

FLICKER + SPECTRAL
PARAMETERS



FLICKER PARAMETERS	
Measuring signal frequency range	0.1 Hz to 12.5 kHz
Sampling rate	125 kHz (10x max. measured frequency)
Flicker illuminance	0.1 lx – 15,000 lx
Calculated parameters	flicker index, flicker percentage, dominant frequencies
Visualization of signal as time series and in frequency domain (Fast Fourier Transformation – FFT)	
Additional metrics, as standards evolve, are incorporated as firmware updates	

SPECTRAL PARAMETERS	
Spectral range	340 – 780 nm
Illuminance	1 – 200,000 lx
Irradiance	20 – 200,000 mW/m²
Luminous flux (with GL OPTI SPHERE 48)	0.03 – 150 lm
Radiant power (with GL OPTI SPHERE 48)	0.03 – 500 mW
Luminance (with GL OPTI PROBE 1.0.10 LUMINANCE)	3 – 80,000 cd/m²
Physical resolution	~ 1.7 nm
Wavelength reproducibility	0.5 nm

TECHNICAL DATA SHEET	
Flicker sensor	high-speed photodiode, V(λ) correction class B
Spectral sensor	CMOS image sensor
Number of pixels	256
Integration time	10 ms – 10 s
A/D conversion	16 bits
Signal to noise ratio	1000:1
Cosine correction	Class B according to DIN 5032 Part 7
Stray light	2*10E-3
Spectroradiometric accuracy	4%
Measurement uncertainty of color coordinates (x,y)	0.0015
Display full color	240x320 px
PC interface	USB 2.0 standard
Micro SD card	4GB
Power	lithium-ion battery 1400 mAh
Power consumption	~ 640 mA
Power supply	Input: AC 100-240V 50/60 Hz 0.15 A Output: 5 V-1 A
Ambient temperature	5 – 35°C
Dimensions	74 mm x 146 mm x 24 mm
Weight	315 g (< 1 pound)

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NEW
Touch
the Flicker

GL SPECTIS 1.0 T Flicker

Integrates the measurement of flicker parameters, colorimetric and photometric data – all in a high performance hand-held package



WHAT IS FLICKER?

- Flicker is the perception of temporal changes in the light output (luminance flicker) or color (chromatic flicker) of the light.
- Part of a broader problem termed Temporal Light Artifacts (TLA) that include:
 - Stroboscopic Effect that appears when an object with continuous motion is illuminated with a flickering light source
 - Phantom array occurs when we make a saccade (fast eye movements) and the image of the fluctuating light source is transited across the retina

WHY MEASURE FLICKER?

- Flicker frequencies from a few Hz to 70-100 Hz can be perceived by humans.
- Long exposure to light flicker causes headaches, migraines, increases eye strain and attention distraction.
- Flicker impacts workplace comfort and effectiveness while reducing visual task performance and productivity.

WHAT IS MEASURED?

- IESNA has defined two primary quantities used to characterize flicker:
 - flicker index
 - flicker percentage
- Fundamental flicker frequency is also commonly captured.



GL Optic products are made in Europe, sold and serviced on all continents.

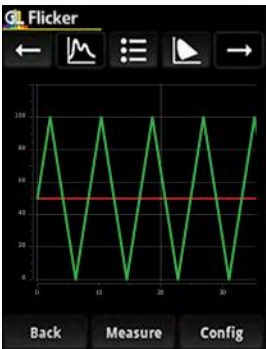
TOUCH the FLICKER

GL Spectis 1.0 T Flicker, the latest innovation from GL Optic, integrates the accurate measurement of light flicker with all the measurement quantities of the GL Spectis 1.0 Touch. Flicker quantification is accomplished with a combination of photodiodes, high speed analog circuits, and high sample rate analog to digital (A/D) converters.

SPECTROMETER and PHOTODIODE MEASUREMENT

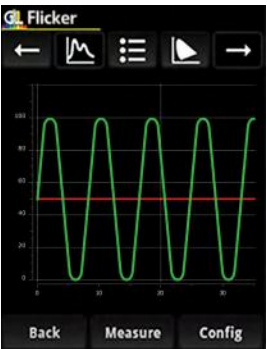
GL Optic spectrometers are predominantly designed and preconfigured for light measurement. The B class cosine corrected measurement head is a standard accessory allowing for the proper measurement of light. With the addition of a separate, dedicated photodiode and real-time data processing, they measure flicker as well.

SIMPLE PERIODIC WAVEFORM PROPERTIES and FLICKER METRICS



Triangle Waveform Shape

- Percent flicker = 100%
- Flicker index = 0.250
- Frequency 100 Hz



Sine Waveform Shape

- Percent flicker = 100%
- Flicker index = 0.318
- Frequency 100 Hz



Square Waveform Shape

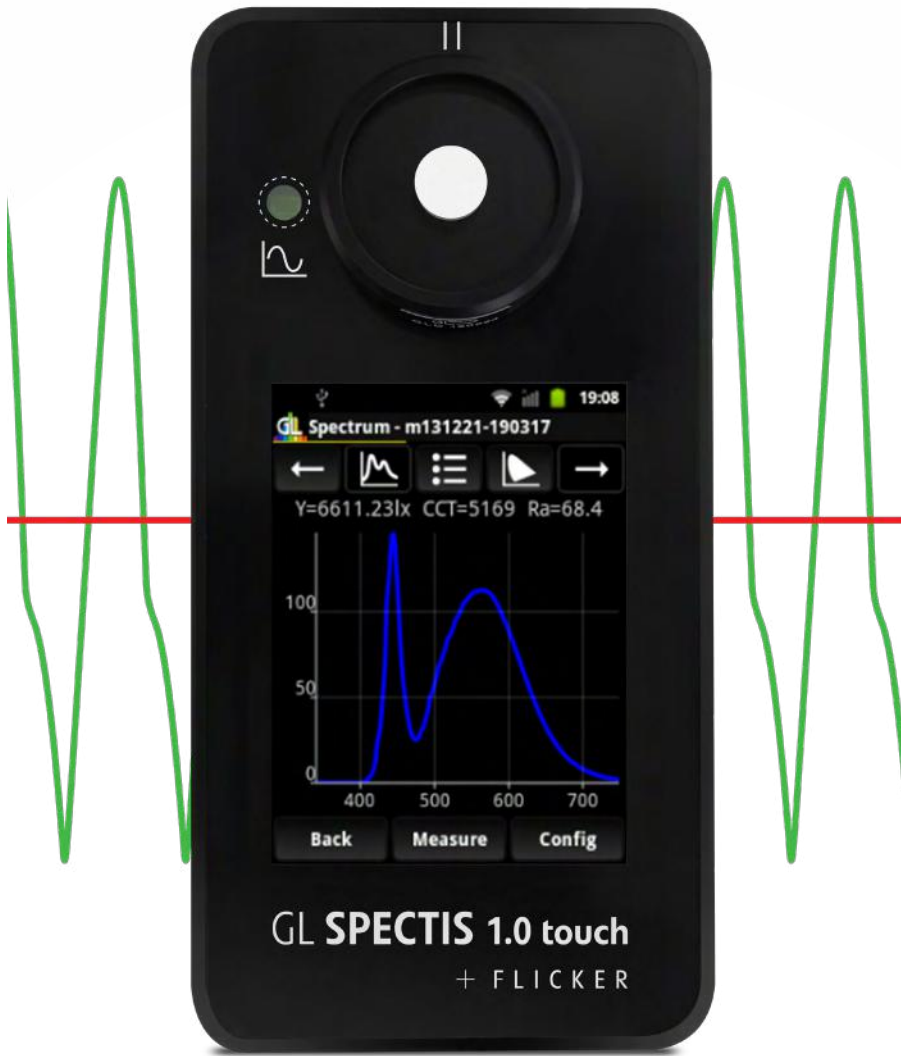
- Percent flicker = 100%
- Flicker index = 0.500
- Frequency 100 Hz

KEY FREATURES:

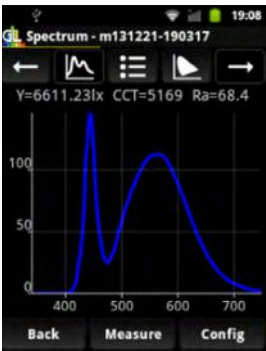
- Compact, portable, solidly built
- Intuitive, color LCD touch screen user interface
- Laboratory grade accuracy and repeatability
- Dark current and temperature compensation
- Automatic accessory detection and calibration loading
- Use standalone, or in conjunction with system accessories

INCLUDES:

- Certificate of calibration to reference standard
- Cosine-corrected standard diffuser head (illuminance)
- Versatile interfaces: USB, SD card
- Remote trigger socket
- Universal mount for tripod or optical bench use
- Rugged case, charger, cable
- 1 year warranty with extension options
- Use standalone, or in conjunction with system accessories

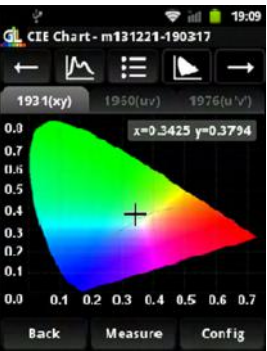


INTEGRATED FLICKER and ILLUMINANCE SPECTRORADIOMETRIC MEASUREMENT INSTRUMENT



SPECTRUM

This calibrated spectroradiometer provides Spectral Power Distribution curves that are the basis for all photometric and colorimetric calculations.



COLOR

Various CIE Chromaticity Charts and calculated color coordinates help the user to check the light color output.



VALUE

Displays high accuracy illuminance measurements and includes all key photometric and colorimetric values directly on the screen such as: lx, fcd, x,y, color coordinates, CCT, CRI and radiometric scaling.

GL SPECTROSOFT with TM 30 (available in GL Spectrosoft PRO and LAB)

The optional analytical software, GL Spectrosoft, adds the latest capabilities to evaluation and reports key light metrics, including The Illuminating Engineering Society TM-30-15 method for evaluating light source color rendition quality. This is an objective and statistical approach, quantifying the fidelity (closeness to a reference) and gamut (increase or decrease in chroma) of a light source.

The software also generates color vector graphics that indicate average hue and chroma shifts, to assist in interpreting Rf and Rg characteristics.

