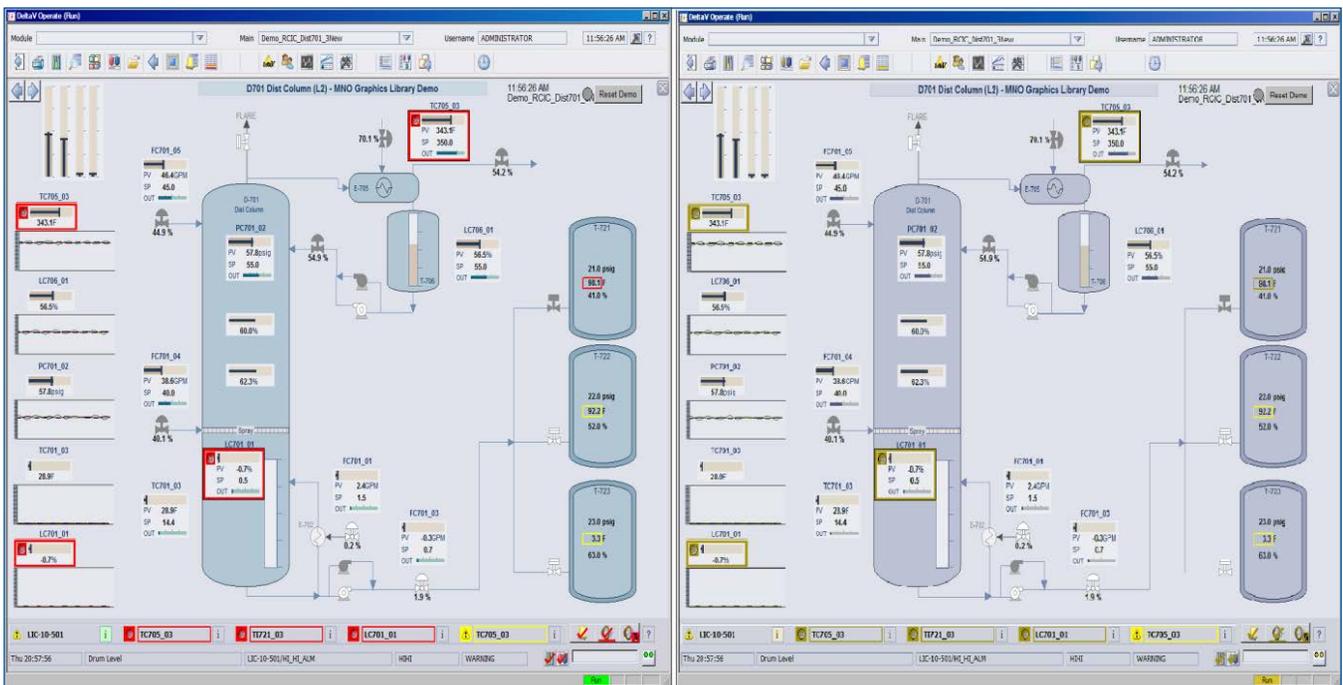


What do Colorblind Operators See?

DeltaV™ default alarm colors are distinguishable for the three types of color blindness.



Display of silver and Deutrope comparison.

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Introduction

Users have often asked, “What do my color-blind operators see when they look at an operator screen?” This can be a very important question. Many plants have operators that are color-blind; yet, we use color to draw their attention to important events. If these people cannot distinguish among the colors, they can miss critical information.

Software from Vischeck (www.vischeck.com) is available to help you analyze the use of color on your displays. It can be used to analyze three types of color-blindness: two types of red-green and blue-yellow.

In the following examples, Vischeck was used to analyze the DeltaV default alarm colors and DeltaV Operate color palette. In these examples, the DeltaV default alarm colors were found to be distinguishable. Individual plants should ensure that their operators can distinguish between these and the other colors used to highlight important process conditions.

Vischeck relies on assumptions about the end-user's display device. Because the colors perceived by users depend on variations such as the type of monitor used, Vischeck should be used only as a rough guide to what your color-blind operators will see.

Analyze Your Own Displays

If you would like to analyze your own displays, you can go to www.vischeck.com and download the analysis software. It can be used within Paint Shop Pro or Adobe Photoshop. The **Readme** file explains the Adobe Photoshop use. To use in Paint Shop Pro, select:

File/Preferences and select the **Plug in filters** tab.

The first three check boxes may already be selected. However, verify that the path referenced **|Paint Shop Pro|Plugins** exists. If it does not, create the **Plugins** directory under Paint Shop Pro and copy the filter file to this location.

Close and **restart** Paint Shop Pro. You will find the new filter option as the last selection under the effects menu choice.

This is easiest to do if you have both applications on the same PC. This is a good application for using **DeltaV Simulate**. Open a display to be analyzed, select print screen and paste into Paint Shop Pro. Then you can run the filter and see how the display would look for three different types of color blindness.

Vischeck Details

The Vischeck simulation is an approximation that makes certain assumptions about the physical properties of the user's display device. Specifically, it assumes that you are viewing the original and simulated images on a typical CRT computer monitor.

The simulation is fairly robust across many different CRTs, but is known to be quite poor, for example, on an LCD display, such as those used in many flat-panel displays, laptops and video projectors. The general trends should still hold, though (e.g. "purple becomes shades of blue").

Standard DeltaV Operate Color Palette

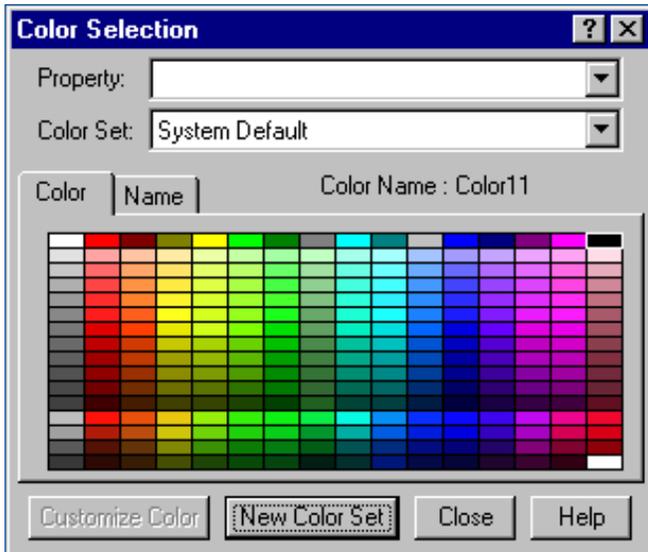


Figure 1 — Normal.

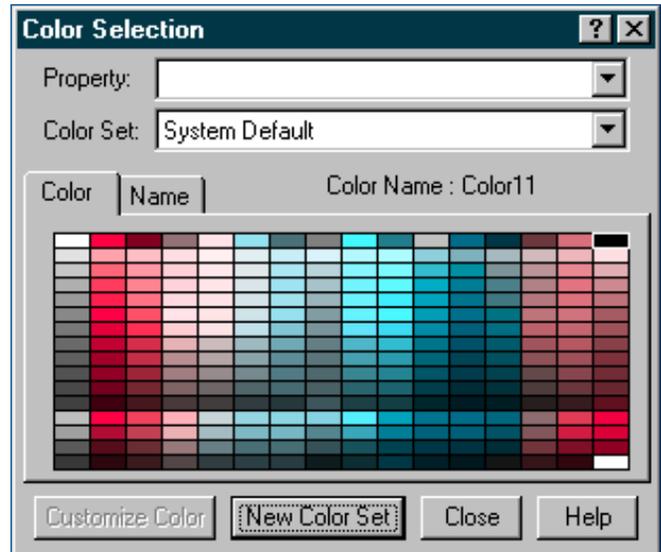


Figure 3 — Rare Blue-yellow (Tritanope).

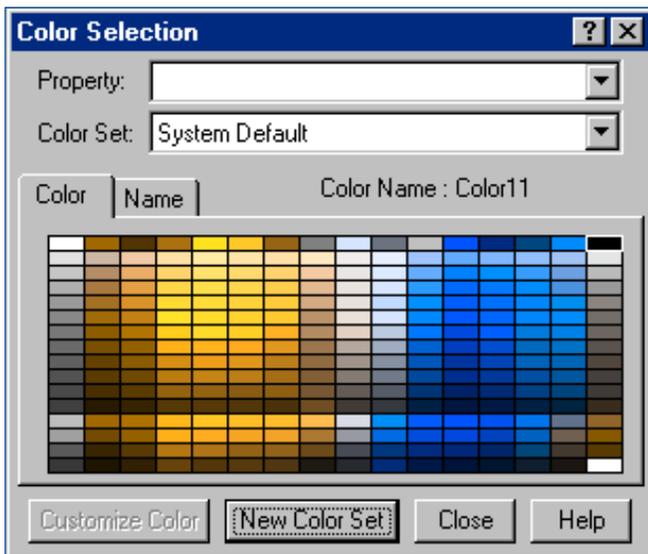


Figure 2 — Most common red-green (Deuteranope).

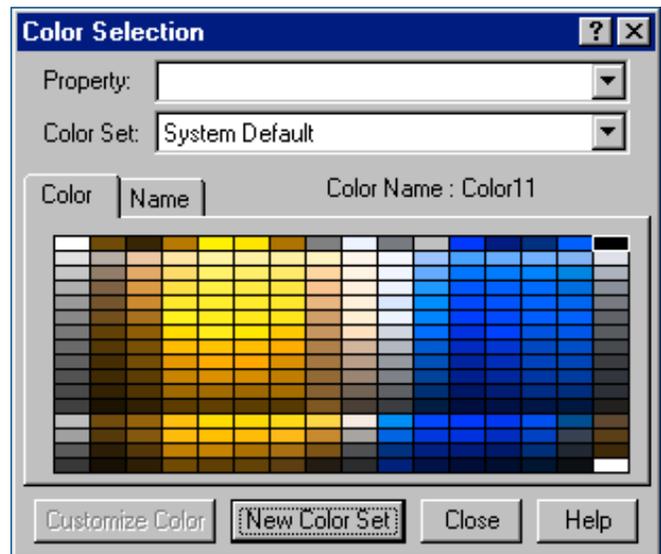


Figure 4 — Less common red-green (Protanope).

Note that for the most common color blindness (red-green—Deuteranope):

- Purple becomes shades of blue
- Red and green become shades of yellow-brown (although in the alarm list, the red was more of a burnt red)
- Grey, blue, and yellow are largely unchanged

DeltaV Alarm List with Default Alarm Colors

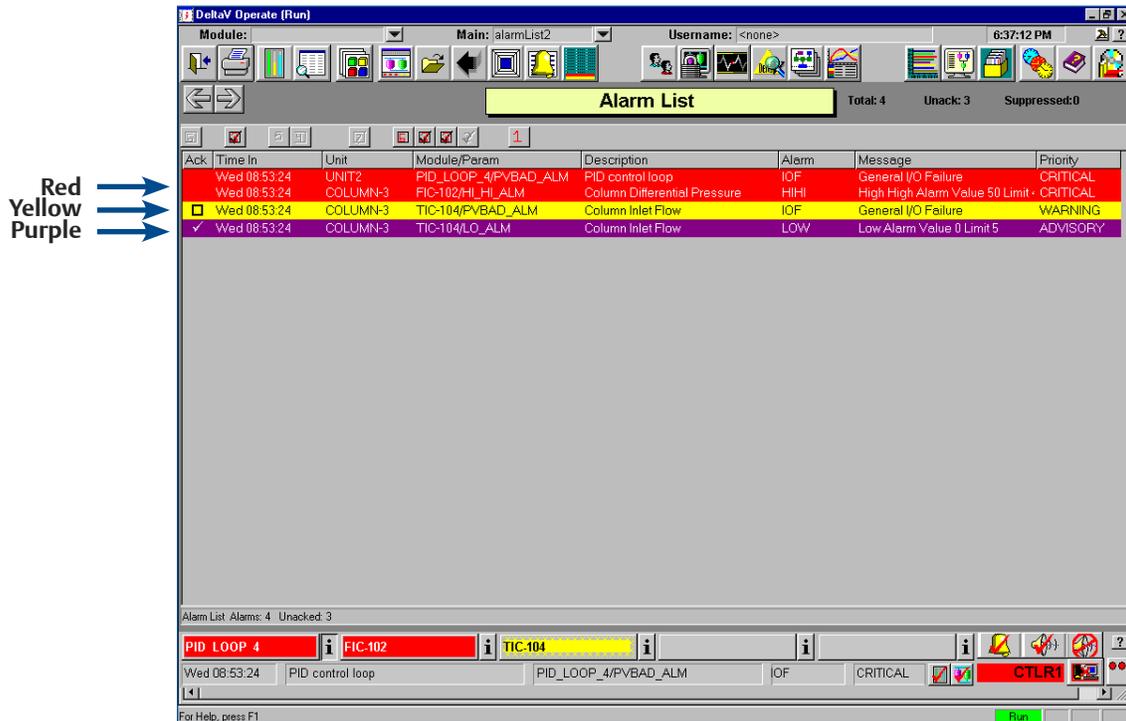


Figure 5 — Alarm list.

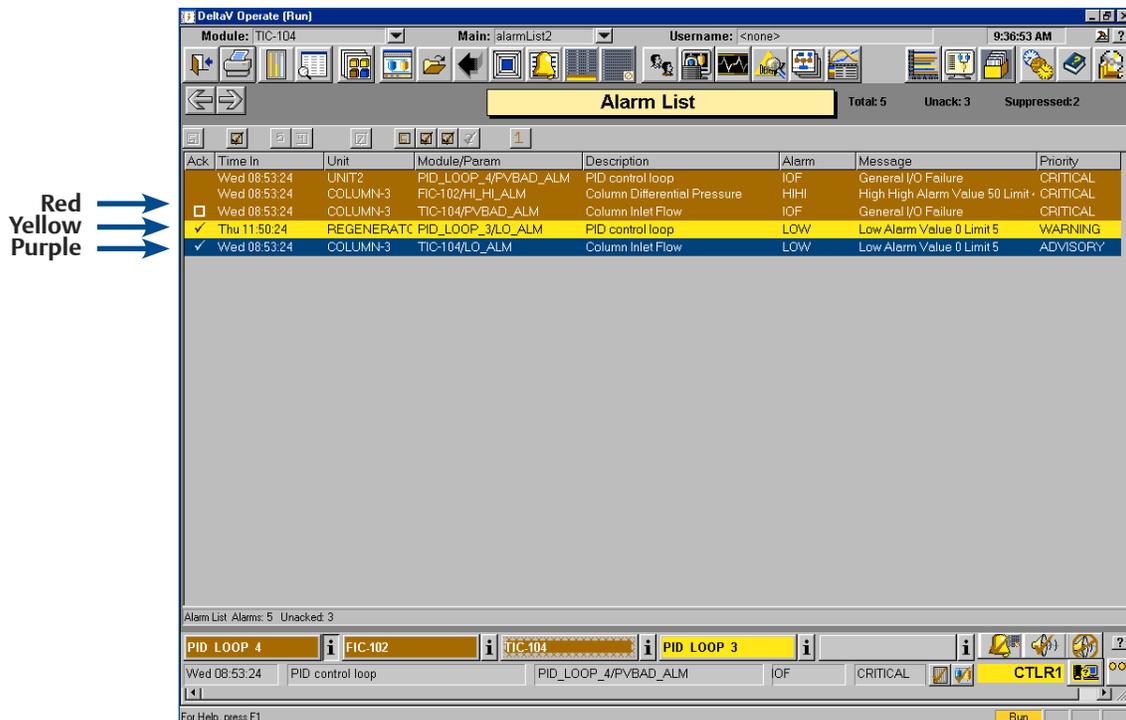


Figure 6 — Alarm List as seen by most common Red-green (Deuteranope).

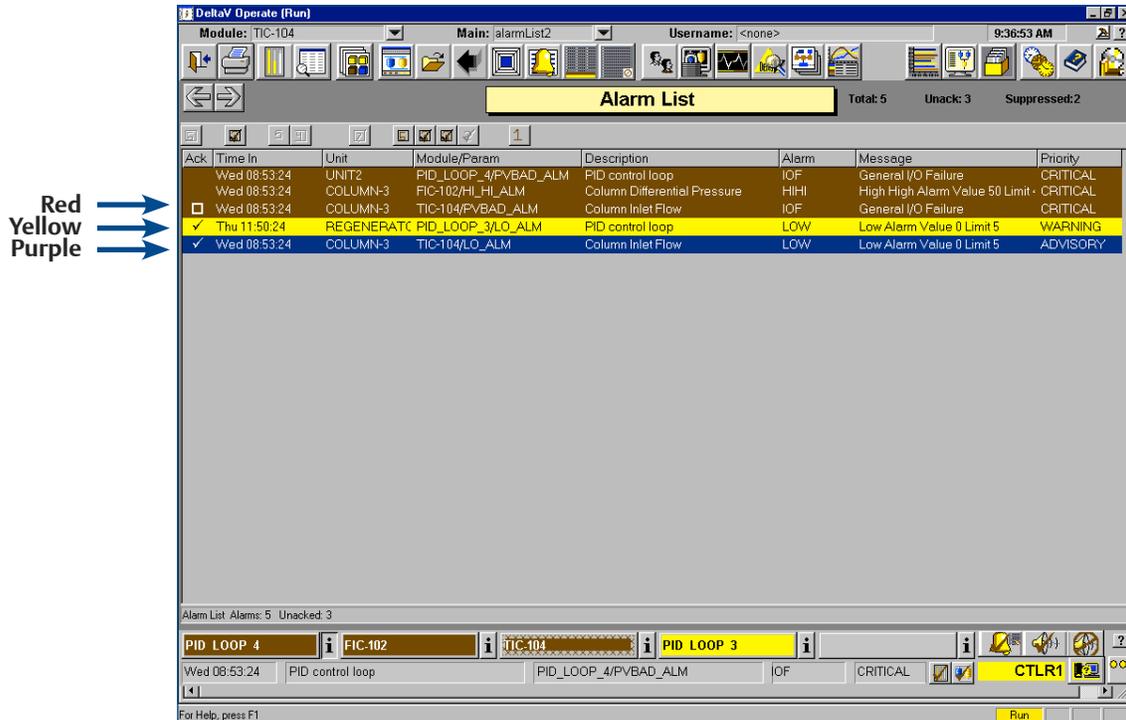


Figure 7 — Alarm list as seen by less common Red-green (Protanope)

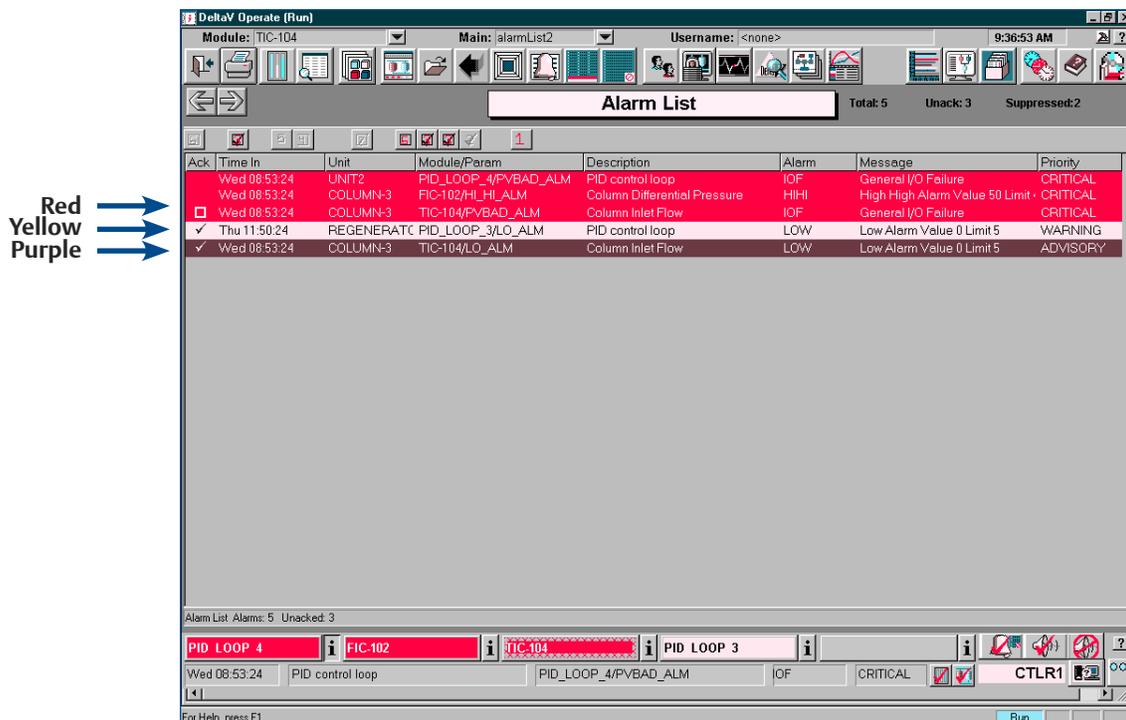


Figure 8 — Alarm list as seen by rare blue-yellow (Tritanope).

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