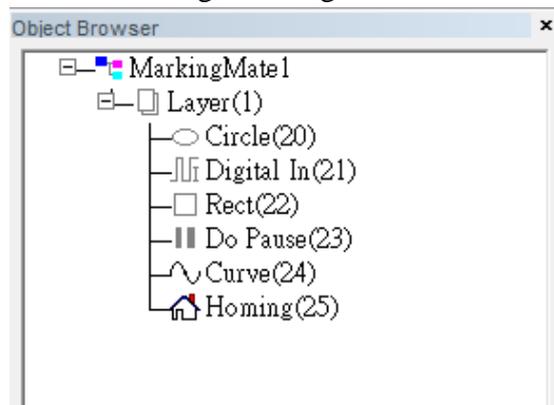
Fig. 1.3.12

Method:
● Click "Draw" from Menu Bar and select "Control Object" function.
● Click function users want to use from Control Object Tool Bar.

1.3.16 Group Hatch

Group-Hatch object is a special object which is generated within object browser when a group is generated and deleted when a group is ungroup. Users could use this object to perform carved marking task. **This object is useless to all barcode object, image object and vector object**.

Method:
● Generate a group will create a group-hatch object within object browser automatically. See fig 1.3.13.

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- Choose a group hatch object from object browser. Modify group hatch object from Pass0 to Pass1 or other pass from marking property to enable hatch function. See fig 1.3.14.

Fig. 1.3.13

Fig. 1.3.14

General Introductions
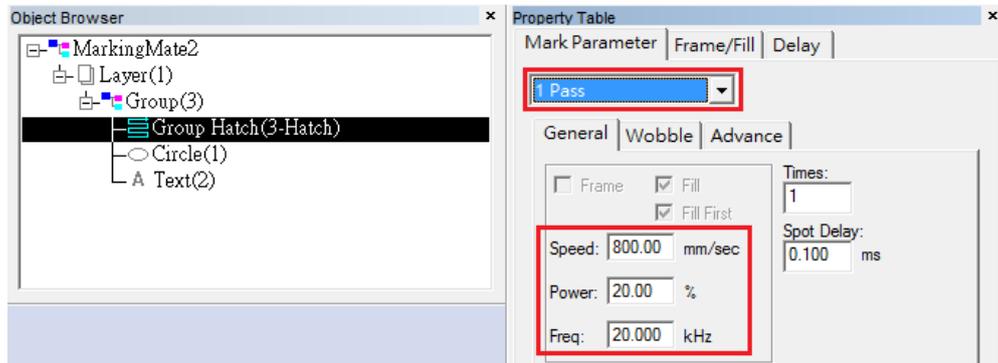
1.4 Image Menu

"Image" menu offers the following functions:

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

General Introductions

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1.4.1 Effects

1.4.1.1 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.
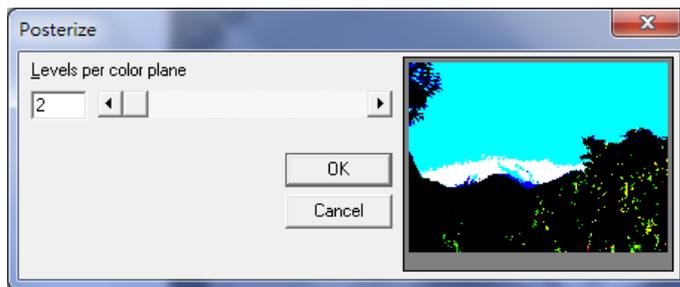
Fig. 1.4.02

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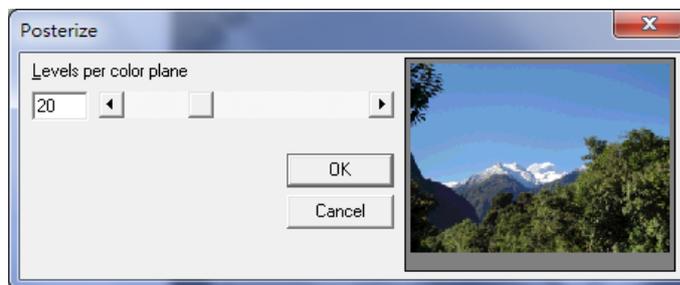
Fig. 1.4.03

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

Fig. 1.4.04

General Introductions
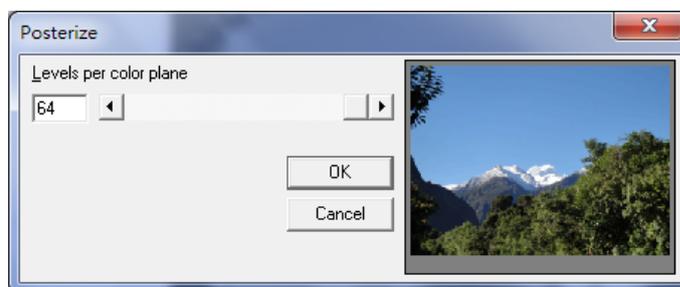
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1.4.1.2 Mosaic

Click "Image – Effects - 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.
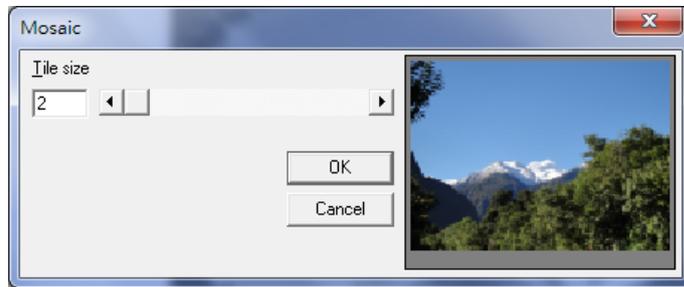
Fig. 1.4.06

When Tile size is 20, see Fig.1.4.07.
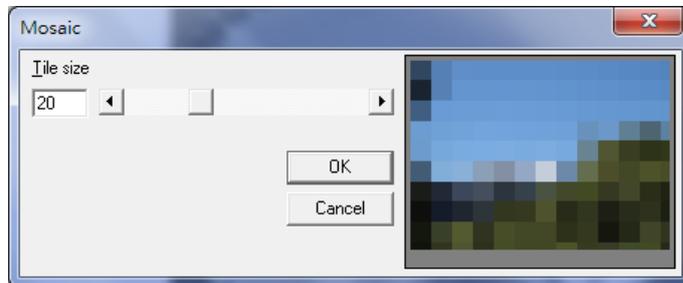
Fig. 1.4.07

When Tile size is 64, see Fig.1.4.08.

Fig. 1.4.08

General Introductions
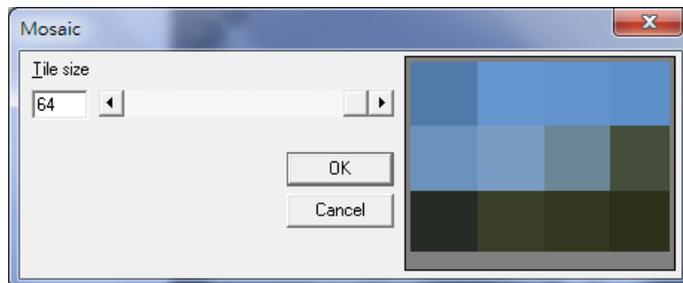
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1.4.1.3 Average

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.
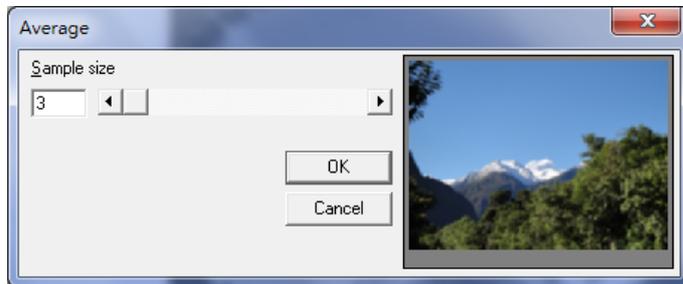
Fig. 1.4.10

When Sample size is 7, see Fig.1.4.11.
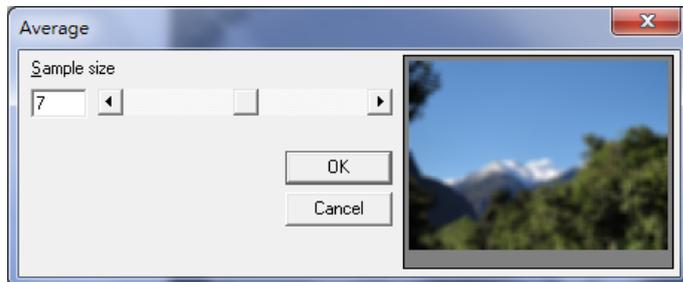
Fig. 1.4.11

When Sample size is 11, see Fig.1.4.12.

Fig. 1.4.12

General Introductions
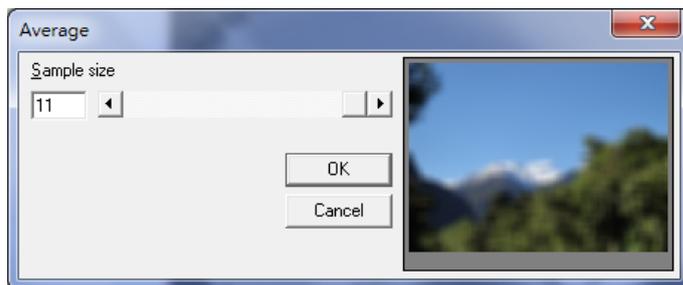
1.4.1.4 Median

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.
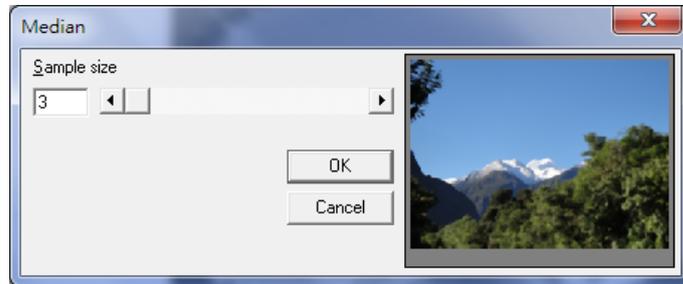
Fig. 1.4.14

When Sample size is 7, see Fig.1.4.15.
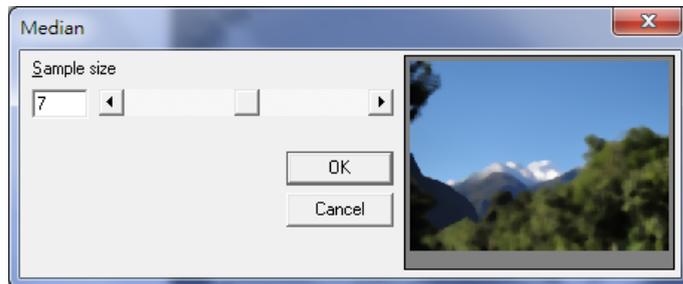
Fig. 1.4.15

When Sample size is 11, see Fig.1.4.16.

Fig. 1.4.16

General Introductions
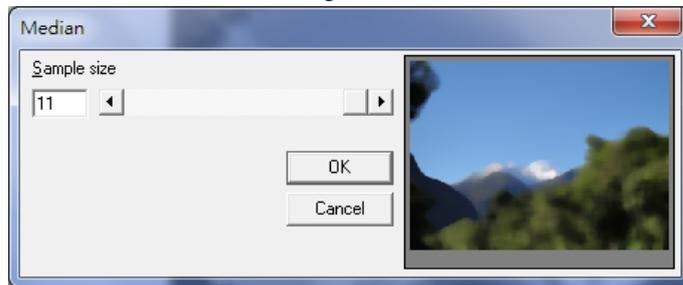
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1.4.1.5 Sharpen

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.
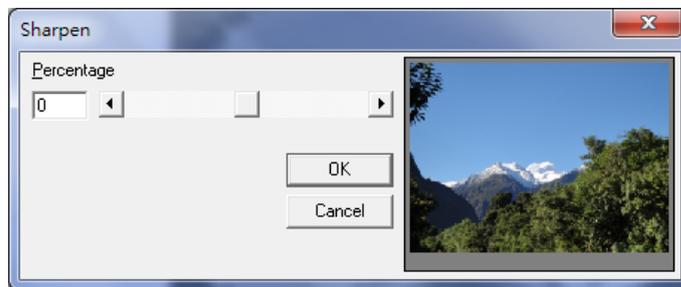
Fig. 1.4.18

When Percentage is -100, see Fig.1.4.19.
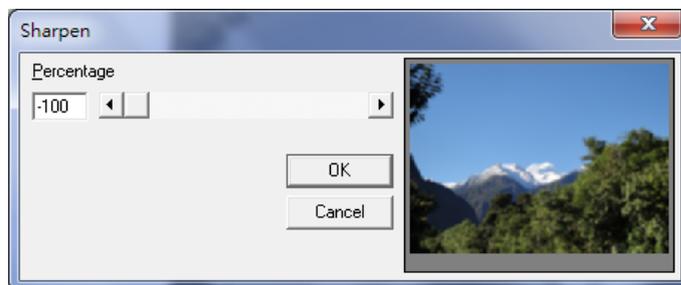
Fig. 1.4.19

When Percentage is 100, see Fig.1.4.20.

Fig. 1.4.20

General Introductions
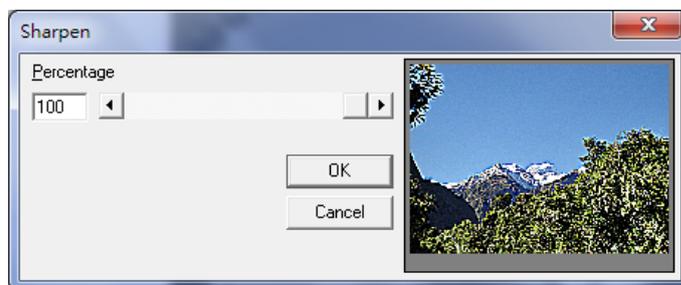
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1.4.1.6 Add Noise

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.
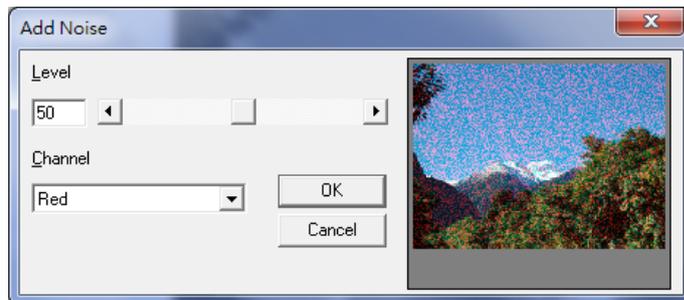
Fig. 1.4.23

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

Fig. 1.4.24

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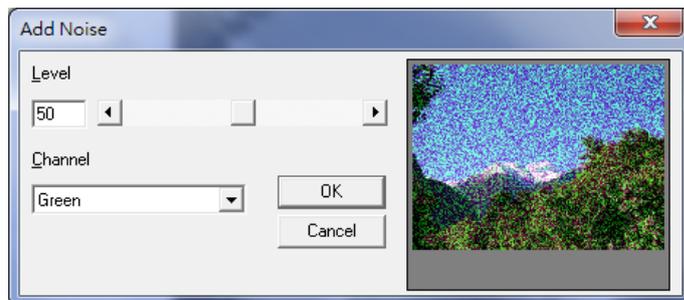
When Noise Level is
50 and Level is Blue,
see Fig.1.4.25.
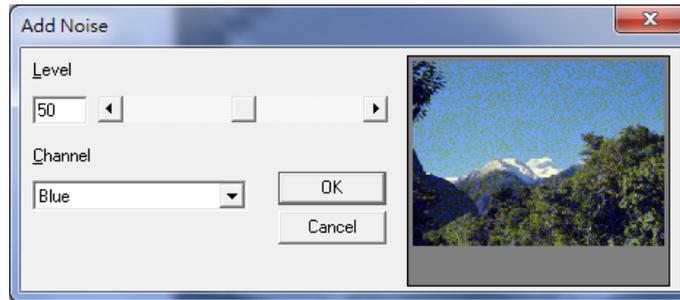
Fig. 1.4.25

1.4.1.7 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.
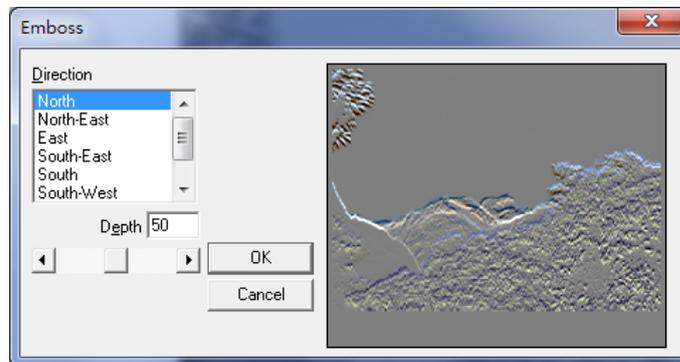
Fig. 1.4.27

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

Fig. 1.4.28

General Introductions
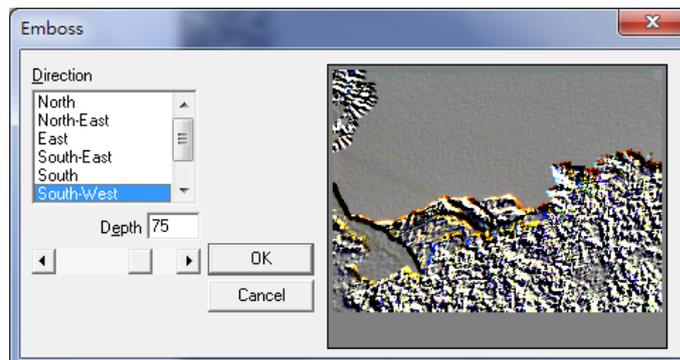
1.4.1.8 Edge Enhance

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

1.4.1.9 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.
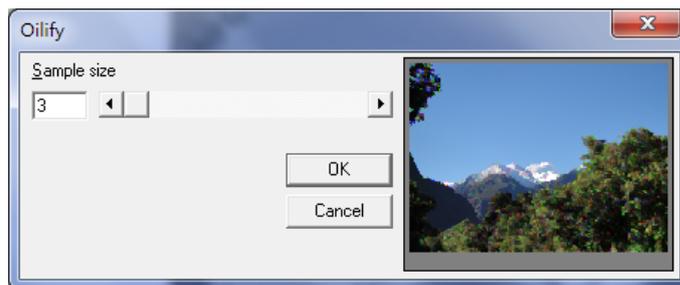
Fig. 1.4.32

When Sample size is 7, see Fig.1.4.33.

Fig. 1.4.33

General Introductions
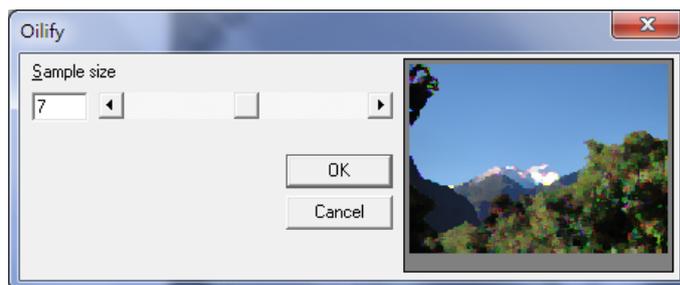
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When Sample size is
11, see Fig.1.4.34.
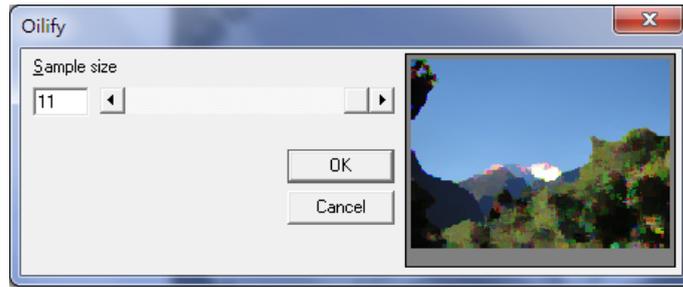
Fig. 1.4.34

1.4.2 Special Filters

1.4.2.1 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.
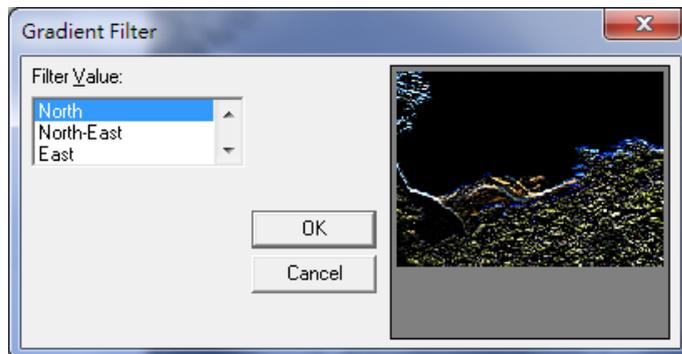
Fig. 1.4.36

Direction: South-East,
see Fig.1.4.37.

Fig. 1.4.37

General Introductions
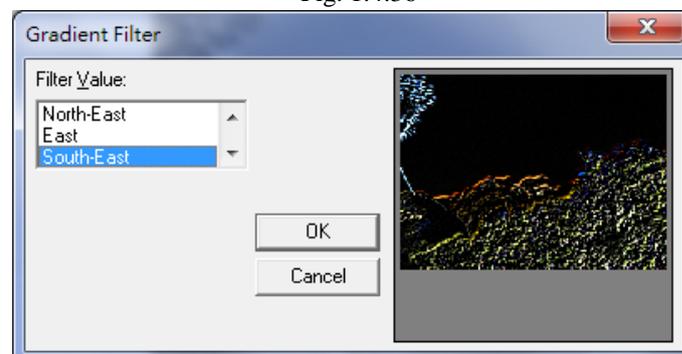
1.4.2.2 Laplacian

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.
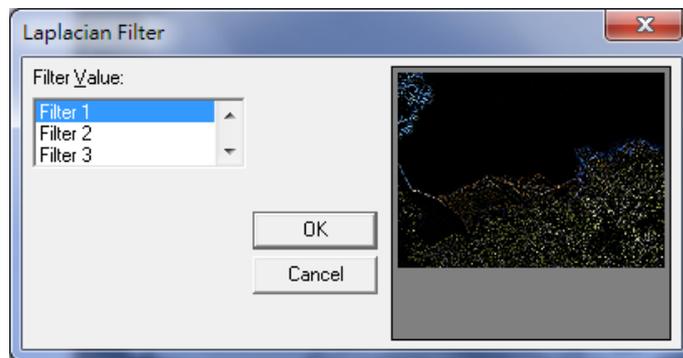
Fig. 1.4.39

When select Filter 2,
see Fig.1.4.40.
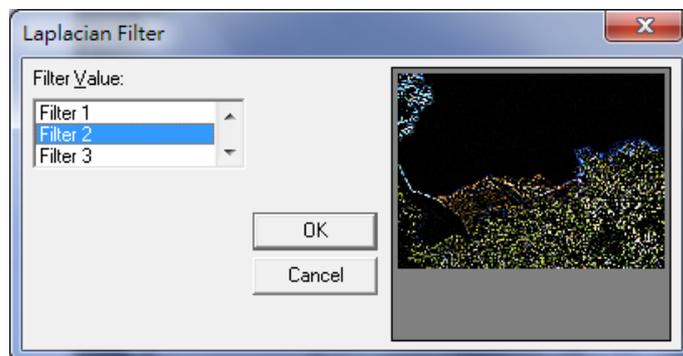
Fig. 1.4.40

When select Diagonal,
see Fig.1.4.41.

Fig. 1.4.41

General Introductions
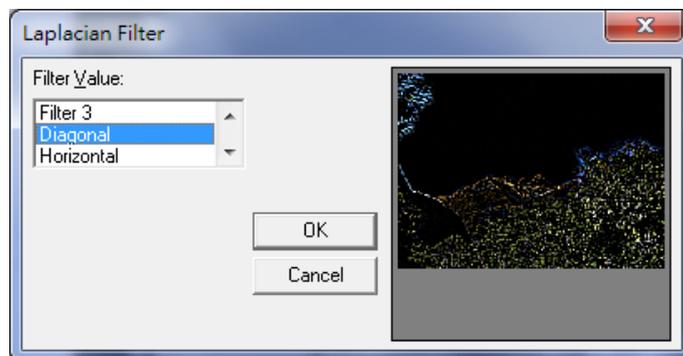
1.4.2.3 Sobel

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.
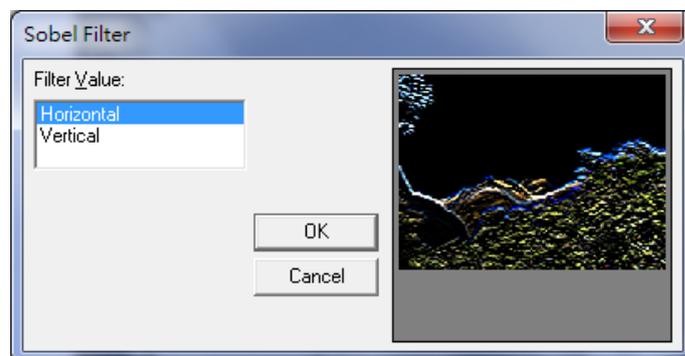
Fig. 1.4.43

When the value
is Vertical, see
Fig.1.4.44.

Fig. 1.4.44

General Introductions
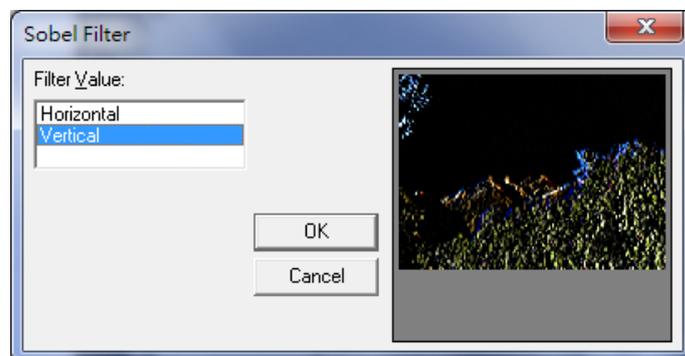
1.4.2.4 Prewitt

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.
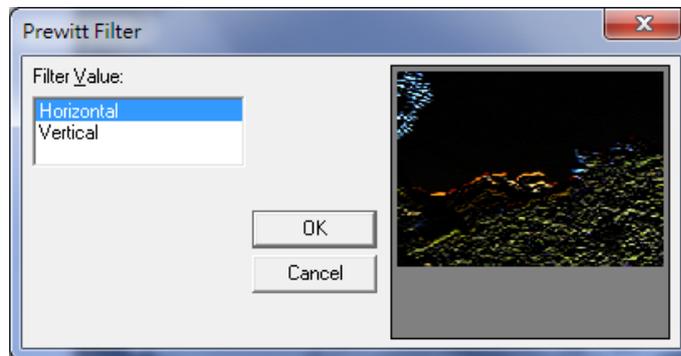
Fig. 1.4.46

When the value is Vertical, see Fig.1.4.47.

Fig. 1.4.47

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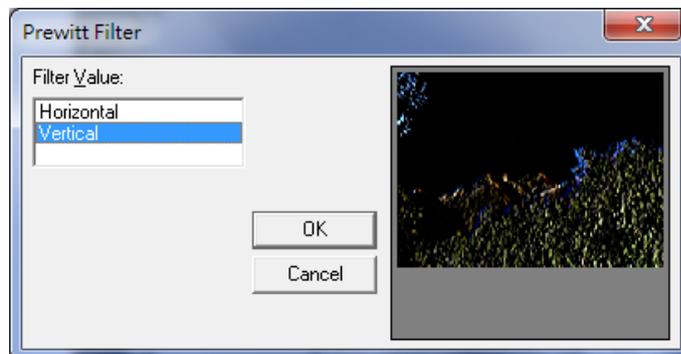
1.4.2.5 Shift Difference

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.
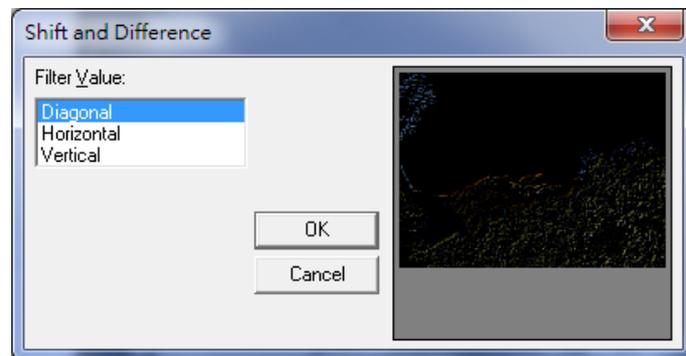
Fig. 1.4.49

When the value
is Horizontal,
see Fig.1.4.50.
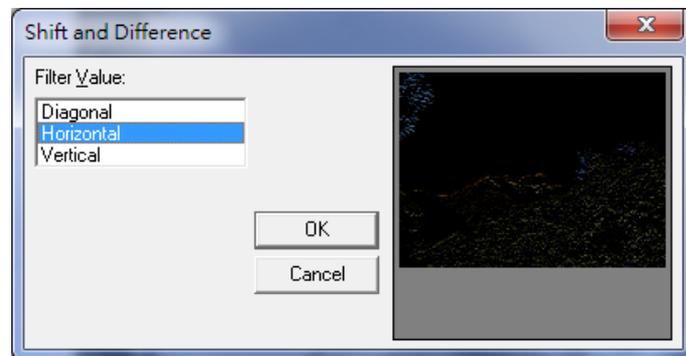
Fig. 1.4.50

When the value
is Vertical, see
Fig.1.4.51.

Fig. 1.4.51

General Introductions
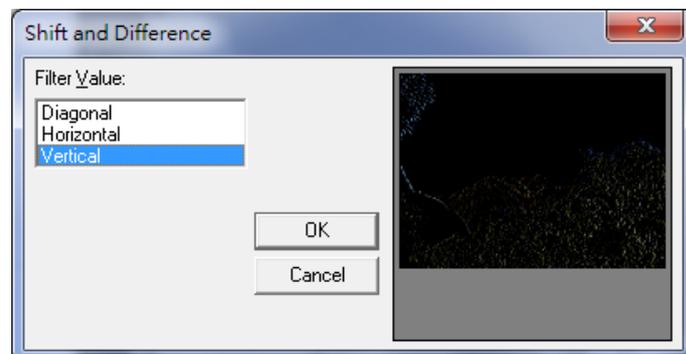
1.4.2.6 Line Segment

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.
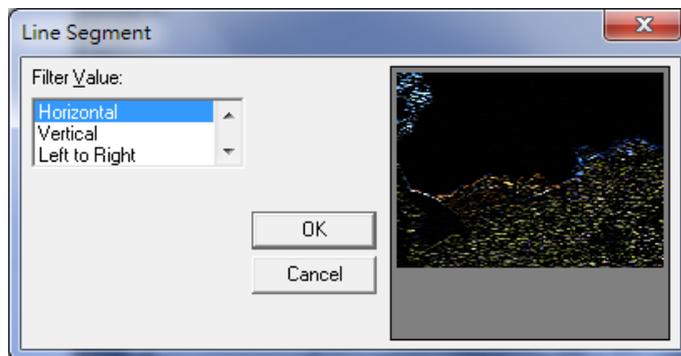
Fig. 1.4.53

When the value
is Vertical, see
Fig.1.4.54.
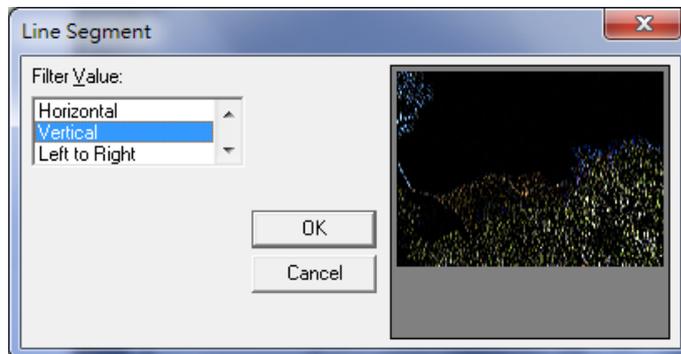
Fig. 1.4.54

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

Fig. 1.4.55

General Introductions
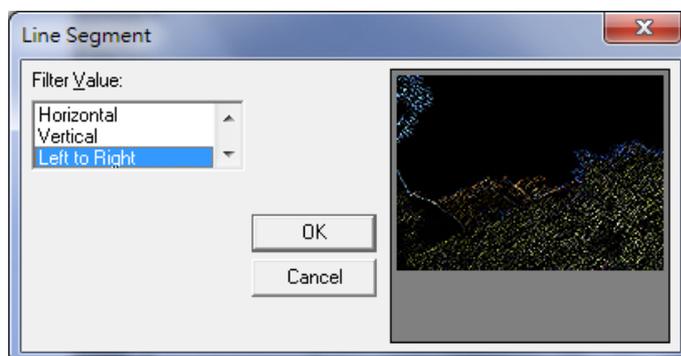
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When the value
is Right to Left,
see Fig.1.4.56.

Fig. 1.4.56

General Introductions
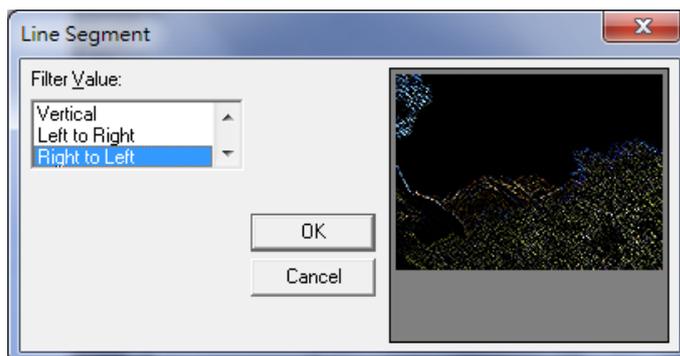
1.5 Color Menu

"Color" menu offers the following functions:

   Gray Scale

   Color Resolution

   Brightness

   Contrast

   Hue

   Saturation

   Gamma

   Intensity

   Histogram

   Invert

   Solarize

General Introductions

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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 Image

Fig. 1.5.02 Gray Scale Image

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

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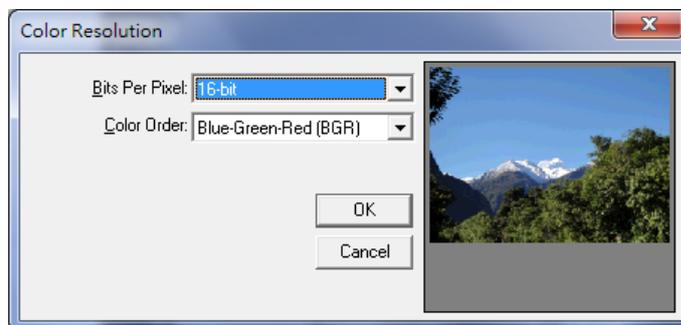
Fig.1.5.05
Bits Per Pixel: 16-bit
Color Order: Red-Green-Blue
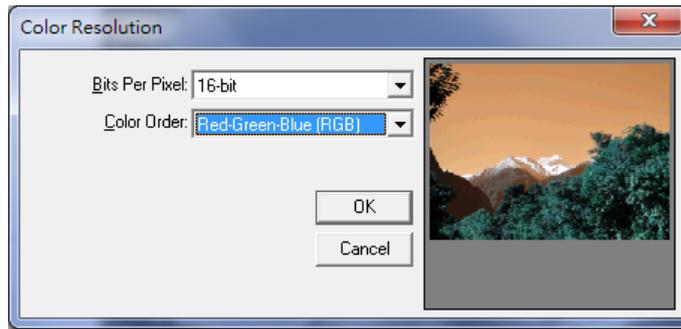
Fig. 1.5.05

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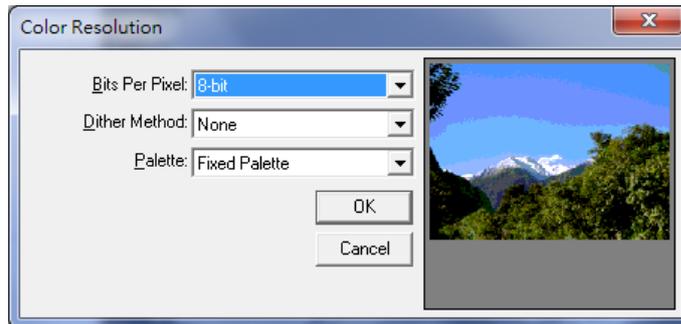
Fig. 1.5.06

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

Fig. 1.5.07

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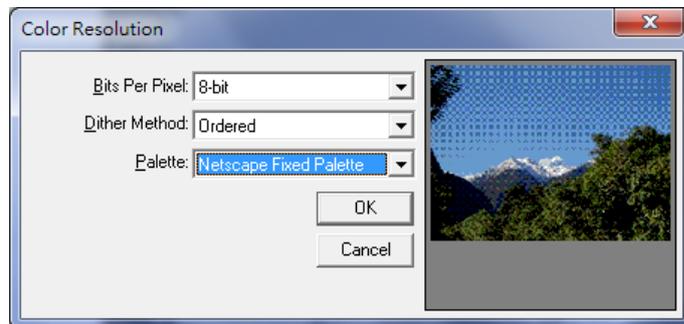
1.5.3 Brightness

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.
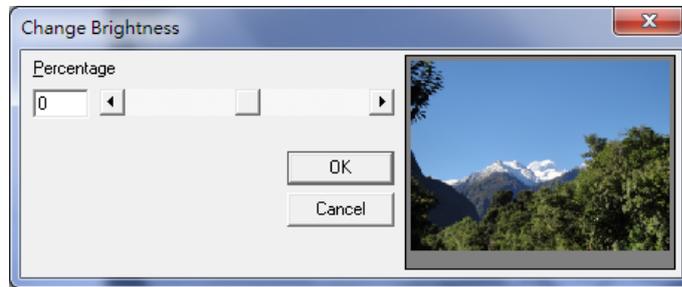
Fig. 1.5.09

When Percentage is -30, see Fig.1.5.10.
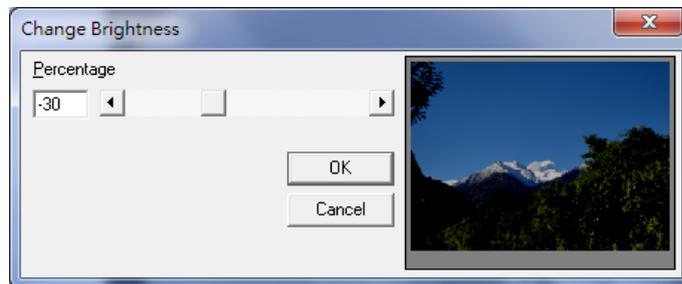
Fig. 1.5.10

When Percentage is 30, see Fig.1.5.11.

Fig. 1.5.11

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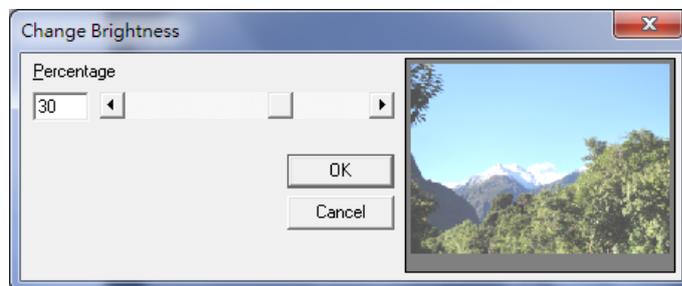
1.5.4 Contrast

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.
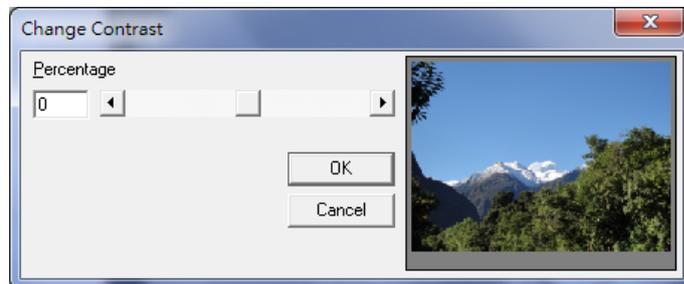
Fig. 1.5.13

When Percentage is -100, see Fig.1.5.14.
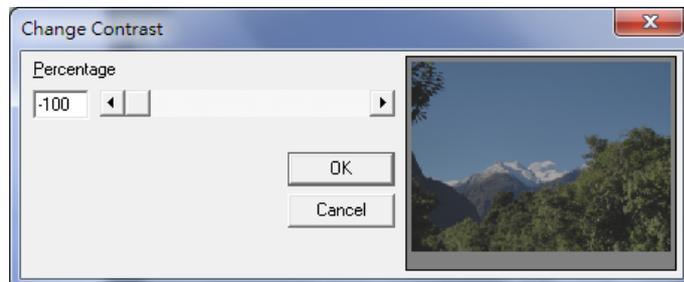
Fig. 1.5.14

When Percentage is 100, see Fig.1.5.15.

Fig. 1.5.15

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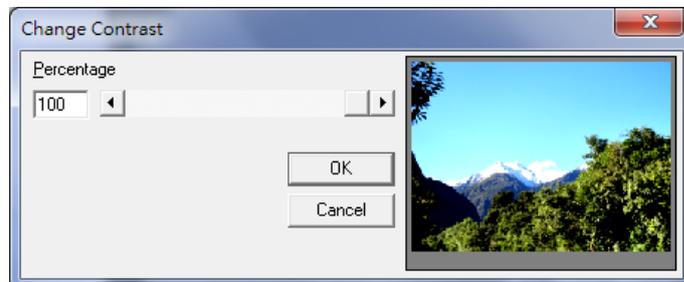
1.5.5 Hue

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.
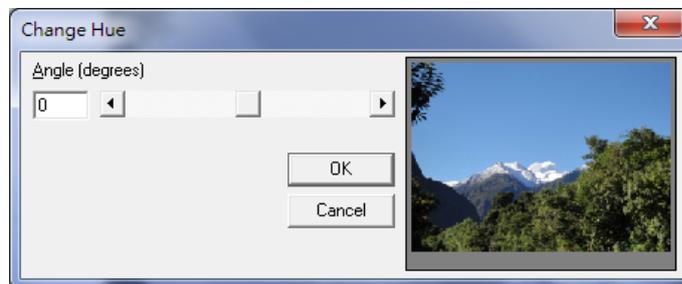
Fig. 1.5.17

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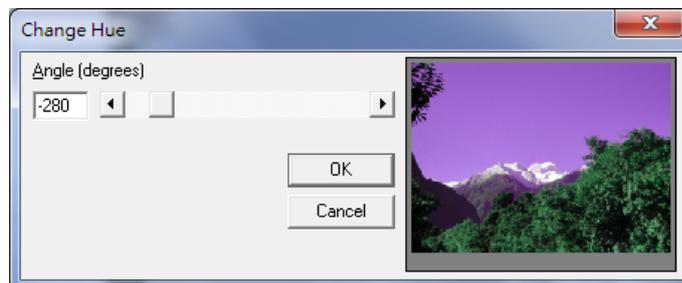
Fig. 1.5.18

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

Fig. 1.5.19

General Introductions
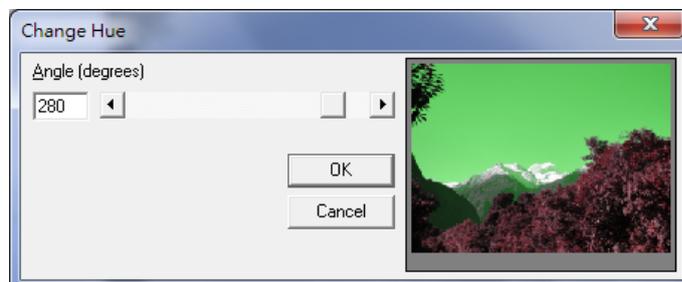
1.5.6 Saturation

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.
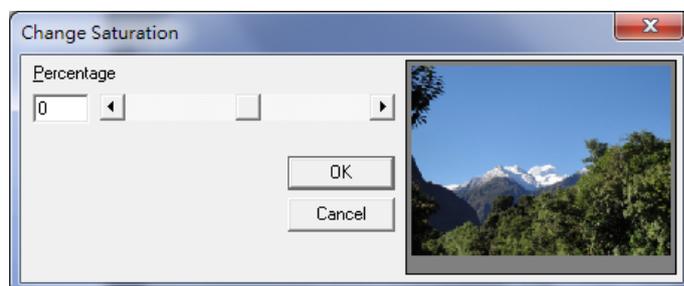
Fig. 1.5.21

When Percentage is -100, see Fig.1.5.22.
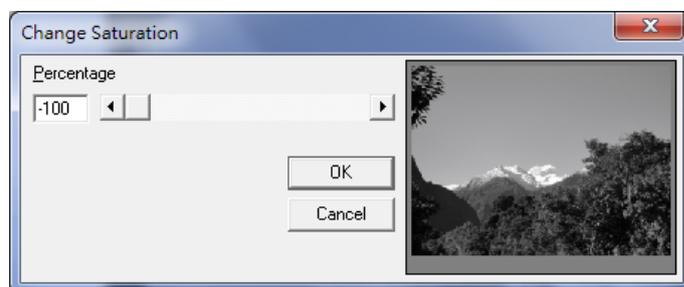
Fig. 1.5.22

When Percentage is 100, see Fig.1.5.23.

Fig. 1.5.23

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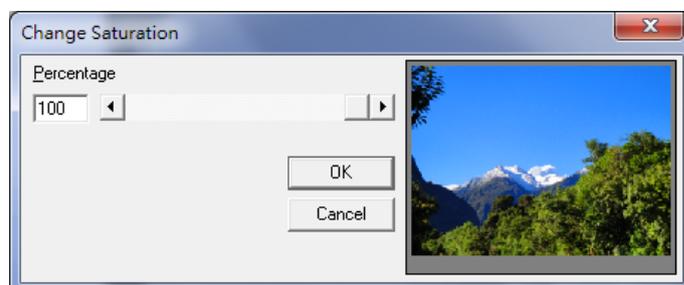
1.5.7 Gamma

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.
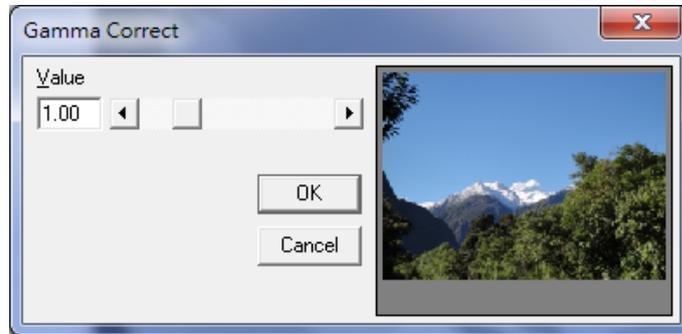
Fig. 1.5.25

When Gamma Value is
0.30, see Fig.1.5.26.
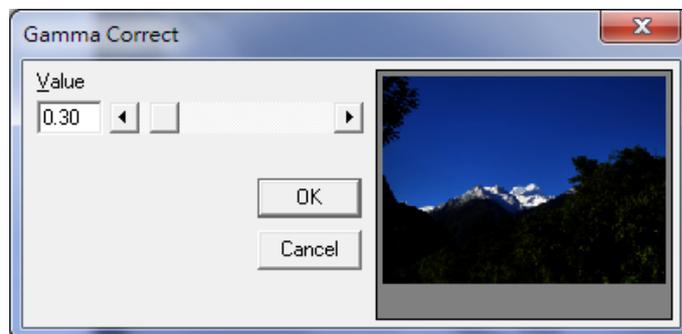
Fig. 1.5.26

When Gamma Value is
4.99, see Fig.1.5.27.

Fig. 1.5.27

General Introductions
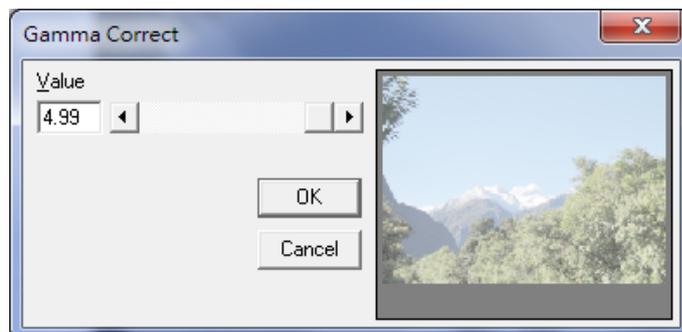
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1.5.8 Intensity

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.
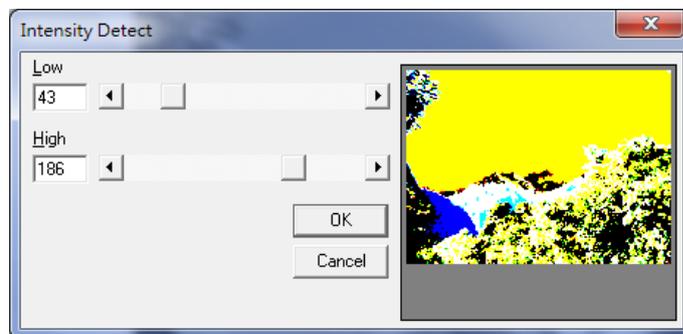
Fig. 1.5.29

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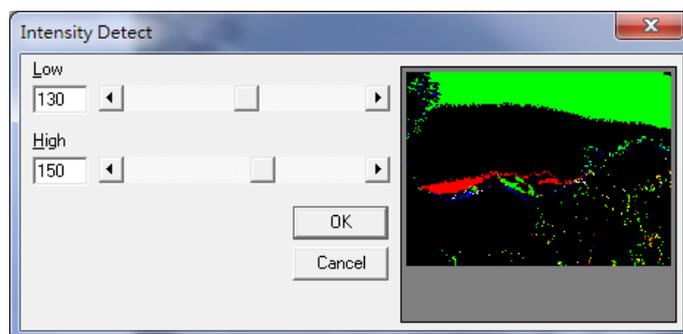
Fig. 1.5.30

1.5.8.2 Stretch
Change the image intensity according to the previous settings.

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1.5.9 Histogram

Click "Color - Histogram"

1.5.9.1 Equalize

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

Fig. 1.5.31 Original Image

Fig. 1.5.32 After Equalizing

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1.5.9.2 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.
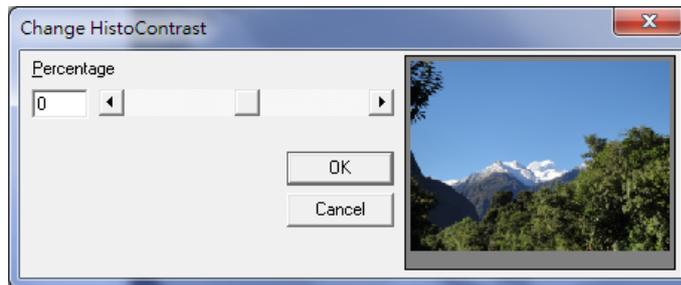
Fig. 1.5.34

When Percentage is
-100, see Fig.1.5.35.
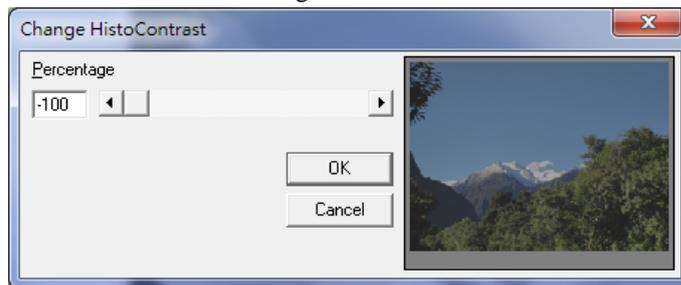
Fig. 1.5.35

When Percentage is
100, see Fig.1.5.36.

Fig. 1.5.36

General Introductions
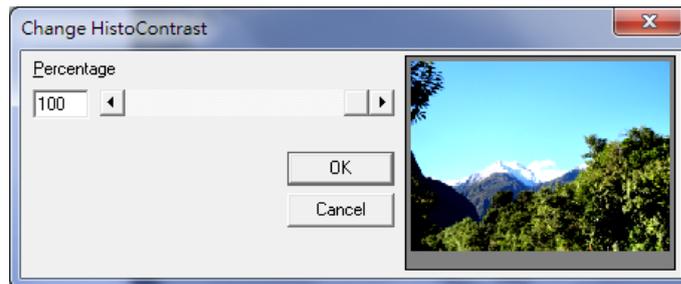
1.5.10 Invert

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

1.5.11 Solarize

Click "Color - Solarize"

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

Fig. 1.5.39

When Threshold is 30, see Fig.1.5.40.
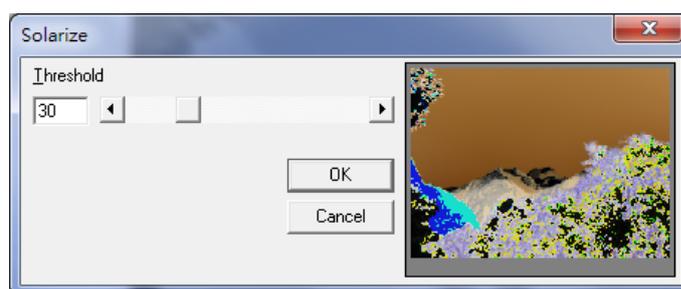
Fig. 1.5.40

When Threshold is 80, see Fig.1.5.41.

Fig. 1.5.41

General Introductions
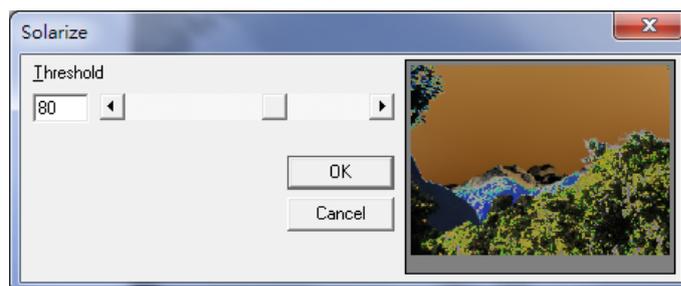
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When Threshold is
128, see Fig.1.5.42.

Fig. 1.5.42

General Introductions
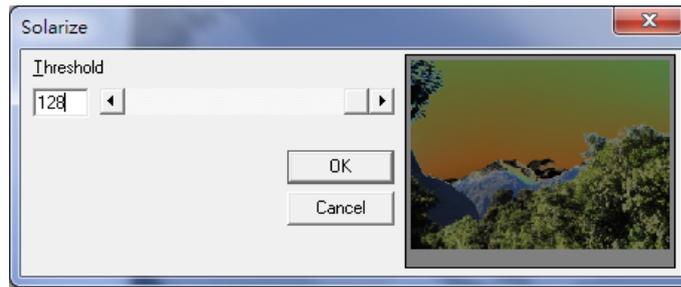
1.6 Execute Menu

"Execute" menu offers the following function:

Marking	Set the marking related parameters and execute marking.
Preview	Using align light to preview the marking path.
Mark Sample(s)	Mark the selected objects once as a sample for user to adjust the parameters.
Quick Mark	Execute marking. However, the Control Object will be ignored.
Align Test	Allow users to examine the mark position is correct or not.
User Level	User Level is divided into Operator, Programmer, and Administrator to separate user's authorities.
Mark Parameter List	Allow users to name, save, and load the marking parameters.
Auto Text Manager	Activate the auto text manager for users to edit auto text object.
Rotary Marking	Provide common used rotary marking functions.
Laser Setting	Some types of laser provided specified parameters setting to pursue better marking quality.

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1.6.1 Marking

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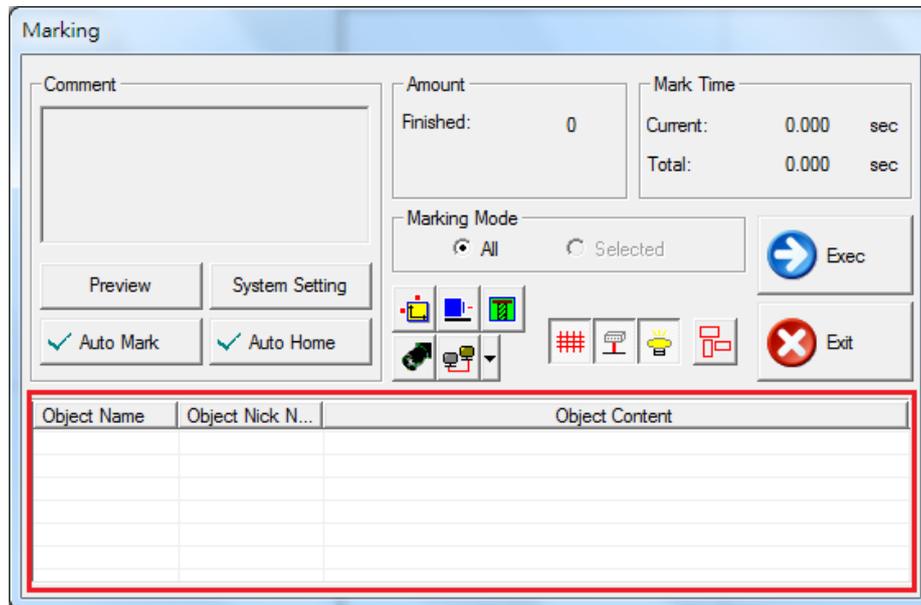
Fig. 1.6.01

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

Preview: Preview marking. (Refer to 1.6.2)

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).
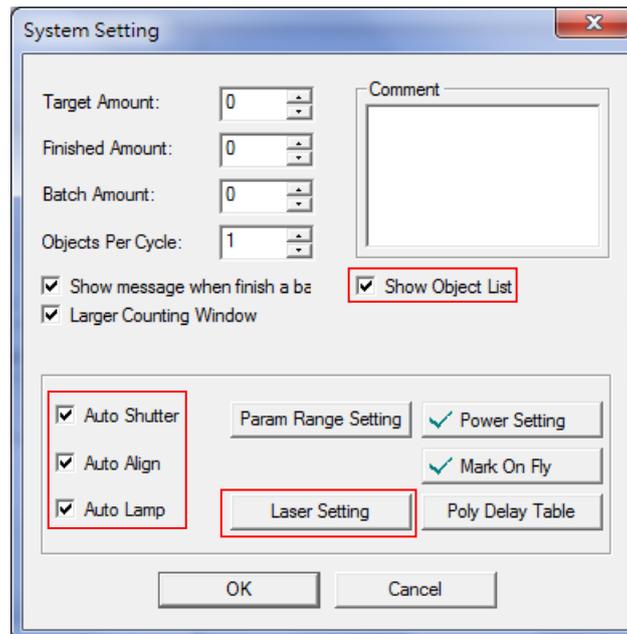
Fig. 1.6.02

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.

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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.

Set Mark Info
Customizable mark info title: Object Name, Object Nickname, Auto-Text, Type, Start Value, and Mark Content.

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 ✗ Auto Mark will become ✓ Auto Mark.
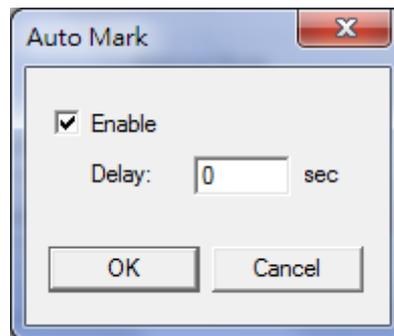
Fig. 1.6.03

Delay: The waiting time between each 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 ✗ Auto Home will become ✓ Auto Home.

Fig. 1.6.04

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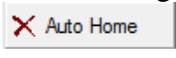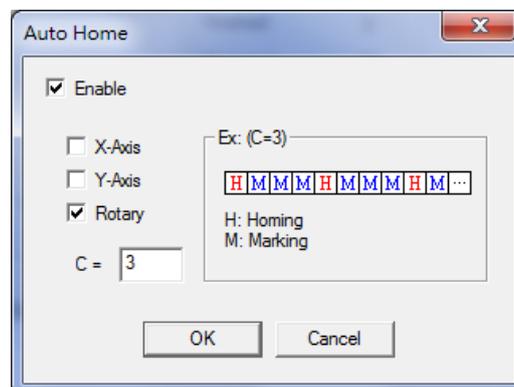
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Amount
    Finished: Display the completed marking amount.
    Expected: Display the expected marking amount. (This will be display only when setting the Target Amount value in "System Setting," see Fig.1.6.02)
    Total: Display the completed marking amount since MarkingMate 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 1.7.14.1)

Rotary Control Panel (please refer to section 1.7.14.2)

Z Axis Control Panel (please refer to section 1.7.14.3)

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

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).

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

Preview: Preview the marking route.

Start   marking. Press "Esc" to stop or "Space" to pause.

Stop marking or exit marking dialog box.

1.6.2 Preview

This function is usedto position the marking object. The interface shows as Fig.1.6.05. 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 [x] on the upper right of the interface.

Speed: Movingspeed of align light.

Position: Click the four arrows around the control lever in Fig.1.6.05 to move the align light, and the moving distance depends on X or Y value which is set at "**Unit**."

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.

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.1.6.06.
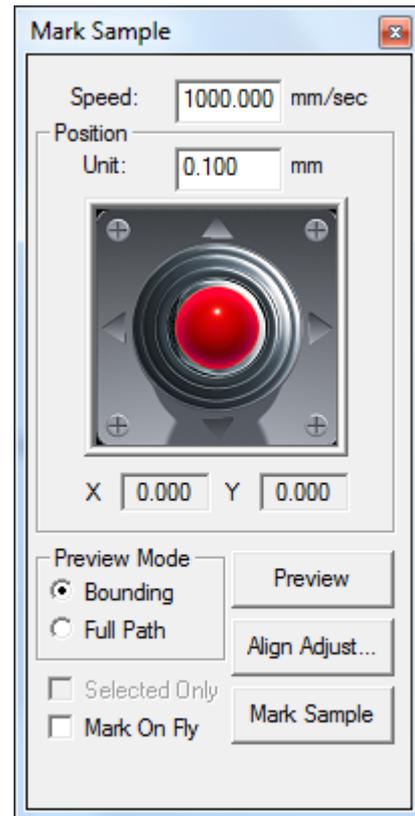
Fig. 1.6.05
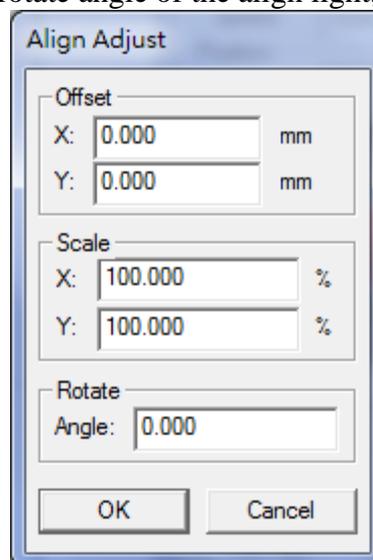
Fig. 1.6.06

    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.
Mark Sample: Execute marking directly.

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1.6.3 Mark Sample(s)

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

1.6.4 Quick Mark

Select this function to start marking, see Fig.1.6.07.
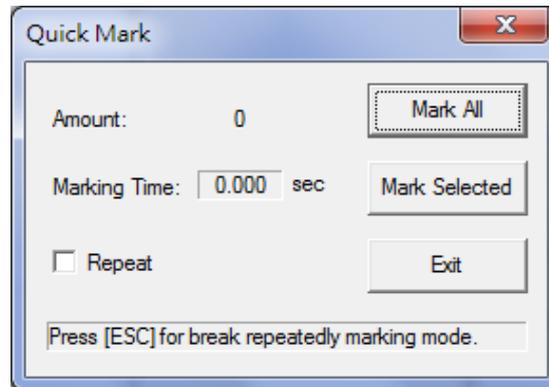
Fig. 1.6.07

Amount: The total marking amount.
Marking Time: The time cost of current marking process.
Repeat: Repeat marking. Users can press "Esc" to stop marking.
Mark All: Mark all the objects.
Mark Selected: Mark the selected objects.
Exit: Exit this mode.

The difference between "**Marking**" and "**Quick Marking**" is that "**Auto Text**" and "**Control Object**" functions will be ignored under "Quick Marking" mode.

1.6.5 Align Test

Set the parameters for align light, see Fig.1.6.08.

Fig. 1.6.08

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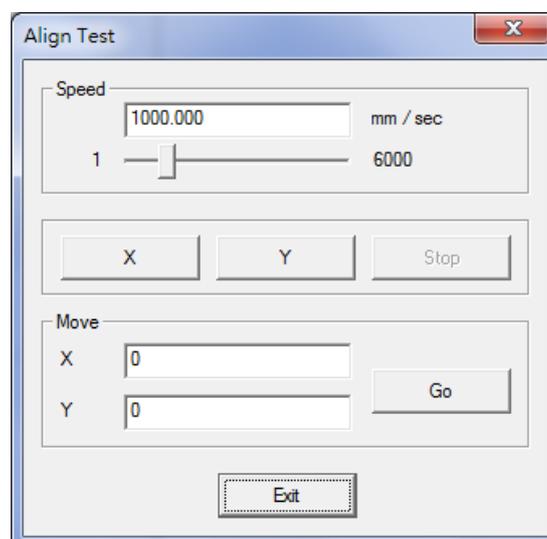
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Speed
Adjust the speed of the align light. Modify it by key in the value or move the scrollbar directly. The maximum speed is 6000 mm/sec.

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 X direction (unit: mm).
Go: Click the button and the align light will adjust the X/Y position according to the X/Y value.

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1.6.6 User Level

Users are allowed to execute different functions according to their authorities, see Fig.1.6.09.
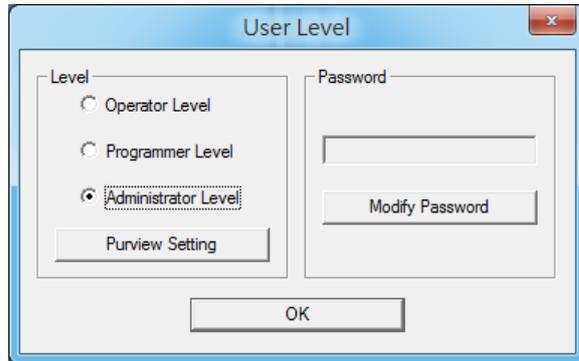
Fig. 1.6.09
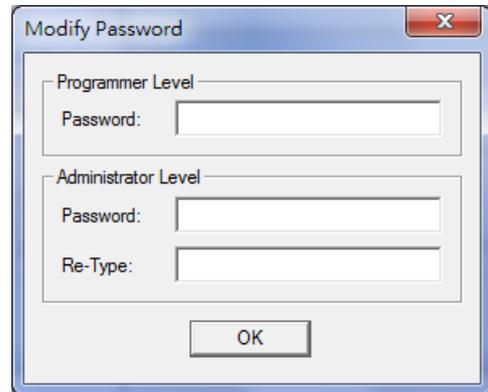
Fig. 1.6.10

Operator: Operator level users can only read and output files.

Programmer: Programmer level users are allowed to draw and edit objects and use some limited functions without system parameter settings.

Administrator: Administrator level users are able to use all the functions and modify their passwords to manage the system, see Fig.1.6.10.

Purview Setting: Need administrator authority. Allow administrator to assign different access right to different level user. See Fig 1.6.11. Administrator could assign the following parts: File, Edit, Draw, Image, Color, Execute, View, Property table, Tracker.

Fig. 1.6.11

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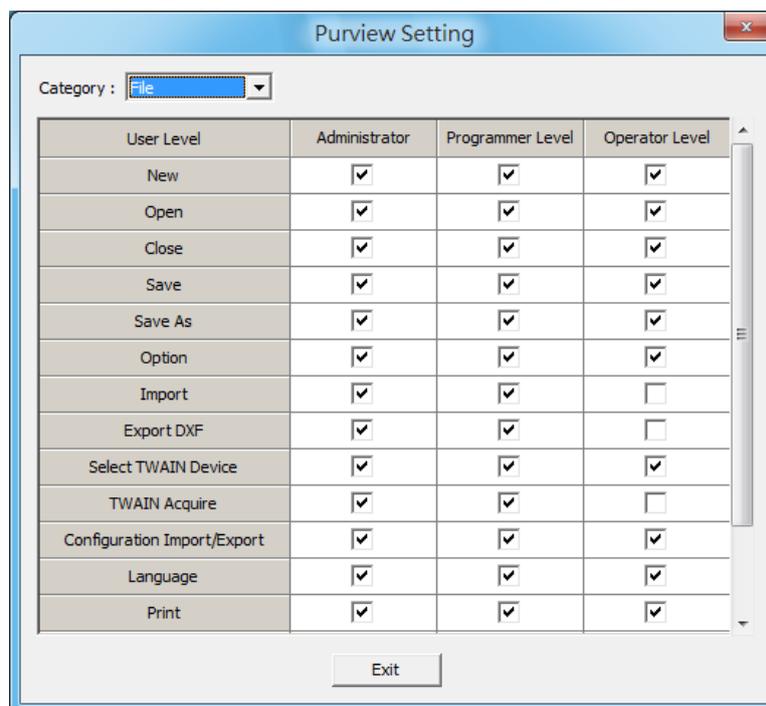
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1.6.7 Mark Parameter List

This list shows all the marking parameters users set themselves. Users can name, sort, and save these parameters for future use, see Fig.1.6.12.
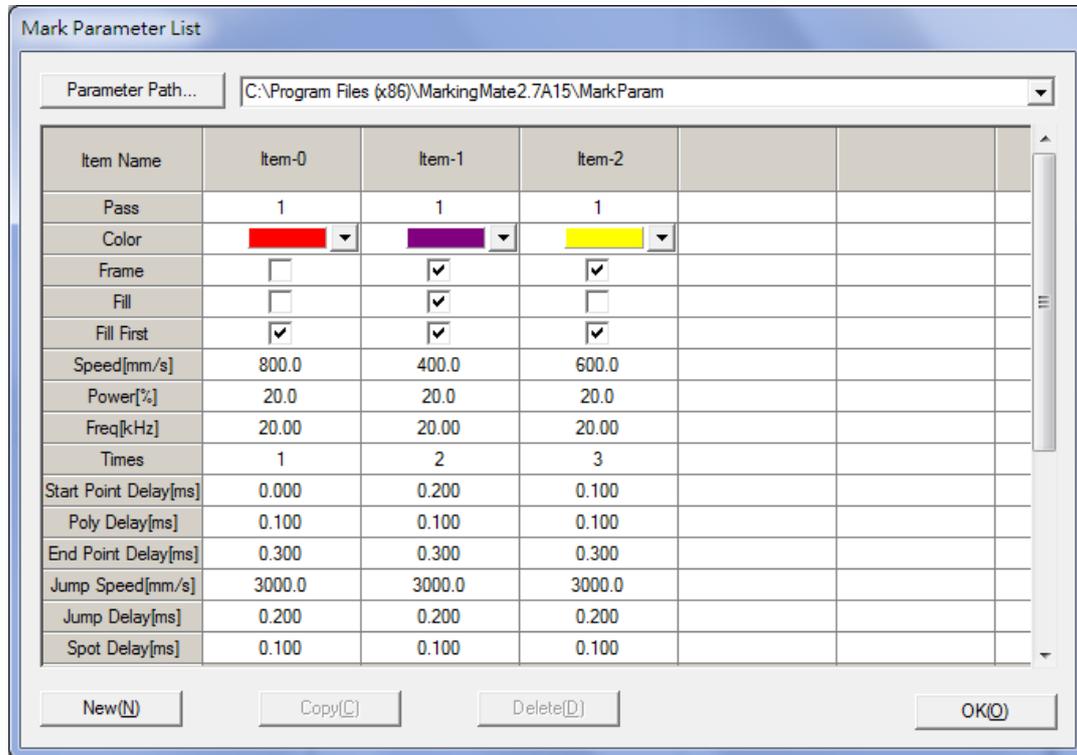
Fig. 1.6.12

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

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	"Laser Shot Mode" in "Burst Mode Setting").
FPK Width	Set the width of FPK.
Pulse Width [µs]	Set the width of pulse (only for YAG).
Waveform No.	There are 64 waveforms for users to choose(only for SPI).
CW Mode	Mark using continuous wave mode (only for SPI).
Wobble	Mark by spiral type and make the line segment become thicker.
Wobble Thick (W)	The diameter of the circle for wobble.
Wobble Overlap	Frequency of wobble. When the speed becomes quicker and the frequency become higher, the line segment will be denser.
Step Distance	The distance between each dot (under Dot Mode).
Step Delay	The staying time for laser on each dot (under Dot Mode).
New	Create a new item.
Copy	Copy the selected item as a new item.
Delete	Delete the selected item.
OK	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.

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1.6.8 Auto Text Manager

This is used to activate the Auto Text Manager for auto text setting, see Fig.1.6.13. For more details, please refer to **Practical Functions Chapter 11－Auto Text.**

Fig. 1.6.13

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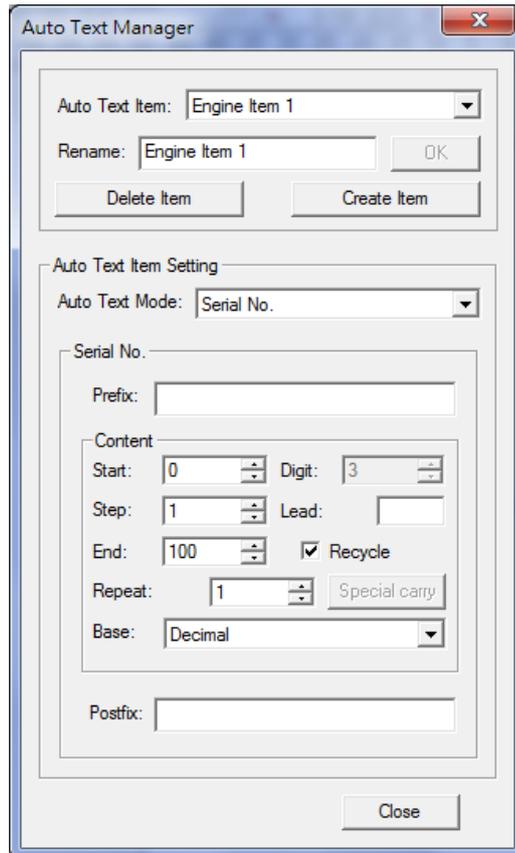
1.6.9 Rotary Marking

The system provides three common used rotary marking functions for users to select, see Fig.1.6.14. Moreover, it also allows users to set the motor. If users click "Setting››," then the "Rotary Control Panel" will display as Fig.1.6.15. Please refer to**Practical Functions Section 7.3－Rotary Library**for more details.
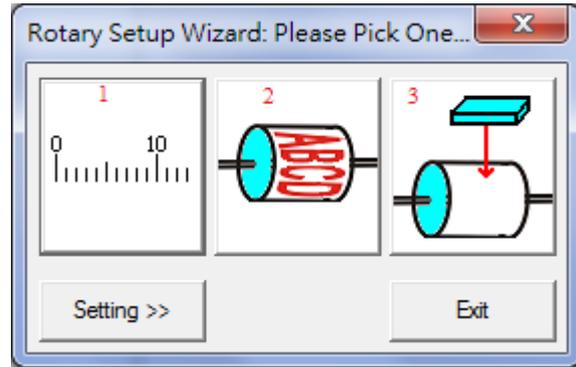
Fig. 1.6.14

1. **Calibration Marking**

2. **Ring Text Marking**

3. **Cylinder Marking**

4. **Rotary Control Panel**
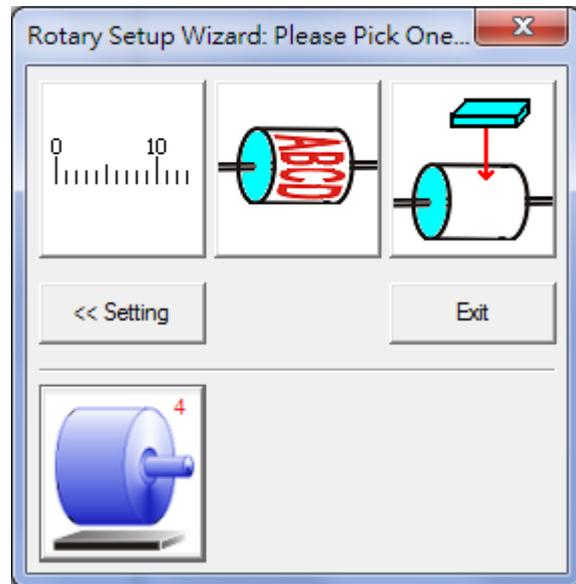
Fig. 1.6.15

1.6.10 Laser Setting

Some types of laser provided specified parameters setting to pursue better marking quality. If this function is grayed, that means this laser is not needed to setting.

General Introductions

1.7 View Menu

"View" menu offers the following functions:

Standard Bar	Enable/disable Standard Bar
Zoom Bar	Enable/disable Zoom Bar
Draw Bar	Enable/disable Draw Bar
Layer Bar	Enable/disable Layer Bar
Object Browser	Enable/disable Object Browser
Modify Bar	Enable/disable Modify Bar
Dimension Bar	Enable/disable Dimension Bar
Obj Property Bar	Enable/disable Object Property Bar
Mark Sample Bar	Enable/disable Mark Sample Bar
Manual Split Bar	Enable/disable Manual Split Bar
Data Wizard	Enable/disable Data Wizard
Make Font Bar	Enable/disable Make Font Bar
Text Property Bar	Enable/disable Text Property Bar
Vector Box	Enable/disable Vector Box
Control Tool	Enable/disable Control Tool
Mark Panel	Enable/disable Mark Panel
Status Bar	Enable/disable Status Bar
Desktop Mode	Enter Desktop Mode or not
Composing	Composing Settings
Show Order	Show the mark order
Tooltips	Enable/disable Tooltips
Tooltips Setting	Go to the Tooltips setting page of Options
Ruler	Enable/disable Ruler
Ruler Setting	Go to the ruler setting page of Options
Grid	Enable/disable Grid
Grid Lock	Enable/disable Grid Locking
Grid Parameter	Grid Parameter setting
Zoom In	Enlarge a specific area
Zoom Out	Shrink a specific area
Zoom Previous	Go back to the previous view
Zoom All	Show the whole Working Area

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Zoom Extend	Show all objects
Zoom Selected Objects	Zoom the selected objects to fit the whole editing area.

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.

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1.7.1 Standard Bar

The Standard Bar provides some basic functions for users to edit the file, see Fig.1.7.01.

Fig. 1.7.01

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

1.7.2 Zoom Bar

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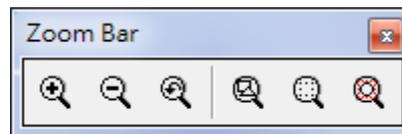
Fig. 1.7.02

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

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1.7.3 Drawing Bar

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

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.
2D Barcode		Create a 2D barcode.
Matrix		Create a matrix object.
Spiral		Draw a spiral object

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1.7.4 Layer Bar

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

Fig. 1.7.04

Layer Manager		The layer page of Property Table will show up for editing.
New Layer		Create a new layer.
Delete the Active Layer		Delete the selected layer.
Current Layer	Layer-1	Select the layer.
Layer Color		Set the layer color.
View Layer		Enable or disable to view the selected layer.
Edit Layer		Enable or disable to edit the selected layer.
Output Layer		Enable or disable to output the selected layer.
Show the Selected Layer		Show the selected layer only.

1.7.5 Object Browser

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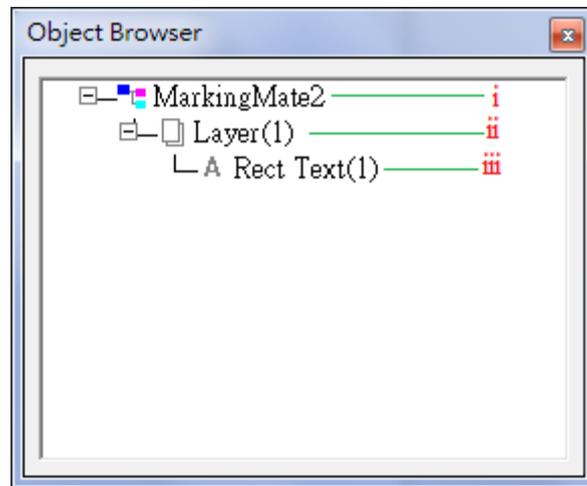
Fig. 1.7.05

i.   **Select the file:** When click the file, like MarkingMate2, 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.

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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.
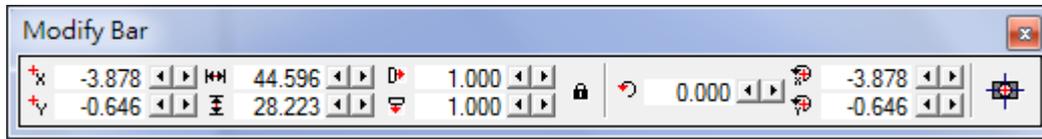
Fig. 1.7.06

X of Center	⁺ₓ	The X-axis value of the object's center.
Y of Center	⁺ᵧ	The Y-axis value of the object's center.
Length	⬌	The length of the selected object.
Width	⬍	The width of the selected object.
X of Scale	▯▸	The scale of the selected object's length.
Y of Scale	▽	The scale of the selected object's width.
Lock to Same Ratio	🔒	Enable this function, the length and width will be adjusted with the same ratio at the same time.
Angle of Rotating	↺	The rotary angle of the selected object.
X of Rotating Center	🔁	Set the X-axis value of rotating center.
Y of Rotating Center	🔁	Set the Y-axis value of rotating center.
Move to the Center	⊕	Move the object to the center of working area.

General Introductions

1.7.7 Dimension Bar

The Dimension Barallows 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

Fig. 1.7,07

General Introductions
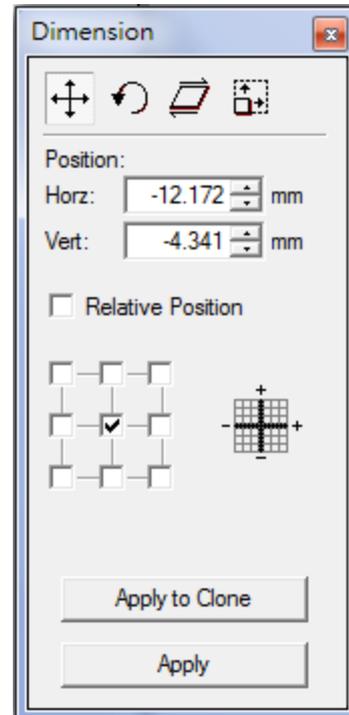
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1.7.8 Object Property Bar

The followings are the introductions of Object Property Bar.

1.7.8.1 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

Origin X	⊡x	The X-axis value of start point of working area.
Origin Y	⊡y	The Y-axis value of start point of working area.
Page Length	⊡	The length of working area.
Page Width	⊡	The width of working area.
Change the Unit	mm ▼	The unit of the ruler (mm or inch).
Trim X	⊹x	Edit the trimming base of X.
Trim Y	⊹y	Edit the trimming base of Y.
Grid X	⊞	Edit the X grid line.
Grid Y	⊞	Edit the Y grid line.
Open the Options Dialogue	⊟	Click this button to enter the Options page.
Show or Hide the Property Table	⊡	Click this button to show or hide the Property Table.

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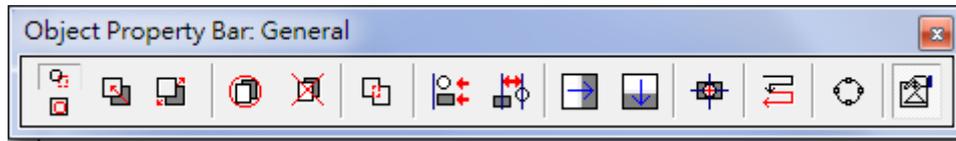
Fig. 1.7.09

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

1.7.9 Mark Sample Bar
Open the Mark Preview function (refer to 1.6.2).

General Introductions

1.7.10 Manual Split Bar

Manual Split Bar allows users to adjust the tiling settings under Manual Split mode, see Fig.1.7.10. For more details about Tiling, please refer to 3.1.3.
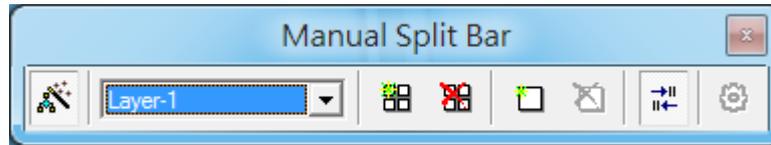
Fig. 1.7.10

Edit Split Bands		Enter or Exit Manual Split Mode.
Current Layer	Layer-1	Current editing layer.
Auto create bands		Auto-generate all bands.
Clear all bands		Clear all existed bands.
Create A New Band		Create a new band.
Delete Bands		Delete selected band(s).
Order The Bands		Show the order of bands.
Tiling setting		Open Tiling dialog

General Introductions

1.7.11 Data Wizard

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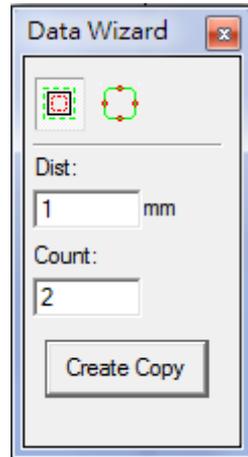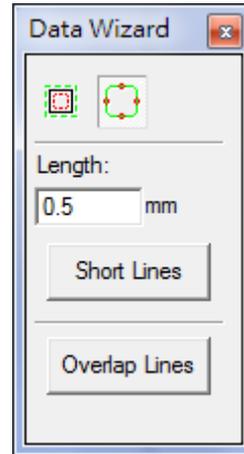
Fig. 1.7.11   Fig. 1.7.12

Beam Compensation	Create (a) shrink or dilate object(s) from a closed path object according to the dist and count, see Fig.1.7.13.
Dist	The shrink or dilate distance (+value: shrink; -value: dilate).
Count	The amount of new created object(s)
Create Copy	Create new objects.
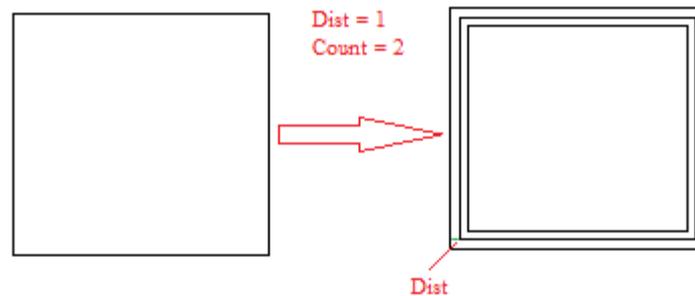
Fig. 1.7.13

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

General Introductions

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.
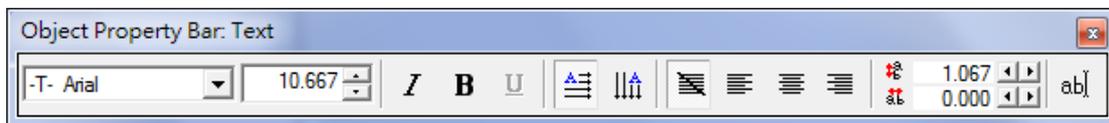
Fig. 1.7.15

Font	-T- Arial	Select font.
Size	10.667	Adjust font size.
Italic Style	*I*	*Italic.*
Bold Style	**B**	**Bold Style.**
Underline	U	Underline.
Hori. Arrangement		Horizontal text.
Vert. Arrangement		Vertical text.
None alignment		None alignment.
Left alignment		Left alignment.
Center alignment		Center alignment.
Right alignment		Right alignment.
Line Pitch	1.301	Space between each line.
Text Pitch	0.000	Space between each character.
Edit Text	ab|	Set up the content of the text.

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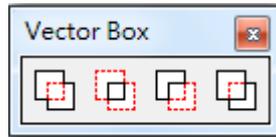
Fig. 1.7.16

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.
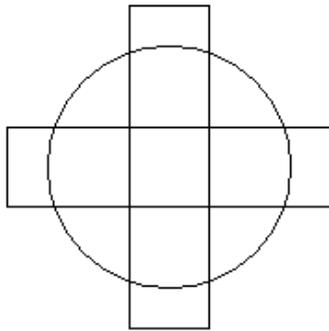
Fig. 1.7.17
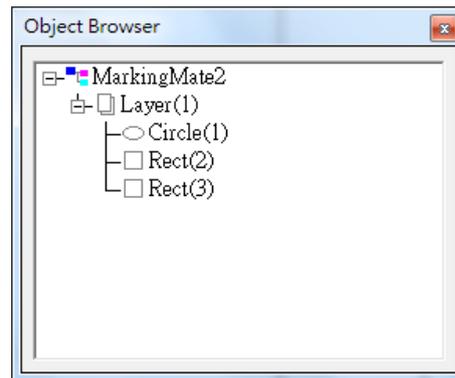
Fig. 1.7.18

Or: Retain the none-overlapping part of the objects, see Fig.1.7.19.
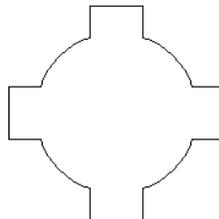
Fig. 1.7.18

And: Retain the overlapping part of objects, see Fig.1.7.19.

Fig. 1.7.19

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Subtract: Retain the none-overlapping part of main object, see Fig.1.7.20.
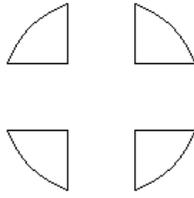
Fig. 1.7.20

Main: Retain the main object and the none-overlapping parts of the other objects, see Fig.1.7.21.
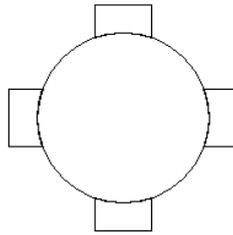
Fig. 1.7.21

1.7.15 Property Table

Click to open property table.

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1.7.16 Control Object Tool Bar

The Control Object Tool Bar allows user to insert control objects, see Fig.1.7.22. For more detail descriptions, please refer to section 3.4.

Fig. 1.7.22

Digital In	IN	Set digital in signals.
Digital Out	OUT	Set digital out signals.
Do Pause	❚❚	Insert a pause object into the marking sequence.
Delay Time	⏲	Insert a delay time object into the marking sequence.
Motion	↵	Move the object to anassigned position.
Set Position	◻	Set the current position as the assigned position.
Loop	↻	Create a loop path in the marking sequence.
Ring	▣	Insert a ring object into the marking sequence.
Homing	⌂	Insert an auto-home object.

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1.7.17 Mark Panel

The Mark Panel offers users to quickly execute some marking related functions, see Fig.1.7.23.

Fig. 1.7.23

Marking		Execute the marking function, please refer to section 1.6.1.
Remote Control		Use remote control function to connect two computers to mark, please refer to Practical Introduction.
Preview		Enter the Preview mode, please refer to section 1.6.2.
Mark Sample		Enter he Mark Sample mode, please refer to section 1.6.2.
X-Y Table		Allow users to adjust X-Y Table settings, please refer to section 1.7.16.1.
Rotary Control Panel		Allow users to adjust rotary axis settings,please refer to section 1.7.16.2.
Z Axis Control Panel		Allow users to adjust Z axis settings, please refer to section 1.7.16.3.
CCD Panel		CCD control setting, please refer to CCD Panel User Manual.

1.7.16.1XY-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.1.7.24.
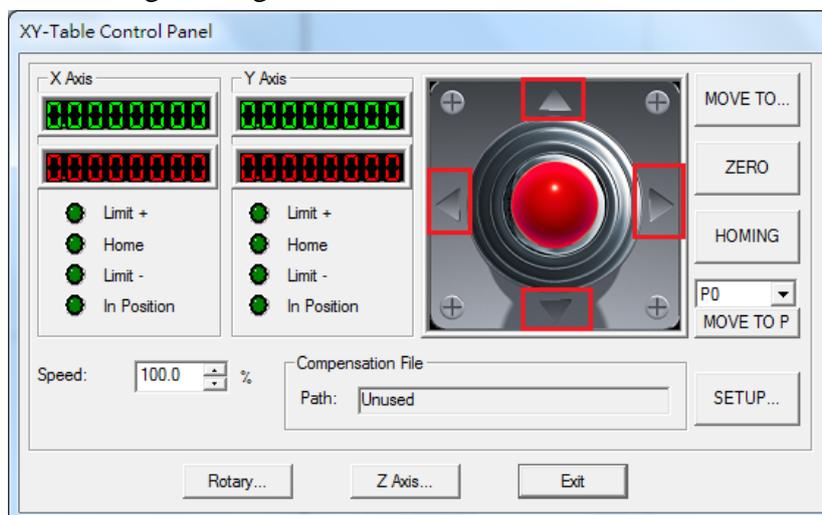
Fig. 1.7.24

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1. Click "MOVE TO…" button and then input the X and Y values in the dialog box like Fig.1.7.25and click "GO," the XY Table will move to that specific position. The moving speed can be adjusted from "Speed" parameter.
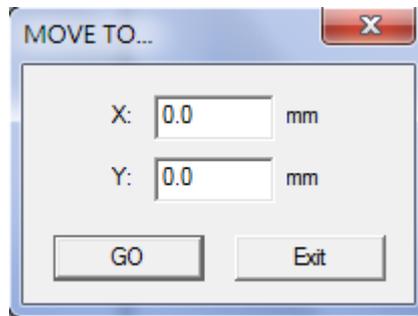
Fig. 1.7.25

2. Click the four direction buttons (the red part of Fig.1.7.24) to move the XY Table.
3. Click "ZERO" and the program will set the present position as (0,0).
4. Click "HOMING" and the XY Table will move to program origin.
5. 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.
6. Click "SETUP…"and do more detail settings, see Fig.1.7.26.
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.
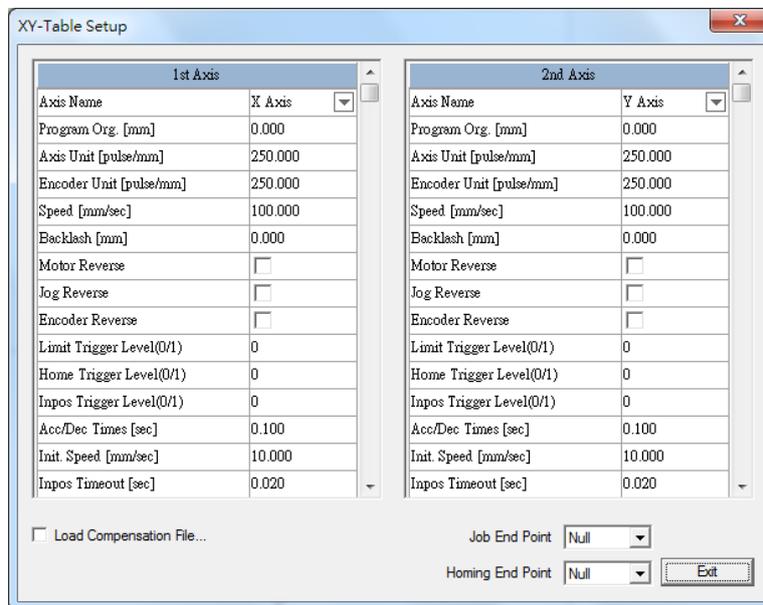
Fig. 1.7.26

| Axis Name | Users can set the 1st Axis as X or Y, andthe 2nd Axis as Y or X. |
| Program Org. [mm] | The program will consider this point as the program origin. |

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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	When XY Table is placed in a different direction with the software's control panel, this parameter can make the X/Y axis move following the right direction.
Encoder Reverse	Reverse the direction of the encoder.
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 Times [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 X/Y axis completed position after passing the time setting here.
Inpos Delay [sec]	The program will wait for thesetting time here to execute 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.
Home Reverse	Reverse the direction of homing.
Home Sensor Touching Mode (0/1)	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.
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 X/Y Axis can reach.
P0~P9 [mm]	Set the position of P0~P9.

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.1.7.27 is an example of the compensation file.
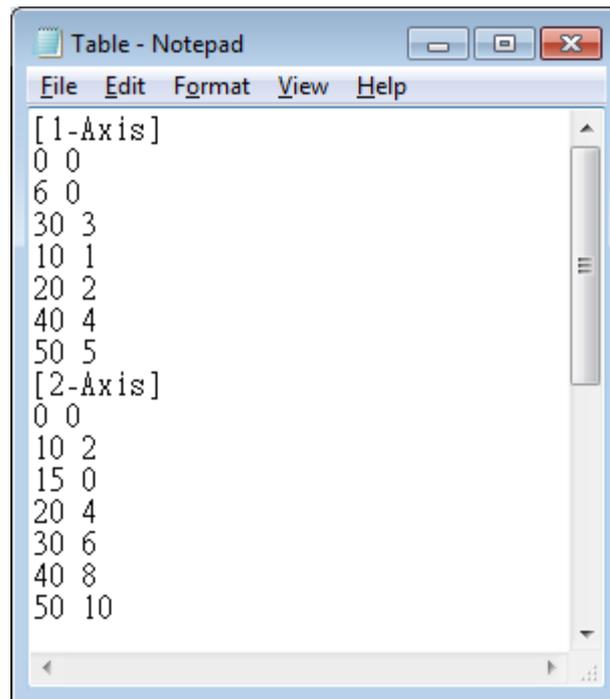
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Fig. 1.7.27

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 willchange 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 maximumcompensation 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.

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1.7.16.2 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] button and do the further setting, see Fig.1.7.28.
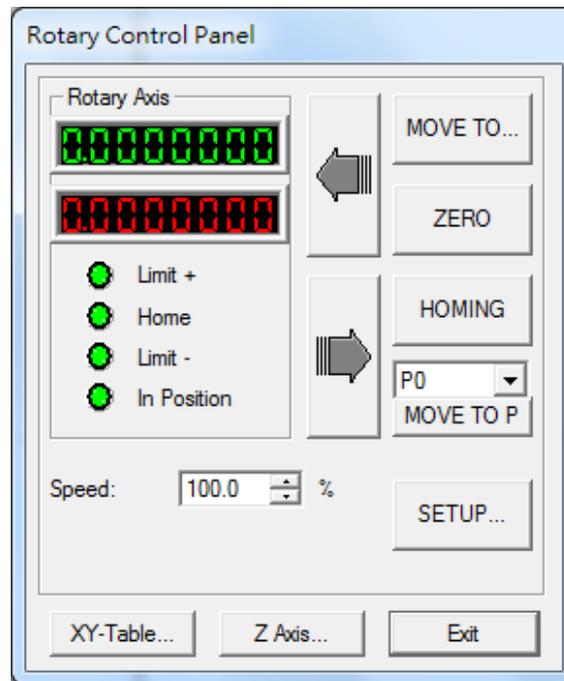
Fig. 1.7.28

1. Click "MOVE TO…" button and input the degree value in the dialog box like Fig.1.7.29and click "GO," the rotary axis will rotate to that specific angle. The rotating speed can be adjusted from "Speed" parameter.
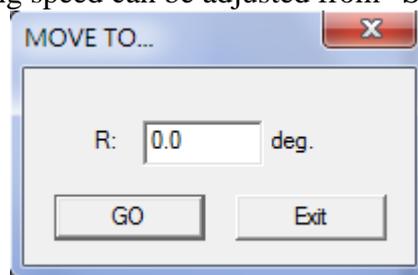
Fig. 1.7.29

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. Click "SETUP…" and do more detail settings, see Fig.1.7.30.
7. Click "XY-Table…" button can do X/Y Table control setting, please refer to section 1.7.16.1.

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8. Click "Z-Axis…" button can do Z-Axis control setting, please refer to section 1.7.16.3.
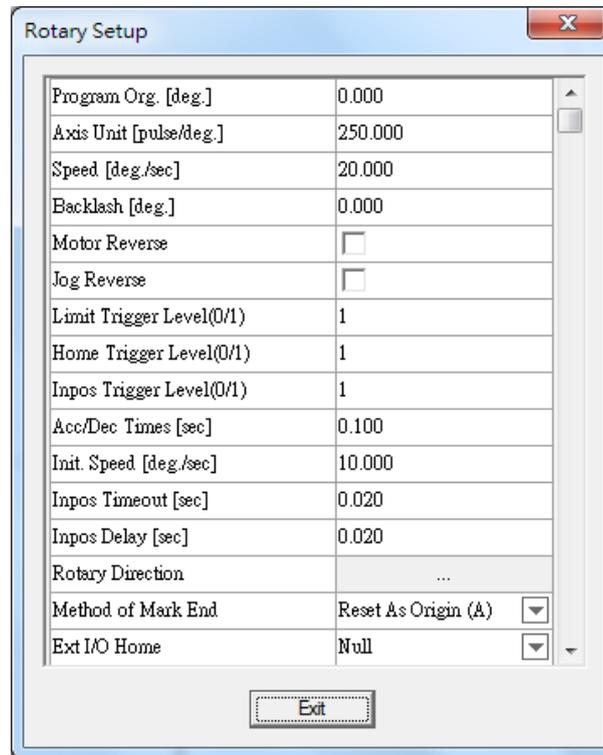
Fig. 1.7.30

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.
Rotary Direction	Click to do further settings for the rotating direction of the rotary axis, see Fig.1.7.31.

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Fig. 1.7.31

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 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.

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 [deg/sec]	The homing speed of rotary axis.

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Home Back Speed [deg/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 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.
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.
P0~P9 [deg.]	Set the position of P0~P9.

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1.7.16.3 Z Axis Control Panel

Please note that only PMC2 driver supports Z Axis control. Click [icon] button and do the further setting, see Fig.1.7.32.
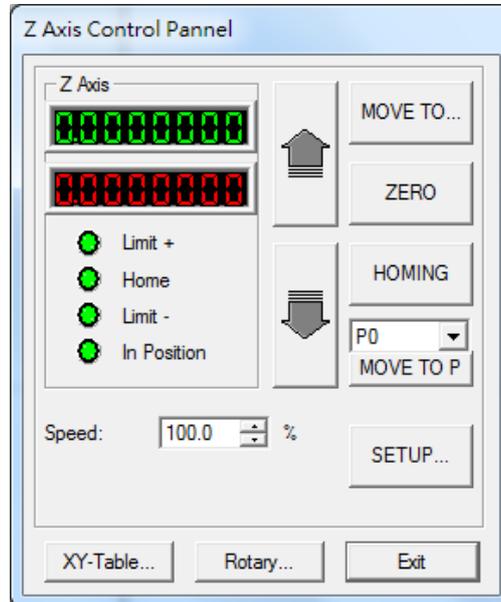
Fig. 1.7.32

1. Click "MOVE TO…" button and input the value in the dialog box like Fig.1.7.33 and click "GO," the Z Axis will move to that specific position. The moving speed can be adjusted from "Speed" parameter.
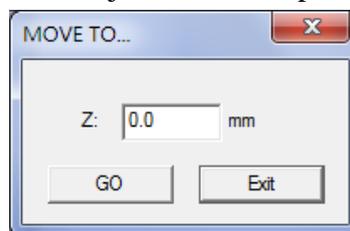
Fig. 1.7.33

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.1.7.34.
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.

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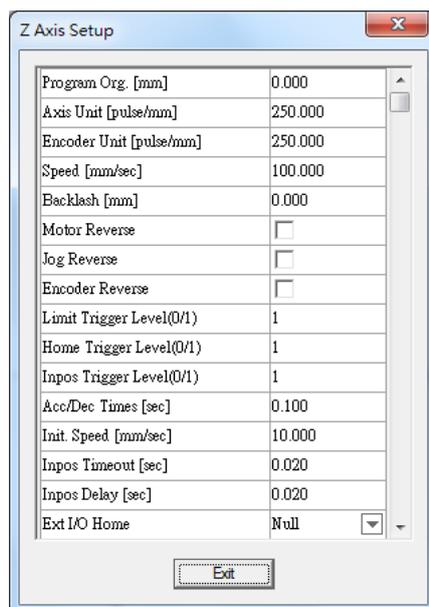
Fig. 1.7.34

Program Org. [mm]	The program will consider this point as the program origin.
Axis Unit [pulse/mm]	The pulse needed for Z 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 (refer to the encoder's specification).
Speed [mm/sec]	The moving speed of the Z axis
Backlash [mm]	The transmission deviation between motor and axis.
Motor Reverse	Reverse the motor moving direction.
Jog Reverse	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.
Encoder Reverse	Reverse the direction of the encoder.
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 Times [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 Z 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.
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).

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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.

1.7.18 Status Bar

Enable or disable the Status Bar which display on the bottom of the software, see Fig.1.7.35.

| Open a new file | 1 | Level: Administrator | 2 | -88.039 , 127.816 | 3 | CAP | NUM | SCRL | 4 |
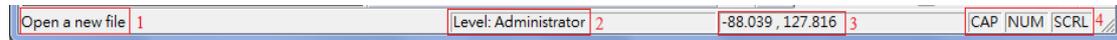
Fig. 1.7.35

Display the function description positioned by the mouse.
Show the user level.
The X, Y-axis value of the mouse position
1. 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.

1.7.19 Desktop Mode
Change the setting Desktop Mode.

1.7.20 Composing Setting

Include tooltips, ruler, grid, and grid locksettings here. The toolbar with a ✓ mark means that function has been opened.

1.7.20.1 Show Order

   Use this function can see the mark order of each object, see Fig.1.7.36.
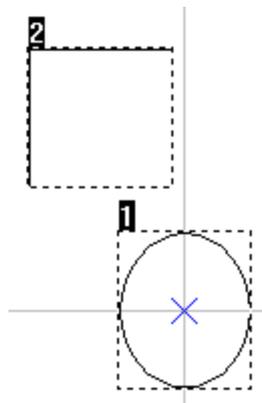
Fig. 1.7.36

1.7.20.2 Tooltips / Tooltips Setting
   The tooltips setting descriptions please refer to 1.1.6.21.

1.7.20.3 Ruler / Ruler Setting
   The ruler setting descriptions please refer to 1.1.6.19.

1.7.20.4 Grid / Grid Lock / Grid Parameter
   The grid setting descriptions please refer to 1.1.6.20.

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1.7.21 Zoom In

Enlarge a specific area.

1.7.22 Zoom Out

Shrink a specific area.

1.7.23 Zoom Previous

Go back to the previous view.

1.7.24 Zoom All

Show the whole Work Area.

1.7.25 Zoom Extend

Show all objects.

1.7.26 Zoom Select Object

Zoom the selected objects to fit the whole editing area.

1.8 Window Menu

"Window" menu offers the following functions:

New	Create new window
Cascade	Allow all open windows overlapping
Tile	Show all open windows without overlapping
Arrange	Rearrange the windows
Close All	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 allopen windows in an overlapping way, see Fig.1.8.01.

Fig. 1.8.01

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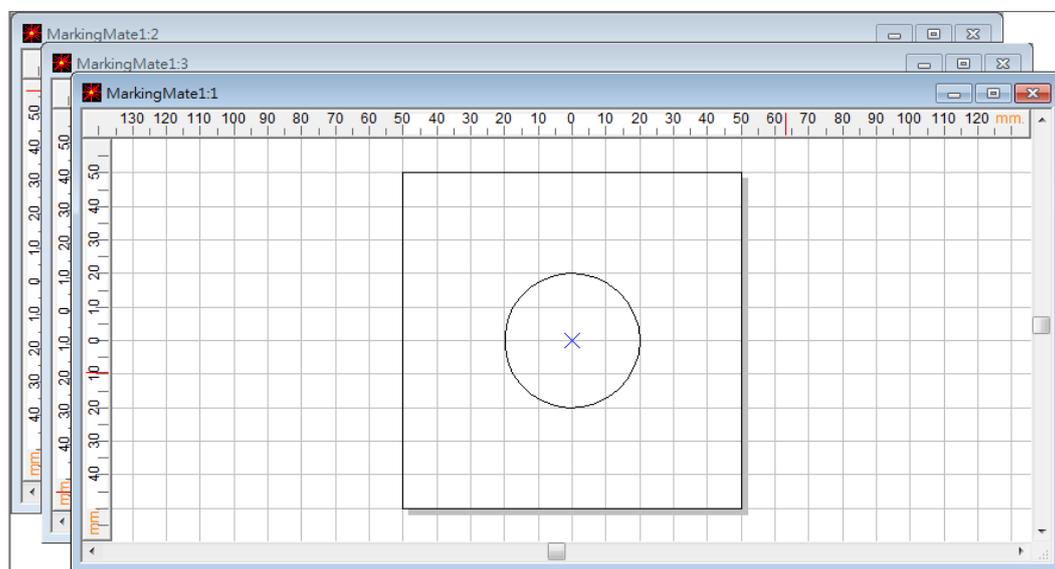
1.8.3 Tile

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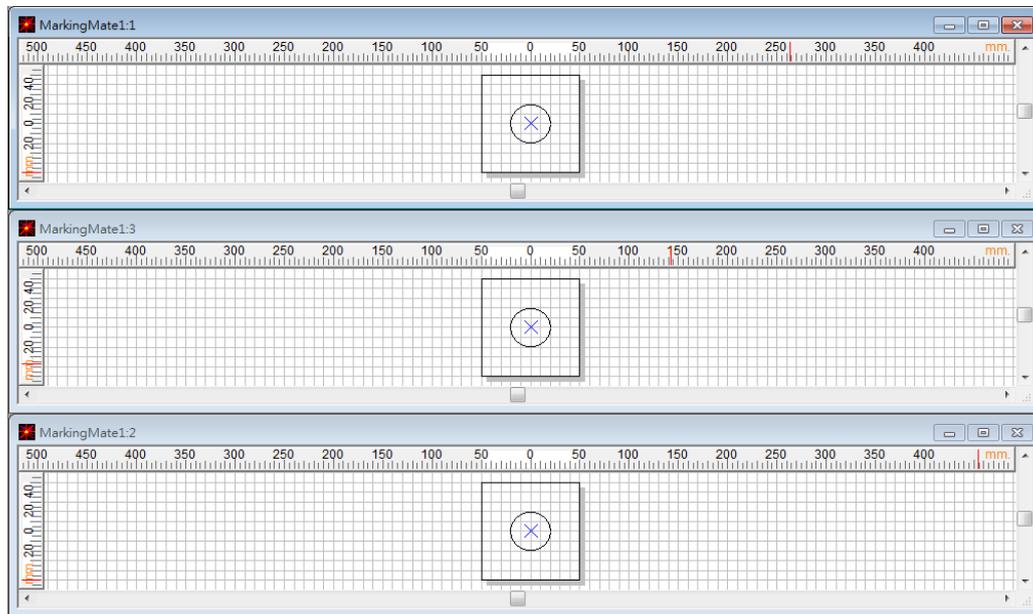
Fig. 1.8.02

1.8.4 Arrange

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

Fig. 1.8.03

1.8.5 Close All

Close all opened windows.

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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.
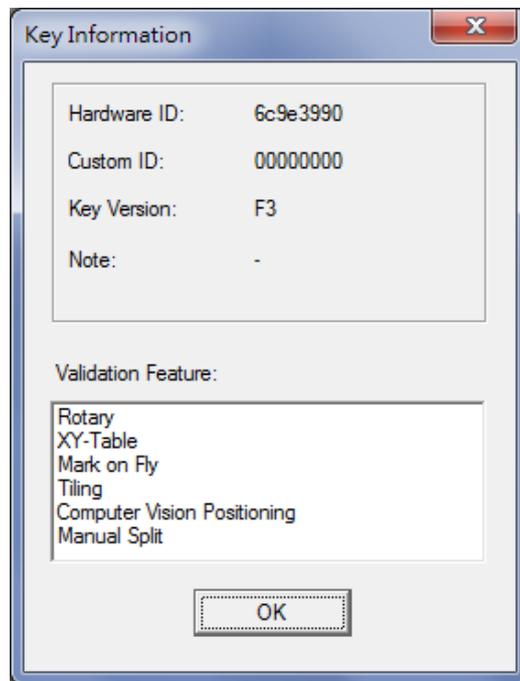
Fig. 1.9.01

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

Fig. 1.9.02

General Introductions
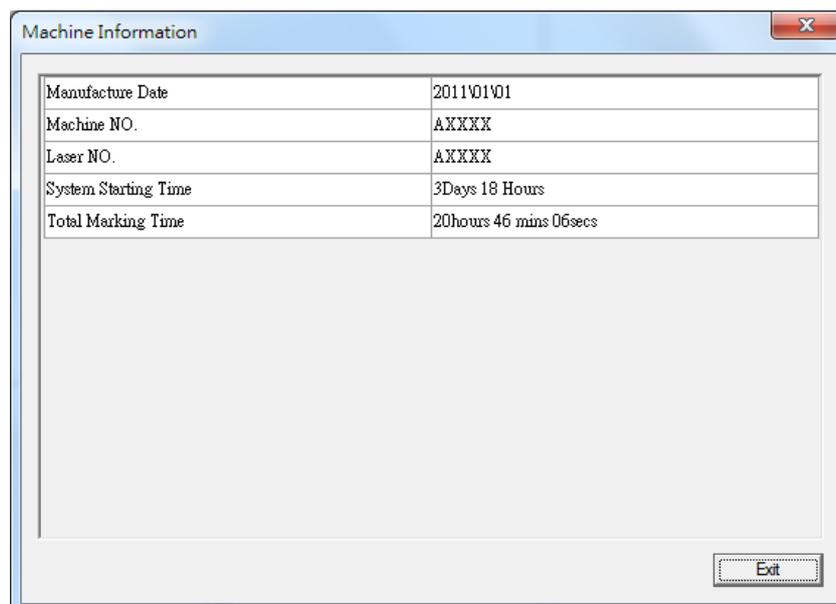
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About MarkingMate   Show the current using version and driver of MarkingMate, see Fig.1.9.03.
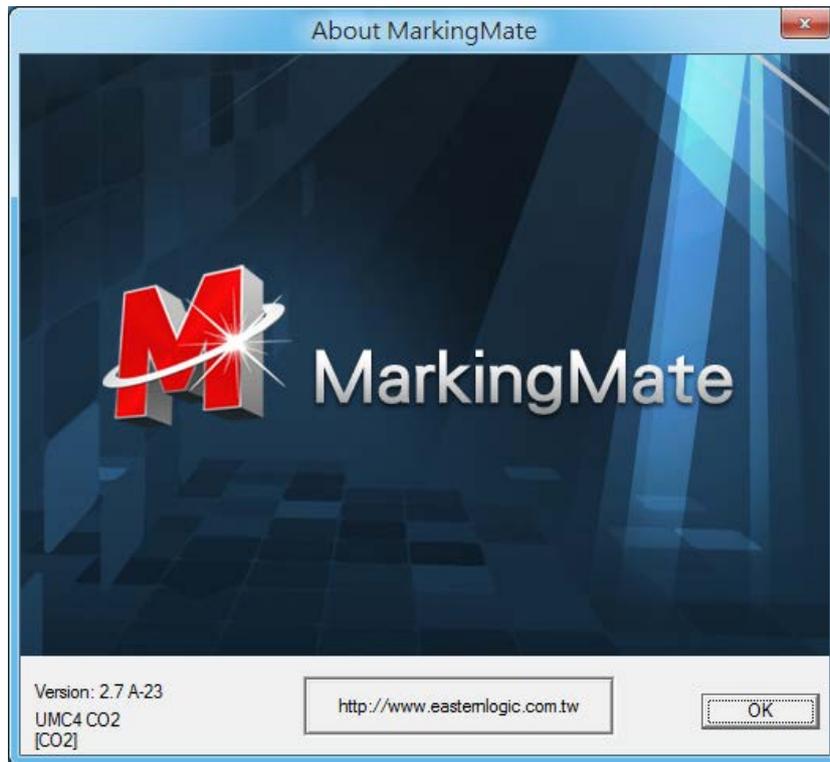
Fig. 1.9.03

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2. Objects

MarkingMate offers "Object Function" for users to draw graphics, texts, and barcodes.   These functions include dot, line, arc, circle, rectangle, curve, curve brash, 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.

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

2.1.2 Popup Menu

Select a general object and click the right button of the mouse, users will see a popup menu, see Fig.2.1.01.

Fig. 2.1.01

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

General Introductions

Array Copy	Execute the array copy function
Property Table	Show the Property Table of the object
Dimension Bar	Enable/disable Dimension bar
Object Browser	Enable/disable Object Browser
Group	Group selected object
Ungroup	Ungroup selected group
Combine	Combine several objects into one object
Break	Break one object into several objects
Set Circle Object Radius	Modify circle that radius same as original radius to modified radius.
Move To New Layer	Move selected objects to new layer

General Introductions

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.

Vector	Draw a point.
Line	Draw a straight 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.
Rectangle Text	Insert a rectangle text object.
1D Barcode	Create a 1D barcode.
2D Barcode	Create a 2D barcode.
Matrix	Create a matrix object.
Spiral	Draw a spiral object.

General Introductions

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.

System	Adjust system-related parameters.
Marking Parameter	Adjust marking-related parameters.
Object	Adjust general object-related parameters.
Control Object	Adjust settings of control objects.
Layer	Set the layer-related functions.

General Introductions

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.

Fig. 3.1.01

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.

General Introductions
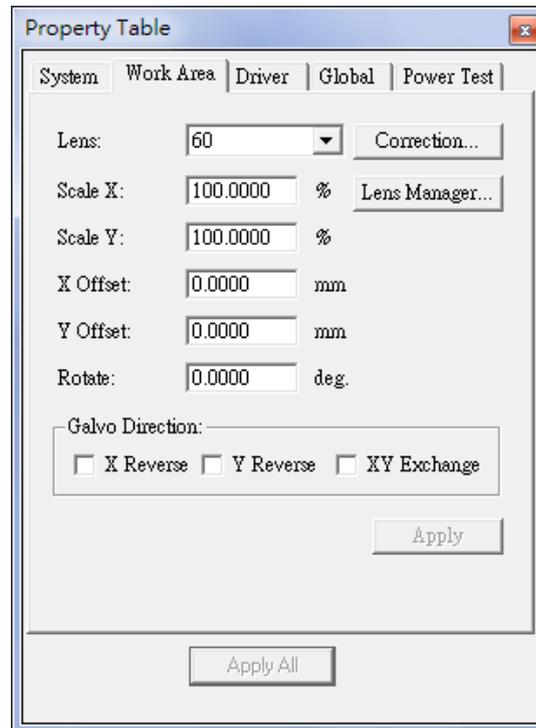
3.1.2 Driver

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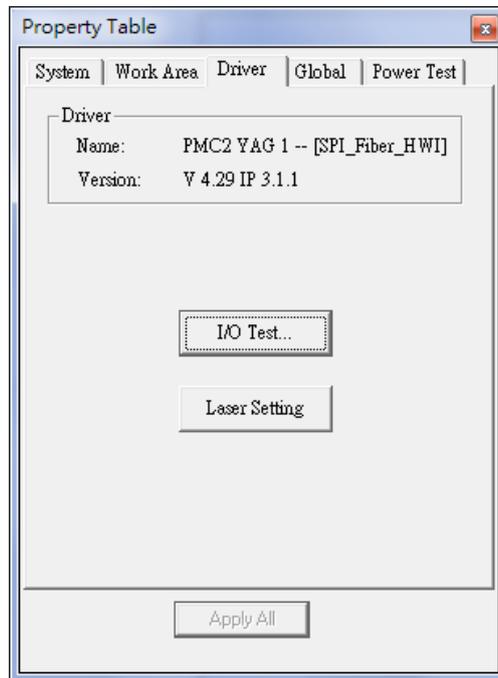
Fig. 3.1.02

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

General Introductions
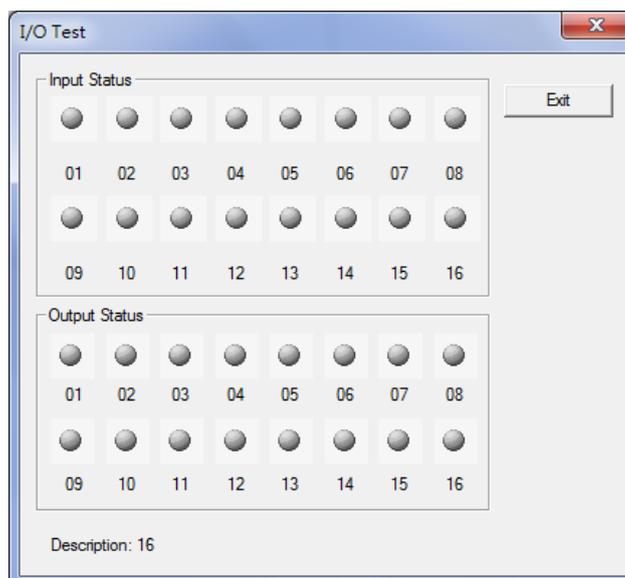
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Laser Setting:

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.
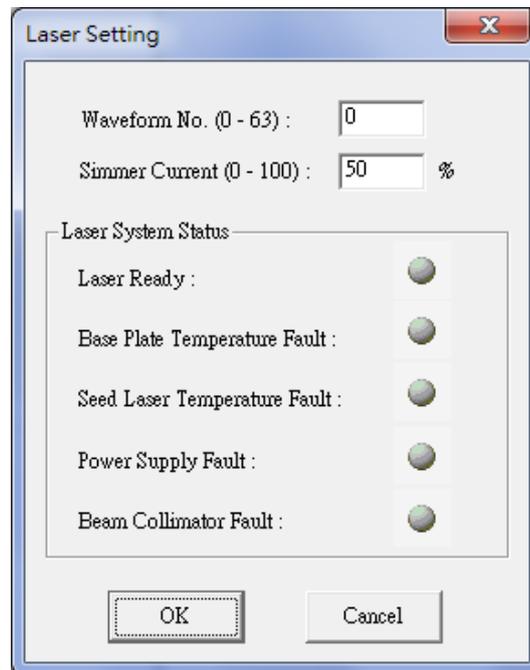
Fig. 3.1.04

3.1.3 Global

The Global Property Page shows like Fig.3.1.05.
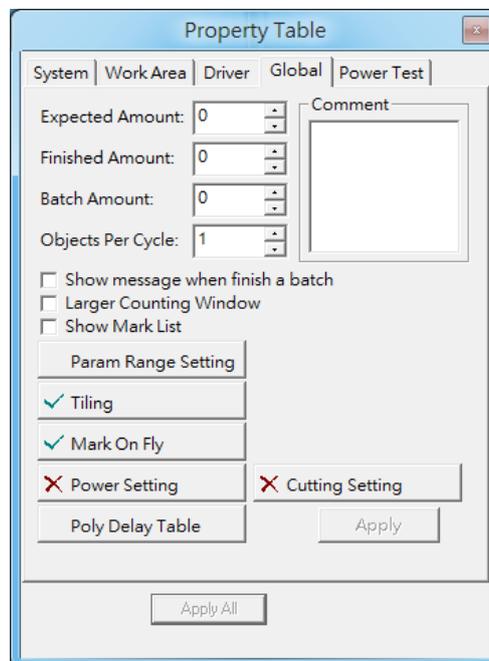
Fig. 3.1.05

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.

General Introductions
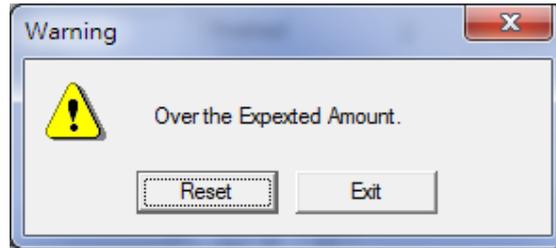
Fig. 3.1.06

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.
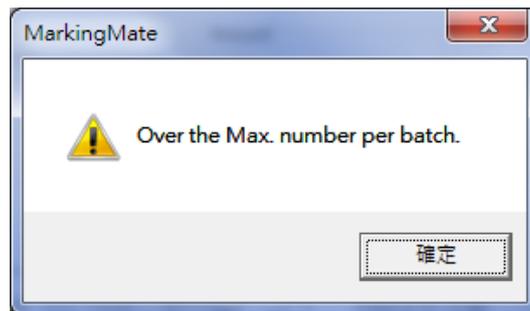
Fig. 3.1.07

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.

General Introductions

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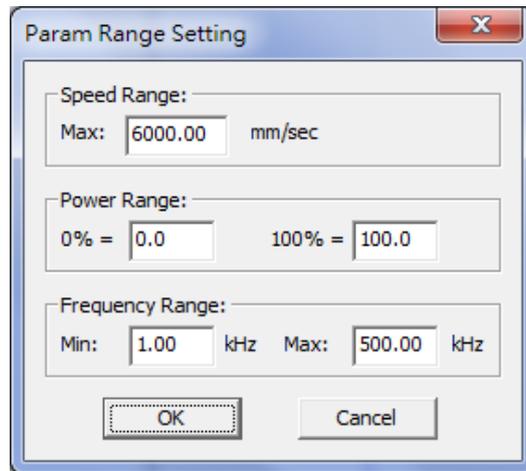
Fig. 3.1.09

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.
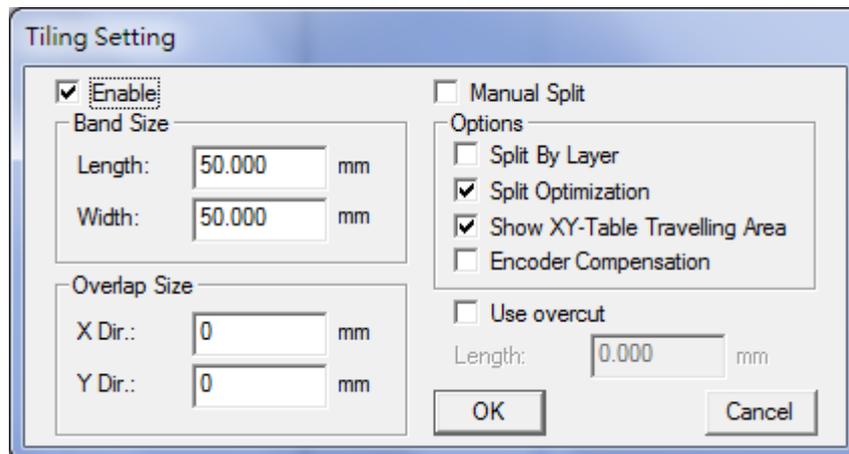
Fig. 3.1.10

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

General Introductions

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. 3.1.11.
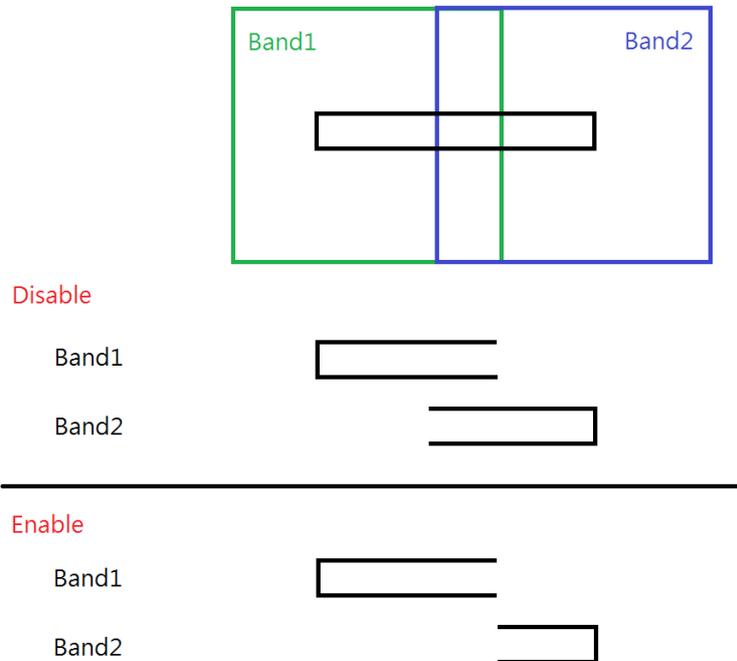
Fig. 3.1.11

Encoder Compensation: Decide to use encoder to do compensation

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.3.1.12. The difference between overlap and overcut is that the overlapping area will be marked twice but overcut won't, see Fig.3.1.13 and Fig.3.1.14. Overlap and overcut cannot be used at the same time.

Fig. 3.1.12

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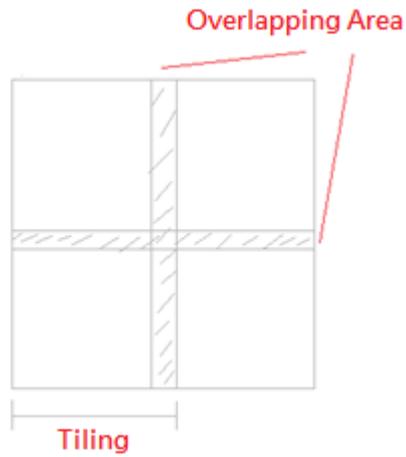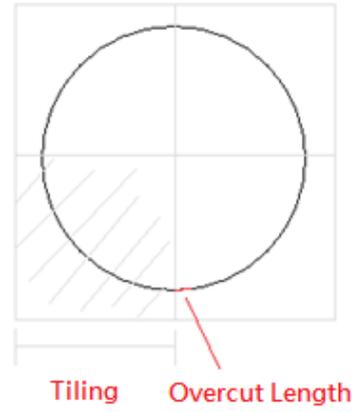
Fig. 3.1.13   Fig. 3.1.14

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

Fig. 3.1.15

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Working Area	The Working Area for graphic split is the sum of XY Table Area and the half of Lens Area.
XY Table Area	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.
Lens Area	About the setting method please refer to Lens Manager.
Offset	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.

Cutting Setting

Cutting means beam out position will maintain at scanner original position, and XY-table will move along the cutting path. In order to use cutting function, users will need to have tilling license.

Enable	Enable cutting function.
Limit	See Fig 3.1.16. If limit angle is smaller than cutting path outer corner, cutting there will tune the motion speed to move along the cutting path. This will make the cutting more accurate.
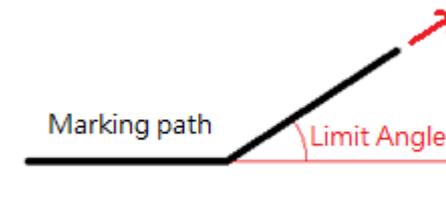
Fig3.1.16

Mark On Fly

The button ![Mark On Fly] means this function is disabled. When it is enabled, the button will become to this ![Mark On Fly]. Please refer to the description of section **1.1.6.3 Mark On Fly**.

Power Setting

The button ![Power Setting] means this function is disabled. When it is enable, the button will become to this ![Power Setting]. Please refer to the description of section **1.1.6.14 Power Setting**.
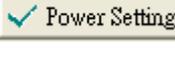
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Poly Delay Table:

Press the "Poly Delay Table" button will show a dialogue box like Fig.3.1.17.
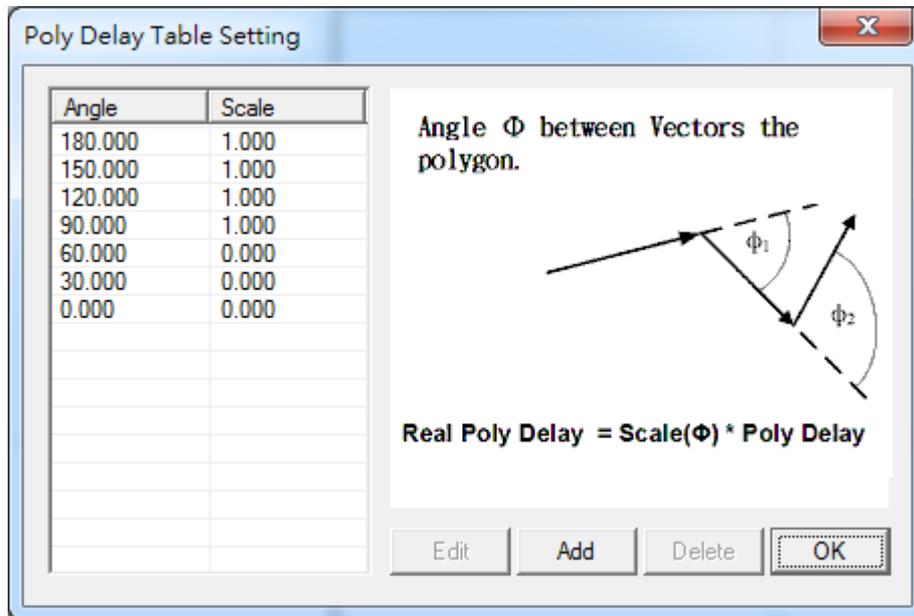
Fig. 3.1.17

The value of Angle and Scale will affect the Poly Delay under the Delay page of Property Table (refer to section 3.2.3). The following is the formula of delay time.

Delay Time(ϕ) = scale(ϕ) • (Poly Delay)

Scale(ϕ) is a ratio value between 0 and 2. Please note that ϕ is a supplementary angle of an included angle, and it is calculated as Fig.3.1.18 and Fig.3.1.19.

Fig. 3.1.18

General Introductions
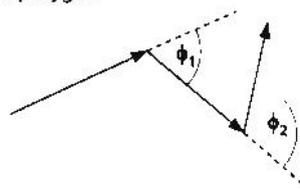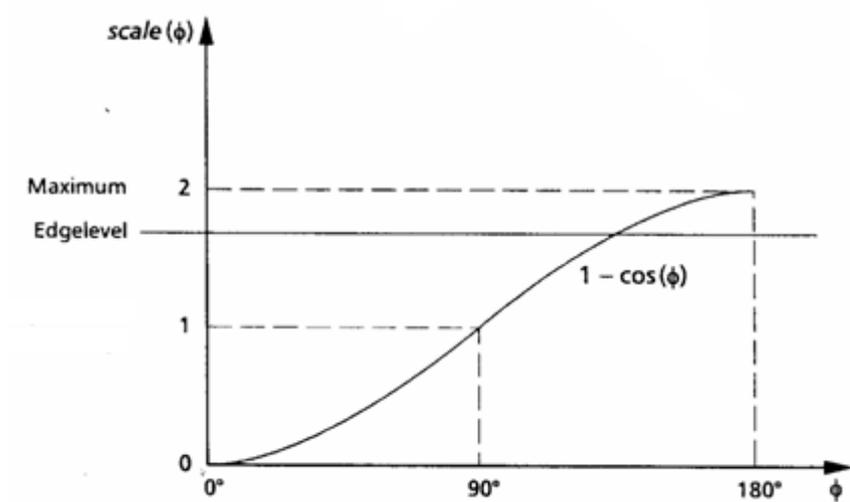
Fig. 3.1.19

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

General Introductions
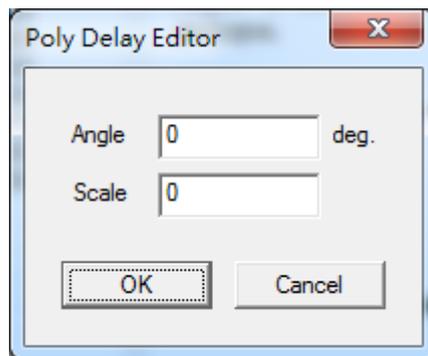
3.1.4 Power Test

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.
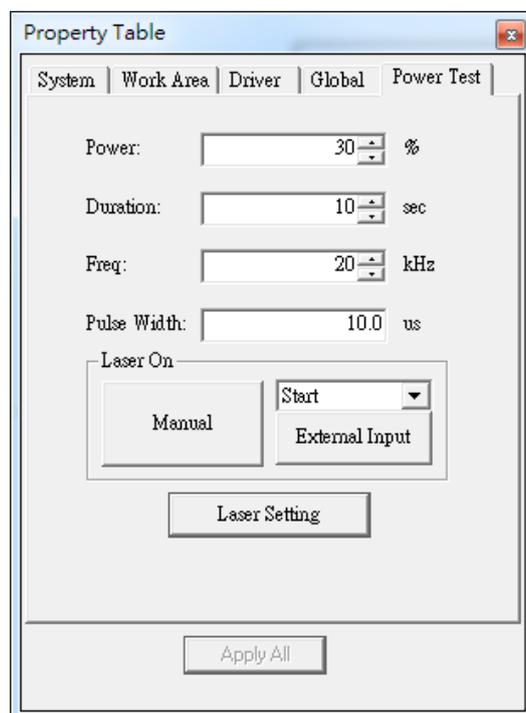
Fig. 3.1.21

Power
For CO2 laser, this value means the ratio of power. For example, if the maximum power of CO2 laser is 10W and the value is 30%, than 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:
Please refer to Section 3.1.2.

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3.1.5 System

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

Fig. 3.1.22

General Introductions
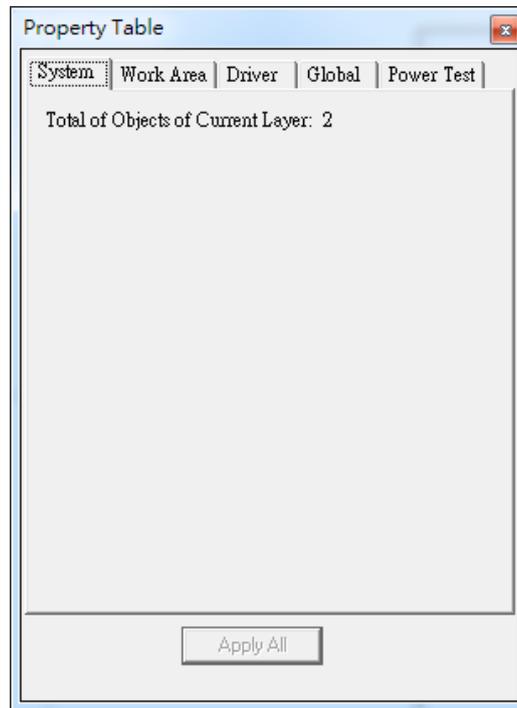
3.2 Mark-related Property Table

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.
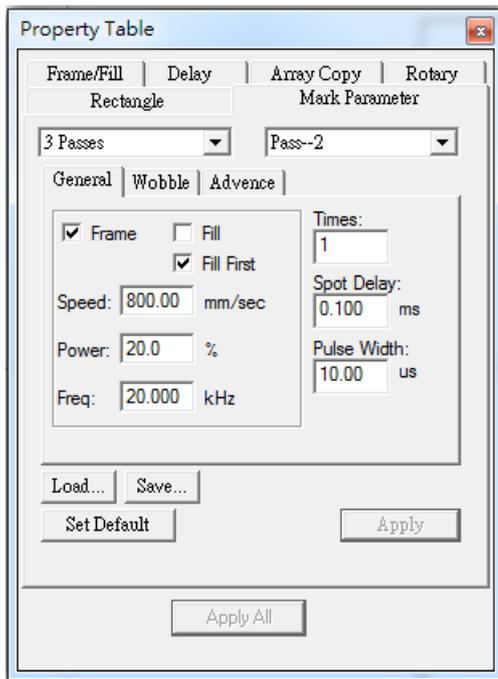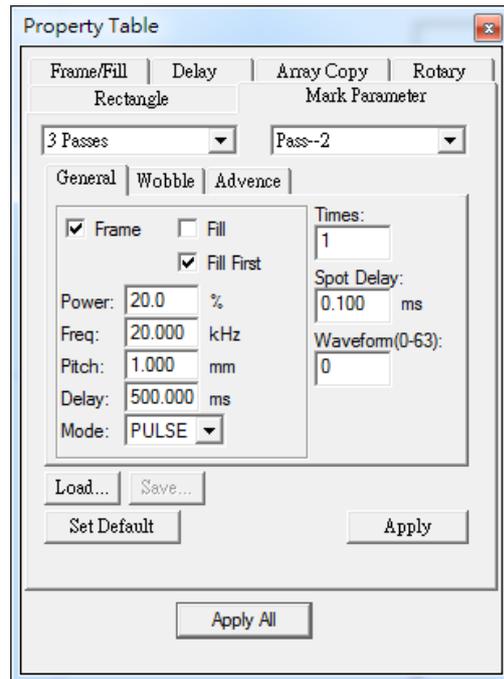
| Fig. 3.2.01 | Fig. 3.2.02 |

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 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.

General Introductions

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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.

Pulse Width

Set the pulse width (YAG driver only).

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.

Wobble

Mark by spiral type and make the line segment become thicker, see Fig.3.2.03.

Thick(W)

The diameter of the circle.

    Overlap

    Higher overlap percentage will get thicker line segment, see Fig.3.2.04.
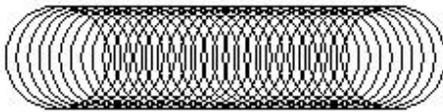
Fig. 3.2.04
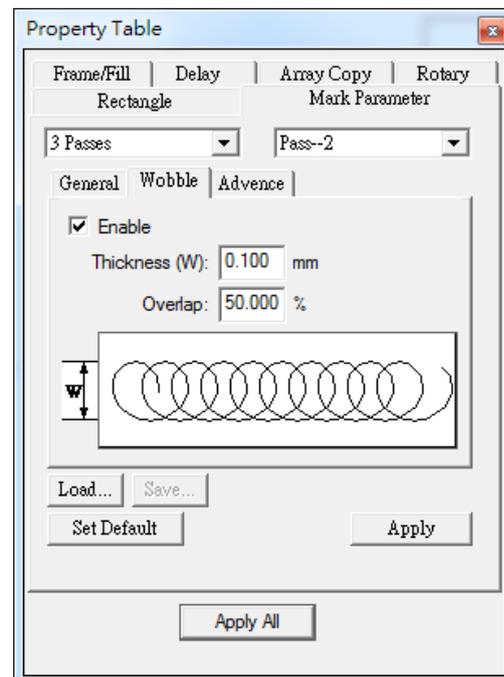
Fig. 3.2.03

    Advance

Provide users some further mark settings, see Fig.3.2.05 and Fig.3.2.06.

    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.

General Introductions
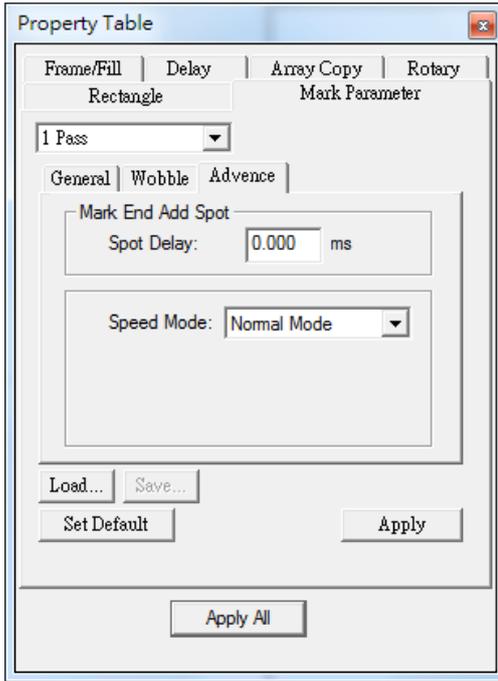
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Fig. 3.2.05
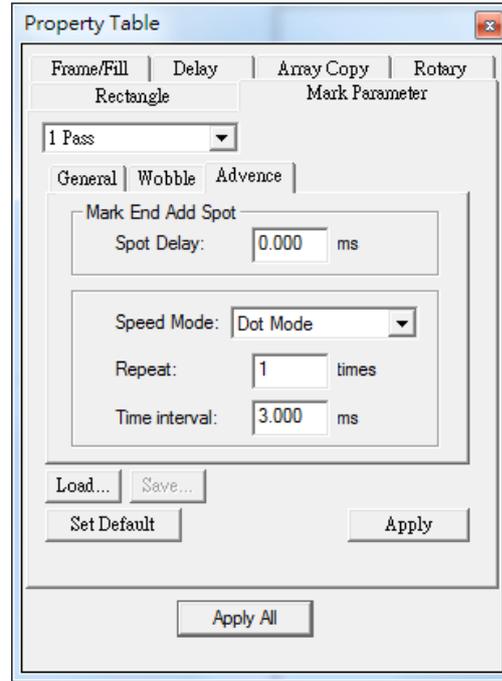
Fig. 3.2.06

Load
Load the previous saved parameter setting.
Save
Save the current setting.
Set Default
Set the current setting as the default setting.

General Introductions

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3.2.2 Cut Parameter

If users set the layer which contain an object processing method as cutting from layer property page, cutting property page will appear after clicking on the object which is under the layer. See Fig 3.2.07.
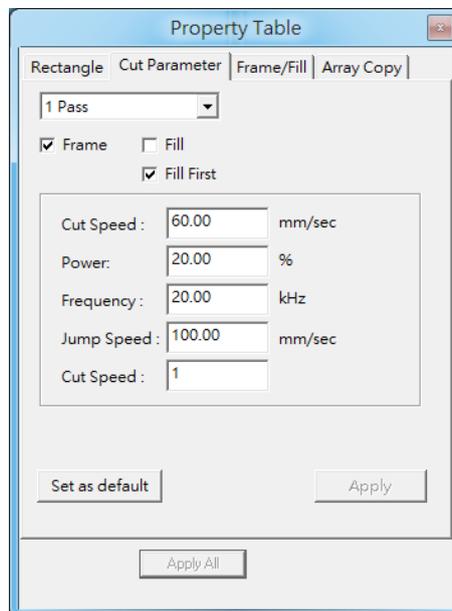
Fig. 3.2.07

Process index
Allowing users store 5 sets of different cutting parameter.
Frame/ Fill
Decide whether to cut the object's frame or fill the object at each pass.
Fill First
Do filling first when cutting.
Cut Speed
Cutting speed could not exceed XY table motion speed.
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 by voltage.
Jump Speed
Motion speed while is not cutting.

General Introductions

3.2.3 Frame/Fill

Set the frame color, fill color and fill style, see Fig.3.2.08.
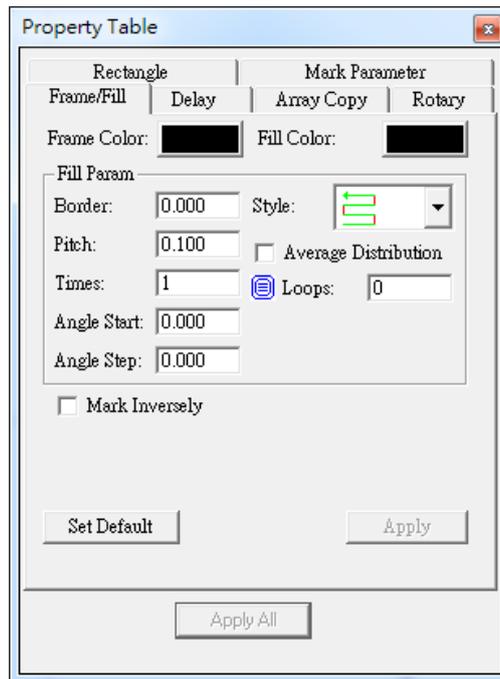
Fig. 3.2.08

Frame/ Fill Color: Select the frame of fill color.

Fill Param: Modify the related parameters when fill.

Border: The distance between hatch line and the frame.

Pitch: The distance between each hatch line.

Average Distribution: Distribute the hatch line averagely based on the pitch and the frame.

Times: The fill repetition times.

Angle Start: The start angle of each hatch line. Fig.3.2.09 shows the fill representation when this value is 45°.

Angle Step: The progressive angle of each hatch line. Fig.3.2.10 show the fill representation when Angle Start is 45°and Angle Step is 90°.
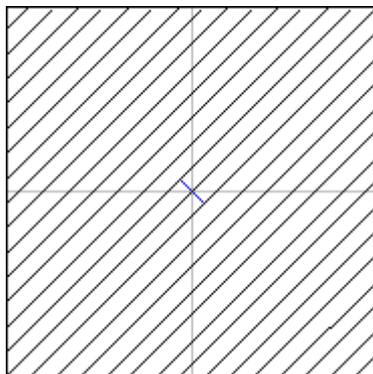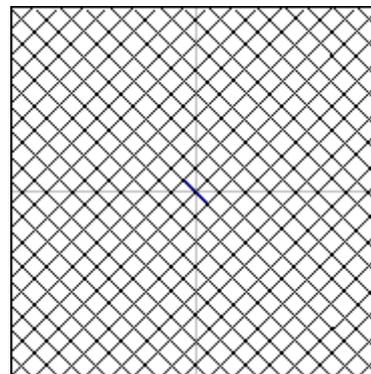
Fig. 3.2.09   Fig. 3.2.10

Style: Decide the traveling path mode of laser when fill. There are five styles for users to select.

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Loops: Decide the amount of loop created inside the object according to the pitch. The hatch line will be filled in the loop. Fig.3.2.11 shows the hatch representation when this value is 2.
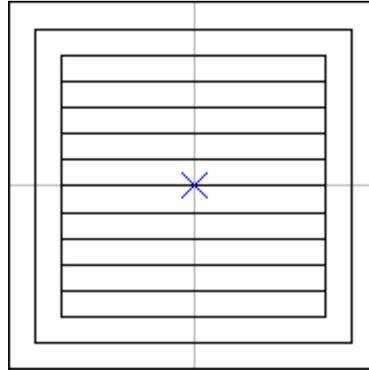
Fig. 3.2.11

* If choose ▣ mode, users can only set pitch parameter.

Mark Inversely: Only when the object is Text, Arc Text or Rect Text. The system will mark the non-text part instead of mark the text object when using this function.

General Introductions

3.2.4 Delay

Adjust the delay time parameters which affect the mark quality, see Fig 3.2.12.
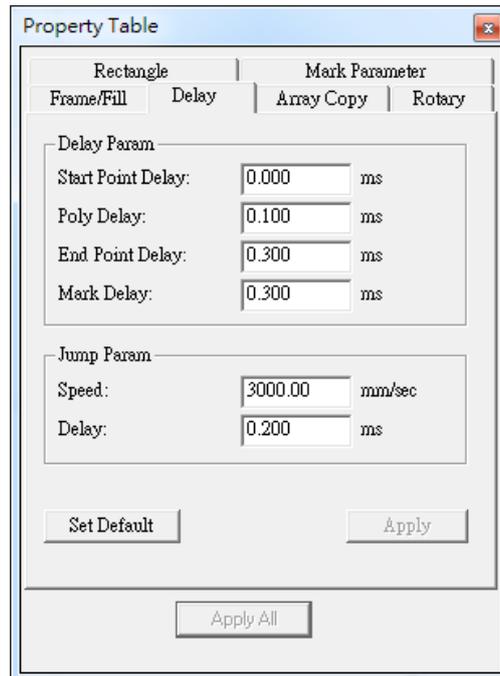
Fig. 3.2.12

Delay Param: Provides four parameters for users to regulate. Users can adjust the required delay time based on the mark result.

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.

The delay time is too long.	The delay time is too short.	The delay time is suitable.
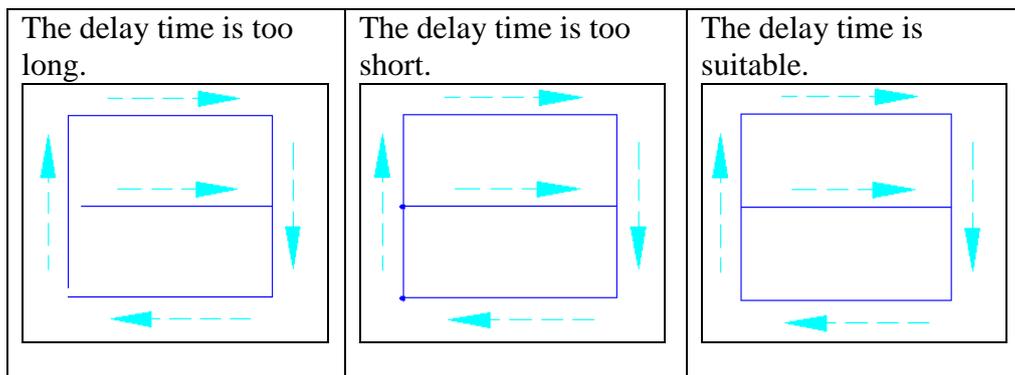
Table 3.1

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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.

The delay time is too short.	The delay time is too long.	The delay time is suitable.
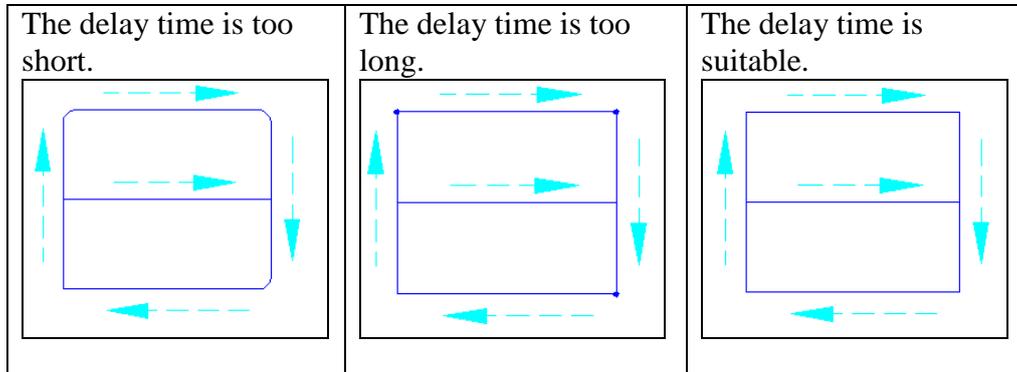
Table 3.2

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.

The delay time is too short.	The delay time is too long.	The delay time is suitable.
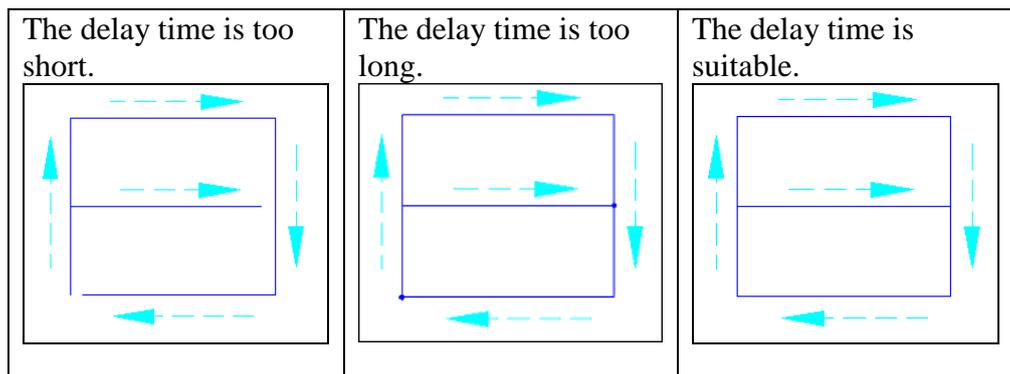
Table 3.3

Mark Delay:

The delay time that ensures the scanner will reach the assigned position before the next command (mark or jump) starts. This delay time includes the End Point Delay.

General Introductions

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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:
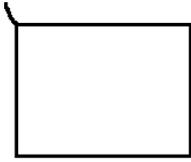
User will need to adjust mark delay. First of all, set both end point delay and mark delay to 0. This time the result will be seen as below:
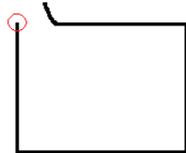
Then enlarge the mark delay until the tail is disappeared. Seen as below:

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.

3.2.5 Array Copy

This function uses the selected object as the main body to copy and create the same new objects. However, the new object is a virtual object, which means the Object Browser will only show the original object. Users can only modify the original object, and the other virtual objects will be changed according to the change of original one. Nevertheless, using "Break" function will make the virtual objects become single objects and allow users to edit them individually. There are two array copy mode for users to select: By Matrix and By Circle.

Array Copy Mode: By Matrix
The Property Table of this mode shows like Fig.3.2.13, and Fig.3.2.14 is the result under this mode.
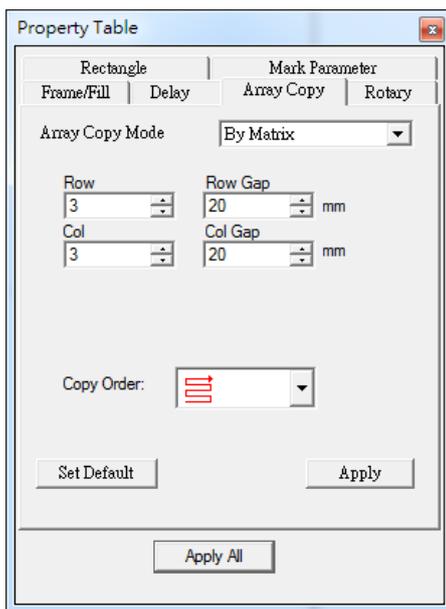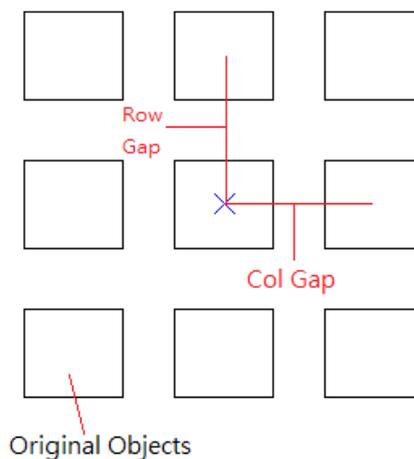
| Fig. 3.2.13 | Fig. 3.2.14 |

Row/ Col: The amount of objects in a row/ column.
Row Gap/ Col Gap: The vertical and horizontal distance between the centers of each object.
Copy Order: Select the copy order of the object. There are four types to choose.

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Array Copy Mode: By Circle
The Property Table of this mode shows like Fig.3.2.15, and Fig.3.2.16 is the result under this mode.
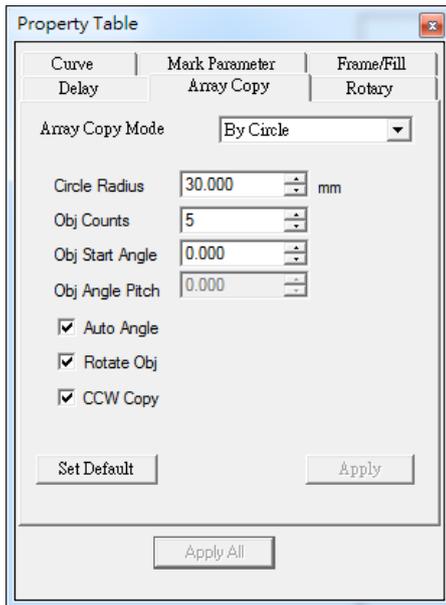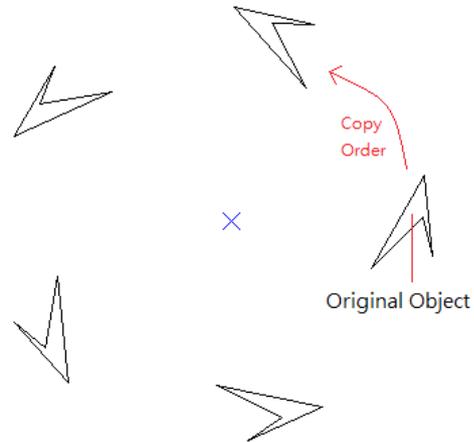
Fig. 3.2.15   Fig. 3.2.16

Circle Radius: Edit the size of the circle.
Obj Counts: The amount of the objects.
Obj Start Angle: Set the start angle of the first copy object.
Obj Angle Pitch: Arrange the objects according to the input pitch degree and the center of the object.
Auto Angle: Arrange the objects averagely as a cycle. This option cannot be used with Obj Angle Pitch at the same time.
Rotate Object: Decide to rotate the object or not. Fig.3.2.16 uses this function, but Fig.3.2.17 doesn't.
CCW Copy: Decide to use the clockwise copy order or counterclockwise copy order. The default is counterclockwise.
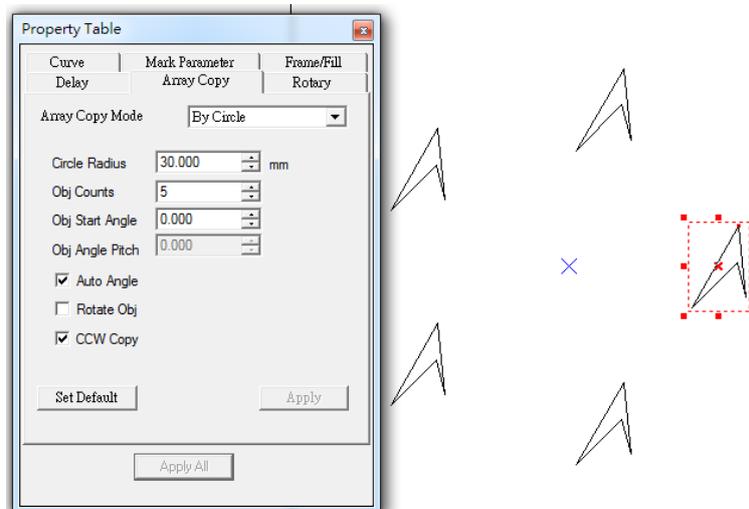
Fig. 3.2.17

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3.2.6 Rotary

This page allows users to enable rotary marking for individual object.
Fig.3.2.18 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.
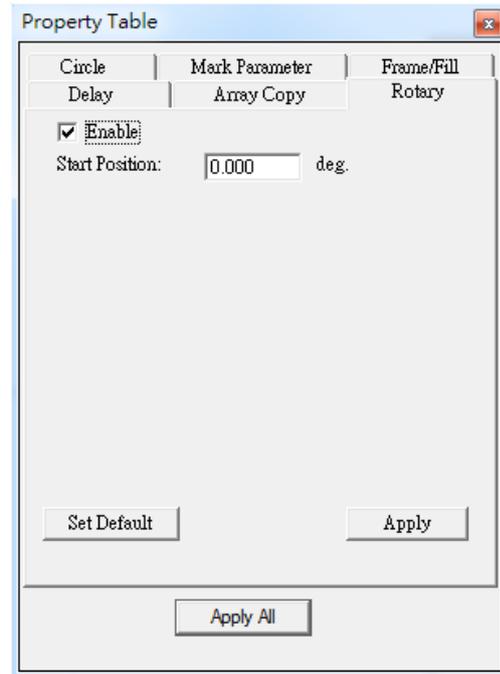
Fig. 3.2.18

Text Object

When a general text object has being selected, the Rotary Page has some particular options, like Fig.3.2.19.

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.3.2.20.

Edge: Calculate the pitch based on the edge of the character, see Fig.3.2.21.

Diameter: The software needs the diameter of the working-piece to calculate the pitch when select Edge mode.
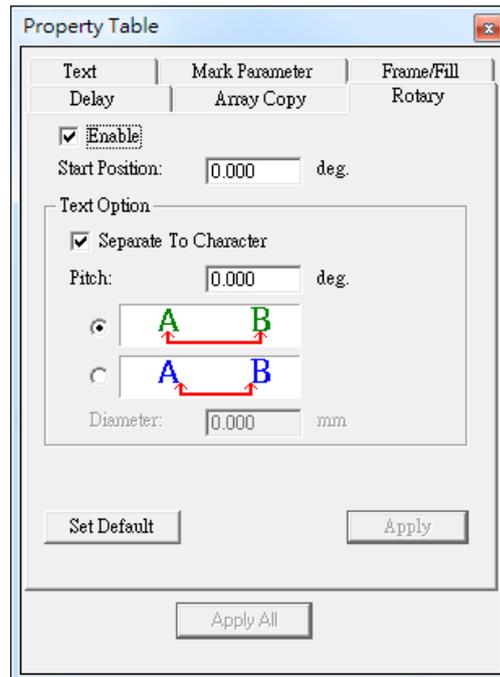
Fig. 3.2.19

Fig. 3.2.20

Fig. 3.2.21

General Introductions
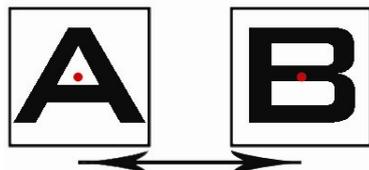
3.3 Object-related Property Table

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.
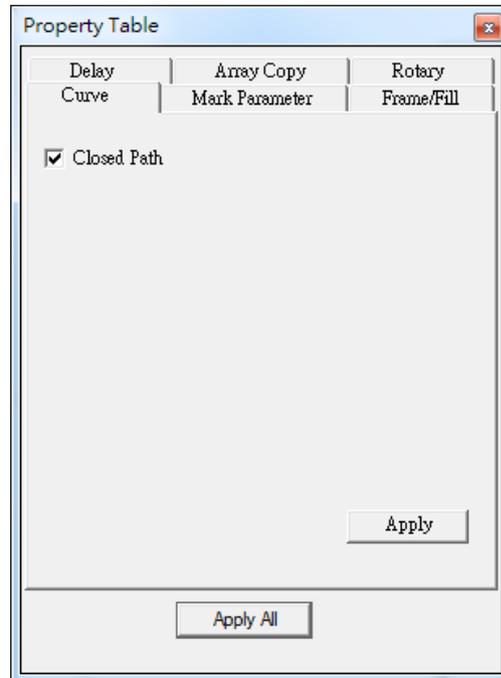
Fig. 3.3.01

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

General Introductions
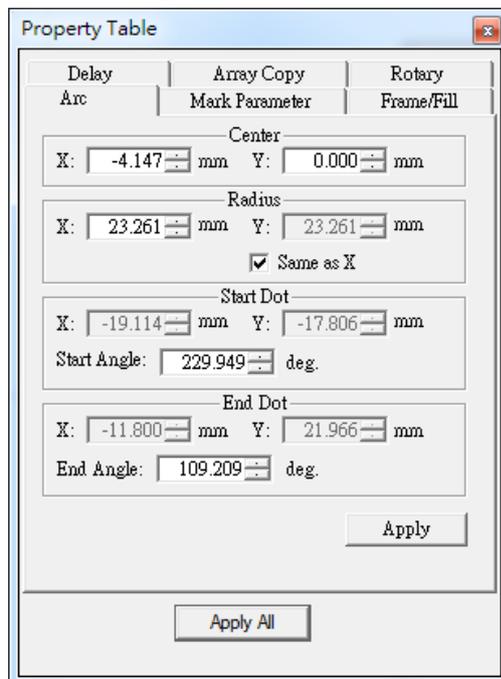
3.3.3 Circle

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.
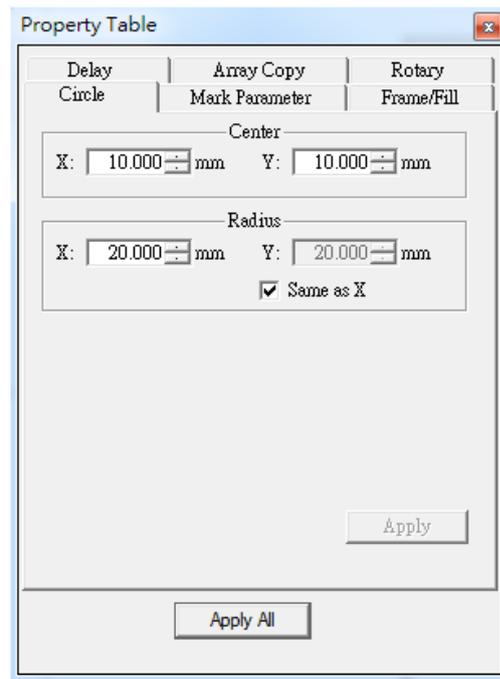
Fig. 3.3.03

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

Fig. 3.3.05

General Introductions
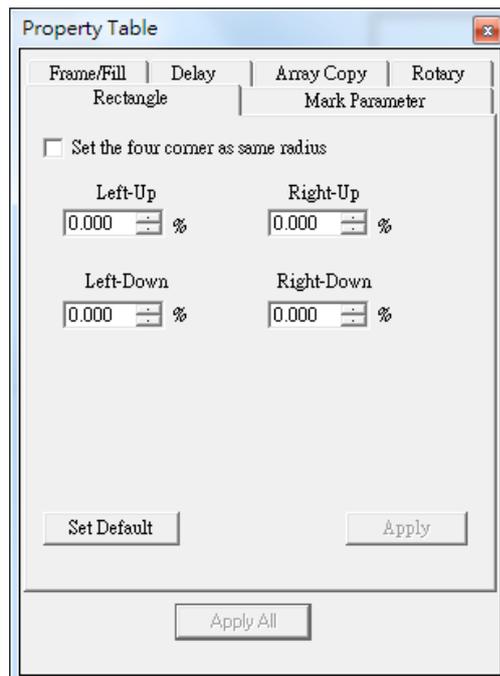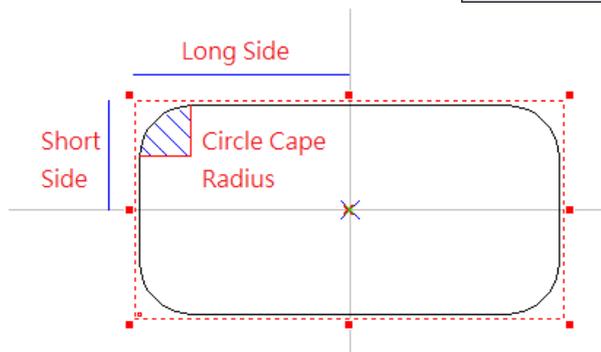
3.3.5 1D Barcode

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.

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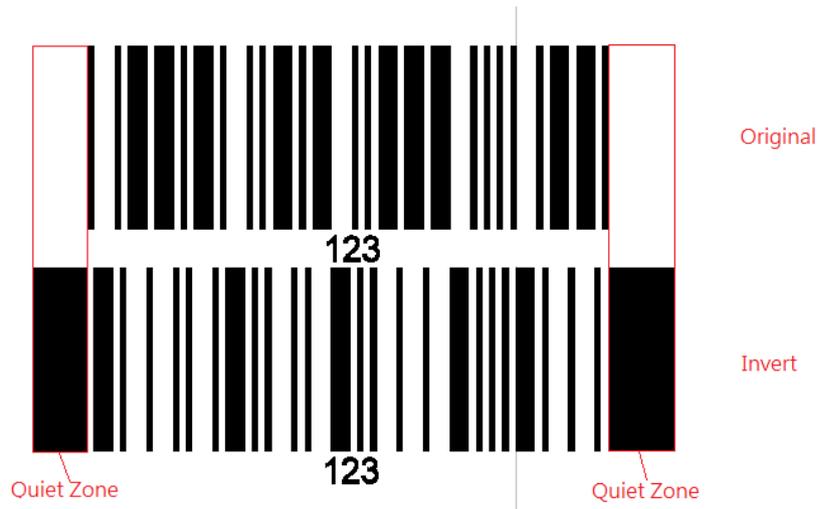
Fig. 3.3.07

3.3.6 1D Marking

Some marking-related settings, see Fig.3.3.08.
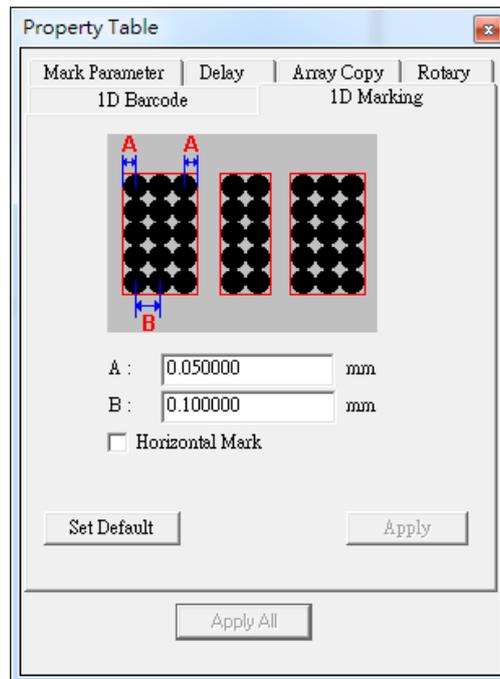
Fig. 3.3.08

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).

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General Introductions

3.3.7 2D Barcode

Create a 2D Barcode object and the parameter page will show like Fig.3.3.09.
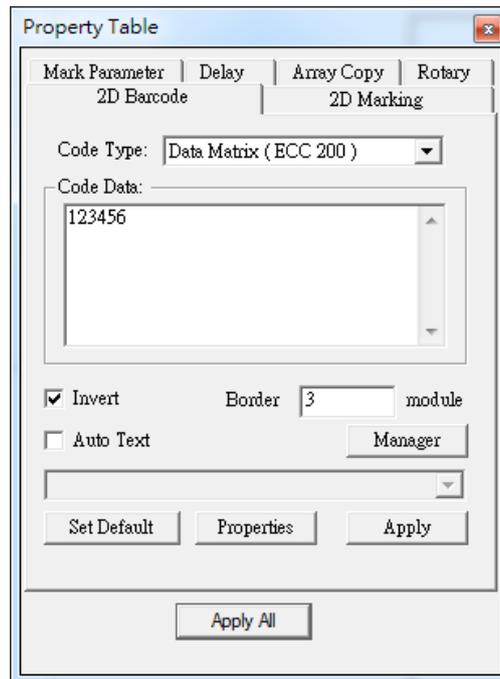
Fig. 3.3.09

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.3.3.10.

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. 3.3.10

General Introductions
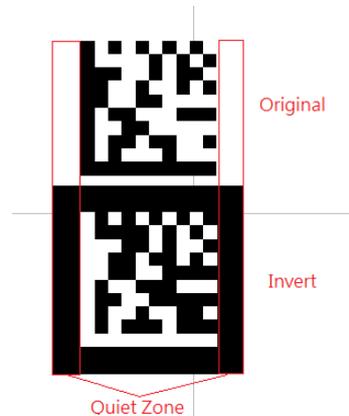
3.3.8 2D Marking

Some marking-related options, see Fig.3.3.11.
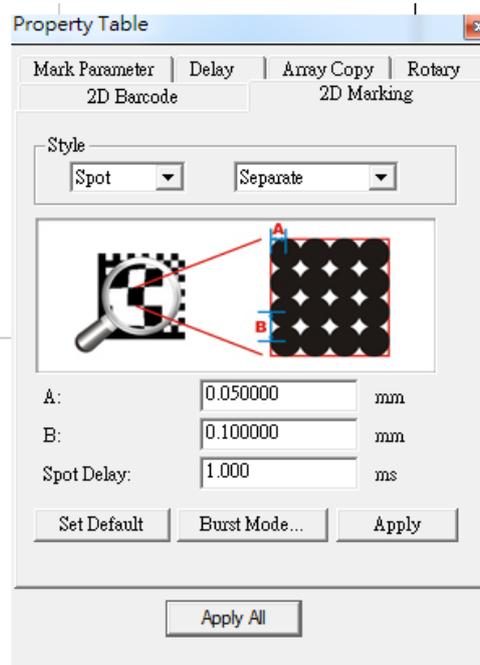
Fig. 3.3.11

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.3.3.14.

	Spot: Mark each cell in spot manner.
	Line: Mark each cell in line manner.
	Rectangle: Mark each cell as a rectangle.
	Spiral: Mark each cell as a spiral.
	Circle: Mark each cell as a circle.
Custom	**Custom:** After user choosing Custom and press on Apply, will appear 2D Barcode toolbar . Clicking on to enter edit mode. If we draw as fig 3.3.12, after clicking on to leave edit mode, 2D barcode will be seen as like fig 3.3.13.

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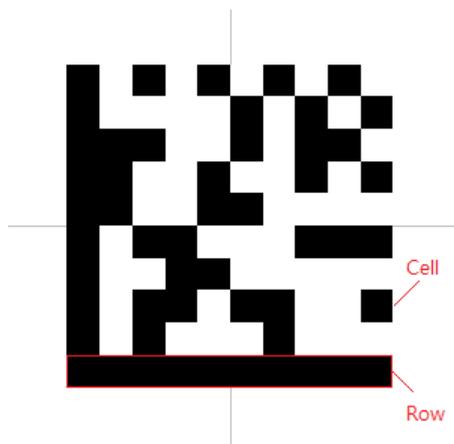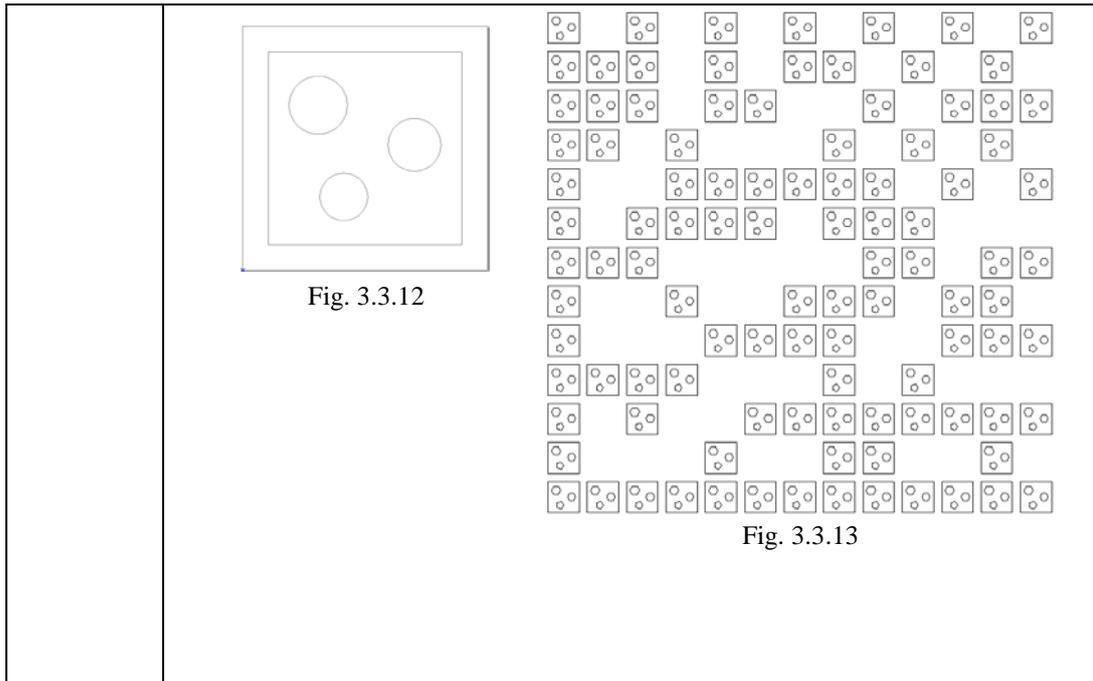
Fig. 3.3.12

Fig. 3.3.13

Fig. 3.3.14

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).
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.
Rectangle Style
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.

3.3.9 Image
Import an image, and the property table will show the related information of this image, see Fig.3.3.15.
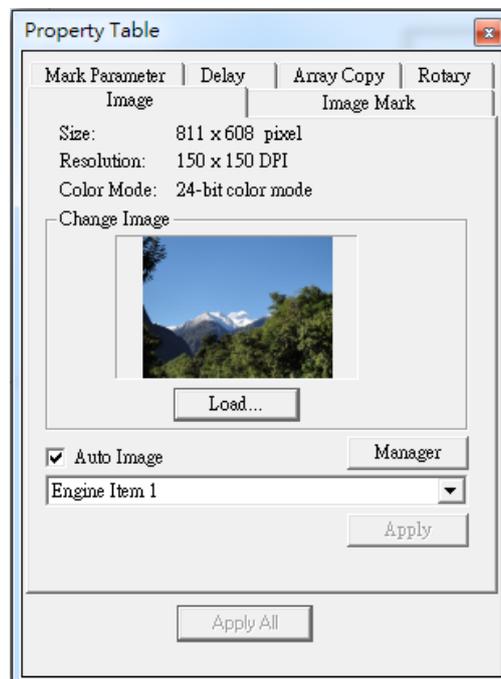
Fig. 3.3.15

Auto Image: Mark the image based on the application of Auto Text when there has a series of images to mark.

General Introductions

3.3.10 Image Mark

Adjust the mark settings of the image, see Fig.3.3.16.
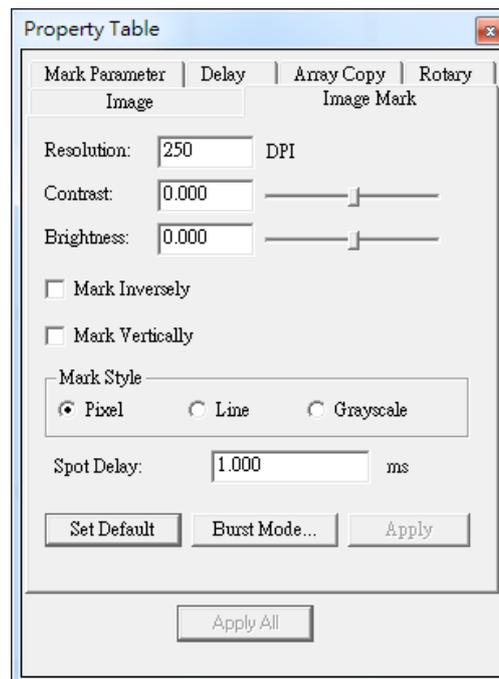
Fig. 3.3.16

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.

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3.3.11 Text

Create a Text object, and the Text Property Page will display like Fig.3.3.17.
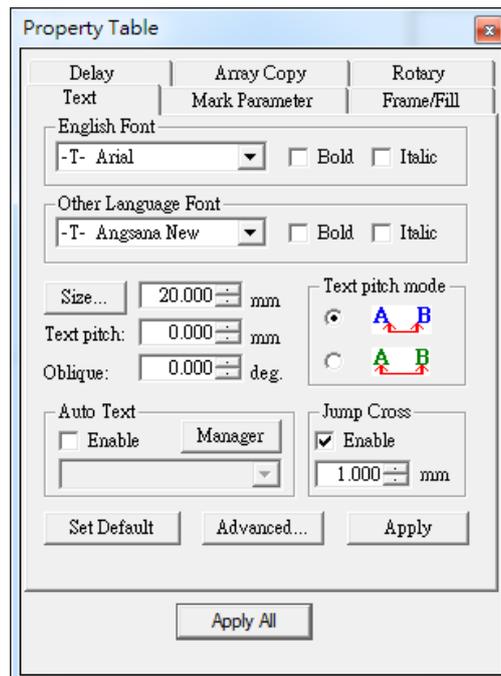
Fig. 3.3.17

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. For more details please refer to 1.2.24.
Advance: Offer further settings for text, see Fig.3.3.18.

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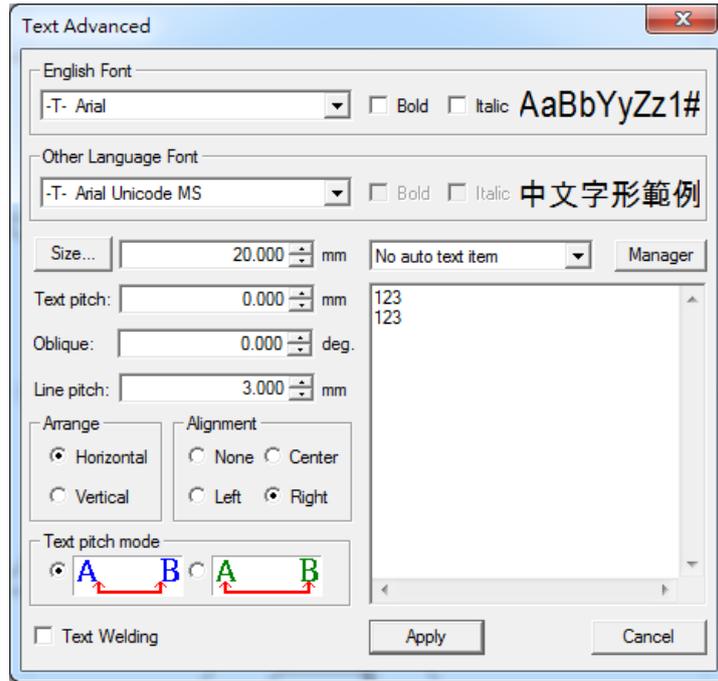
Fig. 3.3.18

Line Pitch: Adjust the spacing between each line.
Arrange: Select the character arrange style, see Fig.3.3.19.

Horizontal   Vertical
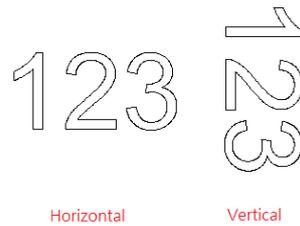
Fig. 3.3.19

Alignment: Use the insert position as the baseline, and align the text object along that baseline.

None	Left	Center	Right
Baseline	Baseline	Baseline	Baseline

Text Welding: Use to avoid the overlapping part of character's strokes.

General Introductions

3.3.12 Arc Text

Create an Arc Text object, and the Arc Text Property Page will be displayed like Fig.3.3.20.
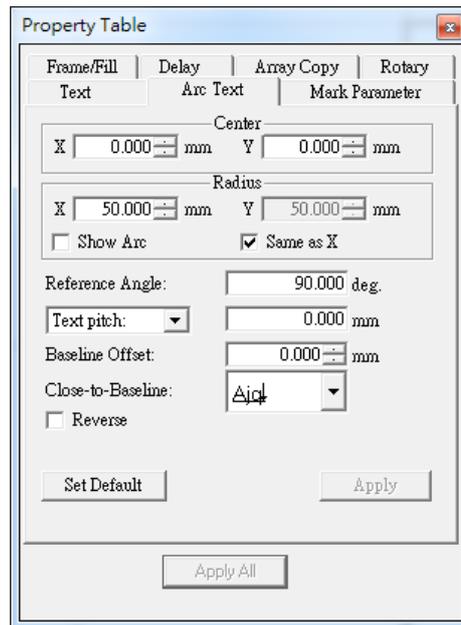
Fig. 3.3.20

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 Position: 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.

Fig. 3.3.21

Fig. 3.3.22

General Introductions
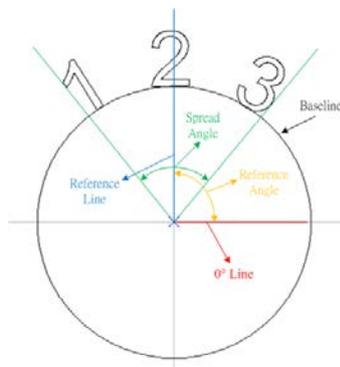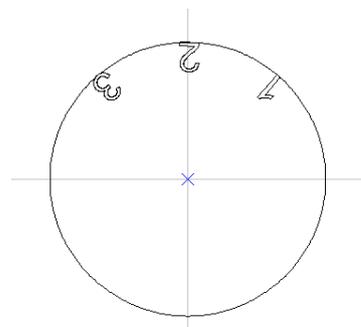
3.3.13 Rectangle Text
Create a Rectangle Text object, and the Rectangle Text Property Page will be displayed like Fig.3.3.23.
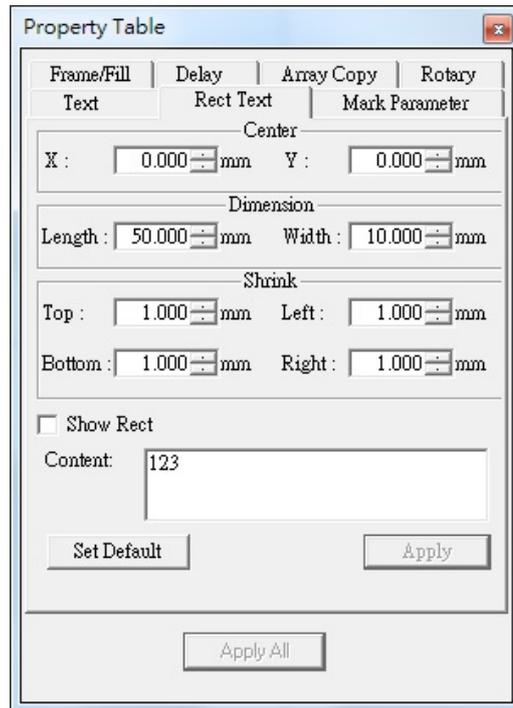
Fig. 3.3.23

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.

3.3.14 Matrix
Create a matrix object, and the Matrix Property Page will be displayed like Fig.3.3.24.

Fig. 3.3.24

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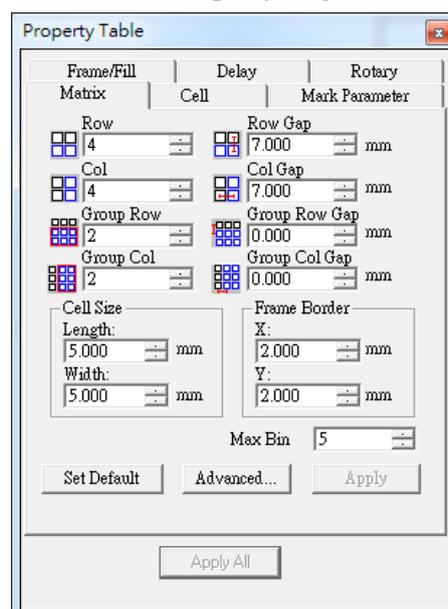
Row/ Col: The amount of cells in a row/ column.
Row/ Col Gap: The spacing between each row/ column.
Group Row/ Col: Set the amount of the cells in a row/ column as a group, see Fig.3.3.25.
Group Row/ Col Gap: The row/column spacing between each group.
Cell Size: The length/ width of each cell.
Frame Border: The frame size of the matrix.
Max Bin: Create new bins (layers) to edit different objects for matrix to use. The range of bins is 1~16. Users can select different bins to edit from Matrix Tool Bar, see Fig.3.3.26.
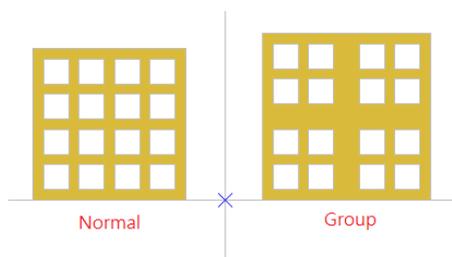
Fig. 3.3.25
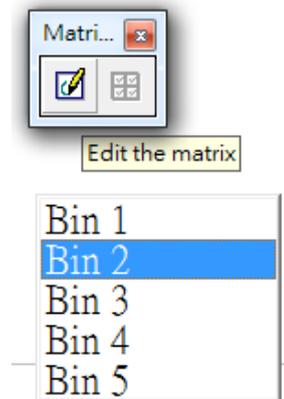
Fig. 3.3.26

Advance: Further settings for matrix, see Fig.3.3.27.
Interleave: Adjust the vertical or horizontal position of even rows or columns, see Fig.3.3.28.
Copy Order: Choose the copy order of the cells.
Frame Color: Choose the color of the matrix's frame.

Fig. 3.3.27

Fig. 3.3.28

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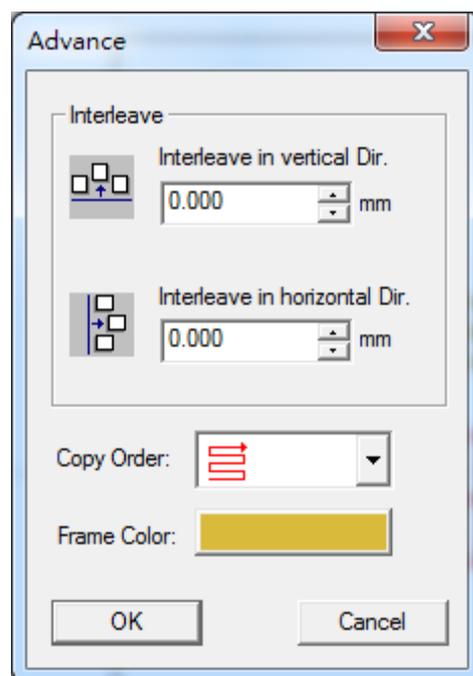
3.3.15 Cell

Allow users to select which cell they want to edit, see Fig.3.3.29.
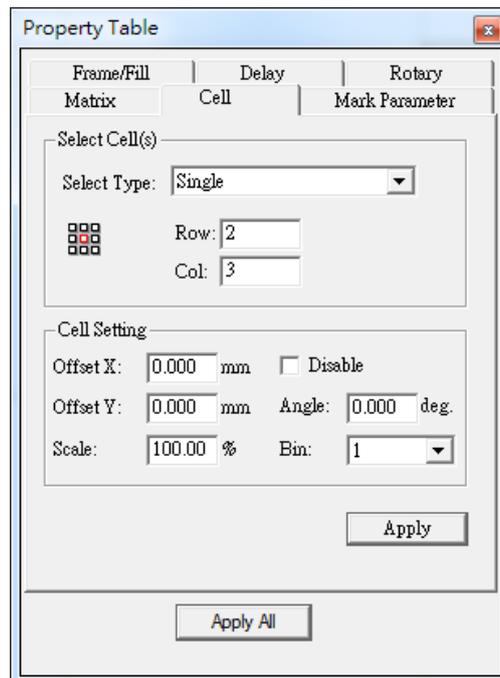
Fig. 3.3.29

Select Cell(s)

> **Select Type:** There are four editing types: Single, Row, Column and Rectangle Area. Users can assign which cell, row, column or area they want to edit by input the value in row/ col.

Cell Setting

> **Offset X/ Y:** The X/ Y offset of the selected cell(s).
>
> **Scale:** Set the scale of the selected cell(s).
>
> **Disable:** The selected cell(s) will be hidden and won't be marked.
>
> **Angle:** The rotary angle of the selected cell(s).
>
> **Bin:** Select the bin users want to edit.

General Introductions

3.3.16 Baseline

The Baseline Property Page will be displayed when using "Baseline" function. There are two different positions according to the baseline-type, see Fig.3.3.30 and Fig.3.3.31.
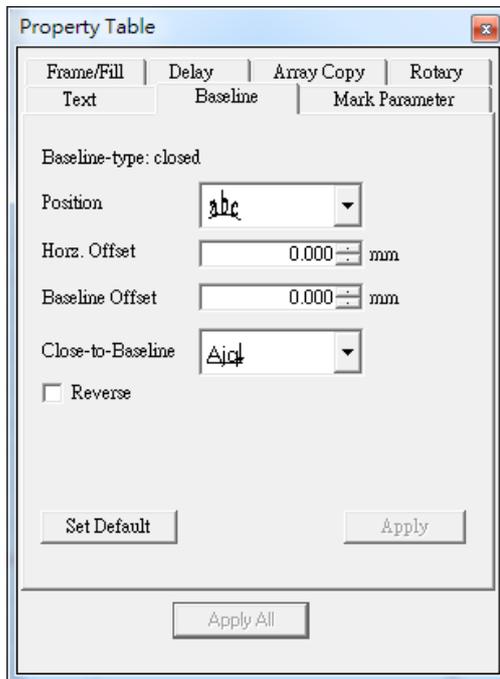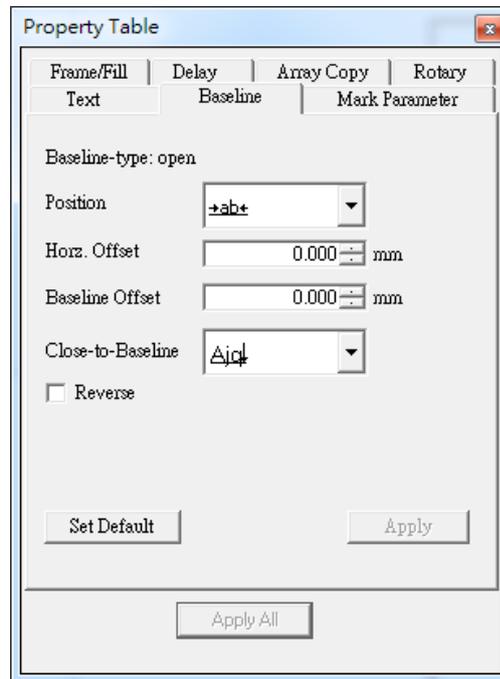
Fig. 3.3.30   Fig. 3.3.31

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.3.3.32
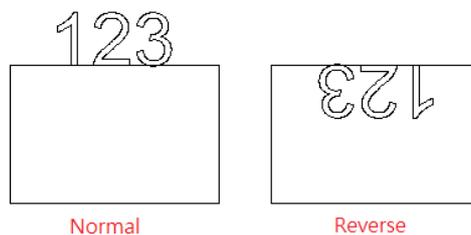
Fig. 3.3.32

3.3.17 Graphic

When users import a "*.dxf" file, the Graphic Property Page will be display like Fig.3.3.33.
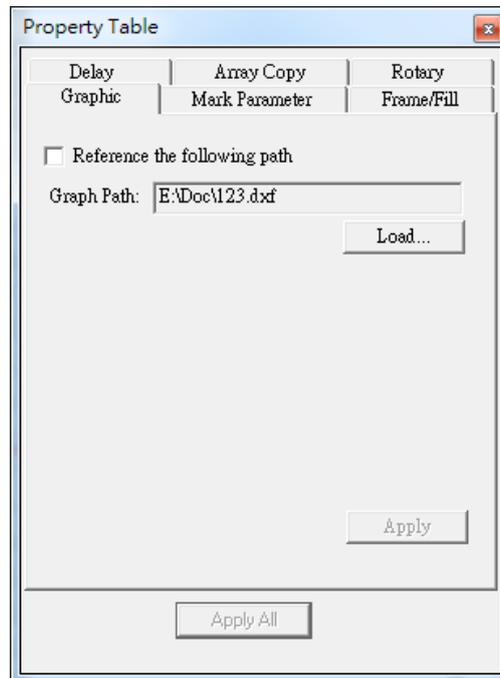
Fig. 3.3.33

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.

Load…
This option can only import a "*.dxf" file.

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3.3.18 Spiral

While a spiral object has been created, spiral property table will show as fig 3.3.34.

Fig. 3.3.34

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.
Outer to inner: Spiral is generated from outer to inner instead of from inner to outer.

General Introductions

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

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.
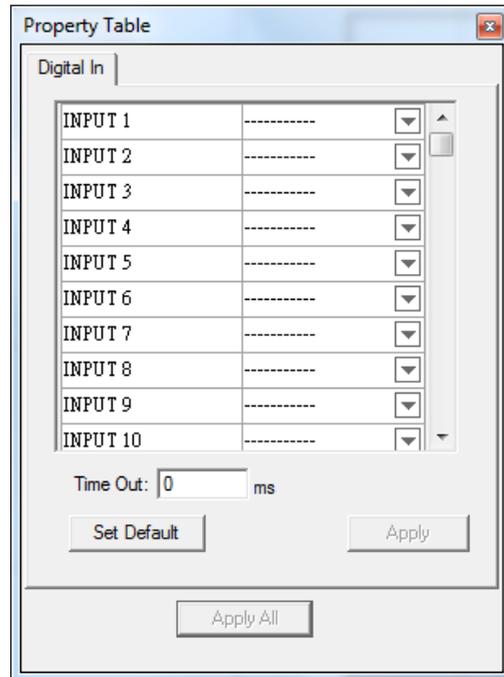
Fig. 3.4.01

3.4.2 Digital Out

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

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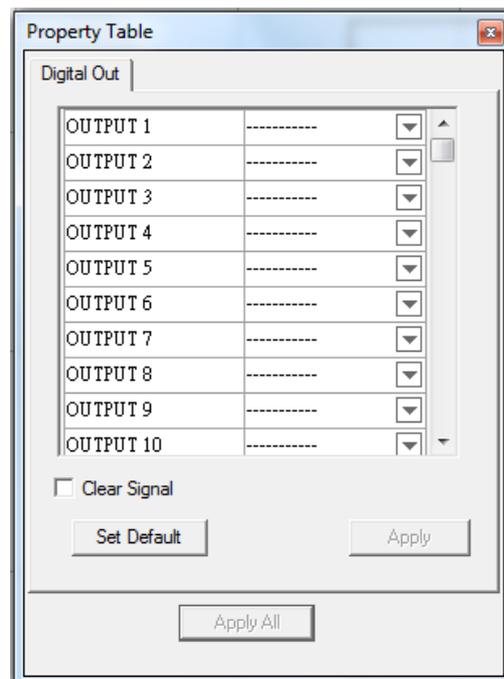
3.4.3 Do Pause

Ⅱ 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

General Introductions
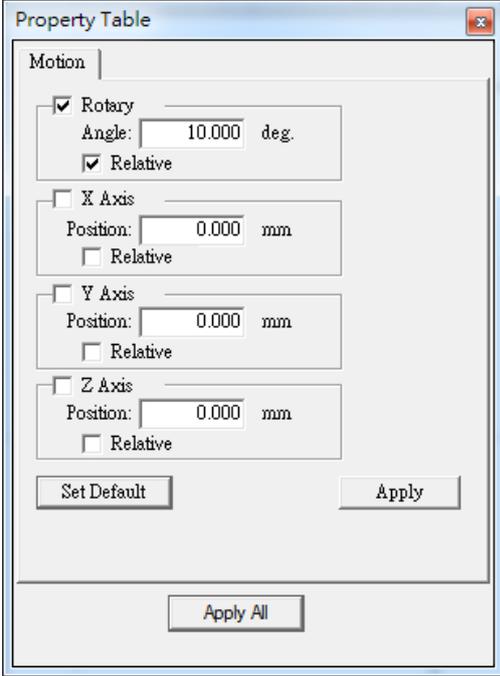
3.4.6 Set Position

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.
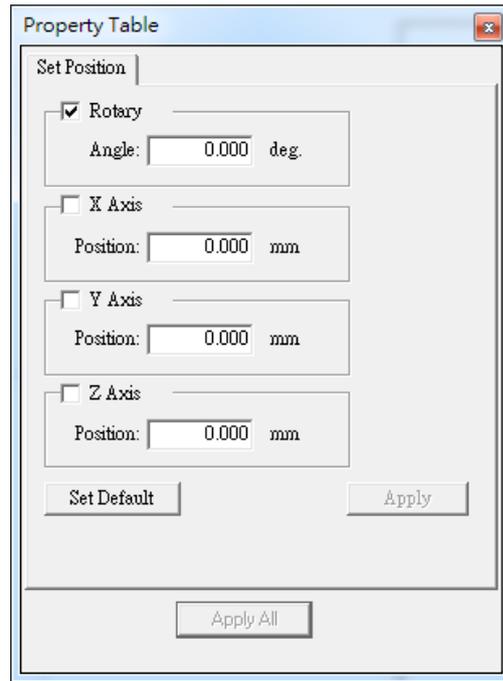
Fig. 3.4.05

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. 3.4.06

Fig. 3.4.07

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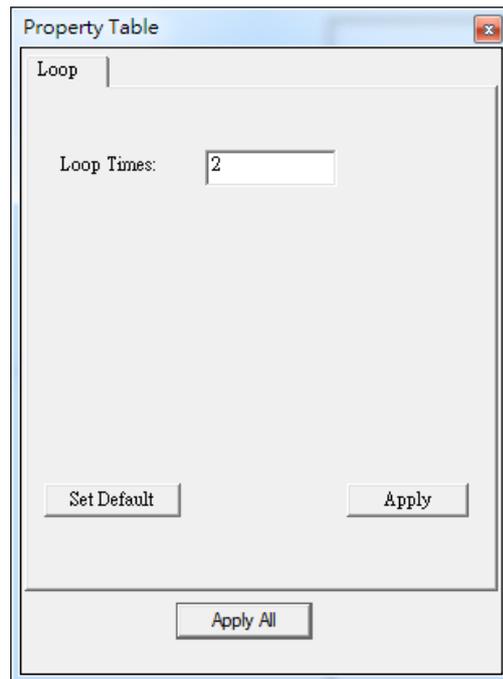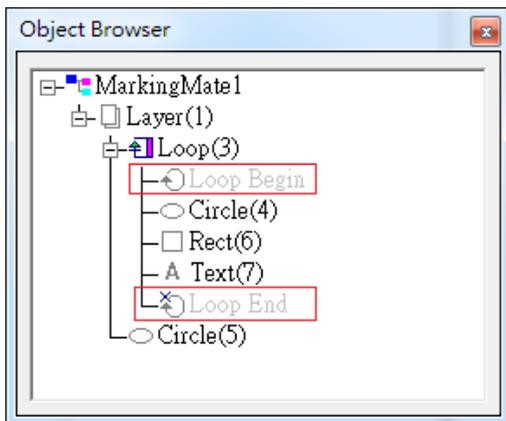
3.4.8 Ring

 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.3.4.08) 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.
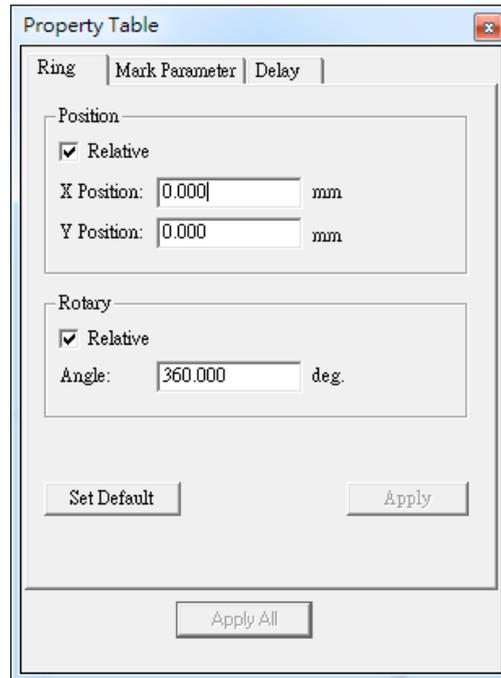
Fig. 3.4.08

3.4.9 Homing

 Homing

When the mark process execute to "Home" object, the axis users select at Property Table (see Fig.3.4.09) will go back to origin.

Fig. 3.4.09

General Introductions
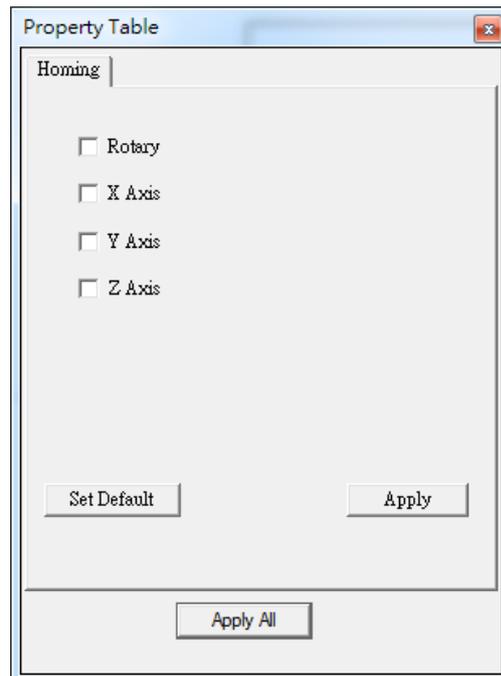
3.5 Layer-related Property Table

When a layer object in the Object Browser has being selected, the Property Table will display the layer-related property page for uses 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.
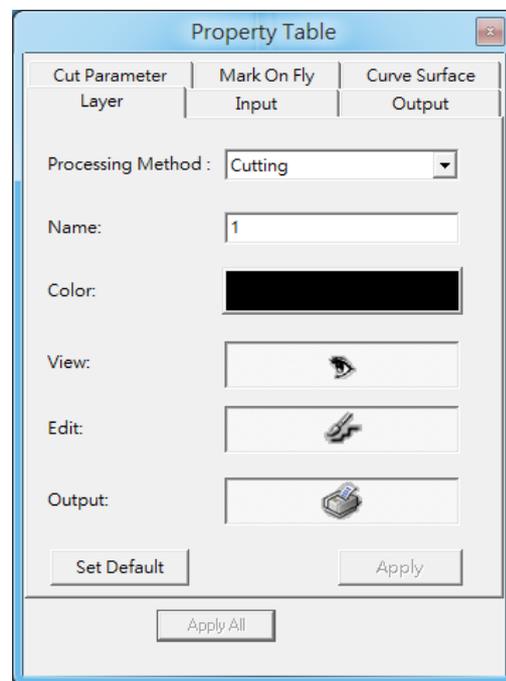
Fig. 3.5.01

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.
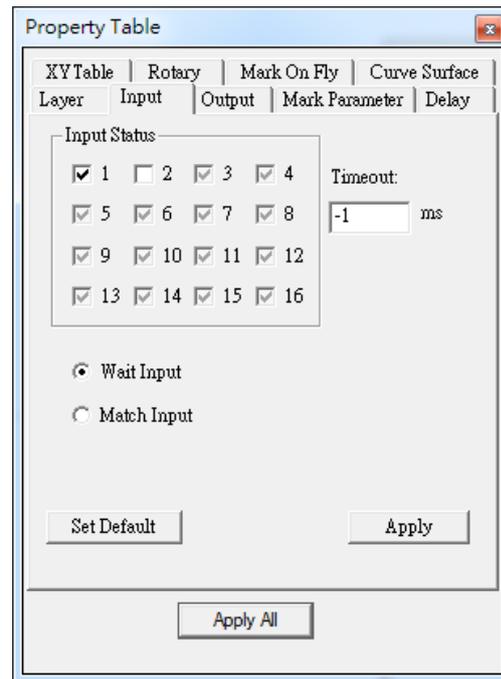
Fig. 3.5.02

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.

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

Auto Clear Signal

Wait for Delay Time and auto clear signal after the voltage settings are done

Fig. 3.5.03

General Introductions
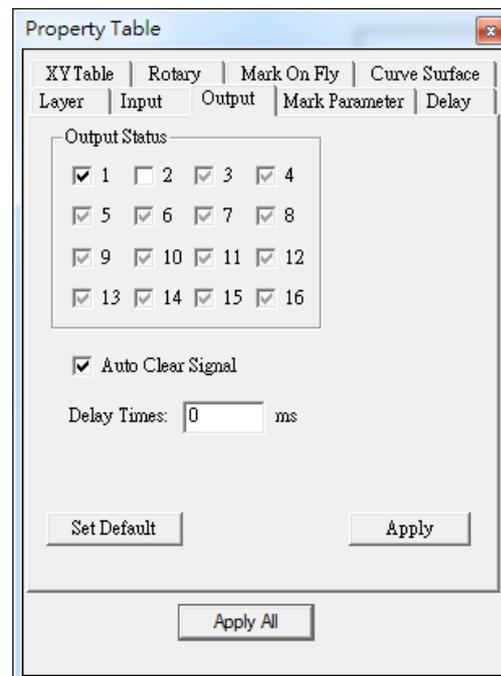
3.5.4 Mark Parameter

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.
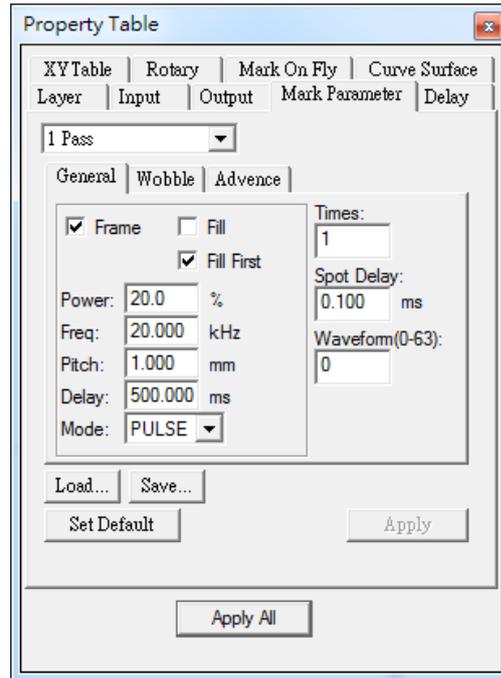
Fig. 3.5.04

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

General Introductions
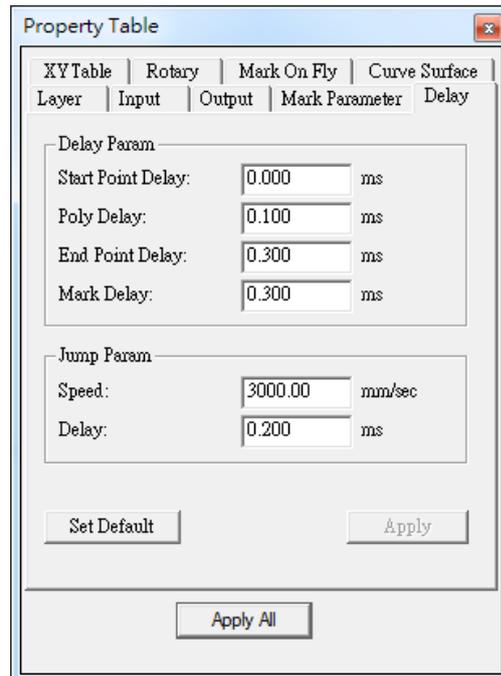
3.5.6 XY(/Z) Table

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.

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.
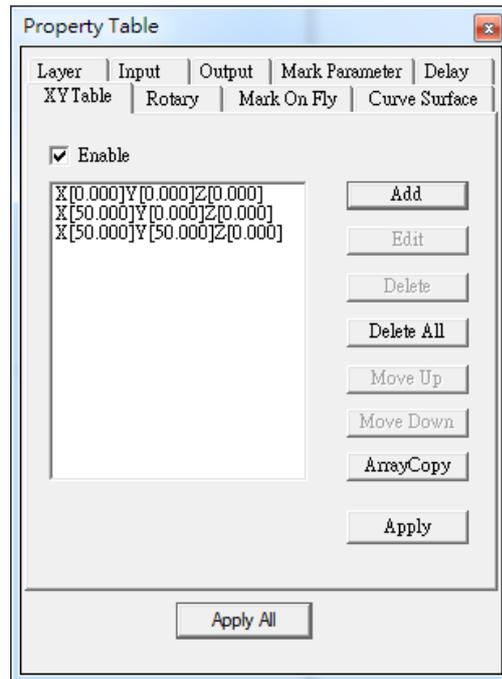
Fig. 3.5.06
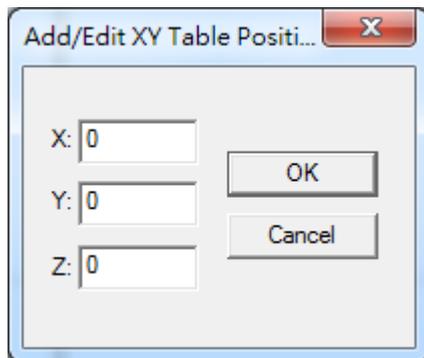
Fig. 3.5.07
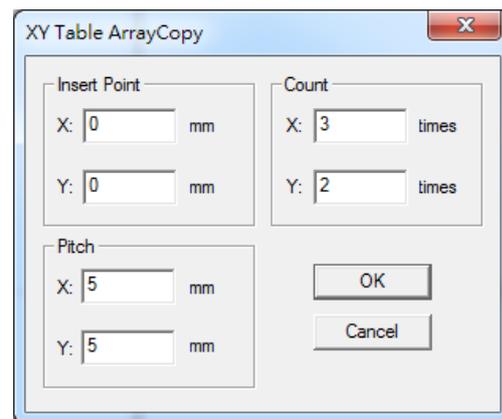
Fig. 3.5.08

Insert Point: Set the start point.
Count: The duplicate amount.
Pitch: The interval of each point.

General Introductions

3.5.7Rotary

Allow users to enable rotary to mark. There are two methods of rotary: Cylinder Mode (see Fig.3.5.09) and Disc Mode (see Fig.3.5.10). The difference between cylinder and disc is the figure of the rotary axis.
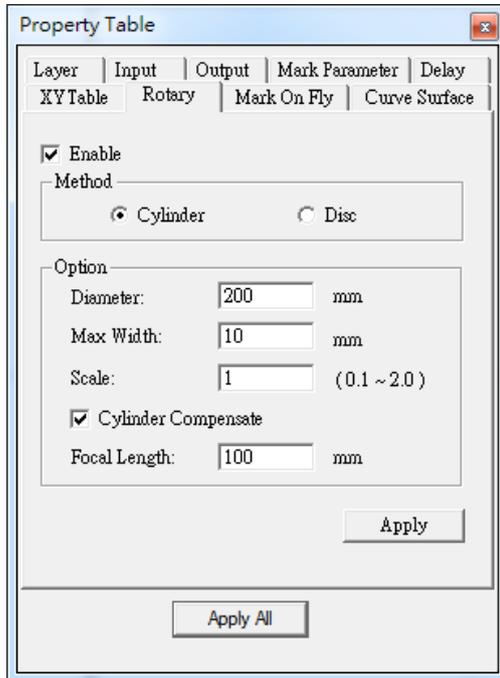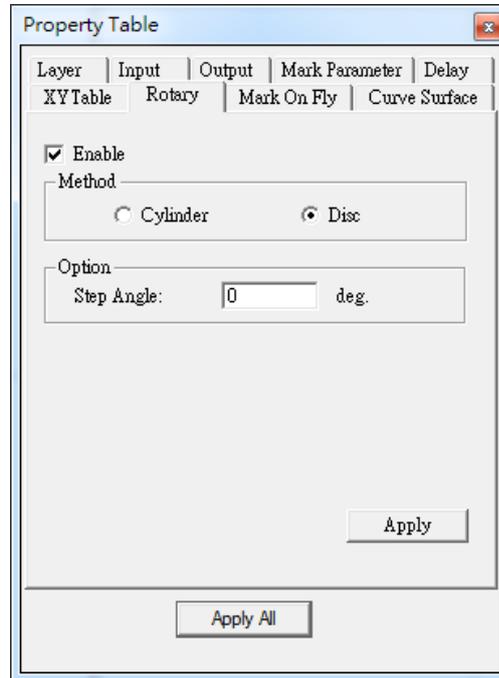
Fig. 3.5.09   Fig. 3.5.10

Cylinder Mode

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.

Example

Suppose that users set the value of rotate rate as 1.5, and the marking result shows like Fig.3.5.11, all sections are overlapping. In this case, users should lower that value, such as 1.0, to make the marking effect optimum, see Fig.3.5.12. On the contrary, if the value of rotate rate is 0.5, and the marking result displays like Fig.3.5.13, there are intervals between each section. As a result, users should increase this value to make the marking effect become ideal, like Figure 3.5.12.
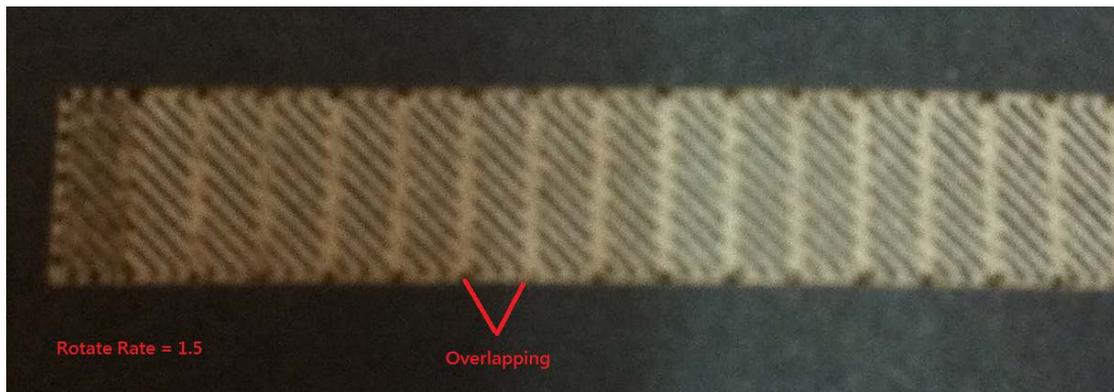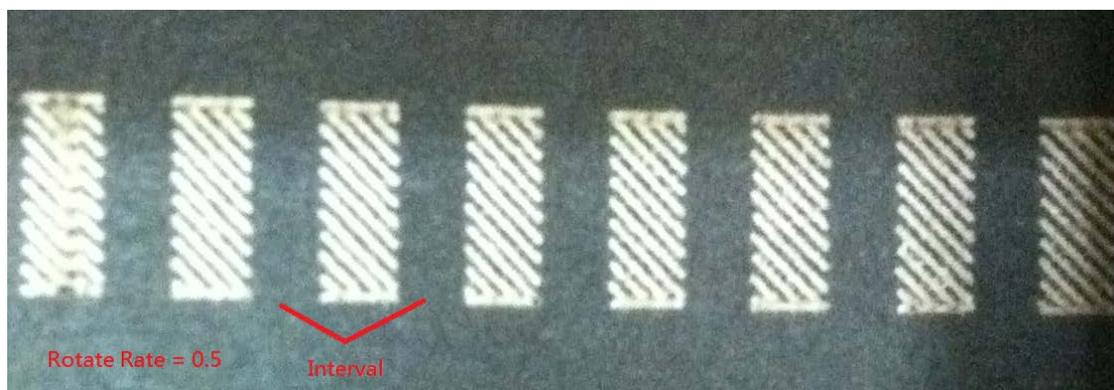
Fig. 3.5.11

Fig. 3.5.12

Fig. 3.5.13

Cylinder Compensate: The default value of this function is disable. Enable the function, MarkingMate system will fix the overlapping of marking result according to the object's radius and the Focal Length.
Focal Length: Input the focal length of the lens.
Disc Mode
Step Angle: Set the rotary angle for each step of marking.

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:

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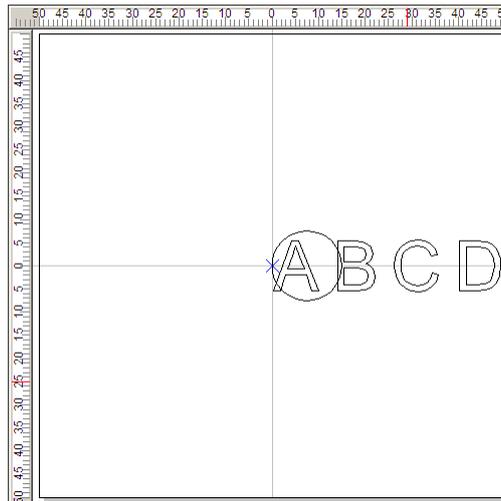
Fig. 3.5.15

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.

   (b) If Layer 1 (circle object) enable the encoder delay function, the marking result will like Fig.3.5.18.

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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.

3.5.9 Curve Surface

When Curve Surface function is enabled, the objects of this layer will be marked according to the setting parameters, see Fig.3.5.19.

Enable
Check this box to enable this function. The default setting is disabled.

Style
There are several styles of the object are listed at Table 3.4.

Fig. 3.5.19

Style 1	Style 2	Style 3
Style 4	Style 5	Style 6

Gray figures represent objects. Red lines represent X/Y direction of the working table. Style 1-4 are cylindrical objects; Style 5-6 are sphere objects
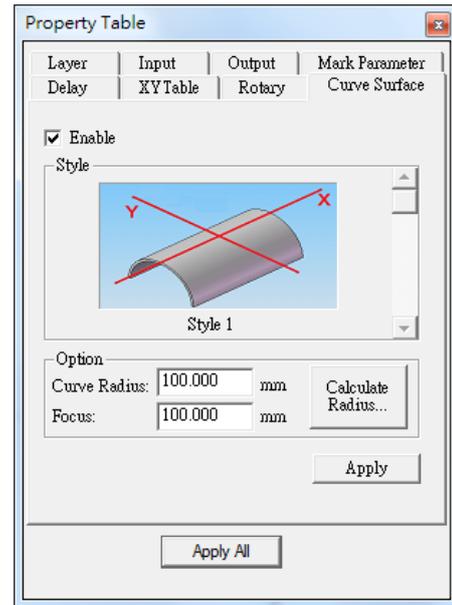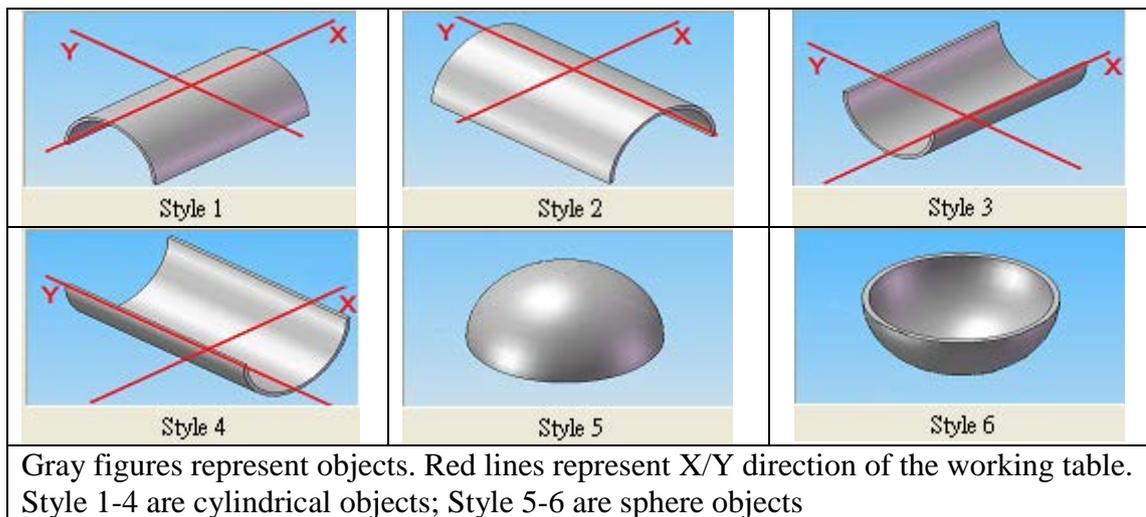
Table 3.4

Option
Curve Radius: radius of the curve.
Focus: focus of the lens.

Calculate Radius
Click the button will see the dialog box, see Fig.3.5.20.
Blue area represents object.
(W) Width: width of the object
(H) Height: the distance between the top point and the surface.
Click "OK" button to renew the curve radius.

Fig. 3.5.20

General Introductions
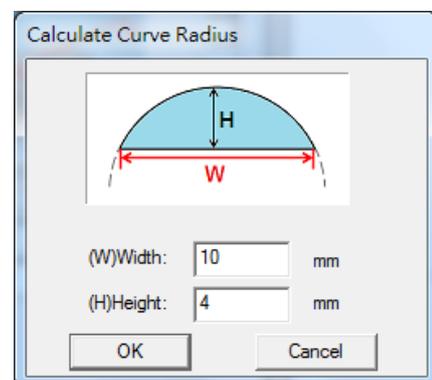
3.6 Manual-split Property Table
3.6.1 Band

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.
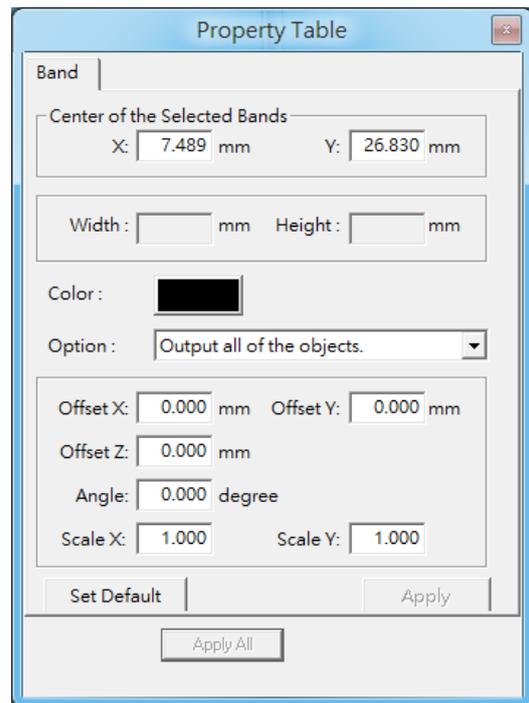
Fig3.6.01

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.

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3.6.2Template

Set the using split band template at this layer. This function is depended on **Split by Layer**. See Fig 3.6.02
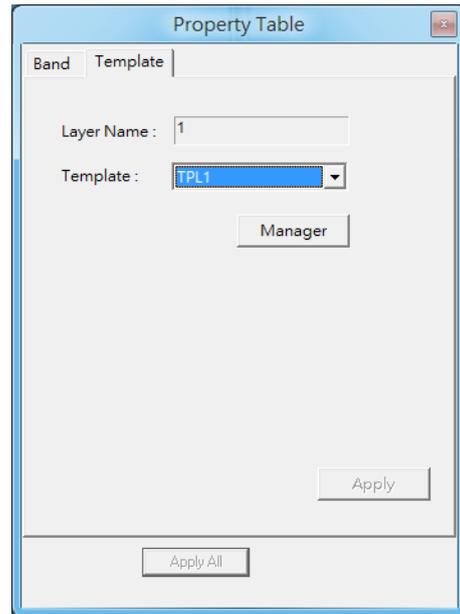
Fig3.6.02

Layer Name	Current editing layer.
Template	Current using template. One template applied to multiple layers is allowed.
Manager	The manager is allowed to add, delete and rename template. See Fig 3.6.03.
Add	Add a template.
Delete	Delete a selected template. A using template could not be deleted.
Rename	Rename a template.

Fig3.6.03

General Introductions
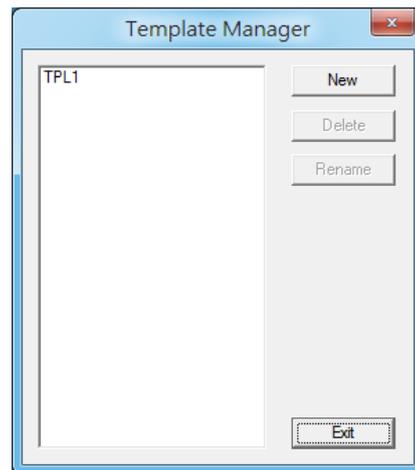
4. Popup Menu

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.

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
√	Object Browser(O)	F2
Group(M)		Ctrl+M
UnGroup(N)		Ctrl+Q
Combine(K)		Ctrl+K
Break(B)		Ctrl+B
Set Circle Object Radius(E)		
Move To New Layer(L)		

Fig. 4.1.01

Cut	Remove selected data and store it in the clipboard for future use
Copy	Duplicate selected data and store it in the clipboard for future use
Paste	Attach data from the clipboard to the current document
Delete	Delete and remove the selected data
Reverse	Reverse sorting mark order
Shortest Horizontal	Sorting mark order by the shortest horizontal direction

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Shortest Vertical	Sorting mark order by the shortest vertical direction
Shortest Distance	Sorting mark order by the shortest distance of object center
Same Radius	Make the circle object become the same radius
Array Copy	Execute the array copy function
Property Table	Show the Property Table of the object
Dimensional Bar	Enable/disable Dimension bar
ObjView Bar	Enable/disable Object Browser
Group	Group selected object
Ungroup	Ungroup selected group
Combine	Combine several objects into one object
Break	Break one object into several objects
Set Circle Object Radius	Modify circle that radius same as original radius to modified radius.
Move To New Layer	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

This function is used to sort mark order by the shortest horizontal direction. Input the partition count number in the box like Fig.4.1.02. 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.4.1.03. If the checkbox of "Reverse" is checked, the mark order will then changed to be sorted from right to left first.

Fig. 4.1.02   Fig. 4.1.03

General Introductions
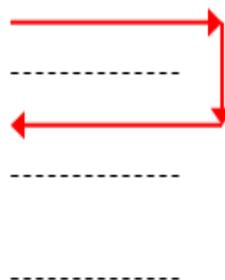
4.1.3 Shortest Vertical

This function is used to sort mark order by the shortest vertical direction.
Input the partition count number in the box like Fig.4.1.04. 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.4.1.05. If the checkbox of "Reverse" is
checked, the mark order will then changed to be sorted from top to bottom first.

Fig. 4.1.04

Fig. 4.1.05

General Introductions
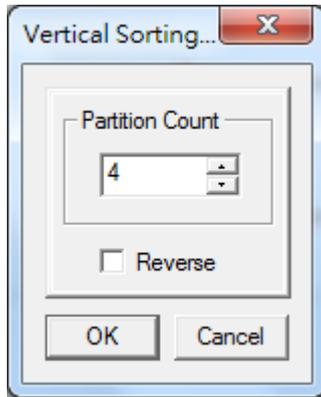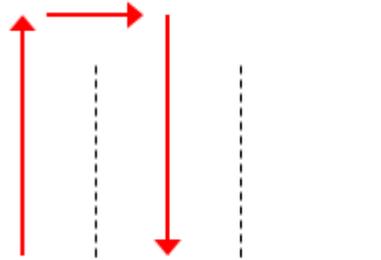
4.1.4 Shortest Distance

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.4.1.06.

Fig. 4.1.06

General Introductions
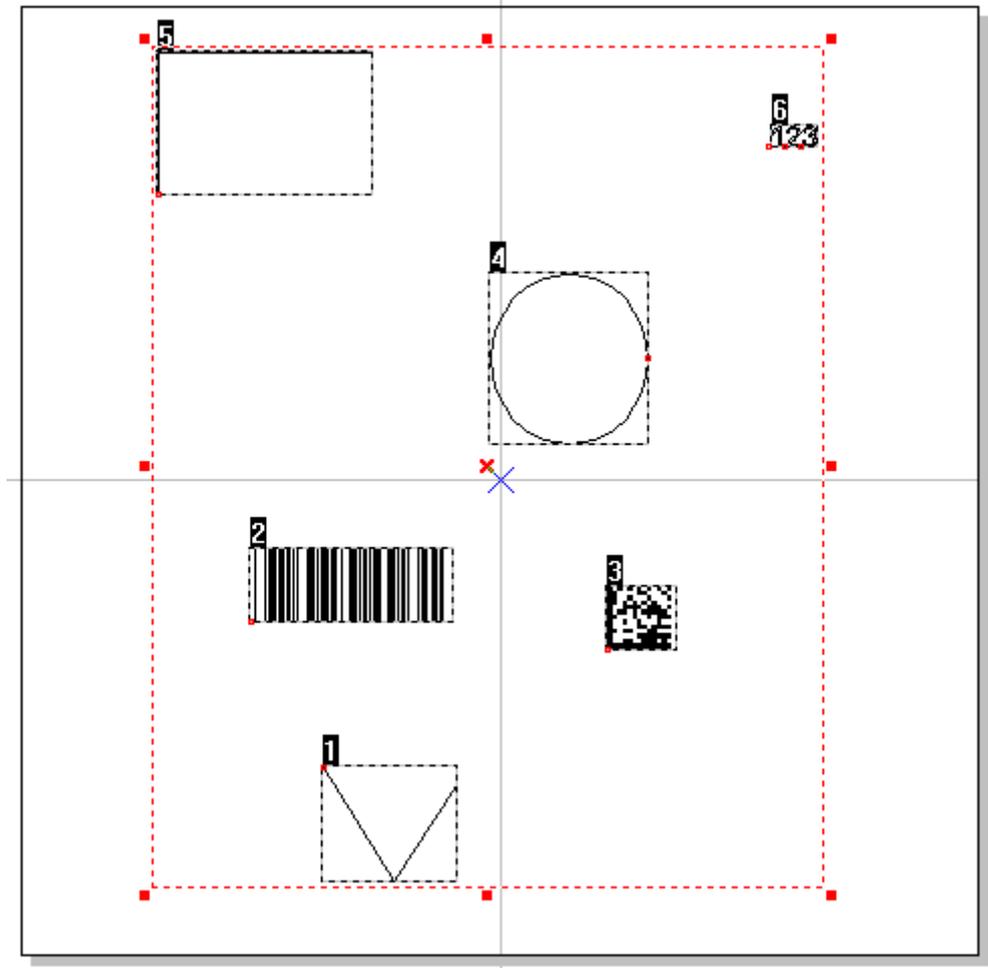
4.2 Curve

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

4.2.1 Add Vertex

This function allows users to modify a curve object; more vertexes will be more convenient to change the shape of the curve, see Fig.4.2.02.

Fig. 4.2.02

General Introductions
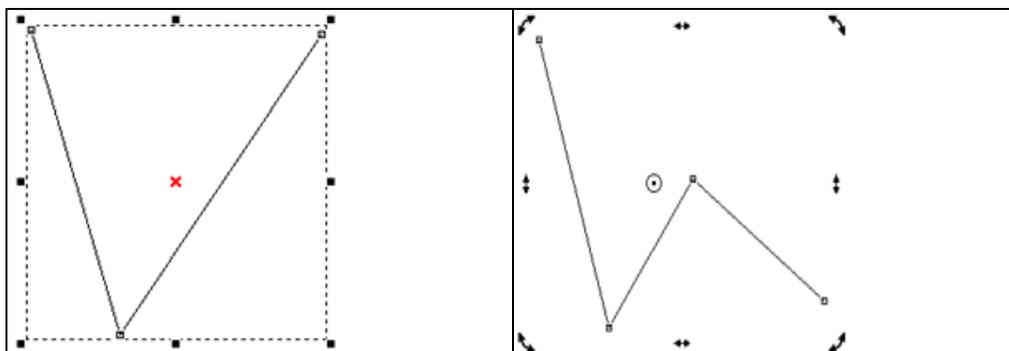
4.2.2 Delete Vertex

Using "Delete Vertex" function will decrease the control points like Fig.4.2.03.
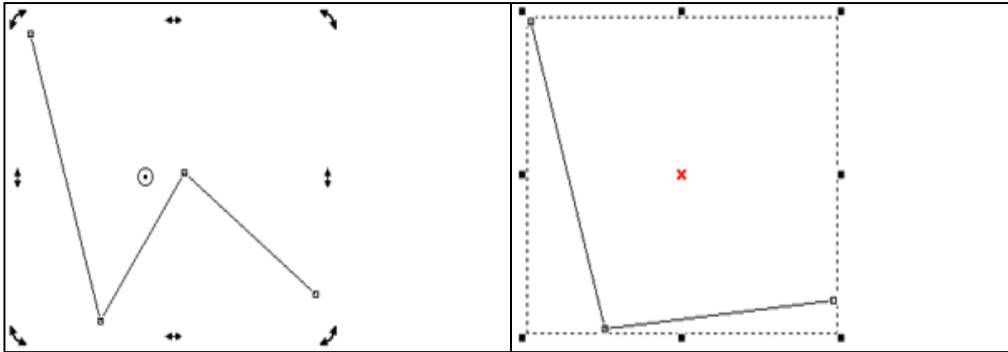
Fig. 4.2.03

4.2.3 Curve to Line

Select "Curve to Line" function; the curve has been transferred to a line segment and lost its control points like Fig.4.2.04.
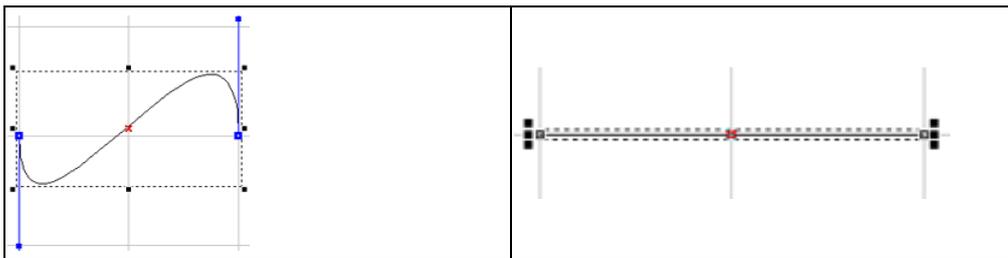
Fig. 4.2.04

4.2.4 Line to Curve

Select "Line to Curve" function; the line segment has been transferred to a curve and its control points appeared like 4.2.05.

The line segment without any control point	Transfer line to curve, the control point appeared.
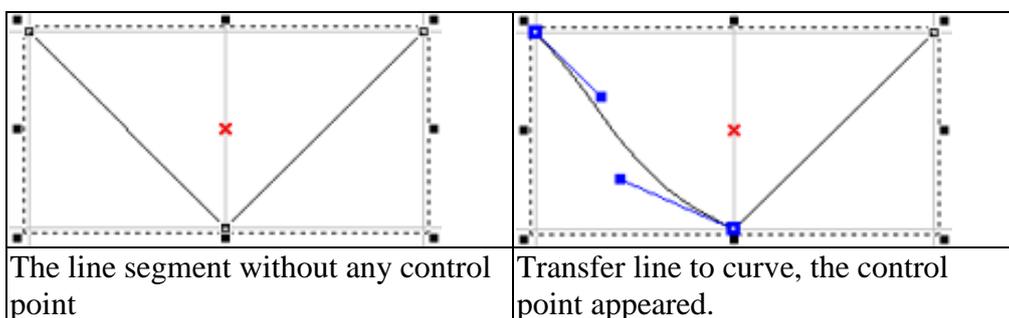
Fig. 4.2.05

4.2.5 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.4.2.06.

General Introductions

| Arc | Trans-Curve | Arc to Curve |
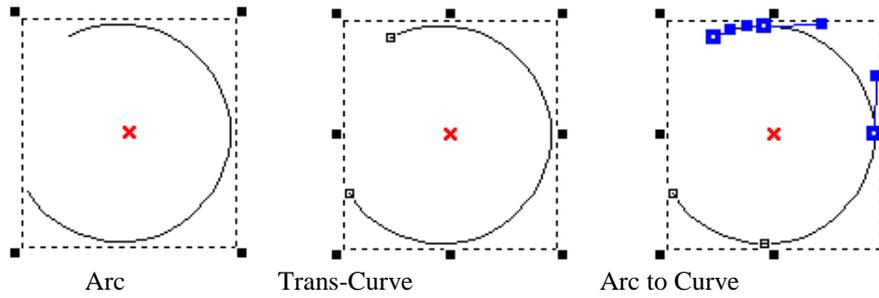
Fig. 4.2.06

4.2.6 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.4.2.07.
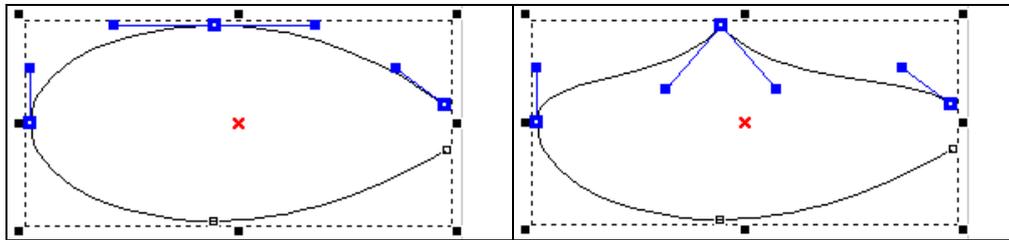
Fig. 4.2.07

4.2.7 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.4.2.08.
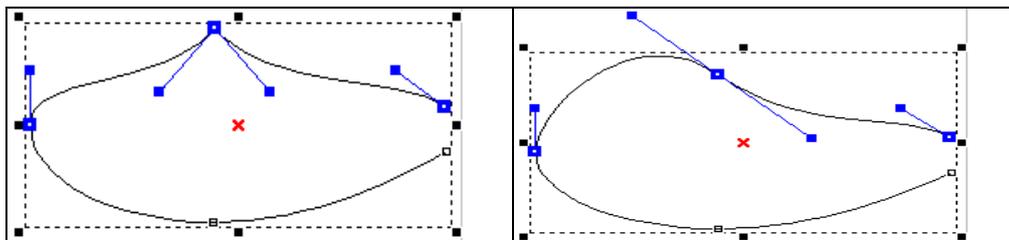
Fig. 4.2.08

4.2.8 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.4.2.09.

Fig. 4.2.09

General Introductions
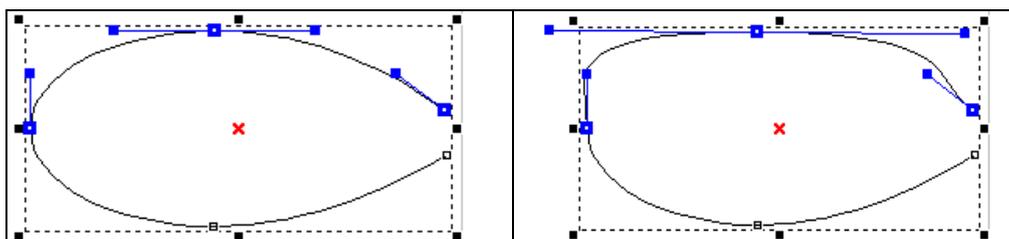
4.3 Show Mark Order of a General Object

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

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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

General Introductions

5. Hot Key

File Menu	
Ctrl + N	Create a new document
Ctrl + O	Open an existing document
Ctrl + S	Save the current document using the existing file name
Ctrl + I	Import
Ctrl + P	Print
Edit Menu	
Ctrl + Y	Replace a cancelled action
Ctrl + Z	Cancel un unwanted action
Ctrl + X	Remove the selected object and place it in the clipboard
Ctrl + C	Duplicate the selected object and place it in the clipboard
Ctrl + V	Place the data on the clipboard on to the document
DEL	Delete the selected object
Ctrl + K	Combine
Ctrl + B	Break
Ctrl + M	Group
Ctrl + Q	UnGroup
Ctrl + H	Mirror Horizontal
Ctrl + L	Mirror Vertical
Ctrl + E	Baseline
Ctrl + D	Split
Ctrl + U	Transfer to a curve
Ctrl + A	Trimming
Ctrl + G	Welding
Ctrl + W	Contour
Execute Menu	
F5	Marking
F6	Quick Mark
F7	Dry Run
F10	Close Dialogue Box of Marking, Quick Mark, and Dry Run
Others	

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F1	Open HELP
F2	Open the Object Browser
Shift+**F2**	Move the Object Browser to the lower left corner
F3	Open the Dimension Bar
F4	Open the User Level dialogue box
Ctrl + F4	Close the current file
Ctrl + F6	Switch to another opened file
Ctrl	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
Ctrl + T	Open the Property Table
Shift	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
Tab	Select object by marking order
C	When you are drawing lines, arcs, and curves, press C key will make the continuous segments become a closed loop.
X/Y	Set the start point or end point of the object

General Introductions

Config.ini

Appendix A: Config.ini

Config.ini is a setting file in the directory of C:\Program Files\MarkingMate. 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 MarkingMate program. The more detail description will be listed as below:

[ENV]	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)
[Rotary]	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)
[MultiMarking]	Auto Marking Parameters
Enable=1	Enable (0: Disable, 1: Enable)
Delay=0	Delay Time (sec)
[LogFile]	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
[Application]	Application related parameters
ShowLaserPanel=0	Show Laser Panel (0: Disable, 1: Enable)
ShowHatch=1	Show Hatch function (0: Disable, 1: Enable)
[SEGMENT]	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.

General Introductions

Config.ini

[IO_INPUT]	Input point related parameters
INPUT01= 01,01	Input No.= Display Name, Description (See below figure)
INPUT16= 16,16	Input No.= Display Name, Description (See below figure)
[IO_OUTPUT]	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)
[MarkAndPrint]	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)
[SignalRule]	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)
[MarkParmList]	Mark Parameters List
CurPath=E:\Program Files\MarkingMate\MarkParam	Current Path
[VERSION]	Version Parameters
Version=1000	Version

The Planning of Input/Output Point:

Open the MarkingMate software, go to the Property Table and select "Driver" label and then click the "I/O Test" button will see the figure as below:

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Config.ini

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
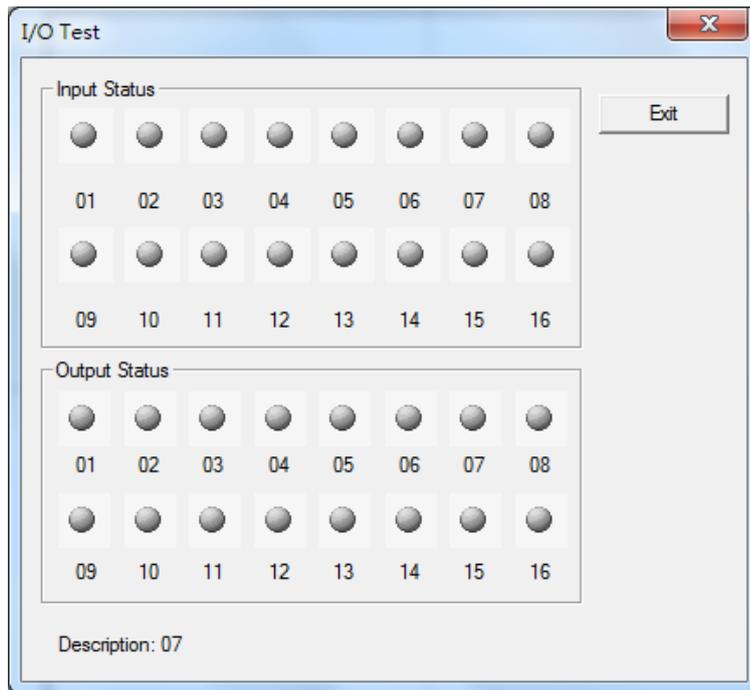
Change the setting as
below in Config.ini
will see the right
figure:

[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
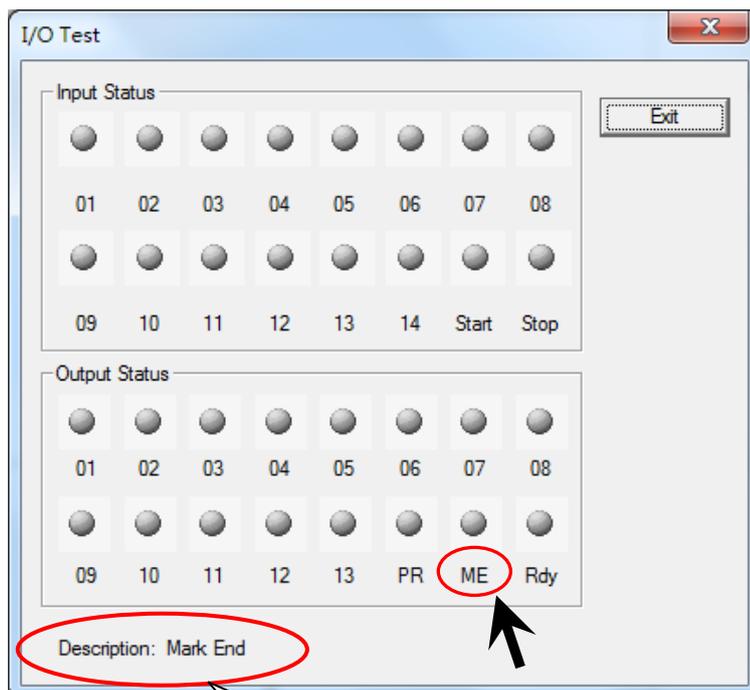
When mouse move to the position
of I/O name (see arrow point), its
description will be showed as
above.

General Introductions

«ini».ini

Appendix B: MM.ini

There were some parameters in MM.ini can be modified but now they are all moved to the Config.ini. If you need to change them please see the detail description in Appendix A: Config.ini.

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1.System Installation

This chapter will letuser known how to install and setup **MarkingMate**.

1.1 System Requirement

- OS: Microsoft Windows 98/2000/XP/Vista/7/8.
- RAM: Win 98/2000/XP: 2GB　Win Vista/7/8: 4GB.
- Resolution:1024*768 or above.
- Font size must be the smaller (100%) one.
- PMC2 card or MC1,MC3, UMC4 laser controller must be connected to the user`s computer.

  Table 1.1 shows the supportive system of controller.

Card	Bus	Windows 32 bit						Windows 64 bit			
		98	2000	XP	Vista	7	8	XP	Vista	7	8
PMC2	PCI	×	○	○	○	○	○	○	○	○	○
MC-1	USB	○	○	○	○	○	○	○	○	○	○
MC-3	USB	×	○	○	○	○	○	○	○	○	○
UMC-4	USB	×	○	○	○	○	○	○	○	○	○

Table 1.1

1.2MarkingMate Installation

Execute "**Setup.exe**" from **MarkingMate** installation disc and follow the steps as listed below (use Win7 64 bit operating system for example).

Step 1: Select Destination Directory

Choose a installation path. The default path is 「**C:\Program Files (x86)\MarkingMate**」. Users can change the path by clicking"**Browse…**" button. After decide the installation path, click "**Next**" to do the next step, see Fig.1.2.01. If users want to stop the installation, click "**Cancel**" or ![X] at the upper right corner of the dialog box and a warning dialog box will appear like Fig.1.2.02 to notice users that the installation has not yet completed. Click "**Resume**" to continue installing, or click "**Exit Setup**" to quit the setup progress.

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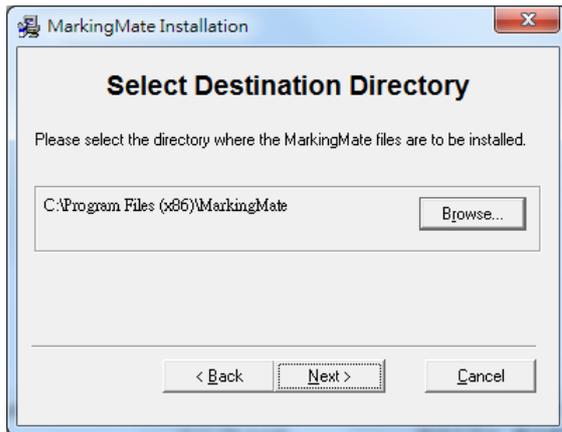
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Fig.1.2.01
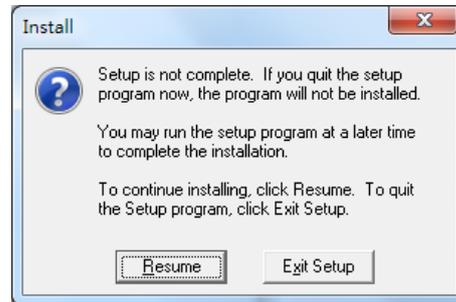
Fig.1.2.02

Step 2: Ready to Install

Confirm that the users are ready to install **MarkingMate** or not, see Fig.1.2.03. Click "**Next**" to proceed the next step or click "**Back**" to go back to previous step.
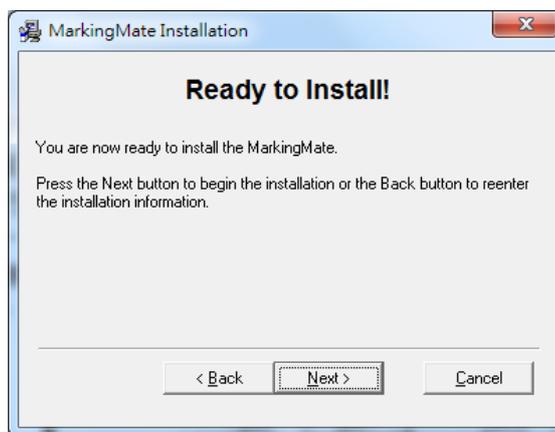
Fig.1.2.03

Step 3: Decide to Upgrade or New Install

Decide to upgrade **MarkingMate** or install it as new software, see Fig.1.2.04. Click "Next" to start installation.

Fig.1.2.04

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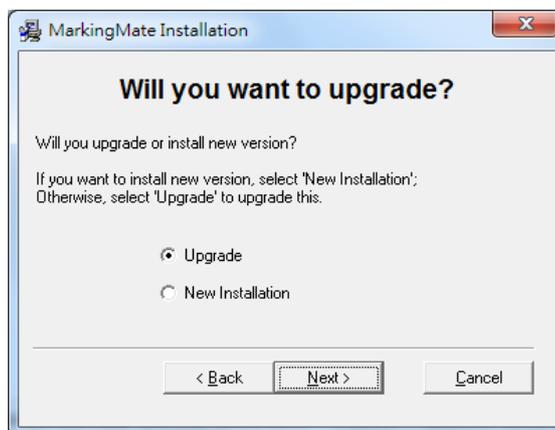
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Step 4: Select Driver

Select an appropriate driver according to the control card and the laser machine, see Fig.1.2.05, and then click "**OK**".
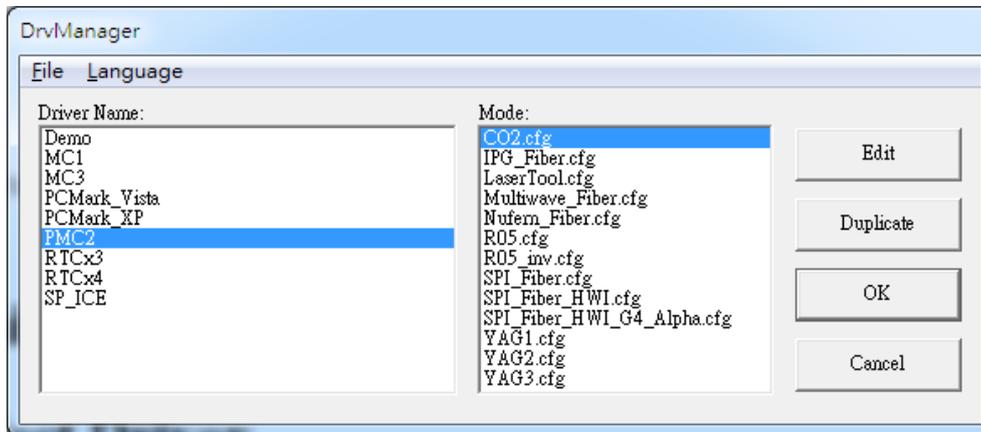
Fig.1.2.05

Step 5: Installation Complete

The installation is finished. Click "**Finish**" to exit the setup program, see Fig.1.2.06.
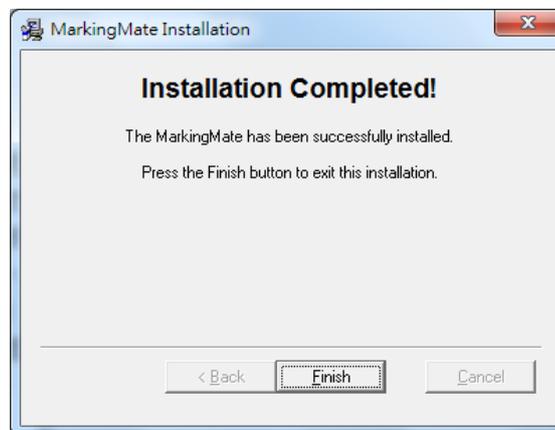
Fig.1.2.06

Step 6: Execute MarkingMate

After the installation is completed, the system will add a "**MarkingMate System**" folder at⌈ **Start→All Programs** ⌋and create a shortcut like on the Desktop.

Users can execute **MarkingMate** by click "MarkingMate" which is under "**MarkingMate System**" (see Fig.1.2.07) or double click the shortcut on the Desktop. Users can also pin the shortcut to the Taskbar and click the icon to execute the software, see Fig.1.2.08.

Fig.1.2.07

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Fig.1.2.08

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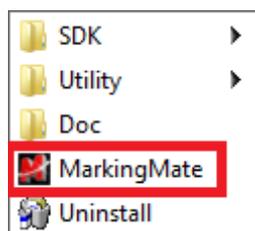
1.3Hardware Protect Key Installation

The **Hardware Protect Key** (or **Dongle**) is a male-to-female connector (Fig.1.3.01) for parallel port or a USB type connector (Fig.1.3.02). If the protect key does not connect to computer correctly, **MarkingMate**will not be able to work normally.

Notice
Every package contains only one protect key.If it is lost or damaged, users can get another one only by purchasing another **MarkingMate** system. Therefore, users should take good care of the key.
If the protect key cannot work normally, please contact with the distributors.

Fig.1.3.01   Fig.1.3.02

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2. Driver Manager

Based on the different marking controller usage, user must select a correct driver. Users need to select the driver when installing **MarkingMate**. Besides, they can also change the driver by executing **Driver Manager** through the following path: **Start – Programs –MarkingMate System–Utility – Drv Manager**, see Fig.2.0.1.

Fig.2.1.01

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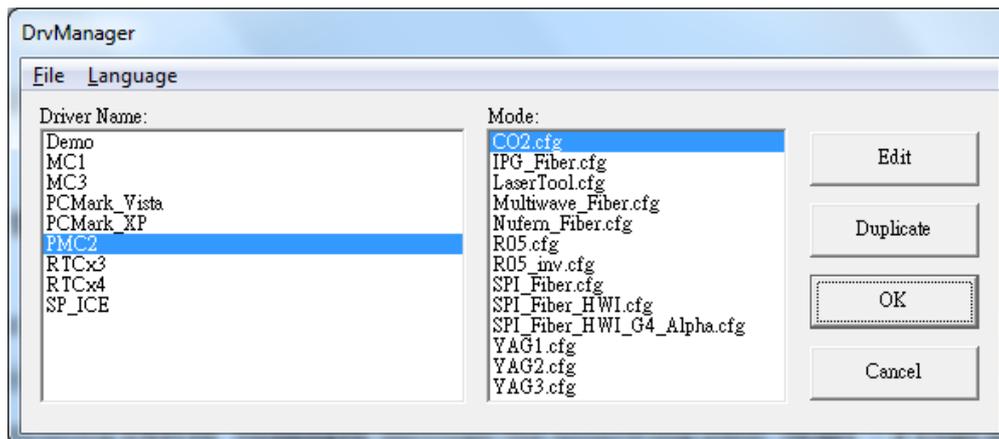
3.System Info Backup and Recovery

3.1Configuration Import/Export

Use this function to load the backup configuration files or export the current configuration files for backup, see Fig.3.1.01.
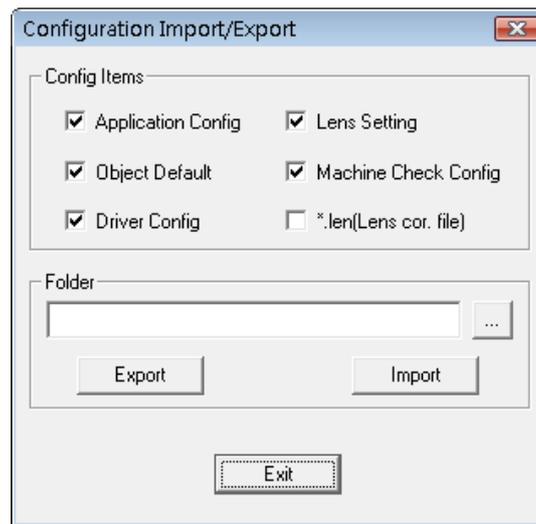
Fig. 3.1.01

Method:

1. Select "**File**" from Menu Bar and click "**Configuration Import/Export.**"

2. Select the items and click "…" to select the folder user want to export or import, then click "Import" or "Export" button. If the name of lens has already existed, the system will pop a warning dialog box, see Fig.3.1.02. Please notice that "*Jen (Lens cor. File) is only used for version 2.4, so it can only be import.

Fig. 3.1.02

3. Restart the program.
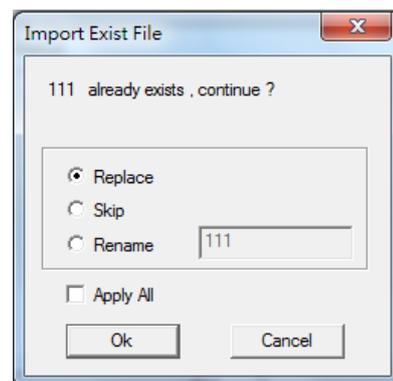
Practical Functions

3.2Auto Save

Activate 「**Auto Save**」function can help users to save the editing file automatically to avoid losing the data. Users can enable this function from「**File Menu**」→「**Options**」 →「**Edit**」→「**Auto Save**」, see Fig.3.2.01.
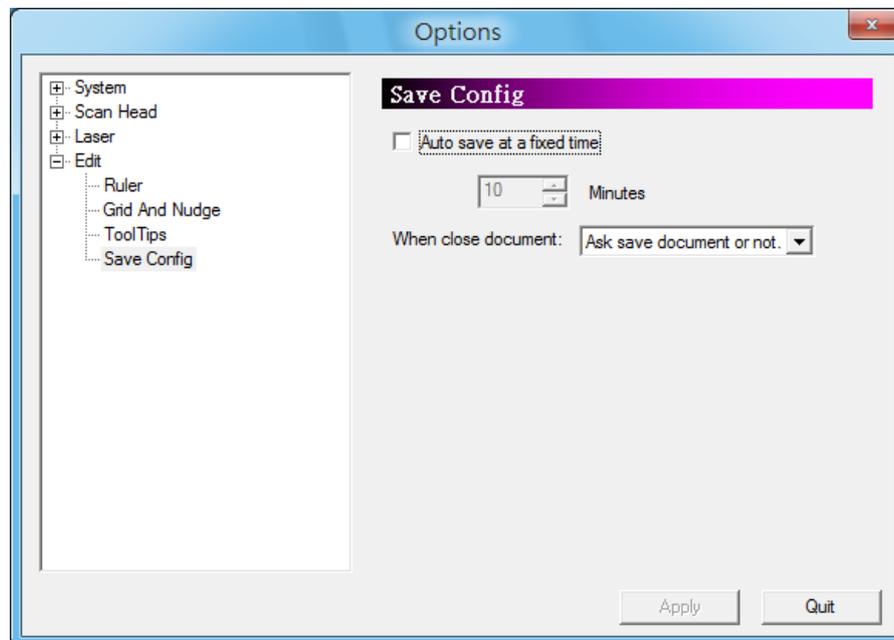
Fig. 3.2.01

Auto Save Rule

Auto-save at a fixed time

The system will save the documents automatically every time period user setted in the field.

When close document

Default action while closing document.

Ask save document or not

Ask if save document or not.

Auto save document

Executing auto save when closing the document every time.

Not save document

Close document directly.

Practical Functions

4.Lens Correction

"**Lens Correction**" function is used to fix the distortion resulted from Lens characteristics or optical problems. If the lens correction has been completed, but the mark result still hassome problems such asunfocused or ratio inaccuracy, usersneed to adjust these parameters from the "**Work Area**" page under "**Property Table**."

4.1Lens Manager

Enter "**Lens Manger**" form 「**File**」→「**Option**」→「**Scan Head**」, see Fig.4.1.01.All lenses users have will be listed here.
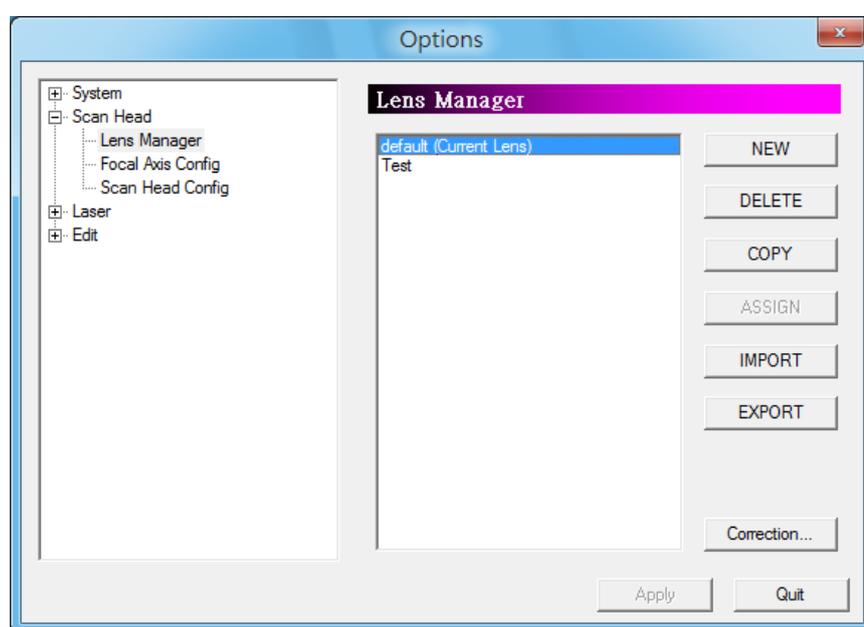
Fig. 4.1.01

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

Practical Functions

4.2 Lens Correction

The system will use math formula to correct the barrel distortion, trapezoid distortion, or parallelogram distortion resulted from lenses and optical devices. Adjust lens parameter properly will make the marking result be the same as the original design. Fig.4.2.01 shows the lens setup under normal mode. Fig.4.2.02 is the lens setup under dot mode.
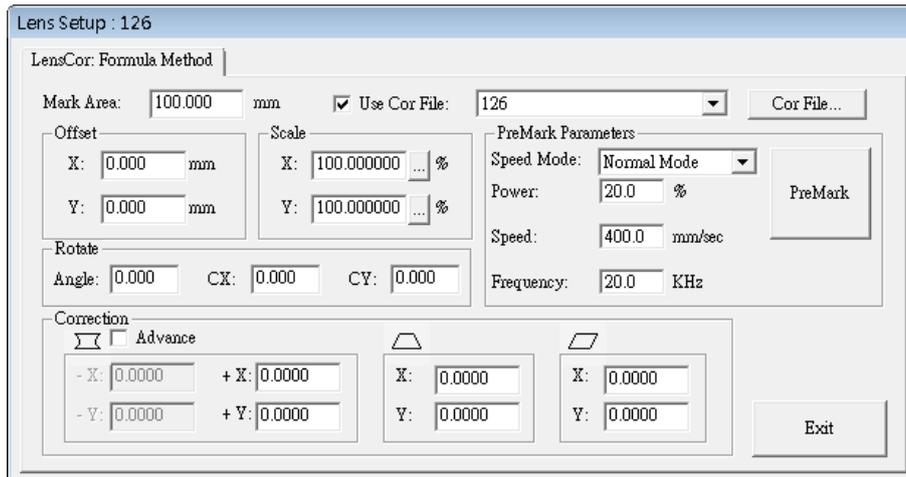
Fig. 4.2.01Under Normal Mode
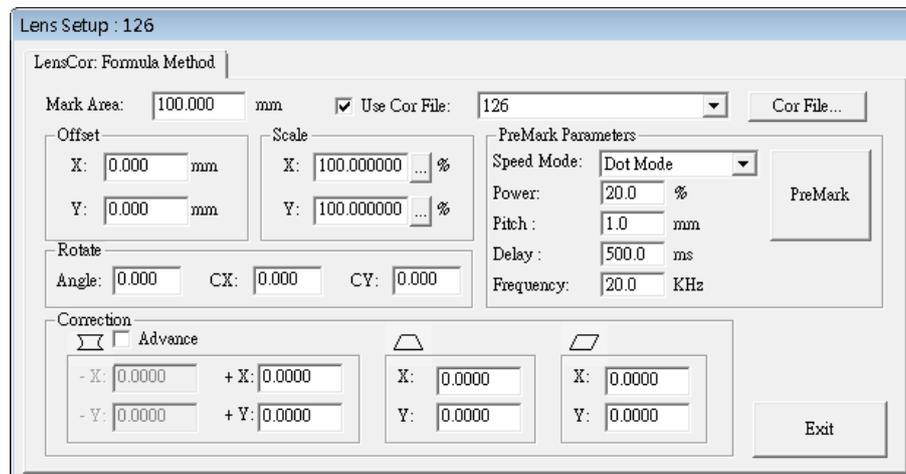
Fig. 4.2.02Under Dot Mode

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

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RayLase).If the selected correction file has the same name as the assigned lens, users are able to click "**Cor File…**" button and do correctionthrough **"Using Correction File"** function.

Offset 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.

Scale 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 (*theoretical size / real size * 100*, the default value is 100). For example, if real size is smaller, this value should be larger than 100.

Rotate 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.

Correction 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 **Distortion Correction.**

Advance Allow users to input different correction values at negative X and Y direction.

PreMark Parameters Setting the parameters for PreMark.

Speed Mode Select to use Normal Mode or Dot Mode to Premark.

Power Laser power percentage for PreMark.

Speed Laser speed (mm/sec) for PreMark.

Frequency Laser frequency for PreMark.

Pitch (Under Dot Mode) The distance between dot and dot on the marking route when doing PreMark.

Delay (Under Dot Mode) The waiting time a lens needs to start radiating when move to a dot while doing PreMark.

Pulse Width (YAG Laser) The spending time for each pulse.

PreMark Click the "**PreMark**" button, the laser will mark according to the parameters setting above.

Practical Functions

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Please follow the steps listed below to do the correctionand 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 4.1 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 Table4.2 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 4.3 to do the correction until four 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.

MarkingMate 2.7 A-24

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)

Table4.1

Practical Functions

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Correction of trapezoid distortion

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

Table4.2

Practical Functions

MarkingMate 2.7 A-24

Correction of parallelogram distortion

O r i g i n a l		
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

Table4.3

Practical Functions

4.3 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. 4.3.01.

Once finding that still need to adjust these values after finishing lens correction, users can come back to this dialog box to modify them.
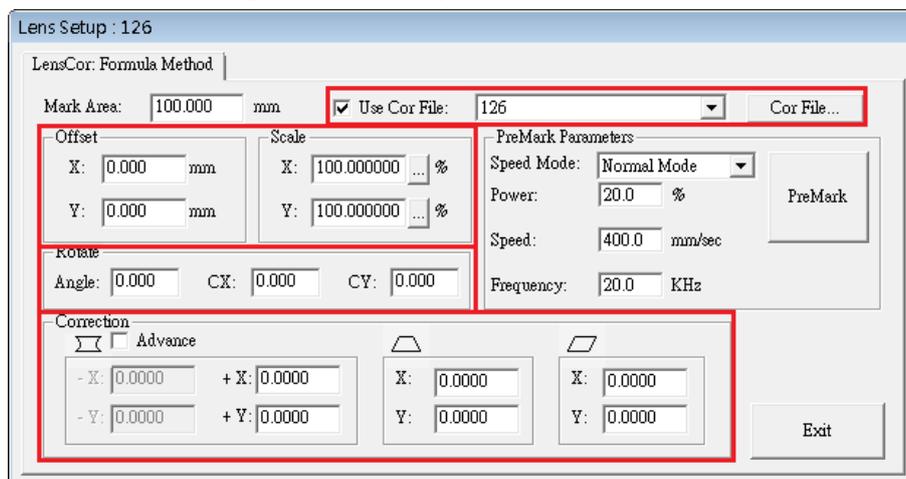
Fig. 4.3.01

4.3.1 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. 4.3.02. Please note that each lens can only choose one method.

Fig. 4.3.02

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Method	Select Scale Method or Grid Method. Please refer to the following description.
Import Cor	Import an existing correction file and do advanced correction.
File	There are three usable file types: COR, CTB, and GCD.
File Path	The path of the imported correction files.

4.3.2 Scale Method

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.4.3.03.

Fig. 4.3.03

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.13**)
Reset
    The purpose of this function is to reset the setting of correcting area, or import a correction file to do correction, see Fig.4.3.04.
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.

Practical Functions
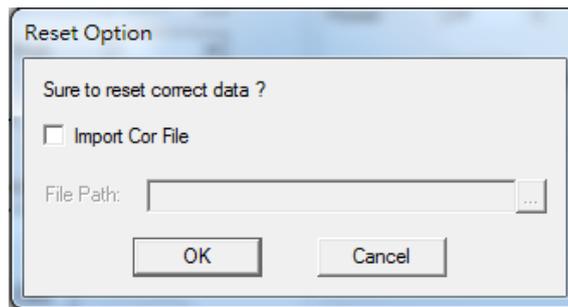
Fig. 4.3.04

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 more correct rings users select the better accuracy they will get.

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.4.3.05.
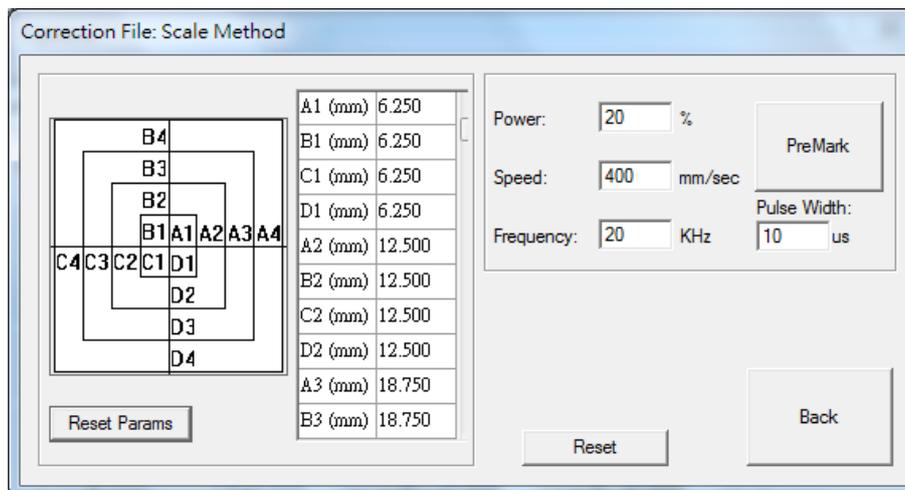
Fig. 4.3.05

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.

4.3.3 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 4.3.06.
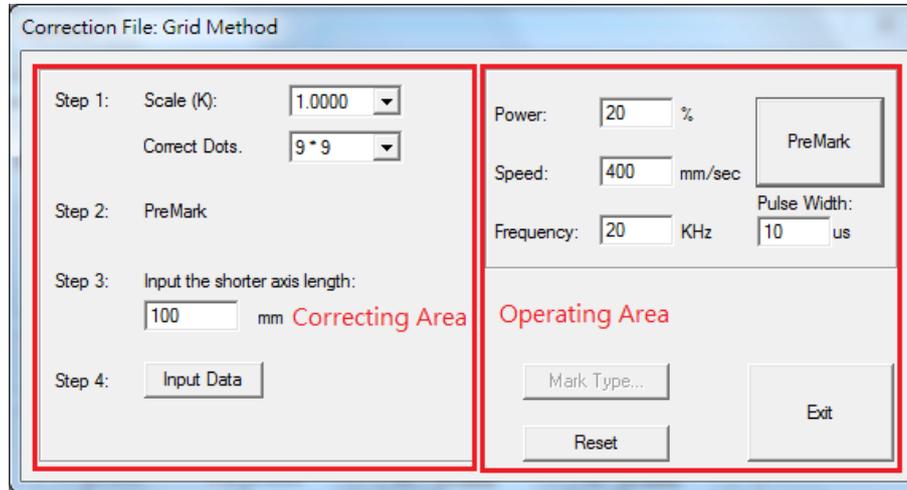
Fig. 4.3.06

Operating Area

On the top of this area is the Premark parameters (refer to **p.13**)

Mark Type

To use the function, users must click "Input Data" at "Correcting Area" first, see Fig.4.3.07.
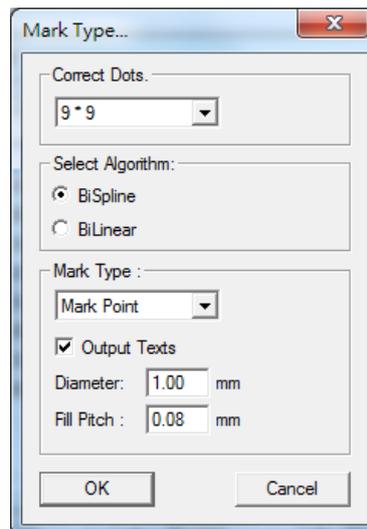
Fig. 4.3.07

Practical Functions

Correct Dots

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

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

Output Texts

If checked the "**Output Texts**" checkbox, the representing numbers will appear next to the grid point or line, see Fig.4.3.08.
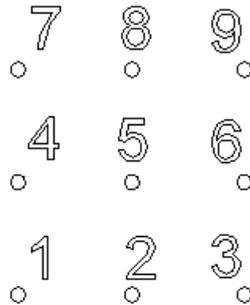
Fig. 4.3.08

Reset

Please refer to page 18.

Correcting Step

Step 1	Select the scale (K) value which is close to the voltage ratio of lens and driver output from the drop down menu. Then select the correct dots. More correct dots will get more accurate result.
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.4.3.09.

Practical Functions
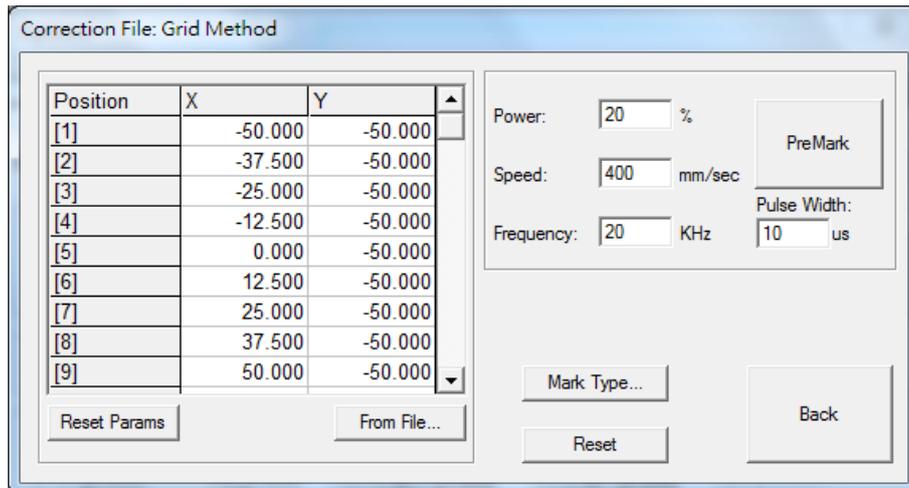
Fig. 4.3.09

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.

Reset Params.	Reset all correction data as the default values.
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.4.3.10.

Fig. 4.3.10

Practical Functions
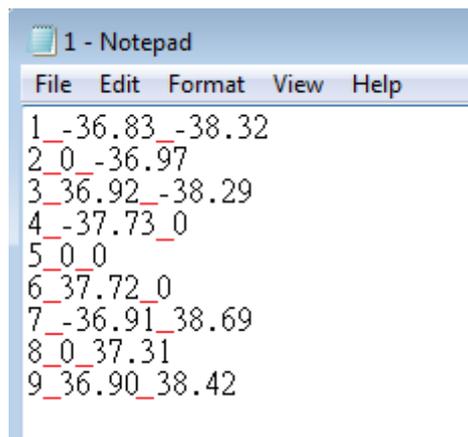
4.4 Work Area

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.4.4.01.

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

Fig. 4.4.01

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.

Practical Functions

5.Alignment

5.1 Mark Preview

This function is used to position the marking object. The interface shows as Fig.5.1.01. 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 [x] on the upper right of the interface.

Speed: Movingspeed of align light.

Position: Click the four arrows around the control lever in Fig.5.1.01 to move the align light, and the moving distance depends on X or Y value which is set at "**Unit**."

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.

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.5.1.02.

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.

Mark Sample: Execute marking directly.

Fig. 5.1.01

Fig. 5.1.02

Practical Functions
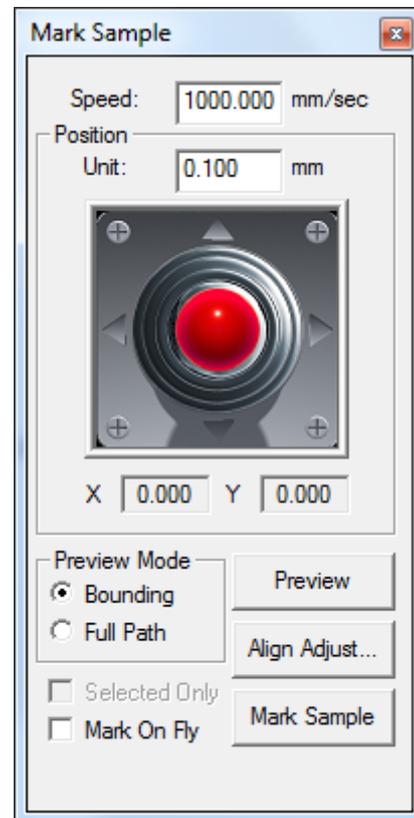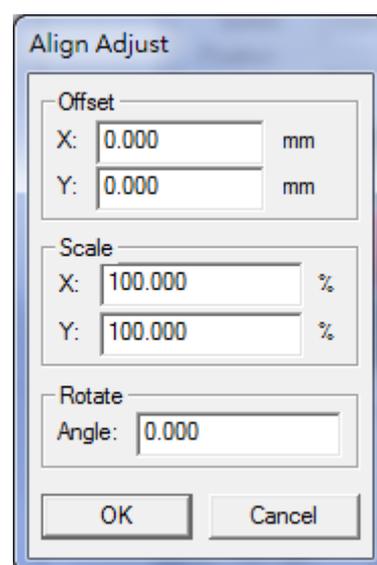
5.2 Align Light Test

Set the parameters for align light, see Fig.5.2.01.
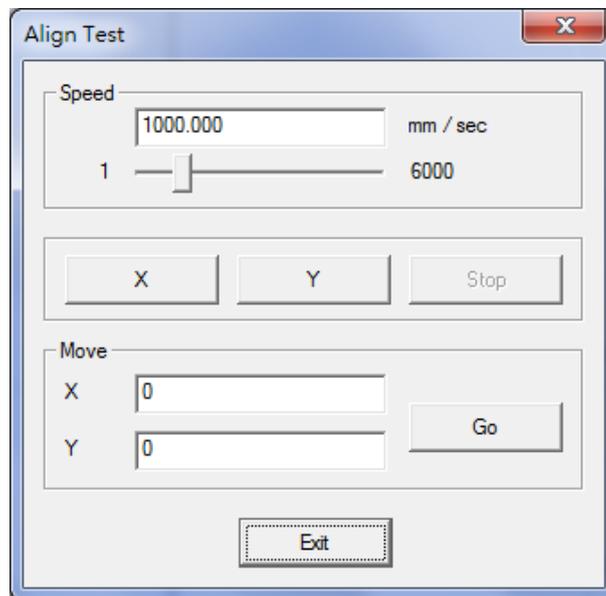
Fig. 5.2.01

Speed

Adjust the speed of the align light. Modify it by key in the value or move the scrollbar directly. The maximum speed is 6000 mm/sec.

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 X direction (unit: mm).
Go: Click the button and the align light will adjust the X/Y position according to the X/Y value.

5.3 How to Control Align Light with MC-1 and MC-3

The default settings of align light of MC-1 and MC-3 Controller is disabled. If users want to enable this function, please follow the steps listed below:

Step 1

To enable the align light control, users need to use "**Notepad**" to open the driver's *.cfg file they use (for example, standard_co2.cfg)which is under the path of "**MarkingMate Insatllation Folder (for example: C:\Program Files\MarkingMate)\Drivers\MCx\cfg**", see Fig.5.3.01. Modifies one of the line "Align_Out=0" to become "Align_Out=3". (0 means function disabled, 3 means the third output will be defined as align control.) There are total 16 outputs can be defined, please refer to the description of MC-1 or MC-3 controller user manual. And then save the file.
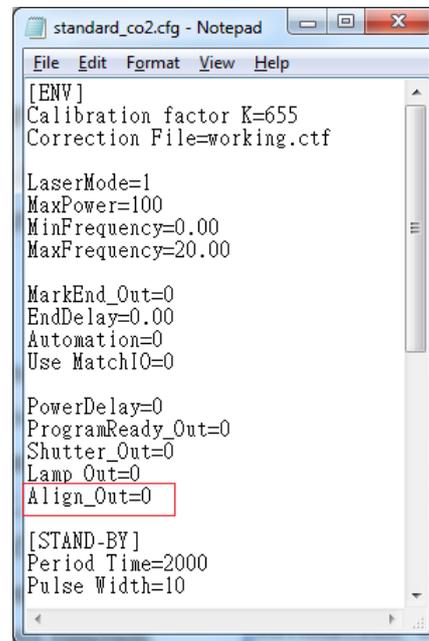
Fig. 5.3.01

Step 2

Restart the MarkingMate software. Go to the "Property Table – Driver" page, and click "I/O Test" button, then will see a dialog box like Fig.5.3.02 that the third output is lighted. If users have connected the third output point of MC-1 or MC-3 controller to the right position of the laser machine, then they can use the ⬚ button to control the align light in the software already.

Fig. 5.3.02

Practical Functions
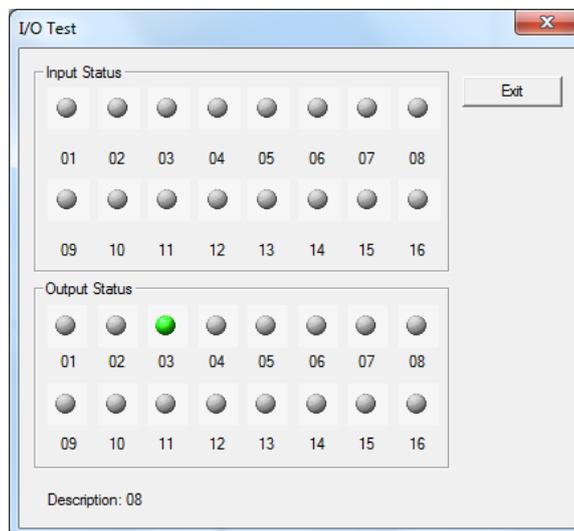
6.Rotary Marking

6.1 Enable Rotary Marking

To control the **Rotary Axis**, users need 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. Or users can decide to enable rotary marking for each object
or not under 「**Mark-Related Property Table** 」→「**Rotary** 」. Layer rotary marking
and object rotary marking are mutually exclusive.

Layer-Related Rotary

> There are two methods of rotary: Cylinder Mode (see Fig.6.1.01) and Disc
> Mode (see Fig.6.1.02). The difference between cylinder and disc is the figure
> of the rotary axis.
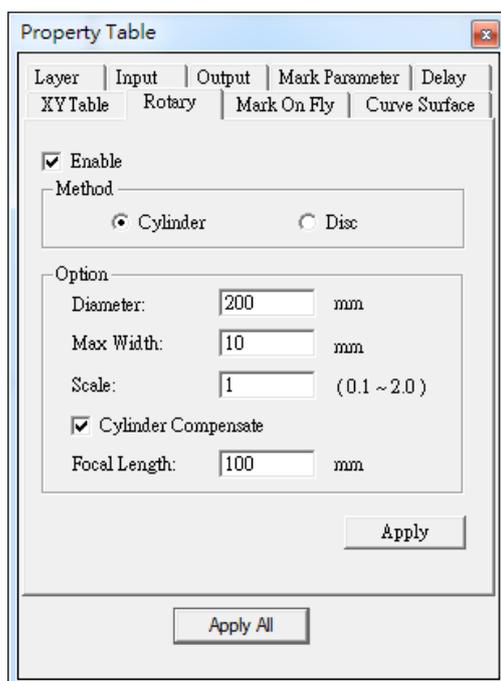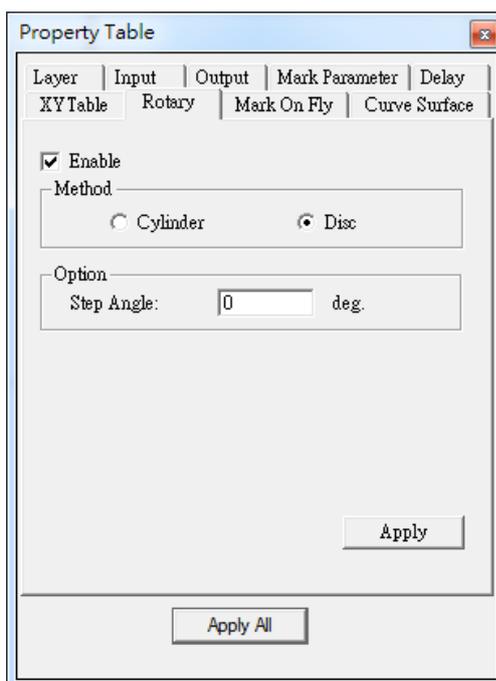
Fig. 6.1.01   Fig. 6.1.02

Cylinder Mode

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.

Example: Suppose that users set the value of rotate rate as 1.5, and the marking result

Practical Functions

is shown as Fig.6.1.03, all sections are overlapped. In this case, users should lower that value, such as 1.0, to make the marking effect optimum, see Fig.6.1.04. On the contrary, if the value of rotate rate is 0.5, and the marking result displays like Fig.6.1.05, there are intervals between each section. As a result, users should increase this value to make the marking effect become ideal, like Figure 6.1.04.
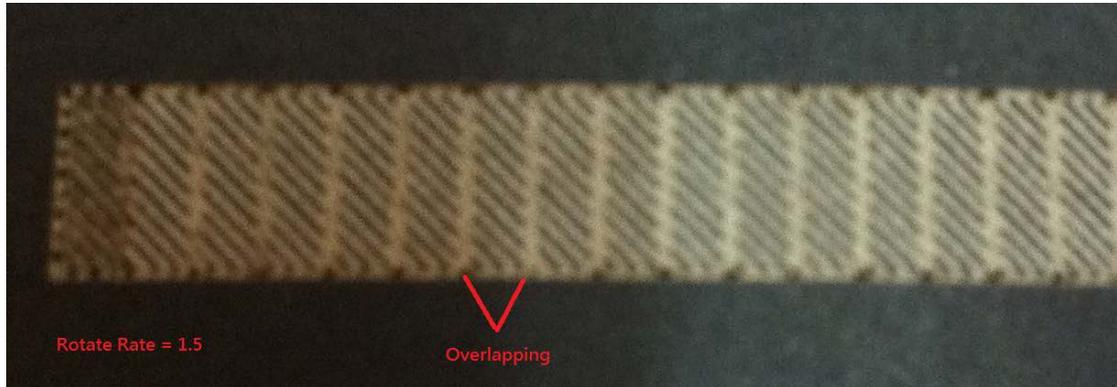
Fig. 6.1.03

Fig. 6.1.04

Fig. 6.1.05

Cylinder Compensate: The default value of this function is disable. Enable the function, **MarkingMate** system will fix the overlapping of marking result according

Practical Functions

to the object's radius and the Focal Length.

Focal Length: Input the focal length of the lens.

Disc Mode

Step Angle: Set the rotary angle for each step of marking.

Mark-Related Rotary

This page allows users to enable rotary marking for individual object. Fig.6.1.06 is the property page when selecting a general object.

General Object

Enable

Allow users to enable or disable the rotary axis function.

Start Position

The start angle of the rotary axis.
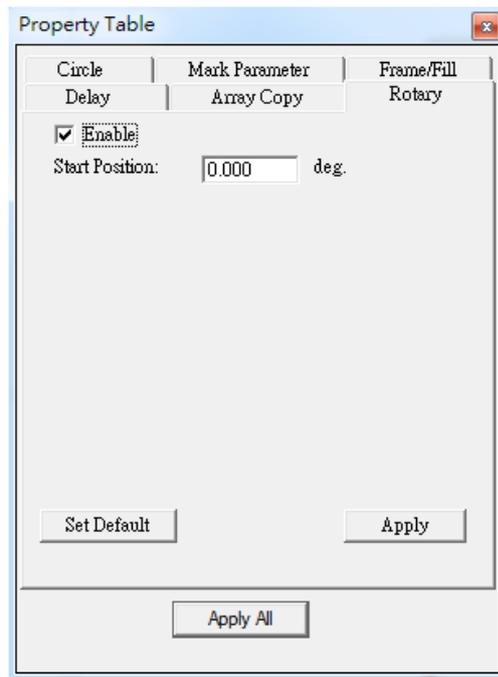
Fig. 6.1.06

Text Object

When a general text object has being selected, the Rotary Page has some particular options, like Fig.6.1.07.

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.6.1.08.

Edge: Calculate the pitch based on the edge of the character, see Fig.6.1.09.

Diameter: The software needs the diameter of the workpiece to calculate the pitch when select Edge mode.
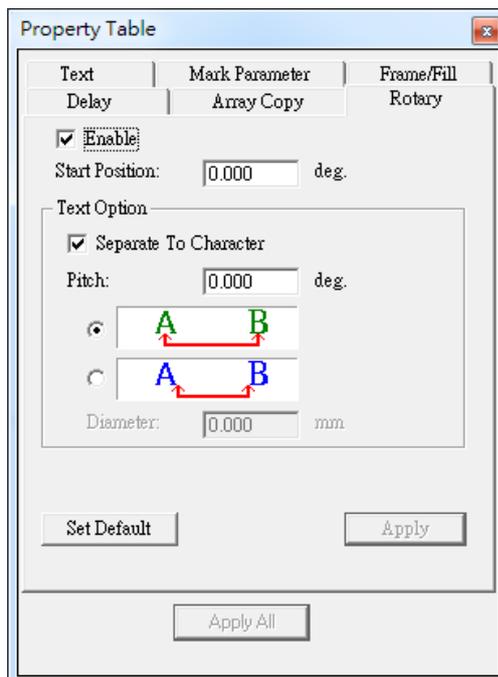
Fig. 6.1.07
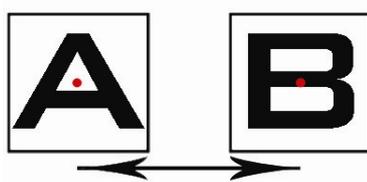
Fig. 6.1.08

Fig. 6.1.09

6.2Rotary Control Panel

After enableing rotary, click ![icon] button and do the further setting, see Fig.6.2.01.
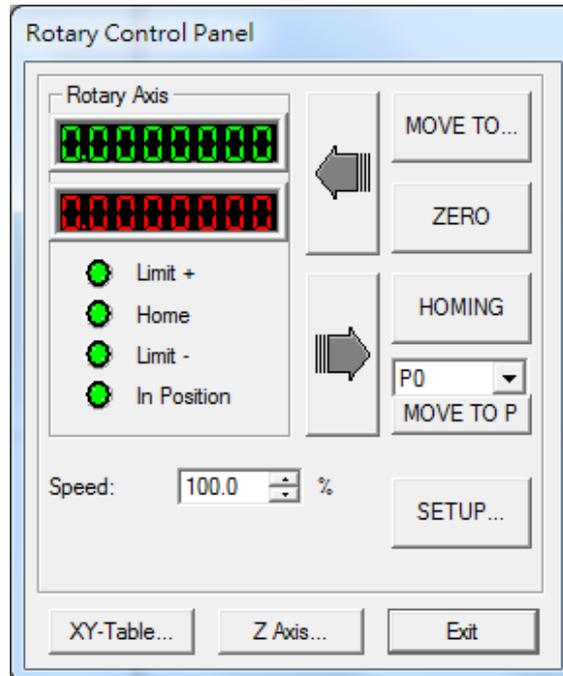
Fig. 6.2.01

1. Click "MOVE TO…" button and input the degree value in the dialog box like Fig.6.2.02 and click "GO," the rotary axis will rotate to that specific angle. The rotating speed can be adjusted from "Speed" parameter.
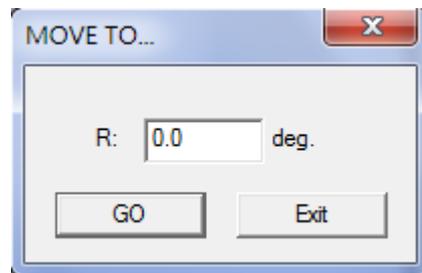
Fig. 6.2.02

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.

Practical Functions

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. Click "SETUP…" and do more detail settings, see Fig.6.2.03.
7. Click "XY-Table…" button can do X/Y Table control setting.
8. Click "Z-Axis…" button can do Z-Axis control setting.
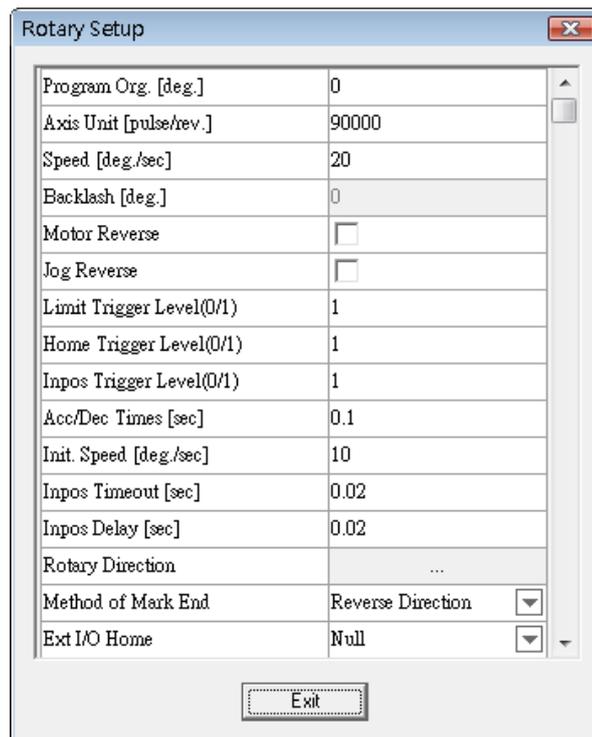
Fig. 6.2.03

Program Org. [deg]	The program will consider this point as the program origin.
Axis Unit [Pulse/rev]	The pulse needed for rotary to move 1 round (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

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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.
Rotary Direction	Click to do further settings for the rotating direction of the rotary axis, see Fig.6.2.04.

Fig. 6.2.04

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.

Practical Functions

◆ Shortest Path: go back to the origin by the shortest path.

◆ Reset As Origin A: set the mark end point as the new 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.

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 [deg/sec]	The homing speed of rotary axis.
Home Back Speed [deg/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 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.
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.
P0~P9 [deg.]	Set the position of P0~P9.

Practical Functions

6.3 Rotary Setup Wizard

The system provides three common used rotary marking functions for users to select, see Fig.6.3.01. Moreover, it also allows users to set the motor. If users click "Setting››," then the "Rotary Control Panel" will display as Fig.6.3.02.
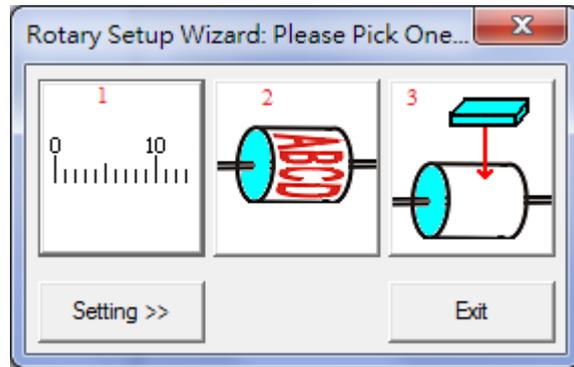
Fig. 6.3.01

1. **Calibration Marking**

2. **Ring Text Marking**

3. **Cylinder Marking**

4. **Rotary Control Panel**

Fig. 6.3.02

Practical Functions
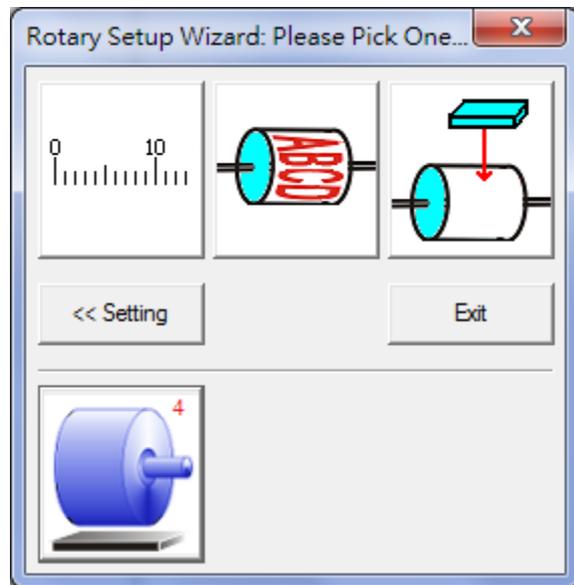
6.3.1 Calibration Marking

Press to display the "**Calibration Marking**" dialogue box, see Fig.6.3.03.
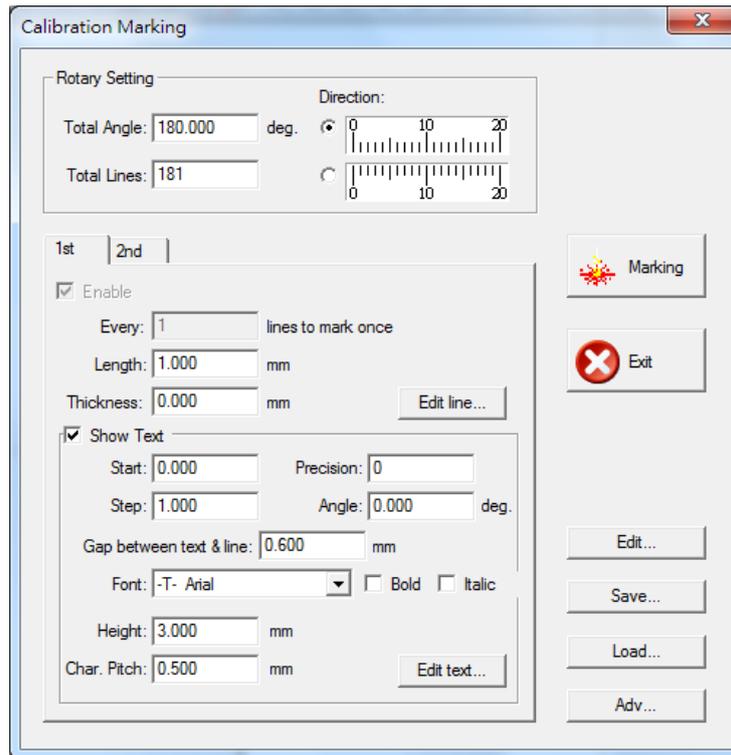
Fig. 6.3.03

Rotary Setting

Total Angle	Set the total mark angle.
TotalLines	The amount of lines users want to mark in the range of total angle.
Direction	Select the corresponding position of scale lines as well and text.

1ˢᵗ / 2ⁿᵈScale Line

Every xxx lines to mark once

The system will mark the selected scale line in every setting amount of lines. For example, if the value of 2ⁿᵈ scale line is 10, then the system will mark the seconf scale line every 10 lines.

Please note that 1ˢᵗ scale line is a default value and cannot be changed.

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Length	Length of scale line (unit: mm)
Thickness	Width of scale line (unit: mm)
Show Text	Check this option to show text when marking and set the text parameters.
Start	Initial value of text(can be reversed calculation).
Step	The increasing value of text.
Precision	Set the decimal digits (from 0 to 3), and 0 means the integer mode.
Angle	The rotary angle for the text.
Text-Line Gap	Set the distance of text and scale lines.
Font	Set the text font (TrueType, SHX, FON, FNT, etc.)
Bold	This option can be checked if the select font supports Bold type.
Italic	This option can be checked if the select font supports Italic type.
Height	Set the height of text.
Char Pitch	Set the spacing of each character.

Edit Line / Edit Text

Click the button to edit the mark parameters of the line or text, see Fig.6.3.04.

Fig. 6.3.04

Practical Functions
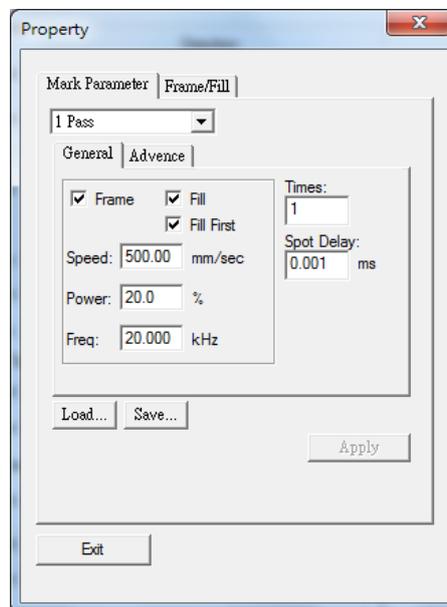
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Advanced

Click the button to do the further setting, see Fig.6.3.05.
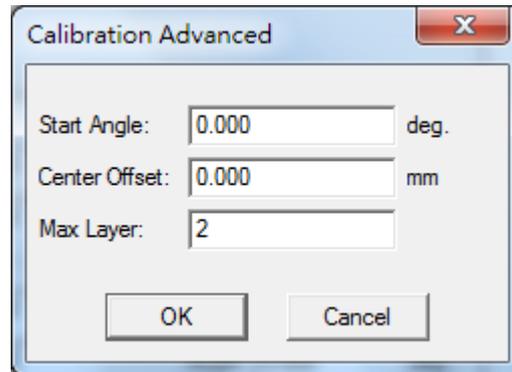
Fig. 6.3.05

Start Angle	Set the start marking angle of the scale line.
Center Offset	The offset on center. The default value is 0.
Line's Layer	Set theamount of scale line layer. The default layer is 2 which means there will be two kinds of scale lines. If users want to have 3 scale lines, please input 3 here.

Edit

Allow the users to edit the scale line.

Save

Export the setting values to assigned folder as a configuration file.

Load

Import the assigned configuration file.

Marking

Click this buttonand the Marking dialog will pop up. Users can click "Exec" button to execute marking or click "Exit" button to return to the setting dialog box.

Exit

Click this button to exit the dialogue box.

Practical Functions

6.3.2 Ring Text Marking
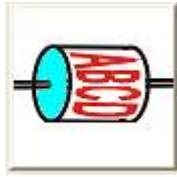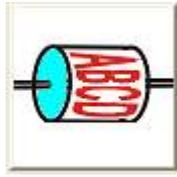
Press to display the "**Ring Text Marking**"dialogue box, see Fig.6.3.06.
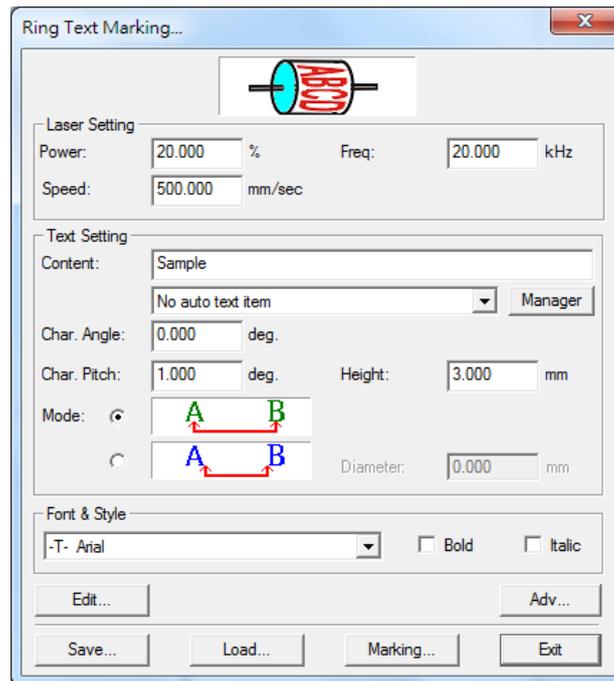
Fig. 6.3.06

Laser Setting

    Speed   Set the marking speed.

    Power   Set the marking power percentage.

    Freq   Set the laser frequency when marking.

Text Setting

    Content   Input the text content here or click "Manager"button to insert an auto text item.

    Height   Set theheight of text.

    Char Angle   The rotary angle for the text.

    Char Pitch   Set the spacing of each character.There are two spacing modes for users to select:

  (1) **Center to center spacing**

      A. Check the first option of"Char Pitch."

      B. The system will calculate the rotary position for each character according to the "Char Pitch"which is based on the center distance of

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the characters.

    C.   For instance, the text content is "Text", the character pitch is 5 degrees in the center mode, the Start Angle is 90 degrees, then the marking flow is as follows:

        I.   The rotary axis will first turnto 90 degrees

        II.   Mark "T" (T in the center of the lens)

        III.   Turn the rotary axis forward by 5 degrees

        IV.   Mark "e" (e in the center of the lens)

        V.   Turn the rotary axis forward by 5 degrees

        VI.   Mark "x" (x in the center of the lens)

        VII.   Turn the rotary axis forward by 5 degrees

        VIII.Mark "t" (t in the center of the lens)

        IX.   Turn the rotary axis to 0 degree

(2) Margin spacing mode

    A.   Check the first option of"Char Pitch."

    B.   The system will calculate the rotary position for each character according to the "Char Pitch" which is based on the margin distance of the characters.

    C.   For instance, the text content is "Ring", the font size is 2mm, the character pitch is 5 degrees in the margin mode, the Start Angle is 90 degrees, the diameter of work is 50mm, then the marking flow is as follows:

        I.   The rotary axis will first turnto 90 degrees

        II.   Mark "R" (R in the center of lens)

        III.   Turn the rotary axis forward by ($2/50 * 360+5 = 19.4$) degrees

        IV.   Mark "I" (i in the center of lens)

        V.   Turn the rotary axis forward by ($2/50 * 360+5 = 19.4$) degrees

        VI.   Mark "n" (n in the center of lens)

        VII.   Turn the rotary axis forward by ($2/50 * 360+5 = 19.4$) degrees

        VIII.Mark "g" (g in the center of lens)

        IX.   Turn the rotary axis to the 0 degree position

Font & Style

Font	Set the font of text(TrueType, SHX, FON, FNT, etc.)
Bold	This option can be checked if the select font supports Bold

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type.

Italic   This option can be checked if the select font supports Italic

type.

Advanced

Click this button to do the futher setting, see Fig.6.3.07.
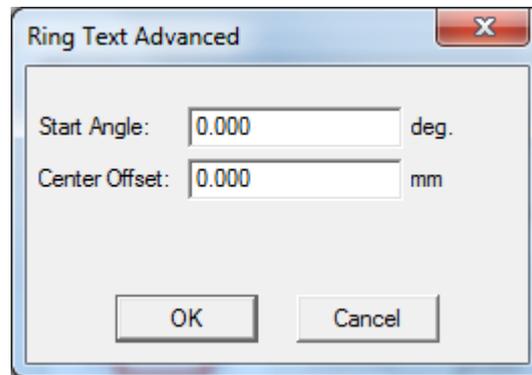
Fig. 6.3.07

Start Angle   Set the start marking angle of the scale line.

Center Offset   The offset on center. The default value is 0.

Edit

Allow the users to edit the text.

Save

Export the setting values to assigned folder as a configuration file.

Load

Import the assigned configuration file.

Marking

Click this buttonand the Marking dialog will pop up. Users can click "Exec"
button to execute marking or click "Exit" button to return to the setting dialog
box.

Exit

Click this button to exit the dialogue box.

Practical Functions

6.3.3 Cylinder Marking
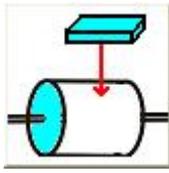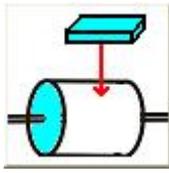
Press button to display the "**Cylinder Marking**"dialogue box, see Fig.6.3.08. Users can import image to mark through this function.
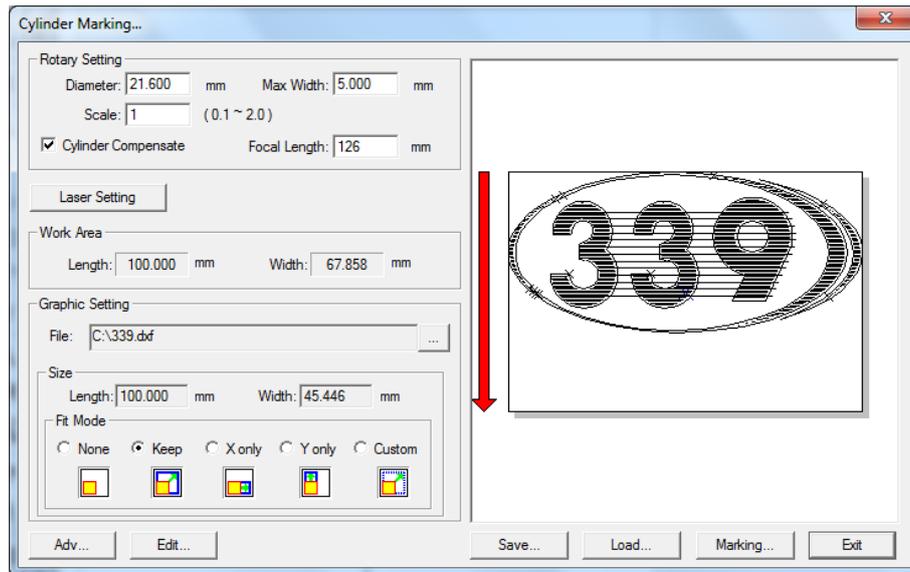
Fig. 6.3.08

Rotary Setting

    About rotary setting, please refer to p.28 "Cylinder Mode."

Laser Setting

    Click this button and enter the "Mark Parameter Page" to set the mark
parameters.

Work Area Info.

    The length and width are based on the lens mark area and the diameter of rotary
users set.

Graphic Setting

File	Display the image file users import.
Size	The image size will be displayed here according to the "Fit Mode" users selected.
Fit Mode	
None	Keep the original size.
Keep	Enlarge the imageisometrically to fit the work area.
X only	Enlarg the image in X direction.

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          Y only   Enlarg the image inYdirection.

          Custom   Users can assign the size of image themselves.

Preview Window:

The image file usersimport will be displayed in this Preview Window. Any changes usersmake will be shown in the Preview Window synchronously.

Edit

Allow the users to edit the image.

Save

Export the setting values to assigned folder as a configuration file.

Load

Import the assigned configuration file.

Marking

Click this buttonand the Marking dialog will pop up. Users can click "Exec" button to execute marking or click "Exit" button to return to the setting dialog box.

Exit

Click this button to exit the dialogue box.

6.3.4 Motor Setting

Press button and"Rotary Control Panel"dialog box will pop up for users to dofurther setting of rotary axis. More details please refer to the section **6.2 Rotary Control Panel**.

7.X/Y(/Z) Table Control

7.1 Enable X/Y(/Z)Table Control

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.7.1.01.

Enable

Enable XY table motion.

Computer Vision Positioning

Enable CVP marking at each XY position.

Add/Edit

Add or edit the XY(/Z) position, see Fig.7.1.02.

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.7.1.03.
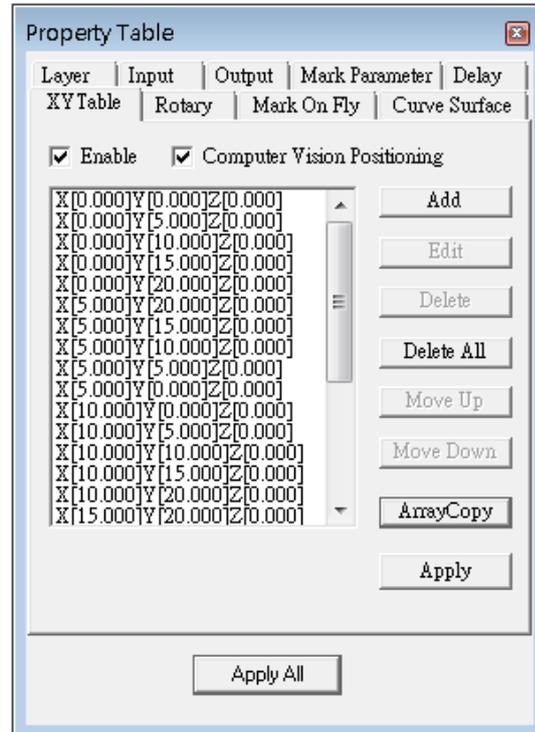
Fig. 7.1.01
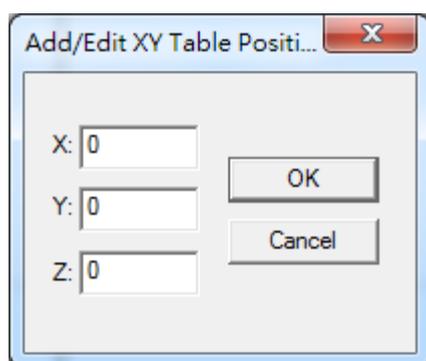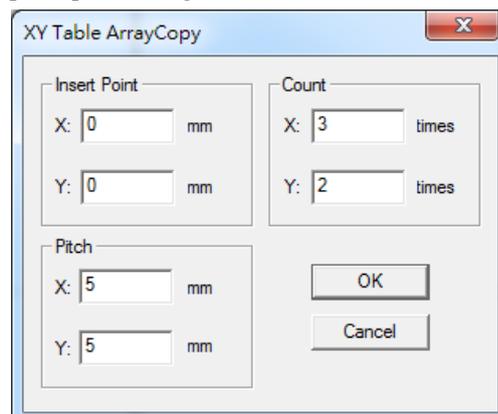
Fig. 7.1.02   Fig. 7.1.03

Insert Point	Set the start point.
Count	The duplicate amount.
Pitch	The interval of each point.

7.2 X/Y Table ControlPanel

After enableing X/Y Table, click [icon] button and do the further setting, see
Fig.7.2.01.
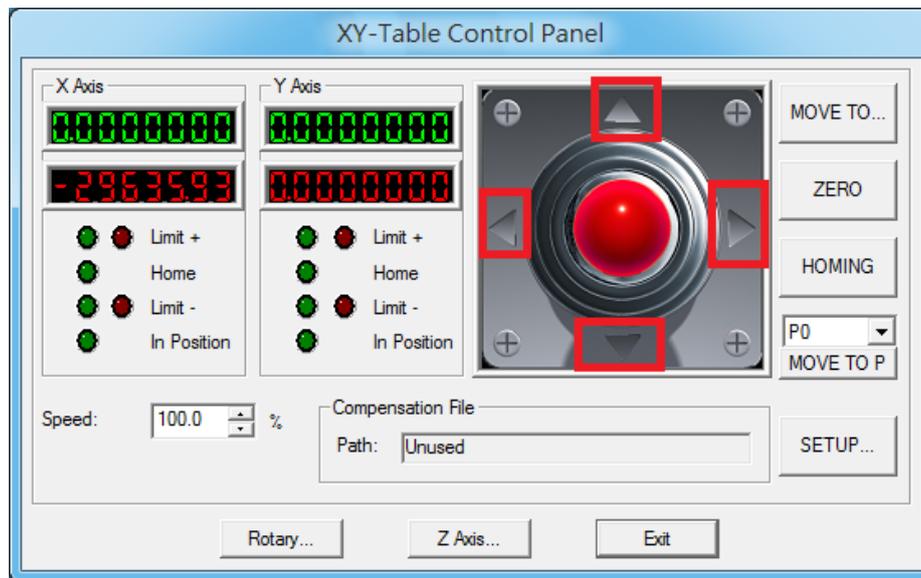
Fig. 7.2.01

1. Click "MOVE TO…" button and then input the X and Y values in the dialog
   box like Fig.7.2.02 and click "GO," the XY Table will move to that specific
   position. The moving speed can be adjusted from "Speed" parameter.
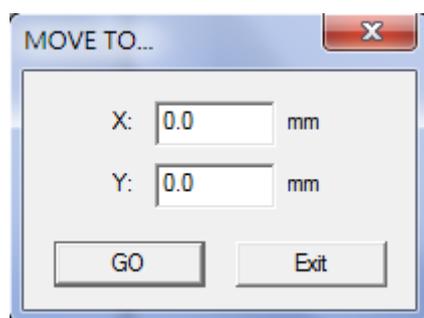
Fig. 7.2.02

2. Click the four direction buttons (the red part of Fig.7.2.01) to move the XY
   Table.
3. Click "ZERO" and the program will set the present position as (0,0).
4. Click "HOMING" and the XY Table will move to program origin.

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5. 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.
6. Click "SETUP…" and do more detail settings, see Fig.7.2.03.
7. Click "Rotary…" button can do Rotary control setting.
8. Click "Z-Axis…" button can do Z-Axis control setting.
9. "Load Compensation File" shows the compensation file users loaded.
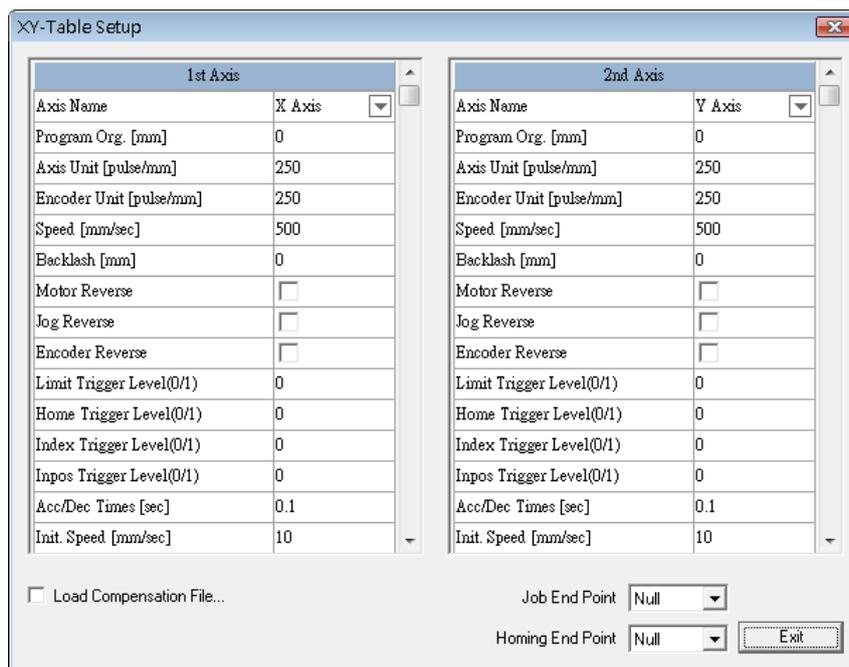
Fig. 7.2.03

Axis Name	Users can set the 1st Axis as X or Y, and the 2nd 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	When XY Table is placed in a different direction with the software's control panel, this parameter can make the X/Y axis move following the right direction.

Practical Functions

Encoder Reverse	Reverse the direction of the encoder.
Limit Trigger Level (0/1)	0: active low; 1: active high
Home Trigger Level (0/1)	0: active low; 1: active high
Index Trigger Level (0/1)	0: active low; 1: active high(Need motor Z-phase support)
InPos Trigger Level (0/1)	0: active low; 1: active high
Acc/Dec Times [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 X/Y 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.
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.
Home Reverse	Reverse the direction of homing.
Home Sensor Touching Mode (0/1)	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.
Index Direction	Choose Index direction.(Need motor Z-phase support)
Limit Stop Mode(0/1)	Decide the motor stop rapidly (0) or slowly (1) when moving to limit sensor.
Distance of Travel [mm]	The maximum available travel distance X/Y Axis can reach.
P0~P9 [mm]	Set the position of P0~P9.

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

Practical Functions

Click "Load Compensation File" to load the compensation file. Fig.7.2.04 is an example of the compensation file.
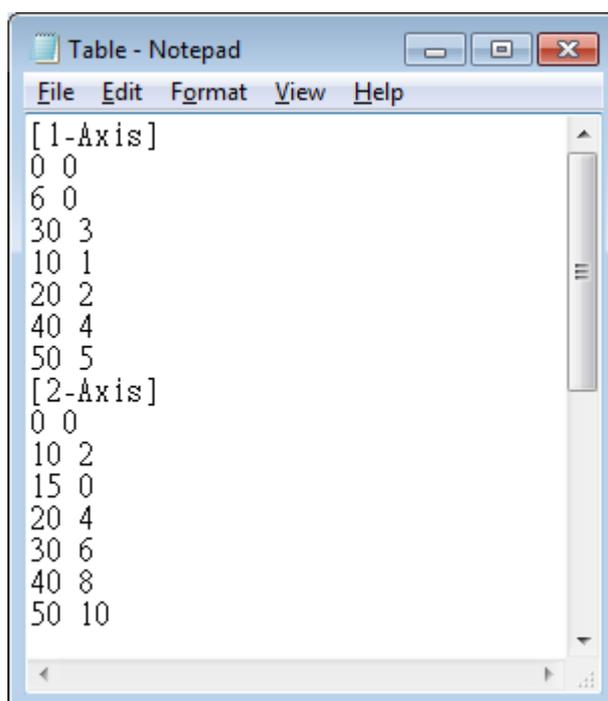
Fig. 7.2.04

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.

Practical Functions

7.3 Z AxisControlPanel

After enableing Z Axis,click ![icon] button and do the further setting, see Fig.7.3.01.

Fig. 7.3.01

1. Click "MOVE TO…" button and input the value in the dialog box like Fig.7.3.02 and click "GO," the Z Axis will move to that specific position. The moving speed can be adjusted from "Speed" parameter.
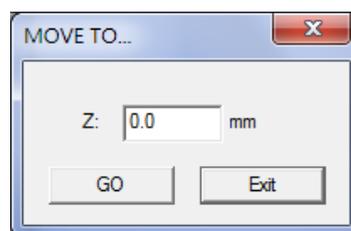
Fig. 7.3.02

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.7.3.03.
7. Click "XY-Table…" button can do X/Y Table control setting.
8. Click "Rotary…" button can do Rotary control setting.

Practical Functions
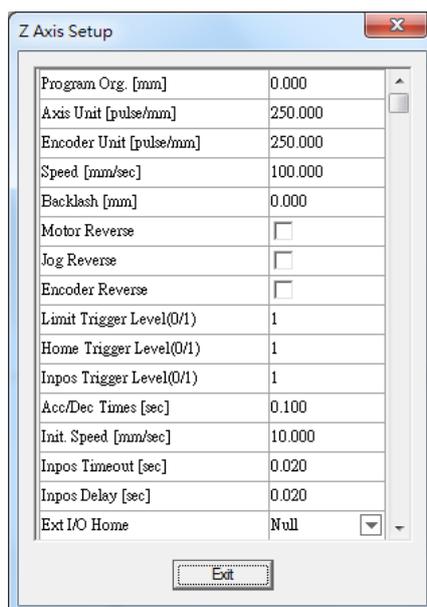
Fig. 7.3.03

Program Org. [mm]	The program will consider this point as the program origin.
Axis Unit [pulse/mm]	The pulse needed for Z 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 (refer to the encoder's specification).
Speed [mm/sec]	The moving speed of the Z axis
Backlash [mm]	The transmission deviation between motor and axis.
Motor Reverse	Reverse the motor moving direction.
Jog Reverse	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.
Encoder Reverse	Reverse the direction of the encoder.
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 Times [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 Z axis completed position after passing the time setting here.

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Inpos Delay [sec]	The program will wait for the setting time here to execute 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.

Practical Functions

8.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

8.1 Enable Mark on Fly

Users can enable "**Mark on Fly**" function from「**File Menu**」→「**Option**」→「**System**」→「**Mark on Fly**」, see Fig.8.1.01. After the parameters setting of X/Y Axis (depends on the users' demand) were finished, users can start using this function.
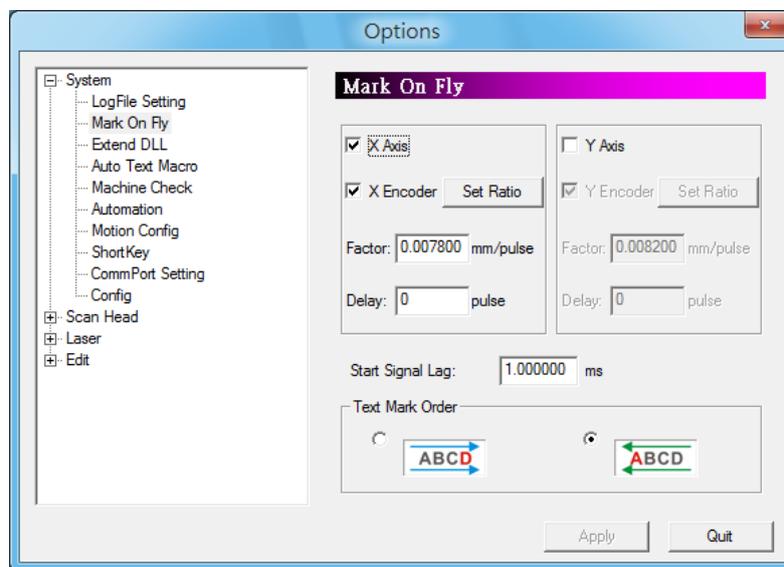
Fig. 8.1.01

Additionally, users can also enable this function from「**Property Table**」→「**Global**」, see Fig.8.1.02.

When the button is like ✕ Mark On Fly, that means this function is disable.If the button shows like ✓ Mark On Fly, that means this function is enable.
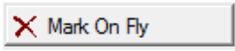
Fig. 8.1.02

Practical Functions
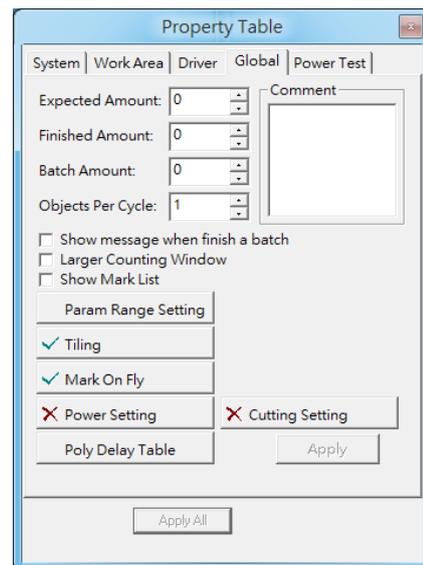
8.2 Mark On Fly Setting

Fig. 8.2.01

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.8.2.01.

Speed

Theoretical speed of conveyer.

Delay

The time that laser needs to start marking after receive the start signal.
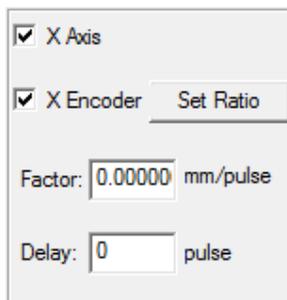
Fig. 8.2.02

X/Y Encoder (checked)

The parameter will change from "Speed" and "Delay" to "Factor" and "Delay", see Fig.8.2.02. 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.

Set Ratio

Counting the factor through the pulse from the encoder and the moving distance, see Fig.8.2.03.

Fig. 8.2.03

Practical Functions

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.8.2.04. 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.8.2.05.

Practical Functions

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, workpiece and sensor must be placed such as Fig.8.2.04.
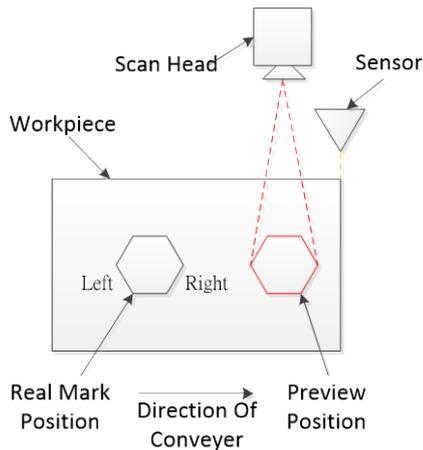
Fig. 8.2.04 Different Position
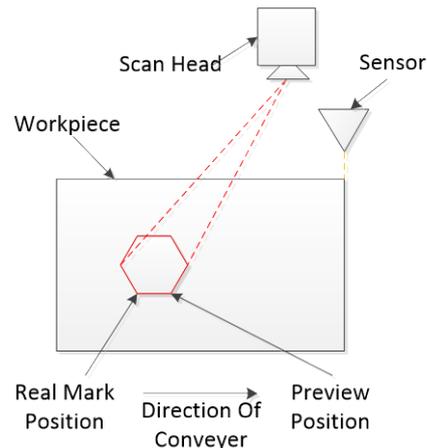
Fig. 8.2.05 Same Position

Adjustment Description

Take Fig.8.2.05 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.

Practical Functions

8.3 Mark on Fly－Distance to Next Layer

This function is set up when using "Mark on Fly" function for marking, enable or disable the delay marking between layers, see Fig.8.3.01.

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.

The following lists are conditions for enable this function:
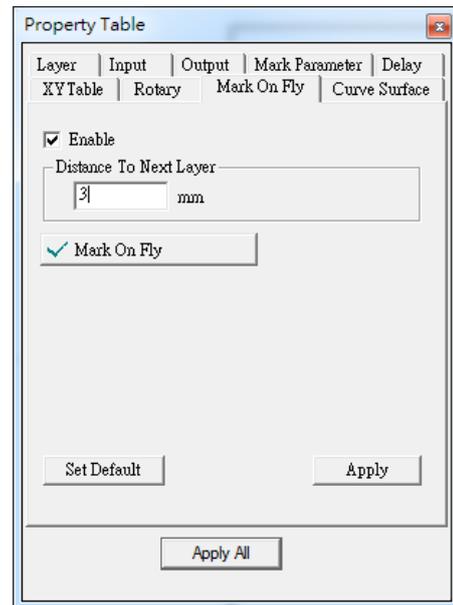
Fig. 8.3.01

1. Driver 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.8.3.02, and the "Mark on Fly" function is enabled and the "Encoder" option is checked:

Practical Functions
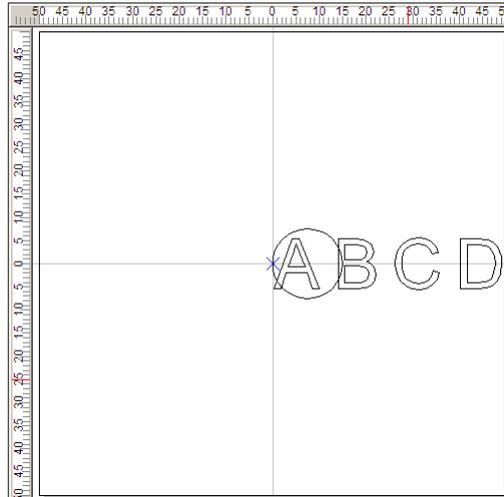
Fig. 8.3.02

1. If two objects are in the same layer, the result of marking will like Fig.8.3.03.

Fig. 8.3.03

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.8.3.04.

Fig. 8.3.04

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.

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(b) If Layer 1 (circle object) enable the encoder delay function, the marking result will like Fig.8.3.05.

Fig. 8.3.05

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.

Practical Functions

9. Split

9.1 Tiling

Users can activate "**Split**" function from
「**Property Table**」→「**Golbal**」, see Fig.9.01. If
the button is like ☒ Tiling , it means the
function is disable. If the button is
✓ Tiling , then users can execute this
function. "**Split**" is used when the size of object
users want to mark is over the lens mark area or
when users have any special demands. Click this
button ✓ Tiling and the setting page will
pop up, see Fig.9.02.
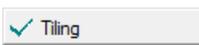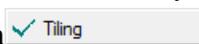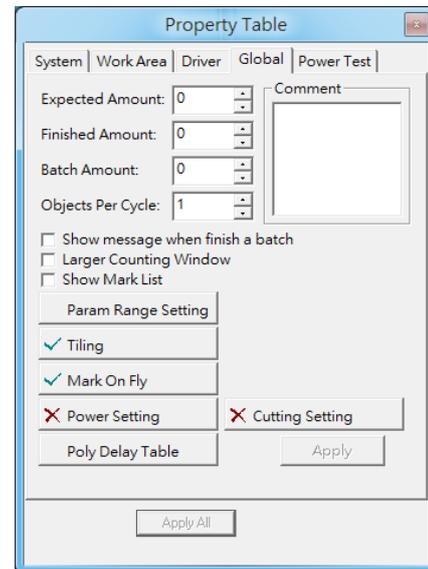
Fig. 9.01
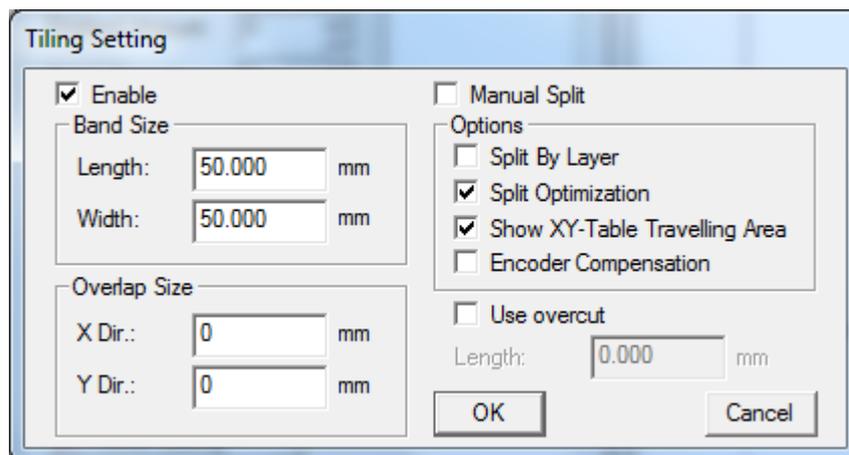
Fig. 9.02

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

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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.

Encoder Compensation: Decide to use encoder to do compensation

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.9.03. The difference between overlap and overcut is that the overlapping area will be marked twice but overcut won't, see Fig.9.04 and Fig.9.05. Overlap and overcut cannot be used at the same time.
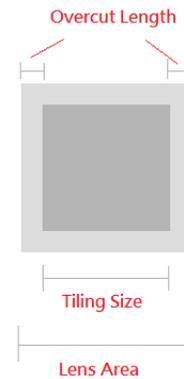
Fig. 9.03
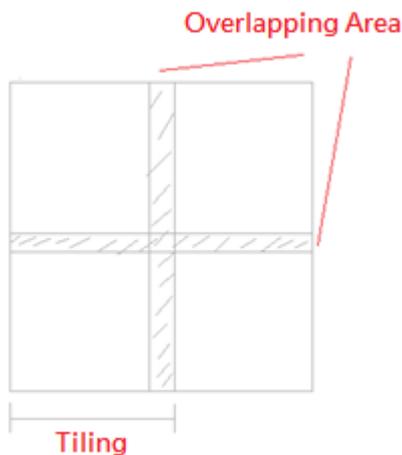
Fig. 9.04
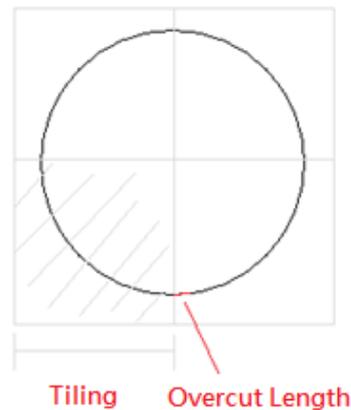
Fig. 9.05

When graphic split function is activated, the working area will be changed according to the settings of XY Table area and lens area as Fig.9.06.

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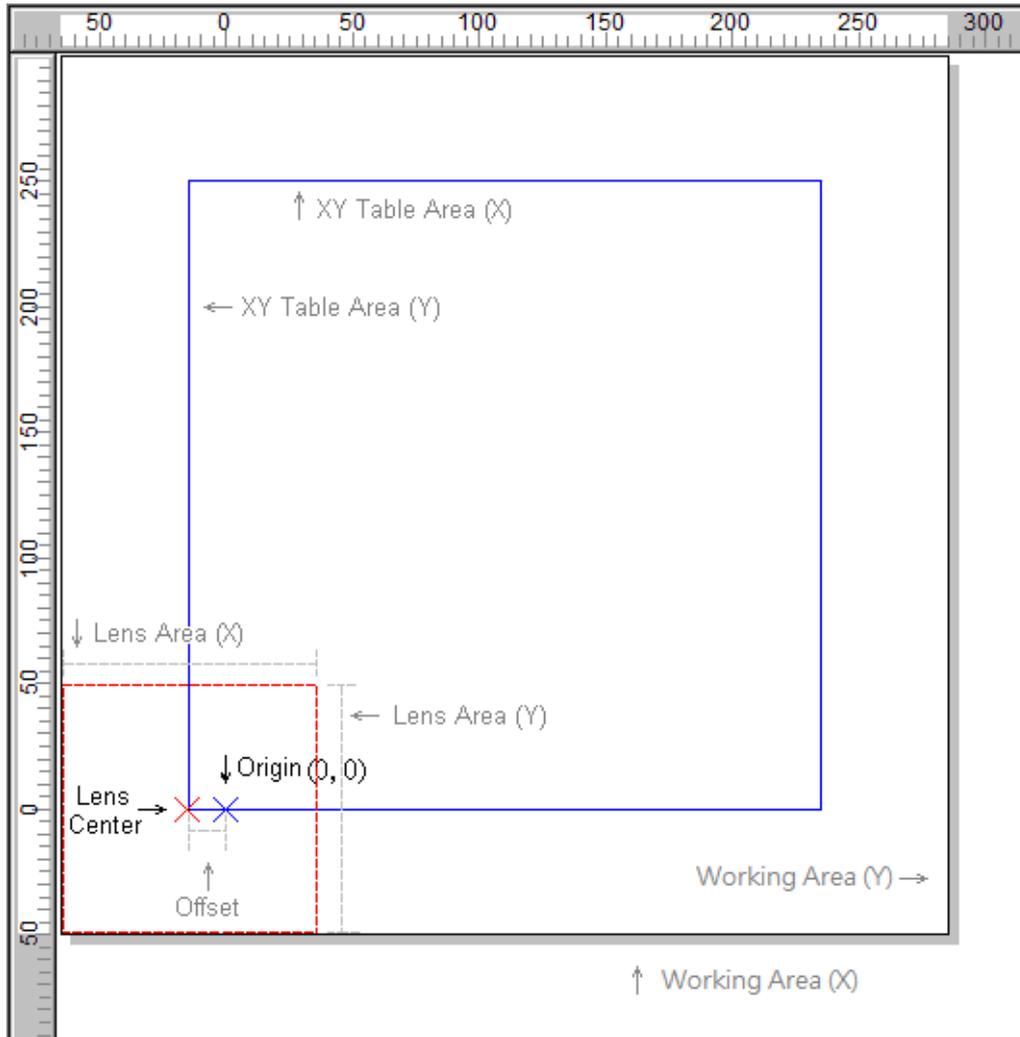
Fig. 9.06

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

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9.2 Manual Split

Allowed users to arrange bands position and marking order, which "**Manual Split Bar**" allowed users to adjust the tiling settings under "**Manual Split**" mode, see Fig.9.07.
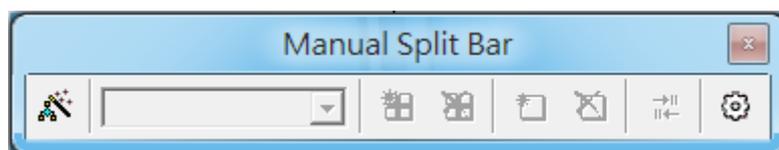
Fig. 9.07

Edit Split Bands		Enable or disable Manual Split Mode.
Select Current Layer	Layer-1	Select an editing layer.
Auto Create Bands		Build default bands at current layer.
Clear All Bands		Delete all bands at current layer.
Create A New Band		Create a new band.
Delete Bands		Delete selected band(s).
Order The Bands		Show the order of bands.
Tiling setting		Open Tiling Setting Dialog.

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After build a new band by "Auto Create Bands" or "Create A New Band", users could adjust band parameter from property page—band. See fig. 9.08
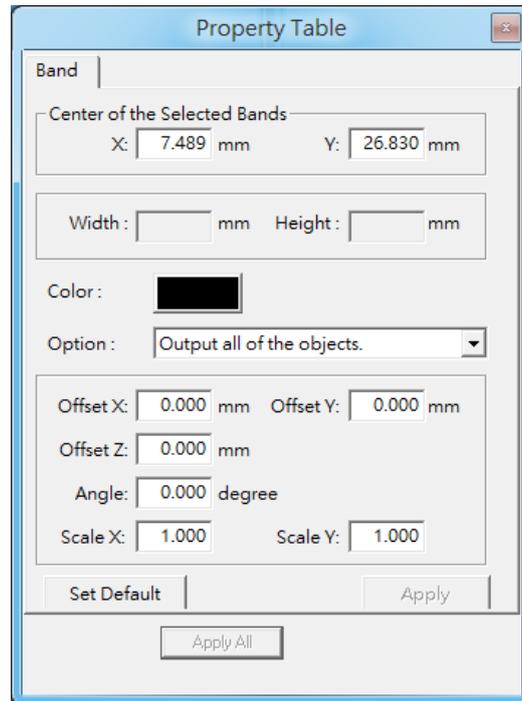
Fig. 9.08

Center of the selected band	The center of the selected band.
Width	Band width
Height	Band height.
Color	Band color.
Option	Output option.
Output complete objects only	Only output whole graphic located within this band.
Output all of the objects	Output all graphic located within this 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.

After complete bands arrangement, users may would like to use this one as template, which "**Split By Layer**" allowed you to do this. Refer to chapter 9.1 to enable this function.

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Enter manual split mode during enable "Split By Layer" will allow you choose a template from property page—Template. See fig 9.09. To use a template:

1. Select a layer from manual split bar.
2. Pick up a template from Template property page.
3. Click "Apply".

Fig. 9.09

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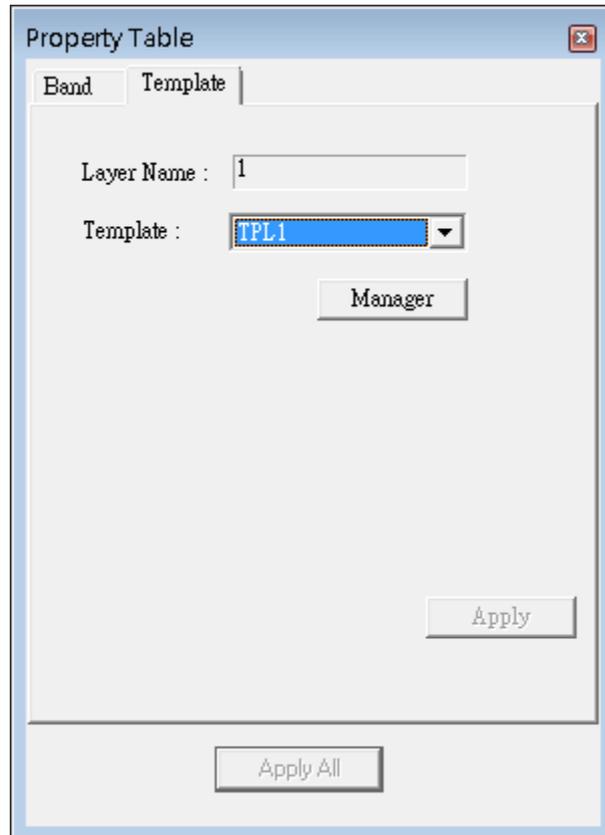
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Users could use template manager to manage templates. See fig 9.10.

New   Create a new template.

Delete Delete a choosen template. A using template couldn`t be deleted.

Rename Rename a choosen template.

Fig. 9.10

Practical Functions
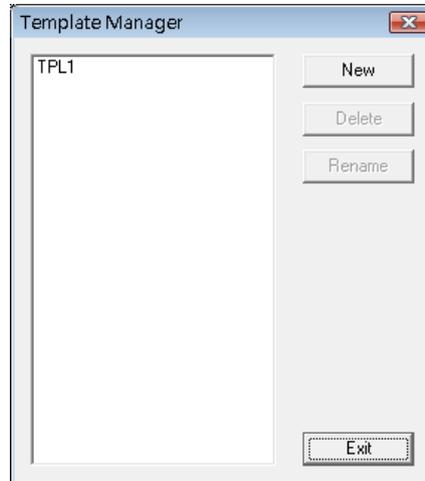
10.Auto Text

To apply Auto Text, users first need to create a text object. After that, go to「**Property Table**」→「**Text**」and enable Auto Text, see Fig.10.01. Then a Auto Text setting page will pop up for users to select mode and do another setting, see Fig.10.02.
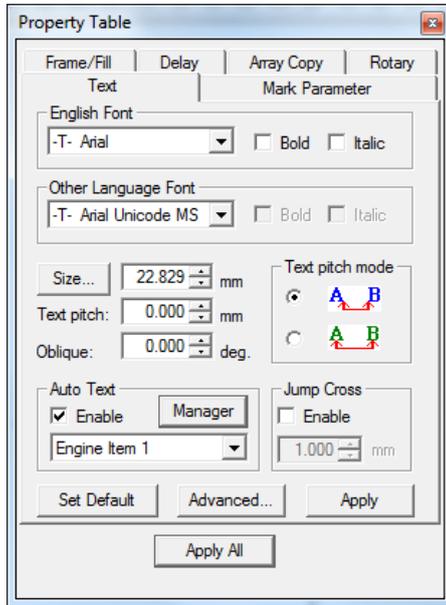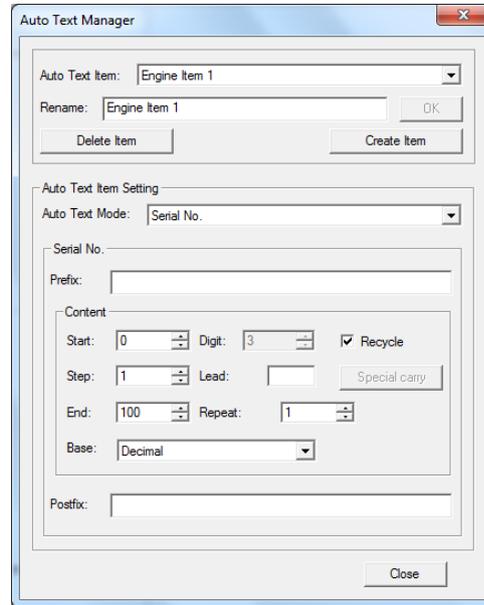
Fig. 10.01   Fig. 10.02

Auto Text Item

The default Auto Text Item is named: "Engine Item 1".Users can change the name in the field of "Rename" and click "OK" button. If click "Create Item" button, then the second Auto Text Itemwill be created. "Delete Item" button allows users to delete the selected item.

Auto Text Item Setting

The system provides several modes of Auto Text such as: "Serial No.", "File", "Keyboard", "Date", "Com Port","Serial No. Advance" and "Excel" for users to use.Please refer to the following descriptions for more details.

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10.1 Auto Text — Serial No.

The text content will be an accumulation serial number which depends on the users' setting.Auto Text has three parts to set, which are "Prefix", "Content", and "Postfix", see Fig.10.02.

Prefix	Set a specificconstant string at the beginning of the Auto Text. This can be blank.
Postfix	Set a specificconstant string at the ending of the Auto Text.This can be blank.

Content

Start	The initialserial number. If "Auto-recycled" has been checked, the serial number will repeat from this number when reach the end number.
Step	The accumulation value.
End	The end number.
Digit	The total digit of serial number. 0 means no limitation.
Lead	Fill up characters. For example, if the digit value is 4andleadvalue is 0, then 1 would be displayedas 0001.
Repeat	The repeatedmarking amount for each number.
Recycle	The system will repeat marking automatically from the start number when finishing marking the end number.
Base	The default setting is Decimal system. Users can select another method. If choosing"Special Carry," a setting dialog will pop up for users to modify, see Fig.10.03.

Example

If the settings are"Start: 0, Step: 1, End: 100, Repeat: 1, Base: Decimal, Digit: 3, Lead: 0, and checked the Recyclecheckbox", the marking result will be 000, 001, 002, 003, 004,……099, 100, 000, 001, 002….

Fig. 10.03

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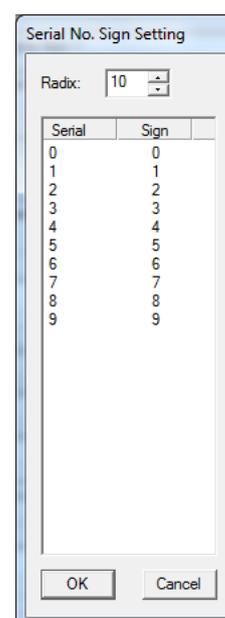
10.2 Auto Text — File

Allow users to import notepad file (*.txt) as the content of Auto Text, see Fig.10.04.
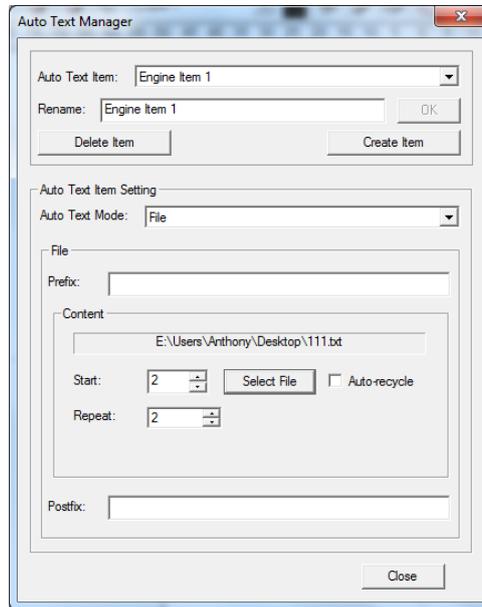
Fig. 10.04

Content

Select File	Select the file users want to use as the content of Auto Text.
Start	Decide the which row of the file will be marked as the first content.
Repeat	The marking times of each row.

Example

If the content of the file is like Fig.10.05, and the value of Start and Repeat are both 2, then the marking result will be 222, 222, 333, 333…999,999.

Fig. 10.05

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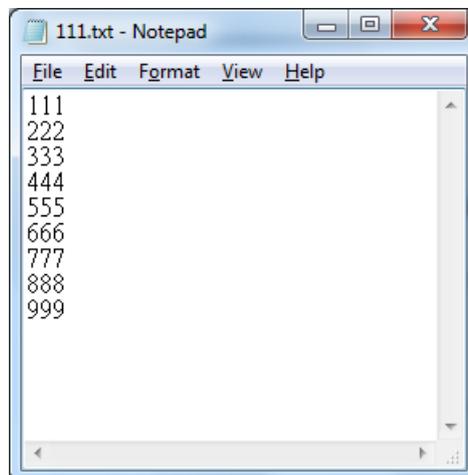
10.3 Auto Text — Keyboard

Users can input the text content through external keyboard such as keyboard or Barcode Reader by applying this option, see Fig.10.06.
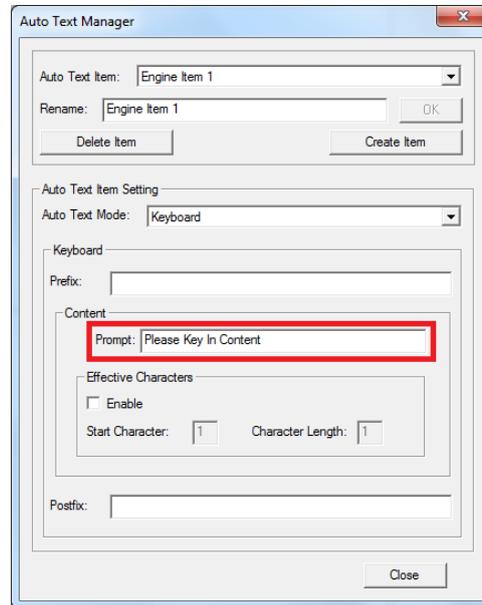
Fig. 10.06

Content

Prompt

Under this mode, when users try to execute marking, a dialog box will pop up for users to key in the text content. Prompt allows users to name the title of this dialog box, see Fig.10.07.
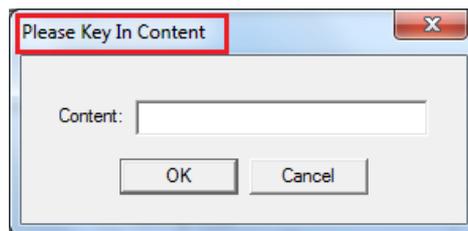
Fig. 10.07

Effective Characters

Enable

Users can set the start character and character length of the input content.

For example

If the"Start Character"is 3; the "Character Length"is 2, and the content of the input text is "ABCDE", then themarking result will be "CD".

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10.4 Auto Text— Date

Allow users to use date as the content of Auto Text, see Fig.10.08.

Content

Users can decide the form and format of date from here.The following descriptions are the meanings of each format.

%Y   Year

%M   Month(number)

%B   Month(English)

%b   Month(abbr.)

%?M   Month(assign)

%?W   Week(assign)

%D   Day

%J   Solar Day

%H   Hour(24-hours)

%-H   Hour(12-hours)

%N   Minute

%A   AM or PM

%S   Second

%W   Week(English)

%w   Week(abbr.)

%U   Current Week Number

Fig. 10.08

Note

"%?M" is filled in the Auto Text by the system according to the file "**MON.txt**" which is under"**MarkingMate Insatllation Folder (for example: C:\Program Files\MarkingMate)\DATA.**

The first line in the file represents the content of January; while the second line represents the content of February, and so on. The system will automatically ignore the contents which are listed after the twelfth line.

Each line can only contain 18 characters at most (a Chinese character or holomorphy characteris regarding as 2 characters). An unexpected error will occur if there have more than 18 characters in one line .

If the amount of lines in the fileare less than 12, the system will replace the lacking part of content by the string of "FMonth".

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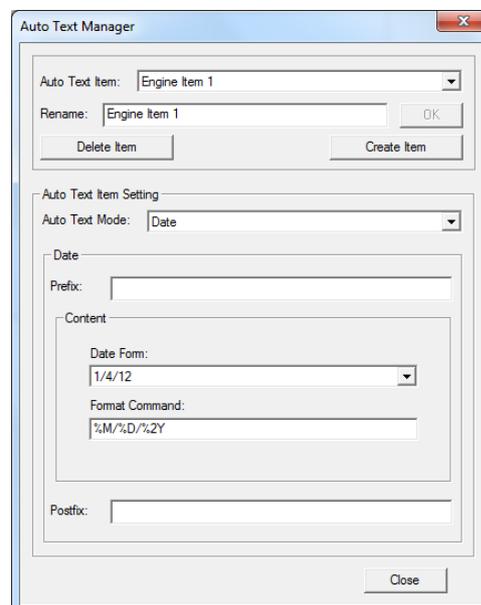
"%?W" is filled in the Auto Text by the system according to the file "**Week.txt**" which is under"**MarkingMate Insatllation Folder (for example: C:\Program Files\MarkingMate)\DATA.**

The first line in the file represents the content of 1st week; while the second line represents the content of 2nd week, and so on. The system will automatically ignore the contents which are listed after the twelfth line.

Each line can only contain 18 characters at most (a Chinese character or holomorphy characteris regarding as 2 characters). An unexpected error will occur if there have more than 18 characters in one line .

If the amount of lines in the fileare less than 52, the system will replace the lacking part of content by the string of "FWeek".

10.5 Auto Text —ComPort

Users can transmit the Auto Text content through communication port by using this option, see Fig.10.09.
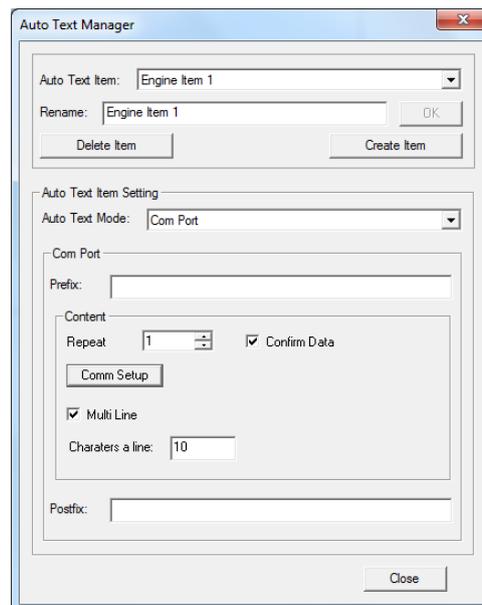
Fig. 10.09

Content

    Repeat

Set the repeated marking times for each data.

    Confirm Data

Under Com Port Auto Text mode, a status dialog box will pop up when users execute marking. If **Confirm Data** is been checked, this dialog box will show the text content users input while receiving data and users need to click "**OK**" to execute marking, see Fig.10.10. If users do not check this option, the system

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will start to mark automatically after receive data, which means users no need to click "**OK**," see Fig.10.11.
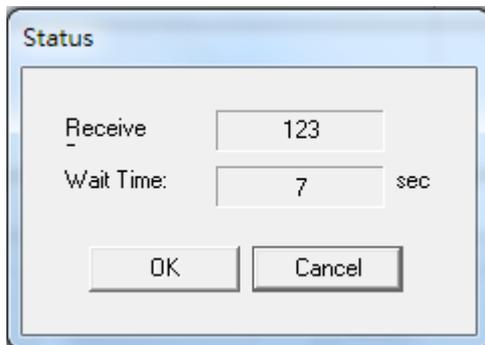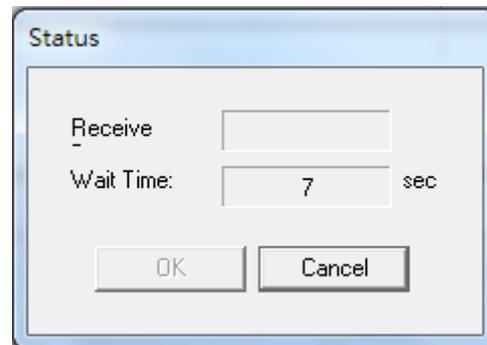
| Fig. 10.10 | Fig. 10.11 |

Comm Setup

In order to make "Auto Text—Com Port" working, users need to enable com port setting first. To do com port settings, please click "Comm Setup" button to enter "CommPort Setting" page. Users can also enter this page from「**File**」→「**Option**」→「**System**」→「**Commport Setting**」, see Fig.10.12.
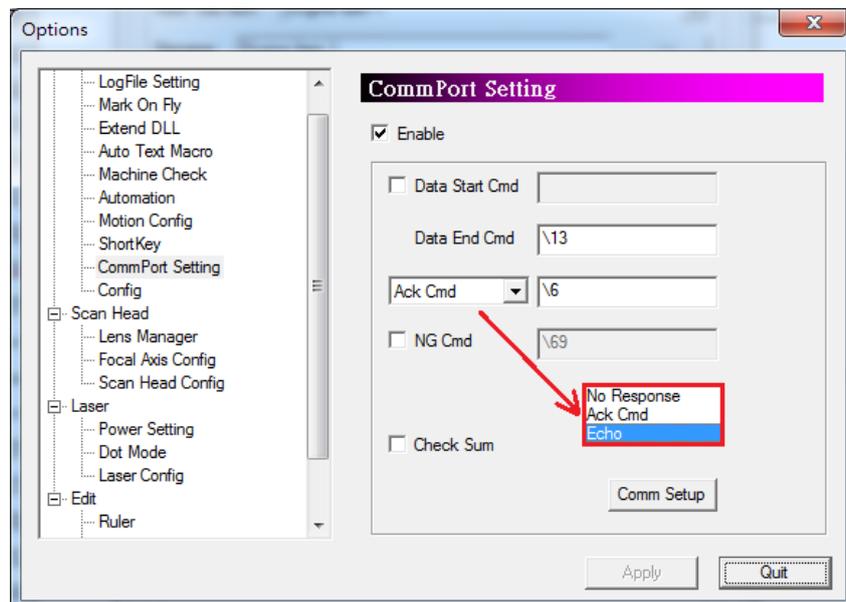
Fig. 10.12

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

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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.10.13.
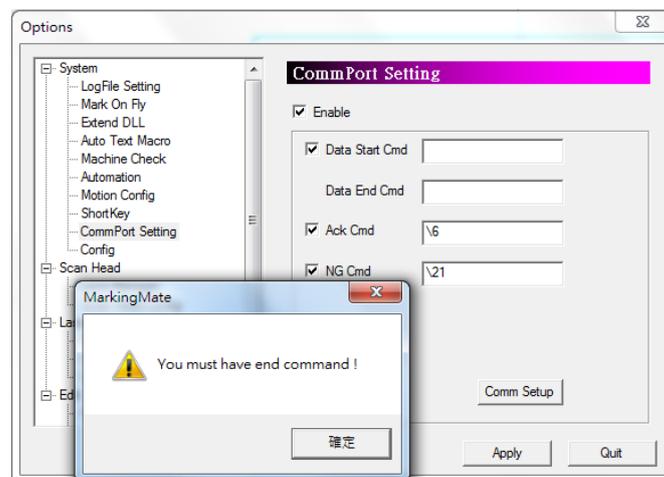
Fig. 10.13

NoResponse

No any reply after receiving "Data End Cmd" and "Check Sum"(if
checked).

AckCmd

Setting this parameter, the software will transmit this value to the host to
report the transmission is regular after system receives the value of "Data
End Cmd" and "Check Sum" and confirms that both values are correct.
Default value is \6.

Echo

Setting this parameter, the software will transmit "Data Start Cmd (if
checked) + transmitted data from host + Data End Cmd + Check Sum (if
checked)" to the host to report the 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.

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.10.14.

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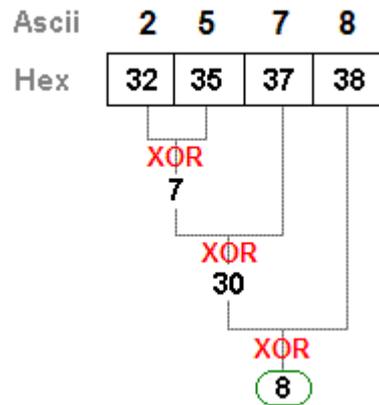
Fig. 10.14

CommSetup

Another dialog box will appear for users to select using Com Port or TCP/IP and do further settings when clicking this button.

COM1 ~ COM8

If select any port from COM1 to COM8, it means the content of Auto Text will be transmited via RS-232,see Fig.10.15.
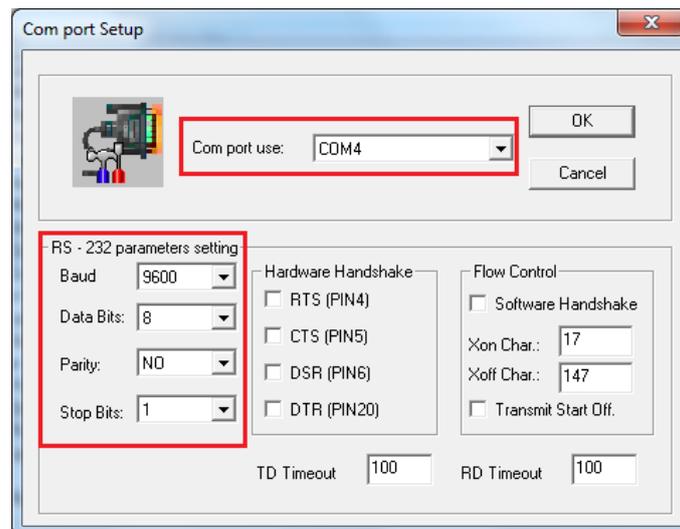
Fig. 10.15

Com Port Use

Choose the proper Com Port according to the computer device.

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 flame of Fig.10.15 if not necessary.

TD/RD Timeout

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This function is available only when "NG Cmd" is active. After receiving data, the system will wait for the time setting here to receive "Data End Cmd" and then do the next step.If "Data End Cmd" is not been received, the system will send a "NG Cmd" and clear all received data.

TCP/IP:

If select TCP/IP port, it means the data of Auto Text will be transmitedviaTCP/IP, see Fig.10.16. Please input the IP address of the remote host.The port number must be the same as the remote host and users also need to select "CLIENT" here.
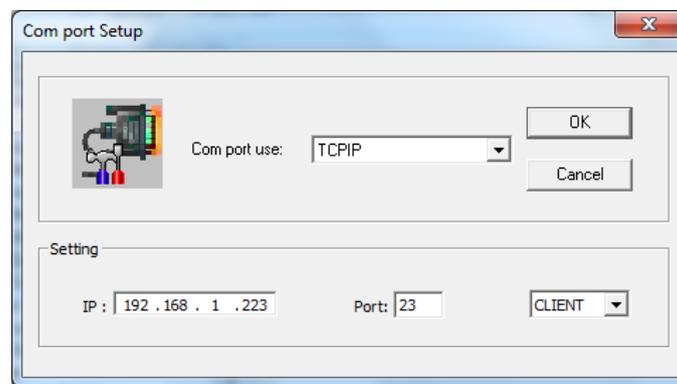
Fig. 10.16

Note

When entering the marking dialog box, the system will connect with the remote host at the same time. Therefore, users must enable the service of remote host before that. Otherwise, the connection between two systems will fail and the marking job will terminate.

Multi Line

Set the amount of character for one line. If exceed this value, the system will automatically do the line feed.

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10.6 Auto Text — Serial No. Advance

If usershave further requirements for Serial Nunber, they can use "Serial No. Advance," see Fig.10.17. Some settings here are the same as "Serial No.," in this case, this section only introduce the different parts.
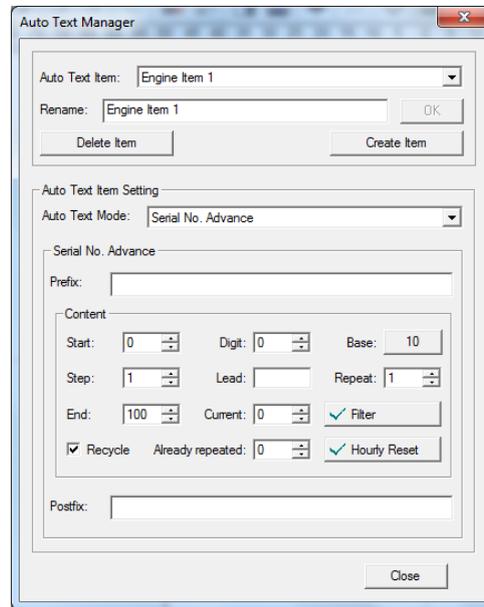
Fig. 10.17

Content

    Current

    This value can be any number which is between "Start" and "End" number. When users execute marking, the system will mark this valur first rather than the "Start" number.

    Already repeated

    The current repeat marking times of current number.

    For example

    Suppose that Start: 0, Step: 1, End: 9, Current: 7, Repeat: 3, Already repeated: 2, and check "Recycle", then the mark result will be "7, 8, 8, 8, 9, 9, 9, 0, 0, 0, 1, 1, 1, 2, 2, 2…"

    Hourly Reset

    The serial number will be reset as the Start number on the hour if enable this function.

    Filter

    If users do not want to mark certain number, they can use this function. When clicking "Filter" button, an edit window like Fig.10.18 will pop up for users to input the filter rule.

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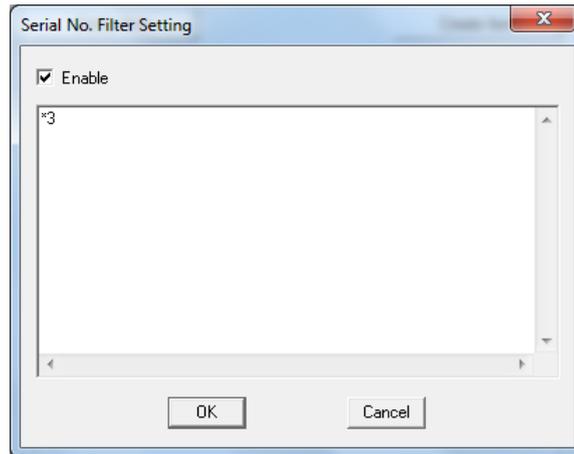
Fig. 10.18

Filter Rule
- If uesers want to filter just one assigned number, for example, 4, then just input "4" in the edit area, and the mark result will be 0, 1, 2, 3, 5, 6…, 12, 13, 14, 15…
- If users want to filter any units digit, for example, 4, then input "*4" in the edit area, and the mark result will be 0, 1, 2, 3, 5, 6…, 12, 13, 15, 16…, 22, 23, 25…
- If users want to filter the first number of the string, for example, 1, then input "*1" in the edit area, and the mark result will be 0, 2, 3, 4,…, 9, 20, 21, 22, 98, 99, 200, 201…
- If users want to filter every certain unmber of assigned digit of the string, for example, every hunderds digit 7 of a five-figure serial number, then input "**7**" in the edit area, and the mark result will be 0, 1, 2, 3, 4, 5, 6, 7, 8…, 69, 70, 71…698, 699, 800, 801, 1698, 1699, 1800, 1801…
- Suppose that users want to filter every string which Start value is 2; End value is 8 and the hundreds digit is 5, they should input "2*5*8" in the edit area, and then each serial number which Start value is 2; End value is 8 and the hundreds digit is 5 will not be marked, for example, 2508, 2518, 20528, 210538… and so on.
- If users want to filter the serial numbers which include a specific number, for example, 8, then all the serial numbers with "8" will not be marked and the filter rule are listed below (take four-figure for example):
  *8
  8
  *8**
  8*

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10.7 Auto Text — Excel

Users can import an excel file as the content of Auto Text, see Fig.10.19.
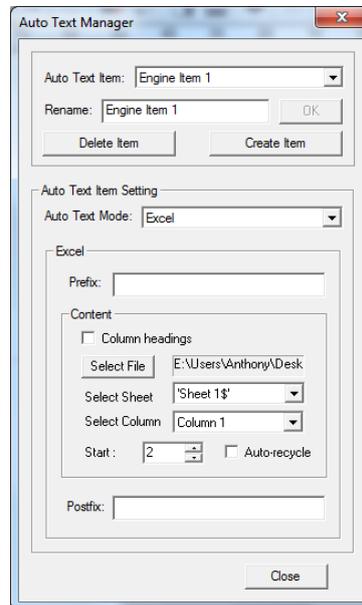
Fig. 10.19

Content

Column headings

If this option has been checked, then the "**Select Column**" will display the heading of the selected column. Otherwise, it will only show the column's number.

Select File

Select the excel file users want to import.

Select Sheet

Select which sheet users want to mark.

Select Column

Select which column users want to mark.

Start

System will start marking the content from the setting row.

If content of excel file at first column is all digits, such as 123, 234, the marking result will be 123.000000, 234.000000.

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10.8 Auto Text — External

Users can set text content. What`s different to normal text object is if used frequently to multiple position, users just need to change one time for changing all content,which is allowed to save massive time. See Fig.10.20.
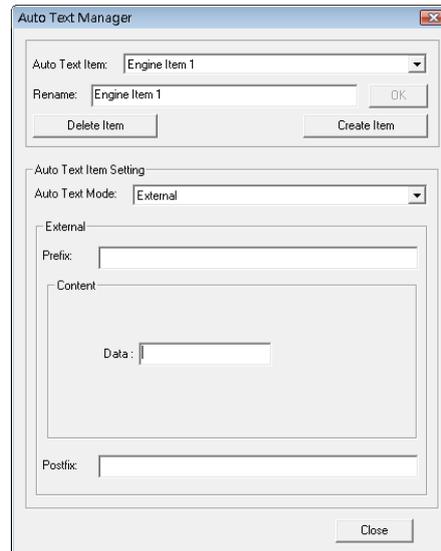
Fig. 10.20

Content

 Data

 Enter text content.

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10.9 Multi Auto Text Setting

If users want to use two or more same or different Auto Text in one text object (take serial number and date for example), please refer to the following steps.

Step 1

Create a text object and then go to「**Property Table－Text**」, then check "**Enable**" from "**Auto Text**," like Fig.10.21, and the "**Auto Text Manager**" will pop up.
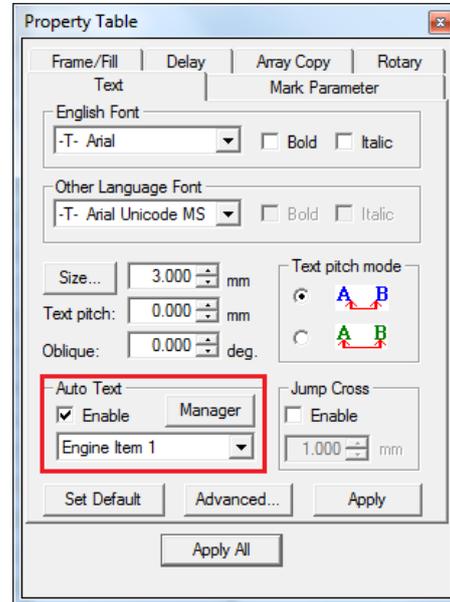
Fig. 10.21

Step 2

Set the mode of the first **Auto Text Item** (for example, **Engine Item 1**) as "**Serial No.**," see Fig.10.22. Then create a new item and set the mode as "**Date**" and click "**Close**" to do the next step.

Fig. 10.22

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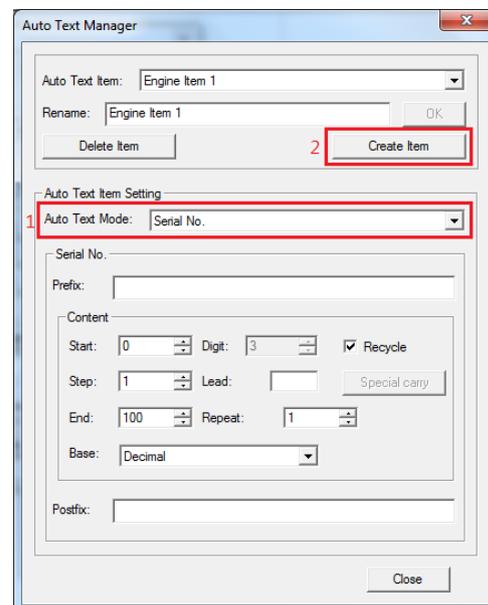
Step 3

Click "**Advanced**" from「**Property Table－Text**」to enter "**Text Advanced.**" Users can edit the text content at the blank area.

In this example, input "**No.:**" first (users can input any word they want or input nothing) and then click "**Insert auto text item**" to select "**Engine Item 1**."At this time, the blank area will be like "**No.:\[1]**."This is the first Auto Text object.
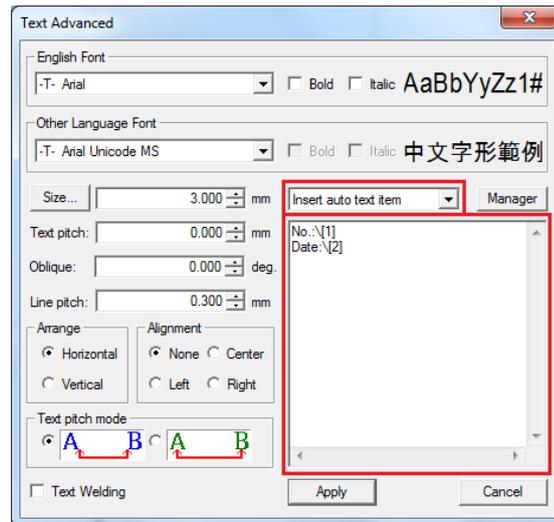
Fig. 10.23

If users wish the second text object and the first object are at the same row, then just input the content of object 2 from the end of object 1. If users want the second object is at the next row, just press "**Enter**" and then input the text content.

In this example, the second object is at the next row. After inputing the content, for example, "Date:," select "Engine Item 2" from "Insert auto text item" drop list. The blank area will display like Fig.10.23. Exit "Text Advanced" and the working area of software will be like Fig.10.24, and this means that users create two Auto Text successfully.

Fig. 10.24

Practical Functions
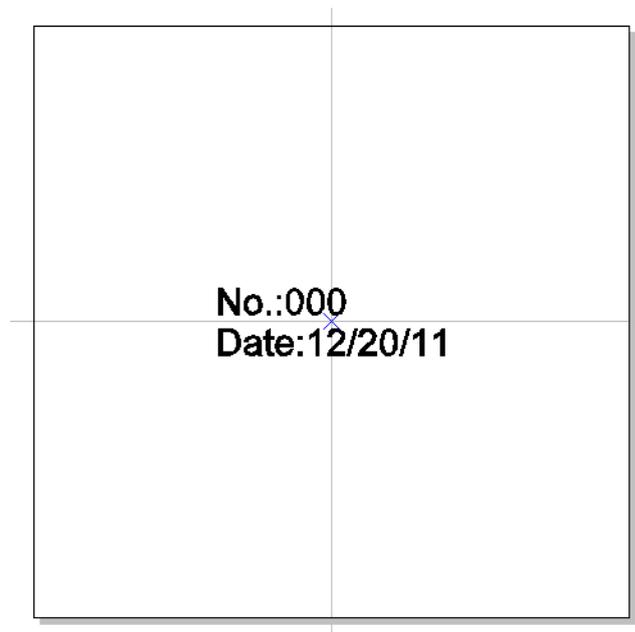
11. Automation

11.1 Automation and I/O

If users want to apply this system in automatic process, all they need to do is understanding how the system works with I/O signals and do the right setting.

11.1.1 Time Sequence Signal

Program Ready/Mark Ready

Program Ready and Mark Ready signals are programmable. System integrators are able to plan the signal as Program Ready or Mark Ready signal depending on their requirements.The setting method is to open "**Config.ini**" with notepad which is under the installation folder of **MarkingMate** and find the parameter "**PR2MR=0/1**." If the value is 0, it means enable **Program Ready**signal. If the value is 1, it means users are using **Mark Ready** signal.If users cannot find this parameter, they can add this parameter under the "**SignalRule**" tag by themselves.

If set as**Program Ready**, the signal will be "**OFF**" when powering up the computer, and will continuing be "**ON**" when executing the software until exiting the software. This signal is mainly planned to tell that the marking software is ready.

If set as **Mark Ready**, the signal will be "**ON**" when entering "**Mark**" dialog, and will turn to "**OFF**" if exiting the dialog.

Ready for Start Signal

Ready for Start signal was called "**Mark Ready**" before. This signal is initially set as "**OFF**".When entering "**Mark**" dialog, the system will wait for "**START**" signal, and the signal will become "**ON**"at this time. After receiving "**START**" signal, the system will start to mark, and this signal will change to "**OFF**". When finishing marking, the system will continue to wait for "**START**" signal, and the signal will become "**ON**" again.

If users add a control object "**DO PAUSE**" into the marking flow, this signal will also be "**ON**" and waiting for "**START**" signal when executing to "**DO PAUSE**" object.

Stop/Error

This signal is also programmable. Under**Normal Mode**, this signal can be planned

Practical Functions

as "**Stop**" signal, while in **Automation Mode**, it can be planned as "**Error**" signal. In **Normal Mode**, when users press "**STOP**" button to break down the marking process, the "**Ready for Start**" signal will be "**ON**" and wait for "**START**" signal to continue the marking process.

Under **Automation Mode**, once the program detecting the "**Error**" signal, the system willexit the "**Mark**" dialog, and the "**Mark Ready**" signal will become "**OFF**" as well as the "**Ready for Start**" and "**Marking End**" signals. Only whenthe breakdown hasbeen eliminated and re-enter the "**Mark**" dialogue, the "**Mark Ready**" and "**Ready for Start**" Signal will be changed to be "**ON**" again.

Mark End/Mark End Pulse

This signal is also programmable. The default setting is Mark End, which means Mark End Pulse Time= 0(this parameter can be changed in Config.ini.)

The signal will be "**OFF**" at the start when the parameter is set as **Mark End.**When the marking process finish,it will become "**ON**." The signal will be "**OFF**" again when the system receives "**START**" signal. If the system stop marking because of "**DO PAUSE**" (**Ready for Start**signal will be**ON** at this time), then even receive "**START**" signal again and continue marking process (**Ready for Start**signal will become**OFF**), the "**Marking End**" signal will stillbe "**OFF**" until the marking finished.

If set as **Mark End Pulse** signal (**Mark End Pulse Time**wasassigned as acertain value), it will be "**OFF**" at the beginning and will become "**ON**" when markingprocessfinish. However, the time this signal keeps "**ON**" isaccording to the value of **Mark End Pulse Time**.

Fig.11.1.01 and Fig.11.1.02 are the signal time sequence under **Normal Mode** and **Automation Mode**.

Practical Functions
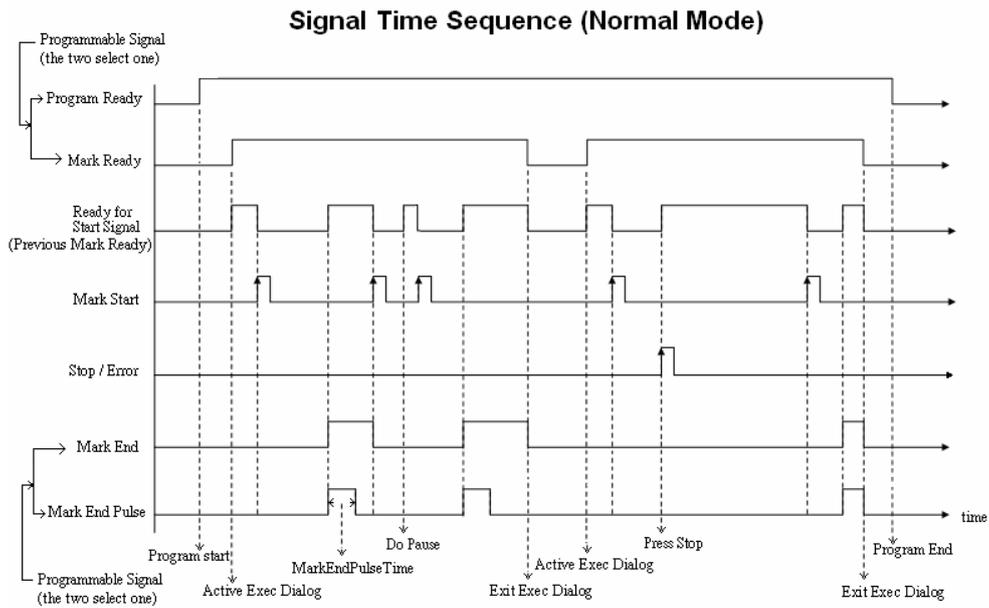
Fig. 11.1.01

Fig. 11.1.02

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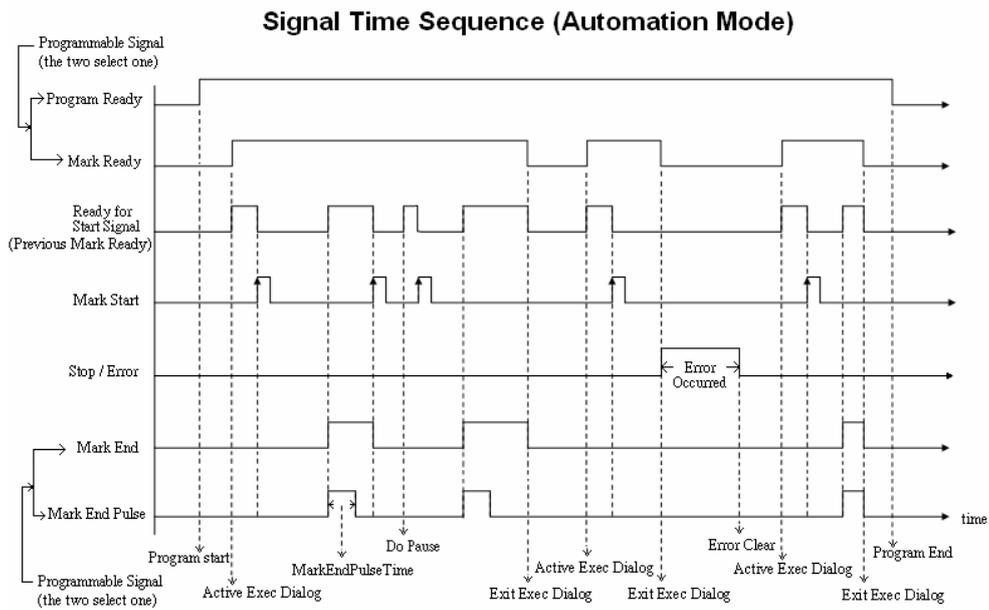
11.1.2 Machine Check Error Message Planning

Enable Machine Check function, users can edit some I/O signals and error messages to help themrealize what happen while mistakes took place.

1. **Activate**

   To activate **Machine Check** function, users need to open a file "**config.ini"**which is under the installation folder of **MarkingMate**(for example, **C:\Program Files (x86)\MarkingMate**) first and then change the value of parameter "**MachineChk=**" from "**0**" to "**1**." Otherwise, users can also enable this function by **MarkingMate** and the path is「**File**」→「**Option**」→「**System**」→「**Machine Check**」, see Fig.11.1.03.

   If users want to activate the error message, change the value of parameter "**MachineChk_ShowMessage=**" (which is also under the file "**config.ini**") from "**0**" to "**1**."
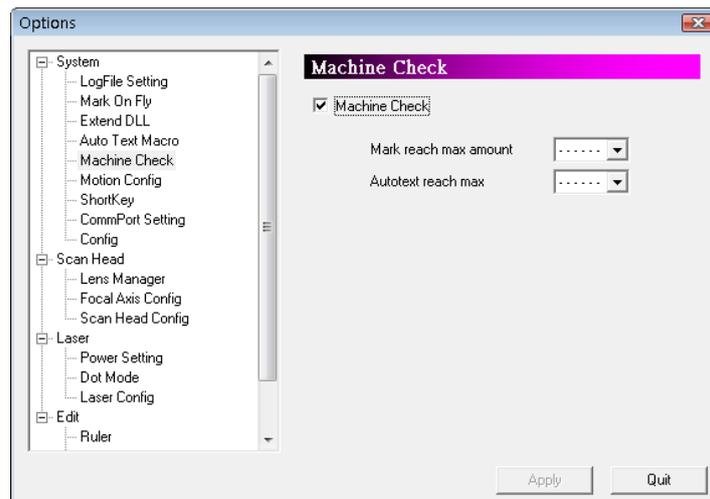
Fig. 11.1.03

| **Mark reach max amount** | Signal will be sent out while mark count reach target amount. |
| **Autotext reach max amount** | Signal will be sent out while serial number reach End value. |

2. **Edit Messages**

   To edit the erroe message, please open the file"**MachineChk.cfg**"which is also under the installation folder of **MarkingMate**(for example, **C:\Program Files (x86)\MarkingMate**). Table 11.1 is the description of the error message. Please note that this file is **not** under the folder of "**MachineChk**."

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Name	Setting method	Description
[I10]		From [I1] to [I16]. [I10] means the tenth input
	ENABLE=1	1 means open, 0 means close.
	LEVEL = 1	INPUT activated potential, 1 means activated when signal changed from 0 to 1, 0 means activated when signal changed from 1 to 0
	OUTLEVEL= 0	Output potential (0 or 1)
	OUT=3	Output number (0 means no output)
	MSG_EN=Error Message(001)\nX Scanner head failure\nResolve Method: Contact with us	Input the error message after "MSG_EN=" (\n means line feed)
	PRIORITY=6	Users can add several different messages for the same I/O; they will show in accordance with priority. Less number means higher priority. (from 0 to 15)
	QUITMARKING=1	Decide to exit Mark dialog or not. (1 means exit; 0 meants not)
[EMG_STOP]		Emergency Stop
	ENABLE=1	1 means open, 0 means close
	OUTLEVEL= 1	Output potential (0 or 1)
	MSG_EN=Error Message\nEmergency Stop!	Input the error message after "MSG=EN" (\n means line feed)
	PRIORITY=7	Less number means higher priority. (from 0 to 15)
	OUT=0	Output number (0 means no output)
	QUITMARKING=1	Decide to exit Mark dialog or not. (1 means exit; 0 meants not)
[GALVO_MOTOR_1]		First GALVO motor error, if the scanhead supports.
	ENABLE=1	1 means open, 0 means close
	MSG_FAIL_EN=X Galvo is unusual	Input the error message after "MSG_FAIL_EN=" (\n means line feed)

Practical Functions

	MSG_SUCC_EN=X Galvo is normal	Input the normal message after "MSG_SUCC_EN=" (\n means line feed)
	IN=9	Input number
	LEVEL=1	INPUT activated potential, 1 means activated when signal changed from 0 to 1, 0 means activated when signal changed from 1 to 0
	PRIORITY=10	Less number means higher priority. (from 0 to 15)
[GALVO_MOTOR_2]		Second GALVO motor error, if the scanhead supports
	ENABLE=1	1 means open, 0 means close
	MSG_FAIL_EN=Y Galvo is unusual	Input the error message after "MSG_FAIL_EN=" (\n means line feed)
	MSG_SUCC_EN=Y Galvo is normal	Input the normal message after "MSG_SUCC_EN=" (\n means line feed)
	IN=11	Input number
	LEVEL=1	INPUT activated potential, 1 means activated when signal changed from 0 to 1, 0 means activated when signal changed from 1 to 0
	PRIORITY=9	Less number means higher priority. (from 0 to 15)
[CONNECT]		Controller connect error, only MC1 Driver supports
	ENABLE=1	1 means open, 0 means close
	MSG_EN=Error Message\nController connect error\nResolve Method:\nStep 1: Make sure the USB connector is connected well.\n Step 2: Make sure the controller power is on and wired\n Step 3: See if the Emergency Stop is activated\n Step 4: Contact us if the above steps do not work.	Input the error message after "MSG_EN=" (\n means line feed)

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	OUT=9	Output number (0 means no output)
	PRIORITY=8	Less number means higher priority. (from 0 to 15)
	OUTLEVEL= 1	Output potential (0 or 1)
	QUITMARKING=1	Decide to exit Mark dialog or not. (1 means exit; 0 meants not)

Table 11.1

11.2 Control Object

The Control Object Tool Bar allows user to insert control objects, see Fig.11.2.01.

Fig. 11.2.01

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

Practical Functions

11.2.1 Digital In

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.11.2.02. 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.
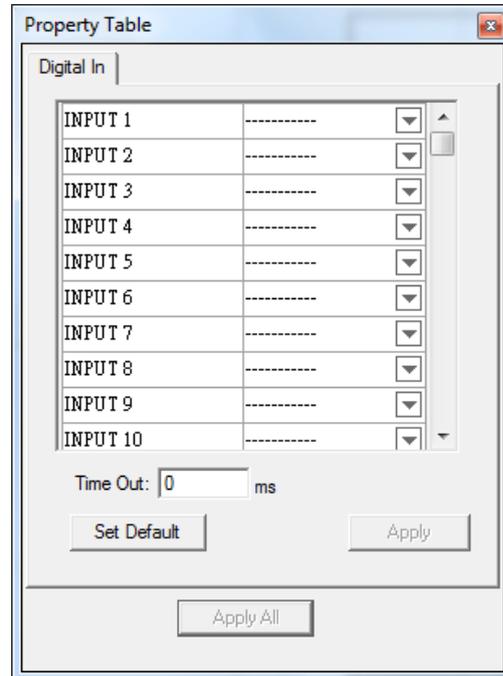
Fig. 11.2.02

11.2.2 Digital Out

OUT **Digital_Out**

Set the output potential signal (high or low) at OUT 1~8, see Fig.11.2.03. 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. 11.2.03

Practical Functions
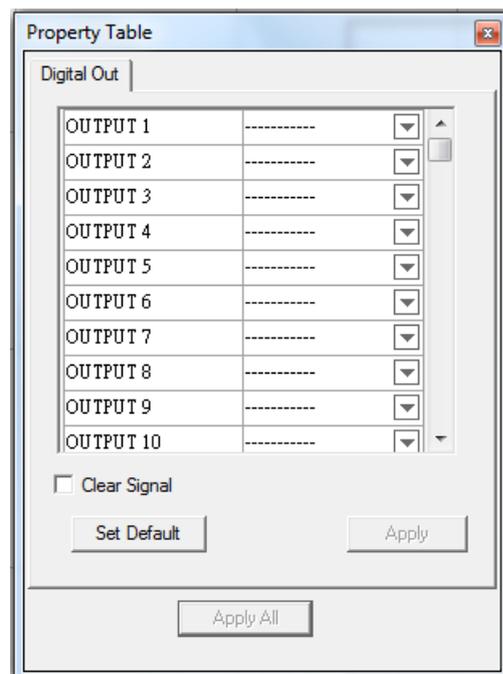
11.2.3 DoPause

▋▋ Do Pause

Stop marking and wait for the Start signal.

11.2.4 Delay Time

🕐 Delay_Time

Suppose a mark process order is "Object A→Delay Time Object→ObjectB." 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.11.2.04.
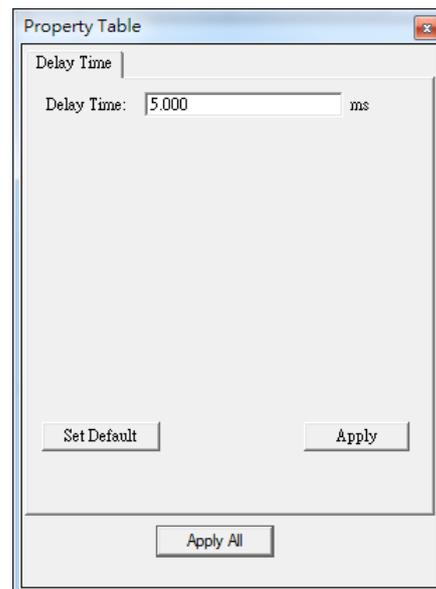
Fig. 11.2.04

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11.2.5 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.11.2.05.

Relative

If check the box, the assigned position will be considered as a relative position, otherwise, it will be considered as an absolute position.
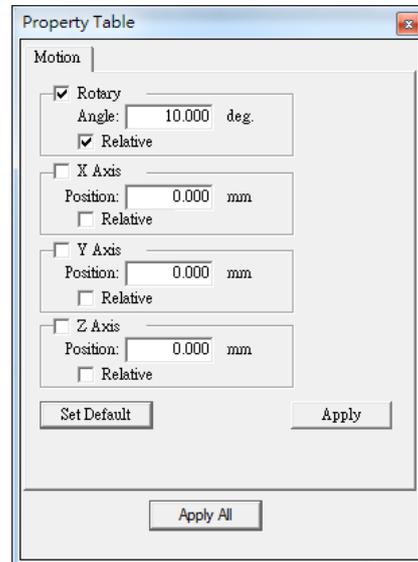
Fig. 11.2.05

11.2.6 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.11.2.06.
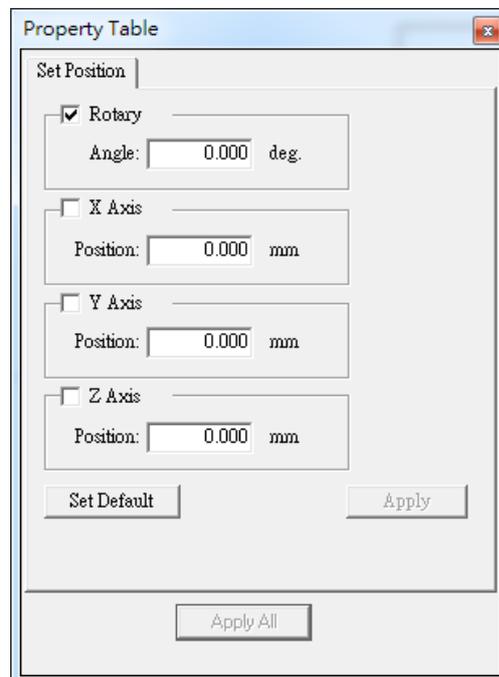
Fig. 11.2.06

Practical Functions

11.2.7 Loop

 Loop

"Loop" is used to mark the selected objects repeatedly. Users can set the repeated time at Loop Property Table, see Fig.11.2.07. When insert this object, users will see two sub-objects (Loop Begin and Loop End) in the Object Browser and then drag the objects users want to repeated mark into the loop, like Fig.11.2.08.
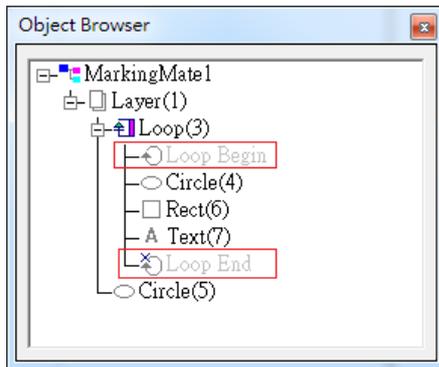
Fig. 11.2.08
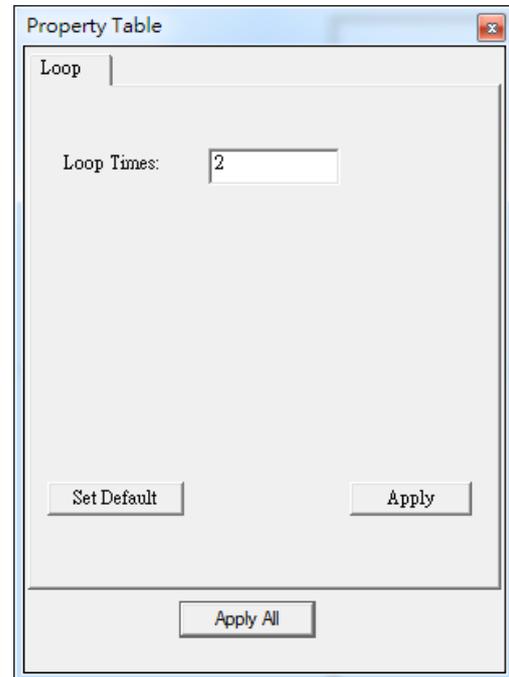
Fig. 11.2.07

11.2.8 Ring

 Ring

"Ring" object must be used accompanied with rotary axis.

When the mark process execute to "Ring" object, the Galvo will move to the X/Y position users set at Property Table (see Fig.11.2.09) first and the laser will strat 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. 11.2.09

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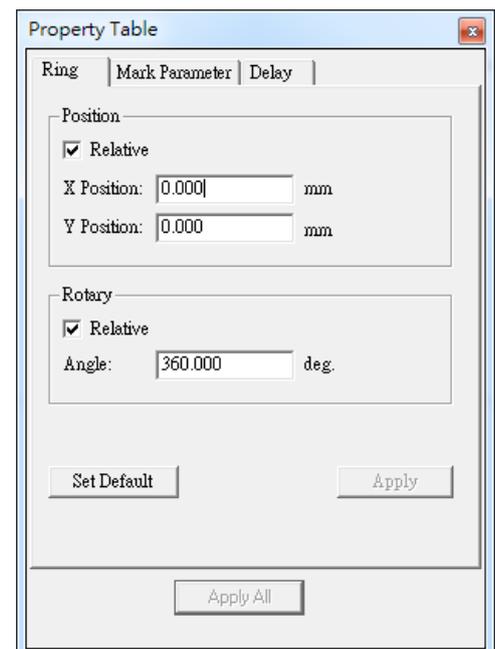
11.2.9 Homing

 Homing

When the mark process execute to
"Home" object, the axis users select at
Property Table (see Fig.11.2.10) will go
back to origin.

Fig. 11.2.10

Practical Functions
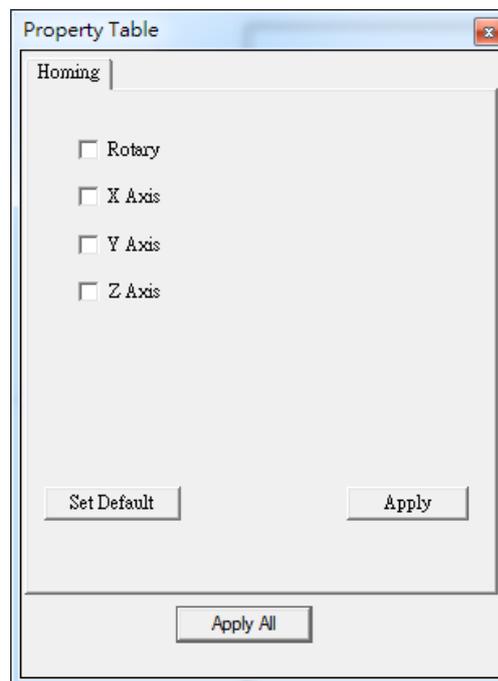
12. Make Font Description

12.1 Execute Make Font Function

To Execute Make Font function, please refer to the following step.

Step 1

Select Make Font Bar from View Manu, see Fig.12.01, and Make Font Bar will pop up like Fig.12.02.
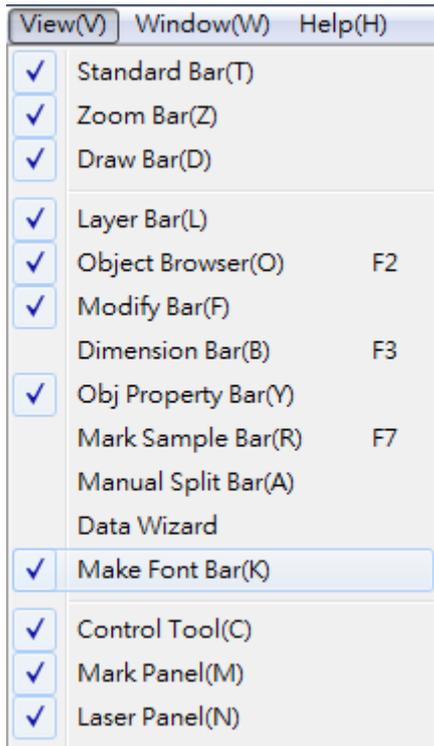
<div style="display:flex; justify-content:space-between;">
Fig. 12.01
Fig. 12.02
</div>

Step 2

Click [icon] and enter make font mode, like Fig.12.03. The make font property page will also be displayed at property page, like Fig.12.04.

Fig. 12.03

Fig. 12.04

Practical Functions
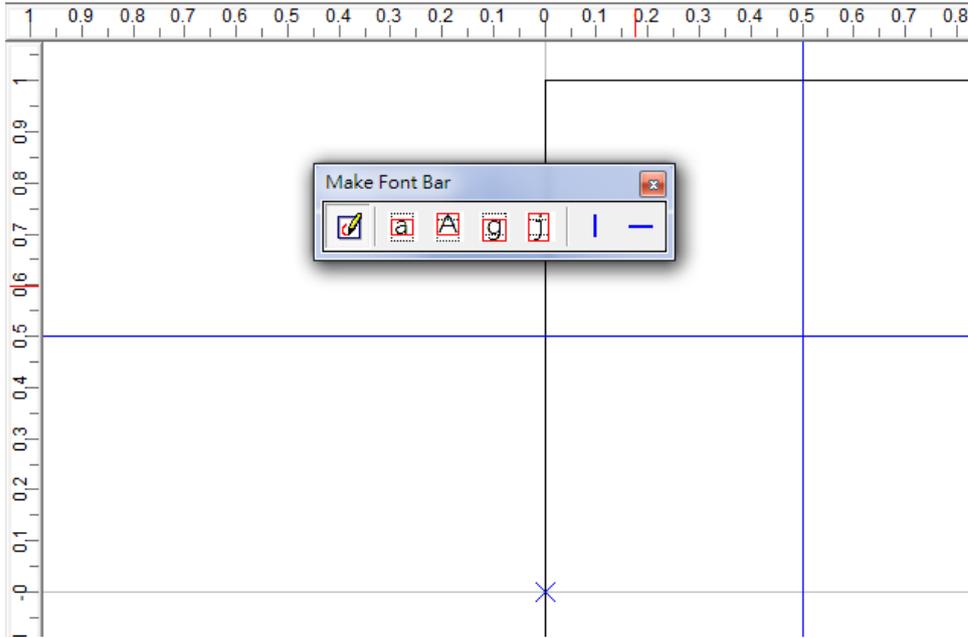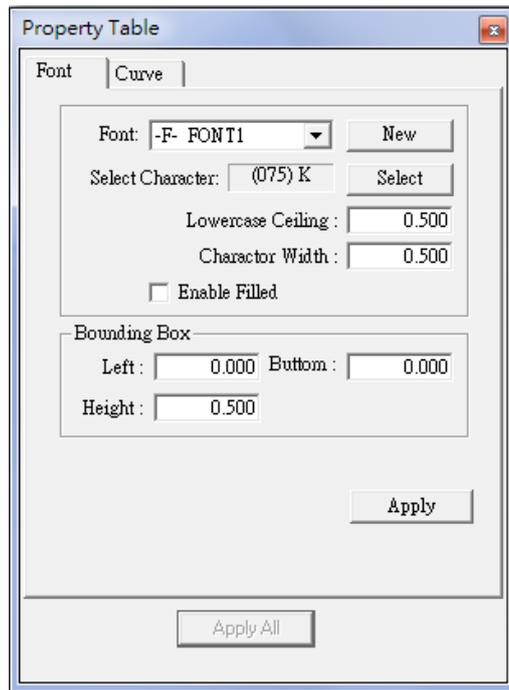
12.2 Parameter Description

The following stayements are the description of Make Font parameters.

Make Font Property Page

Font	Select the font users want to use or create a new font.
Select Character	Select the character users want to edit.
Lowercase Ceiling	Set the upper boundary when select a lowercase character.
Character Width	Set the maximum character width (right boundary). If the right side of the character exceeds this value, then this character will overlap with other ones.
Enable Filled Bounding Box	Decide to fill the character or not when marking.
Left	Set the distance between the character and the left boundary.
Bottom	Set the distance between the character and the bottom boundary.
Height	Set the font size.

Make Font Tool Bar

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

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12.3 Operating Method

Select the font and character first when entering make font mode, see Fig.12.05. After this, users can use drawing objects or adjust the parameters under property page to edit the character, see Fig.12.06.

Fig. 12.05

Practical Functions

Fig. 12.06

Practical Functions
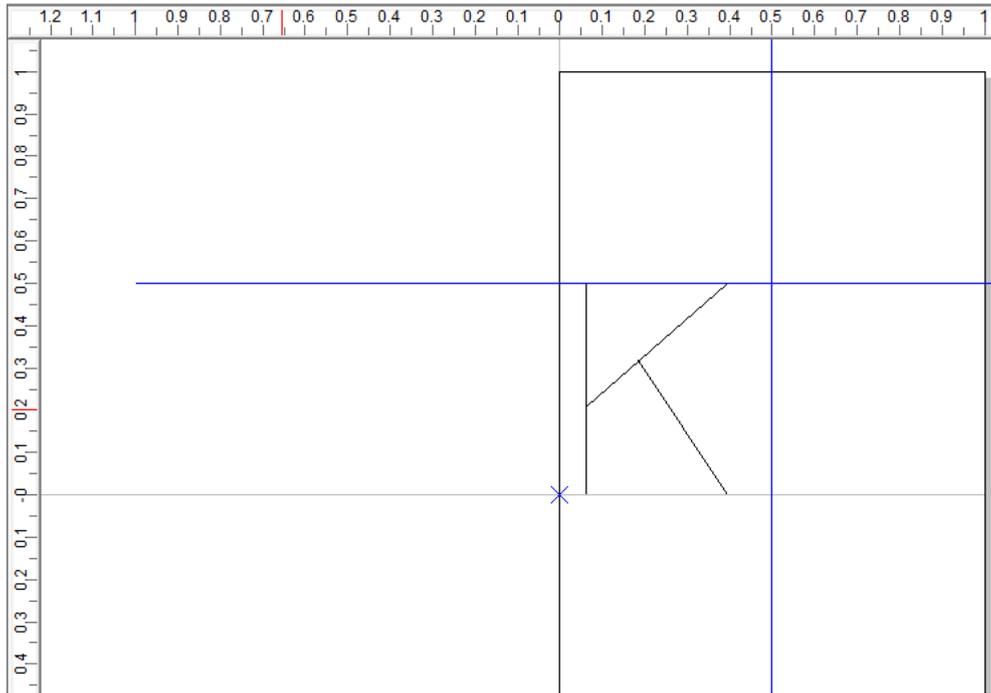
13. Remote Control

User could use remote control function to make local host editing graphic or marking by remote command.Provided since MarkingMate 2.7A-15.4 or above.

13.1 Operation

13.1.1 Click on [icon] within [toolbar icons] to enable remote control function.
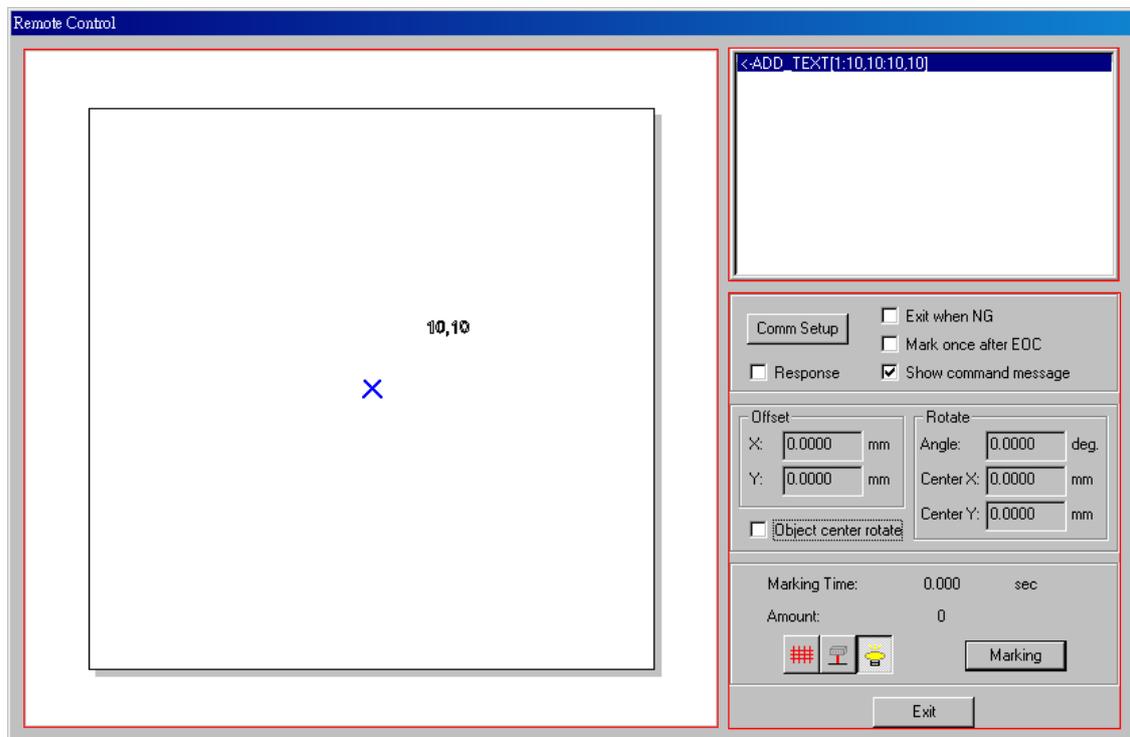
13.1.2 Remote control window looks like the picture above. Following will introduce each sector within the red frames.

Preview Window	Reveal current marking content.
Comm. status window	Until know received or sent commands or information.
Control panel	For setting communication port or revealing current marking status.
Comm. Setting	Click to bring up "Comm port Setting"window.
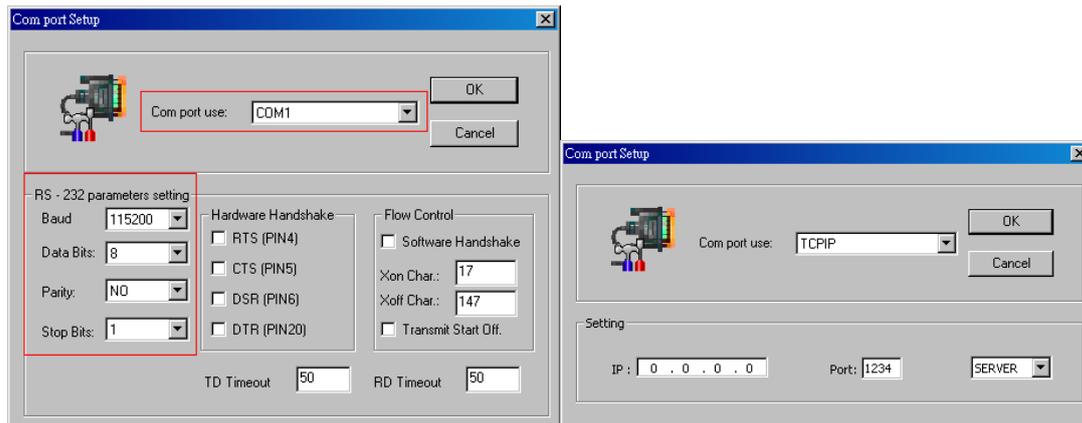
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Com port use	User could choose transfer remote control command through Com Port or TCP/IP. Choose COM1~COM8 to use Com Port, choose TCPIP to use TCP/IP.
a.Use Com Port	For RS-232 communication port setting please do the same setting as the information transmission source. Please do not change the parameters within the red frame if not necessary.
b.Use TCP/IP	Fill the IP address of the remote host. The port number must be the same as the remote host. Besides, mode must set as "SERVER".
Response	Setting if system will send response message to remote host. The message it return will be original command. NG message will still be sent to remote host even if this option is unchecked.
Exit when NG	Exit remote control while NG is occurred. NG message will still be sent to remote host even if this option is checked.
Mark once after EOC	Mark instantly after receiving E[] instead of waiting for END[].
Show command message	Reveal received command on communication status window.

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Offset	Show the global offset.
Rotate	Show the global rotate.
Object center rotate	Rotate center set as bounding box center.
Marking time	Same as marking dialog.
Amount	Same as marking dialog.
Align	Same as marking dialog.
Shutter	Same as marking dialog.
Lamp	Same as marking dialog.
Marking	Same as marking dialog.
Exit	Close remote control function.

13.2 **Control flow chart**

Remote

Remote host

1. Send command.

(For example:

FILE[C:\1.ezm] CR LF)

Local

2. Return NG message.

(For example: NG[001]

CR LF , which 001 means

couldn`t find file.)

Fail

(Couldn`t find file!)

Parse command

Succeed

(File opened!)

3. Return original

command

(For example:

FILE[C:\1.ezm]

CR LF).

Is "Response"

checked?   Yes

Execute command.

(For example: Open file.)

Practical Functions
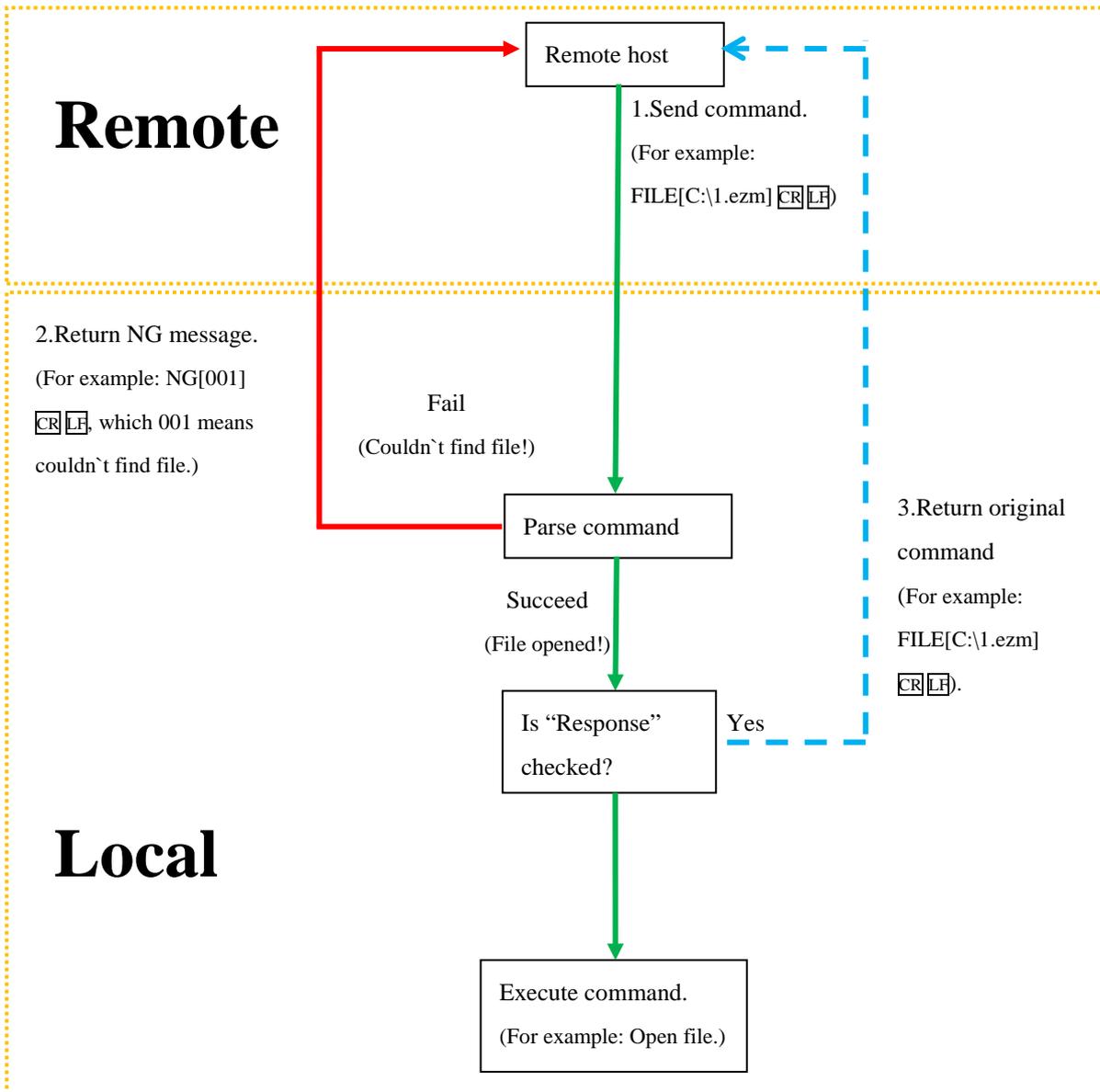
13.3Command List

File Operation	
FILE	Open EZM File
Add Object	
ADD_RECT	Create rectangle object(Version 2.7A-23.8 or above)
ADD_CIRCLE	Create circle object(Version 2.7A-23.8 or above)
ADD_1DBC	Create 1D Barcode object(Version 2.7A-23.10 or above)
ADD_2DBC	Create 2D Barcode object(Version 2.7A-23.10 or above)
ADD_CURVE	Create curve object(Version 2.7A-23.8 or above)
ADD_DOT	Create dot object(Version 2.7A-23.8 or above)
ADD_IMAGE	Create image object(Version 2.7A-23.10 or above)
ADD_TEXT	Create text object(Version 2.7A-23.8 or above)
ADD_ARCTEXT	Create arctext object(Version 2.7A-23.8 or above)
Delete Object	
DEL_OBJ	Delete object(Version 2.7A-23.8 or above)
Global Setting	
G_START_DELAY	Set all objects start delay
G_MARK_SPEED	Set all objects mark speed
G_MARK_POWER	Set all objects mark power(Version 2.7A-23.14 or above)
G_FILL_PITCH	Set all objects fill pitch(Version 2.7A-23.14 or above)
G_FILL_STYLE	Set all objects fill style(Version 2.7A-23.14 or above)
G_POLY_DELAY	Set all objects poly delay
G_END_DELAY	Set all objects end delay
G_OFFSET_X	Set all objects offset on X direction
G_OFFSET_Y	Set all objects offset on Y direction
G_ANGLE	Set all objects rotate angle
G_ANGLE_CENTER_X	Set all objects rotate center on X direction
G_ANGLE_CENTER_Y	Set all objects rotate center on Y direction
Text Object	
TEXT_NAME	Set text nickname
TEXT_WIDTH	Set text width
TEXT_HEIGHT	Set text height
TEXT_CENTER_X	Set text center position X
TEXT_CENTER_Y	Set text center position Y
TEXT_PITCH	Set text pitch
TEXT_FREQ	Set text mark frequency
TEXT_MARK_SPEED	Set text mark speed
TEXT_WOBBLE	Set text wobble
TEXT_WOBBLE_WIDTH	Set text wobble width
Arc-Text Object	

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ARC_TEXT_REFERENCE_ANGLE	Set arc-text reference angle
ARC_TEXT_SPREAD_ANGLE	Set arc-text spread angle
ARC_TEXT_RADIUS	Set arc-text radius
Text Content	
TEXT_CONTENT	Set text or barcode content (Version 2.6B-3 or above)
Graphic Object	
GRAPHIC_NAME	Set graphic nickname
GRAPHIC_WIDTH	Set graphic width
GRAPHIC_HEIGHT	Set graphic height
GRAPHIC_CENTER_X	Set graphic center position X
GRAPHIC_CENTER_Y	Set graphic center position Y
GRAPHIC_FREQ	Set graphic mark frequency
GRAPHIC_MARK_SPEED	Set graphic mark speed
GRAPHIC_WOBBLE	Set graphic wobble
GRAPHIC_WOBBLE_WIDTH	Set graphic wobble width
GRAPHIC_ANGLE	Set graphic rotate angle
Poly-Line Object	
GRAPHIC_POLYLINE	Add poly-line
AutoText	
AUTOTEXT_NAME	Set autotext nickname
AUTOTEXT_START	Set autotext start value
AUTOTEXT_END	Set autotext end value
AUTOTEXT_STEP	Set autotext step value
ArrayCopy	
ARRAY_COPY	Array copy
Mark	
E	Mark standby
END	Mark
Matrix Cell Marking	
MATRIX_MATCH	Enable matrix object cell marking

Practical Functions

13.4Command Description

If error is occured, NG code will be returned as following format: NG[NG Code] CR̲ LF̲

CR：ASCII Code 13

LF：ASCII Code 10

File Operation

Command	FILE
Example	FILE[C:\1.EZM] CR̲ LF̲
Description	Open EZM file.
Unit	Full Path
NG Code	001: Path file didn`t existence.
	002: Invalid command.
	003: Instruction or Parameter beyond range Min value: 1 ANSI character Max value: 256 ANSI characters

Add Object

Command	ADD_RECT
Example	ADD_RECT[Name:x,y] CR̲ LF̲ Name: Object name X: Object center position X coordinate Y: Object center position Y coordinate
Description	Create rectangle object(Version 2.7A-23.8 or above)
Unit	X：mm Y：mm
NG Code	200: Created fail, or object is existed.

Command	ADD_CIRCLE
Example	ADD_CIRCLE[Name:cx,cy:r] CR̲ LF̲ Name: Object name CX: Object center position X coordinate CY: Object center position Y coordinate R: Radius
Description	Create circle object(Version 2.7A-23.8 or above)
Unit	CX：mm CY：mm R：mm
NG Code	201: Created fail, or object is existed.

Command	ADD_1DBC
Example	ADD_1DBC[Name:CodeTyp:Content:CX,CY] CR̲ LF̲ Name: Object name CodeType: Code type index 　0：Code39 　1：Code128 　2：Code128A

Practical Functions

	3：Code128B
	4：Code128C
	5：Code93
	6：CodeBar
	7：ITF
	8：MSI Code
	9：US PostNet
	10：UPC-A
	11：UPC-E
	12：EAN8
	13：EAN13
	14：UCC128
	15：EAN128
	16：FIM
	17：Code25
	18：ITF25
	Content: Code content
Description	Create 1D Barcode object(Version 2.7A-23.10 or above)
Unit	CX：mm
	CY：mm
NG Code	202: Created fail, or object is existed.

Command	**ADD_2DBC**
Example	ADD_2DBC[Name:CodeTyp:Content:CX,CY]　CR　LF
	Name: Object name
	CodeType: Code type index
	0：Data Matrix (ECC 000~140)
	1：Data Matrix (ECC 200)
	2：PDF417
	3：QR Code
	4：Maxi Code
	5：PDF417 Truncated
	6：Micro PDF417
	7：Micro QR Code
	Content: Code content
Description	Create 2D Barcode object(Version 2.7A-23.10 or above)
Unit	CX：mm
	CY：mm
NG Code	203: Created fail, or object is existed.

Command	**ADD_CURVE**
Example	ADD_CURVE[Name:X1,Y1:X2,Y2:…:Xn,Yn]　CR　LF
	Name: Object name
	X1: The first line start point X coordinate
	Y1: The first line start point Y coordinate
	X2: The second line end point X coordinate
	Y2: The second line end point Y coordinate
	Xn: The (n-1)th line end point X coordinate

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	Yn: The (n-1)th line end point Y coordinate
Description	Create curve object(Version 2.7A-23.8 or above)
Unit	X1：mm Y1：mm X2：mm Y2：mm Xn：mm Yn：mm
NG Code	204: Created fail, or object is existed.

Command	ADD_DOT
Example	ADD_DOT[Name:x,y] CR LF Name: Object name X: Dot X coordinate Y: Dot Y coordinate
Description	Create dot object(Version 2.7A-23.8 or above)
Unit	X：mm Y：mm
NG Code	205: Created fail, or object is existed.

Command	ADD_IMAGE
Example	ADD_IMAGE[Name:CX,CY :Path] CR LF Name: Object name Path: Image file path
Description	Create image object(Version 2.7A-23.10 or above)
Unit	CX：mm CY：mm
NG Code	206: Created fail, or object is existed.

Command	ADD_TEXT
Example	ADD_TEXT[Name:Content:cx,cy] CR LF Name: Object name Content: Text content CX: Object center X coordinate CY: Object center Y coordinate
Description	Create text object(Version 2.7A-23.8 or above)
Unit	CX: mm CY: mm
NG Code	207: Created fail, or object is existed.

Command	ADD_ARCTEXT
Example	ADD_ARCTEXT[Name:Content:cx,cy:r] CR LF Name: Object name Content: Text content CX: Object center X coordinate CY: Object center Y coordinate R: Radius

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Description	Create arctext object(Version 2.7A-23.8 or above)
Unit	CX: mm
	CY: mm
	R: mm
NG Code	208: Created fail, or object is existed.

Delete Object

Command	**DEL_OBJ**
Example	DEL_OBJ[ObjName] CR LF
Description	Delete object(Version 2.7A-23.8 or above)
Unit	N/A
NG Code	290: Created fail, or object is existed.

Global Setting

Command	**G_START_DELAY**
Example	G_START_DELAY[100] CR LF
Description	Set all objects start delay
Unit	μs
NG Code	020: Instruction or Parameter beyond range.
	Min value: -42949672(P.S.)
	Max value: 42949672
P.S.	42949672 μs is the maximum value of delay parameter in PMC2. If controller is not listed below, user will have to check official spec. Check value is mainly restricted by PMC2. The value which is beyond the PMC2 capable value will be reported as NG. Other controller also couldn`t beyond the capable range, otherwise will be considered as NG.

Controller	PMC2/UMC4	MC1	RTC3 & RTC4	RTC5
Start Delay	Range: - 42949672us ~ + 42949672us	Range: - 3276.8us ~ + 3276.7us	Range: - 8000us ~ + 8000us	Range: - 1073741824us ~ + 1073741824us

Command	**G_MARK_SPEED**
Example	G_MARK_SPEED[800] CR LF
Description	Set all objects mark speed
Unit	mm/sec
NG Code	021: Instruction or Parameter beyond range.
	Min value: 0
	Max value: According to setting

Command	**G_MARK_POWER**
Example	G_MARK_POWER[50] CR LF
Description	Set all objects mark power (Version 2.7A-23.14 or above)
Unit	%
NG Code	109: Instruction or Parameter beyond range.
	Min value: 0
	Max value: 100

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Command	**G_FILL_PITCH**
Example	G_FILL_PITCH[0.1] CR LF
Description	Set all objects fill pitch (Version 2.7A-23.14 or above)
Unit	mm

NG Code	110: Instruction or Parameter beyond range.
	    Min value: 0
	    Max value: N/A

Command	**G_FILL_STYLE**
Example	G_FILL_STYLE[2] CR LF
Description	Set all objects fill style (Version 2.7A-23.14 or above)

NG Code	111: Instruction or Parameter beyond range.
	    Min value: 0
	    Max value: 5

Command	**G_POLY_DELAY**
Example	G_POLY_DELAY[100] CR LF
Description	Set all objects poly delay
Unit	µs

NG Code	022: Instruction or Parameter beyond range.
	    Min value: 0
	    Max value: 42949672(P.S.)

P.S.	42949672 µs is the maximum value of delay parameter in PMC2. If controller is not listed below, user will have to check official spec. Check value is mainly restricted by PMC2. The value which is beyond the PMC2 capable value will be reported as NG. Other controller also couldn`t beyond the capable range, otherwise will be considered as NG. {TABLE}

Controller	PMC2/UMC4	MC1	RTC3 & RTC4	RTC5
Poly Delay	Max. value is 42949672us	Max. value is 327670us	Max. value is 327670us	Max. value is 42949672960us

Command	**G_END_DELAY**
Example	G_END_DELAY[300] CR LF
Description	Set all objects end delay
Unit	µs

NG Code	023: Instruction or Parameter beyond range.
	    Min value: 0
	    Max value: 42949672(P.S.)

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P.S.	42949672 µs is the maximum value of delay parameter in PMC2. If controller is not listed below, user will have to check official spec. Check value is mainly restricted by PMC2. The value which is beyond the PMC2 capable value will be reported as NG. Other controller also couldn`t beyond the capable range, otherwise will be considered as NG.				
	Controller	PMC2/UMC4	MC1	RTC3 & RTC4	RTC5
	End Delay	Max. value is 42949672us	Max. value is 6553.6us	Range: + 2us ~ + 8000us	Max. value is 1073741824us

Command	G_OFFSET_X
Example	G_OFFSET_X[10] CR LF
Description	Set all objects offset on X direction
Unit	mm
NG Code	024: Instruction or Parameter beyond range.

Command	G_OFFSET_Y
Example	G_OFFSET_Y[10] CR LF
Description	Set all objects offset on Y direction
Unit	mm
NG Code	025: Instruction or Parameter beyond range.

Command	G_ANGLE
Example	G_ANGLE[30] CR LF
Description	Set all objects rotate angle
Unit	degree
NG Code	026: Instruction or Parameter beyond range.

Command	G_ANGLE_CENTER_X
Example	G_ANGLE_CENTER_X[10] CR LF
Description	Set all objects rotate center on X direction
Unit	mm
NG Code	107: Instruction or Parameter beyond range.

Command	G_ANGLE_CENTER_Y
Example	G_ANGLE_CENTER_Y[10] CR LF
Description	Set all objects rotate center on Y direction
Unit	mm
NG Code	108: Instruction or Parameter beyond range.

Text Object

Command	TEXT_NAME
Example	TEXT_NAME[3] CR LF
Description	Set text nickname
Unit	character
NG Code	030: No such text object.

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Command	TEXT_WIDTH
Example	TEXT_WIDTH[10] CR LF
Description	Set text width
Unit	mm
NG Code	031: Parameter error.

Command	TEXT_HEIGHT
Example	TEXT_HEIGHT[10] CR LF
Description	Set text height
Unit	mm
NG Code	032: Parameter error.

Command	TEXT_CENTER_X
Example	TEXT_CENTER_X[10] CR LF
Description	Set text center position X
Unit	mm
NG Code	033: Parameter error.

Command	TEXT_CENTER_Y
Example	TEXT_CENTER_Y[10] CR LF
Description	Set text center position Y
Unit	mm
NG Code	034: Parameter error.

Command	TEXT_PITCH
Example	TEXT_PITCH[1] CR LF
Description	Set text pitch
Unit	mm
NG Code	035: Parameter error.

Command	TEXT_FREQ
Example	TEXT_FREQ[20] CR LF
Description	Set text mark frequency
Unit	KHz

NG Code	036: Instruction or Parameter beyond range.
	    Min value: According to setting
	    Max value: According to setting

Command	TEXT_MARK_SPEED
Example	TEXT_MARK_SPEED[800] CR LF
Description	Set text mark speed
Unit	mm/sec

NG Code	037: Instruction or Parameter beyond range.
	    Min value: 0
	    Max value: According to setting

Command	TEXT_WOBBLE

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Example	TEXT_WOBBLE[50] CR LF
Description	Set text wobble
Unit	%
NG Code	038: Instruction or Parameter beyond range.

Command	**TEXT_WOBBLE_WIDTH**
Example	TEXT_WOBBLE_WIDTH[1] CR LF
Description	Set text wobble width
Unit	mm
NG Code	039: Parameter error.

Arc-Text Object

Command	**ARC_TEXT_REFERENCE_ANGLE**
Example	ARC_TEXT_REFERENCE_ANGLE[45] CR LF
Description	Set arc-text reference angle
Unit	degree
NG Code	042: Parameter error.

Command	**ARC_TEXT_SPREAD_ANGLE**
Example	ARC_TEXT_SPREAD_ANGLE[90] CR LF
Description	Set arc-text spread angle
Unit	degree
NG Code	043: Parameter error.

Command	**ARC_TEXT_RADIUS**
Example	ARC_TEXT_RADIUS[10] CR LF
Description	Set arc-text radius
Unit	mm
NG Code	044: Value less than 0. Min value: 0

Text Content

Command	**TEXT_CONTENT**
Example	TEXT_CONTENT[ABC] CR LF
Description	Set text or barcode content (Version 2.6B-3 or above)
Unit	character

NG Code	003: Instruction or Parameter beyond range.
	    Min value: 1 ANSI character
	    Max value: 256 ANSI characters

Graphic Object

Command	**GRAPHIC_NAME**
Example	GRAPHIC_NAME[3] CR LF
Description	Set graphic nickname
Unit	character
NG Code	050: No such object.

Command	**GRAPHIC_WIDTH**

Example	GRAPHIC_WIDTH[10] CR LF
Description	Set graphic width
Unit	mm
NG Code	051: Parameter error.

Command	**GRAPHIC_HEIGHT**
Example	GRAPHIC_HEIGHT[10] CR LF
Description	Set graphic height
Unit	mm
NG Code	052: Parameter error.

Command	**GRAPHIC_CENTER_X**
Example	GRAPHIC_CENTER_X[10] CR LF
Description	Set graphic center position X
Unit	mm
NG Code	053: Parameter error.

Command	**GRAPHIC_CENTER_Y**
Example	GRAPHIC_CENTER_Y[10] CR LF
Description	Set graphic center position Y
Unit	mm
NG Code	054: Parameter error.

Command	**GRAPHIC_FREQ**
Example	GRAPHIC_FREQ[20] CR LF
Description	Set graphic mark frequency
Unit	kHz

NG Code	055: Instruction or Parameter beyond range.
	  Min value: According to setting
	  Max value: According to setting

Command	**GRAPHIC_MARK_SPEED**
Example	GRAPHIC_MARK_SPEED[800] CR LF
Description	Set graphic mark speed
Unit	mm/sec

NG Code	056: Instruction or Parameter beyond range.
	  Min value: 0
	  Max value: According to setting

Command	**GRAPHIC_WOBBLE**
Example	GRAPHIC_WOBBLE[50] CR LF
Description	Set graphic wobble
Unit	%
NG Code	057: Instruction or Parameter beyond range. Max value: 100

Command	**GRAPHIC_WOBBLE_WIDTH**

Example	GRAPHIC_WOBBLE_WIDTH[1] CR LF
Description	Set graphic wobble width
Unit	mm
NG Code	058: Parameter error.

Command	**GRAPHIC_ANGLE**
Example	GRAPHIC_ANGLE[30] CR LF
Description	Set graphic rotate angle
Unit	degree
NG Code	060: Parameter error.

Poly-Line Object

Command	**GRAPHIC_POLYLINE**
Example	GRAPHIC_POLYLINE[StartX, StartY, EndX, EndY:…,EndY] CR LF
Description	Add Poly-Line StartX: Set add line start point X StartY: Set add line start point Y EndX: Set add line end point X EndY: Set add line end point Y
NG Code	104: Instruction format error.

AutoText

Command	**AUTOTEXT_NAME**
Example	AUTOTEXT_NAME[3] CR LF
Description	Set autotext nickname
Unit	character

NG Code	003: Value beyond range.
	    Min value: 1 ANSI character
	    Max value: 256 ANSI character

Command	**AUTOTEXT_START**
Example	AUTOTEXT_START[0] CR LF
Description	Set autotext start value
Unit	Integer
NG Code	081: Parameter error.

Command	**AUTOTEXT_END**
Example	AUTOTEXT_END[100] CR LF
Description	Set autotext end value
Unit	Integer
NG Code	082: Parameter error.

Command	**AUTOTEXT_STEP**
Example	AUTOTEXT_STEP[1] CR LF
Description	Set autotext step value
Unit	Integer
NG Code	083: Parameter error.

Array Copy

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Command	**ARRAY_COPY**
Example	ARRAY_COPY[ObjName:PositionX,PositionY:PitchX,PitchY:NumberX,NumberY] CR LF
Description	Array copy ObjName :Set array nickname PositionX :Set array object center position X PositionY :Set array object center position Y PitchX: Set array object unit pitch on X direction PitchY: Set array object unit pitch on Y direction NumberX: Set array object unit count on X direction NumberY :Set array object unit count on Y direction
NG Code	103: Instruction format error.

Mark

Command	**E**
Example	E[] CR LF
Description	Mark standby
NG Code	001: Path file didn`t existence.
	040: Beyond marking range Min value: According to setting Max value: According to setting
	102: Couldn`t find protection dongle

Command	**END**
Example	END[] CR LF
Description	Mark
NG Code	003: Marking buffer under run.

Matrix Cell Marking

Command	**MATRIX_MATCH**
Example	MATRIX_MATCH[11001101] CR LF Instruction rule please refer to MMOCX.SetMatrixMatch
Description	Enable matrix object cell marking
Unit	character
NG Code	105: Parameter error. Min value: 0 Max value: 1

Practical Functions

13.5NG Code List

NG	NG Definition
001	Path file didn`t existence
002	Invalid Command
003	Instruction , Parameter beyond range, or marking buffer under run
020	Instruction or Parameter beyond range
021	Instruction or Parameter beyond range
022	Instruction or Parameter beyond range
023	Instruction or Parameter beyond range
024	Parameter error
025	Parameter error
026	Parameter error
030	No such text object
031	Parameter error
032	Parameter error
033	Parameter error
034	Parameter error
035	Parameter error
036	Instruction or Parameter beyond range
037	Instruction or Parameter beyond range
038	Instruction or Parameter beyond range
039	Parameter error
040	Beyond working range
042	Parameter error
043	Parameter error
044	Value less than 0
050	No such object
051	Parameter error
052	Parameter error
053	Parameter error
054	Parameter error
055	Instruction or Parameter beyond range
056	Instruction or Parameter beyond range
057	Instruction or Parameter beyond range
058	Parameter error
060	Parameter error
081	Parameter error

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082	Parameter error
083	Parameter error
102	Couldn`t find protection dongle
103	Instruction format error
104	Instruction format error
105	Parameter error
107	Parameter error
108	Parameter error
109	Instruction or Parameter beyond range
110	Instruction or Parameter beyond range
111	Instruction or Parameter beyond range
200	Created fail, or object is existed
201	Created fail, or object is existed
202	Created fail, or object is existed
203	Created fail, or object is existed
204	Created fail, or object is existed
205	Created fail, or object is existed
206	Created fail, or object is existed
207	Created fail, or object is existed
208	Created fail, or object is existed
290	Deleted fail, or object is not existed

14. Hot Key

The list below is a list of default shortcut key. Users could define most of them from option→shortkey.

File Menu	
Ctrl + N	Create a new document
Ctrl + O	Open an existing document
Ctrl + S	Save the current document using the existing file name
Ctrl + I	Import
Ctrl + P	Print
Edit Menu	
Ctrl + Y	Replace a cancelled action
Ctrl + Z	Cancel un unwanted action
Ctrl + X	Remove the selected object and place it in the clipboard
Ctrl + C	Duplicate the selected object and place it in the clipboard
Ctrl + V	Place the data on the clipboard on to the document
DEL	Delete the selected object
Ctrl + K	Combine
Ctrl + B	Break
Ctrl + M	Group
Ctrl + Q	UnGroup
Ctrl + H	Mirror Horizontal
Ctrl + L	Mirror Vertical
Ctrl + E	Baseline
Ctrl + D	Split
Ctrl + U	Transfer to a curve
Ctrl + A	Trimming
Ctrl + G	Welding
Ctrl + W	Contour
Execute Menu	
F5	Marking
F6	Quick Mark
F7	Dry Run

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F10	Close Dialogue Box of Marking, Quick Mark, and Dry Run
Others	
F1	Open HELP
F2	Open the Object Browser
Shift+F2	Move the Object Browser to the lower left corner
F3	Open the Dimension Bar
F4	Open the User Level dialogue box
Ctrl + F4	Close the current file
Ctrl + F6	Switch to another opened file
Ctrl	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
Ctrl + T	Open the Property Table
Shift	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
Tab	Select object by marking order
C	When you are drawing lines, arcs, and curves, press C key will make the continuous segments become a closed loop.
X/Y	Set the start point or end point of the object

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