



## **Update Guide Release 2018.3**

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# INTRODUCTION

This document serves as a guide for the new features and changes in TracePro 2018.3. The enhancements in TracePro 2018.3 are: Surface Property Generator supersedes BSDF Converter, enhancements to True Color and Photorealistic Rendering plots, 3D Interactive Optimizer, and Lighting Toolkit, and new scheme commands.

## WHAT'S NEW IN TRACEPRO 2018.3?

Changes in TracePro 2018.3 compared to 2018.2 are summarized as follows:

- The Surface Property Generator has superseded the BSDF converter, as the Surface Property Generator can do everything the BSDF converter can do, and more.
- Enhancements for True Color and Photorealistic Rendering plots: saturated pixels can be optionally displayed in a different color, and you can choose to display the normalized integer RGB values or the actual floating point RGB values.
- 3D Interactive Optimizer: Allow Tilt X, Y, and Z to be used as variables for optimization.
- Lighting Toolkit: Add lighting regulations for American Boat and Yacht Council (ABYC).
- New scheme commands: (geometry:primitive-block) and (view:photo-realistic-render-close).

## SURFACE PROPERTY GENERATOR

The Surface Property Generator, introduced in TracePro 7.8.2, has all the capabilities of the BSDF Converter as well as additional features to help you create your own data for BRDF and BTDF. The Surface Property Generator allows you to previsualize the appearance of your property. Select *Define/Generate Property Data/Surface Property* to open the surface property generator utility. Since the BSDF Converter was completely redundant with the Surface Property Generator, the BSDF Converter has been removed as of release 2018.3.

## ENHANCEMENTS FOR TRUE COLOR PLOTS AND PHOTOREALISTIC RENDERING

Two new features have been added to aid in interpreting True Color plots: display of saturated pixels in a special color, and control of the display of RGB and luminance values in the status bar. These new features are available in all plots in which True Color is available:

- Photorealistic Rendering
- Irradiance/Illuminance Map
- 3D Irradiance/Illuminance
- Luminance/Radiance Map

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# Saturation of Pixels in True Color Maps and Renderings

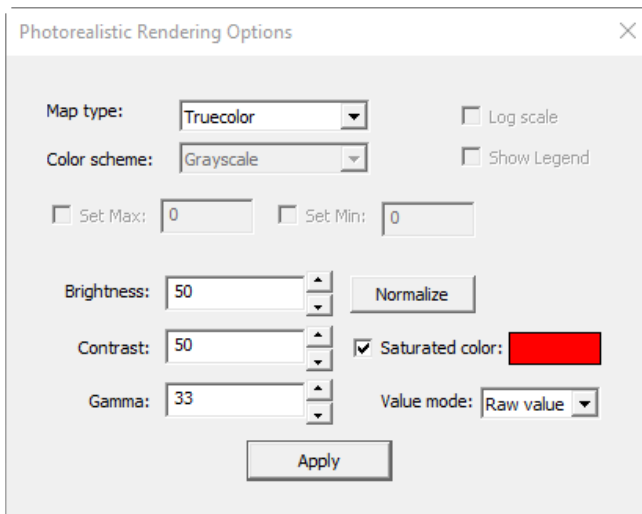
A problem occurs with RGB-encoded color images when increasing the brightness or contrast beyond a certain point; if one of the RGB components saturates, the displayed color can change along with the brightness. A new feature has been added to aid in visualizing images under this circumstance.

## ***Why does the color change in saturated pixels?***

TracePro represents color images as red, green, and blue primary colors (RGB) added together, with an eight-bit number for each color. Therefore each color component can have a value from 0 to 255. The brightness of a given pixel can be increased by increasing the RGB components in proportion. If the color of a pixel contains unequal, non-zero RGB components, when the strongest component reaches 255, it can go no higher. If you continue to increase the brightness, the other components will be increased until they also reach 255. As you increase the brightness, the color shifts from its original appearance, until it becomes white when all three components saturate with color values equal to (255,255,255). If one of the RGB components is zero to start, the saturated color will be a mix of equal amounts of the non-zero components. For example, if the blue component has original value zero, then the saturated pixel will have value (255,255,0). If the only one of the RGB components is non-zero to start (for example green), the color will remain the same, but simply increase in brightness until (0,255,0) is reached.

## ***Controlling the Display of Saturated Pixels***

In order to more easily determine when pixels are saturated, a new feature has been added to those maps that are capable of displaying True Color (Photorealistic Rendering, Irradiance/Illuminance Map, Luminance/Radiance Map, and 3D Irradiance/Illuminance). Saturated pixels can be displayed in a special color of your choice. The default color is maximum red (255,0,0). The saturated color will appear when any of the integer components is calculated to be greater than 255. The settings are available in the Options dialog box for each type of plot. The Options settings for Photorealistic Rendering are shown in Figure 1, and a rendering showing saturated regions is displayed in Figure 2. You can change the color for saturated pixels by clicking on the color bar.



**Figure 1. Photorealistic Rendering Options dialog box showing new settings for Saturated Color and Value Mode, showing the default maximum red (255,0,0) for display of saturated color.**



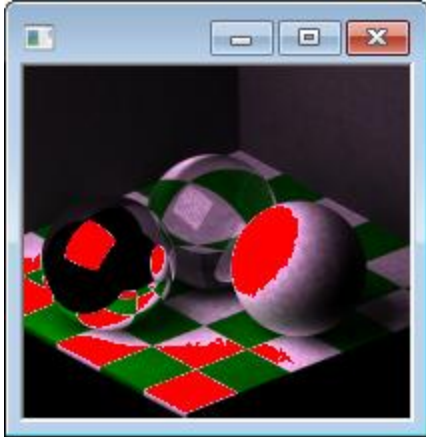


Figure 2. Photorealistic Rendering showing saturated regions as maximum red.

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## Value Mode for RGB and Luminance Values in Status Bar

The Options dialog box for all maps and renderings for which True Color is available also have a new setting for Value Mode. This setting controls the values that are displayed in the Status Bar when you move the mouse pointer over the map or rendering. You can select either Integer or Raw Value. The Raw Value displays the floating-point RGB values in the Status Bar as calculated by TracePro to create the True Color image. With Integer selected, the actual integer values used in the image (0-255 RGB) are displayed. In a Photorealistic Rendering, the approximate luminance in  $\text{cd}/\text{m}^2$  is displayed as a fourth value.

## 3D INTERACTIVE OPTIMIZER

The 3D Interactive Optimizer now allows you to set the x,y,z components of tilt as variables for optimization.

## LIGHTING TOOLKIT ENHANCEMENT

The Lighting Toolkit has a new set of lighting regulations for use in analyzing results: American Boat and Yacht Council (ABYC). The following ABYC regulations are available for analysis:

- A16-F5A
- A16-F5B
- A16-F6A
- A16-F6B

## NEW SCHEME COMMANDS

Two new scheme commands are now available:

- (geometry:primitive-block)
- (view:photo-realistic-render-close)

The (geometry:primitive-block) command enables creation of primitive blocks with inputs the same as the Geometry|Primitive Solid|Block dialog box, as opposed to using the (solid:block) command followed by (edit:move) and (edit:rotate) commands.

The (view:photo-realistic-render-close) command lets you close the Photorealistic Rendering window.