GL OPTIC

Light quality control

Light modulation measurements

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Nowadays when light quality plays such an important role in the design of human friendly lighting environment, designers and auditors need new tools to evaluate light modulation.

Parameters such as flicker percent and flicker index are not enough because they do not adequately describe this phenomenon, nor do they take into account human physiology. Knowing that, customers display a growing interest in lighting parameters related to modulation. There is more and more discussion about lamps, flicker free lighting, also in the context of computer monitors.

In order to help manufacturers and all stakeholders interested in measuring light flicker GL Optic has been systematically developing and updating its software as well as hardware products.

The beginning of 2019 saw the launch of a new onboard application (device firmware) and external PC software **GL SPECTROSOFT,** much to the satisfaction of our existing and new clients who have been using our **GL SPECTIS 1.0 Touch + Flicker**[1]. The updates include new flicker features. Existing metrics like **Flicker percent, Flicker index, SVM and FFT** have been supplemented with new light modulation metrics.

New flicker metrics:

- **JEITA** and **VESA** method

Used especially by manufacturers of LCD monitors. Those metrics are expressed in dB and are based on FFT analysis.

- **SAM** (Stroboscopic Acceptability Metric) equivalent to the SVM measure (Philips Research) developed by ASSIST organization

In combination with SVM metric, SAM should be useful for all users who want to evaluate stroboscopic effects which can be especially dangerous at the workplace. Negative values mean that the stroboscopic effect will be unacceptable (visible).

- ASSIST's **Mp**

Metrics for evaluating direct flicker perception up to 80Hz with the use of FFT analysis.

- **JA10** (California Title 24 JA10)

Important for US market especially in the state of California. California Energy Commission requires that all lamps introduced to the market at this state should be energy efficient as well as have high quality light (low flicker). Lamps should be labelled as meeting the flicker requirements described in Appendix JA8. This method is based on FFT signal filtering method and must be performed on the PC.

- **PstLM**

Short term light modulation is a flicker metrics adopted from electrical standards for power quality evaluation (IEC 61000). It uses time domain analysis to accomplish aperiodical changes in the input signal for frequencies up to 80 Hz. It requires long term measurement of min. 60 s and signal processing (normalisation, filtering, statistical methods) which should be done offline on a PC. Adopted by CIE, NEMA, and ENERGY STAR.

The measures described here are available using **GL SPECTIS 1.0 Touch + Flicker** (some measures like JA10 and PstLM require access to the Spectrosoft software for calculations) or fast photometer **GL PHOTOMETER 3.0 + Flicker.**

1) Only for products delivered after January 2018

Applications:

- R&D departments (a useful tool during the development of new lamps and power supplies for lighting)
- Lighting designers (checking light quality after installation and during lighting audits)
- Production departments (lamp characterization for product datasheets, checking production quality and repeatability)
- Research organisations, universities (excellent tools for education and for research)

GL SPECTIS 1.0 TOUCH + FLICKER

How can light modulation be measured?

- By using a portable **GL SPECTIS 1.0 Touch + Flicker spectroradiometer** without a PC for field measurements where you can get the majority of calculations made onboard the device
- You can connect a **GL SPECTIS 1.0 Touch + Flicker** with a PC and create a professional flicker measuring station in your laboratory. GL Spectrosoft allows for detailed light modulation analysis and reporting
- Measuring flicker inside an integrating sphere or during goniometric measurements is also possible with the use of our new fast photometer **GL PHOTOMETER 3.0 + Flicker** in combination with GL Optic's **GL SPECTROSOFT**

GL PHOTOMETER 3.0 + FLICKER

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