

# How to MDX-50:

## Notes:

- \* Your model must be in .stl format
- \* Cutting bed dimensions are limited to 12" x 15 1/2" wide and 5" deep
- \* Only plastics, foams, and wood materials can be cut on the MDX-50. No metals, glass, concrete, plaster, etc. When in doubt check with a dfab tech.

## Setup:

Turn on the computer and the MDX-50 machine. The power switch is located on the back right.

Place double sided tape on spoil board, and tape spoil board in place on machine bed if need be.

Place double sided tape on your model stock, and tape the stock down to the spoil board. Try to tape the stock down square to the axis of the machines movement. Close the machines cover.

Now you can begin to set the X, Y, & Z stock origins.

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## Step 4 : Setting the XY Origin

### Origin

The origin is the starting point of the coordinates. It is the position where the X, Y, and Z coordinates are all "0." You can freely set the origin position. It is a good idea to match the origin with the position where you want to start cutting. However, you cannot set the origin when you select "Machine coordinate system" for the coordinate system.

### User Coordinate System and Machine Coordinate System

The coordinate system in which the origin position can be freely changed is known as the "user coordinate system." On the other hand, the coordinate system in which the origin position is fixed and cannot be changed is known as the "machine coordinate system." Basically, the user coordinate system is the one that is used during actual work. When you want to know the absolute position of the tool bur, use the machine coordinate system. With this machine, coordinates can be displayed with both the user coordinate system and the machine coordinate system.

➤ Machine coordinate system origins of this machine

X, Y: Front-left part of the table, Z: Uppermost position of the spindle

### Procedure

#### 1 Select and retain the tool bur.

① Press [MENU] several times to select "ATC Tool Bur."

② Turn the hand-wheel to select the tool bur to retain.

③ Press [ENTER].

The machine operates, and the tool bur is retained. Press [MENU] several times to return to the top window.

READY	
ATC TOOL	
TOOL1	RETURN
TOOL2	FORCE RELEASE
TOOL3	
TOOL4	
TOOL5	
▶TOOL6	(CURRENT TOOL #6)

X	Y	Z	A	RATE
COORD. SYSTEM	ORIGIN	SPINDLE	OVER RIDE	
MENU	Z0 SENSE	PAUSE/ CANCEL	ENTER	

#### 2 Move the tool bur to the position where you want to set the origin.

☞ P.41 "Using Hand-wheel Operations to Move the Tool Bur (Hand-wheel Feed)"

#### 3 Press [COORD. SYSTEM] several times to select the coordinate system.

When using SRP PLAYER, which is included with this machine: Select "User coordinate system." Check the coordinate system on the screen of the built-in panel.

### CAUTION

- If you select "Machine coordinate system," you will not be able to set the origins.
- If you are using an application that uses NC codes, switch the command set from "RML-1" to "NC code."

☞ P.58 ""NC code setting" Dialog Box"

READY

USER(RML-1/NC CODE)

▶X 55.00mm S 12000rpm

Y 360.00mm

Z 135.00mm

A 0.00deg OVERRIDE

JOG XYZA 100%

RATE x500 S 100%

X	Y	Z	A	RATE
COORD. SYSTEM	ORIGIN	SPINDLE	OVER RIDE	
MENU	Z0 SENSE	PAUSE/CANCEL	ENTER	

**4 Press the button corresponding to the axis whose origin you want to set.**

Check that ▶ is displayed next to the axis whose origin you want to set.

\* A can only be used when the (optional) rotary axis unit is attached.

READY

USER(RML-1/NC CODE)

▶X 55.00mm S 12000rpm

Y 360.00mm

Z 135.00mm

A 0.00deg OVERRIDE

JOG XYZA 100%

RATE x500 S 100%

The axis whose ▶ mark is lit moves.

X	Y	Z	A	RATE
COORD. SYSTEM	ORIGIN	SPINDLE	OVER RIDE	
MENU	Z0 SENSE	PAUSE/CANCEL	ENTER	

**5 Hold down [ORIGIN].**

This sets the origin. When the origin is set, its coordinate value becomes "0."

READY

USER(RML-1/NC CODE)

▶X 0.00mm S 12000rpm

Y 360.00mm

Z 135.00mm

A 0.00deg OVERRIDE

JOG XYZA 100%

RATE x500 S 100%

X	Y	Z	A	RATE
COORD. SYSTEM	ORIGIN	SPINDLE	OVER RIDE	
MENU	Z0 SENSE	PAUSE/CANCEL	ENTER	

### Coordinate Systems in RML-1 Mode

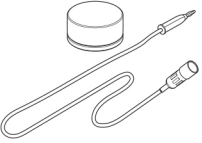

➤ USER: User coordinate system

### Coordinate Systems in NC Code Mode

- G54: Workpiece coordinate system 1
- G55: Workpiece coordinate system 2
- G56: Workpiece coordinate system 3
- G57: Workpiece coordinate system 4
- G58: Workpiece coordinate system 5
- G59: Workpiece coordinate system 6
- EXOFS

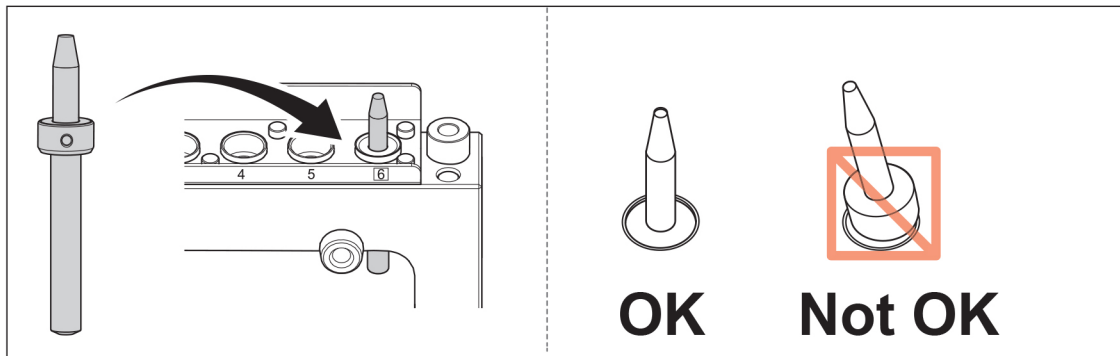
## Step 5 : Setting the Z Origin (Using the Z0 Sensor)

This function is useful when you want to set the Z origin on the upper surface of the workpiece.

 <p>Z0 sensor</p>	 <p>Detection pin</p>	<p><b>MEMO</b></p> <p>You can use not only the detection pin but also the tool bur to set the Z origin with the Z0 sensor. However, using a thin tool bur may lead to it being damaged. Also note that you cannot use the Z0 sensor with tool burs made of a coated non-conductive material. This section explains how to perform detections using a detection pin.</p>
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### 1. Load the detection pin.

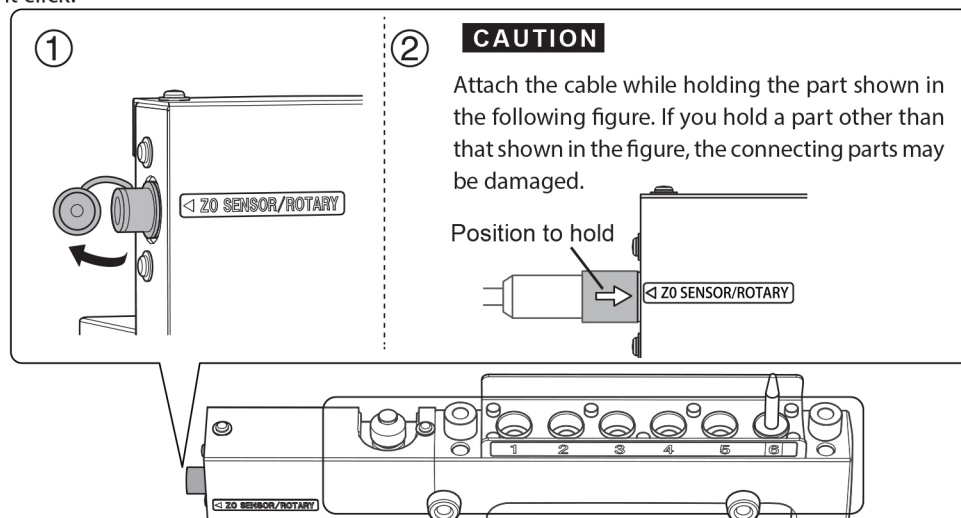
- 1 If the Z0 sensor, detection pin, or workpiece is dirty with cutting waste or similar debris, clean it. If any of these are dirty, it will not be possible to perform correct measurements, which may make it impossible to perform cutting as intended.
- 2 Load the detection pin in the number 6 stocker.



### 2. Load the Z0 sensor.

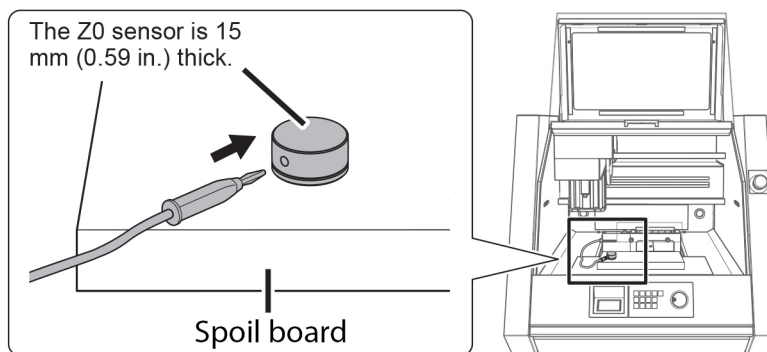
- 1 Connect the Z0 sensor cable.
  - 1 Remove the protective "Z0 SENSOR/ROTARY" cap.
  - 2 Connect the Z0 sensor cable.

Orient the cable so that its arrow mark is as shown in the following figure, and then insert the cable until you hear it click.



**2 Place the Z0 sensor in the position where you want to set the Z origin.**

Orient the Z0 sensor so that its side without screw threads faces upward.



**3 Close the front cover.**

**4 Press [ENTER].**

**3. Set the Z0 origin.**

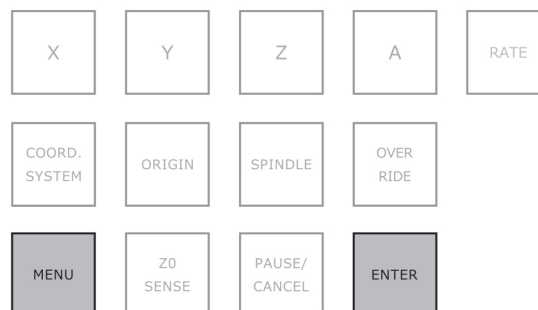
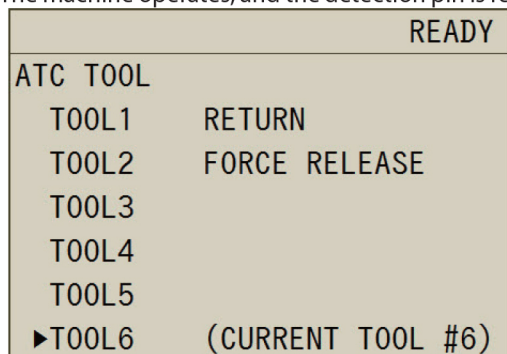
**1 Select and retain the detection pin.**

① Press [MENU] several times to select "ATC Tool Bur."

② Turn the hand-wheel to select "Tool Bur 6."

③ Press [ENTER].

The machine operates, and the detection pin is retained. Press [MENU] several times to return to the top window.



**2 Move the detection pin above the Z0 sensor.**

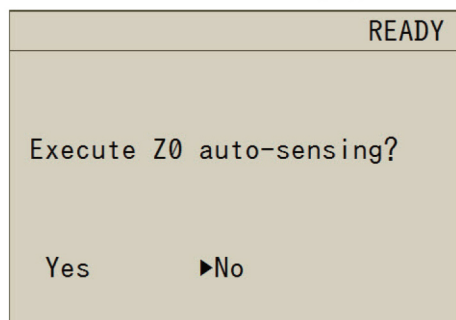
☞ P.41 "Using Hand-wheel Operations to Move the Tool Bur (Hand-wheel Feed)"

**3 Press [COORD. SYSTEM] several times to select the coordinate system.**

If you select [MACHINE], you will not be able to set the origins.

**4 Press [Z0 SENSE].**

The screen shown in the following figure is displayed.



**MEMO**

The screen shown in the figure on the left is not displayed when:

- The tool bur is not retained.
- The spindle is rotating.

5 Turn the hand-wheel to select "Yes."

6 Press [ENTER].

The tool bur slowly descends to touch the sensor. The tool bur then ascends. When it stops moving, the setting is complete.

#### Canceling the detection operation

If you want to stop the tool bur while it is descending, press [ENTER].

### 4. Remove the Z0 sensor and the detection pin.

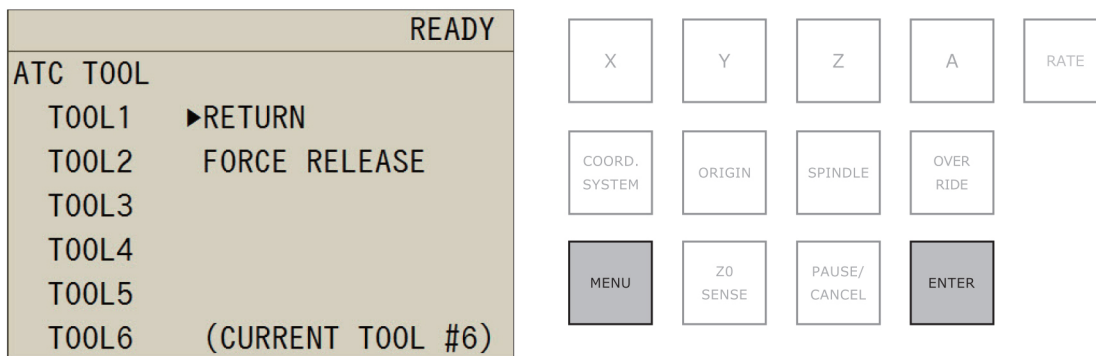
1 Return the detection pin.

① Press [MENU] several times to select "ATC Tool Bur."

② Turn the hand-wheel to select "Return Tool Bur."

③ Press [ENTER].

The machine operates, and the detection pin is returned. Press [MENU] several times to return to the top window.



2 Remove the Z0 sensor.

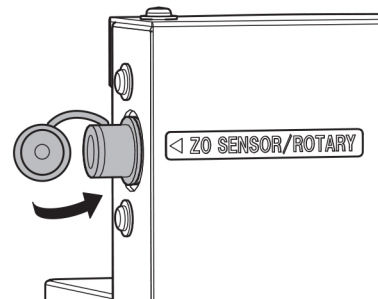
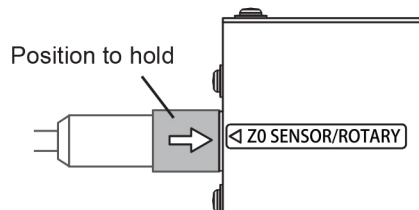
① Open the front cover.

② Remove the Z0 sensor.

③ Attach the protective "Z0 SENSOR/ROTARY" cap.

#### CAUTION

Remove the cable while holding the part shown in the following figure. If you hold a part other than that shown in the figure, the connecting parts may be damaged.



3 Close the front cover.

4 Press [ENTER].

# How to CAM in SRP

## & mill with the MDX-50:

Open the SRP software from the desktop

Go to: Options > Edit Magazine. Verify that the tools listed here are in their appropriate positions in the tool holder.

Go to: File > Open and find your \*.stl file.

**1. Model Size and Orientation:** Enter model size by using a known dimension in the model, i.e. total height or width.

Confirm that the model is correctly oriented. I.e. +Z is facing “up.”

**2. Type of Milling:** Select the type of milling. Smoother finishes take much longer. Select the type of model. Models that need square edges in pockets and recesses will need to select “Model with many flat planes.” These models will be cut with square end mills. “Models with many curved surfaces” will only be cut with ball end mills. Select single sided or double sided cutting

**3. Create Tool Path:** Choose stock material and size. All models cut in SRP need to be set within a frame of the parent material. This means that your model cannot be adjacent to an edge in the X or Y dimension, and your final model will need to be smaller than your stock material. SRP will list the minimum stock size in the “Create Tool Path” window. Entering the correct size for your stock is critical, because this is how the MDX-50 machine locates the stock on the bed. Incorrectly locating the stock is likely to result in tool collisions and broken parts. Most parts should be aligned with the top of the material. Once the stock is set up, and the model aligned, hit “Create tool path.”

**4. Review Results:** Preview the milling operations and ensure that your model is cut correctly. Make any necessary changes to the previous steps if there is an error.

**5. Perform Cutting:** Note the tool list at the bottom of the window. This is a list of the tools used for the job, and their location in the tool holder magazine. Verify that these tools are present, and in their correct location in the magazine. If they are, begin cutting operations. The EMERGENCY STOP button is located on the upper right of the MDX-50 machine. Hitting this button will kill the power to the machine and stop its operation. Powering up the machine after this will cause the machine to retract the tool in the Z+ direction and move back to its home position.

**6. Final Step:** Unstick your part from the spoil board and vacuum out the machine with the shop vac.