Machining Simulation Quick Start For Lathe

Table of Contents

| Machin | ing Simulation Quick Start For Lathe1 |
|--------|---------------------------------------|
| 1. | Right Mouse Button Menu:2 |
| 2. | 3D CNC machine model transformation |
| 3. | Main menu introduce |
| 4. | Tool library7 |
| 5. | Machine panel introduce11 |
| 6. | Manual tool presetting15 |
| 7. | Instant tool presetting |
| 8. | Tool Offset |
| 9. | Use MPG |
| 10. | Note |

1

1. Right Mouse Button Menu:

| Remove tool Remove all tools |
|---------------------------------|
| Tool ready |
| 2D View |
| Wire section |
| Solid section |
| Chuck In Reverse |
| Front view |
| Side view |
| Top view |
| Hide enclosure |
| Move To(JOG Mode) |
| Open door |
| Watch variables |

1) **Remove tool:** Select a tool shank on the turret with mouse cursor, when it is selected or when the mouse cursor rolls over it, the selected tool is displayed with green color, then selecting the item "Remove tool" will remove the tool from the turret.

2) Remove all tools: Selecting the item "Remove all tools" will remove all the tools from the turret.

3) **Tool ready:** Select a tool shank on the turret with the mouse cursor, when it is selected or when the mouse cursor rolls over it, the selected tool is displayed with green color, then selecting the item "Tool ready" will turn the tool into the position for cutting.

- 4) 2D view: Display stock and tool in 2D view
- 5) Wire section: Display stock in a wire section view
- 6) Solid section: Display stock in a solid section view
- 7) Front view: Change to the front view
- 8) Side view: Change to the side view

9) Top view: Change to the top view

10) Hide/Show enclosure: Hide/Show machine enclosure.

11) **Move to center/external:** Move the tool to touch the center or external circle of the workpiece

12) **Open/Close door:** To open/close door, release Emergency button and power on, then select "Open door" or "Close door"

13) **Watch variables:** To observe the values of all MACRO variables with the watch window on which local, common and system variables are displayed.

2. 3D CNC machine model transformation

1) To rotate machine model, press and hold the left mouse button and drag it.

2) To zoom in and out machine model, roll mouse wheel to zoom.

3) To pan machine model, press and hold the mouse wheel and drag it.

Click the door handle to open/close the door



3. Main menu introduce.

Measure – File – Option – View – Switch panel – Workpiece – Check for updates – 😯

1) Measure

- **a)** Select face: Select the face to be measured.
- **b)** Trace and time: Import a NC program to estimate automatically its cycle time for a real CNC machine and generate the tool path.
- c) Export report: Export the report of "Trace and time".
- d) Quit estimate: Quit the mode of "Trace and time".



2) File

- a) Import: Import a NC program from local disks to the simulator under which EDIT mode is available and the NC program is opened or created. The formats of TXT, CNC and NC are supported.
- b) Export: Export a NC program under which EDIT mode is available and then the NC program is exported to as a TXT, CNC or NC from the simulator to local disks.
- c) Save workpiece: Save machined workpiece.
- d) Read workpiece: Read saved workpiece.

3) Options

- a) Displaying programming trace: When on, show programming trace during auto run. When off, hide programming trace.
- b) Display enclosure: When on, show enclosure, when off, hide enclosure.
- c) Sound effect: When on, enable sound, when off, disable sound.
- d) Shadow effect: When on, enable shadow effect, when off, disable shadow effect. If some obsolete display adapters cause several types of problems, such as running slowly, the option better be disabled.
- e) Anti-Alias: To smooth the 3D machine models, tool paths.



4) View

- a) View panels: When CNC panel is closed, use the menu to reopen CNC panel.
- **b)** Show in dual monitors: Separately show panels and 3D model in dual monitors. It's only available when two monitors are connected.

5) Switch panel

a) Switch CNC system and panel to one another.

6) Workpiece---Settings

| | | | × |
|-----------|------------------------------|--|--|
| Parameter | | | |
| Length | 100 | Diameter | 55 |
| Width | | Inner D | 10 |
| | | | |
| | Balanced | | Quality |
| | | | |
| | | | |
| | Apply | OK | Exit |
| | | | |
| | | | |
| | Parameter Length Width | Parameter Length 100 Width Balanced | Parameter Length 100 Diameter Width Inner D Balanced T |

- **a)** There are two options for box and cylinder workpieces.
- **b)** Quality: Improve the smoothness of workpiece you can see on the screen:
- c) Performance: Jaggies
- d) Balance: Less jaggies
- e) Quality: Smooth, you will experience a decrease in performance with the high value. It is recommended to select a value based on how your display adapter can perform.

7) Workpiece---Clamps setting

| Fixt | ure | | | × |
|------|------------------|----|--------|---|
| [| Fixture settings | | | |
| | Fixture type | ~ | | |
| | X direction | | 0 | |
| | Y direction | | 0 | |
| | Z direction | | 18.000 | |
| | | ОК | Exit | |

a) Adjust the position of the stock gripped in jaws in Z-axis position.

8) Check for update

a) Check if a newer version, internet connection is required.



9) Help@, click for a quick start manual.

4. Tool library

1) Click the icon to open the tool library.

7



| ollibrary | | | | | | | | 1000 | Turr | et | | |
|-----------|-----------|--------------|--------|-----------|-----------|----------|-----------|------------|-----------------------|-----------|------|--|
| | Turne | Longth | Width | Diamotor | Incort I | Tocort W | Thickness | | | Tool NO | NO | |
| NO. | туре | Length | widun | Diameter | Insert L | Insert w | THICKNESS | | _ | TOOTNO. | NO. | |
| 1 | Extern | 100.000 | 15.000 | 0.000 | 6.000 | 6.000 | 3.000 | Mount to>> | - | 1 | 1 | |
| 10 | Extern | 120.000 | 10.000 | 0.000 | 6.000 | 6.000 | 3.000 | | | 2 | 1 | |
| / | Extern | 102.038 | 10.000 | 0.000 | 5.000 | 5.000 | 3.000 | | - | 3 | | |
| 3 | Inreading | 102.038 | 10.000 | 0.000 | 3.000 | 3.000 | 3.000 | | - | 4 | | |
| | | | | | | | | | | 5 | | |
| | | | | | | | | | - | 7 | | |
| | | | | | | | | | | 8 | 3 | |
| | | | | | | | | | | 0 | 5 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| • | | 1 | " | | | | + | | - | | | |
| Tool | | | Ins | ert | | | | | | | | |
| Type | Euto | an al Temain | | nath | | | | | | | | |
| Type | Exte | rnai Turnin | · · | Length | | | Add | | Remove all Tool ready | | | |
| NO. | | | Wi | Width | | | | | | | | |
| | | | | Delete | | | | | Re | move tool | | |
| Length | | | Th | ickness | | | Delete | | | | | |
| Width | | | No | se radius | | | | | | | | |
| | | | | oc radius | | | Modify | | | | | |
| Diameter | | | An | gle | 35 | | | | | | | |
| | | | | | | | | | | | | |
| Feedrate | | | Ma | iterial | High-spee | d 🔻 | | | _ | | | |
| RPM | | | | | | | | | | ок | Exit | |
| | | | | | | | | | | | | |

2) New Tool:

- **a)** Select a tool type.
- **b)** Input a tool number and other parameters for the tool, please note that the new tool number must be differ from those existing in the tool library.
- **c)** Press the Add button, the steps for creating a new tool as the screenshot below.

8

| ol libr | ary | | | | | | | | | Turre | et | | |
|--------------|------------------------------------|------------------|--------|-------------|-------|--------|--------|--------|-------------|-------|--------|------|--------------------------|
| con | тод | Туре | Length | Width | Diam | Inse | Inse | Thic | | | St | То | Туре |
| h | 4 | Internal Threa | 80.000 | 10.000 | 0.000 | 2.000 | 2.000 | 3.000 | Mount to >> | | 1 | 1 | External Tur. |
| _ | • | Internal Turning | 100 | 15 000 | 0.000 | 5 000 | 5 000 | 4 000 | Mount to>> | | 2 | 2 | Drill |
| _ | , | Internal running | 100 | 13.000 | 0.000 | 3.000 | 3.000 | 4.000 | | | 3 | 17 | Face turnin |
| | 19 | Face turning(r | 100 | 15.000 | 0.000 | 6.000 | 6.000 | 4.000 | | | 4 | 12 | Threading |
| 51 | 17 | Face turning(R | 60.000 | 8.000 | 0.000 | 5.000 | 5.000 | 4.000 | | | 5 | 5 | Grooving External Tur |
| p | 12 | Threading | 100 | 25.000 | 0.000 | 3.000 | 3.000 | 4.000 | | | 7 | 4 | Internal Thr. |
| 2 | 11 | External Turni | 120 | 12.000 | 0.000 | 5.000 | 5.000 | 4.000 | | - | 8 | | |
| 2 | 16 | Neutral | 100 | 15.000 | 0.000 | 6.000 | 6.000 | 4.000 | | | | | |
| 1 | 13 | Grooving | 100 | 15.000 | 0.000 | 8.000 | 4.000 | 4.000 | | | | | |
| rooi Type | ooi Type 1 a Internal Th | | | ert gth | 2.00 | 0 | - [| 3 Add | | F | lemove | all | Tool ready |
| Tool N | 10. <mark>2</mark> | 4 | Wid | Width 2.000 | | | | Delete | | R | emove | tool | |
| Lengt | h | 80.000 | Thic | kness | 3.00 | 0 | | | | | | | |
| Width | | 10.000 | | | | | | Modify | | | | | |
| Diame | ter | 0.000 | Ang | jle | 110 | | ~ | | | | | | |
| eedr | ate | 0.000 | Mat | erial | High | -speed | ~ | | | _ | | _ | |
| | | | | | | | | | | | OK | | F . 44 |

3) Modify Tool:

a) Select a tool from the tool list, its parameters are displayed below for modification, then edit the parameters, press "Modify" button to finish the modification.

4) Delete Tool:

a) Select a tool from the tool list, press "Delete" button to delete a tool from the library.

5) Mount Tool:

Right-click an item of a tool from the tool library list, the menu popping up as the picture below, select a tool station to mount or press "Mount to" button to do so, the mounted tool will be displayed in the turret list. The green circle indicates which tool has been indexed into the position for cutting.

| ool libr | ary | | | | | | | Turret |
|-------------|------|--------------------|--------|--------|-------|-------|-------|---|
| Icon | Tool | Туре | Length | Width | Diam | Inse | Inse | Thic St To Type |
| B n | 4 | Internal Threa | 80.000 | 10.000 | 0.000 | 2.000 | 2.000 | 1 External T |
| ~ | | | | | | | | 2 Drill |
| | 9 | Internal Turning | 100 | 15.000 | 0.000 | 5.000 | 5.000 | ✓ Station:2<-Tool NO.:2 17 Face turning |
| | 19 | Face turning(r | 100 | 15.000 | 0.000 | 6.000 | 6.000 | Station:3<-Tool NO.:17 12 Threading |
| 6 11 | | From the second to | 60.000 | 0.000 | 0.000 | 5 000 | 5 000 | Station:46-Tool NO :12 13 Grooving |
| M | 1/ | Face turning(R | 60.000 | 8.000 | 0.000 | 5.000 | 5.000 | 5 External T |
| B | 12 | Threading | 100 | 25.000 | 0.000 | 3.000 | 3.000 | Station:5<-Tool NO.:13 4 Internal The |
| | 11 | External Turni | 120 | 12 000 | 0.000 | 5 000 | 5 000 | Station:6<-Tool NO.:5 |
| 200 | | External ramin | 120 | 12.000 | 0.000 | 5.000 | 5.000 | Station:7<-Tool NO.:4 |
| Ļ | 16 | Neutral | 100 | 15.000 | 0.000 | 6.000 | 6.000 | Station:8 |
| 9 | 13 | Grooving | 100 | 15.000 | 0.000 | 8.000 | 4.000 | 4.000 |
| | | | | | | | | |

6) Important for calling T command:

a) Always specify a tool number in the T code , instead of the tool station number , in the NC programs, see the picture below.



7) Check Tool Number: Select a tool with the mouse cursor, if selected, the selected tool is displayed with green color, the details of the tool are displayed.



5. Machine panel introduce

1) CNC machine panel

Emergency stop POWER ON Power on POWER OFF Power off CYCLE START Cycle start CYCLE STOP Cycle stop INC mode AUTO Edit mode MDI mode Auto mode ଚ ₩₩` ÷ HANDLE MPG mode REF REF mode JOG JOG mode ුටිම COOL Coolant system on/off



Tool indexing. The turret will rotate, it should be used in JOG mode.

조미 SPDL CVV SPDL SPDL STOP CCVV Main S

Main spindle CW, Stop, CCW

RAPID Rapid jog



Incremental feeds for INC mode, X1(0.001), X10(0.01), X100(0.1), X1000(1.0)



Spindle override



Feed rate override



Program protect, to edit a NC program, unlock is required.

2) Edit program

a) Switch to EDIT mode, unlock the program protect before edit.

Press EDIT button, then press PORG button and DIR softkey button



b) Open a NC program: Input a NC program name that exists in the system, such as "O0001", press "Arrow Down" button on the system panel to open the NC program



c) New a NC program: Enter a CNC program name that doesn't exist in the system, such as "O0001", press "Insert" button.

d) Edit a NC program: Use the three buttons to edit a program: Alter, Insert, Delete. Edit is not available until program protect is unlocked.

- e) Delete a NC program: Enter a CNC program name, press "Delete" button.
- f) Import a NC program from your disk:
 - Switch to EDIT mode in the Simulation, and then either create or open a CNC program.
 - New a Notepad text file.
 - Enter or paste CNC program into the text file.
 - Select "Save as" and select "Save as type:" as "All files".
 - Enter a file name, such as "XXXX.cnc" or "XXXX.nc".
 - Use Import menu in the Simulation to select the file, click "Open".
 - The file is imported.

3) Auto run

Open an existing NC program or import a NC program, then press





Cycle start, the NC program will be executed.

Press to enable Single Block mode, it helps to check and test your NC program before you hit cycle start and have a problem. When on, CNC program will be executed block by block, one block a time, when off, the function is disabled.

4) MDI

- a) Press button, press button , an image shown as following.
- **b)** Enter a block, such as "G54X0Y0Z0", press to execute the block you enter.



5) Return to reference point.



- a) Press REF button to REF mode.
- **b)** Press the positive direction button for each axis one after the other until each LED is on.

c)



6. Manual tool presetting

1) Switch to JOG mode, start main spindle, move the tool in the negative direction of Z-axis to slightly and gently cut the stock.



2) Enter into measure mode, and measure the cut workpiece and remember the diameter.



3) Press and "WORK".

| WORK | COOR | DINATES | | 000 | 177 | N00000 |
|-------|-------|---------|------|-------|--------|----------|
| (EXT) | | | | | | |
| NO. | | DATA | | NO. | | DATA |
| 00 | х | 0.000 | | 02 | х | -377.126 |
| (EXT) | Z | 0.000 | | (G55) | Z | -140.116 |
| 01 | Х | 0.000 | | 03 | Х | 0.000 |
| (G54) | Z | 0.000 | | (G56) | Z | 0.000 |
| 04 | Х | 0.000 | | 06 | Х | 0.000 |
| (G57) | Z | 0.000 | | (G59) | Z | 0.000 |
| 05 | Х | 0.000 | | | | |
| (G58) | Z | 0.000 | | | | |
| | | | | | | |
| | | | | | | |
| >_ | | | | | | |
| | | | | _ | 512 | |
| JOG | H | OLD *** | ALM | | 12:31: | 50 |
| < 0 | FFSET | SETING | WORK | | _ | (OPRT) + |



- **5)** Input X and the diameter measured, for example, X54.555, press "Measure" soft key to finish the input for X-axis.
- 6) Touch off the tool to the end face of the workpiece by moving it in X-axis, input Z0, press "Measure" soft key to finish the input for Z-axis,

7. Instant tool presetting

- **1)** Move your mouse on the tool shank, and then select "Tool ready", the tool is turned into the position for cutting.
- **2)** Select "Move to center", the tool tip is located to the center or the extern circle of end face of workpiece.



| WORK | COOR | DINATES | | | 00077 N000 | | | | | |
|-------|-------|---------|------|------|------------|--------|----------|-----|--|--|
| (EXT) | | | | | | | | - 8 | | |
| NO. | | DATA | | | NO. | | DATA | - 1 | | |
| 00 | Х | 0.000 | | | 02 | х | -377.126 | - 8 | | |
| (EXT) | Z | 0.000 | | | (G55) | Z | -140.116 | - 8 | | |
| 01 | x | 0.000 | | | 03 | х | 0.000 | - 1 | | |
| (G54) | z | 0.000 | | | (G56) | z | 0.000 | - 1 | | |
| 04 | x | 0.000 | | | 06 | х | 0.000 | - 1 | | |
| (G57) | z | 0.000 | | | (G59) | z | 0.000 | - 1 | | |
| 05 | х | 0.000 | | | | | | - 1 | | |
| (G58) | Z | 0.000 | | | | | | - 1 | | |
| | | | | | | | | - 1 | | |
| | | | | | | | | - 1 | | |
| >_ | | | | | | | | | | |
| | | | | | | 512 | 0 100 | 100 | | |
| JOG | H | OLD 1 | *** | ALM | | 12:31: | 50 | | | |
| < 0 | FFSET | SETIN | IG V | VORK | | | (OPRT) | + | | |

3) Select the desired work coordinate between G54 to G59, input X0, press "Measure" soft key to finish the input for X-axis, the operations for Y and Z axis are the same as for X axis.

8. Tool Offset



- **1)** Move your mouse on the tool shank, the information about the tool pops up.
- 2) Right-click the mouse to show the menu below.



3) Select "Tool ready", the tool is indexed to the cutting position.

OFFSET

- **4)** then select "Move to center", the tool tip is located to the center or the extern circle of end face of workpiece.
- **5)** Press "OFFSET SETTING" **INCOMPANY** displays as below:

| E De | T SETTI elow: | ING" | J butto | n on FA | NUC panel | , the screen |
|---------|------------------|--------------|-----------|---------|------------|--------------|
| | OFFSET | | | 000 | 002 N00000 | |
| | NO. | Х | Z | R | Т | |
| | 001 | -181.126 | -141.028 | 0.000 | 0.000 | |
| | 002 | -141.126 | -141.027 | 0.000 | 0.000 | |
| | 003 | -177.050 | -146.028 | 0.000 | 0.000 | |
| | 004 | -176.446 | -141.028 | 0.000 | 0.000 | |
| | 005 | -140.000 | 0.000 | 0.000 | 0.000 | |
| | 006 | -140.000 | -110.000 | 0.000 | 0.000 | |
| | 007 | -177.050 | -146.028 | 0.000 | 0.000 | |
| | 800 | 0.000 | 0.000 | 0.000 | 0.000 | |
| | ACTUA | L POSITION(F | RELATIVE) | | | |
| | U -1 | 40.000 | | W | -110.000 | |
| | >_ | | | | | |
| | EDIT * | *** *** | *** | ALM | *** | |
| | WEAR | 11 GEOM | 11 | 11 | 1 [(OPRT) | 1 |

6) Input X0, press "Measure" soft key to finish the input for X-axis, the operations for Y and Z axis are the same as for X axis.

| >×. | - | | | | | | | | | |
|-----|----|------|---------|--------|-------|-----|--------|-----|-----|----|
| | | | | | | | S12 | 01 | 000 | 30 |
| J | 0G | **** | *** *** | | * * * | ALM | 18:15: | 24 | | |
| < | < | | MEASU | MEASUR | | | +INPUT | INP | TUY | + |

9. Use MPG

1) Switch to WHEEL or HND mode on the operator panel, To use it by double clicking on the MPG. To close Hand Wheel, Double Click on it again.



- **2)** Select the axis from OFF, X, Y, Z on the axis selector knob.
- **3)** Select the rate from X1 to X1000 on the rate selector knob.
- 4) Use the hand wheel to jog the machine.



10. Note

- 1) A few of computers may have a problem with displaying the 3D machine model due to one of following reasons:
 - a) AMD graiphics card : please download the latest graphic driver from <u>AMD website</u> and update your AMD graphic driver to the latest .
 - b) Dual graiphics cards : please select the high preformance NVIDIA processor for the simulators.

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http://www.greatsim.com feedback@greatsim.com