

KLEIN K-1

COLORIMETER/ FLICKER METER

Tristimulus Colorimeter for CRTs



The Klein K-1 tri-stimulus CIE Colorimeter Probe is designed to be the best colorimeter for CRT measurement in sensitivity, stability, and speed. The K-1's simple optics let it take in a large amount of light, which has made it popular as an intensity and flicker meter. It attaches directly to a PC, and runs with the companion PC program. Whether a desktop or a laptop is used, the Klein measurement application is in control and many additional features are available. K-1's are available with either USB or RS-232.



Data Captured in Milliseconds

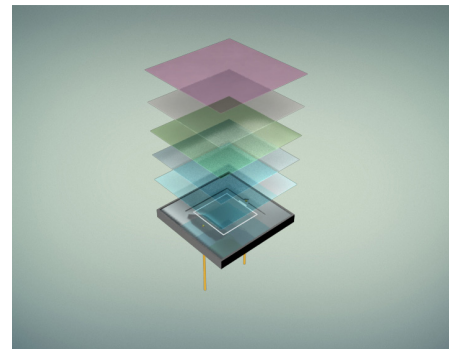
Ultra fast measurements make this colorimeter the perfect choice for quality control and production line purposes. the K-1 can stream Intensity data in 3.2 milliseconds, and can provide color data in 125 milliseconds. The Klein K-1 is also extremely sensitive and color accurate. Large photodiodes give the probe superior performance even in extremely low light (down to 0.00001 cd/m²). Klein diodes are very large; 5mm x 5mm each, and are thermally stable and linear to report the highest degree of accuracy.

Winning Design

Like all Klein colorimeters, the K-1 is ruggedly constructed with machined aluminum and high impact plastic. A rubber guard allows for safe contact measurement. The K-1's auto ranging is solid state, and the housing is impact resistant to hold up to the 24 hours a day, 7 days a week usage that the display manufacturers require. The K-1's compact size and light weight make transportation convenient. It is also fitted with a universal tripod mount for easy positioning and integration into workflows.

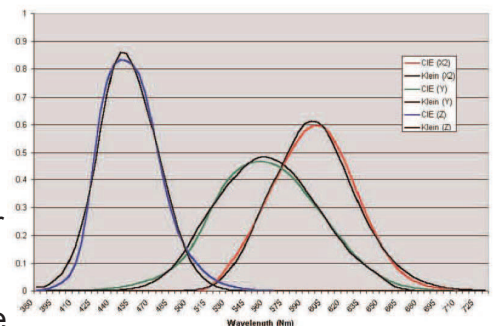
Exceptionally Accurate Filters

For maximum accuracy, not only is the f1' of Y critical, but the accuracy of X and Z as well. To the right is the actual graph of the Klein filters vs. the CIE graph. Each diode has a specially layered filter pack designed for maximum color accuracy. Klein colorimeters are also rigorously tested to ensure that each device is thermally stable with an operating temperature range of 15-35 C.



Versatility

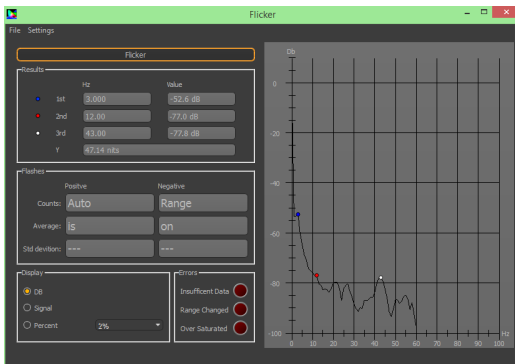
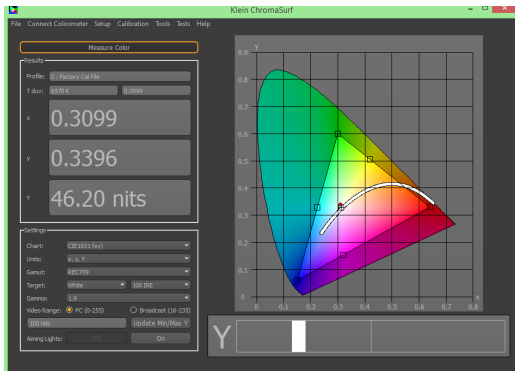
The Klein K-1 provides industry standard colorimetry analysis, as well as the capability to measure flicker. While it is not as color accurate as lensed Klein colorimeters, the K-1 has become very popular as a flicker meter due to its high sensitivity and affordable price. The Klein K-1 can measure and log flashes from various direct light sources.



Klein Chromasurf



Klein Chromasurf is the free companion software for the K-1. Its streamlined, user-friendly interface is perfect for color calibration and flicker analysis. Also available is the Klein SDK, which allows users to develop customized solutions for measuring with a Klein colorimeter.



- **Cross platform:** Chromasurf is available for Windows, Mac, and Linux operating systems, giving you flexibility in your working environment.
- **Streamlined and Intuitive:** Chromasurf features a simple, straightforward interface, with easy access to all the powerful features needed in calibration.
- **Data Display:** Chromasurf gives the user control over how data is visualized. The graph or chart can be changed to a number of different configurations. Displayed units can also be manipulated for added versatility.
- **Real-time Flicker Analysis:** The software's flicker panel gives immediate access to information as it's gathered. Flicker can be displayed in multiple formats to suit multiple applications.
- **Visual calibration:** Chromasurf provides real-time visual information regarding whitepoint, RGB primaries, gammut, and more.

Flicker

The Klein K-1 also functions as an FFT (Fast Fourier Transform) flicker meter. The probe measures and integrates Y data in the head, streams in real time to the PC, and then the FFT is performed. The Klein K-1 can measure regular flicker between 1-150Hz. Multiple methods for displaying flicker data including JEITA, VESA, Percent Flicker, and Contrast methods are selectable in the software. The Klein K-1 can be used to analyze any luminance source, including the common refresh-rate flicker in monitors, and random flashes caused by the transmission of current variations through solid state devices (LEDs). All flicker information can be logged and reported with Klein Chromasurf.

Accessories

- Metal Klein Carrying case
- Desktop Tripod
- Certificate of Calibration
- Install Disc with Klein Chromasurf, Legacy Software, and Drivers

| Model | | K-1 |
|--------------------------------------|----------------|---|
| Receptors | | Silicon Photocells |
| Measurement area | | 22 mm (contact device) |
| Acceptance angle | | Contact device |
| Measurement distance | | Contact device |
| Display range | Luminance | 0.0001 to 10,000 cd/m ² |
| | Chromaticity | Displayed as 4– or 3– digit value (selectable)* |
| Luminance | Measurement | 0.00001 to 10,000 cd/m ² |
| | Accuracy† | 10.00 to 10,000 cd/m ² : ±2% |
| | Repeatability† | 10.00 to 10,000 cd/m ² : ±0.1% |
| Chromaticity | Measurement | 0.0020 to 10,000 cd/m ² |
| | Accuracy | ±0.002†, ±0.004†† |
| | Repeatability† | ±0.0003 0.05 to 0.1 cd/m ² ±0.00003 2 to 10 cd/m ² |
| Flicker (VESA) | Measurement | 1 to 150Hz* |
| | Display range | 0.0 to 999.9% |
| | Accuracy | ±1% (flicker frequency: 30 Hz 75% duty cycle square wave) ±1% (flicker frequency: 60 Hz 75% duty cycle square wave) |
| | Repeatability | 1% (flicker frequency: 30 Hz 75% duty cycle sine wave) |
| Flicker (Contrast Method) | Measurement | 1 to 150Hz* |
| | Display range | 0.0 to 999% |
| | Accuracy | ±.4% (flicker frequency: 30Hz AC/DC 10% sine wave) |
| Measurement speed | xyY | 8 measurements per second, averaging below 0.27 nits |
| | Flicker | 384 measurements per second* |
| SYNC mode | | Universal |
| Memory channels | | 90 stored in colorimeter |
| RGB Analyzer function | | Standard |
| Interface | | USB or RS-232c (38,400 bps maximum) |
| Multi-point measurement axis | | 1,4,5, or 9 probes using Klein K-colorimeter software‡ |
| Software Solutions | | Chromosurf (available on website) |
| | | SDK software (supplied as standard accessory)‡ |
| Operating temperature/humidity range | | Temperature: 15 to 35°C; Relative Humidity 70% or less with no condensation. Luminance change: ±2% ±1 digit of reading for white; Chromaticity change: ±0.002 for white, ±0.006 for monochrome from reading of Klein's standard LCD, 120 cd/m ² at 23°C 40%RH |
| Storage temperature/humidity range | | 0 to 28°C: Relative Humidity 70% or less with no condensation; 28 to 40°C: Relative humidity 40% or less with no condensation |
| Input voltage range/ power | | 5V (USB power), ≤150mA |
| Dimensions | | Diameter: 55mm |
| | | Length: 150mm |
| Weight | | 226g |

*with firmware version P2v01.01ab and higher

†measured at 23°C on Klein Factory display on white field

‡additional software provided by various vendors

††measured at 23°C on Klein Factory display on RGB fields