# Setting and saving origin points

## Introduction

### Step 1: The three axes

The term “origin point” or “home” refers to a position in the X and Y axis direction of the machine. The “names” or characters by which these directions, or “axes”, are indicated have been derived from Cartesian geometry and are conventionally determined as follows:

- the **X axis** is the left-right axis in which the engraving spindle moves. When the machine gantry is stationary and the spindle carriage moves from left to right or back, it is moving in the X axis direction. When the spindle carriage moves to the right, the corresponding X axis coordinate increases, when it moves to the left, the X coordinate decreases.
- the **Y axis** is the back-front axis. When the engraving table moves back and forth, it is moving in the Y axis direction. When the table moves to the back of the machine, the value of the Y axis coordinate increases, when it moves to the front, the coordinate decreases.
- the **Z axis** is the vertical axis, with the spindle moving up and down the slider. When the spindle moves down, the Z axis value increases. When the spindle moves up, the Z axis value decreases.

### Step 2: The origin points or "homes"

The origin points are sometimes also called “zero (point)”, or “home”. The term “zero” says exactly what it stands for: it is the precise spot where the X axis value and Y axis values are 0. Home positions where X=0.0 and Y=0.0 can be defined anywhere on the engraving table.

There are three kinds of origin points or “homes”: the **machine home**, the **programmable homes** and the **soft homes**.

- the **Machine home** is a fixed point on the machine in X, Y and Z direction, beyond which the machine cannot move. It is determined by the machine’s construction. Each time when the machine has been switched on, the spindle will sit in the upper left corner of the engraving table. That is the machine home, and the display of the virtual pendant shows the 0.00 for both the X and Y coordinates.
- **Programmable homes**. Any point on the engraving table can be saved permanently as an origin point. To distinguish such a home from the machine home, we call this a “programmable home”. Not only other locations on the engraving table can be defined as origin, but they can also be saved, to be reused later on, when the same kind of job is being redone, or when the quick lock vise has to be used again.
- the **soft home** is a temporary home which can be set anywhere on the engraving table, but which is not saved in memory under an origin number.

### Step 3: The use of specific home positions

When a machine leaves the factory, it only contains the machine home. For conventional engraving

jobs with rectangular plates or tags, this is the most suitable home position. The machine home is in the upper left corner of the engraving table. Why then provide the possibility of programming a home?

There can be several reasons. A few examples will illustrate this:

- Imagine someone wants to engrave small objects, like pushbuttons, which are difficult to hold on a flat table, so they cannot be put on the machine table. In that case they will want to use a clamping system like a vise, of which the position in the machine can be quite random. In that case, you will want to place the home position on the upper left corner (or in the centre) of the surface you are to engrave.
- Or in the trophy industry, circular or randomly shaped medals will be placed in a so-called vise anywhere on the machine surface. As the name “quick lock vise” already hints, the origin point will be placed in the center of the object, and the coordinates system will work in a slightly different way. We will get back to this later on.

## Setting, saving and canceling a home position

### Setting a home position

1. Using the arrow-keys  the spindle carriage can be moved anywhere over the engraving table.

   Or, using the XYZ key , the spindle can be moved to any precise location over the engraving table.
2. Pushing the “set Home”  key makes this spot the “temporary” soft home, and the coordinates of X and Y of this spot become 0,00.
   This point will remain valid as long as no other home is entered, or until the machine is rebooted. Any job executed from then on will use this point as origin point.

### Canceling the temporary home position

It is always possible to cancel the temporary soft home by using the Shift  and then the Go home  key. This will initialize the machine-home.

### Saving one or more permanent home positions

If a specific spot has to be saved into the machine memory as an origin point, here is how to achieve this.

1. First jog the spindle to the desired spot over the engraving table, or use the  key to move the spindle there.
2. Then push the “Shift” button  and verify that the shift arrow in the status bar of the virtual

pendant gets a different colour .

3. Push the button. The following dialog window opens: 

4. Pick a number you want to use and click on it (from 1 to 9).

Doing so the spot where the spindle stands will become the active home position (0,0), and the number under which this position was saved, will be displayed on Cyborg virtual pendent. If home 3 was chosen to save this set of X,Y coordinates, this is what you will see: .

### Activating a preprogrammed origin point

To reactivate call a previously recorded programmable home position, click the key. The “Go to home number” window appears. When you click on one of the nine available keys, the spindle will move to that specific home position and the virtual pendent will display the number of the active home position on the Cyborg virtual pendent.

When one of the preprogrammed origins is recalled, this origin also becomes the new soft home, and replaces the possibly existing soft home. After switching off the machine and rebooting it, the machine home becomes the origin point again, but the preprogrammed origins (1-9) remain in the machine’s memory and can be reactivated any time.

### Recalling the last softhome after machine reboot

If you have used a soft home, then switched off the machine, or if you had a power fail, and you reboot the machine, it is still possible to recall the last used soft home from before the reboot. This can only be done if after the reboot no new soft home was determined. To recall the last used soft home, click and then .

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