DDCSV Probing Modes

In the latest release [Install_2018-07-30-98 NOR] there are 4 modes supported by the controller.

The mode is selected by parameter #68 [“Tool Setting function mode"]

0 = Disable

1 = Mode 1

2 = Mode 2

3 =Mode 3

Disable

In this mode pressing 2nd/Probe/Probe will have no effect. The display says “Probe” so use the Mode key to select the chosen mode.

Mode 1

This mode uses 2 probe sequences to first establish the height of the tool sensor and then probers the tool onto the sensor. In so doing it updates the value held in #69 ["Thickness of tool sensor"].

It uses the following parameters:

69 ["Thickness of tool sensor"] It updates this parameter with the measured tool height.

[Why can this be negative as defined in the eng file??]

#71 ["Initial tool's position"]

0 = "current position" Where the probe is in the current reference frame. All examples relate to G54

1 = "fixed position" The position of the tool sensor in the MACH machine space

If “fixed” it uses:

These 3 locate the tool sensor in the Machine co-ordinate system (MACH)

#72 ["Initial probe position on X axis"]

#73 [“Initial probe position on Y axis"]

#74 ["Initial probe position on Z axis"]

#75 [“back distance after probe"] How far to retract in Z after the contact

First the user has to manually zero the z axis onto the tool table.

This also sets #69 = 0 [only in Mode 1.

Then either manually move the tool over the tool sensor [#71 = 0] or set #71 = 1 and have the correct values in #72..#74

Mode 2

This mode is the simplest. It uses the height of the tool sensor and the retract distance after the probe to set the Z height of the tool

It uses the following parameters:

#69 ["Thickness of tool sensor"] How high is the tool sensor in the Z axis.

#71 ["Initial tool's position"]

0 = "current position" Where the probe is in the current reference frame. All examples relate to G54

1 = "fixed position" The position of the tool sensor in the MACH machine space

If “fixed” it uses:

These 3 locate the tool sensor in the Machine co-ordinate system (MACH)

#72 ["Initial probe position on X axis"]

#73 [“Initial probe position on Y axis"]

#74 ["Initial probe position on Z axis"]

#75 [“back distance after probe"] How far to retract in Z after the contact

Mode 3

This mode is the most complex and useful as it probes all three axes. In order for this the tool sensor must be a cube or similar regular rectangular block. The mode will first probe for Z, then probe the side of the block [left or right] for X and finally it will probe the face or the back of the block for Y. It then retracts back as dictated by parameter #75 and moves to the X & Y zero position as defined by #2001 and #2002. Note if you want to locate onto the corner you just probed set #2001 and #2002 to 0.

Note:

#69 is NOT used

#71 is NOT used in this mode

#75 is NOT used in this mode

It uses the following parameters:

#2000 ["Cutter diameter"] The diameter of the probe tip

#2001 ["Tool plate thick for X"]

#2002 ["Tool plate thick for Y"]

#2003 [“Tool plate thick for Z"]

#2004 ["shift of X axis before probed"] If Positive it will probe the right hand side of the block.

#2005 [“shift of Y axis before probed"} If negative it will probe the front face of the block

#2006 [“Z position before X(Y)-axis probed"] The distance to descend before moving the X or Y axes to establish probe contact

#2007 ["Back distance when the tool touches the X-axis edge"] After a n axis is touched off these 3 parameters

#2008 ["Back distance when the tool touches the Y-axis edge"] define how much to pull back before the next

#2009 ["Back distance when the tool touches the Z-axis edge"] movement

#2010 ["center of tool plate"] If you want to set the X & Y zero to the corner of the test block you would set #2001 & #2002 to 0. Refer to figure 8, and if this is the case when #2010 = 0 the tip of the tool has to be exactly on the corner. If you set #2010 to a value, the tool is offset (in X) when probing for Y. This should lead to better accuracy.

#2011 ["Probe feedrate"] The feed rate to be used when probing. Probing is done by a G01 command in relative (G91) mode

Figures

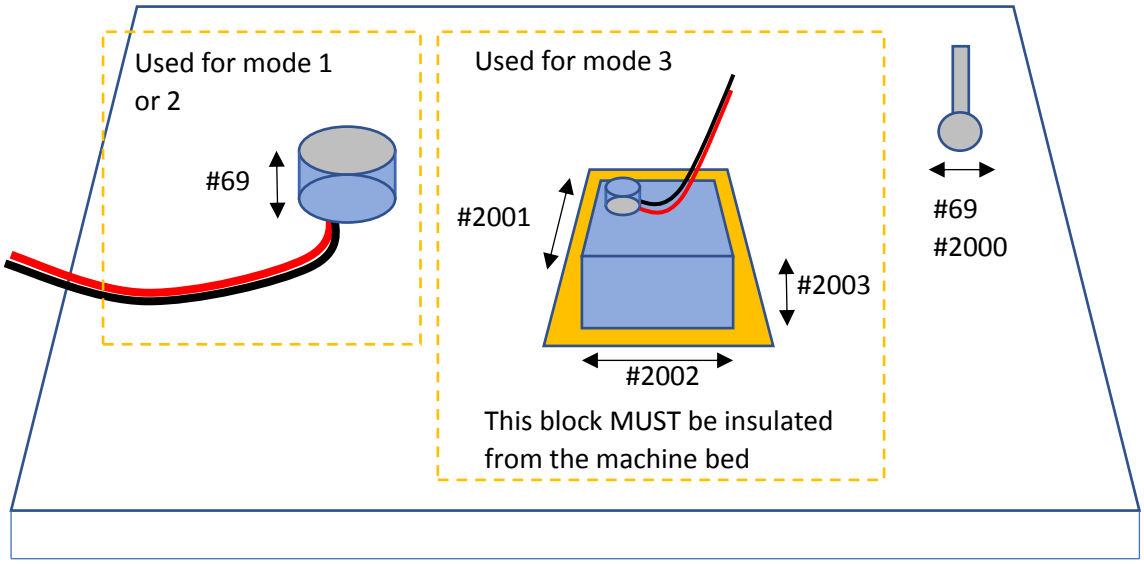

Fig. 1: Basic parameter definitions

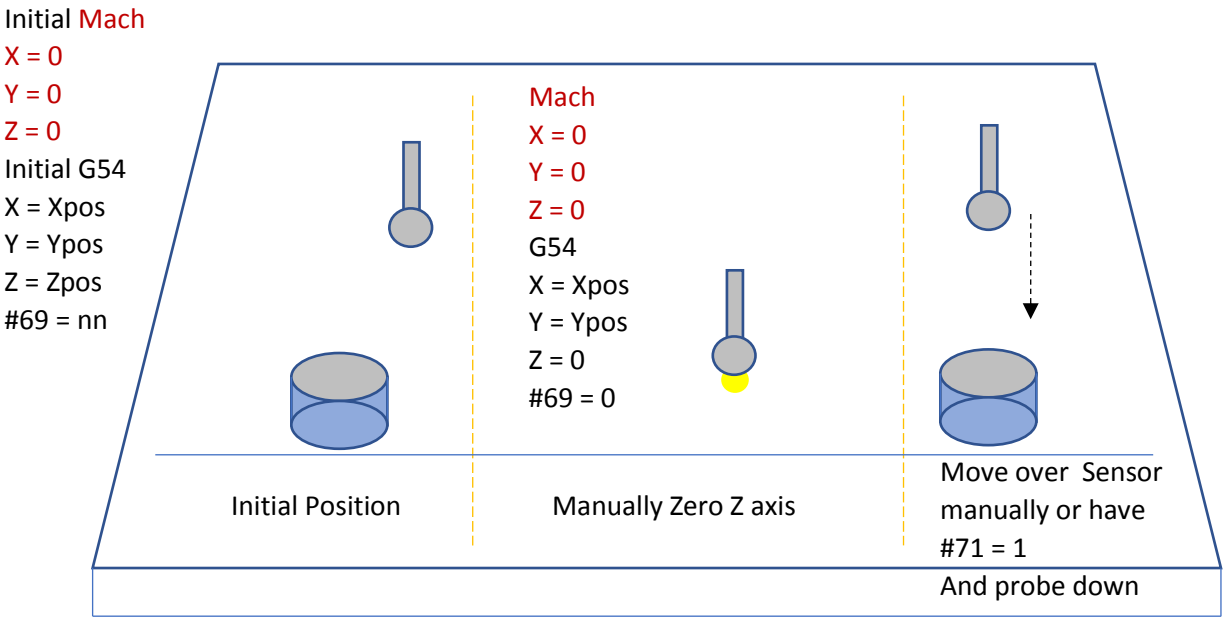

Fig. 2a: Mode 1 Probing Sequence for Z axis

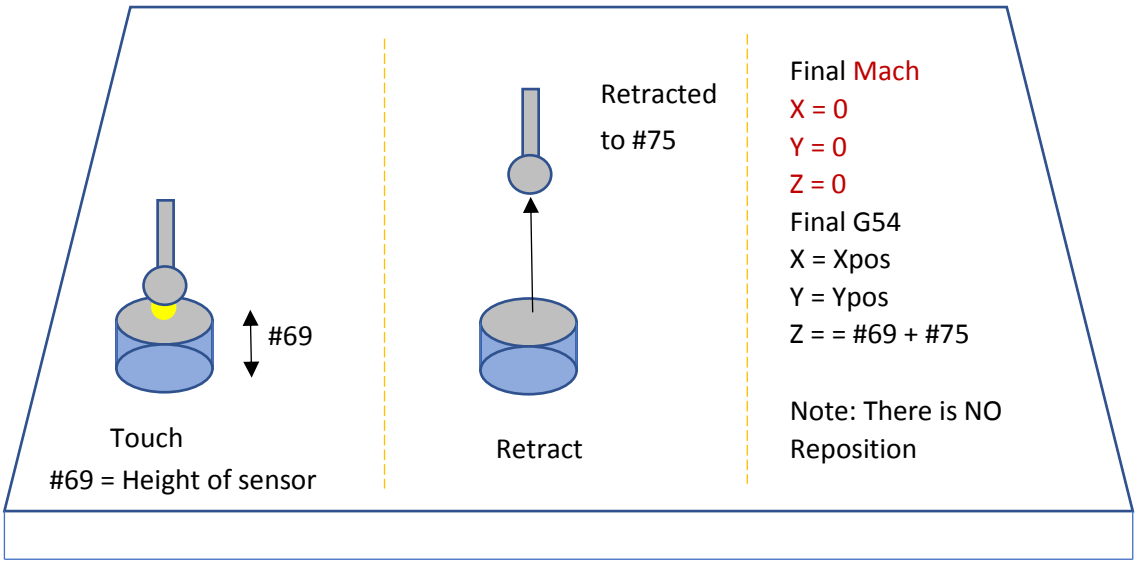

Fig. 2b: Mode 1 Probing Sequence for Z axis

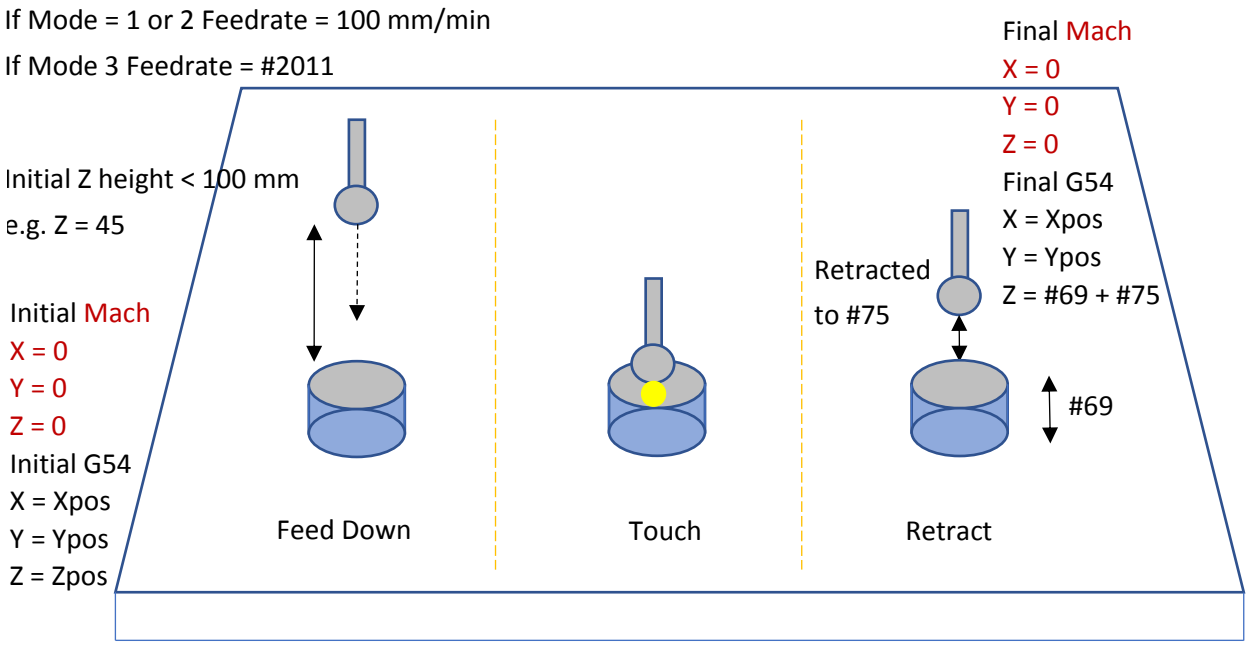

Fig. 3: Mode 2 Probing Sequence for Z axis #71 = 0: Current position

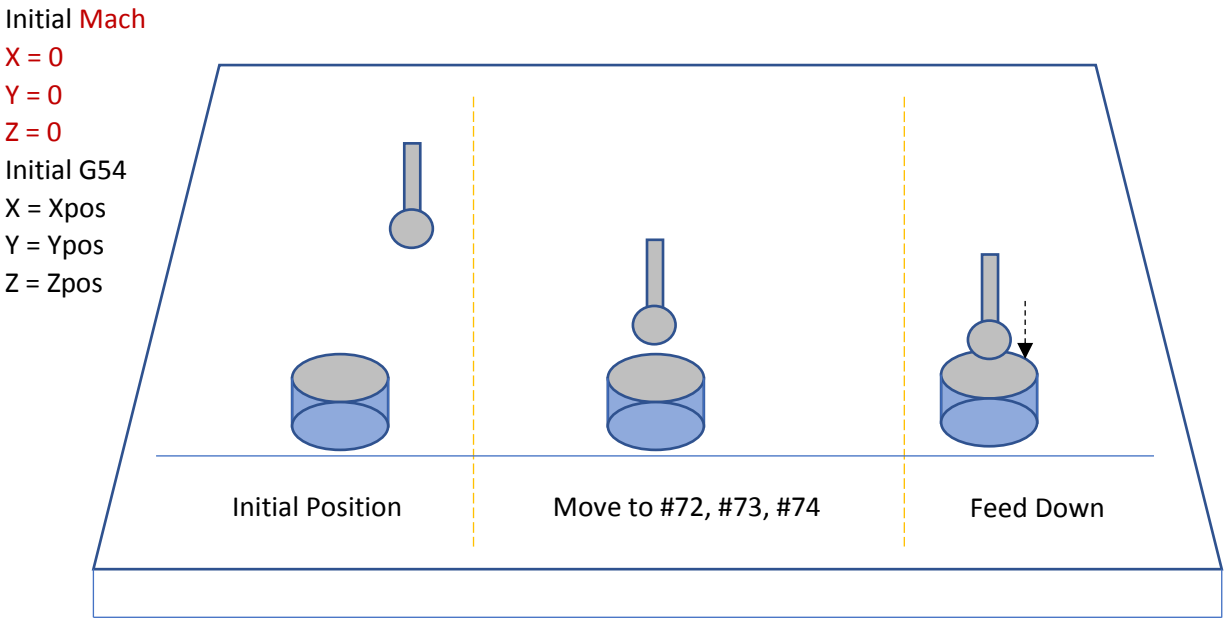

Fig. 4a: Mode 2 Probing Sequence for Z axis #71 = 1 Fixed position

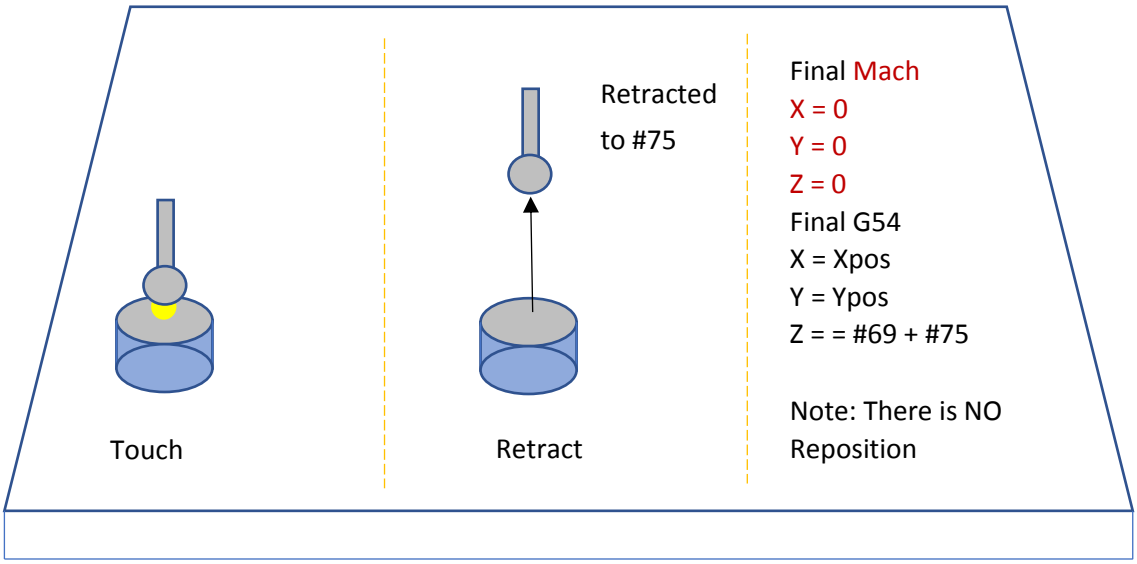

Fig. 4b: Mode 2 Probing Sequence for Z axis #71 = 1 Fixed position

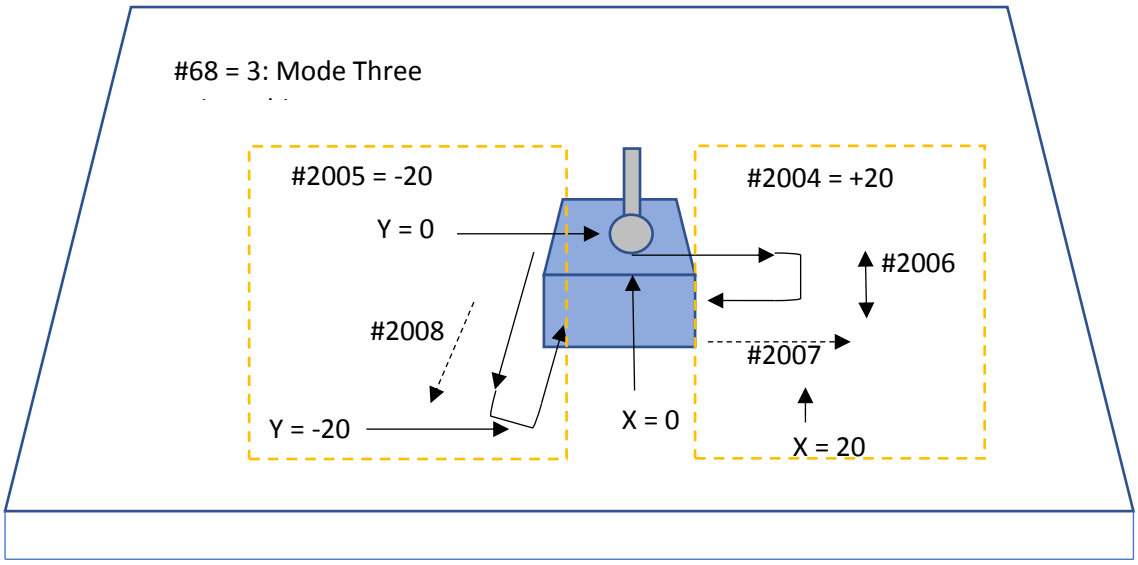

Fig. 5: Mode 3 Probing Directions

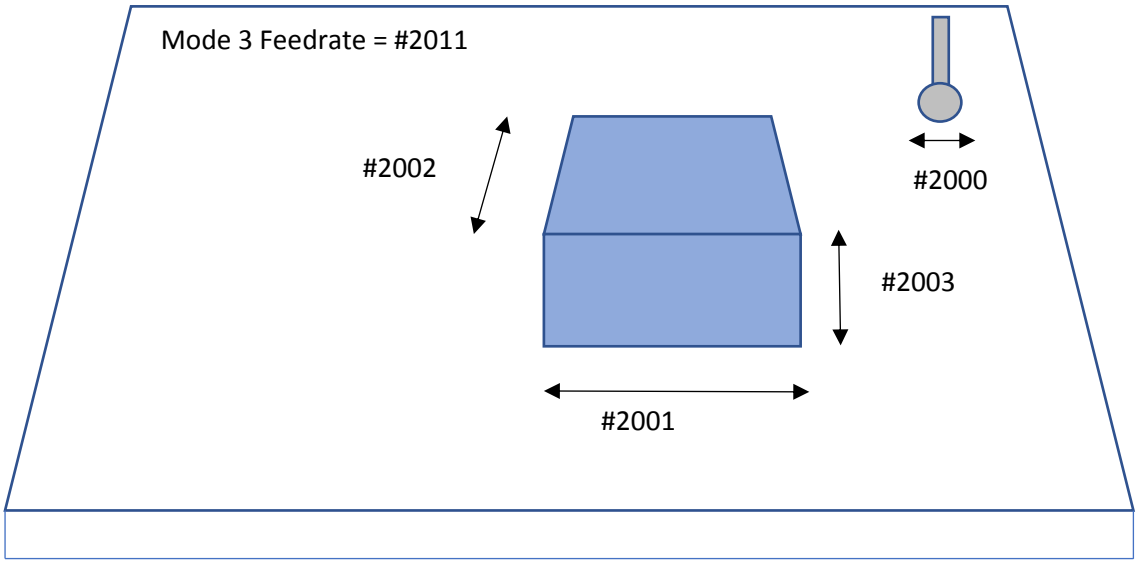

Fig. 6a: Mode 3 Test block parameters

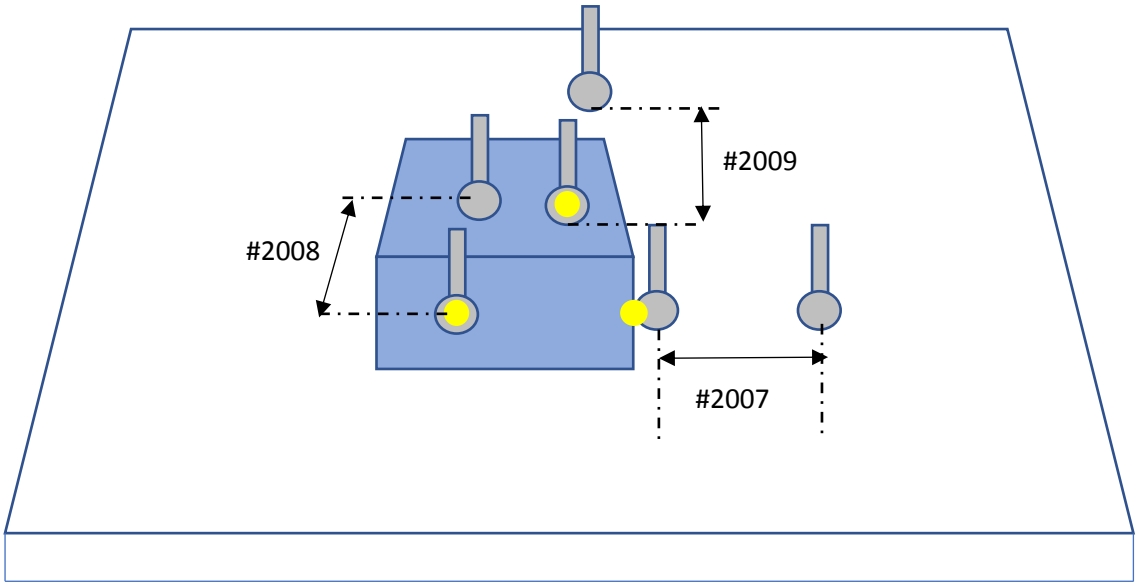

Fig. 6b: Mode 3 Test block retract parameters

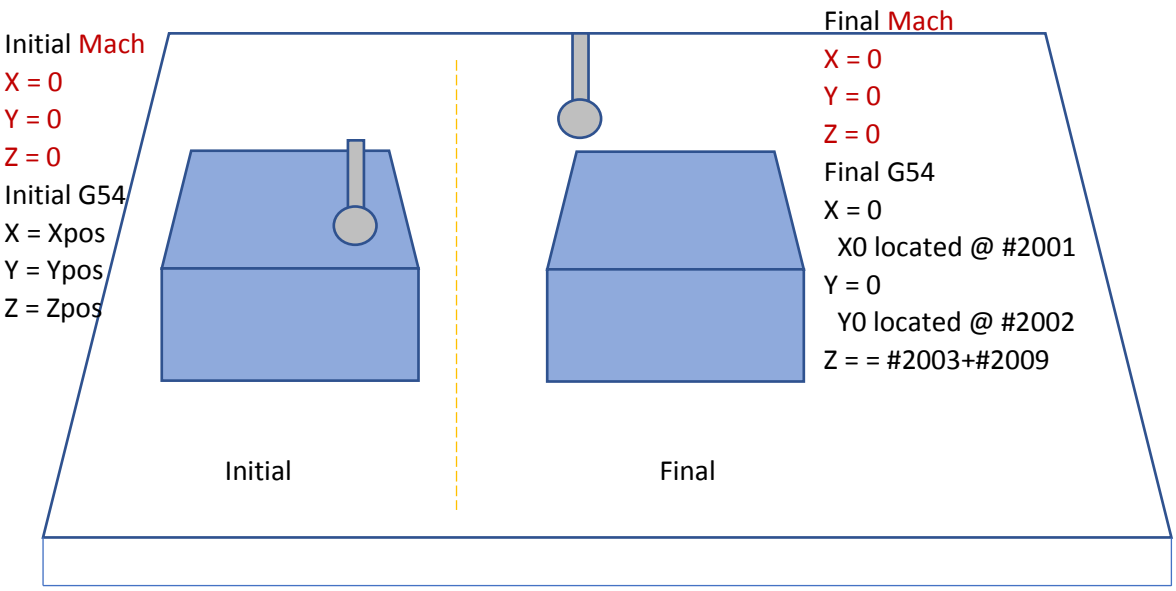

Fig. 7: Mode 3 Initial and Final Positions

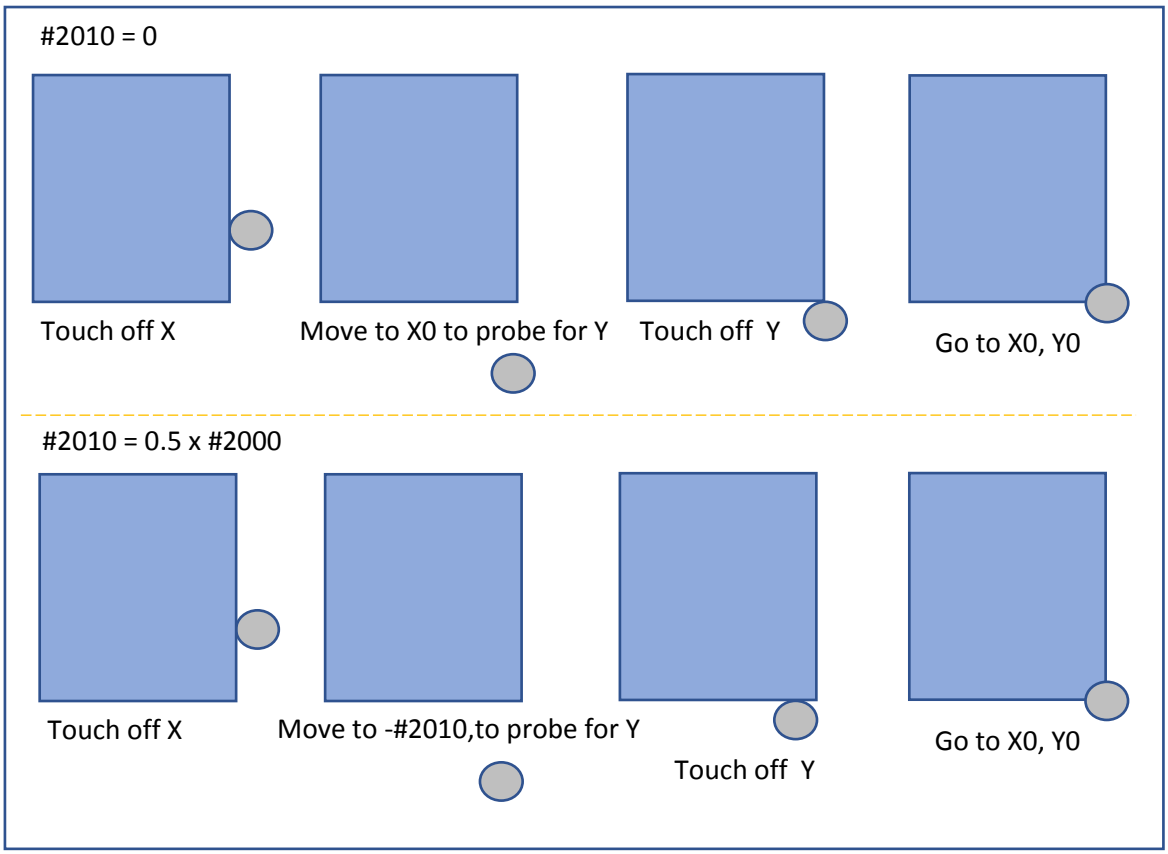

Fig. 8: Use of #2010 in Mode 3

Eng file syntax notes.

The chs or eng file configures the user-defined system parameters.

For example:

#2000 -t1 -s1"Cutter diameter" -s2"in" -m9 -min=0.000 -max=9.000

#n n is the parameter number

-t is used to specify the type of parameter, t0 is an integer, t1 is a real number, and t2 is a selection type

-s1 defines the name of the parameter

-s2 defines the parameter unit

-m parameter group, m0 that the parameters in the parameter configuration page does not show

-min minimum parameter

-max maximum parameter

-i The text of the relevant entry is configured through it when the parameter type is selection type