Chapter 10 - Tools

Visual includes various tools to provide design aids, system setting control, and other functions.
10.1 Customize Dialog

The **Customize dialog** allows advanced users to have control of some of the graphical user interface of Visual.

The **Toolbars tab** controls which commands are shown.

Clicking **New** will create a **Toolbar** below the **Ribbonbar**. A **dialog** box will be shown to name the new **Toolbar**.

If additional **Toolbars** are present, they can be renamed and deleted using the appropriate buttons on this **Tab**.

Command buttons can be placed on a user-defined **Toolbar** from the **Commands tab** or by left-click-dragging buttons from existing **tabs** of the **Ribbonbar**. Note that moving buttons from default **Ribbonbar tabs** will make it challenging for Visual Support to assist users.

The **Commands tab** allows individual commands from any **tab** to be placed on other **tabs** or on a **Custom Toolbar**.

Select a **Category** to find a command of interest. Left-click-drag a command from the listing on the right to a **Toolbar** or **Tab**.

The **Quick Access tab** allows control of which commands are shown in the **Quick Access Toolbar**. Currently assigned commands are shown in the right pane.

Chose a menu **Category** from the drop-down and then left-click the desired
command in the left pane. Click the **Add** button to place the command on the **Quick Access Toolbar**. Conversely, click a command in the right pane and click **Remove** to delete a command from the **Quick Access Toolbar**.

Placing a check in the box will move the **Quick Access Toolbar** to a location below the **Ribbonbar**.

Clicking the **Reset** button will return the **Quick Access Toolbar** to the factory defaults.

The **Keyboard** tab controls **hotkey** assignment. Visual includes multiple hotkeys as outlined in [Keyboard Commands](#). These can be expanded or changed.

Click a **Category** to find a command of interest. Click the command in the left pane. If a **hotkey** assignment has been made, it will be shown in the right pane.

To assign a new **hotkey**, left-click in the **Press new shortcut key** box and press the key combination to be assigned. Click the **Assign** button. If the selected **hotkey** is in use, Visual will alert to this situation. Choose to overwrite the current assignment or cancel the operation.
The **Options** tab controls menus and icons.

Clicking **Large Icons** displays larger icons in any user-defined **Toolbars**. This does not impact the **Ribbonbar**.

**Screen Tips** are shown when the mouse hovers over a button. Unchecking this box removes that feature. If **Screen Tips** are active, Visual can also show the hotkey combination (if assigned) in the **Screen Tip** in the format *Command (hotkey)*; for example "Explode (Shift+E)". This is particularly useful for new users to learn hotkeys.

How menus appear can be modified by making a selection in the **Menu Animations** drop-down.

Note that **Personalized Menus and Toolbars** is not a valid selection for Visual. This section is displayed as part of the core tool used to write the computer code behind Visual and changes made in this dialog have no impact on program operation.
10.2 Design Tools

Design Tools can be found on the Tools tab of the Ribbonbar. These Tools are HTML-based and open in browser windows. Each tool has a tutorial and help information of its own.

**Area** - The tool is designed to allow users to quickly determine pole spacing from an illuminance criteria or illuminance levels from user specified spacing.

**Interior** - The tool is designed to perform lumen method calculations on a rectangular room. The lumen method determines average illuminance achieved on the workplane using a derived property of luminaire photometrics and room geometry called the coefficient of utilization.

**Flood** - The tool was developed to help specifiers select flood, sign, and wall lighting products. The tool only considers the direct illumination component's effect on the wall.

**Roadway** - The tool calculates the largest spacing between regularly spaced poles on a continuous straight and flat roadway using the calculation procedure defined in the IES RP-8-2000 American National Standard Practice for Roadway Lighting. This tool includes the changes to the calculation procedure in the 2007 errata.

**Template** - The tool allows for simultaneous comparison of two luminaire templates. This is a great way to quickly and visually contrast the performance of outdoor fixtures.

**Wallwash** - The tool was developed to help specifiers select flood, sign, and wall lighting products. The tool only considers the direct illumination component's effect on the wall.

**Economic** - The tool is designed to provide users with an interface to perform basic life cycle cost analysis. This tool is based on the IES RP-31-1996 Recommended Practice for the Economic Analysis of Lighting.

All Design Tools can alternately be accessed outside of Visual at http://www.visual-3d.com/tools/.
10.3 Help Tools

Help Tools provide varied information related to Visual.

The Help sub-menu is accessed from the Options panel on the Tools tab of the Ribbonbar.

Contents opens the Help dialog.

Support links to the Support web page with contact information.

Hot Keys opens the PDF of shortcut keys current available on the Visual website.

Knowledgebase links to the Support Search web page to allow for research of commonly asked questions and answers.

Training opens a link to the Acuity Brands Center for Light and Space schedule page where Visual training opportunities can be found among other opportunities in a browser window.

Videos links to a page containing all available videos on the Visual website in a browser window.

Website links to the home page of the Visual website in a browser window.

Activate License opens a dialog that allows for entry of an activation code after purchasing Visual.

Deactivate License opens a dialog that deactivates the license code on the current machine and returns it to the cloud to be used on another computer.
About Visual provides detailed information about: Version Number, Serial Number, License Number, and to whom the codes are registered and licensed.
10.4 Measurement Tools

Tools are provided to measure basic properties of elements in Visual.
10.4.1 Angle Tool

The Angle Tool is found in the Measurement panel on the Tools tab of the Ribbonbar.

The Angle command measures the Angle between objects based on a Vertex and two Endpoints. On-screen cues in the Status Bar aid in command entry.

Select the Vertex of the Angle to be measured. It is not necessary to use Object Snap but it is convenient and accurate.

Select the Endpoint of the first edge of the Angle.

Visual displays the Angle from the first edge to the temporary second edge drawn from the selected Vertex to the cursor. Visual draws a thin black line illustrating this reference. This allows for multiple, quick, approximate measurements by moving the cursor to a location near desired points.
Select the **Endpoint** of the second edge of the **Angle**.

Visual will display the measured **Angle** in the **Status** bar. The **Angle** command is automatically restarted to measure additional **Angles** as can be seen from the command direction in the **Status Bar** that is the first step in this process.

To exit the command, right-click the mouse.

**Lines** do not need to be present for the command to provide a result. **Lines** are used here to more clearly illustrate the concept. The inputs may be based on real or imaginary lines, or **Solid Objects**.
10.4.2 Distance Tool

The **Distance Tool** is found in the **Measurement panel** on the **Tools tab** of the **Ribbonbar**.

The **Distance** command measures the **Distance** between two points as specified.

Select the first point.

Visual displays the **Distance** from the first point to the cursor. Visual draws a thin black line illustrating this reference; obscured at right. This allows for multiple, quick, approximate measurements by moving the cursor to a location near desired points.

Select the second point.
Visual will display the **Distance** in the **Status Bar**. The **Distance** command is automatically restarted to measure additional **Distances** as can be seen from the command direction in the **Status Bar** that is the first step in this process.

To exit the command, right-click the mouse.

**Lines** do not need to be present for the command to provide a result. **Lines** are used here to more clearly illustrate the concept. The inputs may be based on real or imaginary lines, **Solid Objects** or **Luminaires**.
10.4.3 Radius Tool

The **Radius Tool** is found in the **Measurement panel** on the **Tools tab** of the **Ribbonbar**.

The **Radius** command measures the **Radius** of **Background** objects. The command does not operate on **Solids**.

After clicking a **Background** object, Visual displays the **Radius** in the **Status Bar**.
10.5 Minimize Ribbonbar

The Minimize Ribbonbar command is found in the Options panel of the Tools tab on the Ribbonbar.

The Minimize Ribbonbar command changes the behavior of the Ribbonbar to allow for a larger working space in the Design Window. When the function is active, the button will be highlighted in yellow.

Minimizing the Ribbonbar means that only the tabs will be shown until a tab is clicked. When a tab is clicked, Visual will "pull down" the Ribbonbar to allow for further command execution.

Clicking the active button will turn off the feature and maximize the Ribbonbar.
10.6 Settings Dialog

The Settings dialog is accessed in the Options panel of the Tools tab.

Clicking the Settings button initiates the Settings dialog.

Seven tabs allow for advanced control of functionality and setting of defaults.

Make selections as desired and click OK to exit and save those choices. Click Cancel to exit without saving changes.

Click Save As Defaults to use the current choices every time Visual is opened. Choices can be made on multiple tabs and then Save As Defaults can be selected.

Click Reset to change all Settings back to the system defaults.

At the bottom of each tab in the dialog, Visual displays helpful tips about Settings and color-codes that to individual sections. At right, Visual indicates which Settings will require a recalculation to be put into affect.
10.6.1 Calculations Tab

The Calculations tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

The Design Mode panel controls calculation engine parameters. Exhaustive testing has been done to remove the need for an overwhelming number of “sliders”. Select the mode that is most applicable to the project type.

**Interior Mode** and **Exterior Mode** set a large number of parameters used in surface analysis, initial flux evaluation, radiative transfer analysis, and processing renderings specific to either case. Under normal circumstances, no difference in calculations will be seen.

**Sign Lighting Mode** expands analysis to provide proper modeling of shadows caused by sign lettering. This mode is much slower than the others and should be chosen judiciously.

The Calculation Mode panel controls whether or not Visual makes calculations of the interreflected component of radiative transfer. **Direct and Interreflected** calculates both components whereas **Direct Only** is the direct component only. **Direct Only** is assigned when a new Exterior Project is created from the File menu and is appropriate for area lighting, roadway, and sports projects.

The Statistics panel controls which statistical calculations are performed and displayed in the Statistics tab of the Sidebar. See The Sidebar and Statistics for more information.

Selection of statistical quantities should be obvious except two used primarily in sports specifications:

**Uniformity Gradient** - This calculates the local change in lighting quantity (e.g. illuminance) between adjacent points in the grid. The reported value is the highest found in the calculation grid. In summary, the value quantifies how quickly lighting quantity changes and controls “bright and dark spots”.

**Coefficient of Variance** - This is an advanced statistical calculation defined as the standard deviation divided by the mean (average) of all points. In brief, as applied to sports lighting, this is the average difference from the average, and thus measures the concept that one low illuminance should not overly impact the overall acceptability of a design, depending on how low that minimum may be.

The Luminaire Blocking panel controls if Visual considers Luminaires to be light blockers or not. The implication of the two choices is as indicated in their titles. This option does not make the Luminaires reflect light in the radiative transfer system.

Console Mode tells Visual to open a Windows command-prompt window and
display the calculation process and minimal feedback information in a step-by-step process. This setting is for advanced users only.

Settings made in subgroups indicated with a *** and shown in dark red will not take effect until a recalculation is performed.

Choices made apply to the current session. Click Save As Defaults to apply settings to other sessions. See The Calculation Engine for detailed information on how calculations are performed.
10.6.2 Calculation Zones Tab

The Calculations Zones tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

The Calculation Zones panel controls dimensional parameters used in Visual.

**Decimal** is the number of decimals displayed after the integer value. None, one, or two decimal values can be displayed. Only the options shown in the drop-down are valid.

**Height (Distance)** is the height offset from the selected coordinates that the plane will be placed. This may be above or below a Surface if Calculation Zones Surface is used to place the Calculation Zone, depending on the direction of the Surface Normal. A selection can be made from the choices in the pull-down or a value can be typed.

**Row Spacing** is the distance (in feet or meters) between points on the X-axis. A selection can be made from the choices in the pull-down or a value can be typed.

**Column Spacing** is the distance (in feet or meters) between points on the Y-Axis. A selection can be made from the choices in the pull-down or a value can be typed.

The Calculation Zone Points panel controls the formatting of points and values.

**Default Color** is the Color that will be assigned to newly created Calculation Zones.

**Point Style** allows for the selection of a default style for the calculation point marker.

**Max Color** is that which is assigned to the maximum value in a zone. Unchecking the Max checkbox turns off highlighting. Selecting the Above checkbox means that values above the value in the textbox will be highlighted in the Max Color selection.

**Min Color** is that which is assigned to the minimum value in a zone. Unchecking the Min checkbox turns off highlighting. Selecting the Below checkbox means that values below the value in the textbox will be highlighted in the Min Color selection.

**Offset points from zone boundary** means Visual will offset points a certain amount depending on point spacing and Calculation Zone dimensions. This yields a grid of points centered in the selected area. Unchecking the box causes Visual to start placing points in the lower left corner of the selected area based on point spacing as specified in the Calculation Zones panel.

See Using the Color Dialog for more information on Color selection.
The Pseudo-Color Shading panel controls what is displayed in certain modes selected in the Display drop-down from the Rendering panel of the Calculations tab in the Ribbonbar.

Relative will assign the Max Color and Min Color to the highest and lowest values in each Calculation Zone.

Global will assign the Max Color and Min Color to the highest and lowest values in all Calculation Zones in the model.

Selecting the upper Color Preview Bar assigns colors between Max Color and Min Color progressing clockwise around a color wheel. Selecting the lower Color Preview Bar progresses counterclockwise.

Selecting Display Mask Zone Outline will show a dashed line in the Design Environment that indicates where user-selected Masking has been done. This does not impact what is printed in the Print Editor.

Selecting Display Statistical Zone Outline will show a dashed line in the Design Environment that indicates the boundaries of Statistical Zones if present. This does not impact what is printed in the Print Editor.

The Power Density Zones panel controls both the default color and displayed decimal accuracy of Power Density Zones. Valid decimal values are only those provided in the drop-down.


Default Color is assigned to both the Calculation Points and the associated text value and overrides the base selection of the Calculation Zones.

Point Style overrides the selection made in the base Calculation Zones.

Settings made in subgroups indicated with a "***" and shown in dark red will not change existing objects.

Choices made apply to the current session. Click Save As Defaults to apply settings to other sessions.
10.6.3 Contours Tab

The Settings Contours tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

The Contours panel controls which Contour Lines are displayed and what Color is used for each line.

To activate a Contour Line, check the box next to the desired value. Once activated, a Color can be assigned. Values can be entered in any order. Any numerical value can be entered in the text boxes.

See Using the Color Dialog for more information on Color selection.

Making selections here does not turn on Contours. See Setting and Displaying Iso-Illuminance Contours for more information.

The Contour Labels panel controls the display of Labels on Contour Lines. Placing a check in the Display Contour Labels checkbox turns on labelling. The Label Location Increment is the (nominal) number of feet or meters between Labels on each Contour Line.

Settings made in subgroups indicated with a * * * and shown in green will have an effect on existing Contour Lines.

The settings on this tab can also be controlled in the Design Environment with the Contours drop-down in the Calculate panel found in the Calculations tab of the Ribbonbar.
10.6.4 Drawing Aids

The Settings Drawing Aids tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

Circles and Arcs are drawn in Visual as multi-segment polygons and polylines. The resolution of Circles and Arcs can be changed to use a greater or lesser quantity of segments depending on the purpose and size of the Circle or Arc.

As is noted in the settings panel, large Circles and Arcs happen with large projects, and therefore increasing resolution would be appropriate.

This setting applies to Background and Solid objects. As is noted in the panel, increasing resolution could greatly increase calculation time, but may in fact not increase accuracy in any meaningful way. Again, this is dependent on the particular situation.

The Crosshair Size (the mouse cursor) can be changed from the default 150 pixel size (at full screen) to extend to the edges of the Design Window by placing a check in the checkbox.

The Dynamic Modes panel allows control of whether or not the left and right mouse buttons activate the 3D Orbit and Pan functions. If these checkboxes are unchecked, it is necessary to hold the Ctrl key to activate these modes. See Mouse Navigation for more information.

The Snap Modes panel allows control of default Snap settings. Similar control is available in the The Status Bar.

X, Y, and Z Start specifies an alternate Origin for the Snap Increment while leaving the Cartesian origin as (0,0,0). For example, entering the values at right would make the Cursor Snap at 5,15,25, etc.; Snap starts at 5 and moves in increments of 10.

Orthogonal Snap forces the cursor to move perpendicular (orthogonal) to the Cartesian axes. This on/off option is also provided in the Status Bar. See Incremental Snap for related information.

The size of the Selection Box used to select Objects can be changed from 11 pixels to 41 pixels to accommodate personal preference or need for detail. The two extremes are shown at right in actual size. See Selecting Objects for related information.
Settings made in subgroups indicated with a "***" and shown in dark red will not change existing objects.
10.6.5 Environment

The Settings Environment tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

Visual is set to Automatic Save a backup every 5 minutes and will retain those backup files for 30 days. Settings can be user-modified if necessary. See Automatic Recovery and File Backup for related information.

Backup files are located in the directory [drive]\Users\[username]\AppData\Local\Visual 2012\Support

Background Color sets the color of the Design Window in most Display Modes.

Render Background is the color used for the Design Window when Rendered Display Mode is active. See Display Modes for related information.

Selection Color is the color used to indicate an object is part of the Selection Set. See Selecting Objects for related information.

The Units panel allows choices for feet or meters and footcandles or lux. Changes in distance Units will not convert objects already drawn; i.e. a line of length "3" will change from 3 feet to 3 meters and therefore be 3.28 times longer.

Note that Luminance is calculated in cd/m^2 regardless of Units chosen.

It is strongly recommended that unit choices be made prior to starting a project. Conversion after objects have been created may yield non-obvious results.

Hardware Acceleration can be turned off to remedy issues with certain graphics cards. There is no need to change this setting without the involvement of Visual Support.

A Global Axis icon can be shown in the lower left of the Design Window. See Cartesian Coordinates.

Absolute and Relative Coordinates can be shown near the mouse crosshairs. See Mouse Pointer Navigation.
10.6.6 Luminaires

The Settings Luminaires tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

The Luminaire panel sets defaults for Luminaire placement in the Design Environment.

Display Photometric Web will show a scaled 3D mesh of the candlepower curve attached to the Symbol.

Mounting Height is the default used when placing a Luminaire, but the Mounting Height can be modified at placement.

Orientation is the default used when placing a Luminaire, but the Orientation Angle can be modified at placement.

Luminaire Aiming panel settings are useful in floodlighting projects.

The first option will hold the Aiming Point coordinates constant when Moving a luminaire.

The second option moves the Luminaire Label from near the Luminaire to near the Aiming Point.

Enable Aim To Surface allows Visual to provide input and as to which surface a Luminaire is aimed. See Place and Aim Luminaires for more information.

Luminaire Label panel controls default display of Labels. Checking the checkbox tells Visual to display Labels by default and activates the rest of the panel. Using the top radio buttons, the choice can be made to display just the type or the type and the number. If “Type and Number” is chosen, the lower radio buttons control the default method used to assign numbers.

See Luminaire Display Options for information on making modifications to change the defaults and more information on the topic.

Default Template Colors and magnitude can be set (not to be confused with Contours) to apply to new Luminaire Types.

Selecting Use Luminaire Symbol Color will assign all Template lines to the Color of the Symbol and override any other selections.
**Template Resolution** can be changed to include a greater or lesser number of segments in the *polyline* components. The recommended value should be acceptable for a majority of situations.

In some cases, photometry is overly sparse and the user may want greater smoothing between data points. This may not correlate to the reality of *photometric* output so changes should be made with direct knowledge it is necessary and valid.

Increasing above the recommended value may cause graphic display lag depending on computer hardware configuration.

Visual includes only a portion of *photometric* output to speed **Template** display. Changing the **Template Vertical Angle** will include more or less *photometric* information. The graphic at the left of the panel displays the actual angle of inclusion and a dynamic graphic describing the inclusion angle visually. (The recommended angle is 80°.)

In a vast majority of cases, this setting should not need to be changed. If output is low or **Template** lines have very small *illuminance* values, truncation may be seen in the **Template** and adjusting the inclusion angle higher would be valid.

Increasing the angle may cause a noticeable lag in certain computer performance aspects depending on computer hardware configuration.

**Settings** made in subgroups indicated with a "*" and shown in dark red will not change existing objects.
10.6.7 UVGI

The Settings UVGI tab is found in the Settings dialog accessed in the Options panel of the Tools tab on the Ribbonbar.

Enabling UVGI Calculations allows Visual to calculate ultraviolet germicidal irradiation.

The UVGI tab will be added to the Ribbonbar.

Using this function requires advanced knowledge and a different data set than "normal" lighting. See UVGI Calculations for more information.
10.7 Windows Tools

The Windows Tools are found in the Windows sub-menu of the Options panel on the Tools tab of the Ribbonbar.

The Design Manager is an always-on-top dialog.

These tools control the display of some Windows in the Design Environment. The base functions of the features are described in the relevant sections for Layer Manager, Properties, and Statistics. These features are shown in the Sidebar.

On occasion, Microsoft Windows and Visual don't communicate properly. This can result in the tabs at the bottom of the Sidebar disappearing. This command forces a reset of the background computer code and resolves the issue.