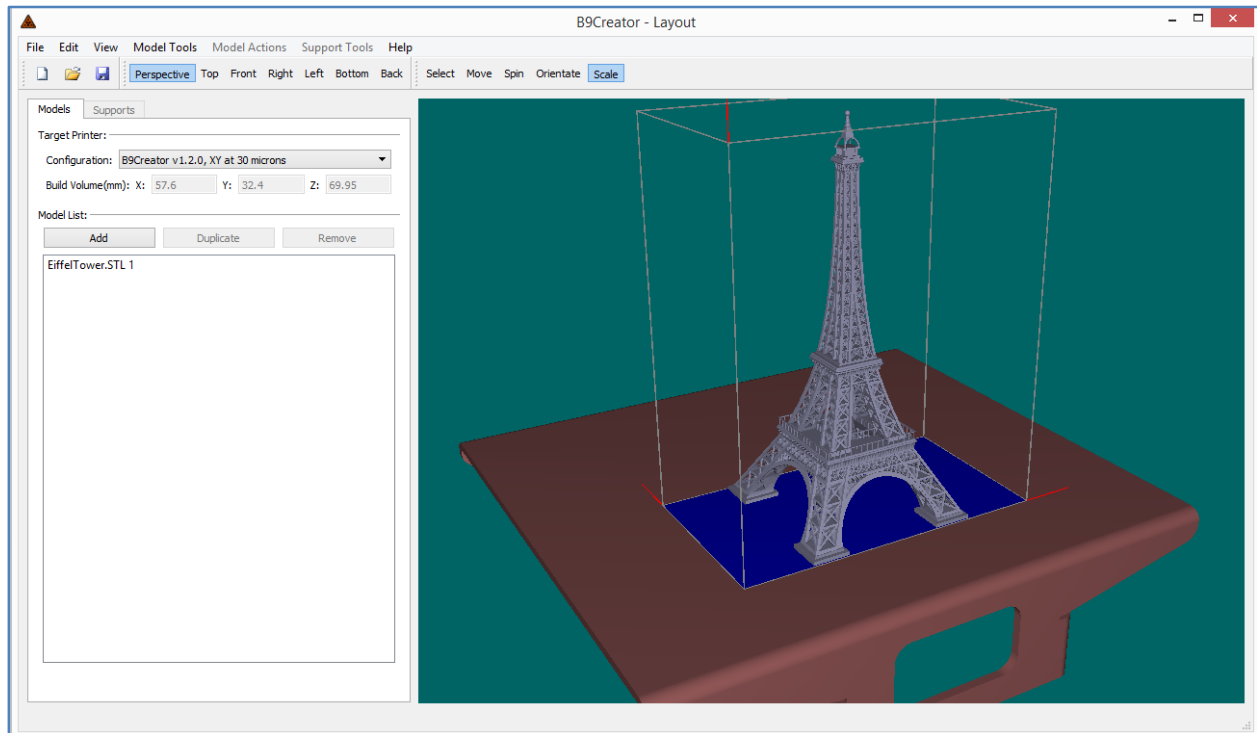


# B9Creator Layout Quick Guide

## Overview



This guide will cover the basics of how to use the Layout portion of the B9Creator software.

Laying out models in preparation for slicing comprises of 2 primary activities:

- Orienting models in the build area
- Supporting models to ensure printability

In order to accomplish these 2 activities there are 2 primary modes of operation within the layout software:

- Model Mode
  - Allows the user to position and orientate models around in the build area
- Support Mode
  - Allows the editing of support structures on the selected model.

The user can switch between these 2 modes at any time by clicking on the Model or Support tab.

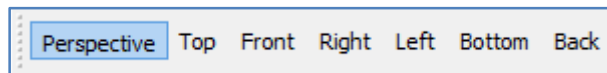
# Using Layout

## View Navigation

The primary method of setting your view of the build area is to drag the mouse inside the viewport with the following key combinations:

- **Right Mouse Button**
  - Rotates your view of the build table
- **Shift + Right Mouse Button or Middle Mouse Button**
  - "Pans" or scrolls across the view up and down as well as side to side.
- **Middle Mouse Scroll**
  - Zooms in and out making the view of the build area larger or smaller.
  - (Holding control and the + or - key will also zoom in and out)

In the toolbar near the top of the screen there are 6 buttons that serve to easily orient the view of the build area:

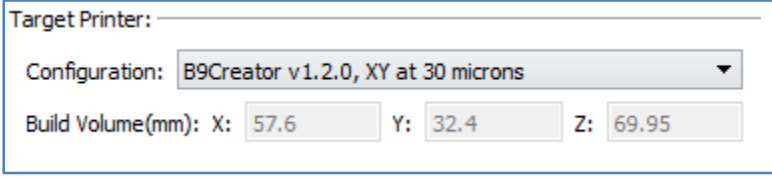


- Perspective (Toggle to enable a Perspective View or Orthogonal View)
- Top
- Front
- Right
- Left
- Bottom

These controls can aid in setting your view of the build area instantly.

## Printer Configuration

Because there are different versions of the B9Creator as well as different configurations, it is important to choose the correct printer configuration before starting a new layout. Select the printer configuration you intend to print on in the following drop-box:



The image shows a software interface for printer configuration. It features a label "Target Printer:" followed by a horizontal line. Below this is a dropdown menu labeled "Configuration:" with the selected option "B9Creator v1.2.0, XY at 30 microns". At the bottom, there are three input fields for "Build Volume(mm):" with labels "X:", "Y:", and "Z:". The values entered are 57.6, 32.4, and 69.95 respectively.

| Field              | Value                              |
|--------------------|------------------------------------|
| Configuration      | B9Creator v1.2.0, XY at 30 microns |
| Build Volume(mm) X | 57.6                               |
| Build Volume(mm) Y | 32.4                               |
| Build Volume(mm) Z | 69.95                              |

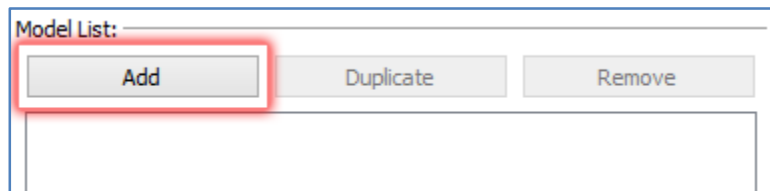
The build volume field indicates the size in millimeter of the build area in the X and Y directions.

## Laying Out Models in Layout

### Importing Models

The B9Creator layout software can import STL files to be oriented in the build area. These files have a ".stl" extension on the end of the name of the file.

In order to import a model into layout click on the Add button to the left of the screen or select "Add Model" from the file menu. A file explorer window will pop up where you can select and stl file for importing.



#### **Important STL File Notes:**

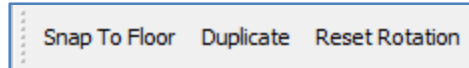
Since the STL file type does not support units, all units are assumed to be in millimeters (mm).

Both the layout software and slicing software in B9Creator do not check for model correctness. Therefore all stl's imported into B9Creator are assumed to consist of closed watertight meshes. It is generally ok for a stl file to consist of multiple closed meshes and they can intersect each other, but the meshes themselves must be closed.

Once the model is imported it will appear in the center of the build area in the viewport and will be selected. The model is then ready to be oriented and supported.

## Model Actions

Model Actions apply quick operations to the currently selected model. These actions can be found in the Model Actions menu as well as the toolbar:

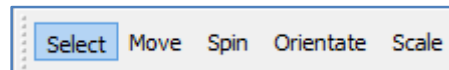


- Snap To Floor
  - Raises or Lowers the selected model in the Z direction until it touches the blue build area.
  - If the model contains support structures, the model is lowered as much as possible to avoid restricting the supports.
  - Useful to use after orientating the model or if the model is sticking out below the build area.
- Duplicate
  - Makes a copy of the selected model and positions the copy in a free area.
  - Also copies support structures if present.
- Reset Rotation
  - Resets the Orientation and Spin of the model to original values.
  - If support structures are present, this action will destroy all supports on the model. (A warning will be given)

## Model Tools

Model Tools are useful for quick manipulation with the mouse. It should be noted that all actions done with the model tools can be fine-tuned or edited in the model information portion of the models tab to the left of the screen.

There are multiple model tools available to use in layout for manipulating models. To select a tool click on the corresponding button in the upper tool bar or select the menu item in the Model Tools menu. It is important to note that only one tool can be selected at a time:

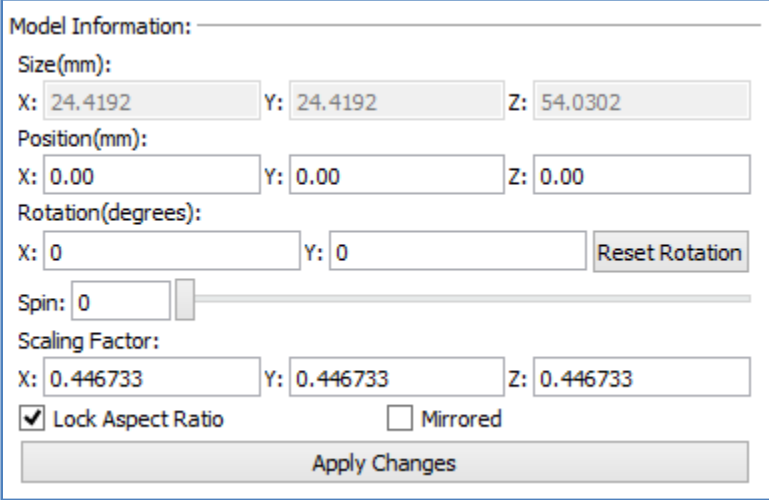


- Select
  - Enables selection of models by clicking on them.
- Move
  - Enables clicking and dragging the model around the build table.
  - To move a model left click the model in the viewport and drag until it is in the desired position, then release the mouse click.
  - When moving the model across the build area, it is best to use this tool in a top view.
  - Hold the shift key while dragging up and down to lift the model in the Z direction.
- Spin
  - Enables spinning the model by clicking and dragging.
  - To spin the model left click and drag from the center of the model and drag the mouse in a circular motion around the build area.
  - It is best to use this tool when in a top view.
  - Spinning results in a Z rotation.
- Orientate
  - Enables orienting or "tilting" the model by clicking and dragging.
  - To orient the model left click and drag from the center of the model and move the mouse up and down for X rotation; and side to side for Y rotation.
- Scale
  - Enables scaling the model dynamically by clicking and dragging with the mouse.
  - To make the model larger move the mouse to the right.
  - To make the model smaller move the mouse to the left.

## Model Information Interface

While the model tools can be used to quickly manipulate models in the build area, the Model Information Interface is useful for more refined model control.

The Model Information Interface is only visible while a model is selected:



The screenshot shows the Model Information Interface with the following fields and controls:

- Model Information:** (Title)
- Size(mm):**
  - X: 24.4192
  - Y: 24.4192
  - Z: 54.0302
- Position(mm):**
  - X: 0.00
  - Y: 0.00
  - Z: 0.00
- Rotation(degrees):**
  - X: 0
  - Y: 0
  - Reset Rotation button
- Spin:** 0 (with a slider)
- Scaling Factor:**
  - X: 0.446733
  - Y: 0.446733
  - Z: 0.446733
- Lock Aspect Ratio
- Mirrored
- Apply Changes button

The following is a description of the primary components of the interface:

- Size(mm)
  - Indicates the size of the bounds of the model
  - This is for reference only
- Position(mm)
  - The position in mm of the center-bottom of the model.
  - The center of the build area is 0 millimeters in the X, Y and Z directions.
- Rotation(degrees)
  - Gives the X and Y rotations of the model in degrees
  - Clicking the "Reset Rotation" Button will reset both the X and Y rotations back to 0, 0
  - Editing these values will "Orient" or "Tilt" the model. (Same as using the Orientate Model Tool)
- Spin(degrees)
  - Gives the Spin of the model in degrees.
  - Moving the slider will rotate the model from 0 to 360 degrees.
- Scaling Factor
  - Gives the scaling factors in the X, Y and Z directions.

- A scaling factor of 1.0 restores the model to original scale.
  - Scales across the X, Y and Z directions are force to be the same if the "Lock Aspect Ration" checkbox is enabled.
- Lock Aspect Ratio
  - Forces the scaling factors to remain the same in the X, Y and Z directions.
  - Unchecking this checkbox allows for "skewing" of the model, to correct a skewed model simple re-enable this checkbox
- Mirrored
  - Flips the model around its local X axis
  - Flipping occurs on the model before its Orientation and Spin are applied, re-orientating and spinning may be needed to truly flip the model with respect to the build area.
  - Attempting to mirror a model with supports will give a warning and delete all supports on the model.
- Apply Changes Button
  - Applies all changes in the Interface to the model
  - Produces the same result as when enter is pressed within any of the fields above)



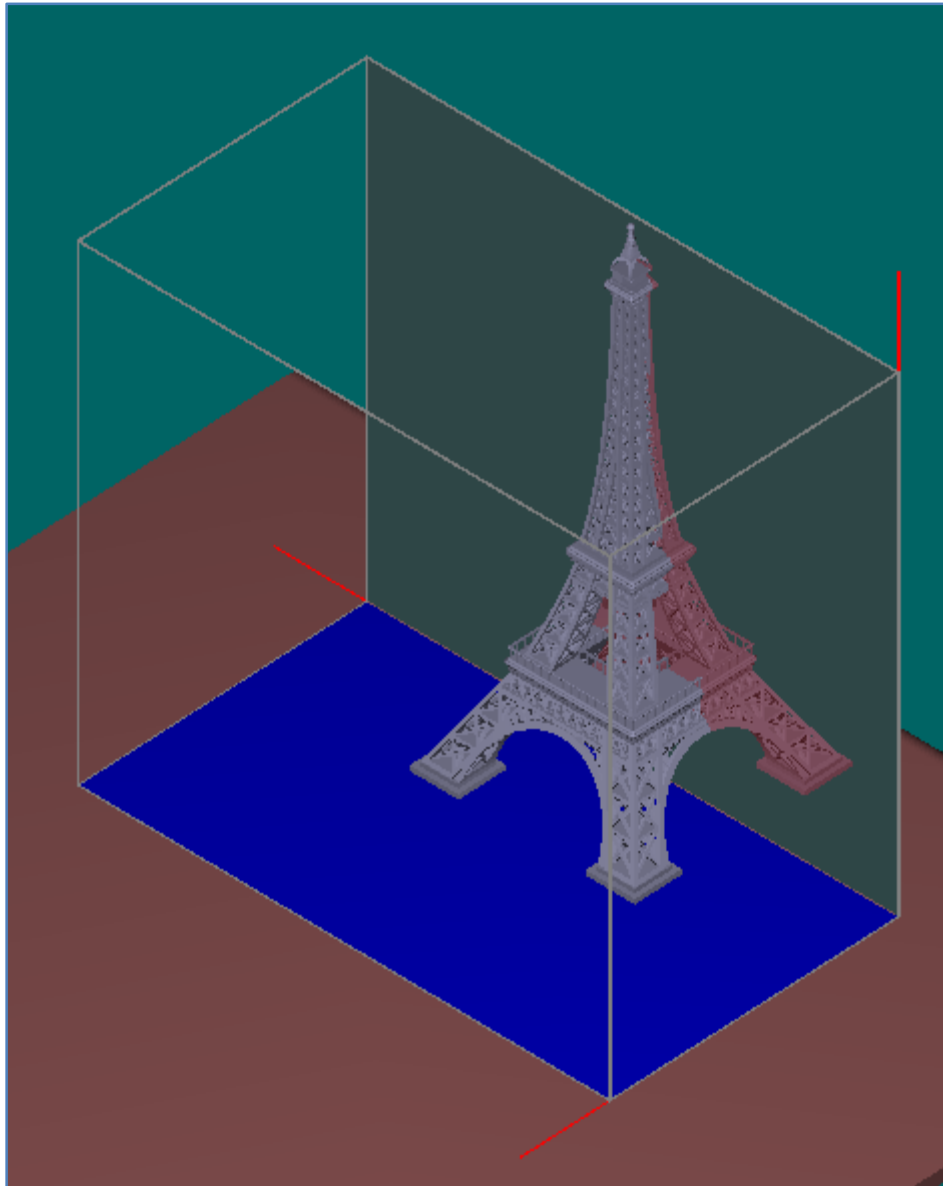
## Model Alignment Tips

When Positioning and Orientating a model in the build area, It is important that the model be oriented in such a way as to minimize needed support structures.

- Keep Long Faces Vertical
- Avoid Large Horizontal Faces (unless it is a pre-defined support structure as part of the model)
- Keep parts of the model with larger mass down near the build table.

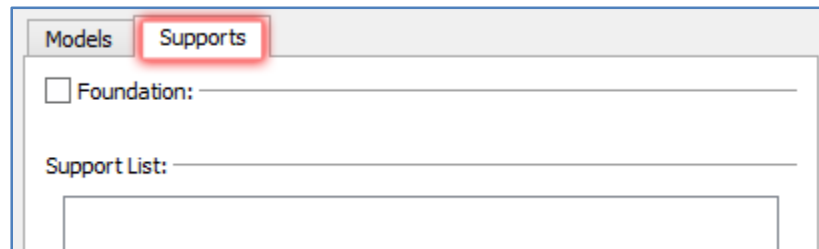
## Build Area Boundaries

If any model is positioned outside of the build area indicated by the white lines forming the boundary rectangle, a red "wall" will appear indicating that a model is outside of the build area and will be clipped when slicing occurs:



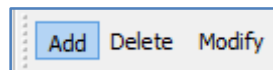
## Support Mode

When a model is positioned and oriented on the build table, the model then needs support structures. Support mode switches the interfaces within layout to enable support editing. Support mode is only available when the desired model is selected. Support mode only allows the user to edit supports on one model at a time:



## Support Tools

The support tools can be found in the "Support Tools" menu or in the toolbar. Of the following tools, only one can be selected at a time:

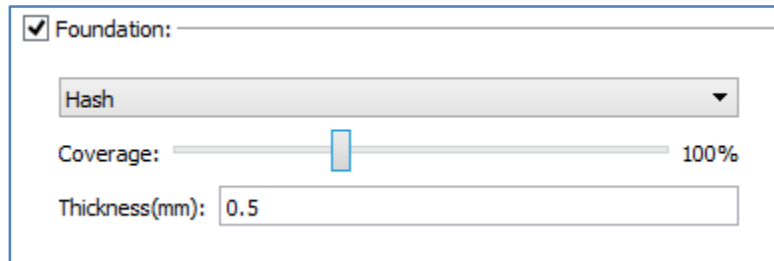


- Add
  - Enables adding of supports with the mouse
  - To add a support, left click on the model where the support should connect to.
  - Supports can only be added when there is a green line shown below the mouse cursor against the model.
  - Parameters of added supports can be altered in the Support Parameters interface.
- Modify
  - Enables modification of supports.
  - Supports can be modified with the mouse or via the Support Parameters Interface.
  - Clicking and dragging the top or middle of a support will move the top of the support across the model's surface
    - While holding control and dragging the top of the support, the length of the top will be altered.
    - While holding control and dragging the middle of the support, the overall width of the support will be altered.
  - Clicking and dragging the bottom of the support will move only the bottom of the support.

- While holding control and dragging the bottom of the support, the overall thickness of the support will be altered.
- Delete
  - Enables deletion of supports with the mouse.
  - To delete a support lift click on it with the mouse.
- Automatic Supports (Found only in drop down Menu)
  - Automatically places supports on the model
  - Should be considered a useful tool for getting supports added in generally the correct areas.
  - Supports can be modified/delete afterwards.

## Adding Foundations

For many models, creating a large flat base against the build table can be beneficial in order to create a good structural bond with the build table. In order to add a foundation click the "Foundation" checkbox under the Supports tab to the left of the screen.

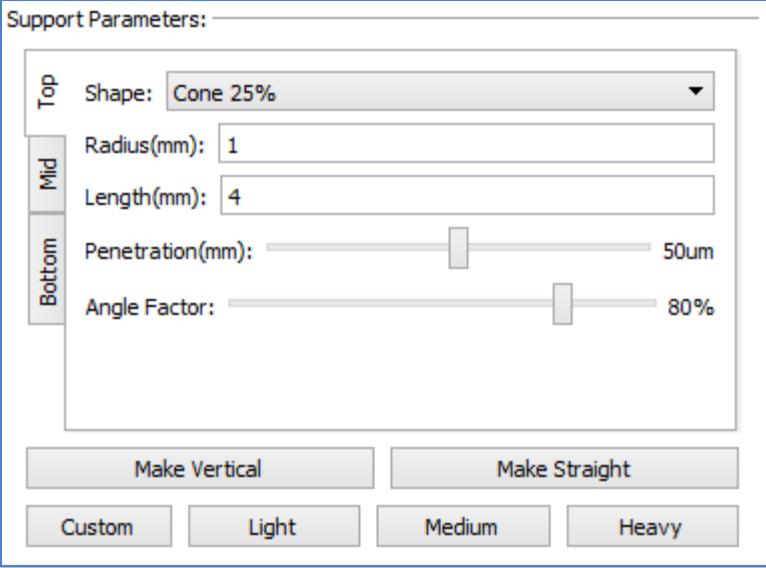


The screenshot shows a settings panel for a foundation. It includes a checked checkbox labeled "Foundation:" followed by a horizontal line. Below this is a dropdown menu with "Hash" selected. Underneath is a slider labeled "Coverage:" with a blue handle positioned at the right end, which is labeled "100%". At the bottom is a text input field labeled "Thickness(mm):" containing the value "0.5".

- The foundation shape can be changed using the drop down menu once the foundation checkbox is enabled.
- The relative size of the foundation can be adjusted with the "Coverage" slider. This resizes the foundation as a percentage of the size of the model.
- The thickness of the foundation can also be adjusted in the "Thickness" field. Units are in millimeters.

## Support Parameters Interface

The Support Parameters Interface serves to specify the size and shape of supports. If the user is using the Add tool, the interface shows the parameters that the next support added will have. If the user is using the modify tool and a support is selected, the interface is used to edit the parameters of the selected support:



The screenshot shows the 'Support Parameters' dialog box. It is divided into three sections: 'Top', 'Mid', and 'Bottom'. The 'Top' section has a 'Shape' dropdown menu set to 'Cone 25%'. The 'Mid' section has a 'Radius(mm)' input field with the value '1' and a 'Length(mm)' input field with the value '4'. The 'Bottom' section has a 'Penetration(mm)' slider set to '50um' and an 'Angle Factor' slider set to '80%'. Below the input fields are four buttons: 'Make Vertical', 'Make Straight', 'Custom', 'Light', 'Medium', and 'Heavy'.

In order to quickly set all of the parameters in the interface there are 4 buttons that fill all support settings:

- Make Vertical
  - Forces the Middle section of the support to be perfectly vertical
- Make Straight
  - Forces the tip of the support to align with the Middle section of the support.
  - Does not necessarily make the support vertical.
- Light
  - Indicates a thin support
  - Good for supporting small delicate parts
- Medium
  - Indicates a medium sized support
  - Good for general usage
- Heavy
  - Indicates a thick support
  - Good for supporting large/heavy parts of the model.
- Custom
  - Sets all parameters to a state where the user last edited any of the support values.
  - Serves as a memory of your last support customization.

Supports are made up of 3 basic sections:

- Top
- Middle
- Bottom

These sections are accessible in the interface by clicking on the corresponding sideways tab in the interface:



Each of these sections have the following parameters which are accessible via the Support Parameters Interface:

- Shape
  - The shape of the section
- Radius(mm)
  - The radius of the section
- Length(mm)
  - The Length of the section
- Penetration(mm)
  - How far the section should extend past it's position and into the model or the floor
  - No available in the mid-section.
- Angle Factor
  - How intense the angle should be between the section and the model
  - Only Available in the top section.

# Contents

1. Overview
2. Using Layout
  - a. View Navigation – including using mouse to rotate.
  - b. Printer Configuration
  - c. Laying Out Models in Layout
    - i. Importing STL's
      - i. Model Specs Needed
        - a. mm dimensions
        - b. hints on sliceability
      - ii. Model Actions
        - i. Snap to Floor
        - ii. Duplicate
        - iii. Reset Rotation
      - iii. Model Tools
        - i. Selecting
        - ii. Duplicating
        - iii. Moving
        - iv. Rotating
        - v. Scaling
      - iv. Model Information Interface
      - v. Good Alignment tips
      - vi. Build Area Boundaries
    - d. Support Mode
      - i. Support Tools
        - i. Automatic Supports
        - ii. Add
        - iii. Delete
        - iv. Modify
      - ii. Foundations
        - i. Support Parameters Interface