

# **Z Commands**

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## Z Commands

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zoom fit	zoom in	zoom out
zoom points	zoom previous	zoom selection
zoom swap views	zoom world	zrouter

## zcopy shape

The `zcopy shape` command lets you copy a shape, closed polygon, line, cline, or rectangle and add it to a different class/subclass at the same location in your design.

When you copy a shape, you can retain any voids or net name associated with the shape as well as shape fill patterns, depending on the class to which the copied shape belongs. However, if you copy a dynamic shape to another dynamic layer, any shape override properties attached to it are not maintained. For additional related information on working with dynamic shapes, see [Preparing for Layout](#) in your documentation set.

Common shapes, rectangles, or polygons that can be reused include route keepins or keepouts and conductor shapes.

 The FIXED, IDF\_OWNER, and CLIP\_DRAWING properties no longer propagate to the copied shape.

For example, you might require a route keepout with the same dimensions, on different layers in your design. Each route keepout must be located in the same position in your design. You can use the command to copy the selected route keepout to a different conductive layer and assign a different subclass name to the destination route keepout (in this case, the subclass name would be the name of the conductor layer).

## Zcopy Shape Command: Options Panel

### Access using


Menu Path: *Edit – Z-Copy*

<i>Copy to Class/Subclass</i>	Specifies the class to which you want to copy the selected elements. If you would like the selected item copied to multiple subclasses c indicate that any number of characters are to be considered in the subclass specification, for example D*. The selected item is copied to be considered in the subclass specification, for example D?. The selected item is copied to any subclass name beginning with the letter
Shape Options	
<i>Create dynamic shape</i>	Choose to create a dynamic shape when the selected destination Class is ETCH/CONDUCTOR. If the destination Class is BOUNDARY
<i>Net</i>	Choose whether you want to <i>Unassign</i> , <i>Retain</i> , or manually <i>Assign</i> net names to the shape. You can browse the net in the <i>Net Names</i>
<i>Copy</i>	<i>VOIDs</i> : Choose to retain voids associated with the shape.
<i>Size</i>	<i>Contract</i> : Choose to reduce the shape size. <i>Expand</i> : Choose to increase the shape size.
<i>Offset</i>	Choose to reduce or increase the shape size in user-defined units.

## Copying a Shape and Adding It to a Different Class/Subclass at the Same Location in Your Design

Perform the following steps to copy and add a shape to a different class or subclass in your design:

1. Choose *Edit—Z-Copy*  
Alternatively, type `zcopy shape` in the Command window. You are prompted to choose a shape, rectangle, or closed polygon.
2. Choose the shape, rectangle, or closed polygon to be copied.  
You can use the Find Filter to choose the item to be copied.

 You can use the *Temp Group* command in the pop-up menu to choose more than one element, provided the items are in the same class/subclass. The command: Highlights the selected items

Highlights the selected items

Identifies the class and subclass of the selected items in the Selected Class/Subclass field in the *Options* panel.

3. In the *Options* panel:
  - a. If you want the selected items to be copied to a different class, choose the appropriate class from the *Class* list box.
  - b. If the selected items are to be copied to a different subclass, choose the appropriate subclass from the *Subclass* list box.  
You can enter a wildcard for matching multiple subclass names. `?` is a single character and `*` is for multiple characters.
  - c. If any voids associated with the shape are to be retained in the copy, click *Copy Voids* on.
  - d. If the net name associated with the shape, rectangle, or closed polygon is to be retained in the copy, select the *Net: Retain* check box. You can also choose to unassign a net associated with shape or assign a different name.
  - e. If the copied shape is to be larger or smaller than the original, choose the appropriate *Shape Expansion* option then enter a value in the *Offset* field.  
The value is in user-defined units, specified the *Design* tab of the *Design Parameter Editor*.
4. Click the right mouse button to display the pop-up menu and choose *Done*.
5. In the design window, choose a point on the item to be copied.  
The selected item is copied to the same location in the design. The "copy-to" class/subclass names specified in the *Options* panel is assigned to the copied item.  
A shape is filled if it is copied to one of the following classes:
  - ETCH
  - ANTIETCH
  - PACKAGE GEOMETRY
  - PACKAGE KEEPOUT
  - REF DES
  - ROUTE KEEPOUT
  - VIA KEEPOUT
6. Use the `color192` command to display the item (class/subclass) just created.
7. Click the right mouse button to display the pop-up menu and choose *Done*.  
Rule checking and generates DRC error generation occurs as needed.

## Related Topics

- [prmed](#)



## **zcore**

An internal Cadence engineering command.

## zone create

The `zone create` command creates a physical area in the design that is mapped to one of the available stackups in the design. Different stackups can be mapped to different zones. Zones are created for inlay sections that require different materials for RF/Analog. These zones can either be rigid, flex or flex with stiffeners. You can also assign constraint region and room to a zone.

Zones are added in form of shapes and zone boundaries can be edited using shape commands.

### ***Access using***

- Menu Path: *Setup – Zones – Create*

### Zone Create Command: Options Panel

Zone Data	
<i>Name</i>	Specify the name of the zone.
<i>Stackup</i>	Specifies the name of the stackup to map with the zone.
<i>Constraint reg</i>	Specifies the name of a constraint region assign to the zone.
<i>Room</i>	Specifies the name of the room for component s placement in the zone.
<i>Zone Manager</i>	Displays Zone Manager dialog box to manage the zone attributes.
Zone Creation Controls	
<i>Line lock</i>	Defines whether the editor lays in the segments as lines or arcs. Defines the angle of the corner when a line segment changes direction. The choices are Off, 45, and 90. This option is enabled only if <i>Add Shape</i> option is enabled in the pop-up menu.

### Zone Create Pop-up Menu Options

Close Shape	Choose to complete the shape of the zone.
Apply	Click apply to save the changes.
Add Rectangle	Choose to create rectangular zone. By default, zones are created as a rectangle.
Add Shape	Choose to create irregular shaped zone.
Snap pick to	Specifies the snap mode for selecting the point.

## Creating a Physical Area in the Design

To create a physical area in your design, perform the following steps:

1. Choose *Setup – Zones – Create*.  
Alternatively, type `zone create` in the Command window.
2. Enter the name of the zone.
3. Choose name of the stackup from the drop-down list.
4. Optionally, assign constraint region.
5. Optionally, assign room to the zone.
6. Draw a shape within the design boundary.  
A zone is created in the design.
7. Right-click and choose *Done* to complete the command.

## zone manager

The `zone manager` command manages zone related information. The *Zone Manager* dialog lists all zones, stackup reference, start and stop layers, constraint region name, and room name. You can modify and save zone data using this command.

### Access using

- Menu Path: *Setup – Zones – Manage*

<i>Select</i>	Enables the zone to remove and for adding notes.
<i>Name</i>	Displays the name of the zones available in the design.
<i>Stackup</i>	Displays name of the stackups associated with the zones.
<i>Start Layer</i>	Displays the start layer of the stackup that is associated with the zone.
<i>Stop Layer</i>	Displays the end layer of the stackup that is associated with the zone.
<i>Constraint Reg</i>	Displays the name of the constraint region associated with the zone.
<i>Room</i>	Displays the name of the room associated with the zone.
Zone Technology	Displays the name of alternate symbol technology for mapping alternate symbols to the zone
<i>Delete</i>	Delete the selected zone from the design.
<i>Add/Replace Note</i>	Specify comments for a selected zone.This option is enabled when a zone is selected.
<i>Notes</i>	Displays comments for a selected zone.
<i>OK</i>	Click to close the dialog box.
<i>Apply</i>	Click to save the changes.

## Managing Zone Data

Perform the following steps to manage zone data:

1. Choose *Setup – Zones – Manage*.  
Alternatively, type `zone manager` in the Command window. The *Zone Manager* dialog box is displayed.
2. Enable *Select* to choose a zone.
3. Change stackup, constraint region, and room assigned to a zone.
4. Add comments in the *Add/Replace* notes for the selected zone.
5. Click *Apply* to save the changes.
6. Click *OK* to close the dialog box.

## **zoom all**

The `zoom all` command supports dynamic zooming. See *Getting Started with Physical Design* in your documentation set for details on dynamic zooming. Do not run this command from the console window prompt.



## zoom center

The `zoom center` command moves the indicated point in the drawing into the center of the window display.

### ***Access using***

- Menu Path: *View – Zoom Center*

## Centering a Design Window About a Specific Point

Do one of following to move the indicated point in the drawing into the center of the window display:

- Run `zoom center`, then click the location you want to be the center of the new display.
- Use dynamic zooming by way of the middle mouse button, which gives you access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`) without the need to make a menu selection or enter a command at the console window prompt. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

For more details on dynamic zooming, see *Getting Started with Physical Design* in your documentation set.

## zoom fit

The `zoom fit` command fits your entire layout in the design window.

Where a design type has multiple fit layers, it tries each in turn until objects are found on that layer. Except for the symbol editor, the objects do not have to be visible. If nothing is found, zoom world executes. Zoom fit attempts to fit as follows.

Board/module:

- board outline
- package keepins
- route keepin

.mcm

- board outline
- package keepins
- route keepin
- package assembly top/bottom


Partition:

- partition boundary of active partition
- package keepins
- route keepin

Symbol:

- fits to visible objects

### ***Access using***

- Menu Path: *View – Zoom Fit*
- Toolbar Icon: 

In APD, the command focuses around ASSEMBLY\_TOP/ASSEMBLY\_BOTTOM shapes if there is no package substrate outline or no keepouts in the design.

## Fitting Your Layout in the Design Window

Do one of the following to fit your entire layout in the design window:

- Choose *View – Zoom Fit*.
- Alternately, type `zoom fit` at the console window prompt.
- Press `F2`.
- Use dynamic zooming by way of the middle mouse button, which gives you access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`) without the need to make a menu selection or enter a command at the console window prompt. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

A full view of the design, excluding legends and borders, displays in the design window.


## Related Topics

- [zoom all](#)
- [zoom out](#)

## zoom in

The `zoom in` command magnifies your view by a factor of two. You can continue to zoom in on a design by repeating this command.

### ***Access using***

- Menu Path: *View – Zoom In*
- Toolbar Icon: 

## Magnifying Your View

Do one of the following to magnify the layout:

- Choose *View – Zoom In*.
- Alternately, type `zoom in` at the console window prompt.
- Press `F10`.
- Draw the Zoom stroke (z) with the mouse.  
Use dynamic zooming by way of the middle mouse button, which gives you access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`) without the need to make a menu selection or enter a command at the console window prompt. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.  
For more details on dynamic zooming, see *Getting Started with Physical Design* in your documentation set.

## Related Topics


- [strokefile](#)

## zoom out

The `zoom out` command halves the magnification of your layout.

You can continue to zoom out on a design by repeating this command.

### ***Access using***

- Menu Path: *View – Zoom Out*
- Toolbar Icon: 

## Reducing the Magnification of Your Layout

Do one of the following to zoom out on the canvas:

- Choose *View – Zoom Out*.
- Alternately, type `zoom out` at the console window prompt.
- Press `F11`.

Use dynamic zooming by way of the middle mouse button, which gives you access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`) without the need to make a menu selection or enter a command at the console window prompt. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

## Related Topics

- [zoom fit](#)
- [zoom center](#)
- [zoom all](#)



## zoom points

The `zoom points` command lets you define an area of your layout to zoom in on (magnify).

For access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`), use dynamic zooming by way of the middle mouse button. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

### ***Access using***

- Menu Path: *View – Zoom By Points*

- Toolbar Icon: 

## Zooming in on a Specific Area of Your Design

To zoom into a specific area of your design, perform the following steps:

1. Do one of the following:
  - Type `zoom points` at the console window prompt.
  - Choose *View – Zoom By Points*.
  - Press `F8`.

Draw the Zoom stroke (z) with the mouse. Use dynamic zooming by way of the middle mouse button.

2. Click in the layout to anchor the start coordinate.
3. Move the mouse pointer over the layout to define the zoom boundary.  
A bounding box expands as you move the mouse.
4. Click again to define the end coordinate.  
The selected area expands into view.

## Related Topics

- [zoom fit](#)
- [zoom center](#)
- [zoom all](#)
- [zoom selection](#)

## zoom previous

The `zoom previous` command lets you to zoom back from the current window extents to the prior view.

For access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`), use dynamic zooming by way of the middle mouse button. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

### ***Access using***

- Menu Path: *View – Zoom Previous*
- Toolbar Icon: 

### **Related Topics**

- [zoom fit](#)
- [zoom center](#)
- [zoom all](#)

## zoom selection

The `zoom selection` command lets you zoom the display to a group of chosen elements.

For access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`), use dynamic zooming by way of the middle mouse button. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

### ***Access using***

- Toolbar Icon: 

### **Related Topics**

- [zoom fit](#)
- [zoom center](#)
- [zoom all](#)

## zoom swap views

The `zoom swap views` command swap views between main design window and *Split View* window. Using this command you can flip to the other end of the design and perform commands on the design elements in the main canvas.

### ***Access using***

- Menu Path: *View – Swap Views*

### **Related Topics**

- [zoom fit](#)
- [zoom center](#)
- [zoom all](#)

## zoom world

The `zoom world` command reduces the magnification of your design so you can view your entire drawing.

### ***Access using***

- Menu Path: *View – Zoom World*

## Zooming Out to a Full View of Your Design

Do one of the following:

- Choose *View – Zoom World*.
- Alternately, type `zoom world` at the console window prompt.

Draw the Zoom-In stroke (W) with the mouse.

Use dynamic zooming by way of the middle mouse button, which gives you access to all the zoom features available from the menu bar or keyboard commands (except `zoom in`, which is integrated into `zoom points`) without the need to make a menu selection or enter a command at the console window prompt. Use of the middle mouse button also enables you to roam or pan, which are the terms used to describe the action of moving across a design in the workspace. To pan a design, place the cursor inside the design workspace, click and hold the middle mouse button as you drag the cursor across the design. As long as the mouse button remains pressed, you can move all areas of the design into full view. You cannot drag the cursor outside the boundaries of the design.

## **zrouter**

The `zrouter` command lets you route vias that extend directly from an MLC module's I/O pins to specific layers (subclasses of class ETCH/CONDUCTOR) in the module. One via, or as many vias as possible, can be routed between the I/O pin and a layer. The command can also connect a shape on a specified net on one layer to shapes on another layer.

The `zrouter` command does not route vias that generate a DRC.

The `zrouter` command uses a Connections Control file to specify connections.

- [Connections Control File](#)
- [Zrouter Dialog Box](#)
- [Running zrouter](#)



## Zrouter Dialog Box

Use this dialog box to specify how vias are to be routed from a module's I/O pins to specific layers in the module.

<i>Connections file name</i>	Indicates the Connections Control file name.
<i>X-grid spacing</i>	Indicates the horizontal via grid size.
<i>Y-grid spacing</i>	Indicates the vertical via grid size.
<i>X-grid offset</i>	Indicates the via grid's horizontal offset distance from the drawing's 0,0 point.
<i>Y-grid offset</i>	Indicates the via grid's vertical offset distance from the drawing's 0,0 point.
<i>Min. Distance between via and pad edge</i>	Indicates the minimum distance between the edge of the I/O pin and the edge of the via. The value is in drawing units.
<i>Run</i>	Stars the Zrouter program.
<i>Close</i>	Closes the Zrouter dialog box without running the Zrouter program.
<i>Browse</i>	Displays an Open browser window for indicating the Connections Control file name.

## Connections Control File

Before running `zrouter`, you must use a text editor to create a Connections Control file to specify the connections. In the Connections Control file, you associate a net name with a layer. The `zrouter` command extends vias to the layer you specify from all the I/O pins in the connector assigned to the net you specify.

Each line in the Connections Control file defines a connection. The `zrouter` command routes the vias in the order of the lines in the file. It begins by routing vias on the I/O pin pads that are on the net referenced on the file's first line. It then routes the vias that are on the I/O pin referenced on the second line.

For example, the order of the lines in the Connections Control file and the use of the asterisk (\*) let you route vias to power and ground planes and then route all other vias to a specific internal layer from which you can route to the fanout from the module chips, as the following example illustrates.

```
# Connect all GND pins on component CN to
# subclass G1-1 with multiple vias cn gnd g1-1 1
# Connect all +5V pins on component CN to
# subclass V1-1 with multiple vias cn +5v v1-1 1
# Connect all other pins on component CN to
# subclass Y1 with one via cn * y1 1 1
```

Based on this example, `zrouter` would perform the following steps:

1. Connect all the I/O pins on connector CN that are on net gnd to layer g1-1, which is the ground plane
2. The first line contains no *Maximum Number Of Vias* field so `zrouter` routes as many vias as possible on these pins.
3. Connect all the I/O pins on connector CN that are on net +5v to layer v1-1, which is the power plane
4. The second line also contains no *Maximum Number Of Vias* field so `zrouter` routes as many vias as possible on these pins.
5. Connect all the I/O pins on connector CN that are on a net other than gnd or +5v to layer y1  
This line contains a *Maximum Number Of Vias* field with a value of 1 so `zrouter` extends only one via on each of these pads to layer y1.

You use specific formats in the Connections Control file to specify

- I/O pad-to-layer connections

The format in the Connections Control file to define I/O pad-to-layer connections is:

```
<I/O refdes> <net> <extend_layer> <min#vias> [<max#vias>]
```

<I/O refdes>	The reference designator of the connector that consists of the module's I/O pins
<net>	A net name 4 If <code>zrouter</code> encounters an asterisk (*) in this field, it routes vias to the layer specified on the command line from all the I/O pins in the connector that meet the following criteria: The I/O pin must be on a net. Not all I/O pins in the connector are on a net. The I/O pin must not already connect to a layer by a via routed by a previous line in the Connections Control file.
<extend_layer>	The ETCH subclass to which <code>zrouter</code> extends a via from an I/O pin
<min#vias>	Specifies the minimum number of vias on an I/O pin
<max#vias>	An optional field that specifies the maximum number of vias on an I/O pin If you omit this field <code>zrouter</code> creates as many vias as possible (without creating DRCs) between the I/O pin and layer.

All fields must be in the order of this format. The fields in each line must be separated by one or more spaces or tabs. The `zrouter` command ignores all blank lines and lines that begin with the pound sign (#).

MLC technology calls for using as many vias as possible to connect an I/O pin to a power or ground plane layer. This technology also calls for a single via for I/O pin connections to layers that are not power or ground planes.

- Shape-to-layer connections

The format in the Connections Control file to define shape to layer connections is:

```
* <net> <shape_layer> <extend_layer> <percentage_shape_coverage>
```

<net>	Must be the first non-blank character in the line.
<shape_layer>	The name of the net assigned to the shape or shapes from which vias extend to another layer.
<extend_layer>	The ETCH subclass to which <code>zrouter</code> extends a via from a shape on another layer.
<percentage_shape_coverage>	Specifies the percent of valid via locations on a shape on which <code>zrouter</code> routes a via. This percentage must be a value greater than zero, and no more than 100.

- `zrouter`

- [Running zrouter](#)

## Running zrouter

Perform the following steps to run the zrouter command:

1. Choose *Route – Zrouter* to display the Zrouter dialog box.  
Alternatively, type `zrouter` in the Command window.
  2. Enter the name of the Connections Control file in the *Connections* file name box.
  3. Enter the X-grid, Y-grid spacing and offset values as required.
  4. Enter the Min. distance between vias and pad edges value as required.
  5. Click *Run*.  
Zrouter writes a log file (`zrouter.log`) as it routes vias on I/O pins. The log file contains the following:  
The number of vias types added to the layout  
Descriptions of any conditions that gave rise to warning or error messages during the routing of these vias.
- [Zrouter Dialog Box](#)
  - [Connections Control File](#)

