

PHOTOMETRY



INTRODUCTION



InterElectronic Hungary Ltd. offers equipments, machines and different materials (ESD) of different production technologies (SMT/THT/LED). Including high quality, special request fulfilling soldering machines, devices, tools, instruments and materials for the electronic industry and services.

SERVICES

Our each and every product has a warranty granted by the InterElectronic Hungary Ltd. For more complex appliances our company offers a well-needed training for set up and usage. We grant the repair of all of the products traded by our company during and after the warranty period. As well as we guarantee the continuous supply of accessories and instruments.

DEMONSTRATION

In case if any of our products aroused your interest the InterElectronic Hungary Ltd. would be glad to visit your company and hold a presentation of the product of your interest. As far as possible we serve you by bringing demo devices with us. In the most cases of our products we are proud possessors of references nation-wide. Major machines also could be observed at our partners' site.

PRICE LIST

Most of the prices of our products can be requested on our website and will be sent via email to you. In case of special and more complex machines the prices are given after consultation individually through a price offer. If you are interested in more information or user manuals of our products we recommend you to visit our website (www.interelectronic.com), which is updated continuously with professional information. We also recommend you to visit our office, where you can purchase any of the needed devices and spare parts of the product of your interest.

ORDER/SHIPPING

Our soon to be partners are welcomed to be helped via telephone, fax or e-mail. We use different ways of delivery, depending on the preference of our partner. We can deliver your purchased product by ourselves, by freight or courier service. The way of delivery might be negotiated previously. We offer you cash on delivery nation-wide!

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If you are looking for reliable, precise and intuitively operated spectrometers and light measuring instruments, our state-of-the-art light measuring tools are the best answer to all your spectral light measurement needs. GL Optic offers complete SOLUTIONS for measuring illumination [lx], luminous flux [lm], CRI, CCT, COLOR, luminance [cd/m²] and many more.

At GL OPTIC, we realise that for an instrument to produce dependable light measurement results its precision is as its reliability. For over 40 years we have been a leading supplier of standardized light solution. Presently, as an expert in lighting industry, we have managed to combine German know-how with fresh and innovative approach to spectral light measurement.

Now not only experts can obtain accurate light measurement data - our individually calibrated measurement tools deliver fast and precise results, and the included software is intuitive and easy to navigate.

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GL OPTIC SPECTROMETERS

Our spectrometers are versatile instruments for lab, field, process and OEM environments with no compromise on accuracy. That's why we call them "smart".

Not only since the introduction of LED technology, the lighting market has been continually intensifying requirements on spectrometers to attain accurate measurement results. GL Optic offers a wide range of spectrometers using different sensor technology (such as CMOS, CCD, back-thinned CCD) and combines them with in-

novative touch screen operation. WiFi connection, USB direct transfer, Micro SD Cards and Li-Ion batteries in most of our devices allow the user to take the product where the measurement is needed in the field. Hardware triggering and rack mount systems provide easy integration into production line environments.

GL SPECTIS 1.0



Precise Light Measurement Technology in a handy size.

GL SPECTIS 1.0 is a high quality easy to operate measuring device that gives you all you need for reliable light measurement. Check out the unique capabilities of the GL SPECTIS 1.0.

Technical Data Sheet

Absolute Spectoradiometric accuracy	4%
Spectral Range	340-750 nm/640-1050 nm (optional)
Detector Technology	CMOS. 256 pixels
Datapoint interval	~1.7 nm/ ~1.8 nm
Integration time	5 ms - 100 s
Signal: Noise Ratio	1000 : 1
Stay Light	2 *10E-3
Dimensions	72 x 115 x 19 mm; 120 g

Hardware trigger & software capable | USB 2.0 connection | 16 bit A/D conversion. Please inquire for complete specifications.

GL SPECTIS 1.0 Touch



The world's first smart spectrometer.

GL SPECTIS 1.0 Touch is the world's first intuitively operated touch screen version of our successful SPECTIS 1.0 product line. Often copied but never duplicated this is a reliable and versatile device for accurate absolute spectral measurement.

Technical Data Sheet

Absolute Spectoradiometric accuracy	4%
Spectral Range	340-750 nm/640-1050 nm (optional)
Detector Technology	CMOS. 256 pixels
Datapoint interval	~1.7 nm/ ~1.8 nm
Integration time	5 ms - 100 s
Signal: Noise Ratio	1000 : 1
Stay Light	2 *10E-3
Dimensions	72 x 145 x 24 mm; 315 g

Hardware & software trigger | USB 2.0 connection | Wi-Fi | 16 bit A/D conversion | Li-Ion battery. Please inquire for complete specifications.

GL SPECTIS 5.0 Touch



Hardware & software trigger
| USB 2.0 connection | Wi-Fi
| Micro SD Card | 16 bit A/D
conversion | Li-Ion battery.
Please inquire for complet
specifications.

Discover the new compact size laboratory grade spectrometer.

With the new GL SPECTIS 5.0 Touch we expanded our smart, touch screen technology into laboratory grade equipment. The wide wave-length range allows for measurement according to many standards including Photobiological Safety (EN 62471) and measurement of SSL products (IESNA LM-79-08).

Technical Data Sheet

Absolute Spectoradiometric accuracy	4%
Spectral Range	VIS 340-850 nm US-VIS 200-800 nm VIS-NIR 380-1050 nm US-VIS-NIR 200-1050 nm
Detector Technology	CCD back thinned
Optical Resolution (FWHM)	2.5 nm-3.5 nm
Integration time	5 ms - 100 s
Signal : Noise Ratio	1000 : 1
Stay Light	2 *10E-3
Dimensions	72 x 145 x 24 mm; 315 g
Featuring temperature monitored sensor system	

GL SPECTIS 6.0



Rack mounted laboratory grade spectrometer module.

With the new GL SPECTIS 6.0 we expand our high-end spectrometers into mass production and large laboratory setups for high speed measurement of SSL products (IESNA LM-79-08), LED wafers, large street-laps and luminaries.

Technical Data Sheet

Absolute Spectoradiometric accuracy	4%
Spectral Range	VIS 340-850 nm US-VIS 200-800 nm VIS-NIR 380-1050 nm US-VIS-NIR 200-1050 nm
Detector Technology	CCD back thinned
Optical Resolution (FWHM)	2.5 nm-3.5 nm
Integration time	10 ms - 60 s
Signal : Noise Ratio	1000 : 1
Stay Light	2 *10E-3
Dimensions	2U 19" 480 x 262 x 88.9 mm; 2.5 kg
Featuring temperature monitored sensor system	

Hardware & software trigger | USB 2.0 connection | Wi-Fi | 16 bit A/D conversion | Please inquire for complet specifications.

GL SPECTIS 8.0



Technical Data Sheet

Absolute Spectoradiometric accuracy	3%
Spectral Range	300-800 nm
Detector Technology	CCD back thinned, cooled (5°C)
Optical Resolution (FWHM)	1nm
Integration time	10 ms - 10 s
Signal : Noise Ratio	2000 : 1
Stay Light	3 *10E-4
Dimensions	20 x 175 x 320 mm; 7.1 kg

USB 2.0 connection | 16 bit A/D conversion | Please inquire for complet specifications.

GL OPTIC SPHERES

All our spheres connect to any spectrometer using a direct connection.

Integrating spheres have become a standard instrument in photometry and radiometry since R. Ulbricht's practical implementation of the light-collecting cubical box more than 115 years ago. Today GL Optic produces high reflectance integrating spheres using modern materials such as composite and combining them with the latest calibration technology (LED based Auxiliary correction source). Using no fiber means you are not losing your calibration when changing be-

tween different sphere sizes. The system automatically detects and uses the correct calibration file. The spheres also come with LED auxiliary correction sources, 2Pi and 4Pi configurations and a 98% reflectivity in the visible range. Our high reflection BaSO₄ coating is 98% reflective within the visible wavelength range. And other materials such as optical PTFE or gold are available as custom options in addition to other sphere sizes (1.5m, 3m, 4m).

GL OPTIC SPHERE 48

The measurement of radiant power, luminous flux, color temperature, color coordinates and color rendering index (CRI) of LEDs.

GL OPTI SPHERE 48 is an accessory for our GL SPECTIS 1.0, GL SPECTIS 1.0 touch and GL SPECTIS 5.0 touch for luminous flux measurement of LEDs and other small light sources.



Technical Data Sheet

Sphere inner diameter	48 mm
Entrance aperture diameter	9 mm
Spectral range (coating)	240-2600 nm
Material (Sphere / Coating)	Aluminium / BaSO ₄
Dimensions	52 x 88 x 51 mm
Weight	126 g

GL OPTIC SPHERE 205

The ultimate solution for radiant power and luminous flux measurements of LEDs and LED modules.

The GL OPTI SPHERE 205 is designed for the measurement of radiant power and luminous flux of LEDs and other light sources compliant with the recommendation of the CIE Technical Committee published in Technical Report CIE 127:2007. The sphere is suitable for IESNA LM-79-08 compliant measurements.



Technical Data Sheet

Sphere inner diameter	205 mm
Entrance aperture diameter	50 mm
Spectral range (coating)	240-2600 nm
Material (Sphere / Coating)	Aluminium / BaSO ₄
Dimensions	265 x 270 x 225 mm
Weight	3.3 g

GL OPTIC SPHERE 500



The best solution for luminous flux and radiant power measurements of LED retrofit lamps.

The set is equipped with adapters and sockets for most popular retrofit bulbs. The GL OPTI SPHERE 500 is designed for the measurement of luminous flux and radiant power of LED replacement lamps and LED modules. The sphere is suitable for IESNA LM-79-08 compliant measurements.

TECHNICAL DATA SHEET

Sphere inner diameter	500 mm
Entrance aperture diameter	80 mm
Spectral range (coating)	240-2600 nm
Material (Sphere / Coating)	Composite / BaSO ₄
Auxiliary source	White LED
Dimensions	52 x 88 x 51 mm
Weight	126 g

GL OPTIC SPHERE 1100



Measurement of luminous flux and radiant power of large LED modules and LED luminaries.

The GL OPTI SPHERE 1100 has been designed for the measurement of Luminous Flux and Radiant Power of LED Luminaries and big LED modules as well as for other light compliant with the recommendation of the CIE Technical Committee published in Technical Report CIE 127:2007. The sphere is suitable for IESNA LM-79-08 compliant measurements.

TECHNICAL DATA SHEET

Sphere inner diameter	1100 mm
Entrance aperture diameter	168 mm
Spectral range (coating)	240-2600 nm
Material (Sphere / Coating)	Composite / BaSO ₄
Auxiliary source	White LED
Dimensions	1260 x 1800 x 1220 mm
Weight	60 kg

GL OPTIC SPHERE 2000



The ultimate solution for radiant power and luminous flux measurements of LEDs and LED modules.

The GL OPTI SPHERE 2000 has been designed for the measurement of luminous flux and radiant power of LED Luminaries and big LED modules as well as for other light sources compliant with the recommendation of the CIE Technical Committee published in Technical Report CIE 127:2007. The sphere is suitable for IESNA LM-79-08 compliant measurements.

TECHNICAL DATA SHEET

Sphere inner diameter	2000 mm
Entrance aperture diameter	660 mm
Spectral range (coating)	240-2600 nm
Material (Sphere / Coating)	Steel / BaSO ₄
Auxiliary source	White LED
Dimensions	2200 x 2200 x 2300 mm
Weight	200 kg

GL OPTIC ACCESSORIES

From single LED emitter measurement to complete luminaire testing, GL Optic provides comprehensive light measurement solutions.

Changing from Lux to Lumen and then to cd/m^2 is as easy as connecting a new accessory to your spectrometer. Automatically the system re-calibrates to the new scenario and you have the peace of mind that you are always using the correct absolute spectral calibration file. The advanced optical design of our accessories allows you to increase

the usability of your GL SPECTIS series spectrometer without the need to purchase a new measurement device. You can upgrade your existing GL SPECTIS series device for luminance measurements, calculating PAR values and even measure under water – anything is possible. Please inquire for custom solutions.

GL OPTIC PROBE 1.0



For measurement of luminance [cd/m^2] and color coordinates (x, y, Y)

This optical probe from GL Optic is an accessory which is designed to be used with our GL SPECTIS 1.0 or GL SPECTIS 1.0 Touch for luminance measurement of flat LCD and OLED panels, plasma FPDs and other back-lit sources. It is also the perfect solution for testing projection displays as well as for OLED light sources, or traffic and emergency sign measurement.

TECHNICAL DATA SHEET

Measuring point diameter	8 mm
Fiber optic length	1.5 m
Spectral range	400 – 730 nm
Dimensions	44 x 63 x 15 mm

Various additional optical probes are available to perform different measurement tasks. Please inquire for detailed specification.

GL OPTIC LIGHT LED 127

The uniform, programmable, multichannel LED light available in one box.

The reference luminance standard for the calibration of optical instruments. Free selection of color temperatures and color coordinates out of available color space. Long-lasting, stable performance by a unique, multilevel calibration method (patent pending).



TECHNICAL DATA SHEET

Sphere inner Diameter	127 mm
Aperture (exit port) diameter	47 mm
Spectral range	385 – 750 nm
Uniformity	+/- 1% over 2000 operating hours
Luminance range	100 – 3000 cd/m^2
Colorimetric stability	+/- 0.0020%
Dimensions	216 x 227 x 130 mm

GL OPTI LIGHT LED 127 CLC

Same as GL OPTI LIGHT 127 LED but with closed loop calibration using a high accuracy Photodiode.

GL GONIO SPECTROMETER



Comprehensive solution for spectral angular measurement of LED based lamps and luminaires.

Introducing new C-type gonio spectrometer systems in C-(gamma) coordinate for the measurement of SSL source and luminaires. Up until now, gonio-photometers were the only comparable systems available on market, used to measure light intensity with a photo-detector. Now, LED-based luminaires need to be measured using a gonio-spectrometer to check the angle dependence luminous intensity along with colorimetric values like color, color temperature and CRI.

PRODUCT	GLG-1-20	GLG-6-70	GLG-20-150
Application are	Small LED sources, retrofit lamps (E14,E27,etc)	up to medium sized SSL sources	up to large luminaires
Height,Width, Length, Weight	300 mm, 300 mm (stand), 300 mm (stand), appr.4 kg	700 mm, 700 mm (stand), 700 mm (stand), appr. 25 kg	240 mm, 1500 mm (stand), 1500 mm (stand), appr. 70kg
LUT Photometric center positioning	adjustable within 150 mm (vertical axis)	adjustable within 300 mm (vertical axis)	adjustable within 150 mm (vertical axis)
Max. dimension of the LUT*	0.2 m	0.7 m	1.5 m
Max. mass of the LUT* (in installed status)	1.5 kg	6 kg	20 kg

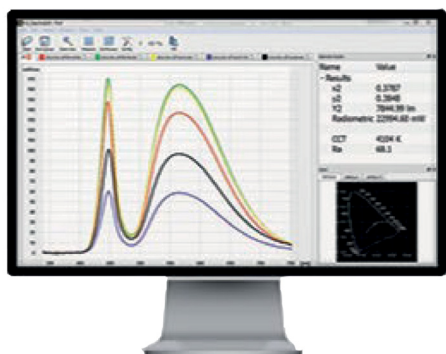
*LUT - Light sources under test

GL SPECTROSOFT

Your tool for the analysis, interpretation, presentation and reporting of your data.

GL SPECTROSOFT is an optional software package. It is a helpful tool for laboratory applications, field work in production quality control and for general light assessment purposes. The software interface gives the user quick access to useful information and functions such as correlated color temperature CCT, chromaticity error, color peak, color dominant, and color rendering index CRI (CIE 13.3).

The program calculates color coordinate values according to CIE standards. Additionally it can calculate scotopic and photopic values, PAR and PPFD, MacAdam's ellipses and much more...



GL SPECTROSOFT v. 3.0 NEW FEATURES

- MacAdam ellipses and Duv +/-
- PASS/FAIL function for production applications
- Personalized report generator using templates prepared with any text editor
- Peripheral devices management such as current sources, power supplies, TEC controllers
- Command line for LabVIEW™ and other systems

REMAINING FEATURES

- Measurement of LEDs compliant with CIE 127:2007 and IESNA LM-79-08
- Absolute or relative measurements
- Flexible data interpretation
- Helpful tools for easy analysis and interpretation of measured spectra
- Calculation of metamerism index MI Index (CIE 51.2)
- Measurement procedure conforming to the ISO 3664:2009
- Comparison window: presentation of the collective measurements chart
- Selected Results window: presentation of selected results
- Binning Tool: brightness and color groups selection for LEDs
- Transmission and Reflection measurement

GL SPECTIS 1.0

Precis Light Measurement Tehchology in a handy size.

GL SPECTIS 1.0 is a high quality easy to operate measuring device that gives you all you need for reliable light measurement. Check out the unique capabilities of the GL SPECTIS 1.0.



Demo kit available

ACCESSORIES

GL OPTI SPERE 48



The measurement of radiant power, luminous flux, color temperature, color coordinates and color rendering index (CRI) of LEDs.



GL OPTI PROBE 1.0



For measurement of luminance [cd/m^2] and color coordinates (x,y,Y) conforming to CIE standards.



GL SPECTROSOFT PRO



Your tool for the analysis, interpretation, presentation and reporting of your data.

GL OPTIC





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