ZCadToMore

V2.0

Product Manual

Content

Welcome

Welcome to ZCadToMore software developed by Shenzhen Zmotion Technology Co.,Ltd. This software is totally free, which only needs to connect with ZMOTION motion controller. If you don't get authorization from ZMotion, ads will pop up some times. Please contact us if you like our products. (tel: 19925228195; email: zlm@zmotion.com.cn)

Software Features:

- ✓ Support opening / importing vector files in DXF, PLT and AI format.
- ✓ Support importing and exporting Basic code and NC code.
- ✓ Support automatic optimization setting when importing, multi-step optimization can be achieved easily.
- ✓ Support several ways to optimize graph.
- ✓ Support graph and code comparison in real time.
- ✓ Support several methods to automatically optimize trajectory, also support flexible manual optimization of trajectories.
- ✓ Support flexible original point setting.
- ✓ Support inserting self-defined actions.
- ✓ Support customizing the height of axis Z and speed of each segment.
- ✓ Support one-key simulation processing and simulation processing control.
- ✓ Parameters are saved automatically, and can recover when ON again.
- ✓ Support downloading into controller directly for processing.

Chapter I Quick Start

1.1 Software Introduction

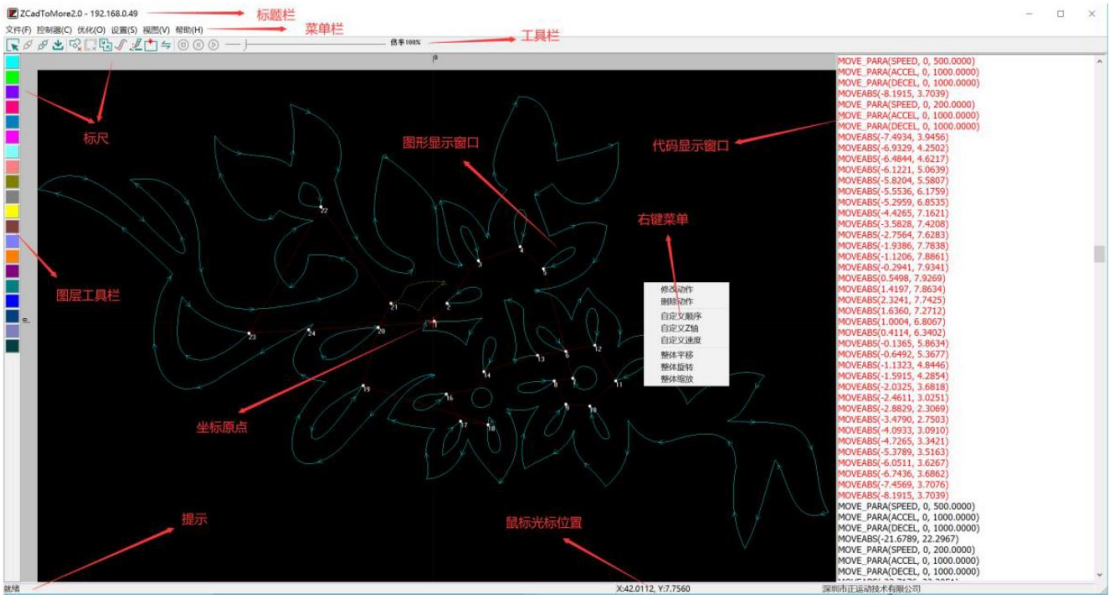
ZCadToMore V2.0 is a set of powerful graphics-to-Basic code and NC code generation and processing software. The main functions include vector file import, graphics optimization and display, Basic code and NC code display, editing and export, setting of origin position, action of customized graphics, planning of processing trajectory, simulated processing and downloading to the controller for processing, etc.

1.2 System Requirements

	The minimal requirements	Recommendation
CPU	Pentium level processor, master frequency is 1GHz.	Pentium level processor, master frequency is 2.6GHz.
Memory size	512MB	2GB
Hardware free space	128MB	512MB
Control system	Windows 7	Windows 10
Displayer	1024 x 768 / 24 bits real color	1024 x 1024 / 24 bits real color

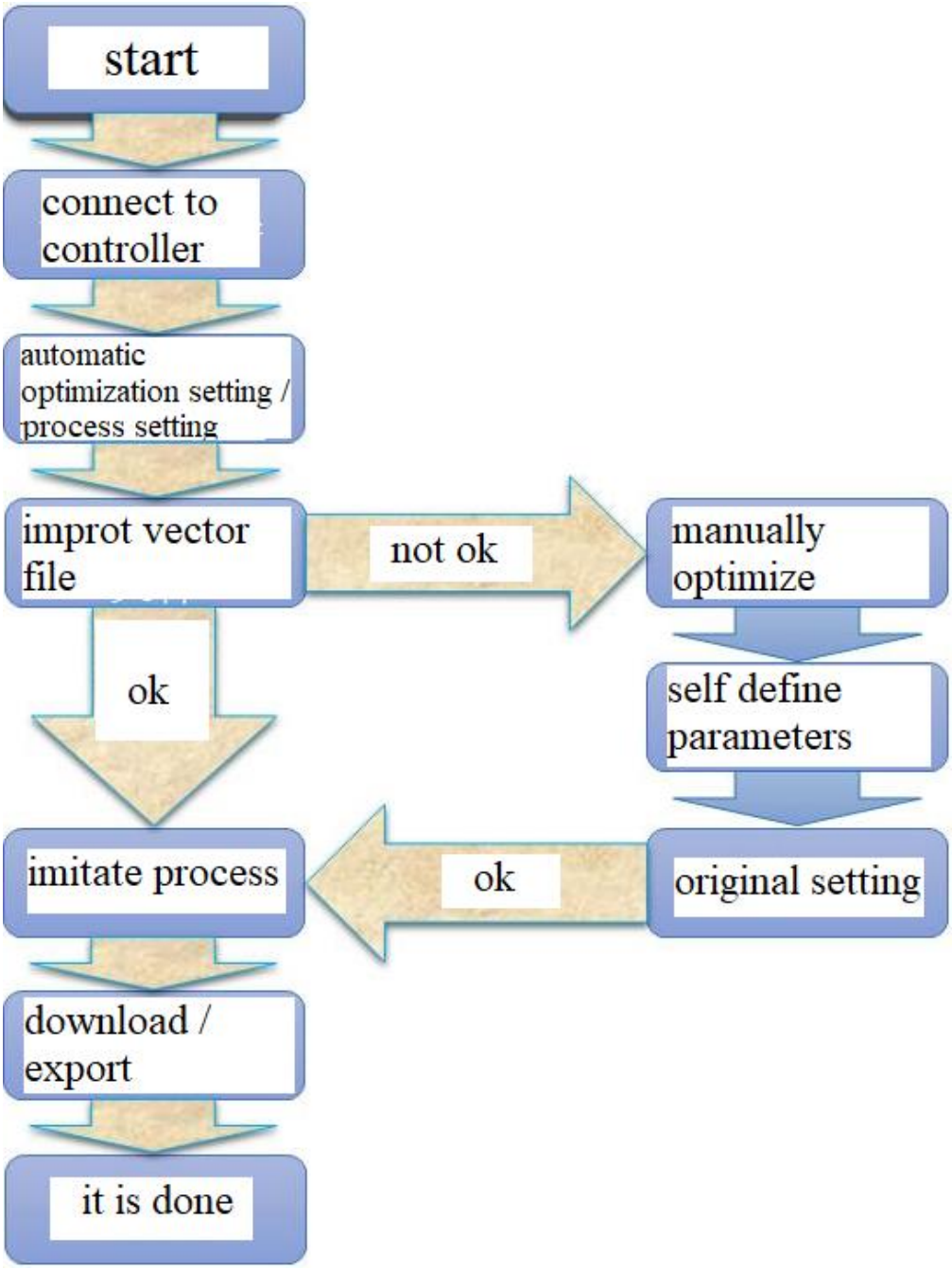
1.3 Start Interface

1.3.1 Main Interface



1. 标题栏 title bar: show software name and controller IP that is connecting now.
2. 主菜单栏 main menu bar: function selection
3. 快捷工具栏 shortcut tool bar: rapidly select functions
4. 标尺 ruler: graphic size reference
5. 图层工具栏 layer tool bar: select layer or modify layer rapidly
6. 图形显示窗口 graphic showing window: show processing graphic (small white point means the start point of graphic, red dotted line represents the idling track, the arrow represents the direction, and the serial number means the processing sequence)
7. 代码显示窗口 code showing window: show processed Basic code or NC code
8. 状态栏提示 status bar indication: show software indication
9. 鼠标光标位置 mouse and cursor position: show the current cursor position of mouse
10. 原点位置 original position: the position of origin
11. 右键菜单 right-click menu: user's customized G code parameter menu.

1.3.2 Operation Process

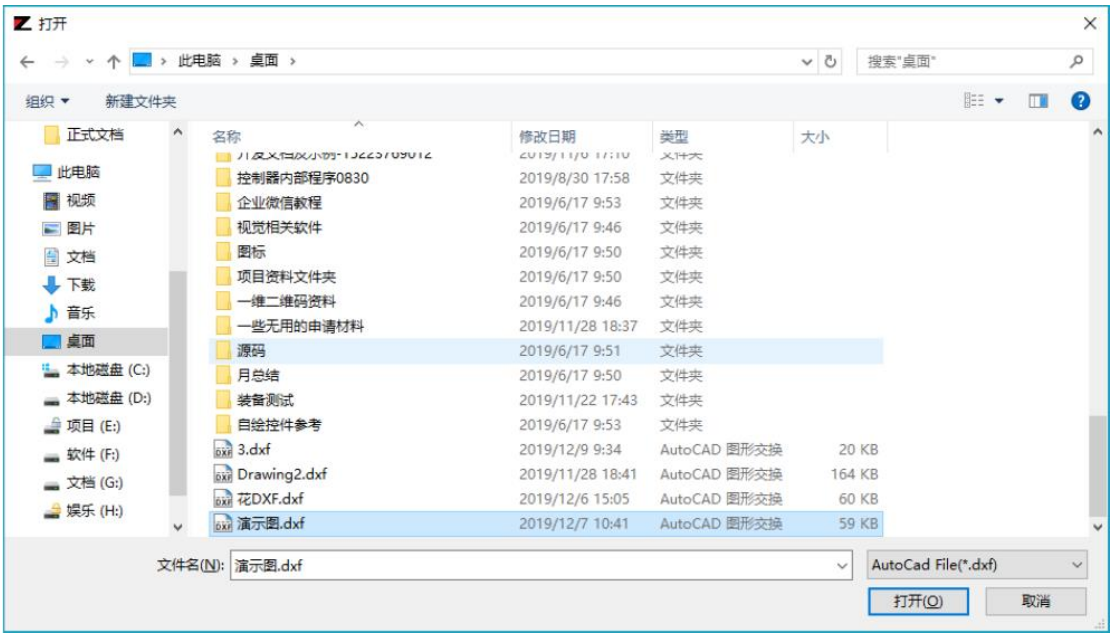


Chapter II File Operations

2.1 New-built

Click 文件 (file) – 新建 (new build) button, software will clear all data automatically.

2.2 Import



Supported file formats: DXF, PLT, AI.

Click the 文件 File → 导入 Import button (or press Ctrl + I), select the file type and select a file (only one file can be selected at a time), click the 打开 Open button, the new operation will be performed first, and then the import operation will be performed. The opened graph will be displayed where it fits the screen if succeeds in importing, and the corresponding code will be displayed in the code display window.

2.3 Export

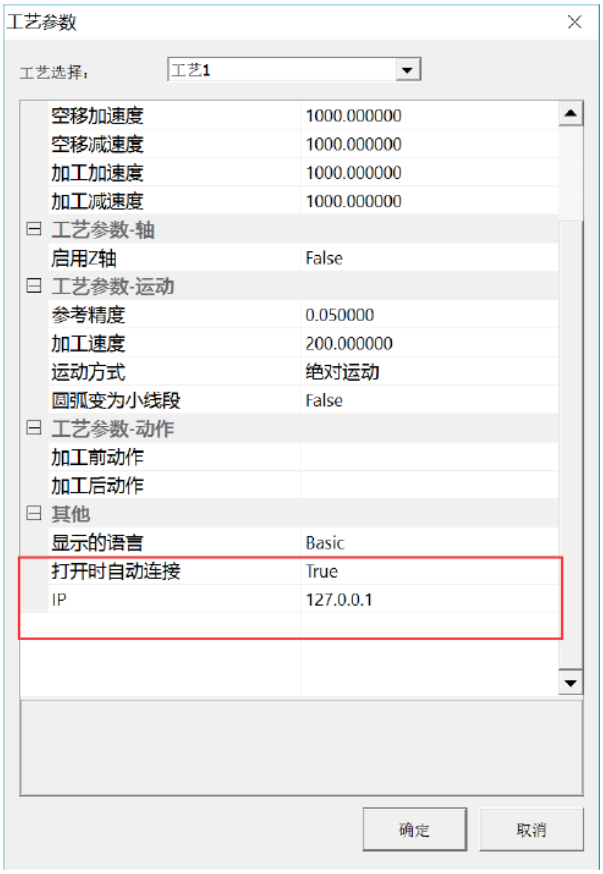
Click the 文件 File → 导出代码 Export Code button (or press Ctrl + O) to save the code in the code display window. The format is .bas or .nc. If there is a file with the same name, it will prompt whether to overwrite it. Click the 确定 OK button to save the code to the specified path.

Chapter III Controller Operation

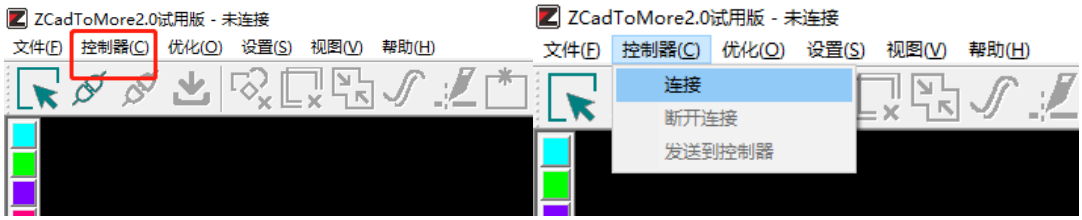
3.1 Connect to Controller

3.1.1 Automatic Connection

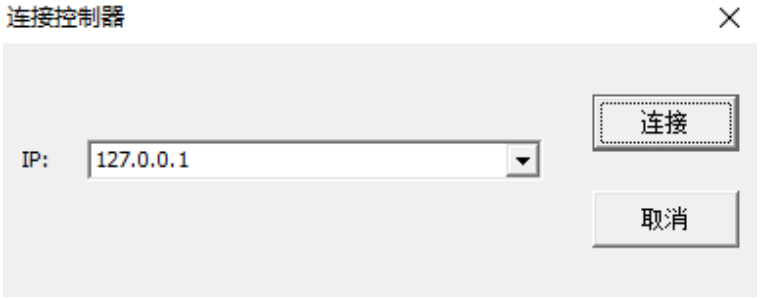
Click 设置 (configuration)– 工艺设置 (process configuration), then the process setting will pop up. Modify the “自动打开时设置“ (set when automatically open) as True and input the state IP address (see below red frame place), then click “确认” (ok). When open software next time, it will try to automatically connect this IP address controller.



3.1.2 Manual Connection



Click 控制器 (controller) – 连接 (connect). Then, below window will appear, select or input controller IP address. Next, click “连接” (connect).



3.2 Disconnect to Controller

Click 控制器 (controller) – 断开连接 (disconnect).

3.3 Send to Controller

Click 控制器 (controller) – 发送到控制器 (send to controller) button, in this way, codes in code display window can be sent to controller, the file name is ZCAD.z3p.

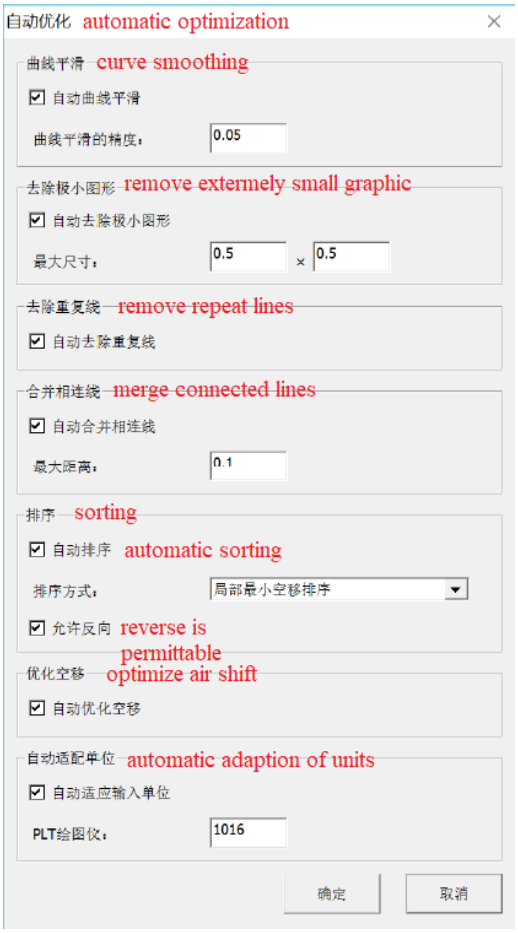
Chapter IV Optimization Operation

4.1 Select Graphic

This software supports several ways to select the graphics. There are point selection (move the mouse to the figure and click the left button of the mouse to select an entity), left frame selection (select all the graphics in the selection frame, they must be completely inside the selection frame), right frame selection (select the graphics touched by the marquee or the graphics inside the marquee) and select by layer (if no graphics are selected, click the layer toolbar on the left to select all graphics in the layer).

4.2 Automatic Optimization

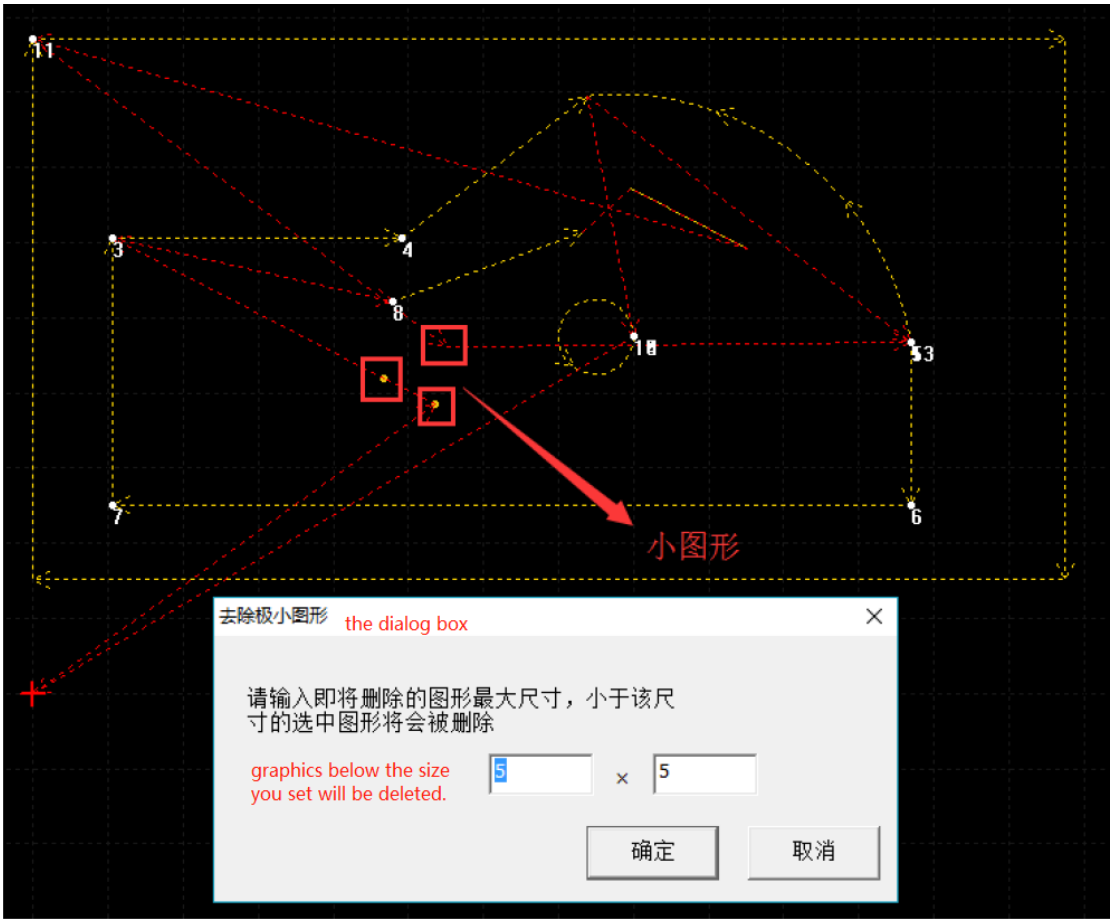
Click the 设置 (Settings) → 自动优化 (Auto-optimization) button, and the Auto-optimization dialog box will pop up. You can set the items and parameters of the automatic optimization. Click the 确定(OK) button, and the graphics will be automatically optimized according to this setting when the graphics are imported next time. The supported optimization items include (as shown in the figure below): curve smoothing, removal of extremely small graphics, removal of repeat lines, merging of connected lines, sorting, optimization of air movement and automatic adaptation of units.



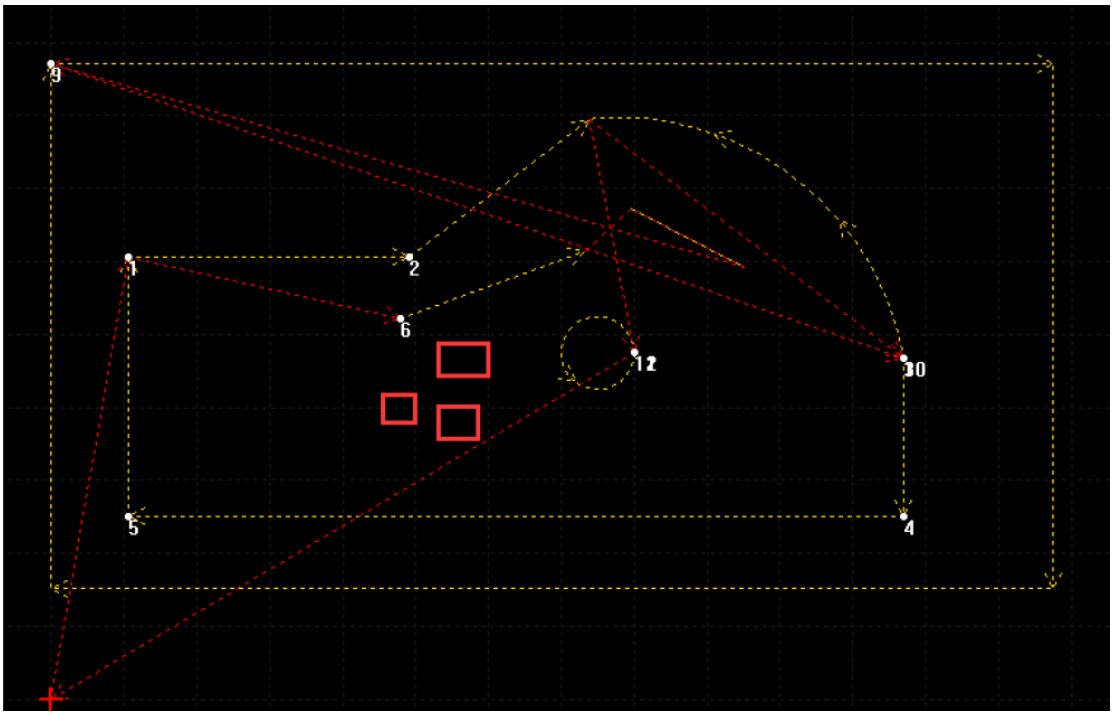
4.3 Manual Optimization

4.3.1 Remove very small graphics

Select the graphics to be optimized, click the 优化 (Optimize) → 去除极小图形 (Remove Minimal Graphics) button, and the Remove Small Graphics dialog box will pop up, set the maximum size of the removed graphics, and click the 确认 (OK) button. If the selected graphics are smaller than the set range, they should be removed, please see below.



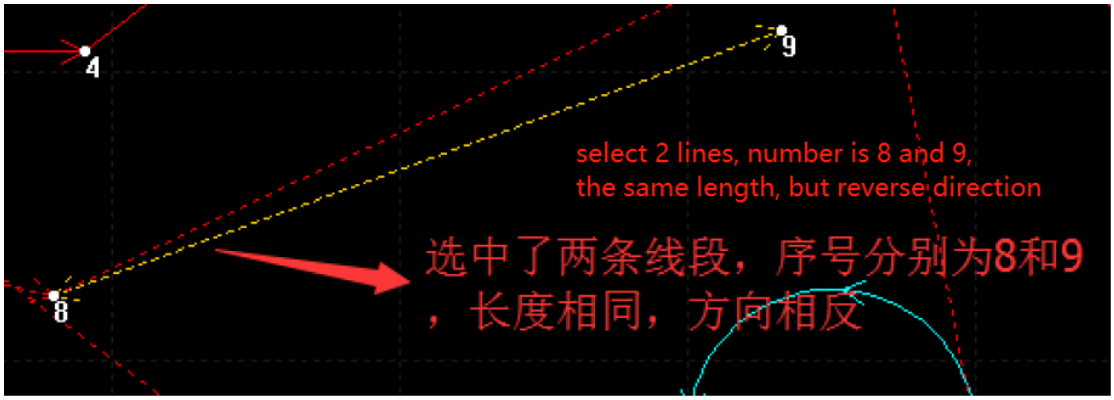
Before removing



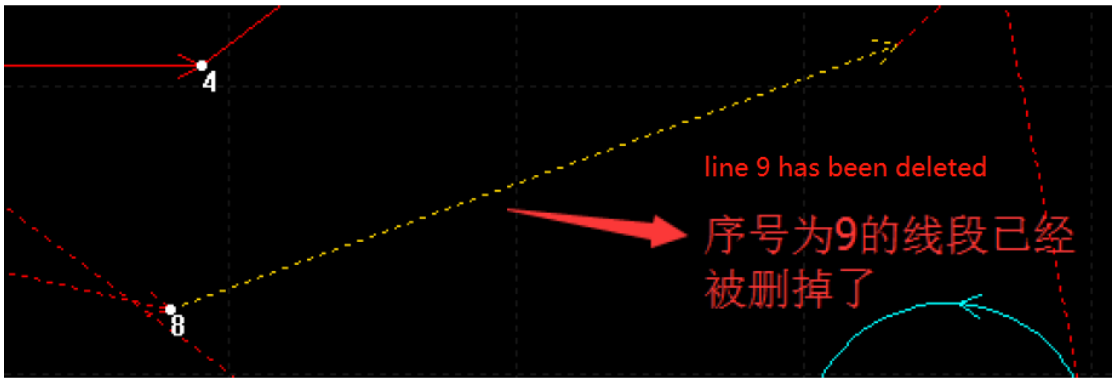
After removing

4.3.2 Remove repeat line

Select graphics to be optimized, click 优化 (optimize) – 去除重复线 (remove repeat lines) button, then repeated lines will be deleted, unit is curve. Direction is not considered. Please see below.



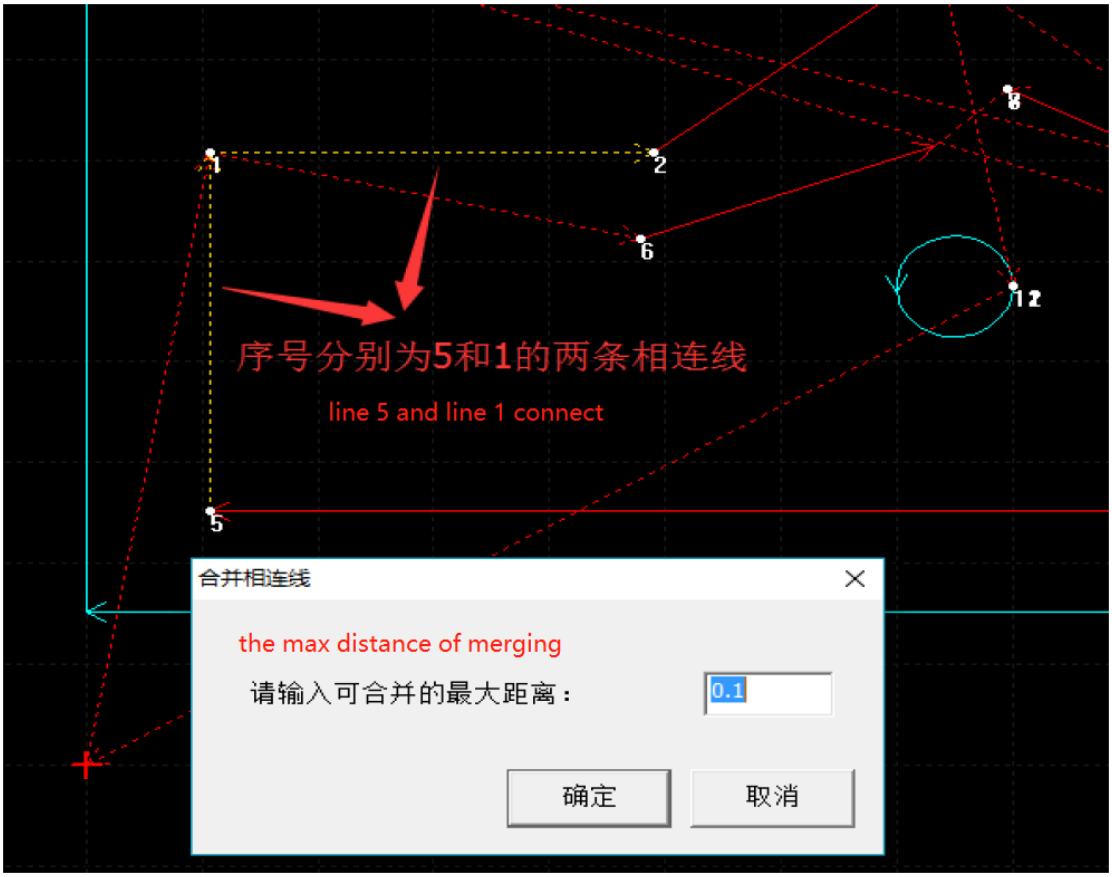
Before removing



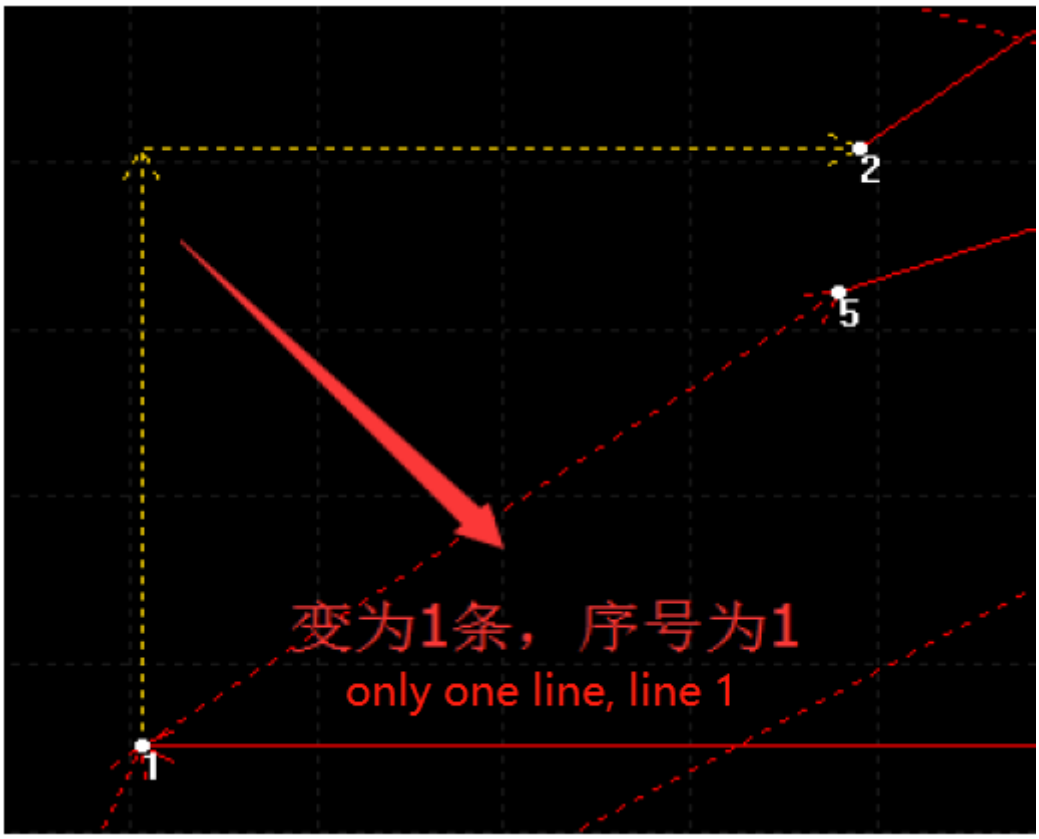
After removing

4.3.3 Merge connected lines

Select the graphics to be optimized, click the 优化 (optimize) → 合并相连线 (Merge Connecting Lines) button, and the Merge Connecting Lines dialog box will pop up, enter the maximum size that can be merged, and click the 确认 (OK) button to merge the qualified connecting lines (as shown in the figure below).



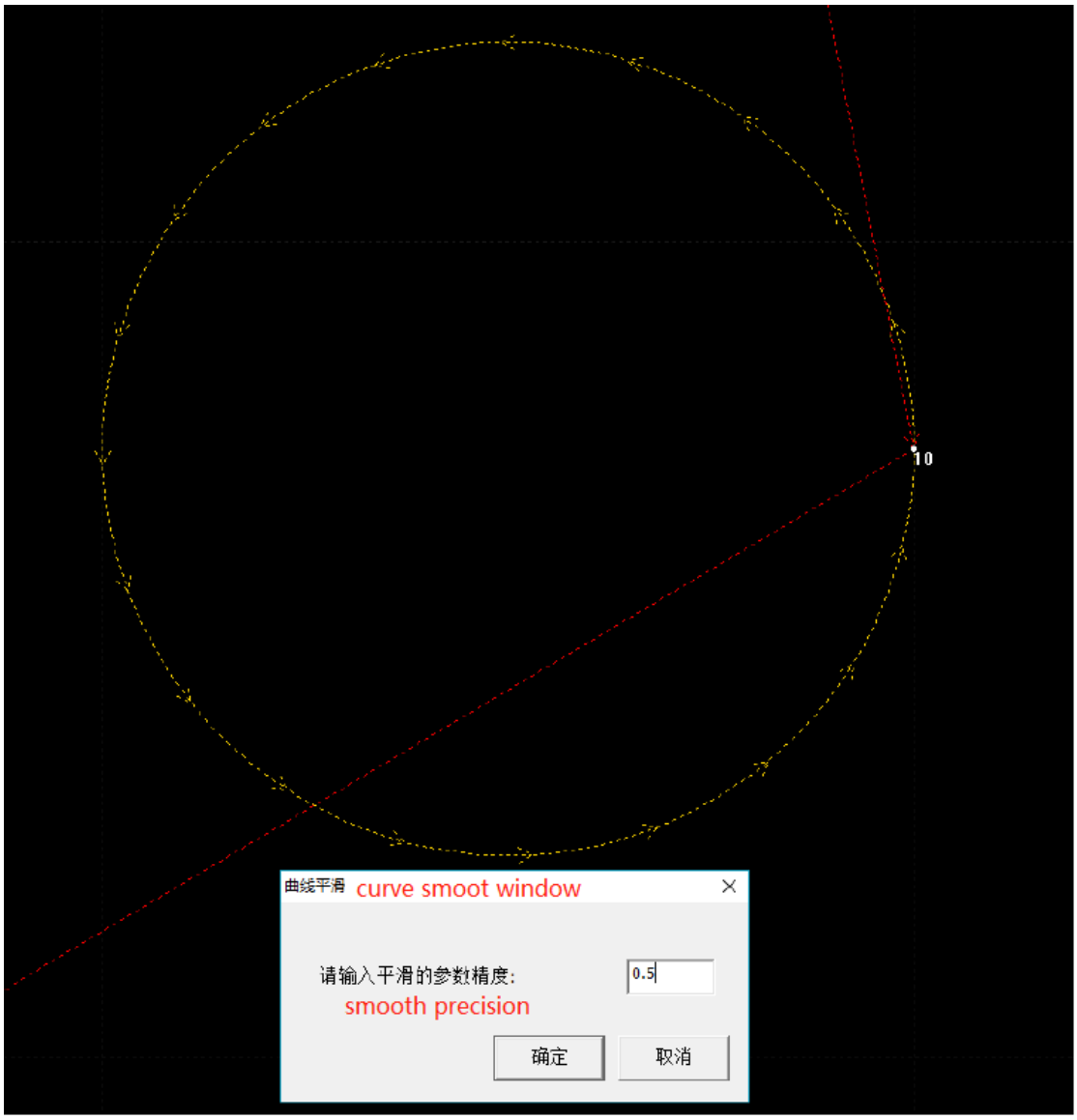
Before merging



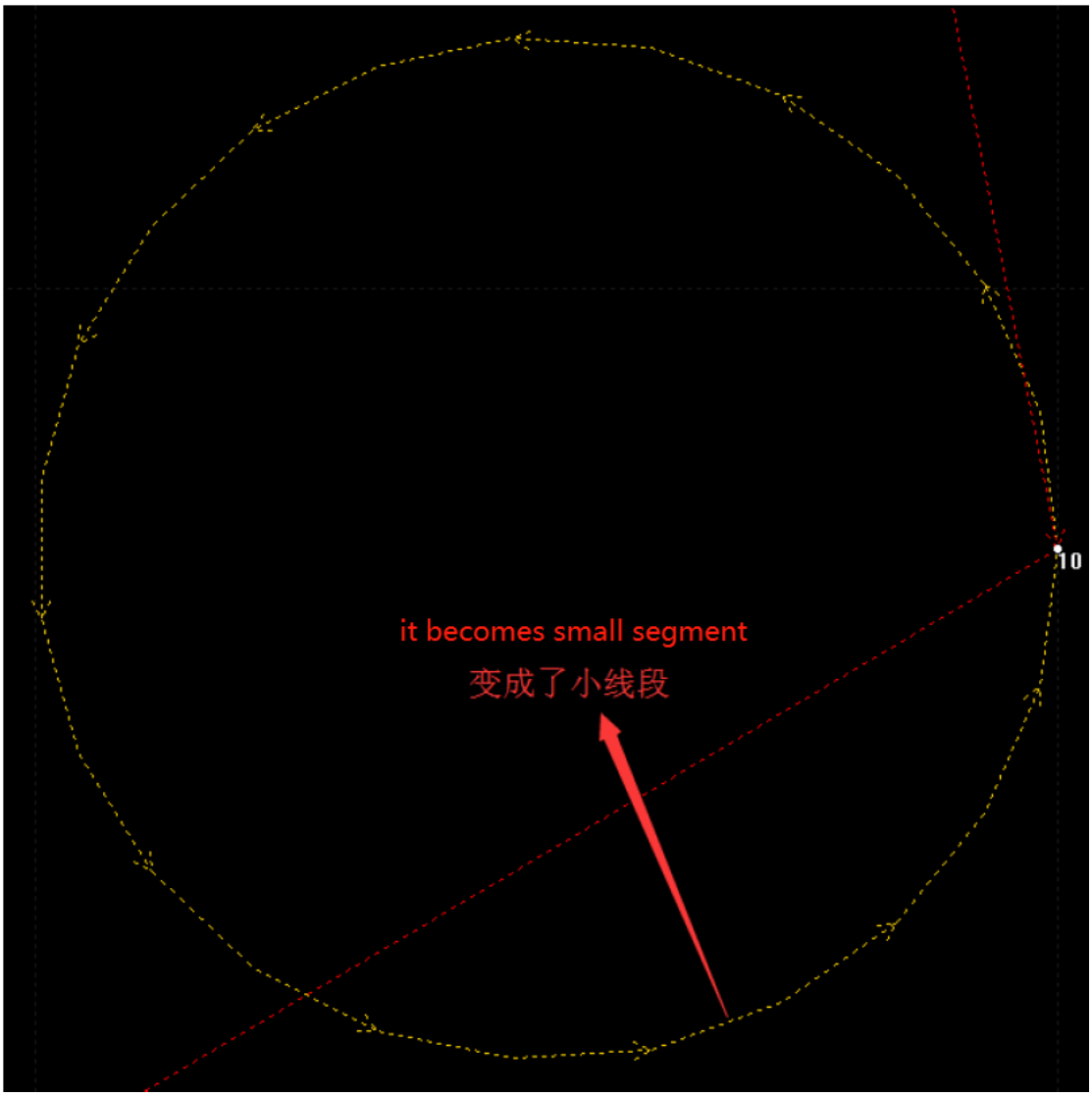
After merging

4.3.4 Curve Precision

Select the graph to be optimized, click 优化 (optimize) → 曲线精度 (curve accuracy) command, the curve accuracy dialog box will pop up, then click the 确认 (ok) button after inputting the accuracy, and the curve that meets the requirements will smooth automatically.



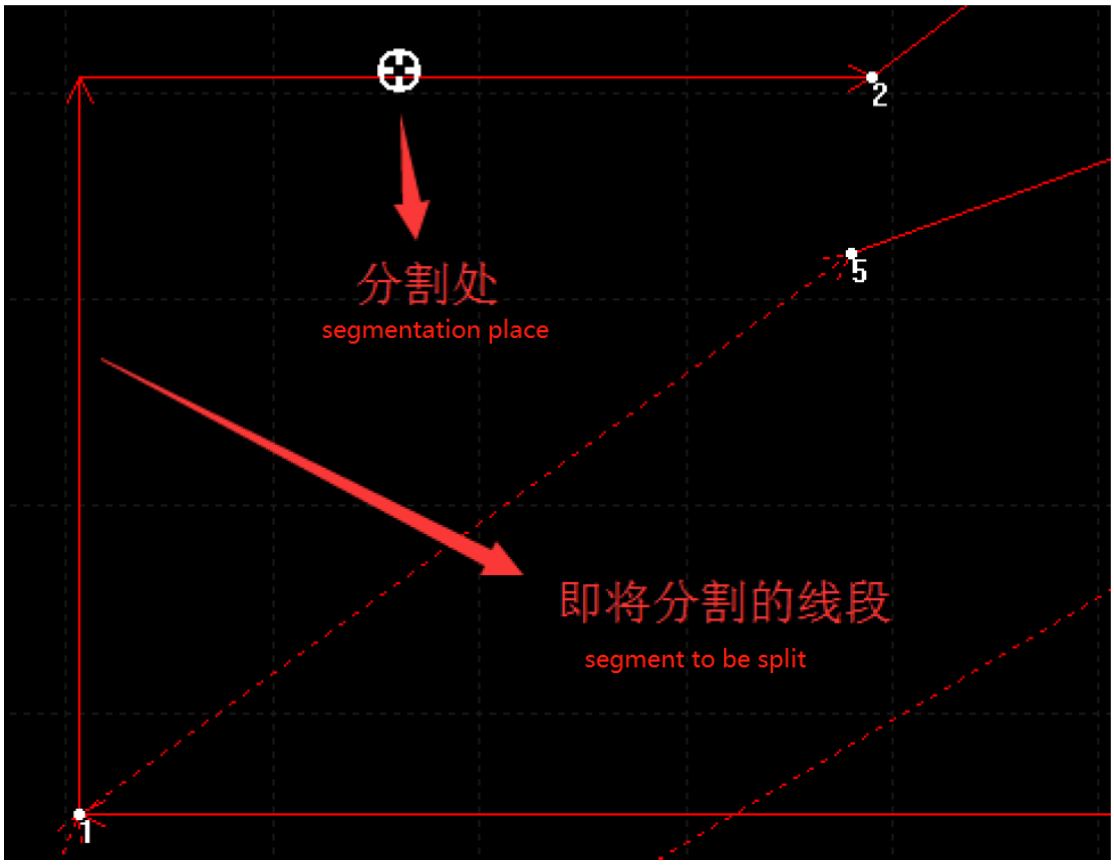
Before smoothing



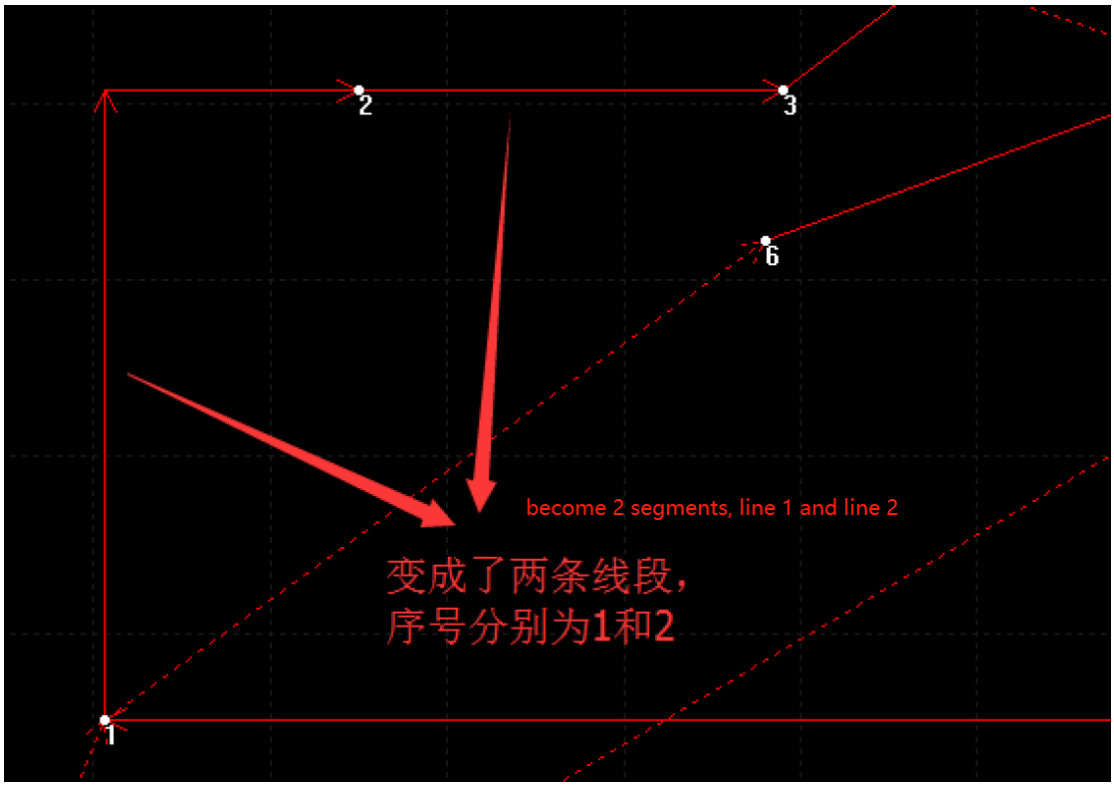
After smoothing

4.3.5 Curve Segmentation

Select the graph to be optimized, click the 优化 (optimize) → 曲线分割 (curve split) button, move the mouse to the position to be split, the mouse pointer will become in the valid area, click the left mouse button to divide the graph into two at this position, press The ESC key to cancel the split state.



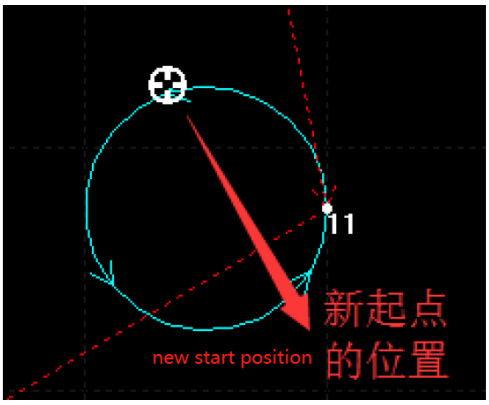
Before segmentation

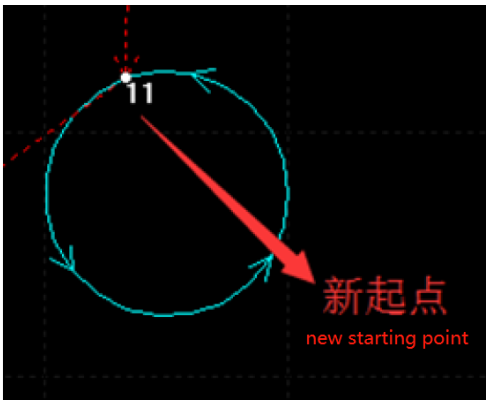


After segmentation

4.3.6 Modify Starting Point

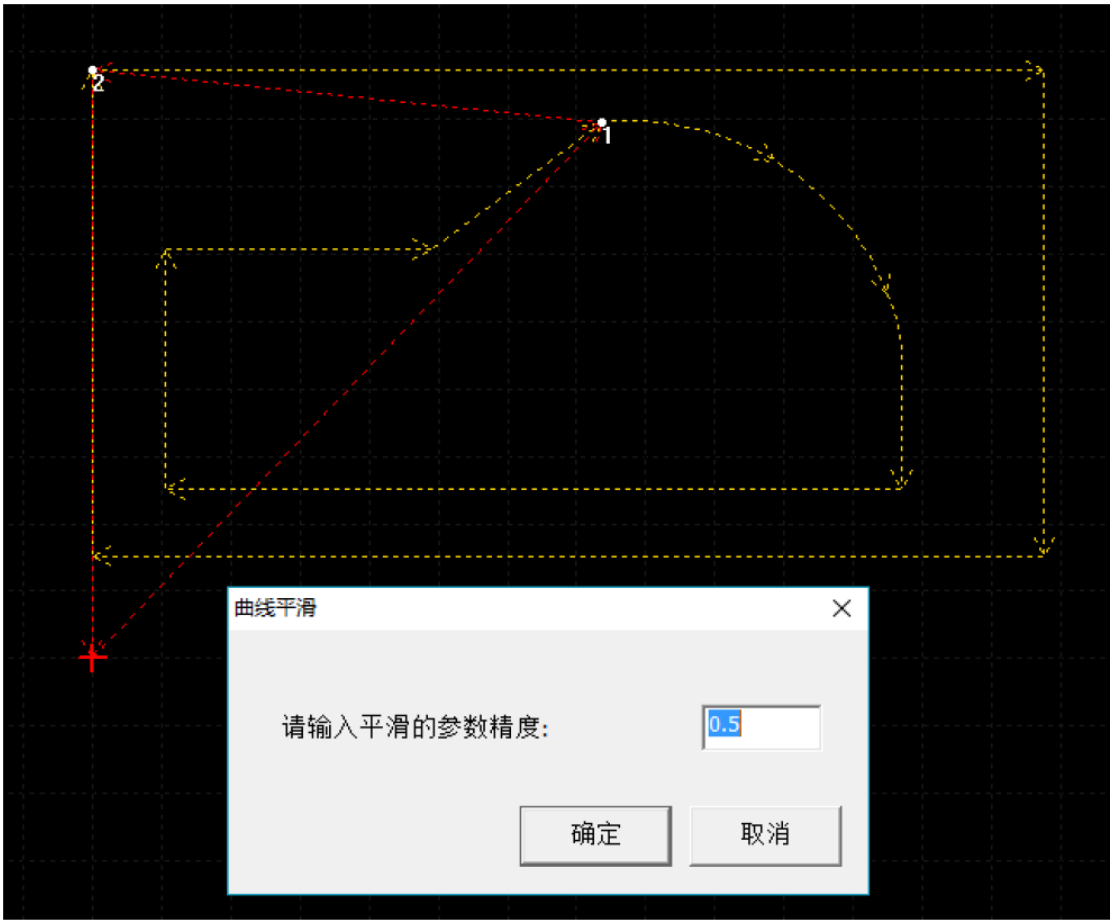
Select the graph to be optimized, click the 优化 (optimize) → 更改起点 (change start) button, move the mouse to the position of the new starting point of the closed graph, the mouse pointer will become  in the valid area, click the left mouse button to change the starting point of the graph, press ESC to cancel change the starting state (as shown below).



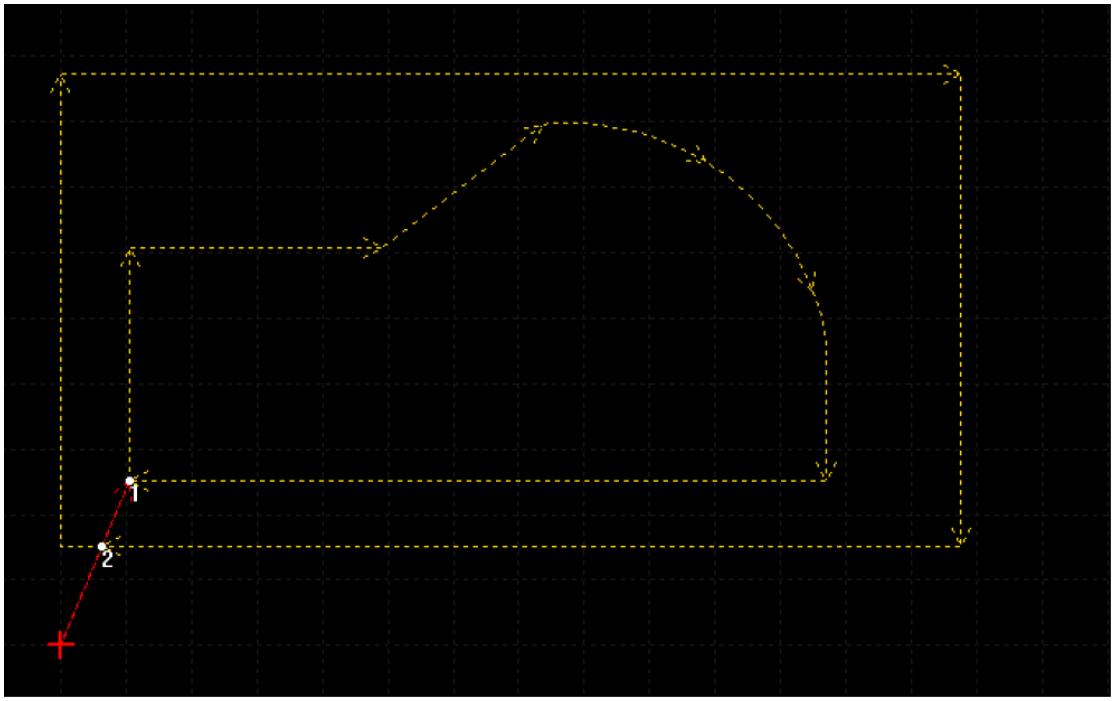


4.3.7 Optimize Air Move

Select the graph to be optimized, click the 优化 (optimize) → 优化空移 (optimize air shift) button, enter the precision (for calculation), and click the 确认 (ok) button to optimize the idling (the red dotted line is the idling route), as shown in the figure below.



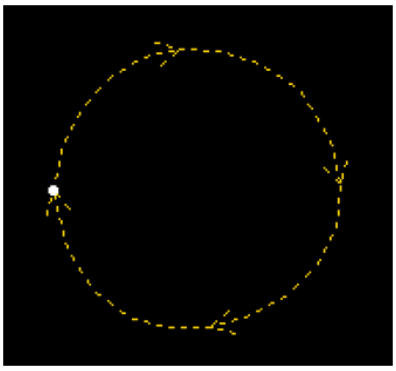
Before optimization



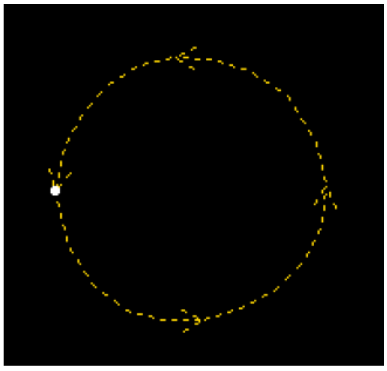
After optimization

4.3.8 Reverse

Select the graph to be optimized, click the 优化 (optimize) → 反向 (reverse) button, then the direction of graph can be modified.



Before



After

4.3.9 Trajectory Planning

4.3.9.1 Grid Sequence

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 网格排序 (grid sequence) button, then it can make an order based on a 100×100 grid (the grid order is based on the bottommost leftmost principle).

4.3.9.2 Local Mix Air Shift

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 局部最小空移 (local minimal air shift) button, it will make a sequence according to the local minimal air shift method.

4.3.9.3 Small Graph Priority

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 小图优先 (small graph priority) button, It can be sorted according to the range of graphs from small to large.

4.3.9.4 From In to Out

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 从内到外 (from inside to outside) button. It can be sorted according to the order of the distance

from the center point of the drawing from the nearest to the farthest.

4.3.9.5 From Left to Right

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 从左到右 (from left to right) button. It can be sorted according to the order of the position of graph from left to right.

4.3.9.6 From Right to Left

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 从右到左 (from right to left) button. It can be sorted according to the order of the position of graph from right to left.

4.3.9.7 From Top to Bottom

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 从上到下 (from top to bottom) button. It can be sorted according to the order of the position of graph from top to bottom.

4.3.9.8 From Bottom to Top

Select graphics to be optimized, click 优化 (optimize) → 自动排序 (automatic ordering) → 从下到上 (from bottom to top) button. It can be sorted according to the order of the position of graph from bottom to top.

4.3.9.9 Automatic Sort Setting

In 优化 – 自动优化 – 允许反向处（optimize – auto optimization – reverse is permittable), it can set whether the direction of graph is allowed to change or not when sets auto sort (check "✓" means it can change the direction).

4.3.9.10 Move forward

Select graphics to be optimized, click 优化 (optimize) → 手动排序 (manual ordering) → 前移 (move forward) button. Selected graph will move forward one step.

4.3.9.11 Move backward

Select graphics to be optimized, click 优化 (optimize) → 手动排序 (manual ordering) → 后移 (move backward) button. Selected graph will move backward one step.

4.3.9.12 Move to the first one

Select graphics to be optimized, click 优化 (optimize) → 手动排序 (manual ordering) → 移动到第一个 (move to the first one) button. Selected graph will move to the first one.

4.3.9.13 Move to the last one

Select graphics to be optimized, click 优化 (optimize) → 手动排序 (manual ordering) → 移动到最后一个 (move to the last one) button. Selected graph will move to the last one.

4.3.9.14 Reverse sequence

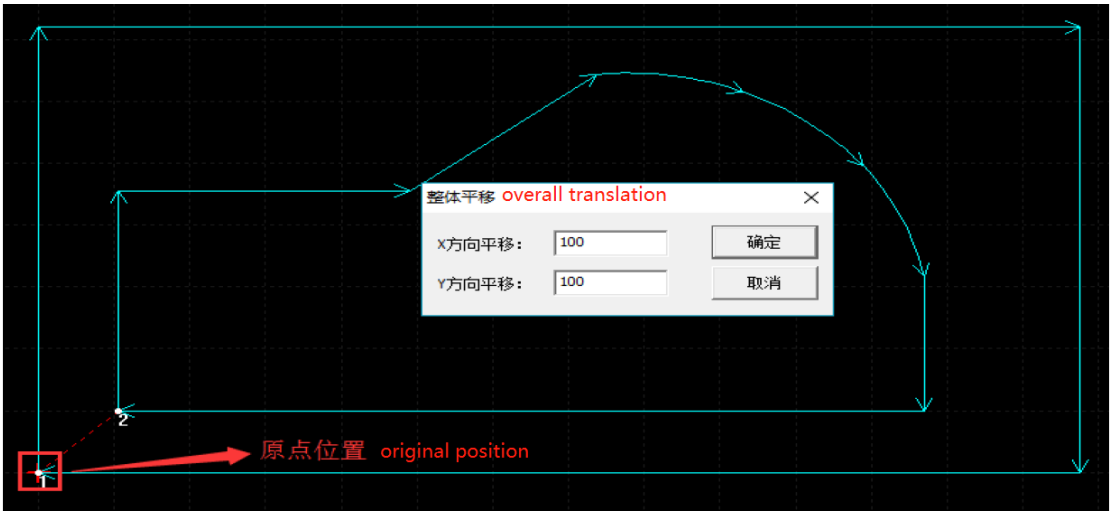
Select graphics to be optimized, click 优化 (optimize) → 手动排序 (manual ordering) → 反序 (reverse sorting) button. The sequence of selected graph will be reverse.

4.3.10 Modify the layer

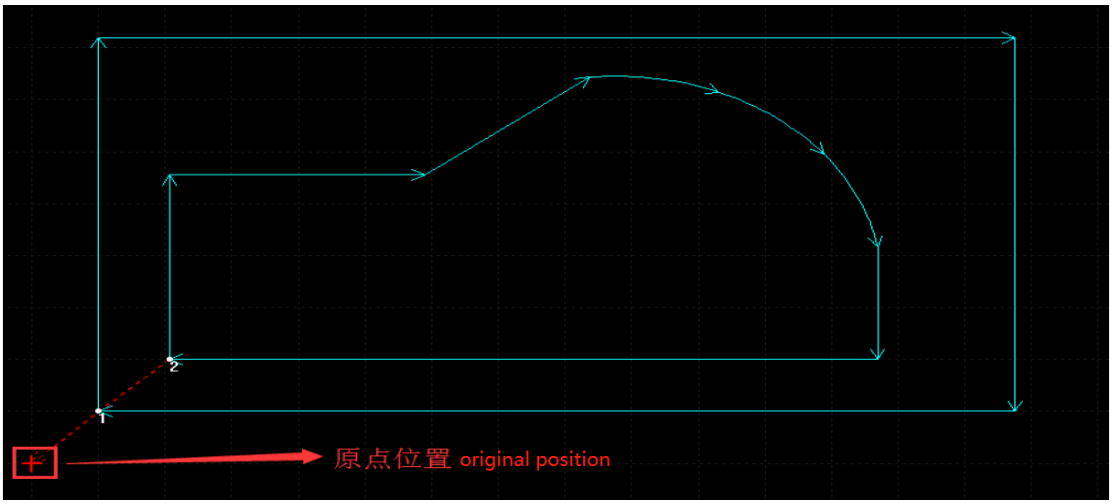
Select the graph that needs to modify the layer, click the “需要更改的图层“ (layer needs to be modified) button in 图层工具栏 (layer tool bar), then layer of selected graph can be changed into clicked layer.

4.3.11 Overall Translation

Click the right button of the mouse, select the “整体平移“ (overall translation) in the pop-up menu, the overall translation dialog box will pop up, enter the translation distances in the x and y directions respectively, and click the ”确定“ (ok) button to translate all the graphics along the x and y directions by the specified distance (as shown in the figure below).



Before translation

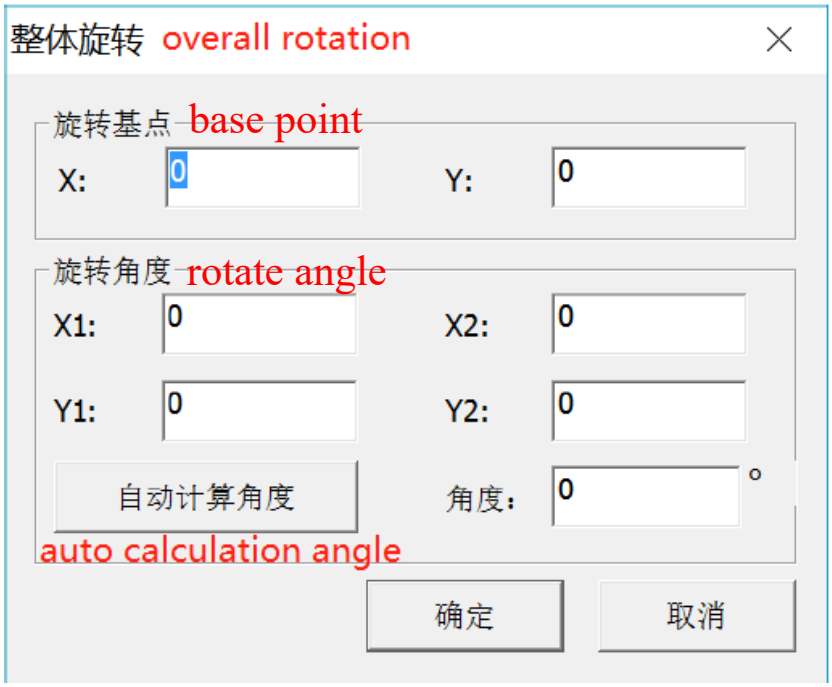


After translation

4.3.12 Overall Rotation

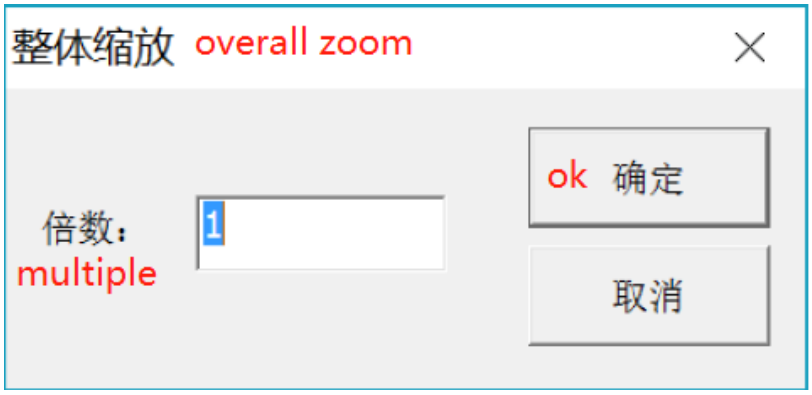
Click the right button of the mouse, select "整体旋转" (overall rotation) in the pop-up menu, the Overall Rotation dialog box will pop up, input the rotation base point and rotation angle, and click the "确认" (ok) button to rotate all graphics according to the specified base point by the specified angle.

If you are not sure about the angle, you can enter two points ((X1, Y1) and (X2, Y2) in the figure below), and click the "自动计算角度" (Auto Calculate Angle) button to automatically calculate the angle (as shown in the figure below).



4.3.13 Overall Zoom

Click the right button of mouse, select the "整体缩放" (overall zoom) in the pop-up menu, the overall zoom dialog box will pop up, enter the zoom multiple, and click the "确认" (ok) button to zoom all graphics along the origin as the base point (as shown in the figure below).



Chapter V Settings

5.1 Process Configuration

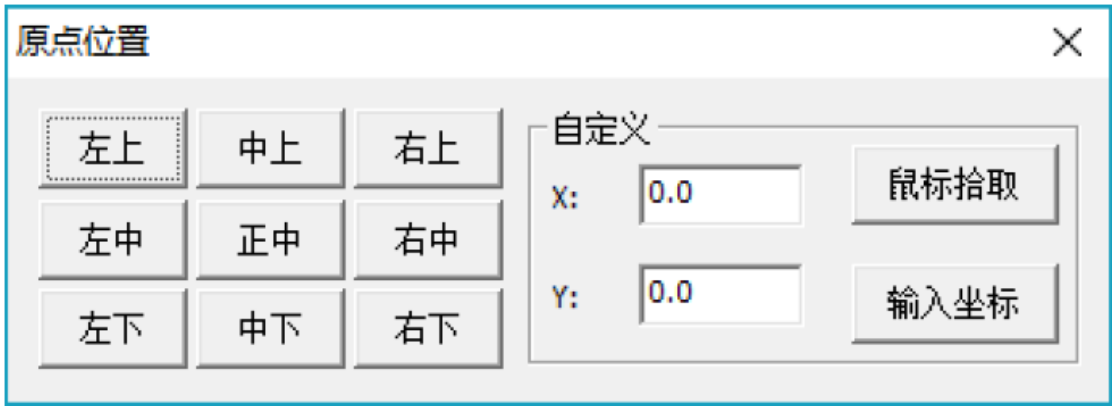
Click “设置“ – “工艺设置” (settings – process settings) button, then it can do process setting (see below).

5.2 Origin Configuration

Click “设置“ – “工艺设置” (settings – process settings) button, then it can do origin setting (like below figure). Default origin position is in left bottom corner. You can click the upper left, upper middle and other buttons to set the origin at the corresponding position of the graph, or you can input X and Y values, and then click the 输入坐标 (input coordinates) button, the origin will

be changed to the position of the input value, or you can click the “鼠标拾取“ (mouse pick up) button, and click the left button of the mouse at a valid position on the interface to set the origin to the cursor.

Note: the position of origin is always (0,0).



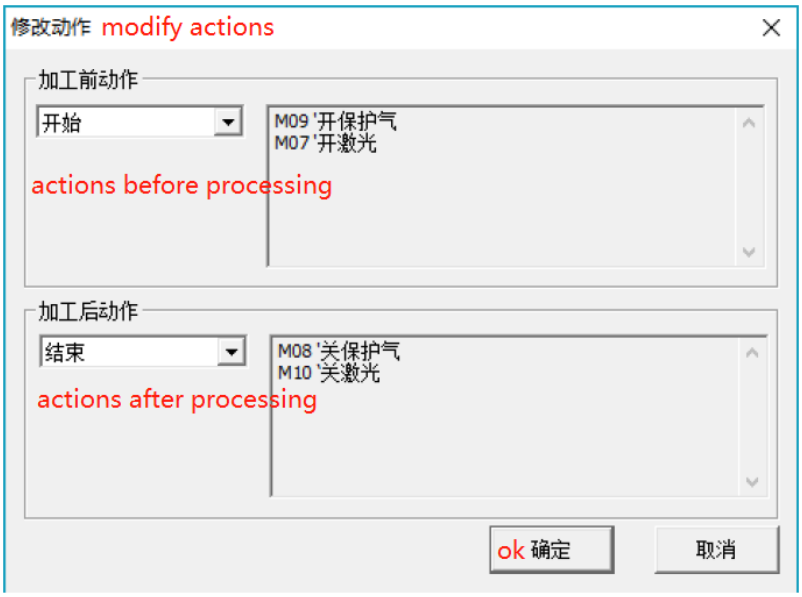
Chapter VI Customized Style

6.1 Add / Modify Actions

There are two ways to add actions of graphics:

1. In “设置“ – “工艺参数” (settings – process parameters) to add / modify the unified action of graphics in layer (see 5.1 process configuration).
2. 视图 – 命令管理器 – 管理动作 / 视图 – 动作管理器 (view – command manager – manage actions / view – action manager). There includes 编辑动作 / 新增动作 / 删除动作 (**add action:** click “新增” (add) button, then the dialog box will pop up, input the name of action and instructions, click “确认” (ok) button, then actions can be added.

   edit action: directly click the action button that needs to be edited (it can’t be as delete status), then it can edit action, then select the graph to be added or its action to be modified, click the right mouse, click “修改动作” (**modify action**) button, then the window will pop up (the action displayed in dialog box is the current action of the most front graph in selected graphics). You can select an action in the action selection box before processing and select an action in the action selection box after processing, and click the “确认“ (ok) button to add/modify actions for all selected graphics (as shown in the figure below).



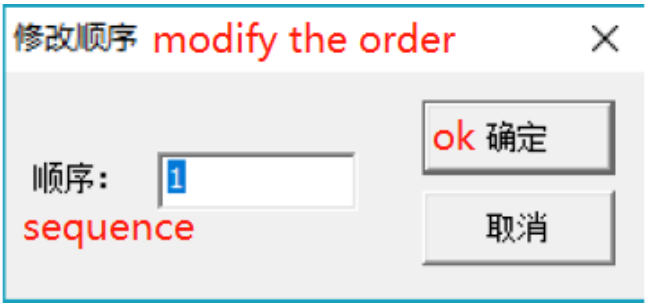
6.2 Delete Actions

There are 2 ways to delete actions of graphics:

1. Select the graph whose action needs to be deleted, right-click the mouse, and click the "删除动作" (Delete Action) button to delete the action of the selected graph.
2. Select the graphic whose action needs to be deleted, right-click the mouse, and click the "修改动作" (Modify Action) button to pop up the Modify Action dialog box. You can set the pre-processing or post-processing actions to none, and then click the "确认" (ok) button to delete the pre-processing or post-processing actions.

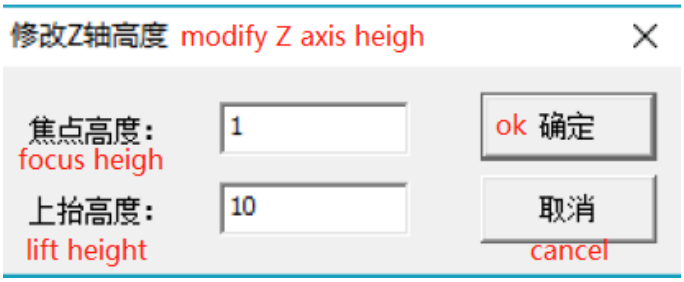
6.3 Modify the Sequence of Graphics

Select a graphic whose processing order needs to be changed (must be one), right-click the mouse, click the "修改图形顺序" (Modify Graphics Order) button, and the relative dialog box will pop up. The current displayed order is the current processing order of the selected graphic. Then, input new processing order, click the "确认" (ok) button to modify the processing order of the selected graphics (as shown in the figure below).



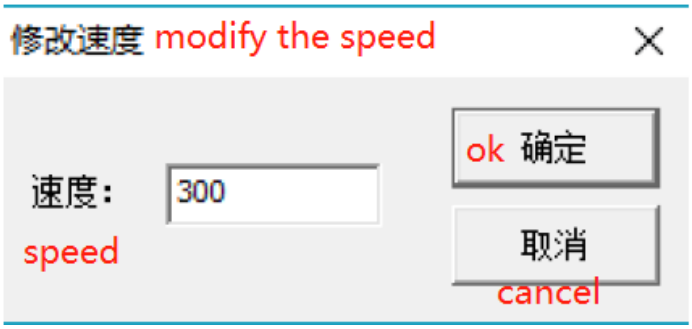
6.4 Modify the Height of Axis z

Select the graphic whose Z-axis height needs to be changed, right-click the mouse, and click the “修改 Z 轴高度“ (Modify Z-axis height) button, and the relative dialog box will pop up. The currently displayed focus height and lift height are the focus heights and lift heights of the most front graphics in the selected graphics. Input the new processing height and lift height, and then click the “确认” (ok) button to modify the processing height and lift height of all selected graphics (invalid when there is no Z axis) (as shown in the figure below).



6.5 Modify the Speed

Select the graphics whose processing speed needs to be changed, right-click the mouse, and click the “修改速度” (Modify Speed) button, then relative dialog box will pop up. The currently displayed speed is the processing speed of the most front graphics in the selected graphics. After inputting the new processing speed, click the “确认” (ok) button. You can modify the processing speed of all selected graphics (as shown in the figure below).



Chapter VII View

7.1 Zoom View

Scroll the mouse wheel to zoom in or out. The reference point is the current position of the mouse pointer.

7.2 Translation View

Press and hold the middle mouse button, move the mouse in the direction of panning, and then release the middle mouse button to pan the view according to the distance and direction of the mouse movement.

7.3 Code Display

In “视图” – “代码显示” (view – code display), you can choose whether to update the code automatically. If you choose not to update the code, the code will not be refreshed when you change the graph; if you choose to update the code automatically, the code will be refreshed according to the graph.

7.4 Grid Display

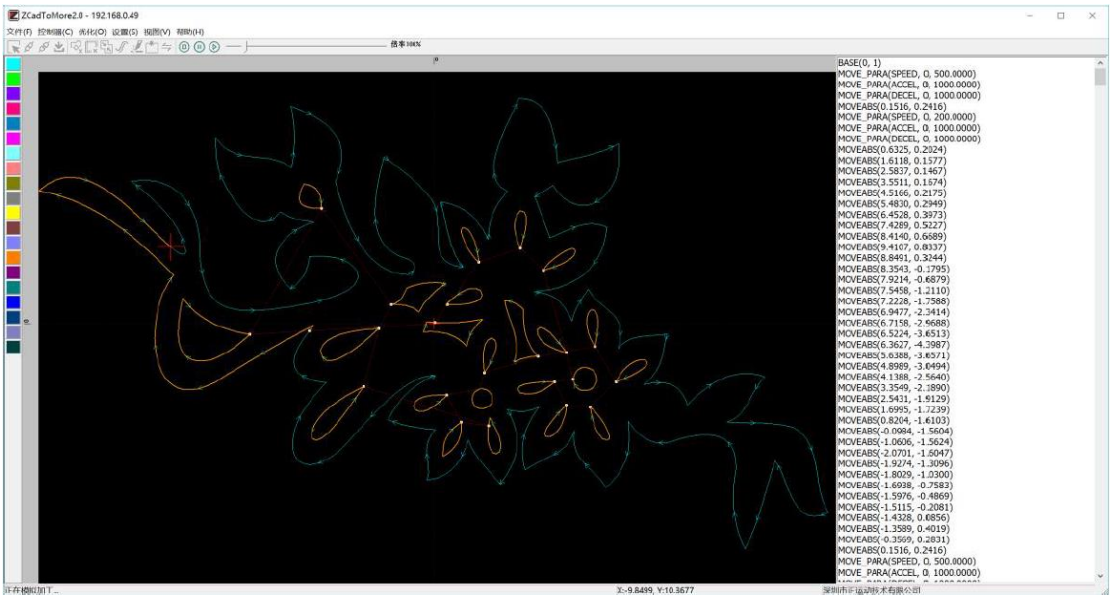
In “视图” – “网格” (view – grid), it can set whether display grid or not.

7.5 Reset Window Layout

In “视图” – “重置窗口布局” (view – reset window layout), it can recover default view layout.

7.6 Imitate Processing

Click the“视图”–“模拟加工”(View→ Simulation process) button (or press F5 directly) to simulate processing and display the processing process in the graphics display window. In the shortcut toolbar, you can choose to stop processing, pause processing, continue processing and drag the slider to adjust the feed override of the simulation speed (the override range is 1%~1000%). No other operations can be performed during the processing. Press the ESC key to exit the simulation processing, as shown in the figure below.


ZCadToMore2.0 - 192.168.0.49
文件(F) 控制器(C) 优化(O) 设置(S) 视图(V) 帮助(H)
BASE(0, 1)
MOVE_PARA(SPEED, 0, 500.0000)
MOVE_PARA(ACCEL, 0, 1000.0000)
MOVE_PARA(DECEL, 0, 1000.0000)
MOVEABS(0.1516, 0.2416)
MOVE_PARA(SPEED, 0, 200.0000)
MOVE_PARA(ACCEL, 0, 1000.0000)
MOVE_PARA(DECEL, 0, 1000.0000)
MOVEABS(0.6325, 0.2024)
MOVEABS(1.6118, 0.1577)
MOVEABS(2.5837, 0.1467)
MOVEABS(3.5511, 0.1674)
MOVEABS(4.5166, 0.2175)
MOVEABS(5.4830, 0.2949)
MOVEABS(6.4528, 0.3973)
MOVEABS(7.4289, 0.5227)
MOVEABS(8.4140, 0.6689)
MOVEABS(9.4107, 0.8337)
MOVEABS(8.8491, 0.3244)
MOVEABS(8.3543, -0.1795)
MOVEABS(7.9214, -0.6879)
MOVEABS(7.5458, -1.2110)
MOVEABS(7.2228, -1.7588)
MOVEABS(6.9477, -2.3414)
MOVEABS(6.7158, -2.9688)
MOVEABS(6.5224, -3.6513)
MOVEABS(6.3627, -4.3987)
MOVEABS(5.6388, -3.8571)
MOVEABS(4.8989, -3.6494)
MOVEABS(4.1388, -2.5640)
MOVEABS(3.3549, -2.1890)
MOVEABS(2.5431, -1.9129)
MOVEABS(1.6995, -1.7239)
MOVEABS(0.8204, -1.6103)
MOVEABS(-0.0984, -1.5604)
MOVEABS(-1.0606, -1.5624)
MOVEABS(-2.0701, -1.6047)
MOVEABS(-1.9274, -1.3096)
MOVEABS(-1.8029, -1.0300)
MOVEABS(-1.6938, -0.7583)
MOVEABS(-1.5976, -0.4869)
MOVEABS(-1.5115, -0.2081)
MOVEABS(-1.4328, 0.0856)
MOVEABS(-1.3589, 0.4019)
MOVEABS(-0.3599, 0.2831)
MOVEABS(0.1516, 0.2416)
MOVE_PARA(SPEED, 0, 500.0000)
MOVE_PARA(ACCEL, 0, 1000.0000)
正在模拟加工...
X:-9.8499, Y:10.3677