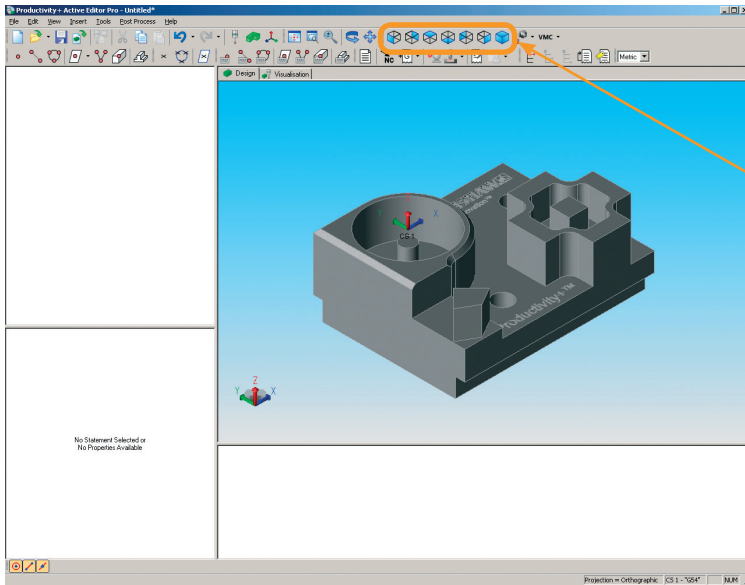


# Productivity+™ Active Editor Pro: initial set-up

The aim of this module is to guide users through the process of manipulating a solid model using pan, zoom and isometric functions, aligning an imported solid model to the machine axis, and creating and aligning new co-ordinate systems.

Having completed this module you will be able to:

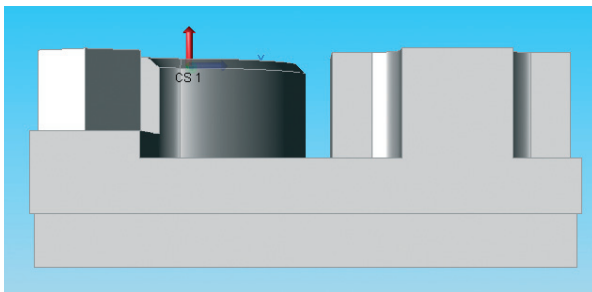
- Manipulate a CAD (solid) model within the Model viewer window
- Orientate the model with respect to your machined part using the Solid Model Tools dialog
- Create and assign a CS (co-ordinate system) to a feature on the model using the Co-ordinate System Manager dialog
- Align and orientate generated co-ordinate systems for multi-axis probing



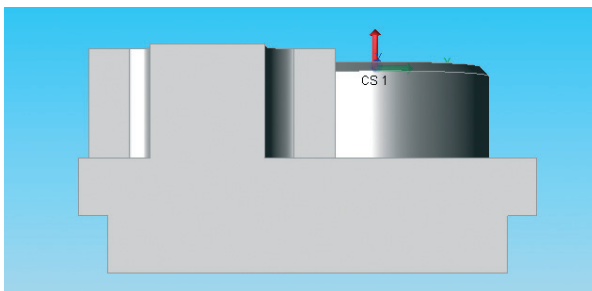
## Manipulating a CAD model

The orientation of a model can be manipulated in one of two ways:

- using the icons from the Standard views toolbar
- using a combination of keyboard keys and mouse buttons



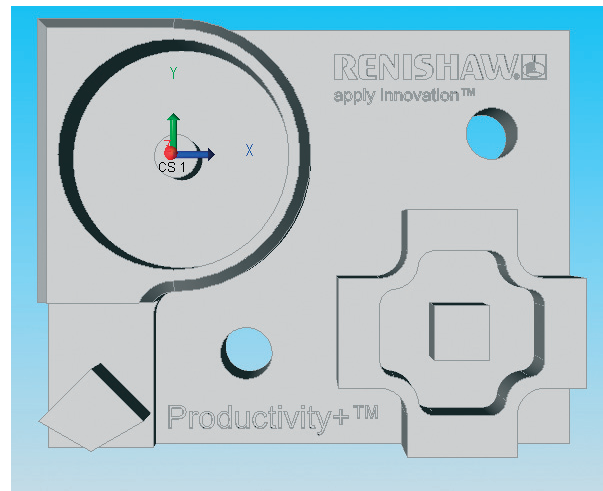
Front view



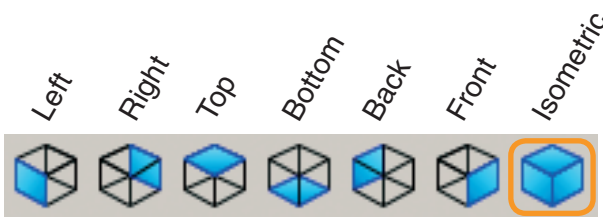
Right view

Icons in the Standard views toolbar adjust the model such that it is viewed from:

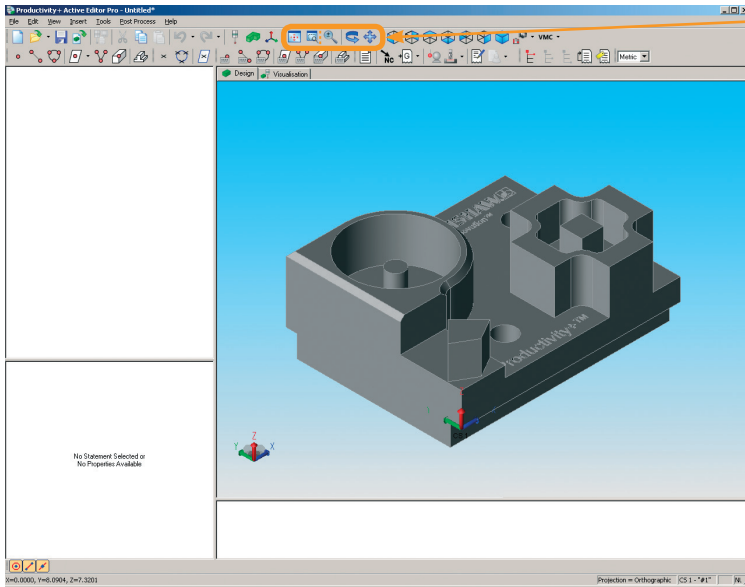
- left
- right
- top
- bottom
- front
- back



Top view



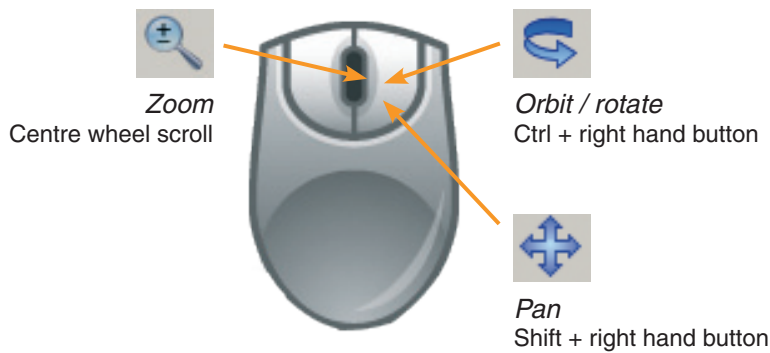
The most commonly used model orientation icon returns the model to the isometric view.



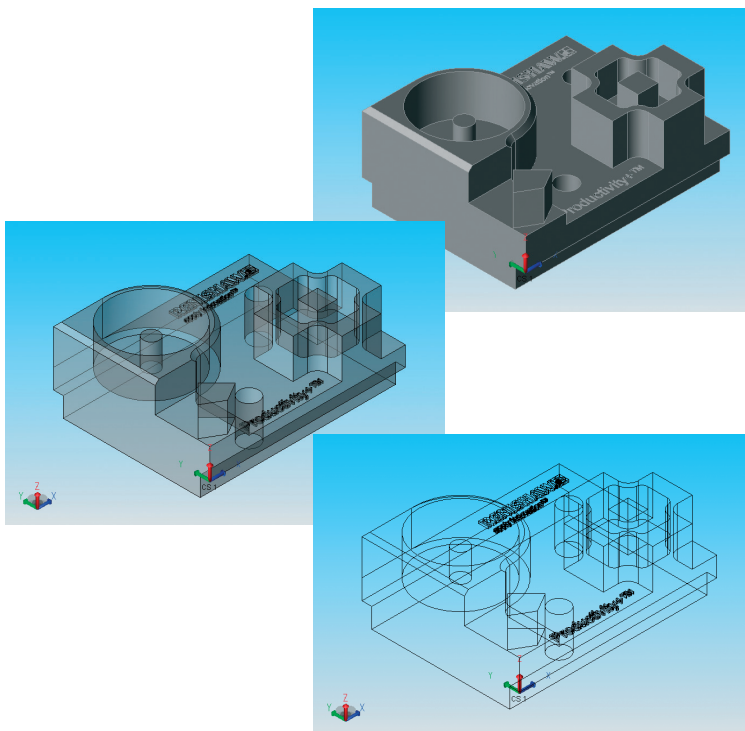
The View manipulation toolbar allows users to Zoom, Orbit and Pan the model to navigate to and view a particular feature in more detail.

Select the required icon and use the left mouse button to manipulate the model until the desired view is achieved.

Two additional Zoom options are available: Zoom to Extents, which resizes the model to fit within the Model viewer window, and Zoom to Window, which fits the model to a subsequent, user selected frame (left mouse click, hold and drag to create this frame).

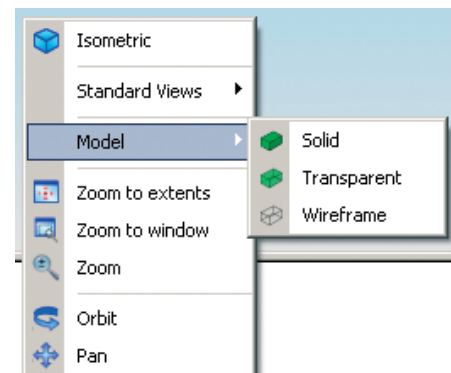


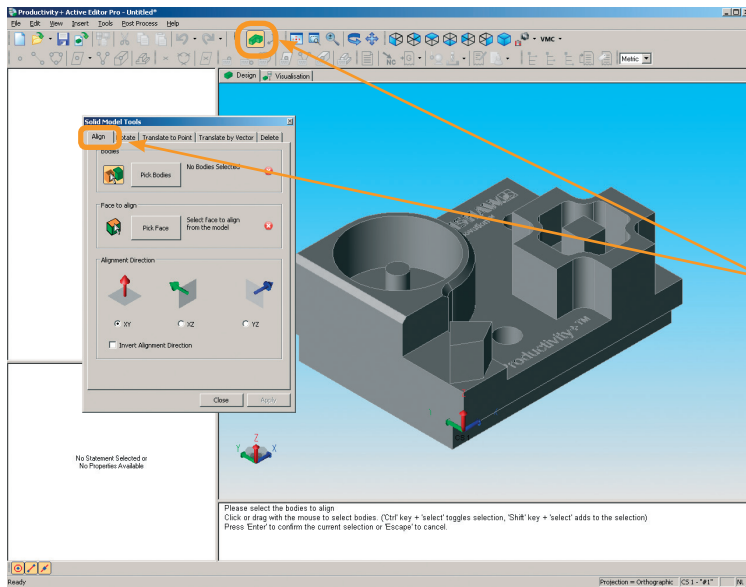
Solid model manipulation is also possible using a combination of keyboard keys and mouse buttons, as indicated in the image on the left.



In addition to manipulating the viewing angle of a solid model, it is also possible to vary the shading applied to the model.

With a solid model imported, right mouse click in the Model viewer window. From the resulting menu, select Model, then Solid, Transparent or Wireframe as required.

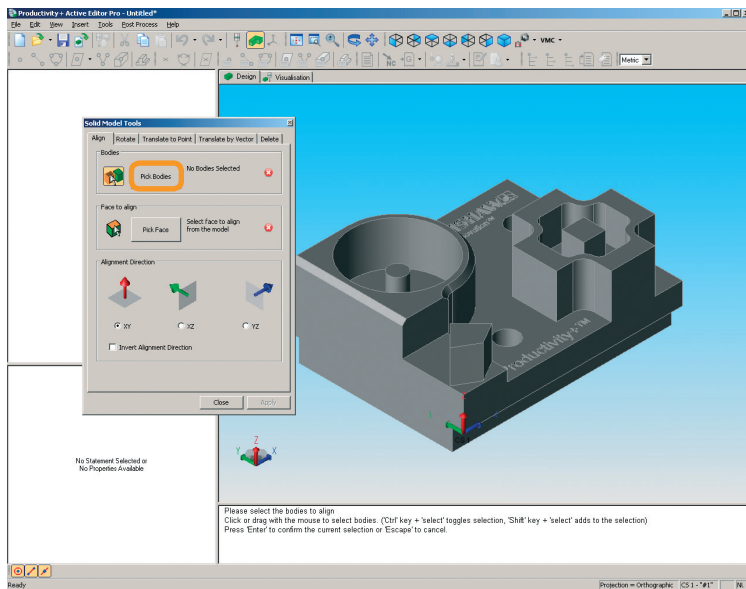




## Aligning a model to the machine axis

When a model is first imported into Productivity+™ Active Editor Pro it may be necessary to align the model to the machine co-ordinate system.

If not already opened by the New Part Wizard, click the Solid Model Tools icon, and select the Align tab.



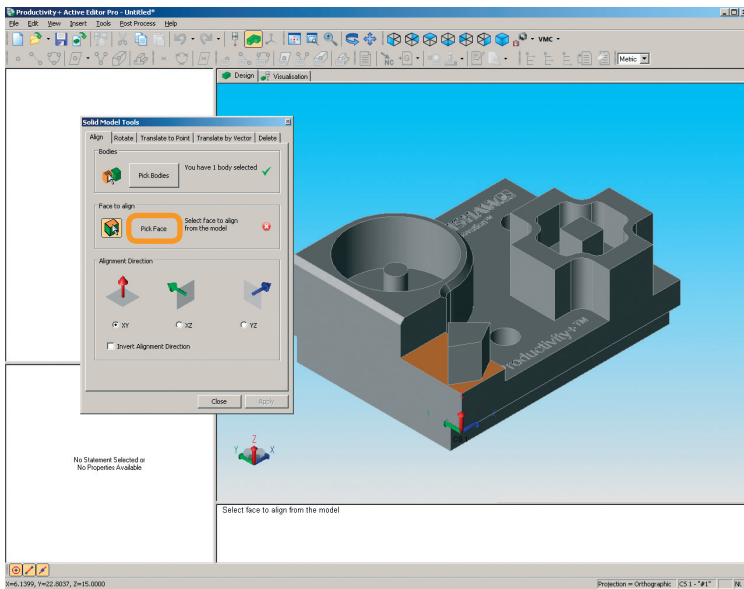
Select the Pick Bodies icon.

Notice that the model changes colour (to orange) as the cursor moves over it.

When you now click anywhere on the model surface, the whole model will change colour (to yellow) to signify that all of the model features have been selected.

(To fully select a model that is composed of several elements or bodies, left click in the Model Viewer window and drag to create a window around all features, or hold down the Shift key and select each individual body.)

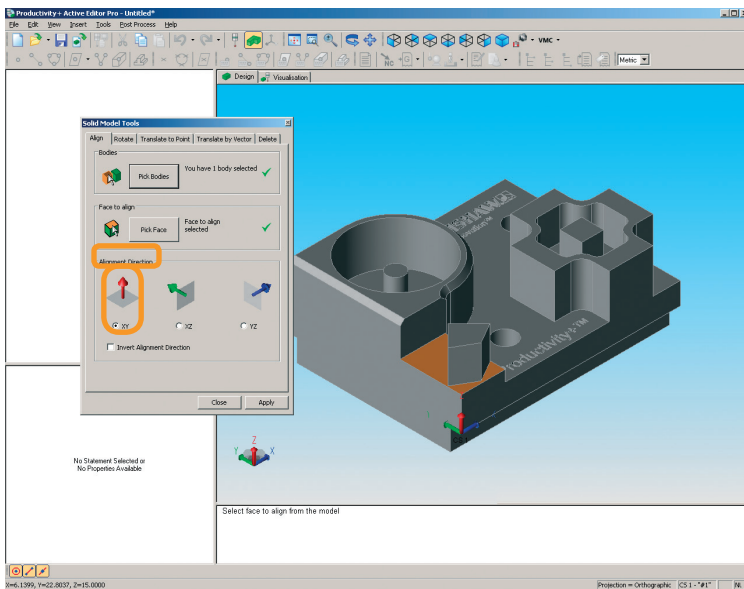
A green tick appears in the Solid Model Tools dialog box to indicate that a selection has been made.



Select the Pick Face icon. With this option selected individual faces on the model change colour as the cursor is moved over the surface.

Navigate the cursor to a horizontal face and left click once with the mouse.

Once selected, the surface reverts to its original colour. A green tick indicates that a surface has been selected.

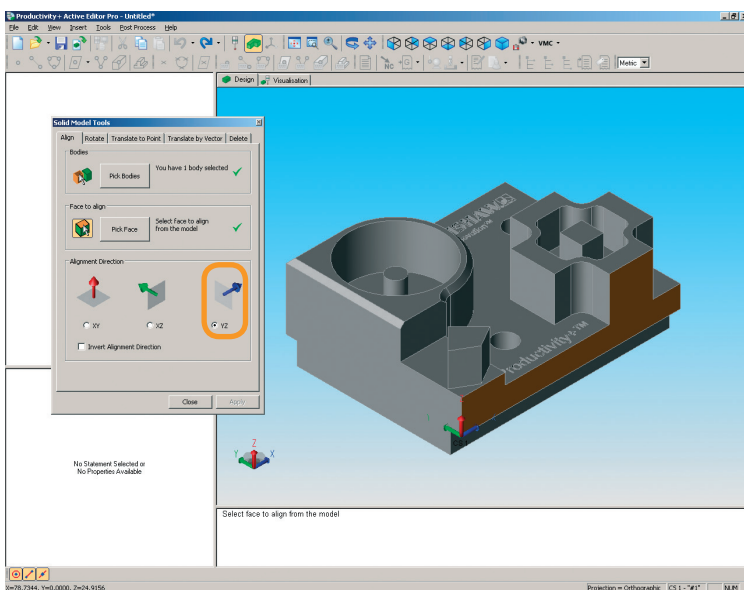


Now select the axis to align using the Alignment Direction area of the dialog box.

In this exercise it is going to be the top face to ensure that the model is level with the machine's XY axis.

Click Apply.

Notice how the model changes colour as the alignment is applied. No movement of the model will occur with this example.

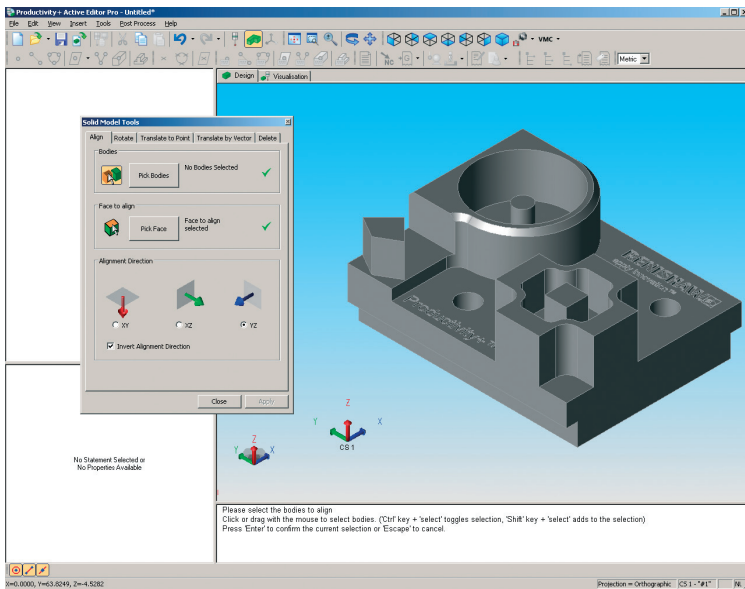


To align the XZ or YZ axis, simply select Pick Face again. As previously, the faces change colour as the cursor is moved over them.

Select the face to be aligned (as indicated). A green tick indicates that a face has been selected.

Choose the YZ option, and select the Invert Alignment Direction. This dictates where the model lies with respect to the face.

Now select Apply.



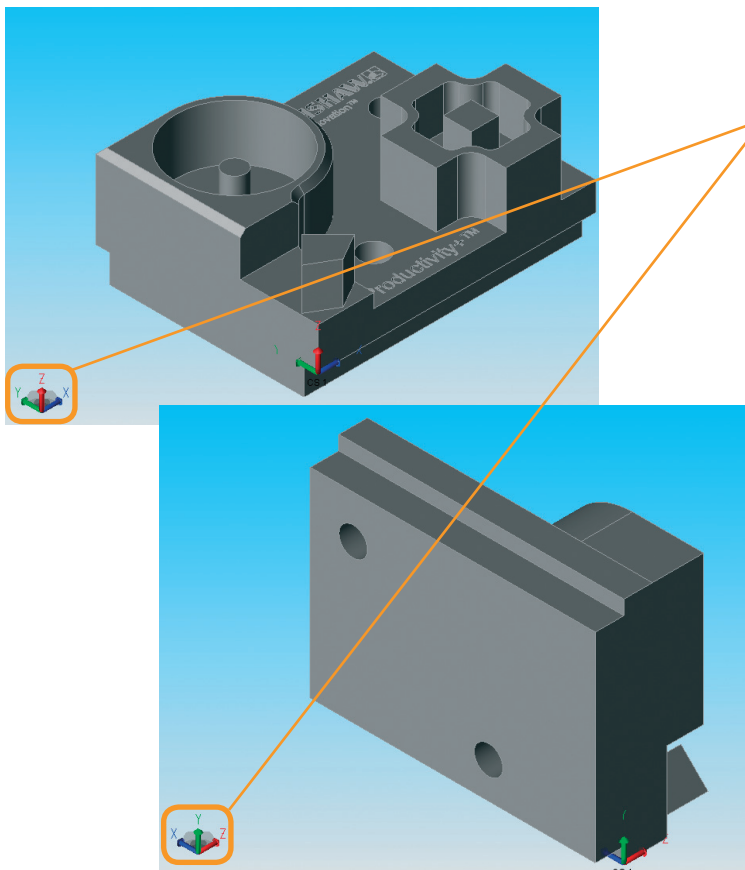
The model is now aligned in the YZ plane.

As this was only an exercise in aligning the model, and to ensure continuity throughout the remaining training modules, the model should be realigned to the original position.

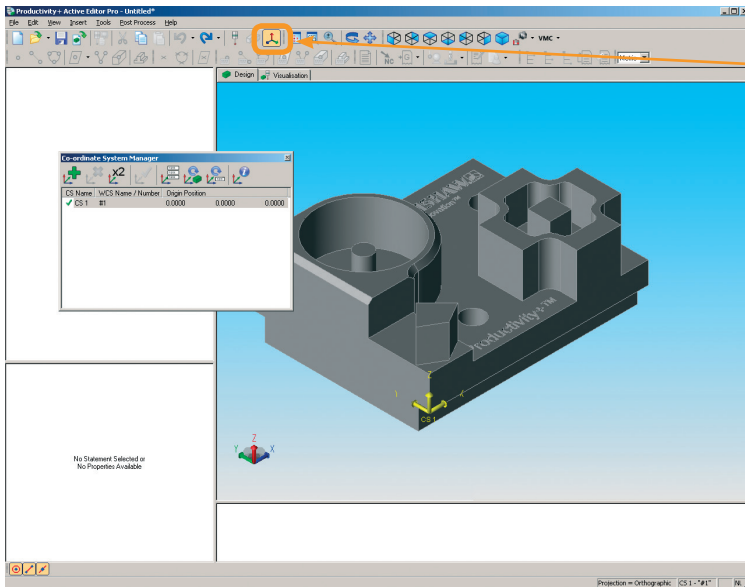
Try getting the model back in its original position by using the Solid Model Tools dialog box, or close the dialog and click the Undo icon once. This will return the model to its starting position.



Once the solid model is correctly aligned to the machine axis, the Align as VMC (or Align as HMC) icons (coupled with a selection from the Standard view toolbar) can be used to orientate the solid model as it appears on the machine tool.

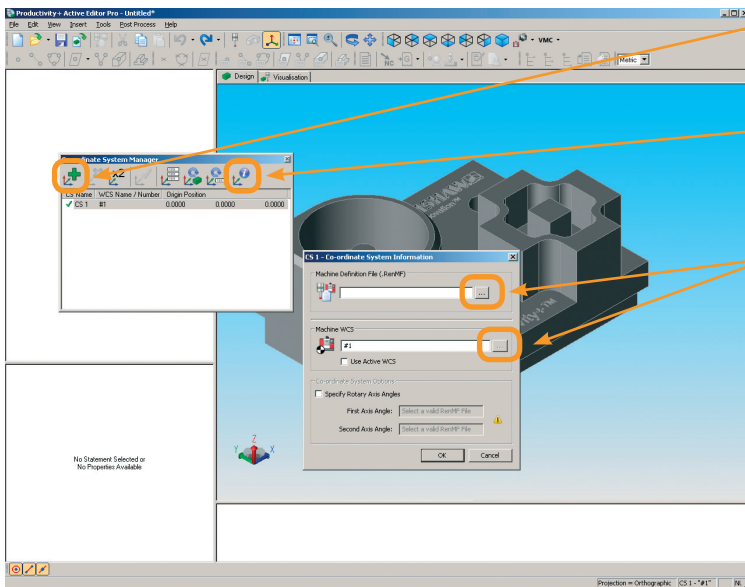


Note the differing orientation of the free space axis marker in the Align as VMC (upper) and Align and HMC (lower) images.



### Creating a new CS

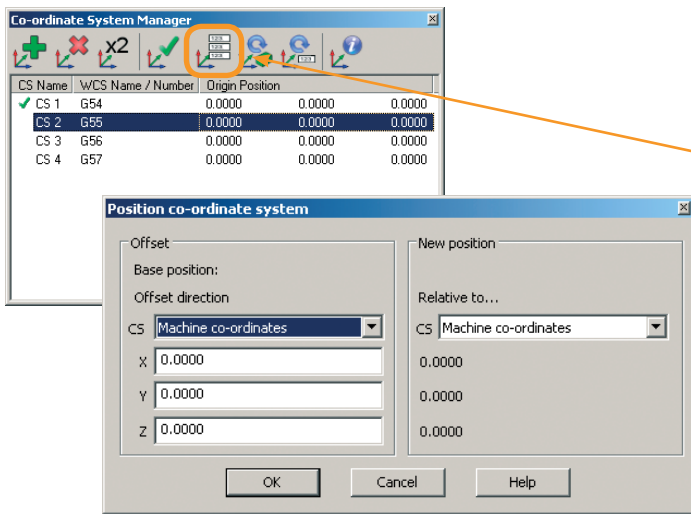
To create a new co-ordinate system, select the Co-ordinate Systems icon. Note that the colour of the CS1 icon on the solid model changes colour.



Add a new co-ordinate system by selecting the Add co-ordinate system icon in the resulting dialog.

Next, select the Co-ordinate System Information icon and use the resulting dialog (via the ellipsis buttons) to select the appropriate Machine Definition File (.RenMF) and corresponding Machine WCS.

Repeat to create the desired number of co-ordinate systems.

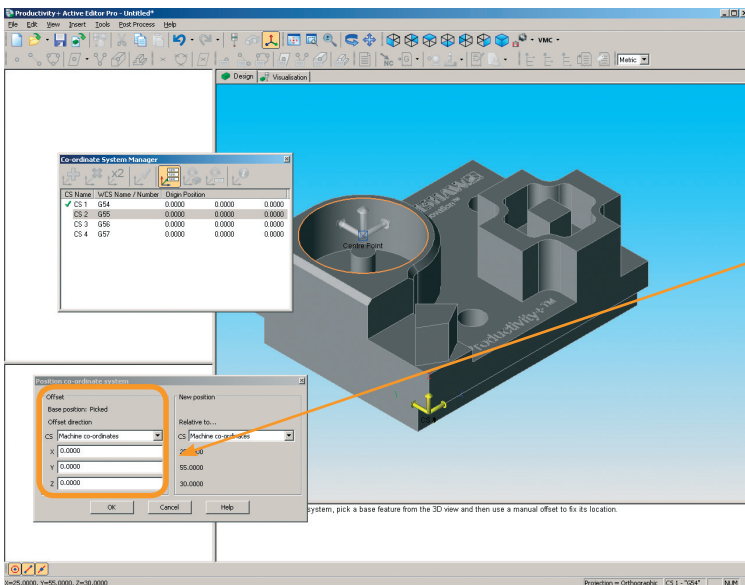


## Positioning a CS

In the Co-ordinate System Manager dialog, select the co-ordinate system that you wish to position, followed by the Position co-ordinate system icon. This opens the Position co-ordinate system dialog.

From here it is possible to position the co-ordinate system using features on the solid model.

Hint: To help with feature selection, it is useful to ensure the three 'snap to' buttons (bottom left of screen) are selected.



As the mouse cursor is moved across the solid model, various feature elements such as end point and mid point are highlighted. Left mouse click to select the required feature when highlighted to position the co-ordinate system.

If required, offsets in X, Y or Z can be added using the Offset area of the Position co-ordinate system dialog.

Click OK to finalise position of the co-ordinate system.

Repeat until co-ordinate systems have been positioned.

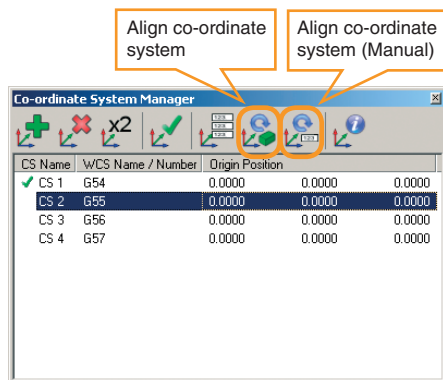
## Aligning a CS

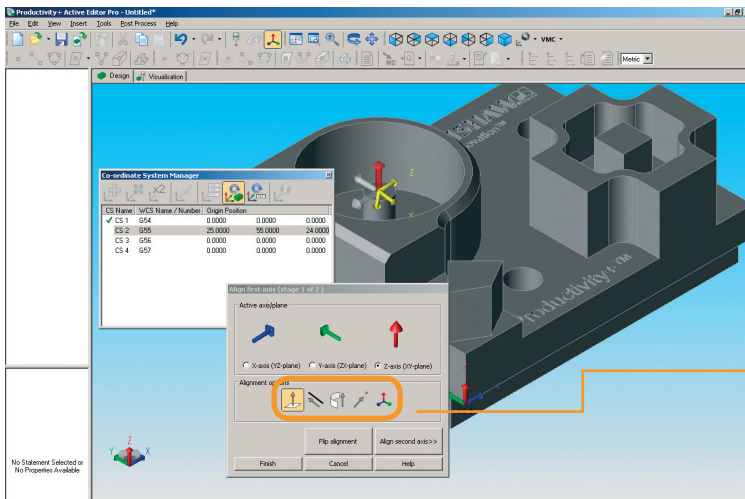
All co-ordinate systems are now positioned and are currently aligned with the machine axis (indicated by the free space axis marker).

These co-ordinate systems can now be adjusted relative to the machine axis either by aligning them to features on the solid model, or by manually entering rotation data.

Alignment to solid model features is performed in two stages:

1. set the alignment of one axis
2. set the rotation of the remaining axes around the now fixed axis





Select the required co-ordinate system from the Co-ordinate system manager dialog, then the Align co-ordinate system icon.

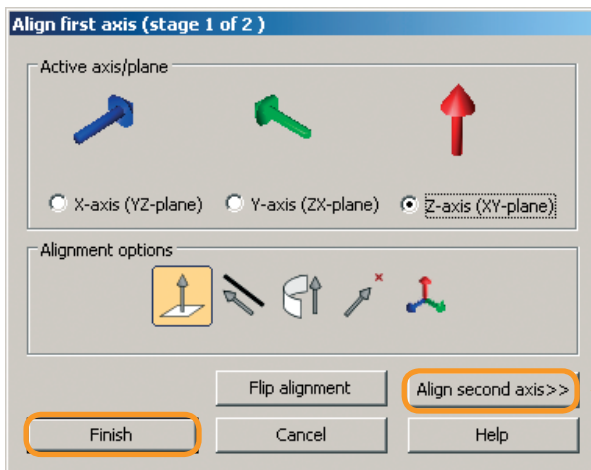
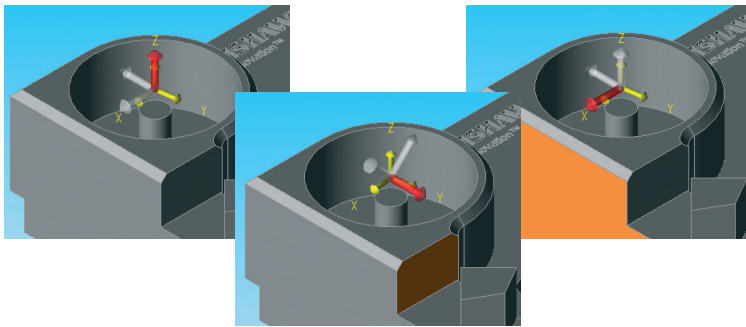
Select the axis for which alignment is to be set. (Typically this is Z, but another axis may be selected if required.) The corresponding axis of the co-ordinate system marker on the solid model is now highlighted.

Select an option to align the co-ordinate system:

- Align to planar face
- Align to edge direction
- Align to cylindrical face axis
- Align to point
- Align to co-ordinate system

These options toggle on/off and more than one may be selected.

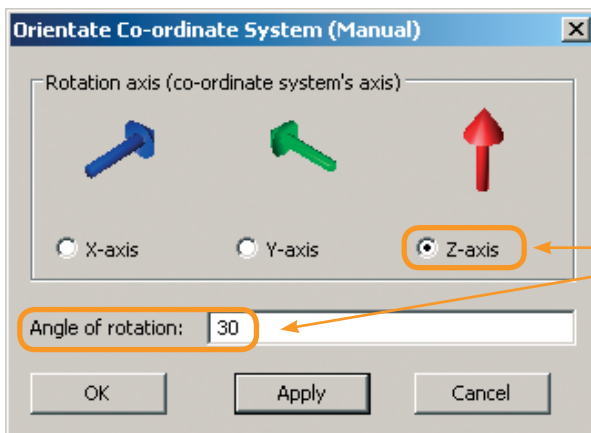
As the mouse cursor moves across the solid model, the co-ordinate system alignment changes to reflect the selection(s) made. When the correct orientation is achieved, click on the solid model to confirm the alignment indicated.



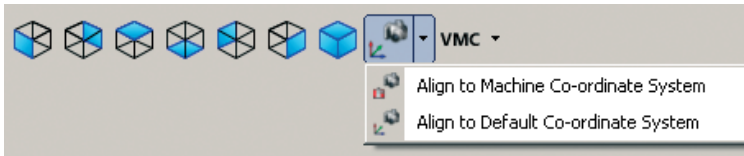
Click Align second axis and select the second axis to align. (The axis which has just been set is greyed out and cannot be selected.)

As before, select an alignment option and move the mouse cursor across the solid model. Click on the model when the desired alignment is achieved.

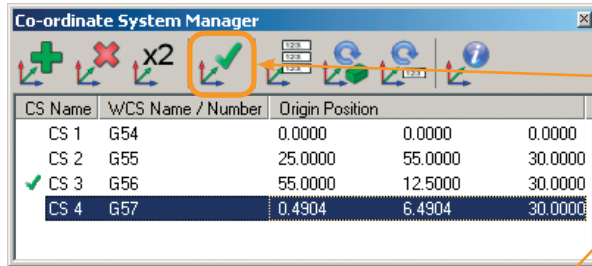
Click Finish to complete the alignment process.



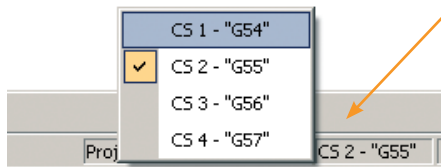
To manually align a co-ordinate system, select an axis and enter the angle of rotation to be applied around that axis.



With all co-ordinate systems set, CAD model orientation can be quickly adjusted using the Align to Machine Co-ordinate System or Align to Default Co-ordinate System icons (followed by a selection from the Standard views toolbar).



A co-ordinate system may be set as the default via the Co-ordinate System Manager dialog or by selecting the desired co-ordinate system from the bottom right of the status bar.



The co-ordinate system selector is a quick and simple method of changing between co-ordinate systems when programming multi-axis probe routines.

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