Little
CMS

Insighter

Version 1.0

Introduction

ICC color profiles are the invisible glue of color management. Every time an image moves from camera to screen to printer, ICC profiles describe how to interpret and convert color data faithfully. Understanding what's inside those profiles, their tags, transforms, curves, and lookup tables, is essential for diagnosing color problems, validating profile quality, and building color-managed workflows.

LittleCMS Insighter is designed for color scientists, profile authors, and developers who need to look inside ICC profiles rather than just use them. It exposes every tag, every pipeline stage, and every numerical value stored in a profile, presented in visual, human-readable form. You can inspect tone curves, browse multi-dimensional lookup tables, examine chromatic adaptation matrices, and visualize the full color gamut of a profile as a 3D hull in CIE Lab space.

Insighter is built on LittleCMS 2 and Qt 6. It runs on Windows and macOS and supports ICC profiles of any version or device class. iccMAX profiles are only partially supported.
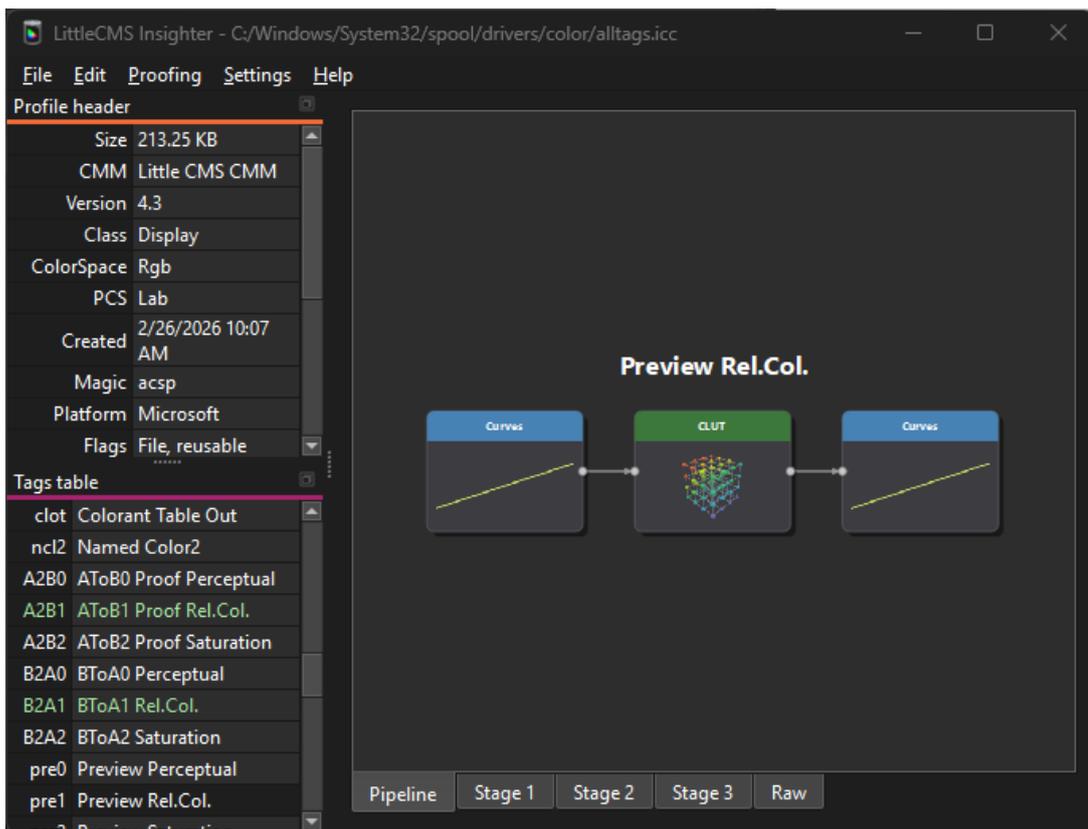
Quick reference

1. Launch Insighter.
2. Open a profile via File → Open ICC Profile, drag-and-drop, or pass a path on the command line.
3. Read the Profile header panel to identify the profile class, color space, and PCS.
4. Click any tag in the Tags table to inspect it in the viewer on the right.
5. For pipeline tags (AToB, BToA, etc.), use the workflow diagram to navigate stages.
6. Open the Gamut tab inside a pipeline tag to see the profile's color gamut in 3D Lab space (enhanced only).
7. Open the Proofing panel to preview how an image looks through the profile (enhanced only).

Standard and Enhanced Modes

Insighter has two operating modes.

Standard mode is always available at no cost. It gives full access to the ICC header, every tag viewer, all pipeline stages, curves, matrices, CLUTs, chromaticity diagrams, and the hex viewer.

Enhanced mode unlocks two additional features, the Gamut Hull visualization and the Soft Proofing panel. Enhanced mode is activated automatically when any of the following LittleCMS products is installed and registered on the same computer:

- **LittleCMS Translator**
- **LittleCMS Translator MINI**
- **LittleCMS Abstractor**
- **LittleCMS Monitor ICC Tweaker**

If none of those products is detected, Insighter starts in standard mode. The **Proofing** menu entries and the **Gamut tab** inside pipeline tags are hidden until enhanced mode is active. The About dialog shows which mode is currently in use.

User Interface Overview

After opening the application, you can see a window like this. Mac, Windows and Linux look almost identical. On Mac, menus look slightly different just because Mac conventions.
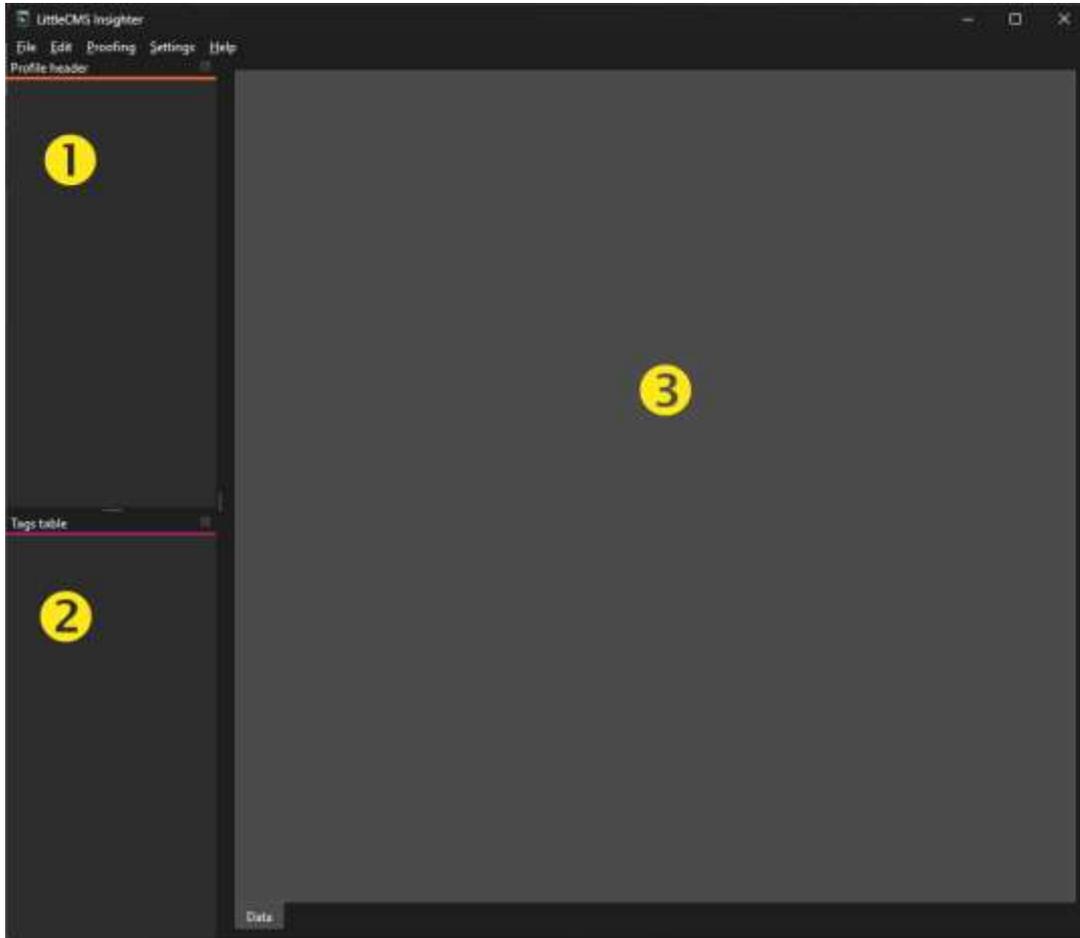
The main window is divided into three dockable panels:

1. **Profile header** (top-left by default), ICC header fields for the loaded profile.

2. **Tags table** (left), all tags in the profile. Click a tag to select it.

3. **Tag viewer** (center/right), detailed display of the selected tag, with one or more tabs depending on tag type.

The **Proofing** dock is hidden by default. Toggle it via **Proofing → Show preview** *(enhanced only)*.

*This program fully supports **dark and light modes**.*

Opening a Profile

- **File → Open ICC Profile** (Ctrl+O), opens a file dialog. Extensions .icc, .icm, and .pf are recognized.
- **Drag and drop,** drop a profile file anywhere on the main window.
- **Recent files, File → Recent Files** lists the last ten profiles opened.
- **Command line**, pass the profile path as a command-line argument to open it on launch.

The ICC Header

The **Profile header** panel shows the fixed fields from the ICC profile header. You can undock it by dragging from the window title.

Profile header	
Size	105.64 KB
CMM	Little CMS CMM
Version	4.4
Class	Display
ColorSpace	Rgb
PCS	Lab
Created	9/12/2025 6:15 PM
Magic	acsp
Platform	Microsoft
Flags	File, reusable
Manufacturer	
Model	0
Attributes	Reflective, Glossy, Positive, Color
Intent	Perceptual
Illuminant	D50
Creator	Little CMS
ProfileID	AF75E714-F840B767-B8C9FEE3-A179C3B0

Inspecting Tags

Clicking a tag in the **Tags table** loads its content into the viewer. The viewer automatically selects the most appropriate display for each tag type.

Related tags

When a tag is selected, all functionally related tags in the list are highlighted with an accent color. This makes it easy to spot, for example, which AToB and BToA tags share the same rendering intent, or which colorant and curve tags together form the matrix-shaper. The highlight clears as soon as a different group is selected. Tags that share storage with another tag (linked duplicates) also show a → 🔗 indicator in the name column.

Pipeline Tags (AToB, BToA, DToB, BToD)

Pipeline tags contain a sequence of processing stages. They are displayed as a **workflow diagram** showing each stage as a labeled, color-coded node connected by arrows. Clicking a node in the diagram jumps directly to that stage's own tab.
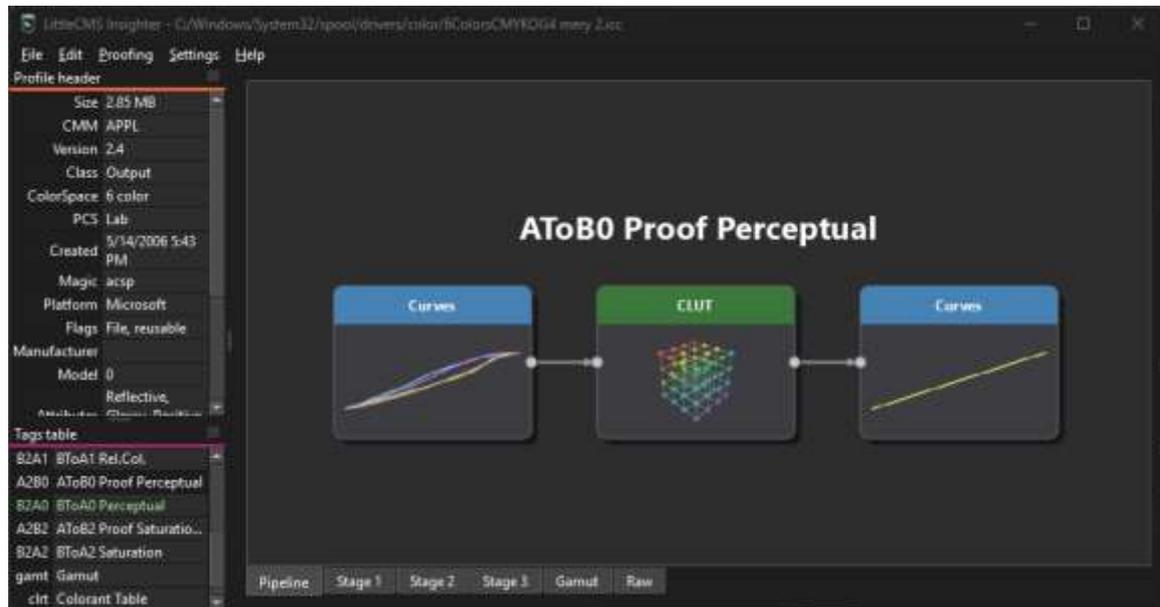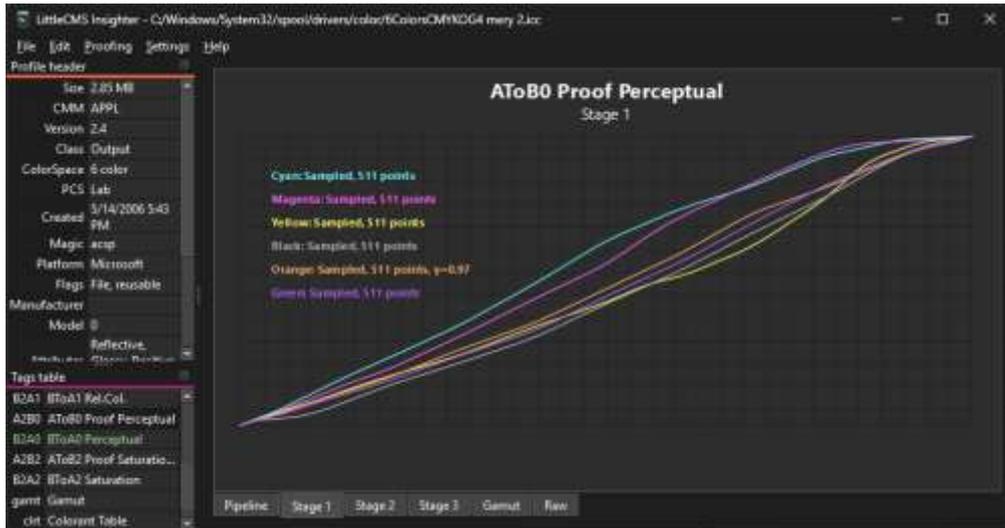

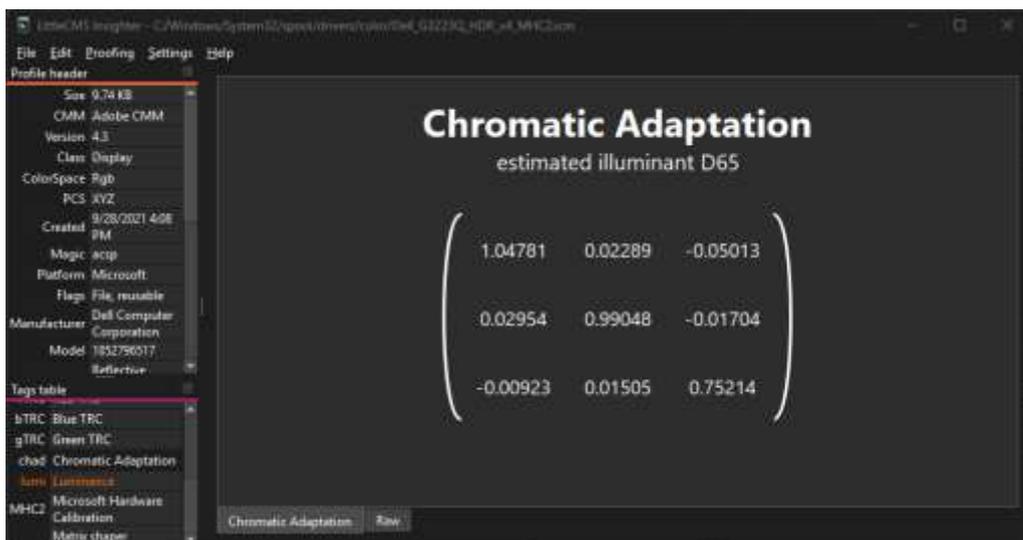Each stage gets its own numbered tab (**Stage 1**, **Stage 2**, etc.):

Curves

Tone response curves are drawn as graphs. Each channel is plotted separately. Parametric curves are decoded and their formula type and parameters are shown as a tooltip on the node.

- Zoom: mouse wheel
- Pan: click and drag
- Context menu: right-click → **Zoom in**, **Zoom out**, **Fit to window**


Matrix

The matrix stage is displayed as a visual math formula with bracket notation, showing rows, columns, and any offset vector. Useful for reading chromatic adaptation and shaper-matrix values.

CLUT

Multi-dimensional lookup tables are presented as an **interactive slice viewer**. Use the combo boxes to fix one or more dimensions and browse the remaining ones as a 2D color plane.

Matrix-Shaper Virtual Tag

The **Tags table** also contains a virtual entry that synthesizes the full matrix-shaper pipeline from the profile's individual shaper curves and matrix tags. This is useful for display profiles that do not carry explicit AToB/BToA tags. It follows the same pipeline tab layout as any other pipeline tag.

Gamut Hull Visualization (enhanced only)

This feature requires enhanced mode. See Standard and Enhanced Modes.

When running in enhanced mode, pipeline tags for RGB and ink-based profiles show an additional **Gamut** tab containing a 3D hull of the profile's color gamut in CIE Lab space. Each vertex is colored with the Lab-derived sRGB approximation, giving an intuitive visual impression of the gamut's shape and richness.
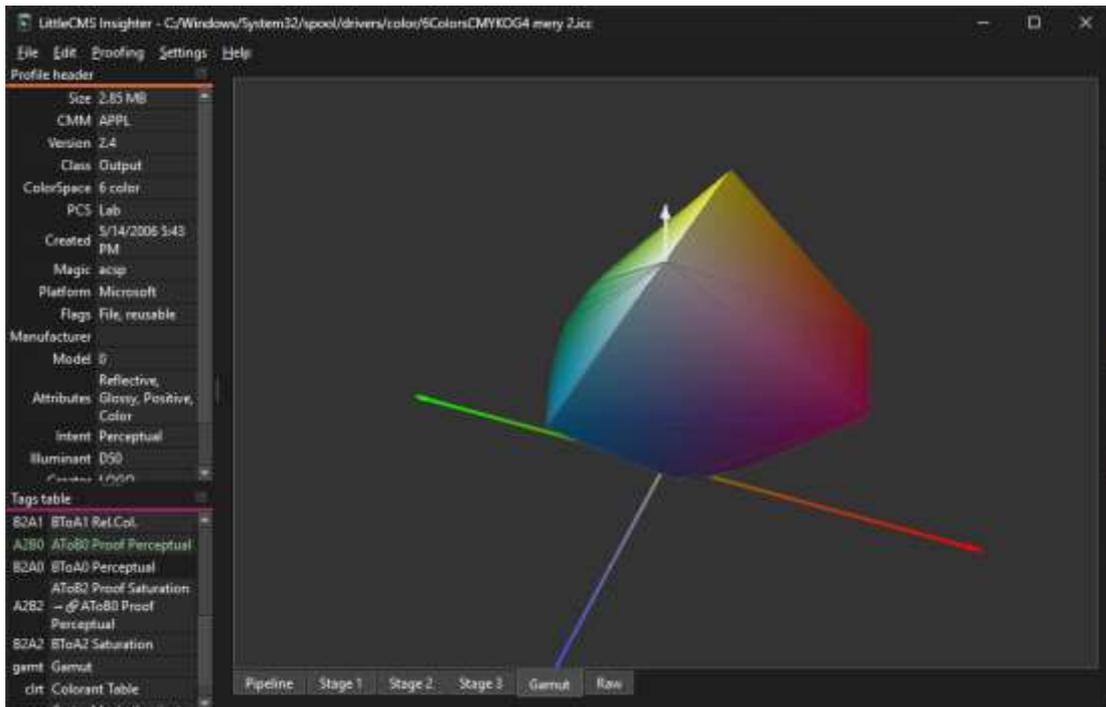
The hull is computed on first tab selection using the color transform embedded in the tag. For ink profiles with many channels or tags that involve a round-trip transform (BToA, BToD), computation may take a few seconds.

Navigating the 3D View

- **Rotate,** left-click and drag
- **Zoom,** mouse wheel

Exporting

Right-click anywhere in the hull view → Export as VRML... to save the hull geometry as a .wrl file suitable for import into 3D applications. The option is disabled until the hull has been computed.

On preferences you can choose whatever solid/wireframe or both.

Chromaticity and XYZ Tags

Color primaries (rXYZ, gXYZ, bXYZ) and the media white point are plotted on **a CIE 1931 chromaticity diagram**. The standard spectral locus is drawn as reference for white/black.
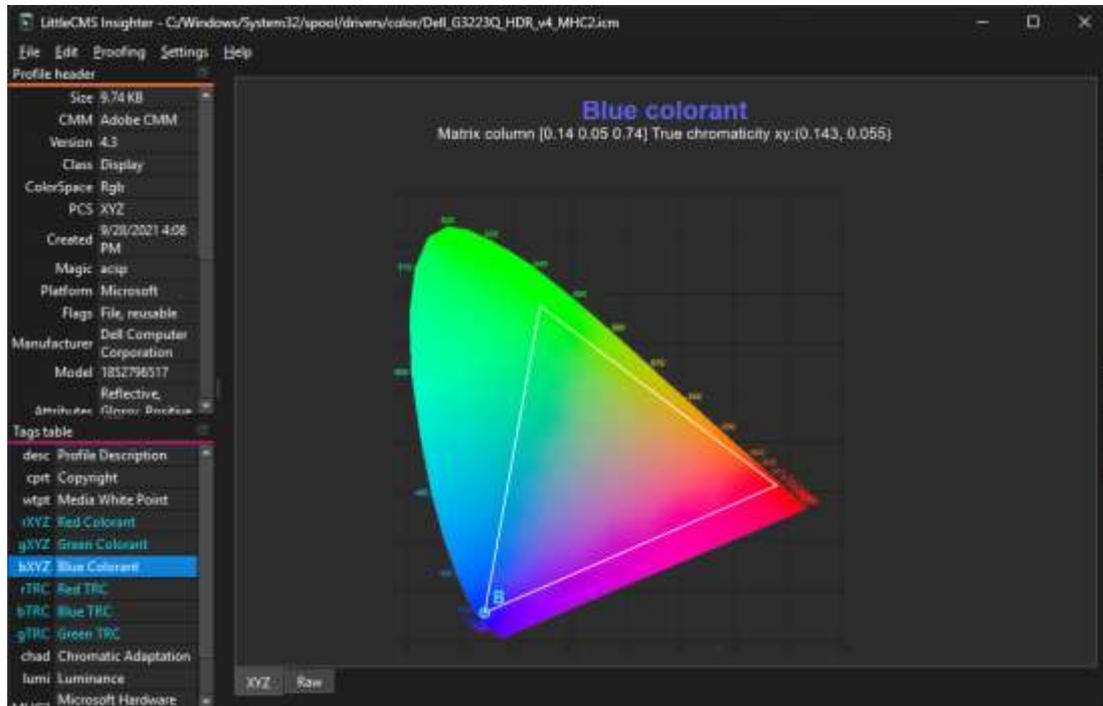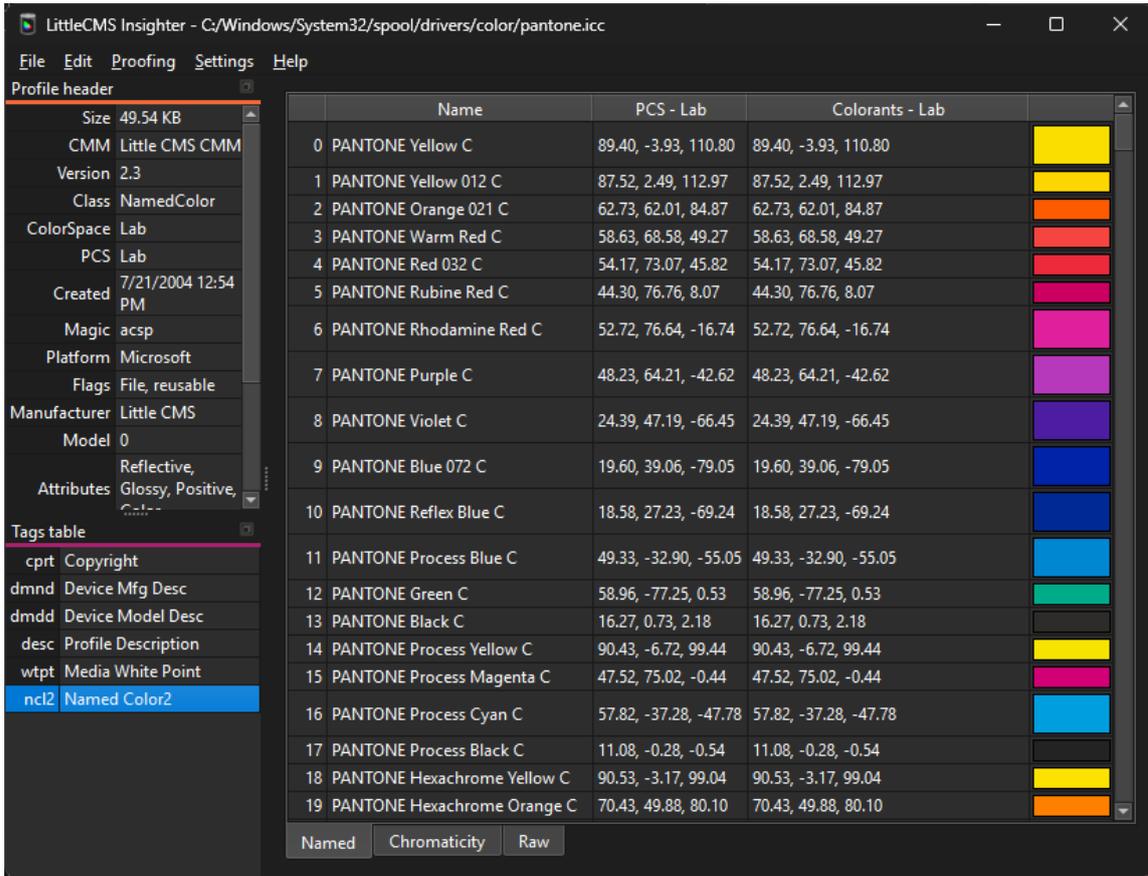

Chromatic Adaptation (CHAD)

The chromatic adaptation matrix tag is displayed in matrix formula notation. Insighter also computes and shows the **estimated illuminant** by inverting the matrix and mapping the D50 white point back through it.

Named Colors

Named color lists (tags ncl2, clrt) are shown as a table with:

- Index, name (with prefix and suffix decoded separately)
- PCS values
- Device colorant values
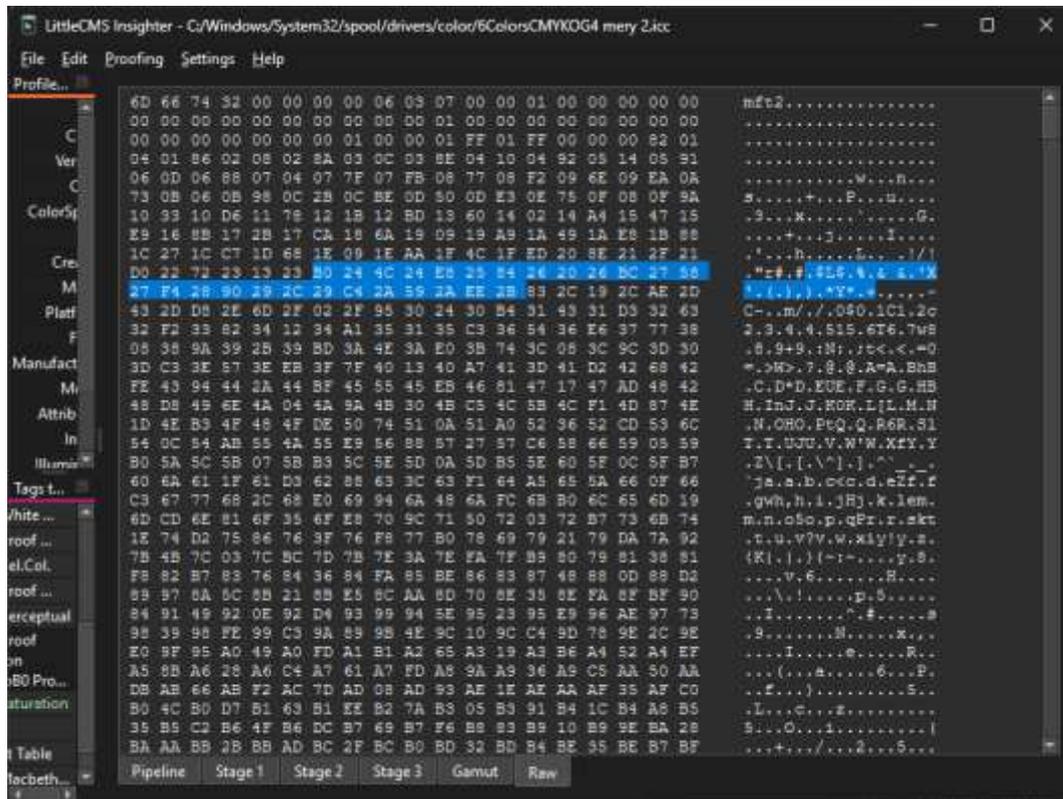- A **color swatch** column showing the approximate monitor appearance

Monitor profile is used to display accurate colors. You can also plot the values in a Chromaticity diagram.

The raw data viewer

Unrecognized tags are dumped in hexadecimal and ASCII formats. You can select in preferences whatever to have always this option available as a tab.

Every tag has a **Raw** tab that shows its binary content in three columns:

- **Offset**, byte position from the start of the tag data
- **Hex**, byte values in hexadecimal, 16 bytes per row
- **ASCII**, printable ASCII decode of each byte

Soft Proofing (enhanced only)

This feature requires **enhanced mode**. See Standard and Enhanced Modes.

The **Proofing** dock lets you preview how an image will look when reproduced through the loaded profile, directly on your monitor.
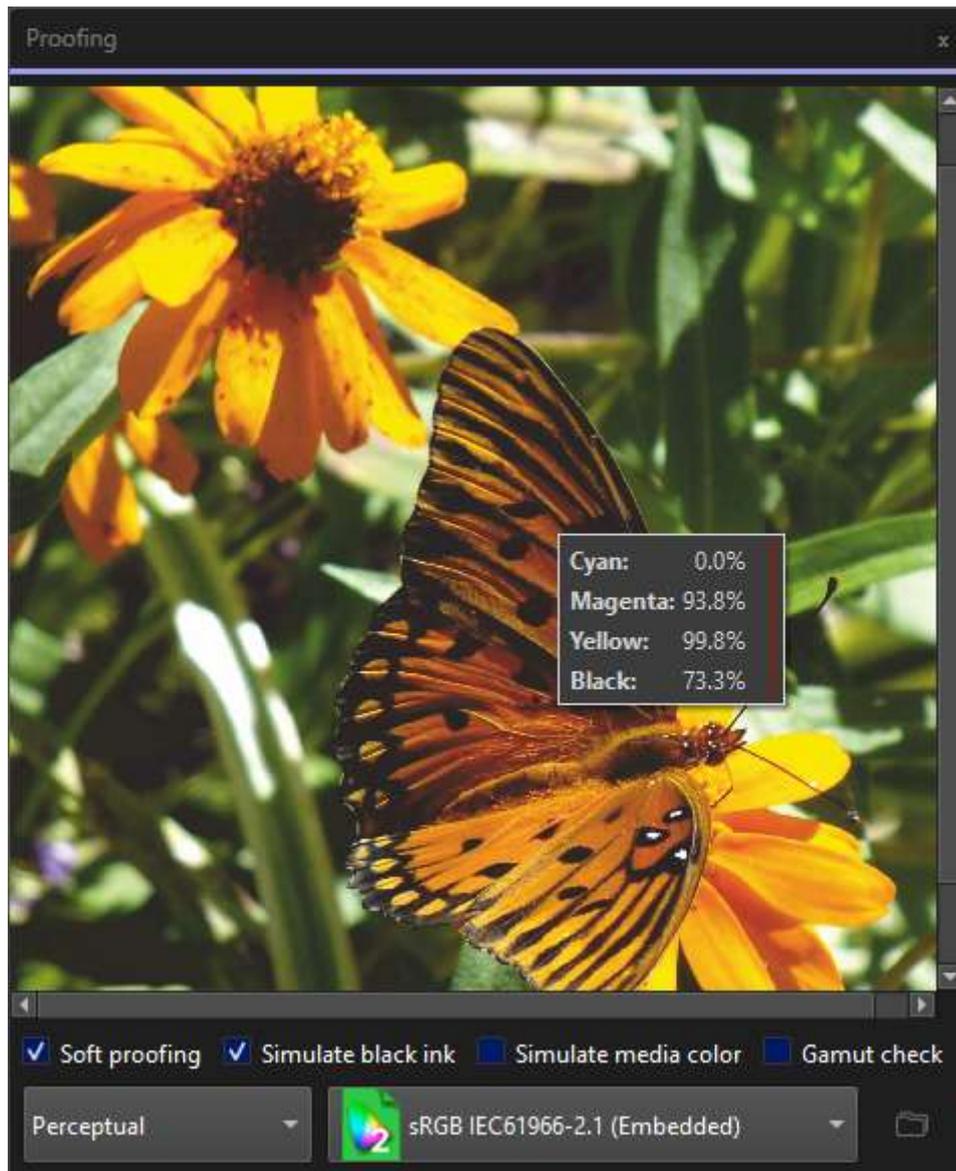
Loading an Image

- **Proofing → Load preview image**, opens a file dialog
- Right-click the image area → **Load image...**
- Right-click the image area → **Paste image** (available when the clipboard holds an image)

PNG, JPEG, and BMP images are supported. If the image has an embedded ICC profile, it is used automatically. If not, select the source color space in the profile selector.

Navigating the Preview

- Zoom: mouse wheel
- Pan: click and drag
- Context menu: right-click → **Zoom in, Zoom out**

Control	Description
Image profile	Source color space of the loaded image (RGB workspace profiles)
Rendering intent	Perceptual, Relative Colorimetric, Rel.Col + BPC, Saturation, Absolute Colorimetric
Soft proofing	Simulate the color appearance through the loaded profile
Simulate black ink	Model the profile's minimum density (only with Soft proofing, not with Simulate media color)
Simulate media color	Absolute colorimetric simulation including the media white point
Gamut check	Highlight out-of-gamut colors in a warning color

Hover over any pixel in the preview to see an eyedropper tooltip with channel values in the proofing profile's color space.

Keyboard Shortcuts

Shortcut	Action
Ctrl+O	Open ICC profile
Ctrl+C	Copy selected table data
F1	Open user manual

Zoom and pan in diagram and image views are mouse-only (wheel to zoom, drag to pan). Additional actions are available via right-click context menus in each view.

System Requirements

- Windows 10 / 11 or macOS 11+
- OpenGL 2.1 or later (required for the gamut hull 3D view)
- Qt 6 runtime libraries

Finally…

This is a short manual for a tool that has been created with simplicity in mind. While it streamlines the process, remember it's just a tool, the real finesse comes from experimenting.

Regarding Qt6 LGPL

LittleCMS Insighter is using Qt under LGPL v3

The Qt source code needed to build the DLL, so or dylib dynamic libraries used by this program is available on https://www.littlecms.com/lgpl3. If not available because technical reasons, Please contact us at sales@littlecms.com to get source code. Additionally, you can get this code from the Qt Company https://www.qt.io/ No modifications have been done on those libraries. Compiling Qt6Core Qt6Gui and Qt6Widgets and substituting those found in the installation directory allows you to use your LGPL v3 rights.