

Coordinates

The screenshot shows the 'Parameter' dialog box with the 'Co-ordinates' tab selected. The dialog is organized into several sections:

- Top Section:** Contains fields for X, Y, and Z coordinates for Park position, Scaling factors, Surface block, Toollift, and Zero point. The 'Zero point in file' dropdown is set to 'bottom left'.
- Working Piece Section:** Includes checkboxes for 'Define size of working piece' and 'Work piece area monitoring'. Below these are fields for 'Working piece from' and 'to' for X, Y, and Z axes.
- Axis 4 Section:** Includes a dropdown for 'Move to zero 4th axis...' set to 'first' and a 'Zero point' field.
- Bottom Section:** Contains three buttons: 'OK' (green checkmark), 'Abort' (red X), and 'Save...' (floppy disk icon).

Parameter-Coordinates

Park position

Defined position for breaks

It is necessary to define a park position if the machine slide is to be moved out of the working area at certain times. This may be necessary for a tool change, for example, or for clamping the workpiece.

It is also possible to make this definition during jog movement by moving into position with the keyboard or mouse.

The parked position can be moved to in jog movement or automatically during a tool change and at the end of a working process.

The unit is millimeters and the distances are measured from the machine reference point (machine coordinates).

Scaling factors

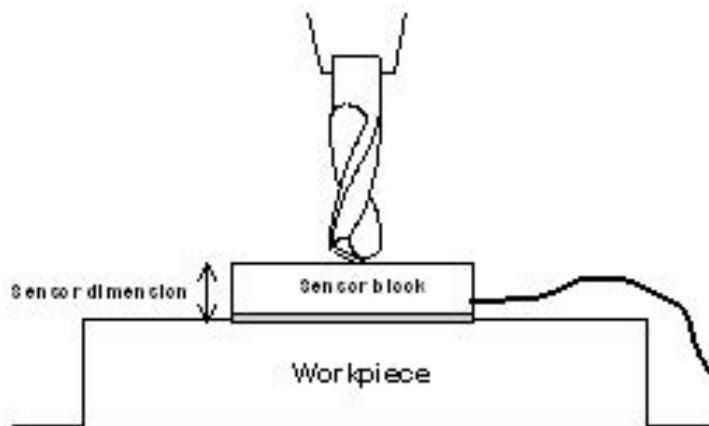
It is possible to compensate for calibration differences using the scaling factors. If both the axis resolution and the unit of measurement are set correctly but the machine does not move to the exact length nevertheless, this problem can be corrected using the scaling factors.

The values must be specified to 3 decimal places and are used for multiplying the coordinate values to which the machine is to move. It affects the imported NC data only.

Sensor dimension

*Measuring
Z-axis heights
automatically*

WinPC-NC can automatically measure different Z-axis heights using a sensor block (surface block). The sensor block outputs a signal when it is contacted from above, and the signal is processed as an input at the LPT port of ncUSB.-



Automatic measurement of the Z-axis zero point

The measuring procedure involves several steps:

1. Place the sensor block on the workpiece surface or on the machine
 2. Move the tool over the sensor block in jog mode
 3. Start the measurement using the MOVE-JOG menu function
 4. **WinPC-NC** slowly moves the tool down to the sensor and stops when it makes contact. The position is checked and added to the defined sensor dimension, the result being stored as a parameter.
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Clearing distance

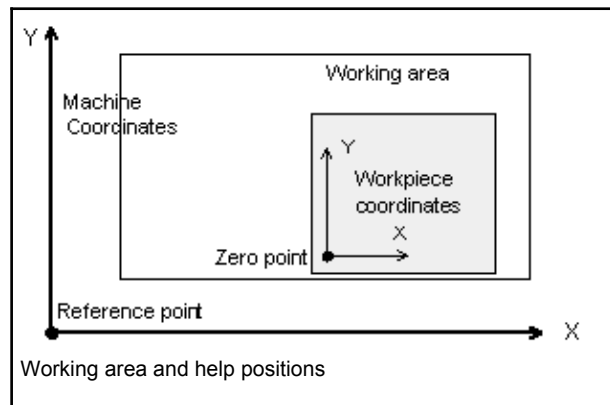
Additional distance for collision avoidance

Clearance distance can be defined as additional height of the Z-axis above the zero point level. With each job process the tool is lifted above the zero point by this distance and the new height is used as tool lift height.

On the next plunge movement, **WinPC-NC** first covers the safety clearance down to the zero point at high speed, before pressing into the material with the defined plunge speed.

Zero point

The zero point refers to the reference point of the coordinates in the working file. It is the position with a specific X and Y-axis coordinate within the NC file, e.g. the left-hand bottom corner. All processing distances are measured from here.



Zero point as origin of the workpiece coordinates

The zero point can also be defined manually. To do this, it is necessary to move to the required position using jog movement and then save this as the new zero point. The positions of the axes can also be saved individually.

The unit is millimeters and the lengths represent the absolute distance from the machine reference point (machine coordinates).

Zero point in file

The workpiece zero point is the point in the NC file which has its position defined in the coordinate parameters. However, it can be located at various points inside or outside the workpiece and these points are defined here.

Six positions are possible:

- | | |
|------------------------------|---|
| Bottom left | The zero point is at the smallest X and Y-axis coordinates in the file, normally at the bottom left edge. Mostly used with HPGL files. |
| Origin of Coordinates | The zero point is at the coordinate origin, i.e. where the CAD programs places it for the output. This setting is to be recommended if several files are being used on the same workpiece, e.g. routing and drilling a board or when using G code files |
| Center | The zero point is in the middle of the workpiece, i.e. exactly in the center of the coordinate dimensions in the X and Y-axis directions. This setting is useful for processing round workpieces, e.g. plates |
| Bottom right | The zero point is positioned at the highest X and smallest Y coordinate of the file |
| Middle right | The zero point is positioned at the highest X coordinate and exactly between the smallest and highest Y coordinate |
| Top left | The zero point is positioned at the smallest X and the highest Y coordinate of the file |

Working area and monitoring working area

Software area monitoring-

The working area defines the section, e. g. for marking material dimensions. Limits are visible in the graphical display and it is immediately recognizable whether milling or engraving can be effected with the material piece. A check is made when job starts.

Maximum plunge depth for Z-axis-

The working area for the Z-axis determines the maximum plunge depth to which tools can move without damaging the bed of the machine.

Easy definition by moving to corners

It is very easy to move the machine to the lower left and upper right corner of the desired area and press the function keys **F5** and **F6**.

These parameters are not to be mixed up with the values determining the size of the machine table and thereby the maximum moving area.

Measuring is made in mm and distances refer to the machine reference point (machine coordinates).

The management of an additional area is activated when you enable the corresponding workpiece by checkbox.

Homing sequence of 4th axis

The reference movement or move to zero point of the 4th axis can be performed either before or after the other axes.

Zero point 4th axis

Here you enter the zero point for the 4th axis. Depending on the mechanic for controlling the 4th axis, it is a position in mm or degrees. Thus the position is exactly approached during the homing run of the 4th axis.