D52-ADC DENTAL MILLING MACHINE

OWNER'S MANUAL

2022-8
1.0 version

CONTENTS

1.Mill machine description

1.1 Safety instruction

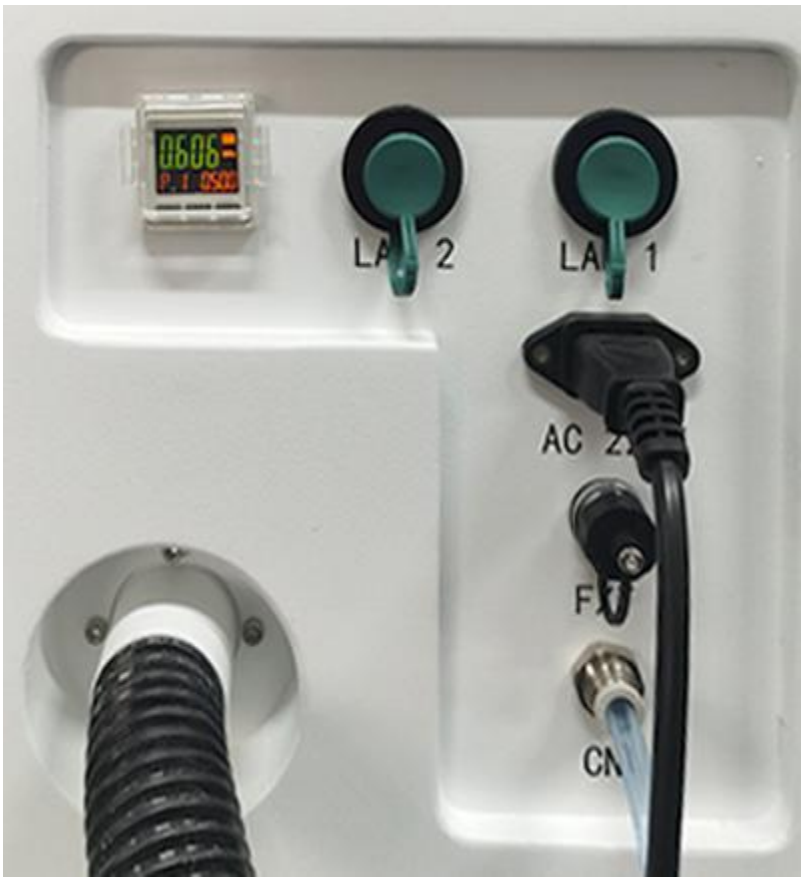
A. Before operate the mill machine, please read through carefully the following safety instructions.
B. Suitable power is 220V 50/60Hz, and ensure well grounded.
C. The leakage protection switch must be in good contact and stable.
D. Ensure power and power cables are properly managed and undamaged to prevent short circuit trips.
E. Ensure that the external air pressure is continuously input after drying, otherwise the spindle will be burned

1.2 Mill machine parameters

Item	Intelligent 5 axes mill machine with automatic discs change
Power input	Single phase AC 220V 50/60Hz 8A 1.8KW
Air pressure input	≥6 bar
Dimension	850*780*835mm
Net weight	230kgs
Spindle speed	60000RPM
Spindle power	500W
Maximum rotation axis	B axis：±360° A axis：+30° -90°
Tool shank diameter	4mm
Tool QTY	10PCS
Process mode	Dry
Material suitable	Zirconia,wax,PMMA,composite resin,PEEK, soft milling CoCr sintering metal
Automatic disc changer	8-slot

1.3 Ports

Machine interface panel Ports located at bottom left rear of the machine



Explanation:

From left to right, top to bottom

A.  Presents the current air pressure

B. LAN2: Internet port through which the device is connected to the Internet

C. LAN1: LAN port for debugging and file transfer

D. Power: Single phase AC 220V 50/60Hz 8A 1.8KW

E. FXT: The automatic start-stop port of the vacuum cleaner connects the device to the vacuum cleaner through an aviation plug.

F. CN: air source access port

2.Installation and adjustment of the mill machine

2.1 Accessories list

No.	Name		QTY	Note
1	Intelligent 5 axes discs changer	D52-ADC	1pcs	
2	Calibration disc	Φ98*10	1pcs	
3	Spare screws for clamps	M4*10	20pcs	
4	Clamps	Φ98.9mm	8pcs	
5	Vacuum gun components	Innerφ32mm-Outer φ9mm	1set	
6	Vacuum plug	φ18-35mm blue	1pcs	
7	Spindle Maintenance Tooling		1set	
8	D52-ADC owner's manual		1pcs	
9	USB disc		1pcs	
10	2-pin aviation plug		1pcs	For vacuum cleaner
11	Ball plunger	M12	1pcs	
12	Air pipe	8MM	5m	
13	T air pipe	8MM	1pcs	
14	Screwdriver		1set	
15	Hexagon		1set	
16	Torque wrench	0.6NM	1set	
17	Electrician's flat-blade screwdriver	2.4*50mm	1set	
18	Quality pass card		1pcs	
19	Accessories list		1pcs	

2.2 Machine stand required

2.2.1 The workbench for the machine should be able to bear 300KG, and ensure that there is enough space to

place the machine.

2.2.2 Use tools to disassemble the surrounding plywood boards, pay attention when removing the boards to avoid that the boards fall and hit people or equipment.

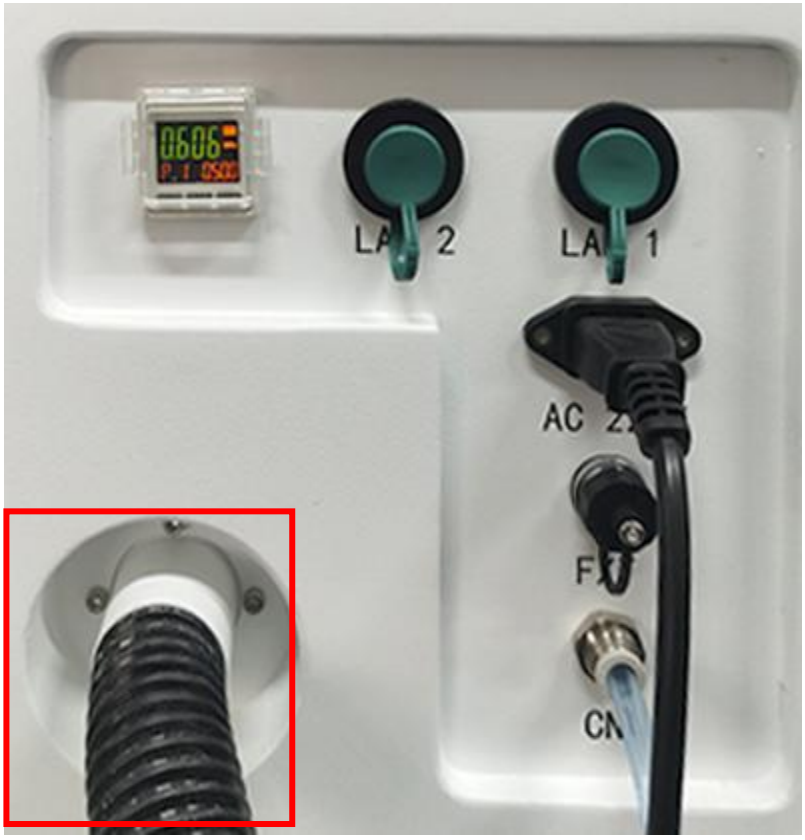
2.2.3 After the boards are disassembled, four handling aids are attached to the bottom of the side of the equipment, and four adult males lift the equipment to the workbench.

2.2.4 After placing the machine, assure the feet to be evenly stressed.

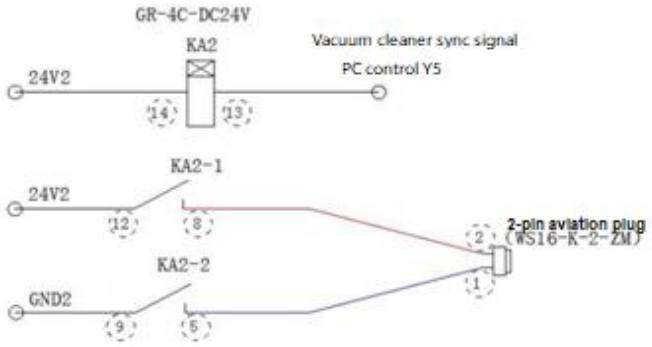
2.3 Vacuum cleaner

2.3.1 Connect the vacuum cleaner

Connect the vacuum cleaner pipe, **φ40mm**,to the port on vacuum cleaner, and the other end of the pipe connected to the machine.



2.3.2 The connect of automatic start-stop line



2.4 Connect to the outer air pressure

2.4.1 The compressed gas used by the machine should be dried and should not contain moisture, otherwise it will burn the spindle.

2.4.2 The mill machine applied pipe dia 8mm to connect to the outer air source.
C. The air source pressure should be kept above 0.6 MPa, and the air flow should be greater than 95L/min. If the air pressure is too low, the device will stop working and display the low air pressure fault standby.

2.5 Connect to the power plug

2.5.1 Plug the equipment triangle into the socket and make sure the equipment end connector is firmly connected.

2.5.2 Press the ON/OFF button on the right side of the machine, then the machine turns on.

2.6 Checks after power on

2.6.1 The machine lights work normally, and the fans on the back of the machine work normally.

2.6.2 Check the display interface for ice water machine alarm and air pressure alarm.

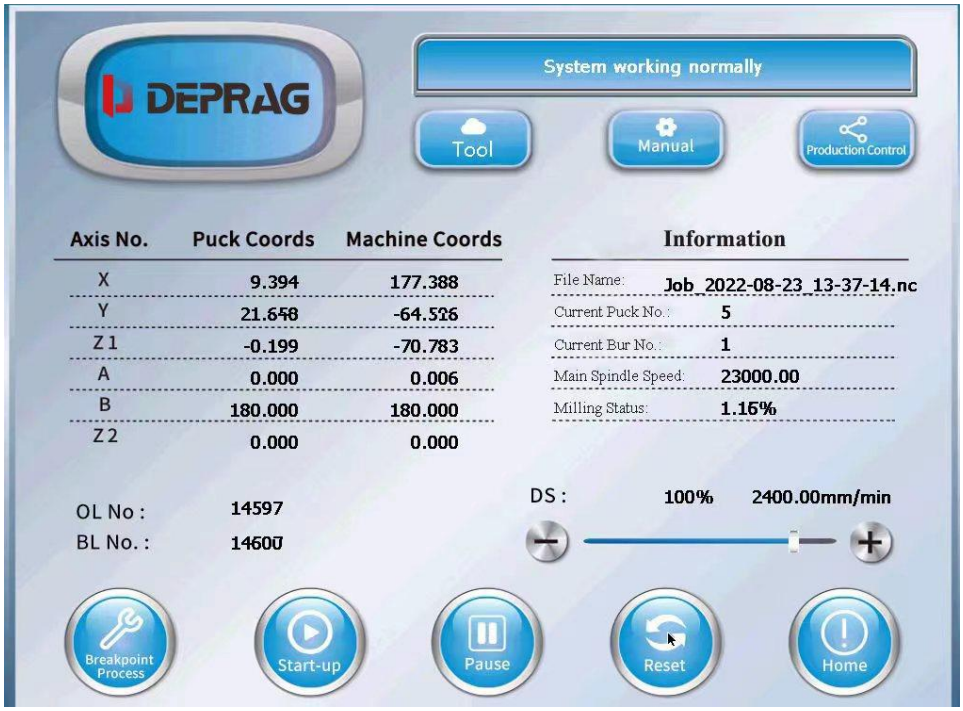
2.6.3 Check if the silo is pushed and pushed out smoothly, and whether it is locked firmly after it is in place.

2.6.4 Confirm that there is no foreign matter stuck in the A axis and B axis.

3. Machine operation

Machine power on, confirm the state of the emergency stop button, if the side emergency stop button is in the red state, release the emergency stop button, otherwise the device is in the emergency stop state.

If the emergency stop button is not pressed, skip this step; if the emergency stop button is pressed, after releasing the emergency stop button, click the "Reset" button in the lower right corner of the home page to reset the system.



Automatic zero return: enter the home page, click the "Home" button, the device will automatically return to zero, and the zero return sequence is Z1Z2XYAB. The device has not completed the zero return, and the functional buttons in the manual mode must not be operated.

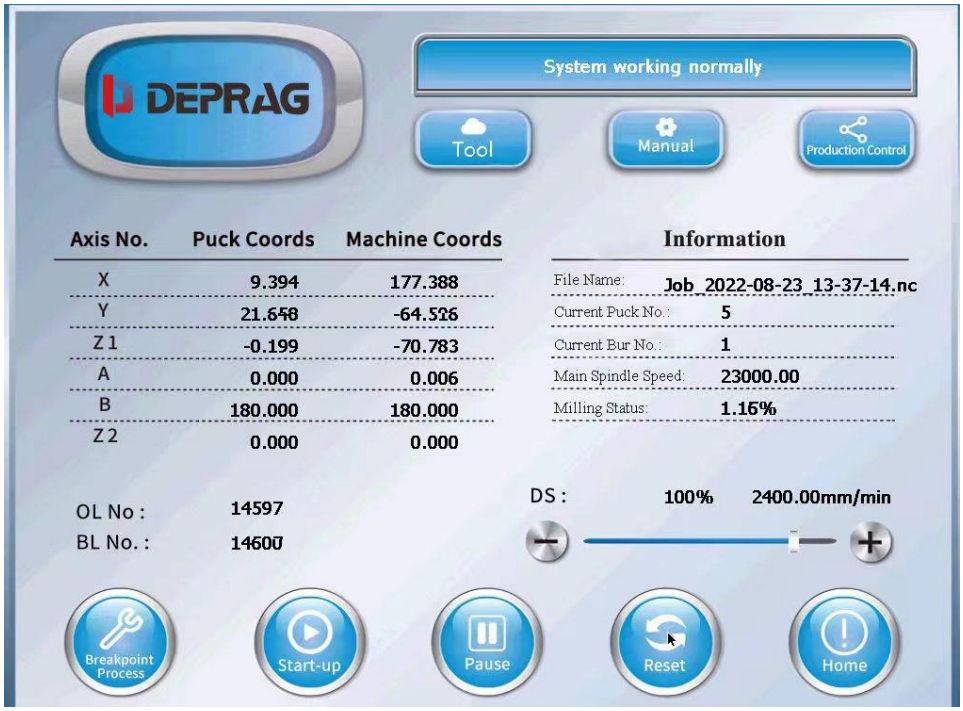
Calibration between the chip code of the material disc holder and program is required.

After the chip calibration is completed, confirm that there is no abnormality, and then perform the device axis calibration

4. Panel interfaces explanation

4.1 homepage introduce

4.1.1 home page



※DEPRAG: Press the logo on the top left, input the pass code to enter into higher permission.

※Tool: Click the “Tool” button to enter the tool life setting page.

※Manual：Click the “Manual” button to enter the coordinate setting page.

※Production Control：Click the Production Control button to enter the plan list and local memory。

※Breakpoint Process：When the machine is stopped and reset, press the Breakpoint Processing button, and the program can continue to be processed after the previously disconnected program line.

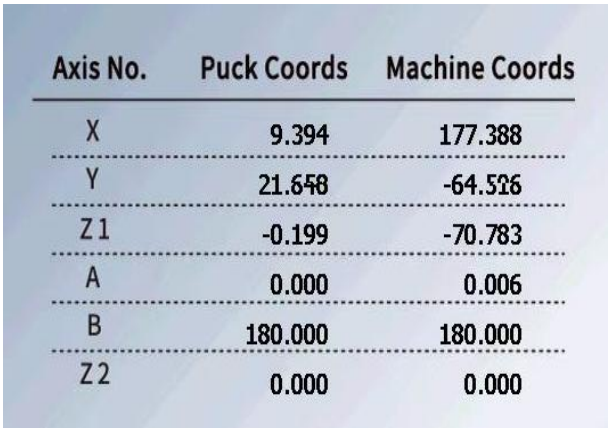
※Start-up：Start the programs and files in the schedule list.

※Pause：Click to suspend equipment processing

※Reset：Reset abnormal alarm information and reset running program files

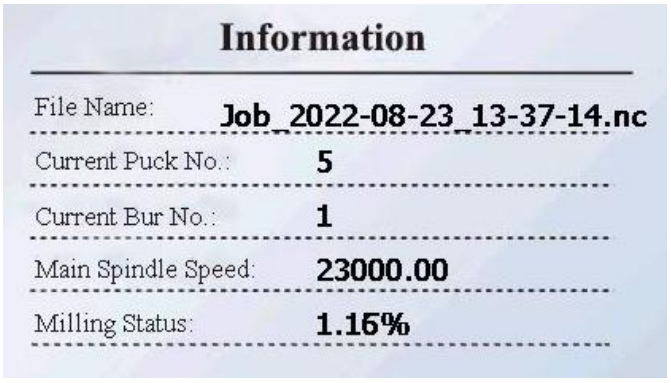
※Home：Click the Home button, All axes of the equipment will perform zero return action, and each time the equipment is turned on, it needs to perform zero return once, otherwise there will be a warning prompt to return to zero.

4.1.2 Display of coordinate information of each axis



Axis No.	Puck Coords	Machine Coords
X	9.394	177.388
Y	21.648	-64.526
Z1	-0.199	-70.783
A	0.000	0.006
B	180.000	180.000
Z2	0.000	0.000

4.1.3 Display the current processing file, material disc number, tool number, Spindle speed and milling status.



Information

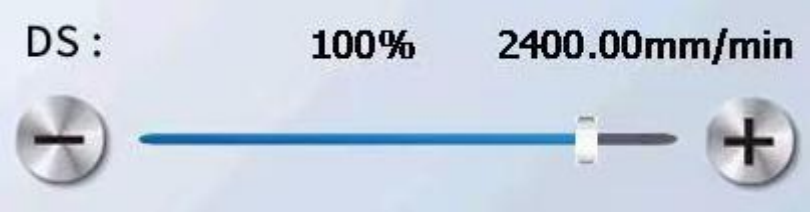
File Name:	Job_2022-08-23_13-37-14.nc
Current Puck No.:	5
Current Bur No.:	1
Main Spindle Speed:	23000.00
Milling Status:	1.16%

4.1.4 Display system status, including alarm information

4.1.5 Operating line number and breakpoint line number display

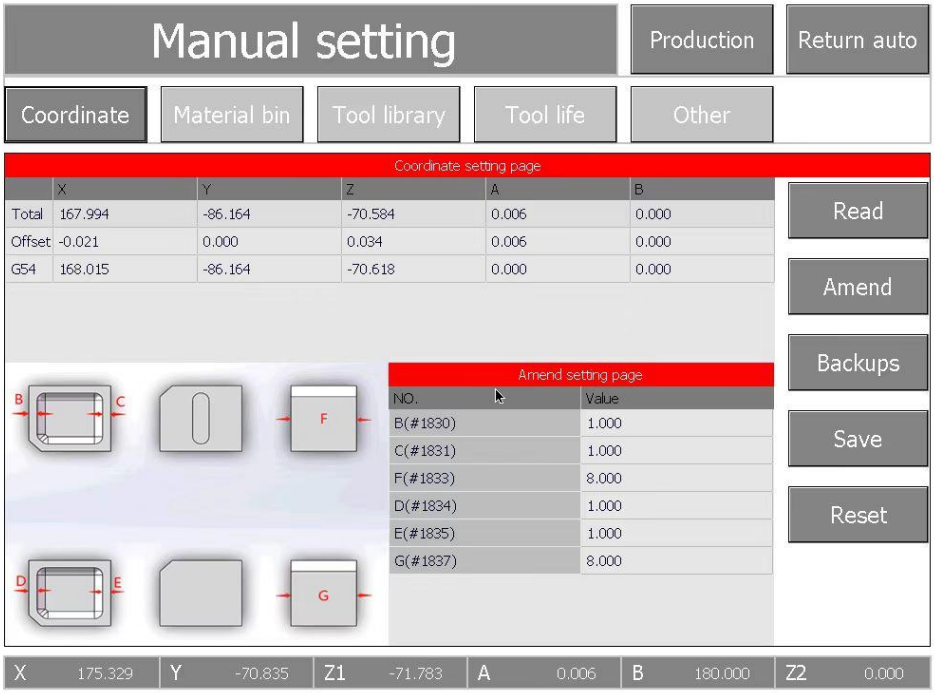
OL No :	14597
BL No. :	14600

4.1.6 Feed rate progress bar control



4.2 Coordinate setting page introduction

4.2.1Click the “Manual” button to enter the coordinate setting page



※Production：Click this button to enter page of production management.

※Return auto：Click this button to return to the home page.

※Material bin：Click this button to enter into the page of material setting.

※Tool library：Click this button to enter the tool parameters setting page.

※Tool life：Click to enter into the page of setting tool life.

※Other：Entering the manual page, you can perform manual tool change, tool information change, language switch, etc.

※Read： read the current coordinates of the device (for debugging).

※Amend：to modify the axis parameters.

※Backups：to view historical coordinate setting records.

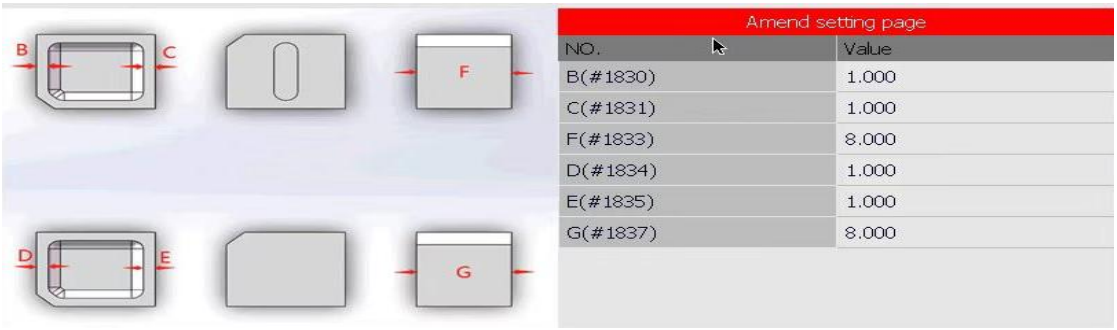
※Save：Used for save operation after parameter modification.

※Reset：For data reset to factory settings.

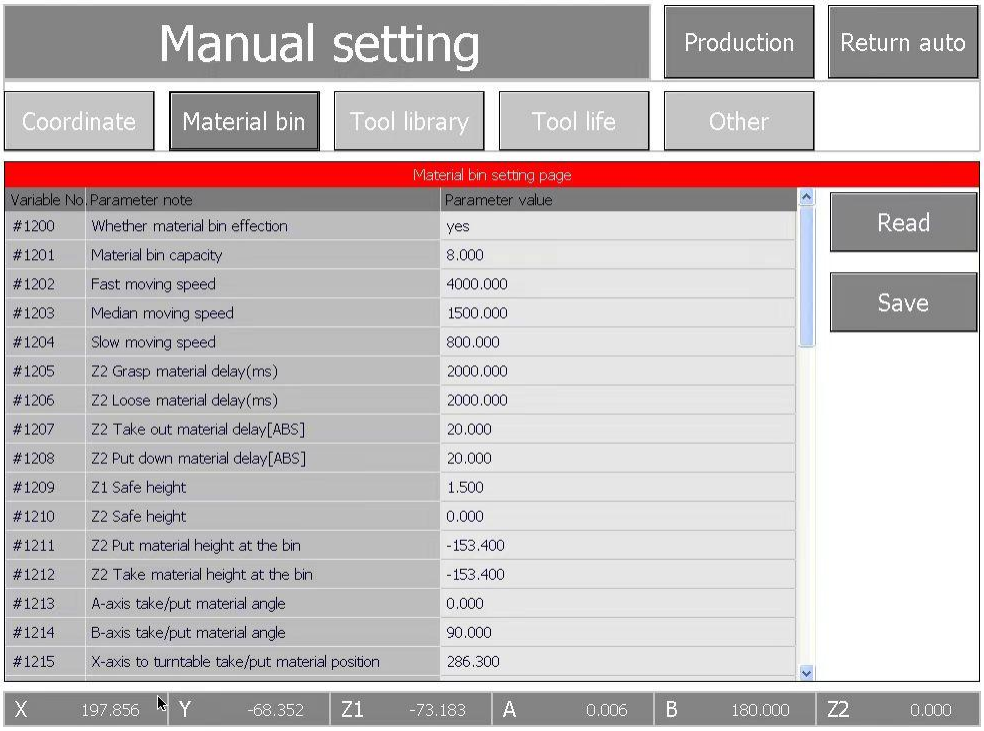
4.2.2 Axis coordinate display window

	X	Y	Z	A	B
Total	167.994	-86.164	-70.584	0.006	0.000
Offset	-0.021	0.000	0.034	0.006	0.000
G54	168.015	-86.164	-70.618	0.000	0.000

4.2.3 Axis calibration parameter setting window, input various values corresponding to the picture



4.3 Bin settings page, you can set the bin related parameters



※Read：Read the current point coordinates (for debugging).

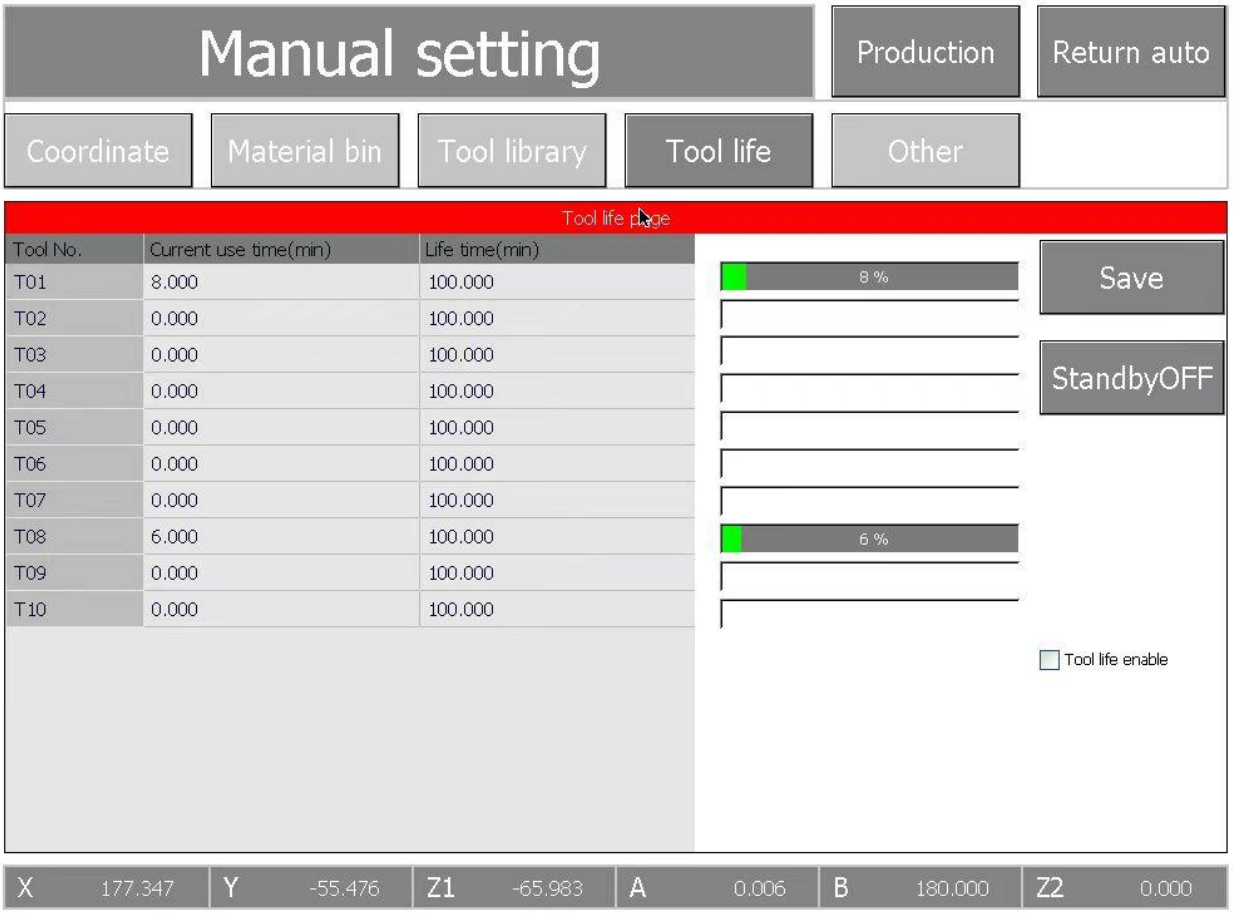
※Save：Save the modified parameters.

4.4 Tool library manual setting page, you can modify the parameters about tool change, Read and Save button function as above.

※Read：Read the current point coordinates (for debugging).

※Save：Save the modified parameters.

4.5 Tool life manual setting page, you can set the tool life and OPEN/OFF the standby (standby tool library) function.

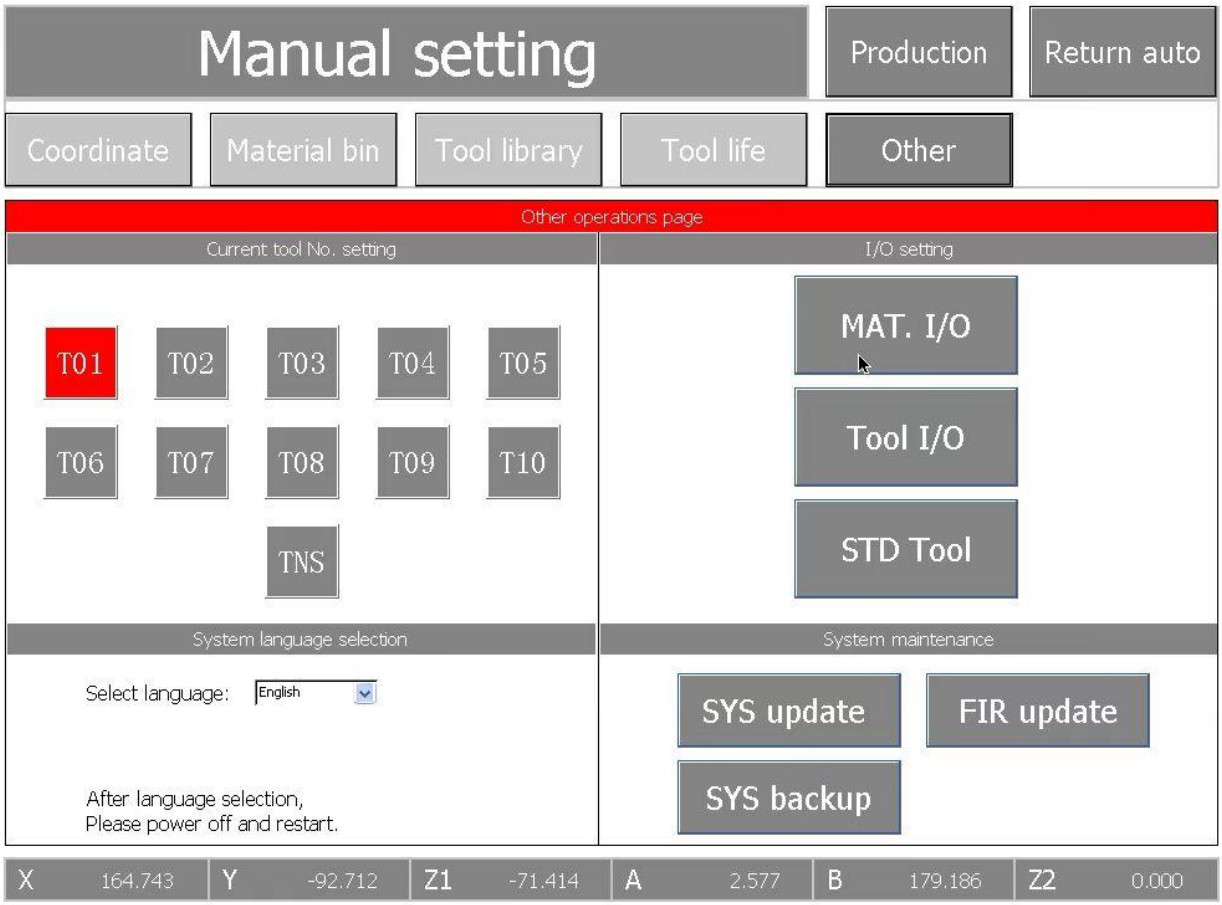


※Save: Saves the current tool life setting.

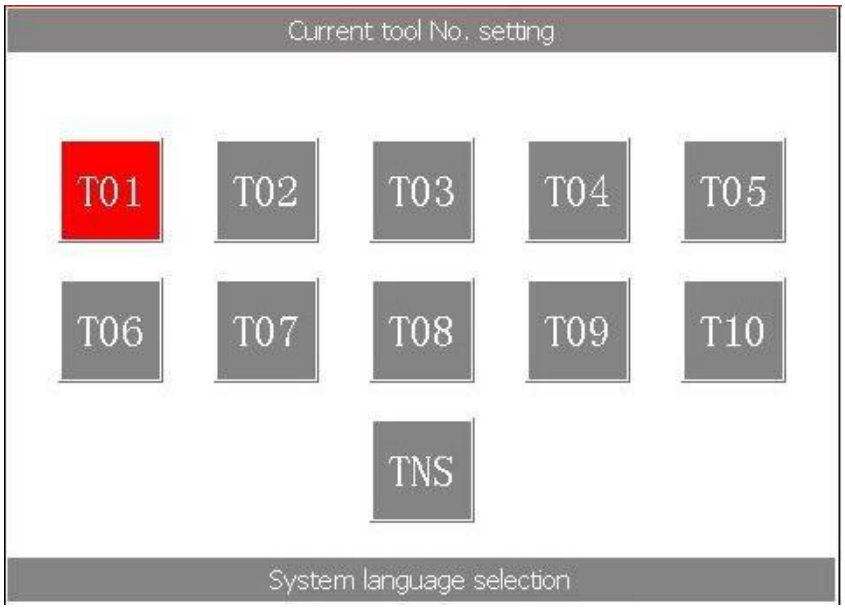
※Standby OFF：This button for setting the Standby tool library to open and close.

※Tool life：Turn on Tool life can Activate tool life count function

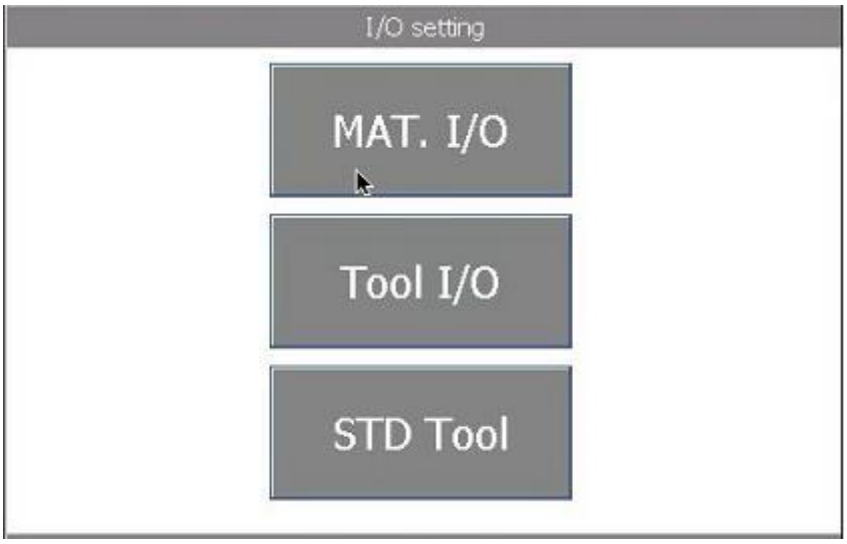
4.6 Other Page



4.6.1 Manual tool change and manual resetting of spindle tool number. When the TNS key is gray, click on any number between T01-T01, the device will execute tool change action and grab the selected tool; when TNS is red highlighted, click on any number between T01-T10 to change the spindle current number.



4.6.2 I/O settings window (Input and output settings window)



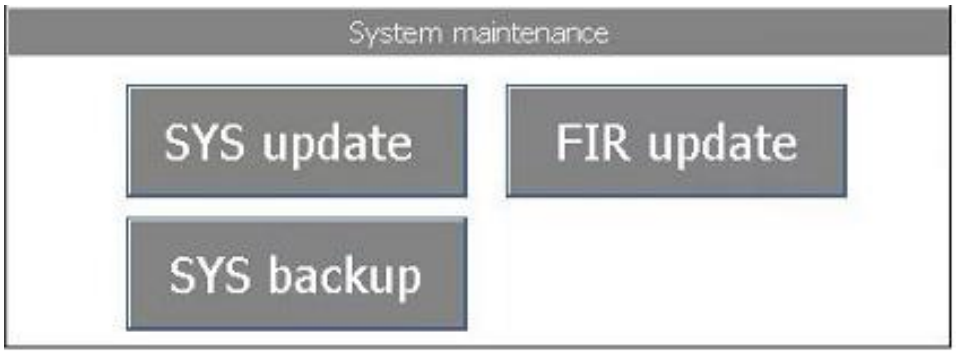
※MAT.I/O: Click this button to realize the loosening and clamping of the robot arm.

※Tool I/O: opening and locking of spindle chuck.

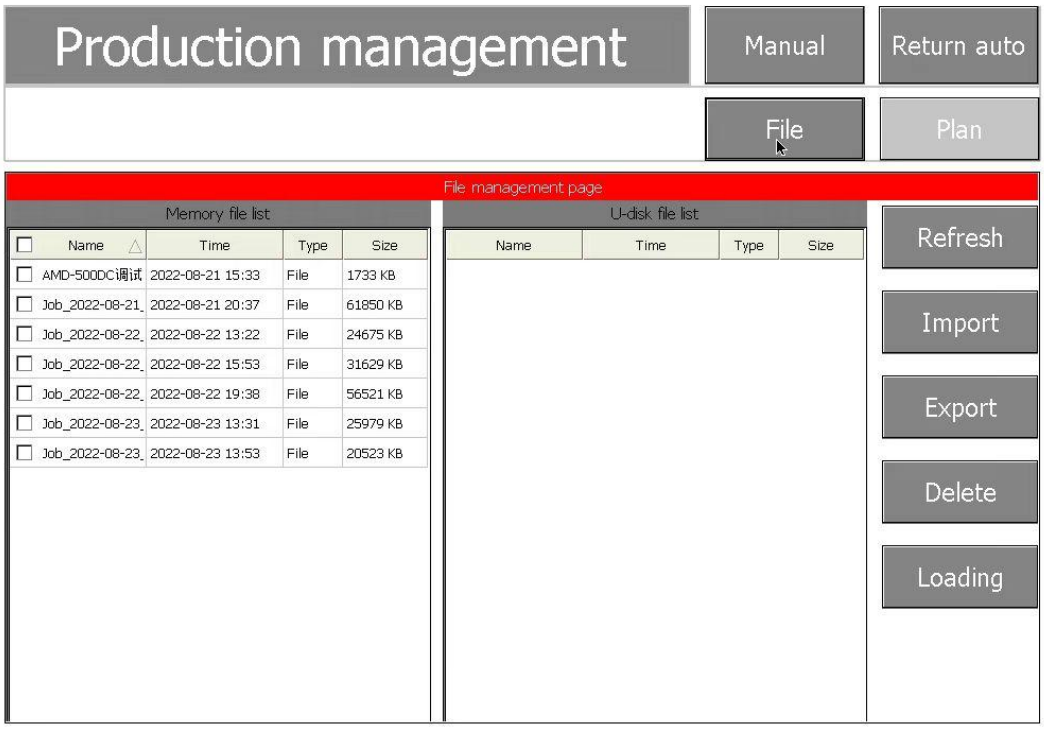
※ STD Tool: Click this button to realize Measuring tool length

4.6.3 system Language selection , multi-language switching is available, and the device needs to be restarted to take effect after switching the language.

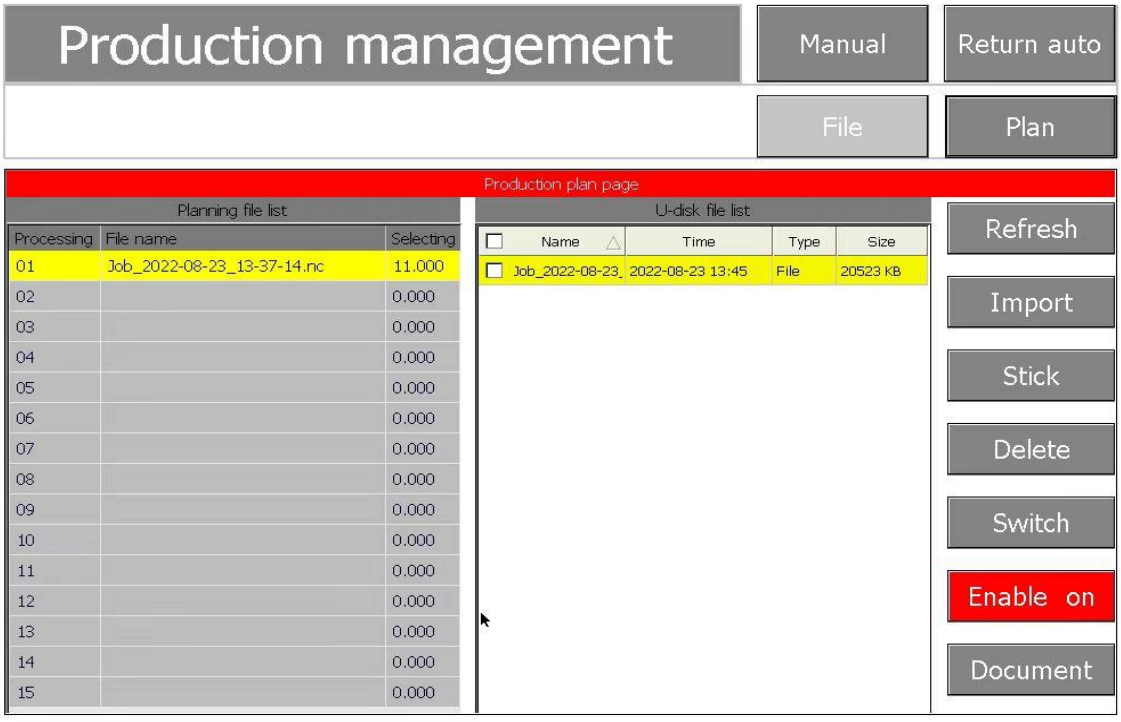
4.6.4 System maintenance window to update the system and backup the system



4.7 Production management interface for local file deletion and local file import and export



4.7.1 Plan



※Refresh: Used to refresh the files on the USB flash drive.

※Import: Used to select the files in the U-disk file list on the right and add them to the Planning file list on the left.

※Stick: You can put the plan with the lowest ranking to the priority processing after the current execution plan.

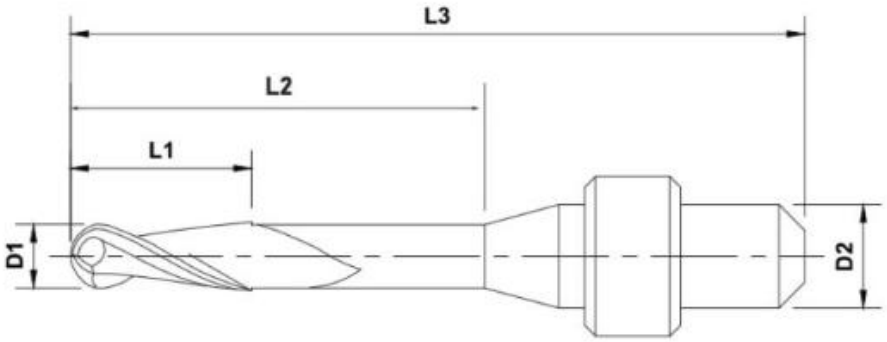
※Delete: Delete the Planning file in the Planning file list.

※Switch: Switch between local memory file list and U-disk.

※Enable on: The Planning file execution enable switch button. When enable is off, the system will not execute the Planning file.

※ Document: Automatic scanning of bin disc information, this function is enabled with denture machine file management software.

5. Axis Calibration



5.1Tool information confirmation

NO	Processing material	Tool type	Tool shank diameter	Long	L2 size	Tool Spec	Tool library NO.
1	Zirconia	Ball Head	4	50	16	R1	T1
2	Zirconia	Ball Head	4	50	14	R0.5	T2
3	Zirconia	Ball Head	4	50	5	R0.3	T3
4	Zirconia	Flat Head	4	50	20	D1.5	T4
5	Zirconia	Ball Head	4	50	5	R0.15	T5
6	Composite resin	Ball Head	4	50	16	R1	T6
7	Composite resin	Ball Head	4	50	14	R0.5	T7
8	Composite resin	Ball Head	4	50	5	R0.3	T8
9	Composite resin	Flat Head	4	50	20	D1.5	T9
10							

5.1.1 T1-T5 are the tool positions used for zirconia, T6-T10 are the corresponding tool positions for resin materials

5.2 Pre-calibration preparation

5.2.1 Calibration material: synthetic wood or plastic disc material (alternative material disc for test calibration)

5.2.2 Disc size: 98.5mm/114.4mm in diameter and 10mm/14mm in thickness (depending on fixture specifications to confirm the size of the alternative material disc)

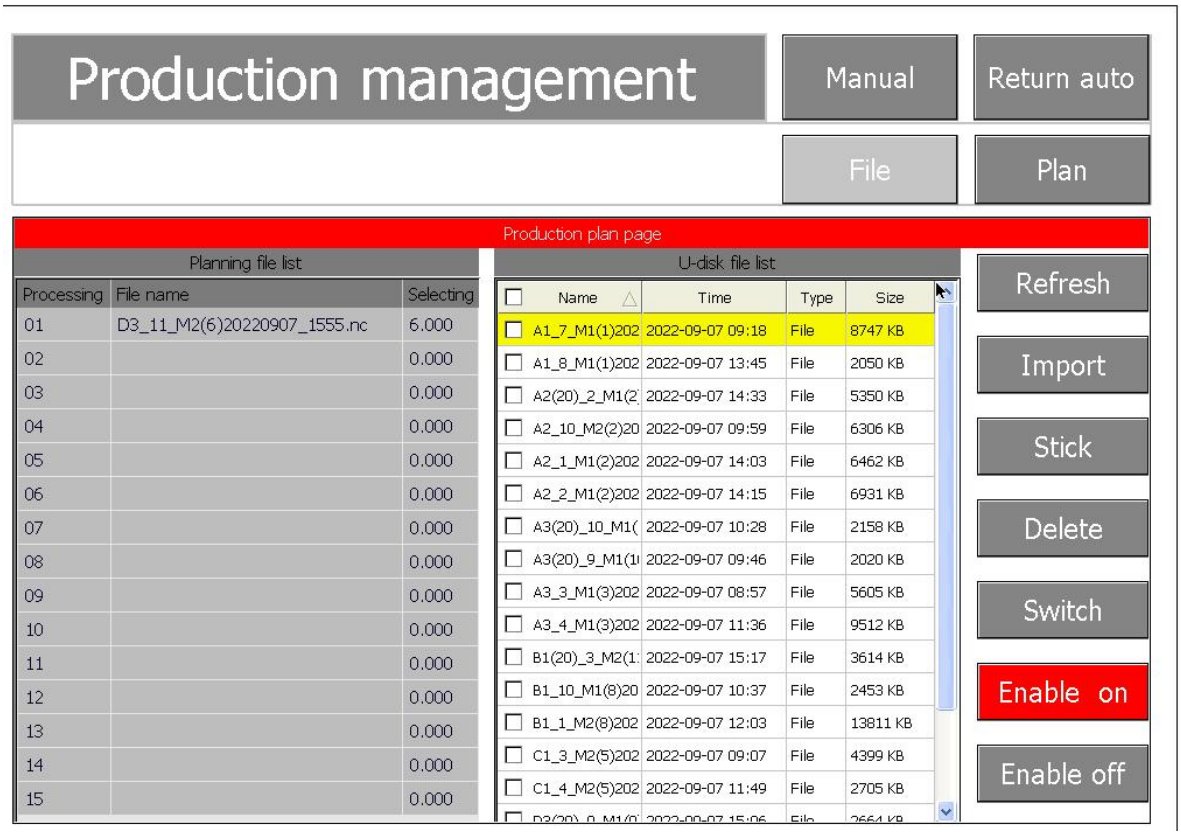
5.2.3 Alignment pin: 2.0mm for #1 tool

5.2.4 Calibration procedure." D52-ADC calibration procedure" document.

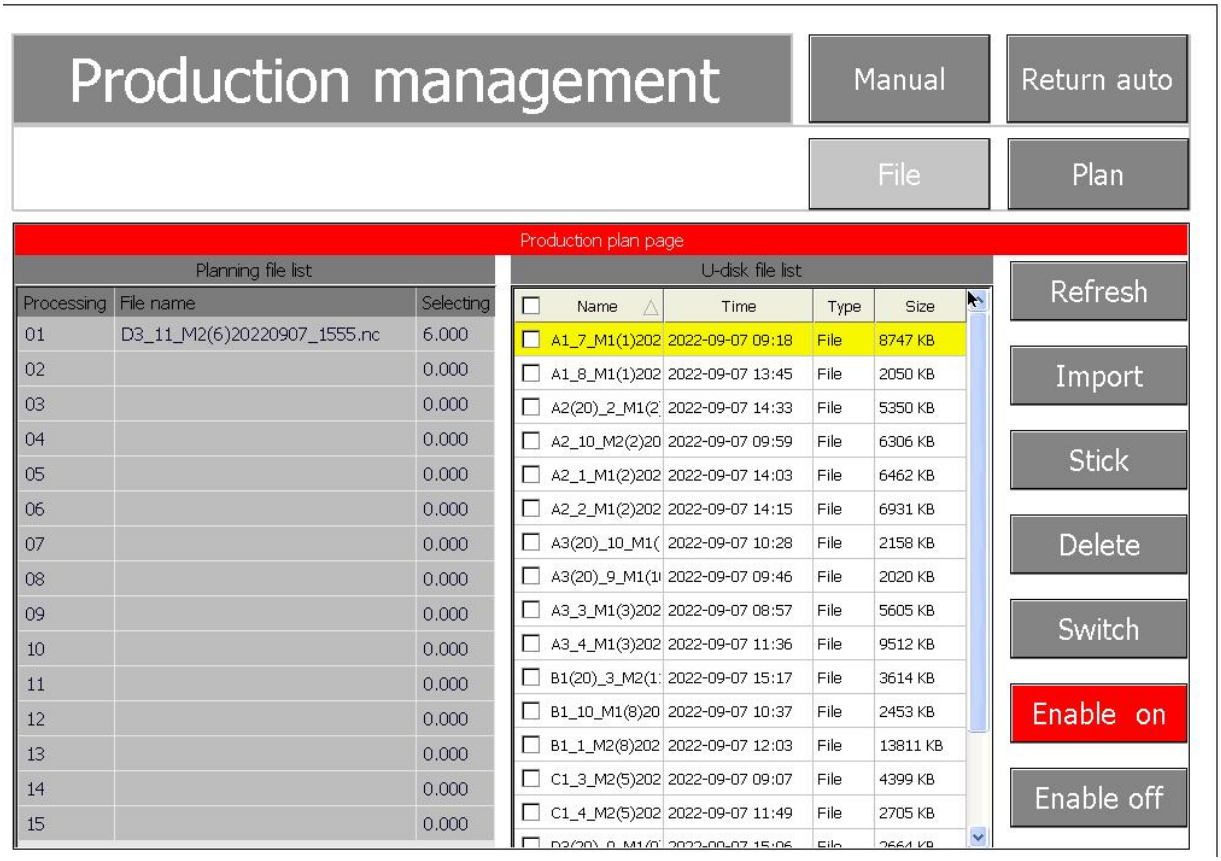
5.2.5 Replacement material disc clamped to fixture #1 on any position in the bin .

5.3 Calibration block processing

5.3.1 Import calibration file: Put the "D52-ADC calibration program" into the USB disk, insert the USB disk into the USB port of the machine, click the "Refresh" button, and the processing file in the USB disk will be displayed in the plan list (or send the processing file directly to the plan list through the network transfer software). (or send the processing file to the schedule list directly through the network transfer software).



5.3.2 Find the calibration file "D52-ADC Calibration Program", click to select this file, click the "import" button, and confirm the "Enable on" status.

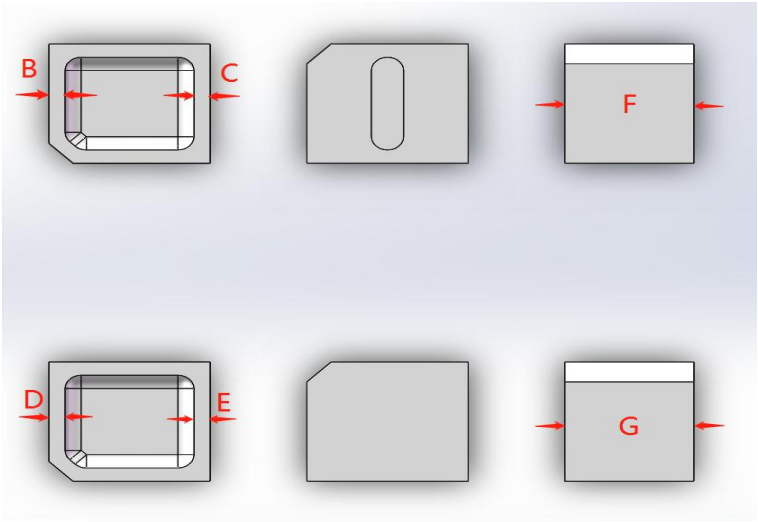


5.3.3 Make sure that the 2.0mm burs of the No.1 tool and the calibration disc are installed, and click the "Start" button.

5.3.4 After the cutting is finished, remove the material disc and use the grinding tool to grind down the two squares

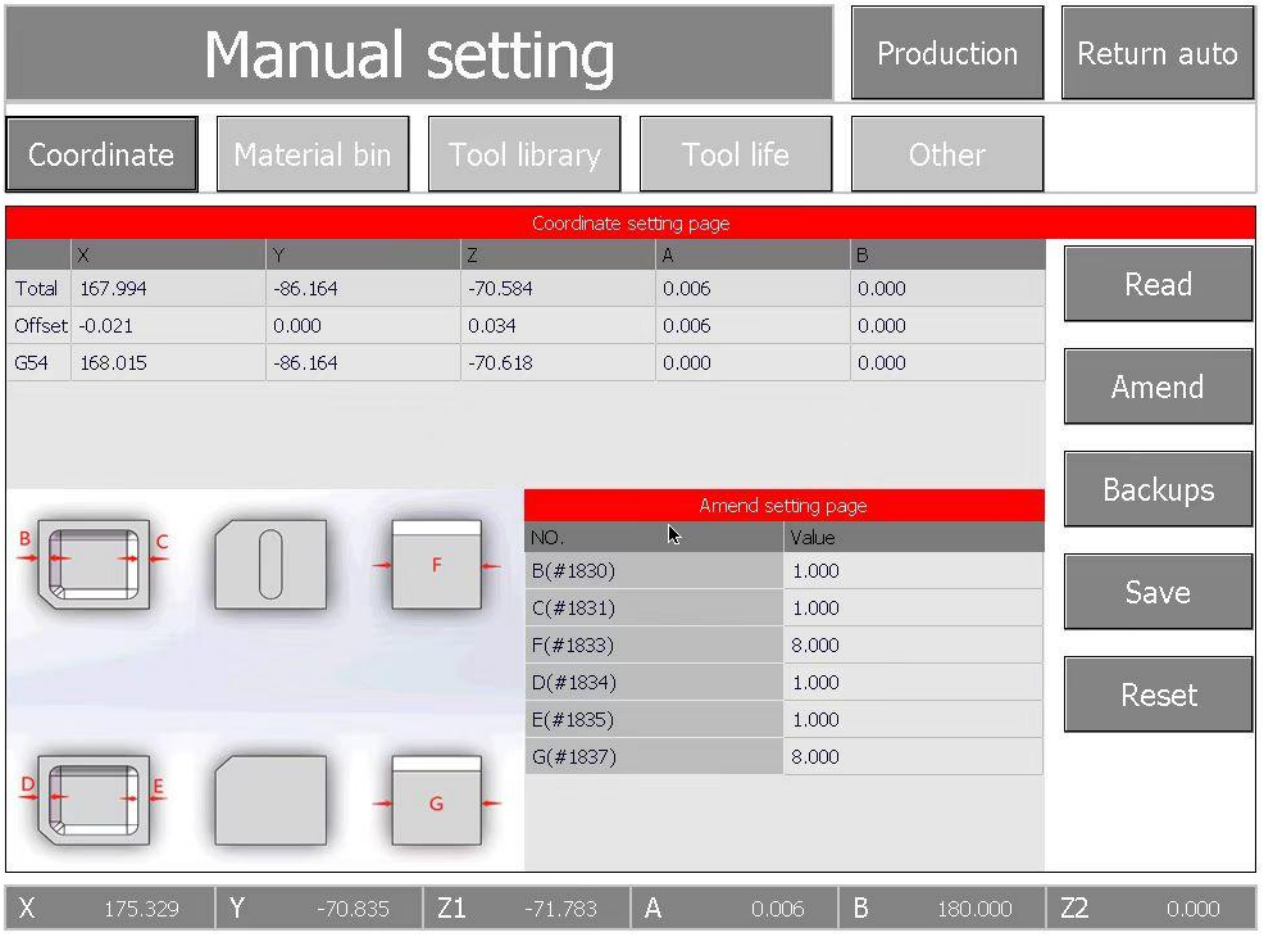
5.4 Calibration block measurement

Prepare digital vernier calipers, measure and record the values of B, C, F, D, E and G in turn.



Enter the “coordinate” to input the record value

5.4.1. Click the "Manual" button, and then click the "Coordinate" button to enter the calibration interface.



5.4.2 Enter the measured values of B, C, F, D, E and G into the corresponding dialog box on the Amend Setting page.

5.4.3 Click the "Amend" button after the input is completed, and then click the "Save" button to complete the calibration action.

5.5 Calibration confirmation instructions (important)

5.5.1 To confirm that the machine coordinates have been calibrated back to within the standard range, it is

necessary to cut the calibration block again and measure the values of B, C, F, D, E, and G. Standard range: B, C, D, E = 1±0.05mm F, G = 8±0.03mm

5.5.2 If the corrected values are not within the standard range, the calibration procedure needs to be performed again.

5.5.3 Calibration cycle.

A, The calibration procedure can be performed at any time when the machine has abnormalities such as chipping and not seating.

B, The recommended periodic calibration operation is once a month.

6. Daily use instructions

6.1. Use process

6.1.1 Disc holder installation

The zirconia material is clamped by the material disc, and the material disc is placed on the material disc holder loader, and the material disc holder loader is placed in the material bin and pushed into place.

Note: After the zirconia is placed on the material disc, pay attention to the strength when screwing the screws, and the three screws should be locked with even strength.

6.1.2 Loading NC files

Under "Production Management" in automatic mode, click "Plan" to add NC files ready to start processing.

Please note: If you use a U disk to transfer the program, the system will automatically identify and display all NC files in the root directory of the U disk. You can also send the plan files to be processed directly to the planning file list through the network.

6.1.3 In automatic mode, "Start-up" is used to start the program processing, and "Pause" is used to pause the current processing program.

6.1.4 If you encounter any problem during processing, please click "Pause" or "Reset" button first. If there is a red alarm, click "Reset" first, and then click "Breakpoint process" after the abnormal alarm is lifted, and the program will continue to process with the suspended reset lines.

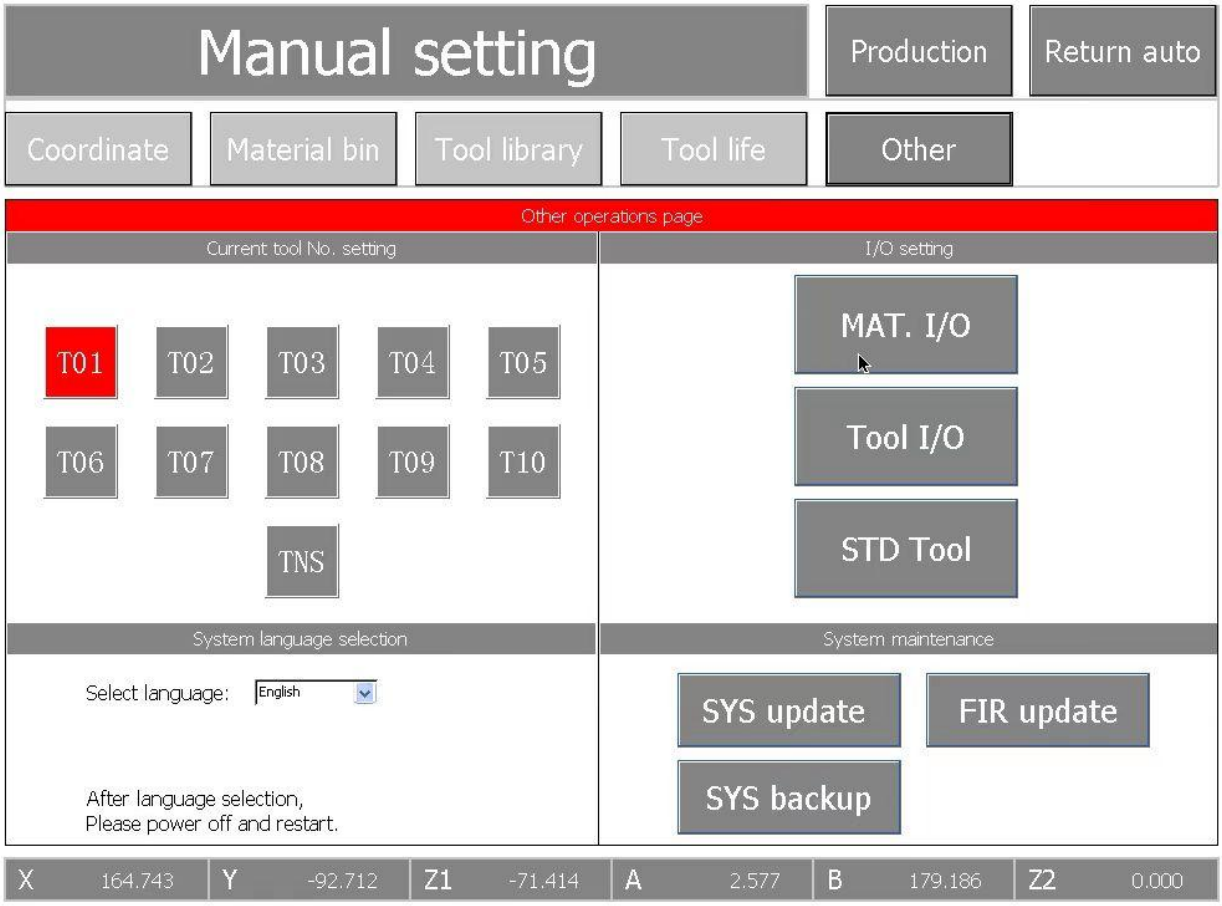
6.1.5 Machine shutdown: directly press the "shutdown" button to power off.

6.2 Tool change

6.2.1 The first case: the tool to be replaced is on the tool holder of the tool magazine, the tool can be directly inserted and removed for replacement!

6.2.2 Second case: the tool to be replaced is located on the spindle, take the No.1 tool as an example for illustration, and so on for other tools.

A, In manual mode, confirm that the tool number button shown in red is the tool to be replaced, such as the T01 button in this case.



B, In manual mode, hold the tool on the spindle with your left hand, click the "Tool I/O" button on the touch screen with your right hand, release the spindle chuck, remove the old or broken tool, replace it with a new one, and click "Tool I/O" again to clamp the spindle chuck.

C, In “other ”setting mode, click "STD Tool ", the machine will automatically measure the tool length of the new tool.

D, If there is an abnormal alarm message for "STD Tool ", "Return auto" mode and click "Reset" button to clear and adjust the abnormal tool alarm **(there are three abnormal conditions: 1) broken tool; 2) wrong tool clamping position; 3) mismatched tool).** If there is no alarm, then skip this step.