ILT lightmeters, optical radiometers and detectors





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International Light Technologies

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Content

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International Light TECHNOLOGIES

ILT lightmeters, optical radiometers and detectors

International Light Technologies (ILT) has been the most respected name in research oriented light measurement for 40 years. They offer a variety of modular light meters. Optical radiation is perhaps the most difficult form of energy to measure accurately. Light energy is distributed over wavelength, position, direction, time and polarization.

A light meter or a radiometric light measurement system must be designed to measure the distribution of energy over one parameter while holding all others constant. In addition to high levels of measurement uncertainty, the field of radiometry and photometry has been characterized by confusion of terminology, symbols, definitions and units.

International Light Technology's goal is to provide customers with light measurement solutions to these problems by offering a comprehensive line of accurate modular light meters, i.e. radiometers and photometers. There are many (low-cost) instruments called radiometers on the market, which were designed to measure power from a light source with a constant known spectrum. These give erroneous results when measuring any other radiation.

The extremely modular light measuring system concept of International Light Technology is based on a choice of suitable radiometer display devices and a wide range of different detectors. As a special feature the detector head allows a custom-designed modular configuration by using special matched filters and input optics.

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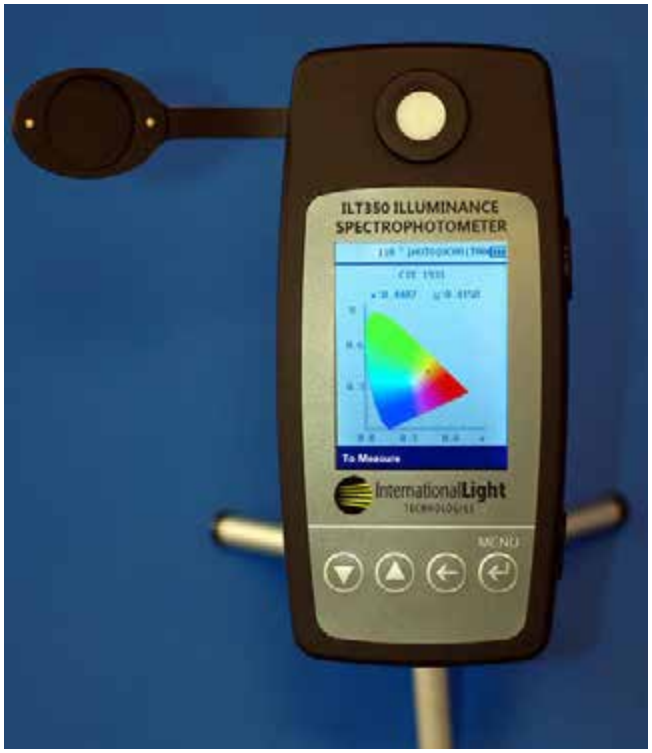
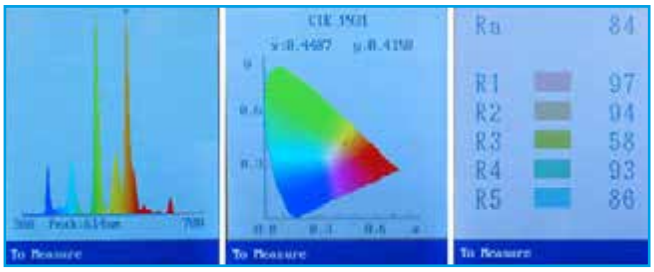
International Light TECHNOLOGIES

ILT350
Spectroradiometer





Specifications	
Sony CCD linear image detector with 16 bit A/D resolution	
Measurement range	380-780 nm
Lux measurement range	20-100,000 lux
Irradiance measurement range	0.1 W/m²~500 W/m²
PPFD (Plant growth/PAR) measurement range:	0.3~1500 µmol/m² *s
NIST traceable ISO17025 accredited calibration	
Data storage for up to 100 readings	
Windows XP, Windows 7 & Windows 8 Compatible Software	
Rechargeable battery lasts up to 6 hours	
OEM and/or custom instrument configuration inquiries welcome	

Features and benefits

- 3.5" full color display
- 10 full color displays for easy data analysis including: Lux, CCT, CRI, CIE1931 color spectrum, and more
- NIST traceable ISO17025 accredited calibration
- Hand-held, compact, ergonomic design
- Data storage for up to 100 readings
- Windows XP, Windows 7 and Windows 8 compatible software
- Easy to use internal, data capture software
- Rechargeable battery lasts up to 6 hours

Description

The hand-held ILT350 spectroradiometer was designed for portability, quality and ease of use. The housing design is ergonomic and light weight yet packed with features such as a built in full color display. Extensive data capture and analysis software, rechargeable battery and internal data storage. The menu buttons are intuitive and easy to use.

The built-in 12 mm diameter cosine receptor is protected by a magnetic rubber cap that remains attached to prevent loss or damage. The toggle buttons allows the user to easily scroll up and down to view readouts between lux & foot candles, spectrum, CRI, CCT, W/m2 PPRF, umol/m2 *s and more.

The ILT350 has three measurement speeds including Fast (0.5 s), Slow (2.5 s) and Auto (0.5 – 27 s) depending on light intensities (20 lux to 100K lux). The spectral resolution is approximately 10 nm with an accuracy of ±3 nm. Relative spectral distribution data is exported in 1 nm increments using the light meter software.
The internal memory can store up to 100 files and export data into Excel/Work formats.

Ordering information	
ILT-ILT350	ILT350 Spectroradiometer (includes Luxmeter manager software)

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InternationalLight TECHNOLOGIES

ILT350
Spectroradiometer

Typical illuminance applications

- Light box calibration – lamp quality and maintenance:
  For testing numerous types of light booths and color viewing lamps including D75/D65/D50, Fluorescent, Halogen, TL84/83, SPX35, and more. Many standards state specifications with regard to color quality, light intensity, evenness of illumination, and ambient conditions as differences in any of these conditions can affect color appearance. The ILT350 can test for lamp quality (CCT, CRI, lux, purity, spectrum etc.), ambient levels, as well as determine when light booths need maintenance (cleaning and lamp replacement).

- LED billboard maintenance, construction & environmental pollution:
  Whether testing LED uniformity, color and intensity during installation and maintenance, or testing total output and color temperature for environmental impact, the ILT350's portability, single button operation and built in display make the ILT350 the ideal tool.

- Simple reporting:
  The ILT350 lux manager software makes viewing measurements, exporting and sharing electronic data and creating reports as simple as taking the measurement itself. Lux Manager supports Windows, XP, 7, 8 and 10 and is included at no additional cost.

- Architectural lighting & design:
  Light can be used to create a feeling of warmth and invitation. It can make colors look bold and make them pop. The incorrect color of light can also have damaging affects such as making meats look old, or labels look faded. Checking the color of lighting based on the unique application can add great benefit to the user. For example, using the ILT350 to improve a restaurant's lighting can make the surroundings look as "delicious" as the food they serve.

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International Light Technologies

ILT560A / ILT560
Miniature, portable spectroradiometer series

The ILT560 comes with a SMA905 receptor as standard, allowing it to be used with all of the ILT950 spectroradiometer accessories including the R4 Right angle adapter, mini and standard diffusers, fiber optics, 2, 5 and 10 inch integrating spheres.

Each input optic requires its own unique calibration.

Standard and optional accessories can be combined to allow measurement of total flux (W,lm), irradiance (W/cm^2), radiance ($W/sr/cm^2$), colorimetry, luminance (cd/m^2), illuminance (lux).

Specifications

ILT 560A **350 - 900 nm**
ILT560A-RAA4 **250-900 nm (dual source calibration)***
ILT 560 **360 - 900 nm**
ILT 560-I **600-1100 nm**

	ILT560A	**ILT560**	**ILT560-I**
Stray light		<0.2%	<0.2%
AD converter	16 bit, 2 MHz	16 bit, 2 MHz	16 bit, 2 MHz
Signal/Noise	600:1	200:1	200:1
Integration time	0.5 ms – 10 seconds	1.05 ms - 10 minutes	1.05 ms - 10 minutes
Interface	USB 2	USB 2.0 (480 Mbps)	USB 2.0 (480 Mbps)
Power supply	USB power	USB power	USB power
Dimensions	91x60x 34.5	95 x 68 x 20	95 x 68 x 20
Temperature range	5 to 350 °C	0-550 °C	0-550 °C
CCD	2048	2048	2048
Resolution	1 nm	1.2 nm	< 1 nm
Slit	25 micron	50 micron	25 micron
Software	XP, Win7, Win8, Win10	XP, Win7, Win8, Win10	XP, Win7, Win8, Win10
Radiometric accuracy	200 nm - 350 nm: ±20% ** >350 nm - 450 nm: ±10% ** >450 nm - 900 nm: ±5%		

* Note: Dual range calibration with D_2 and QTH light source is strongly recommended for broadband measurements encompassing UV below 350 nm due to low output of the QTH lamp which increases the difficulty of accurate UV calibration
** Requires dual source calibration upgrade to assure radiometric accuracy in the UV

Ordering information	
ILT-ILT560A-RAA4	UV-NIR spectroradiometer system with RAA4, 250 - 900 nm "dual source" calibration
ILT-ILT560A-W	UV-NIR spectroradiometer system, 350 - 900 nm
ILT-ILT560	UV - NIR, 360 - 900 nm
ILT-ILT560-I	NIR spectroradiometer system, 600 - 1100 nm

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International Light TECHNOLOGIES

ILT560A / ILT560
Miniature, portable spectroradiometer series

SpectriLight III – ILT560 and ILT950 series control & analysis software

SpectriLight™ III is a LabVIEW based software package for Windows that allows you to acquire spectral and color data.
The new version of SpectriLight™ III has additional calculations for metamerism, and 2 and 20 degree observer. The new overlay feature allows the user to compare the base reading to current readings. Wavelength range, integration time, scan average and other controls can be easily set through pop up windows, menus and tool bars.
Absolute irradiance and chromaticity are calculated instantly.
SpectriLight™ III is LabVIEW based software and can be easily customized for specific OEM applications.
For API applications, Multiple DLL's are available.

Specifications

- Automated time line measurements
- Access multiple calibration files
- Auto-integration simplifies user interactions
- Scan average: 1 to 999 for reduced noise
- Peak find
- Enhanced scaling and zoom features including movable vertical cursors
- Export to ASCII text or directly into Excel. Save screens/scans in multiple formats including .bmp, .jpg, and .png
- Powerful import data wizard can even import data from other spectrometers!

SpectriLight™ III version 5 new features

- Overlay: allows comparison to baseline reading
- PAR: plant growth calculations
- New color calculation includes 2 and 10 degree observer, and metamarism

Optional input optics (others on request)

ILT-R2 Radiance optic Specialized fiber optic produces an average field of view of 2 degrees for radiance/ luminance measurement of extended sources. Requires ILT-VS950R calibration.	
ILT-RAA4 Right angle cosine adapter with approx. 6.9 mm diameter aperture, permits measurement of light sources 90° to the standard fiber. Sold with weighted screw-on handle for more stable detector placement when needed. Excellent cosine response, increases signal transmitted to CCD spectrometer, excellent for lower light, low profile, and small diameter light pattern measurements. Calibration required (sold separately).	
ILT-INS50 2-inch Integrating sphere with 2 ports; SMA905 and 5 mm port with lambertian response. For testing mounted and unmounted LEDs, fiber optics and miniature lamps. Provides readout of total flux in watts and lumens, irradiance in W/ cm^2, illuminance in lux, color purity, spectral distribution and color temperature with ILT550 (requires ILT-VS950P calibration). **Alternative: ILT-INS125 5-Inch Integrating sphere** and **ILT-INS250N 10-inch Integrating sphere.**	
ILT-FFOSMA2UV1000 2 meter long, 1000 micron, armored fiber optic light guide. Transmits light from 250 -1050 nm. Strong armored cable adds additional protection against breakage often required for longer fiber lengths.	

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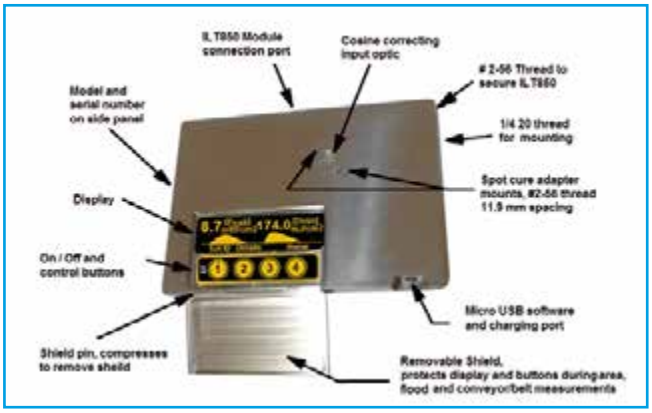
InternationalLight TECHNOLOGIES

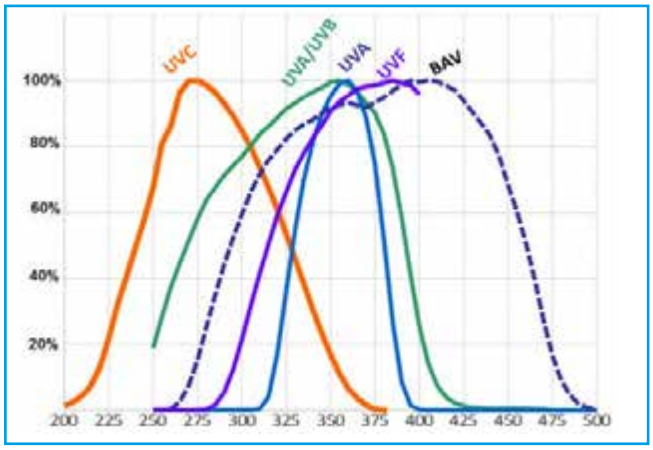
ILT800
CureRight belt radiometer



The ILT800 CureRight is a feature-rich profiling UV radiometer that delivers unmatched flexibility and capability not found in any other system. The ILT800 radiometer meets a broad range of applications across a variety of light measurement needs. The system has been designed with the varying needs of its users in mind, and can be configured and customized to your unique environment.
It is designed to measure and validate all types of UV curing methods and sources including conveyor, belt, oven, flood, area, spot, 3D printing, pulsed and traditional UV lamps, and UV/VIS LEDs and LED light sources.
The ILT800 CureRight system outperforms the competitors with features such as profiling of current/previous/stored measurements, ability to monitor, measure, view and export the date, time, temperature, irradiance, dose, cal due date, model and serial number, and battery status. User programmable settings include minimum light level threshold, lamp-to-lamp measurement interval (delay), time to auto shutoff, and auto/manual/live measurement modes. The ILT800 is the only radiometer with device ID which allows users to program up to 20 unique system/source information, allowing users to store and export baselines and historical data for all their curing stations in one economically priced meter.

Features and benefits

- Largest measurement range at 4.5 decades
- Device ID - store up to 20 unique source IDs
- Customizable with user-programmable settings
- 3000 samples per second
- Measure pulsed and continuous sources
- Store/Recall up to 1000 profiles
- Solid-state sensors with linear response
- Temperature measurement
- UV resistant housing
- Low battery warning
- Made in USA
- ISO17025



Spectral response

Specifications	
Range	4.5 decade (mW/cm² to 40 W/cm²)
Readout	mW/cm², mJ/cm², W/cm², J/cm² & profile/graph, date, time, temp.
Sensors	Linear, solid state GaAsp & SiC
Dimensions	102 X 152 X 12.7 mm (L x W x H)
Display	19 x 170 mm OLED
Power	Micro USB & rechargeable battery
Temp	0 - 75 °C (internal case temp)
Input optic	Cosine correction diffuser
Memory	400,000 data points

Ordering information ILT-ILT800 CureRight belt radiometer	
ILT-ILT800-UVA	315 - 390 nm
ILT-ILT800-BAV	275 - 475 nm
ILT-ILT800-UV	250 - 400 nm
ILT-ILT800-UVC	215 - 350 nm
ILT-ILT800-UVF	275 - 450 nm, (360 - 400 nm flat)

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International Light Technologies

ILT950 / ILT950UV
Portable spectrometers

The ILT950 is equally at home on the production floor as well as in the laboratory combining high performance, accuracy, ease of use, and a wide array of features all in a rugged, compact, portable design.

The excellent performance of the ILT950 spectroradiometerhas been improved further with the addition of a new machined optical bench for reduced stray light and improved thermal stability.

The ILT950 and ILT950UV spectroradiometers also now use the new higher pixel detector CMOS linear image sensor for improved performance including nearly 50% more sensitivity over the entire spectral region, and higher S/N ratio increased from 200:1 to 300:1 with larger quantum well depth.

These improvements combined with the new features in our powerful SpectriLight III software, including PAR µmol/m^2/s, metamerism, and baseline overlay comparisons, make the ILT950 a top performer in the CCD array spectroradiometer market.

Specifications	
ILT950 Resolution: (Calibration options:	**200 - 1100 nm** 1.4 nm with 25 micron slit single source 350 - 1050 nm or dual source 250 - 1050 nm)
ILT950UV Resolution: (Calibration options:	**200 - 450 nm** >1 nm with 50 micron slit single source 200 - 350 nm or dual source 200 - 450 nm)
NIST-traceable/ISO17025 accredited calibration*	
Detector	CMOS linear image sensor
Focal length	75 mm
Dynamic range	3300
Optical configuration	Symmetrical Czerny-Turner
Stray light	<0.3%
Signal/noise	300:1
Integration time	1 ms ~ 20 s
Data transfer speed	2 ms/scan, 16 bits, 2 MHz
Trigger compatible	
Synchronization capability	
Temperature range	15 - 40°C
Size	41x127x178 mm (HxBxT)
Dynamic dark correction	Yes
Non-linearity calibration	Yes
Wavelength accuracy	±0.5 nnm
Radiometric accuracy	200 nm - 350 nm: ±20%** >350 nm - 400 nm: ±10%** >400 nm - 900 nm: ±5% >900 nm - 1100 nm: ±10%

* Note: Dual range calibration with D_2 and QTH light source is strongly recommended for broadband measurements encompassing UV below 350 nm due to low output of the QTH lamp which increases the difficulty of accurate UV calibration. The ILT950 can be calibrated with QTH light source only if UVB/C accuracy is not consequential.

** Requires dual source calibration upgrade to assure radiometric accuracy in the UV

Ordering information	
ILT-ILT950-UV-NIR	UV-NIR spectroradiometer system 350 - 1050 nm "single source" calibration
ILT-ILT950UV	UV spectroradiometer system 200 - 350 nm "single source" calibration
ILT-ILT950UV-DUAL	UV spectroradiometer system 200 - 450 nm "dual source" calibration
ILT-ILT950UV-RAA4	UV spectroradiometer system 200 - 450 nm "dual source" calibration, with RAA4

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ILT950 / ILT950UV
Portable spectrometers

SpectriLight III
ILT950 control & analysis software

SpectriLight™ III is a LabVIEW based software package for Windows that allows you to acquire spectral and color data.
The new version of SpectriLight™ III has additional calculations for metamerism, and 2 and 20 degree observer. The new overlay feature allows the user to compare the base reading to current readings. Wavelength range, integration time, scan average and other controls can be easily set through pop up windows, menus and tool bars.
Absolute irradiance and chromaticity are calculated instantly.
SpectriLight™ III is LabVIEW based software and can be easily customized for specific OEM applications.
For API applications, Multiple DLL's are available.

Specifications

- Automated time line measurements
- Access multiple calibration files
- Auto-integration simplifies user interactions
- Scan average: 1 to 999 for reduced noise
- External trigger
- Peak find
- Enhanced scaling and zoom features including movable vertical cursors
- Export to ASCII text or directly into Excel. Save screens/scans in multiple formats including .bmp, .jpg, and .png
- Powerful import data wizard can even import data from other spectrometers!

SpectriLight™ III version 5 new features

- Overlay: allows comparison to baseline reading
- PAR: plant growth calculations
- New color calculation includes 2 and 10 degree observer, and metamarism
- Improved colorimetry based on 1 nm (previously 5 nm)

Optional input optics (others on request)

ILT-R2 Radiance optic
Specialized fiber optic produces an average field of view of 2 degrees for radiance/luminance measurement of extended sources. Requires ILT-VS950R calibration.

ILT-RAA4 Right angle cosine adapter with approx. 6.9 mm diameter aperture, permits measurement of light sources 90° to the standard fiber. Sold with weighted screw-on handle for more stable detector placement when needed. Excellent cosine response, increases signal transmitted to CCD spectrometer, excellent for lower light, low profile, and small diameter light pattern measurements. Calibration required (sold separately).

ITL-INS50 2-inch Integrating sphere with 2 ports; SMA905 and 5 mm port with lambertian response. For testing mounted and unmounted LEDs, fiber optics and miniature lamps. Provides readout of total flux in watts and lumens, irradiance in W/cm^2, illuminance in lux, color purity, spectral distribution and color temperature with ILT550
(requires ILT-VS950P calibration).
Alternative: ILT-INS125 5-Inch Integrating sphere and **ILT-INS250N 10-inch Integrating sphere.**

ILT-FFOSMA2UV1000
2 meter long, 1000 micron, armored fiber optic light guide. Transmits light from 250 -1050 nm. Strong armored cable adds additional protection against breakage often required for longer fiber lengths.

Real-time analysis

- Irradiance: Total, Visible, UVA, UVB, UVC, PAR, and photopic data
- Selectable bandwidth for irradiance, power, and radiance (requires additional hardware and calibration options)
- Chromaticity analysis: x, y, u, v coordinates and display in CIE color spaces
- Dominant and complementary wavelength and color purity
- General Color Rendering Index (CRI) and 15 special color rendering indices
- Correlated Color Temperature (CCT) and DUV

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InternationalLight TECHNOLOGIES

ILT1000
Light meter, monitor and data logger

The ILT1000 is a broad and versatile UV, VIS and IR datalogging optometer with NIST-traceable ISO 17025 accredited calibrations. System configurations are based on the industry standard ILT1700 research radiometer/photometer detectors, filter/optics and calibrations. The ILT1000 was designed with OEM and custom configurations in mind and can easily accommodate most solid state detectors, 1/2" and 1" optical filters and a vast selection of input optics.
The ILT1000 is capable of measuring over eight decades of light intensity and providing direct readout in W, W/cm^2, Lux, Fc, Lumens, cd/m^2, cd, W/sr, W/sr/cm^2 and more. On board data storage allows continuous monitoring at customer specified sampling rates using the "set it and forget it" datalogging.

Applications
Germicidal (UV disinfection) light monitoring & data logging in the bottled beverage and food industry, drinking and pool water disinfection, HVAC, pharmaceutical/cosmetics, semiconductor, municipal water/wastewater disinfection.
Process monitoring, curing, plant photobiology, thin film deposition, ribbon clarity/glass production and liquid turbidity, and transmission measurements.

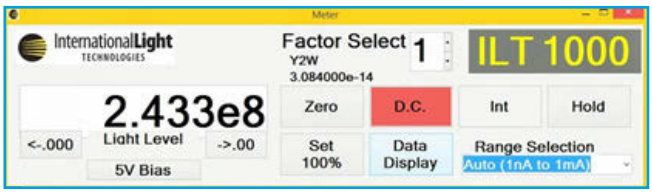
Software
The ILT1000 comes with DataLight II software, a complementary basic Labview DLL and 5 versions of software including: CLI, BAR, TREND, DATALOG and the ALL NEW METERS app. designed to cover a wide range of applications.

Meters
Designed to maintain the look and feel of the Industry Standard ILT1700 Research Radiometer. Designed for wireless use with Windows 8 tablets and touch screen computers, the larger, user-friendly panel includes buttons for hold, zero, integrate, factor, range, average and units selection.

Features and benefits
- Wired and **wireless** versions available
- Ideal for performing multi-point, wireless, remote light monitoring and data logging
- "Set it & forget it" remote data logging with on-board data storage
- Multi-system continuous monitoring (up to 32 systems with one hub)
- 4 open licensed, customer-configurable software options
- 6 decade dynamic range of optical analysis
- Autorange, autodark with manual control options
- 4-20 mA output
- Auto-sample rate configuration to reduce noise
- NIST-traceable calibration and certificate

Specifications	
Six decades of light sensitivity	
Optical density	0.00 to 4.00 optical density
Optical density repeatability	(single) ± 1%, (multiple) ± 2.5%
Operating temperature	-40 to 85°C (calibrated irradiance 0-50 °C)
USB	USB2 including power, for single and multiple systems
USB current draw	200 mA max, 130 mA typical
API	Simple, well documented API for custom programming
Size	76.2 x 76.2 x 25.4 mm (3" x 3" x 1") without filters and input optics
Weight	173 g (less than 0.5 lbs)

Ordering information	
ILT-ILT1000	Broadband, Silicon diode,200 – 1100 nm
ILT-ILT1005	UV-VIS, GaAsp, diode 250 – 675 nm
ILT-ILT1007	IR, InGaAs diode, 850 – 1700 nm
ILT-ILT1254	UVC silicon diode, built in 254 nm filter
ILT-ILT1320	UV, GaN diode 200 – 320 nm
Other ILT1000 filter/optic combinations available on request !	



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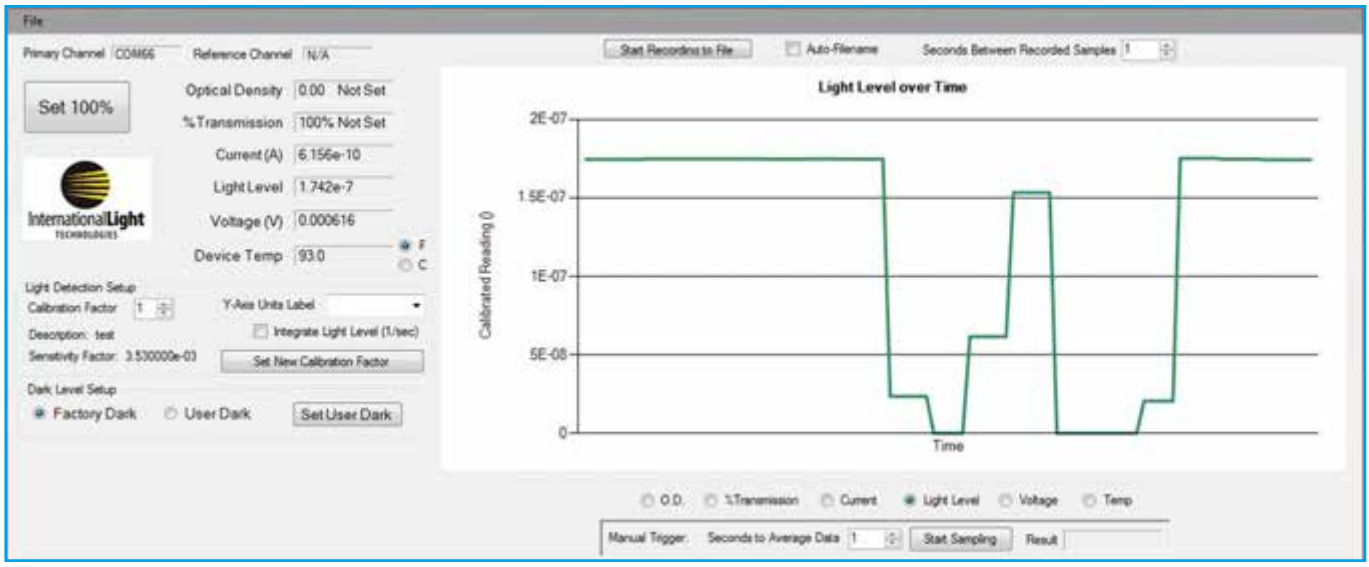
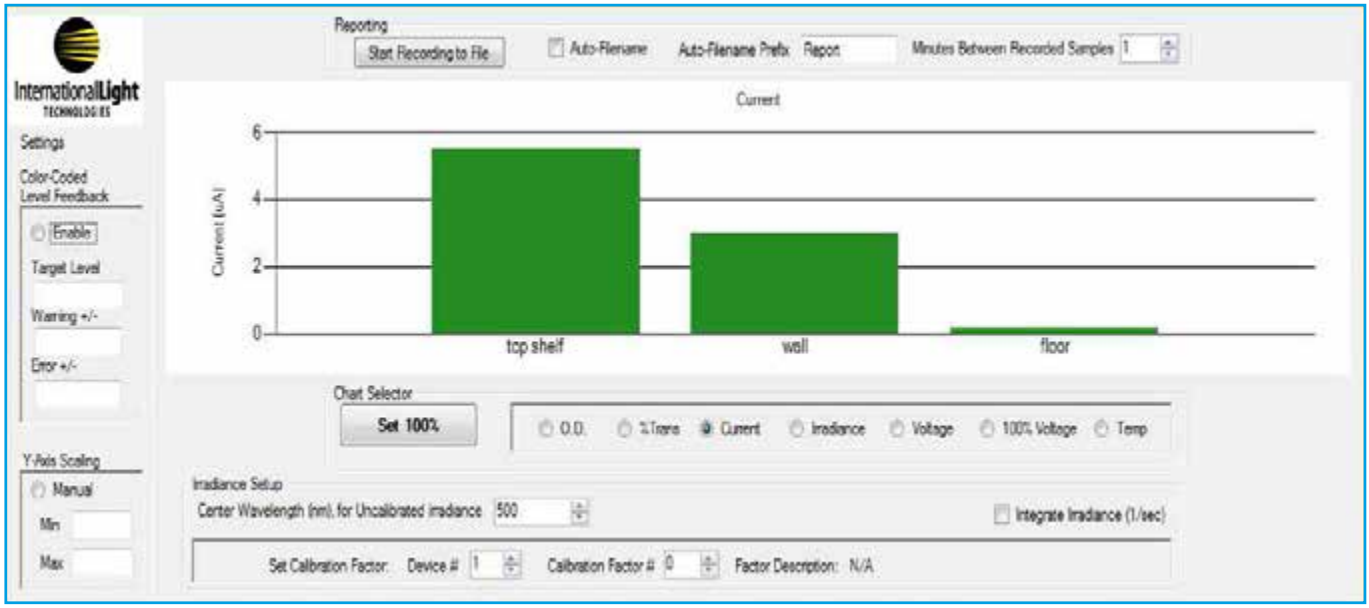
ILT1000
Light meter, monitor and data logger

Trend
Records all six parameters while displaying the trend over time for the user switchable parameter. Multiple examples of trend can be run simultaneously to allow multi-unit comparisons. Trend also has a user-friendly calibration feature.



Bar
Allows multisystem, datalogging and displays the user switchable parameter in a bar graph. The expandable graph can accommodate up to 32 systems simultaneously with use of hub(s). User can enter nicknames for each unit to define the location, application, version, serial number, etc. Customer can program max and min warning levels and use color coded bar responses for easy troubleshooting.



CLI is a very basic command line interface program that allows customer to type commands from the API and record readings into the device memory.

Datalog is a user interface that allows remote "set it and forget it" datalogging.

All software is provided with an open source (MIT) license for ease of customization. A full version API is also available.

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InternationalLight TECHNOLOGIES

ILT2400
Hand-held light meter & optometer

The ILT2400 is the most advanced hand held light meter and optometer on the market today. ILT's Accuspan software automatically sets the averaging while rapidly measuring over 8 decades of light intensities.

The internal software allows customers to capture a peak as brief as 100 µs and to store up to 16 readings per second.
The color display works in both landscape and portrait mode.

The ILT2400 supports numerous light measurement applications including audience scanning laser safety, general purpose light measurements, research, sterilization/UVGI, solar, photoresist – lithography, optical radiation hazard, phototherapy, photo-degradation, PPF & PPFD plant studies, and more.

Features and benefits

- Research quality at a hand-held price
- Meter & sensors with NIST traceable ISO17025 accredited calibration
- Hand-held, compact, ergonomic design
- Brilliant 4.3" touch screen display
- 90° flip screen for landscape and portrait viewing
- 8 decade dynamic range
- ILT's Accuspan: Auto-ranging with smart averaging
- Built-in rechargeable battery lasts up to 8 hours
- Backwards compatible with ILT1700 sensors
- Measurement speeds up to 100 µseconds
- Made in U.S.A

Specifications	
Measurement range	50 pA – 1 mA current, 8 decades of light intensity measurements
4.3" VGA Capacitive touch screen color display	
5V Reverse bias	
Automatic ranging and averaging	
4 GB Internal memory	
Operating temperature	0-40° C
USB	Micro for data download
USB	Mini for charging and remote data logging using DataLight II PC software
Size	1-3/5" H x 3" W x 6" L
Detector/sensor connector	15 pin connector
CE certified	No RF noise

Ordering information	
ILT-ILT2400	ILT2400 Hand-held light meter & optometer with touch screen display (detecor sold separately)

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ILT2400
Hand-held light meter & optometer

Home screen is used to move between applications including:

- Meter tall for portrait, meter wide for landscape
- Trend tall for portrait, trend wide for landscape
- Cloak for low light environments, includes large 1 touch sampling button
- Light stack sets up indicator levels: Green for good, yellow for caution, red for warning
- Time and date for setting the calendar and clock
- Settings for changing parameters such as, calibration factor selection, sample time, background brightness, bias on/off, etc.
- LightCalc handy calculators such as lux to fc converters
- Files provides easy access to saved data
- Info lists the firmware and software version

Meter screen provides a large numerical display which allows customers to easily view the measurement data. While using Meter, customers can also perform many processes including:

- Increase or decrease digits of resolution
- Display units: Empirical units-calibration units, current, % etc.
- Zero: Sets the zero level for ambient subtraction or dark zero.
- Integrate: Provide a summation of the exposure
- Hold: Freezes the value in the numerical display
- Min/Max: Toggles between Min on, Max on, Min/Max off. Min-display remains fixed until a reading lower than the displayed value is obtained. Max changes when a higher reading is obtained
- 100 %: Sets the value for 100 %
- Record: Continuous recording of data on/off (Record/Stop Recording)
- Capture: Stores a single reading with date time stamp when pressed

Trend screen has all the same features included in meter plus a large easy to read graph showing the readings over time. The graph can be displayed in bar or line graph format. Trend Tall
is used for portrait mode and Trend wide is used for landscape mode. The Y scale of the graph is the measurement data in the programmed calibrated units, amps for uncalibrated sensors, or in percentage. The X scale is the time interval in seconds. The inclusion of the graph reduces the size of the toggle buttons, but does not eliminate any features.

- Hold: Freezes the value in the numerical display
- Min/Max: Toggles between Min on, Max on, Min/Max off. Min -display remains fixed until a reading lower than the displayed value is obtained. Max changes when a higher reading is obtained
- 100 %: Sets the value for 100 %
- Record: Continuous recording of data on/off (Record/Stop Recording)
- Capture: Stores a single reading with date time stamp when pressed

Cloak limits the amount of light added to the environment during test. It was designed to allow taking measurements in a dark environment as easy as possible without compromising the results. Simply touch the oversized sample button and a single reading will be stored into the internal memory.

- The ILT2400 includes a micro USB cable that can be use to extract all saved readings with a date time stamp using Cloak, Trend and Meter apps.
- The home button at the bottom returns the display to the home screen as shown above.

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ILT5000
Research radiometer and picoammeter (wired and wireless versions)

The ILT5000 Research Radiometer is "The ILT1700 for the 21st Century" improving on the industry standard with rapid measurements (up to 100 Hz), a broader dynamic range (100fA to 1mA), extensive supporting software apps, wireless communication, internal data storage, and a 4-20 mA output. The broad linear dynamic range of the ILT5000 and the SMA input connector allow the meter to also serve as a broadrange, highly sensitive and accurate picoammeter.

The ILT5000 research radiometer supports numerous light measurement applications including, but not limited to; radiometry, photometry, research, UVGI- sterilization, solar, photoresist, optical radiation hazard, phototherapy, photo-degradation, plant growth and more. System configurations are based on the industry standard ILT1700 research radiometer/photometer.

Note: The ILT5000 is backwards compatible with the ILT1700 "D" type sensors, as well as all of ILT's vast supporting filters, input optics, integrating spheres and ISO 17025/NIST traceable calibrations.

Software
The ILT5000 comes with DataLight II software, a complementary basic Labview DLL and 5 versions of software including: CLI, BAR, TREND, DATALOG and the ALL NEW METERS app. designed to cover a wide range of applications.

Meters
Designed to maintain the look and feel of the industry standard ILT1700 research radiometer. Designed for wireless use with windows 8 tablets and touch screen computers, the larger, user-friendly panel includes buttons for hold, zero, integrate, factor, range, average and units selection.

Features and benefits
- 10 decade dynamic range of optical analysis
- Wireless transmitter, built-in
- Backwards compatible with ILT1700 SED detector/ filter/optics
- Autorange, autodark, auto-sample with user control options
- 4-20 mA output
- "Set it & forget it" remote data logging
- Built-in re-chargeable battery pack
- Multi-system simultaneous continuous monitoring
- 5 Open licensed, customer-configurable software apps
- Labview compatible
- NIST-traceable/ISO17025 accredited calibration and certificate.
- Sample rate up to 100 Hz, programmable

Specifications	
Measurement range	100 fA-1 mA (1nW/cm^2-10 W/cm^2)
Reverse bias	2 voltages/selectable
Automatic ranging:	rapid switching through all current levels
WiFi	Enabled
Operating temperature	-40 to 85°C (Calibrated irradiance 0-50 °C)
USB2	Including power, for single and multiple systems
USB current draw	500 mA max, 250 mA typical
Size	1-3/5" H x 5" W x 7" L 44x127x177,8 mm
Input connector	D-Sub and/or SMA
CE certified	No rf noise

Ordering information	
ILT-ILT5000	Research radiometer & picoammeter

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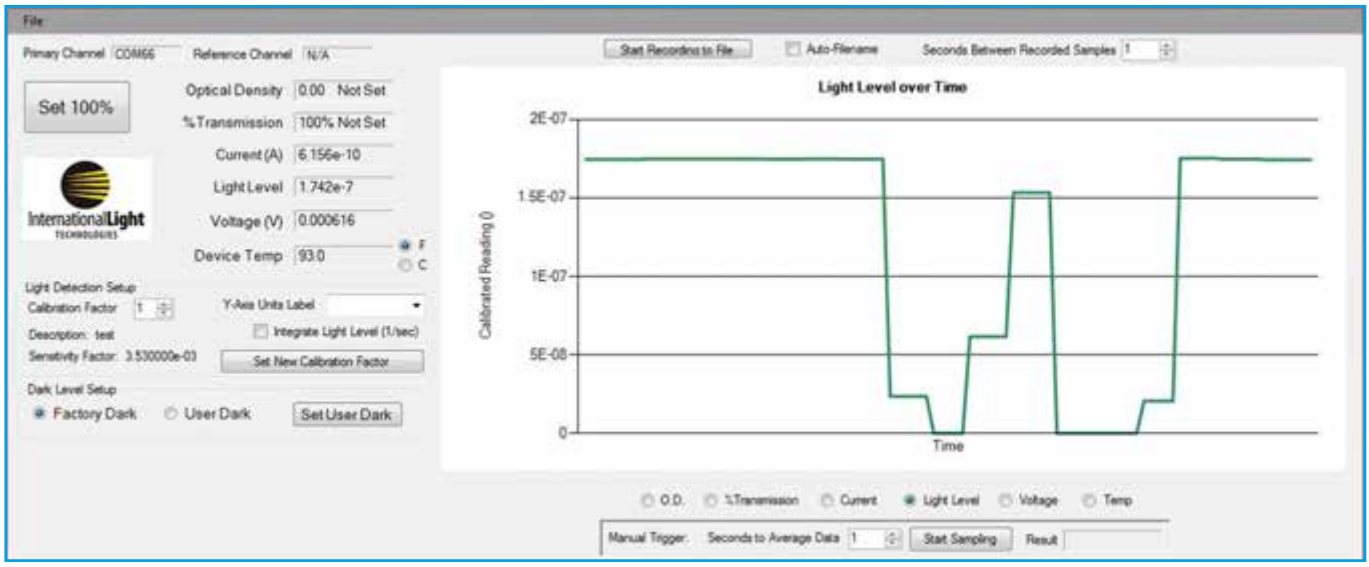
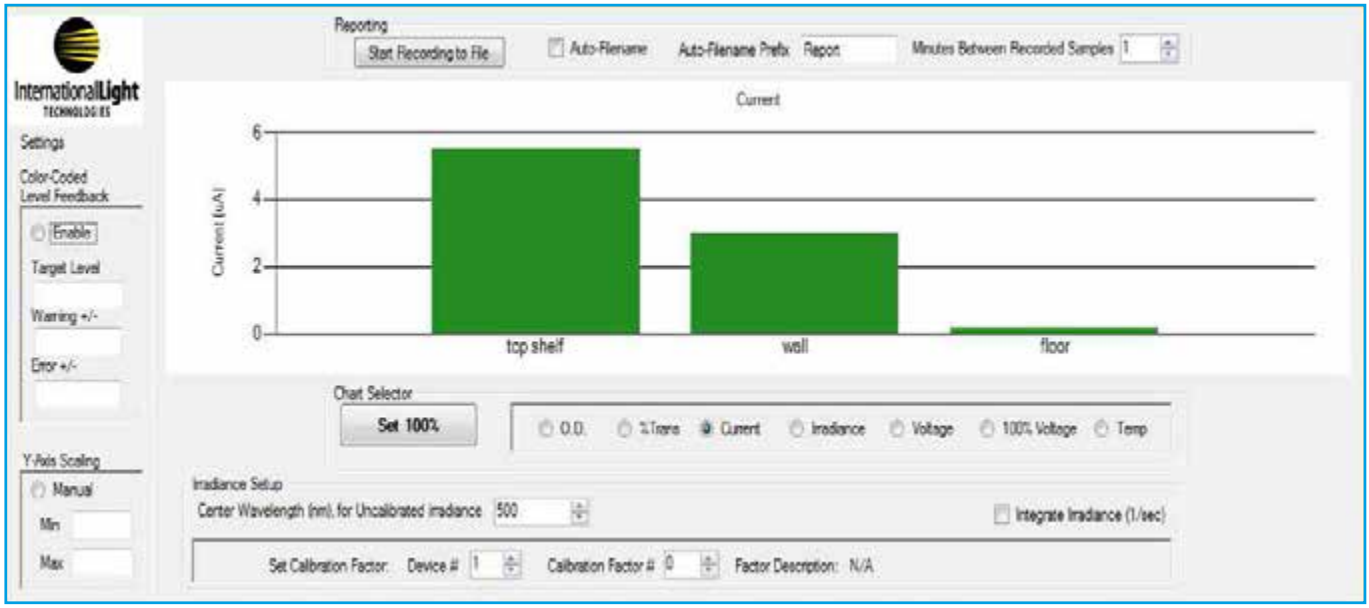
ILT5000
Research radiometer and picoammeter (wired and wireless versions)

Trend
Records all six parameters while displaying the trend over time for the user switchable parameter. Multiple examples of trend can be run simultaneously to allow multi-unit comparisons. Trend also has a user-friendly calibration feature.



Bar
Allows multisystem, datalogging and displays the user switchable parameter in a bar graph. The expandable graph can accommodate up to 32 systems simultaneously with use of hub(s). User can enter nicknames for each unit to define the location, application, version, serial number, etc. Customer can program max and min warning levels and use color coded bar responses for easy troubleshooting.



CLI is a very basic command line interface program that allows customer to type commands from the API and record readings into the device memory.

Datalog is a user interface that allows remote "set it and forget it" datalogging.
All software is provided with an open source (MIT) license for ease of customization. A full version API is also available.

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Detector selection by application
Low light level measurement

Application: Low light

Chemical reactions, moonlight, phosphorescence, R&D, bioluminescence, reflectance, transmission, light blocking

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
250 - 600	W/cm^2	$10e^{-15} - 1e^{-7}$	**ILT-ILT5000**	**ILT-SPM068/QNDS3/W**
320 - 600	$W/cm^2/sr$	$2e^{-13} - 1e^{-6}$	**ILT-ILT5000**	**ILT-SPM068/QNDS3/R**
250 - 780	W/cm^2	$10e^{-15} - 1e^{-7}$	**ILT-ILT5000**	**ILT-SPM068-1/QNDS3/W**
320 - 780	$W/cm^2/sr$	$2e^{-13} - 1e^{-6}$	**ILT-ILT5000**	**ILT-SPM068-1/QNDS3/R**
380 - 680	fc	$1e^{-8} - 7e^{-3}$	**ILT-ILT5000**	**ILT-SPM068-1/ZPM/W Scotopic**
380 - 680	fL	$4e^{-7} - 0.2$	**ILT-ILT5000**	**ILT-SPM068-1/ZPM/R Scotopic**

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Detector selection by application
Plant photobiology

Application: Plant growth (PAR: Photosynthetically Active Radiation)
Common source: sun, solar simulators, plant growth lamps

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
410 - 770	µmol/m²/sec	$2.00e^{-6}$ - $1.00e^{+3}$	**ILT-ILT5000**	**ILT-SED033/PAR/W**
410 - 770	µmol/m²/sec	$6.00e^{-5}$ - $1.00e^{+3}$	**ILT-ILT2400**	**ILT-SED033/PAR/W**
410 - 770	µmol/sec	$1e^{-9}$ - $5e^{-1}$	**ILT-ILT2400**	**ILT-SED033/PAR/INS125**
370 - 515	W/cm²	$1.40e^{-10}$ - $2.86e^{-1}$	**ILT-ILT5000**	**ILT-SED033/TBLU/W**
370 - 515	W/cm²	$1.43e^{-8}$ - $5.00e^{-2}$	**ILT-ILT2400**	**ILT-SED033/TBLU/W**
610 - 730	W/cm²	$5.90e^{-11}$ - $1.18e^{-1}$	**ILT-ILT5000**	**ILT-SED033/TRED/W**
610 - 730	W/cm²	$5.88e^{-9}$ - $2.06e^{-2}$	**ILT-ILT2400**	**ILT-SED033/TRED/W**
710 - 810	W/cm²	$7.70e^{-11}$ - $1.50e^{-1}$	**ILT-ILT5000**	**ILT-SED033/TFRD/W**
710 - 810	W/cm²	$7.36e^{-9}$ - $2.58e^{-2}$	**ILT-ILT2400**	**ILT-SED033/TFRD/W**

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Detector selection by application
Photodynamic therapy

Application: Photodynamic therapy (maladies including cancers)
Common source: Lasers, LEDs, xenon lamps, halogen lamps, laser diodes

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 1064	W	$7.69e^{-13}$ - $1.50e^{-2}$	**ILT-ILT5000**	**ILT-SED100/F/K15**
400 - 1064	W	$4.00e^{-10}$ - $8.00e^{-3}$	**ILT-ILT2400**	**ILT-SED100/F/K15**
400 - 1000	W	$7.30e^{-9}$ - $7.30e^{+0}$	**ILT-ILT5000**	**ILT-SED033/F/HNK15**
400 - 1000	W	$2.00e^{-7}$ - $3.00e^{+0}$	**ILT-ILT2400**	**ILT-SED033/F/HNK15**
400 - 1064	W/cm²	$7.69e^{-11}$ - $1.54e^{-1}$	**ILT-ILT5000**	**ILT-SED033/F/W**
400 - 1064	W/cm²	$4.00e^{-9}$ - $7.00e^{-2}$	**ILT-ILT2400**	**ILT-SED033/F/W**
610 - 730	W/cm²	$5.90e^{-11}$ - $1.18e^{-1}$	**ILT-ILT5000**	**ILT-SED033/TRED/W**
610 - 730	W/cm²	$5.88e^{-9}$ - $2.06e^{-2}$	**ILT-ILT2400**	**ILT-SED033/TRED/W**
710 - 810	W/cm²	$7.70e^{-11}$ - $1.50e^{-1}$	**ILT-ILT5000**	**ILT-SED033/TFRD/W**
710 - 810	W/cm²	$7.36e^{-9}$ - $2.58e^{-2}$	**ILT-ILT2400**	**ILT-SED033/TFRD/W**

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Detector selection by application
Optical radiation hazard

Application: Unprotected skin and eye hazard, extreme sensitivity to any light source
Common source: Manufacturing, welding, office light, office copier, solar simulator, UV light emitters

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
235 - 307*	eff W/m^2	3.0e^{-9} - 2.5e^{-3}	**ILT-ILT5000**	**ILT-SED240/ACT5/W**
180 - 400*	eff W/cm^2	8.0e^{-8} - 1.0e^{-3}	**ILT-ILT2400**	**ILT-SED240/T2ACT5** (also measure germicidal light)

Application: Eye cornea conjunctiva, lens skin photokeratitis, conjunctivitis, cataractogenesis, erythema, elastosis, skin cancer

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
250 - 400*	W/cm^2	2.3e^{-8} - 2.3	**ILT-ILT5000**	**ILT-SED005/WBS320/W**
250 - 400*	W/cm^2	1.0e^{-7} - 1.0	**ILT-ILT2400**	**ILT-SED005/WBS320/TD**

Application: Eye lens, cataractogenesis
Common source: Broadband UV source, UVA lamps, UV curing lamps, UV LEDs

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
315 - 390*	W/cm^2	2.0e^{-10} - 0.1	**ILT-ILT5000**	**ILT-SED033/UVA/W**
315 - 390*	W/cm^2	2.0e^{-8} - 0.2	**ILT-ILT2400**	**ILT-SED033/UVA/TD**

Application: "Blue eye" hazard, retinal photochemical protection, cataract hazard
Common source: LED's solar light, high powered VIS, manufacturing, lasers, welding

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
410 - 510*	W/cm^2	4.0e^{-10} - 0.3	**ILT-ILT5000**	**ILT-SED033/SCS395/TBLU/TD**
Eye lens, cataractogenesis				
410 - 510*	W/cm^2/sr	7.4e^{-10} - 0.741[1]	**ILT-ILT5000**	**ILT-SED033/SCS395/TBLU/R**
305 - 700*	W/cm^2	2.0e^{-8} - 0.3	**ILT-ILT2400**	**ILT-SED033/SCS395/TBLU/TD**
305 - 700*	W/cm^2/sr	5.6 - 5.6	**ILT-ILT2400**	**ILT-SED033/SCS395/TBLU/R**
400 - 700*	W/cm^2	2.0e^{-10} - 0.1^{-1}	**ILT-ILT5000**	**ILT-SED033/F/HMR/W**
400 - 700*	W/cm^2	2.7e^{-9} - 0.1	**ILT-ILT2400**	**ILT-SED033/F/HMR/W**

Application: EML equivalent Melanopic
LED based lamps, signs, TVs, displays

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400-600 nm	Lux	5.0e^{-9} - 0.09	**ILT-ILT2400**	**ILT-SED033/EML/TD**

*EU directive 2006/25/EC

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Detector selection by application
Optical radiation hazard

Application: IR-A, Near IR, retinal protection protocol
Common source: IR heat sources, manufacturing, lasers

Spectral range [nm]	Units	Measurement range	Radiometer	Detector
800 - 1400*	W/cm²	$4.0e^{-11}$ - 0.03	**ILT-ILT5000**	**ILT-SED007/W**
800 - 1400*	W/cm²	$2.0e^{-9}$ - 0.03	**ILT-ILT2400**	**ILT-SED007/W**

Application: IR hazard, cornea thermal injury
Common source: IR heat sources, manufacturing, lasers

Spectral range [nm]	Units	Measurement range	Radiometer	Detector
700 - 2100*	W/cm²	$9.0e^{-5}$ - 0.4	**ILT-ILT5000**	**ILT-SED623/SCS695/W****
700 - 2100*	W/cm²	$9.0e^{-5}$ - 0.4	**ILT-ILT2400**	**ILT-SED623/SCS695/W****

**Note: SCS780 filter can be substituted for SCS695 to obtain cutoff of 780 nm

Application: Visible, IR-A and IR-B bands, Skin, burn

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
380 - 3000*	W/cm²	$9.0e^{-5}$ - 0.4	**ILT-ILT5000**	**ILT-SED623/SCS395/W**
380 - 3000*	W/cm²	$9.0e^{-5}$ - 0.4	**ILT-ILT2400**	**ILT-SED623/SCS395/W**

*EU directive 2006/25/EC

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Detector selection by application
Germicidal (UV-disinfection)

Application: Dual germicidal light and optical radiation hazard measurement

Common source: Mercury arc, tube, UV, xenon arc, mercury lamps

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
249 - 259	W/cm²	$4.0e^{-9}$ - $3.0e^{+0}$	**ILT-ILT5000**	**ILT-XRD140T254**
249 - 259	W/cm²	$2.0e^{-7}$ - $2.0e^{+0}$	**ILT-ILT2400**	**ILT-XRD140T254**
235 - 307	eff W/cm²	$3.0e^{-9}$ - $2.5e^{-3}$	**ILT-ILT5000**	**ILT-SED240/ACT5/W**
235 - 307	eff W/cm²	$8.0e^{-8}$ - $1.0e^{-3}$	**ILT-ILT2400**	**ILT-SED240/ACT5/W**
254	W/cm²	$8.0e^{-9}$ - $4.0e^{-3}$	**ILT-ILT1700**	**ILT-SED240/NS254/W**
254	W/cm²	$2.0e^{-6}$ - $2.0e^{-2}$	**ILT-ILT2400**	**ILT-SED240/NS254/TD**

Application: Effective germicidal radiation measurement

Common source: only low pressure mercury lamps

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
185 - 320	W/cm²	$1.0e^{-9}$ - $5.0e^{-4}$	**ILT-ILT5000**	**ILT-SED240/W**
185 - 320	W/cm²	$2.0e^{-5}$ - 0.3	**ILT-ILT2400**	**ILT-SED240/QNDS2/TD**
185 - 320	W/cm²	$6.7e^{-6}$ - 0.33	**ILT-ILT5000**	**ILT-SED240/QNDS2/W**

Application: Ozone / Germicidal

Common source: low intensity, ozone-producing lamps

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
165 - 200	W/cm²	$4.7e^{-7}$ - $4.7e^{-1}$	**ILT-ILT5000**	**ILT-SED185/NS185**
165 - 200	W/cm²	$2.0e^{-5}$ - 0.3	**ILT-ILT2400**	**ILT-SED185/NS185**
165 - 200	W/cm²	$5.0e^{-9}$ - $2.0e^{-3}$	**ILT-ILT2400**	**ILT-SED220/NS185**

Application: Air and water sterilization

Common source: LEDs

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
365	W/cm²	$2.0e^{-6}$ - 1	**ILT-ILT2400**	**SED005/NS365/W**
365	W/cm²	$2.0e^{-6}$ - 1	**ILT-ILT1005/NS365/W**	

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Detector selection by application
UV-Curing

Application: Broadband UV

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
250 - 400	W/cm²	2.3e^{-8} - 2.3	**ILT-ILT5000**	**ILT-SED005/WBS320/W**
250 - 400	W/cm²	1.0e^{-7} - 1.0	**ILT-ILT2400**	**ILT-SED005/WBS320/TD**

Application: Narrowband 335

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
330 - 340	W/cm²	5.0e^{-9} - 5	**ILT-ILT5000**	**ILT-SED005/NS335/W**
330 - 340	W/cm²	5e^{-7} - 5	**ILT-ILT2400**	**ILT-SED005/NS335/W**

Application: Xenon flash

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
326 - 401	W/cm² & J/cm²	3.0e^{-8} - 20	**ILT-ILT5000**	**ILT-SED033/B/QNDS2/W**

Application: Low profile high UV

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
250 - 400	W/cm²	5.0e^{-7} - 100	**ILT-ILT5000**	**ILT-SED005/WBS320/RAMP**
250 - 400	W/cm²	5.0e^{-6} - 10	**ILT-ILT2400**	**ILT-SED005/WBS320/RAMP**

Application: Low profile low UV

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
250 - 400	W/cm²	2.2e^{-7} - 0.9	**ILT-ILT5000**	**ILT-SSD001**
250 - 400	W/cm²	6.0e^{-6} - 0.9	**ILT-ILT2400**	**ILT-SSD001**

Application: Dental curing

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
370 - 515	W/cm²	1.3e^{-7} - 13[1]	**ILT-ILT5000**	**ILT-SED033/TBLU/T1MM**

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Detector selection by application
Laser power measurement

Application: Laser light measurement
Nd:YAG, HeNe, laser diodes, CW laser

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
215 - 355	W	$2.00e^{-7}$ - $3.33e^{-2}$	**ILT-ILT5000**	**ILT-SED270/HNK15**
215 - 355	W	$6.00e^{-6}$ - $3.33e^{-2}$	**ILT-ILT2400**	**ILT-SED270/HNK15**
250 - 675	W	$4.15e^{-5}$ - $2.00e^{+2}$	**ILT-ILT5000**	**ILT-SED005/QNDS3/HNK15**
250 - 675	W	$2.00e^{-3}$ - $2.00e^{+2}$	**ILT-ILT2400**	**ILT-SED005/QNDS3/HNK15**
400 - 1064	W	$1.82e^{-10}$ - $1.82e^{-1}$	**ILT-ILT5000**	**ILT-SED100/F/K15**
400 - 1064	W	$4.00e^{-10}$ - $8.00e^{-3}$	**ILT-ILT2400**	**ILT-SED100/F/K15**
400 - 1064	W	$1.22e^{-5}$ - $2.00e^{+2}$	**ILT-ILT5000**	**ILT-SED033/F/QNDS3/HNK15**
400 - 1064	W	$4.00e^{-4}$ - $2.00e^{+2}$	**ILT-ILT2400**	**ILT-SED033/F/QNDS3/HNK15**
200 - 2100	W	$4.39e^{-3}$ - $4.88e^{+1}$	**ILT-ILT5000**	**ILT-SED623/HNK15**
200 - 2100	W	$4.00e^{-3}$ - 10	**ILT-ILT2400**	**ILT-SED623/HNK15**

Application: Laser light safety, audience scanning, LIP's testing, optical hazard, eye safety
Nd:YAG, HeNe, laser diodes, CW laser
Audience scanning laser systems

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400-1000 nm	W/cm^2	$7e^{-11}$ – 0.05	**ILT-ILT5000**	**SED033/F/A313-7MM**
400-1000 nm	W/cm^2	$4e^{-9}$ – 0.05	**ILT-ILT2400**	**SED033/F/A313-7MM**
400-1000 nm	W/cm^2	$4e^{-9}$ – 0.05	**ILT1000/F/A313-7MM**	

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Detector selection by application
Photometry

Application: Illuminance
Common source: office/home lights, lamp manufacturer, LED's, fluorescents, halogen

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 700	lux	$8.34e^{-5}$ - $1.67e^{+6}$	**ILT-ILT5000**	**ILT-SED033/Y/W**
400 - 700	lux	$3.00e^{-2}$ - $5.00e^{+5}$	**ILT-ILT2400***	**ILT-SED033/Y/W**
400 - 700	lux	$9.00e^{-2}$ - $1.00e^{+6}$	**ILT-ILT2400***	**ILT-SCD110**

Application: Luminance
Common source: displays, LED's, signs

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 700	cd/m^2	$6.00e^{-3}$ - $1.00e^{+7}$	**ILT-ILT5000**	**ILT-SED033/Y2/R**
400 - 700	cd/m^2	$3.00e^{-1}$ - $5.00e^{+6}$	**ILT-ILT2400**	**ILT-SEL033/Y2/R**
400 - 700	cd/m^2	$6.67e^{-3}$ - $1.33e^{+7}$	**ILT-ILT5000**	**ILT-SPD025Y**
400 - 700	cd/m^2	$4.00e^{-1}$ - $6.00e^{+6}$	**ILT-ILT2400**	**ILT-SPD025Y**
400 - 700	cd/m^2	5.00e-1 - 2.5	**ILT-ILT5000**	**ILT-SED033/Y/PIN4**
400 - 700	cd/m^2	$2.00e^{+1}$ - 2.50 e^{+7}	**ILT-ILT2400**	**ILT-SED033/Y/PIN4**

Application: Flash photometry; luminous intensity, beam candela
Common source: warning lights, runway lights

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 700	lux	$7.00e^{-6}$ - $3.0e^{+3}$	**ILT-ILT5000**	**ILT-SED033/Y/L30** (>25'/7.62 m) Flash/steady
400 - 700	lux	$3.00e^{-4}$ - $3.0e^{+3}$	**ILT-ILT2400**	**ILT-SED033/Y/L30** (>25'/7.62 m) Flash/steady
400 - 700	lux	$2.00e^{-4}$ - $9.0e^{+4}$	**ILT-ILT5000**	**ILT-SED033/Y/H** (<25'/7.62 m) Flash/steady
400 - 700	lux	$9.00e^{-3}$ - $9.0e^{+4}$	**ILT-ILT2400**	**ILT-SED033/Y/H** (<25'/7.62 m) Flash/steady

Application: Scotopic luminance/illuminance
Common source: sings, displays, LED's

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 700	lux	$2.00e^{-3}$ - $1.0e^{+6}$	**ILT-ILT5000**	**ILT-SED033/ZCIE/W**
400 - 700	lux	$9.00e^{-2}$ - $1.0e^{+6}$	**ILT-ILT2400**	**LT-SED033/ZCIE/W**
400 - 700	cd/m^2	$3.00e^{-2}$ - $2.0e^{+7}$	**ILT-ILT5000**	**ILT-SED033/ZCIE/R**
400 - 700	cd/m^2	$3.0e^{-1}$ - $2.0e^{+6}$	**ILT-ILT2400**	**ILT-SED033/ZCIE/R**

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Detector selection by application
Photostability

Application: Photodegradation
Common source: photostability, chambers

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
315 - 390	W/cm^2	7e^{-9} - 0.1	**ILT-ILT2400**	**ILT-SED033/UVA/TD**
Light source				
400 - 700	lux	0.024 - 2.4^{+6}	**ILT-ILT5000**	**ILT-SED033/Y/TD**
Solar Simulator				
400 - 700	lux	3.00e^{-2} - 5.00e^{+5}	**ILT-ILT2400**	**ILT-SED033/Y/TD**

Application: Photostability
Common source: UVA and visible (white) light test system

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
315 - 390	W/m^2 (UVA)	2.22e^{-6} - 4.44e^{+3}	**ILT-ILT5000**	**ILT-SED033/UVA/TD**
& 400 - 700	lux (VIS)	2.43e^{-2} - 2.43e^{+6}		**ILT-SED033/Y/TD**
315 - 390	W/m^2 (UVA)	2.00e^{-3} - 1.00e^{+3}	**ILT-ILT1000/UVA/W & ILT-ILT1000/Y/W**	
& 400 - 700	lux (VIS)	& 9.00e^{-1} - 7.00e^{+5}		

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Detector selection by application
LED Test and measurement systems

Application: LED Measurement

Common sources: UV VIS IR LED's, medical devices, indicator lights, fiber optics, remonte controls

Spectral range [nm]	Units	Measurement range	Radiometer	Detector
185 - 310	W	$6.00e^{-8}$ - $5.00e^{-2}$	**ILT-ILT5000**	**ILT-SED240/INS250N**
185 - 310	W	$2.50e^{-6}$ - $5.00e^{-2}$	**ILT-ILT2400**	**ILT-SED240/INS250N**
400 - 700	cd	$3.00e^{-6}$ - $4.00e^{+3}$	**ILT-ILT5000**	**ILT-SED033/Y/LED**
400 - 700	cd	$2.13e^{-4}$ - $7.45e^{+2}$	**ILT-ILT2400**	**ILT-SED033/Y/LED**
400 - 700	lm	$5.00e^{-6}$ - $8.00e^{+3}$	**ILT-ILT5000**	**ILT-SED240/Y/INS250N**
400 - 700	lm	$2.50e^{-4}$ - $8.70e^{-2}$	**ILT-ILT2400**	**ILT-SED240/Y/INS125**

Application: LED Measurement

Common sources: thermal management, architectural lighting

Spectral range [nm]	Units	Measurement range	Radiometer	Detector
400 - 1064	W/sr	$3.50e^{-9}$ - $3.00e^{+0}$	**ILT-ILT5000**	**ILT-SED033/F/LED**
400 - 1064	W/sr	$2.00e^{-7}$ - $3.00e^{+0}$	**ILT-ILT2400**	**ILT-SED033/F/LED**
400 - 1064	W	$3.50e^{-9}$ - $6.60e^{+0}$	**ILT-ILT5000**	**ILT-SED033/F/INS250N**
400 - 1064	W	$3.30e^{-7}$ - 4.0	**ILT-ILT2400**	**ILT-SED033/F/INS125**

Application: LED Measurement

Common sources: automobiles, blimp display

Spectral range [nm]	Units	Measurement range	Radiometer	Detector
400 - 700	cd/m^2	$6.00e^{-3}$ - $1.00e^{+7}$	**ILT-ILT5000**	**ILT-SED033/Y2/R**
400 - 700	cd/m^2	$3.00e^{-1}$ - $5.00e^{+6}$	**ILT-ILT2400**	**ILT-SED033/Y2/R**
400 - 1064	$W/cm^2/sr$	$3.00e^{-9}$ - $2.00e^{+0}$	**ILT-ILT5000**	**ILT-SED033/F/R**
400 - 1064	$W/cm^2/sr$	$6.00e^{-8}$ - $1.00e^{+0}$	**ILT-ILT2400**	**ILT-SED033/F/R**

*The ILT-ILT2400 can be replaced by the new ILT-ILT1000. More information on request.

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Detector selection by application
Solar radiation measurement

Application: Sun and solar simulator

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
200 - 1100	W/cm²	$1.00e^{-8}$ - $1.00e^{+1}$	**ILT-ILT5000**	**ILT-SED033/QNDS2/W**
200 - 1100	W/cm²	$6.00e^{-7}$ - $1.00e^{+1}$	**ILT-ILT2400**	**ILT-SED033/QNDS2/W**
200 - 2100	W/cm²	$6.92e^{-4}$ - $7.69e^{+0}$	**ILT-ILT5000**	**ILT-SED623/QNDS1/W**
200 - 2100	W/cm²	$7.00e^{-4}$ - $3.00e^{+0}$	**ILT-ILT2400**	**ILT-SED623/QNDS1/W**

Application: UVB

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
265 - 310	W/cm²	$5e^{-9}$ - 1	**ILT-ILT5000**	**ILT-SED270/UVB-Z/TD**
265 - 310	W/cm²	$3.0e^{-7}$ - 1	**ILT-ILT2400**	**ILT-SED270/UVB-Z/TD**

Application: UVA

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
315 - 390	W/cm²	$3.0e^{-9}$ - 2	**ILT-ILT5000**	**ILT-SED005/UVA/TD**
315 - 390	W/cm²	$1.0e^{-7}$ - 2	**ILT-ILT2400**	**ILT-SED005/UVA/TD**

Application: Visible

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 700	lux	$1.20e^{-2}$ - $1.20e^{+6}$	**ILT-ILT5000**	**ILT-SED033/Y/TD**
400 - 700	lux	$9.00e^{-2}$ - $1.00e^{+6}$	**ILT-ILT2400**	**ILT-SCD110**

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Detector selection by application
Photoresist

Application: Photoresist
Common source: PC board-exposure systems, UVA sources, UV-VIS sources

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
320 - 475	W/cm²	$2.00e^{-9}$ - $2.00e^{+0}$	**ILT-ILT5000**	**ILT-SED033/A/W**
320 - 475	W/cm²	$2.00e^{-7}$ - $2.00e^{-0}$	**ILT-ILT2400**	**ILT-SED033/A/W**
320 - 475	W/cm²	$4e^{-8}$ - 0.7	**ILT-ILT2400**	**ILT-XSD140A**
320 - 475	W/cm²	$2.0e^{-7}$ - 2.0	**ILT-ILT1000/A/W**	
320 - 475	W/cm²	$8.0e^{-7}$ - 10	**ILT-ILT2400**	**ILT-XSD340A**
326 - 401	W/cm²	$3.0e^{-10}$ - 0.2	**ILT-ILT5000**	**ILT-SED033/B/W**
326 - 401	W/cm²	$2.0e^{-8}$ - 0.2	**ILT-ILT2400**	**ILT-SED033/B/W**
326 - 401	W/cm²	$2.0e^{-7}$ - 2.0	**ILT-ILT1000/B/W**	
326 - 401	W/cm²	$7.0e^{-8}$ - 1.0	**ILT-ILT2400**	**ILT-XSD140B**
326 - 401	W/cm²	$2.0e^{-6}$ - 30	**ILT-ILT2400**	**ILT-XSD340B**
260 - 400	W/cm²	$6.00e^{-6}$ - $9.00e^{-01}$	**ILT-ILT2400**	**ILT-SSD001**

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Detector selection by application
Radiometry

Application: Radiometry
Common source: all sources of light, lamps, flames, chemical reactions

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
400 - 1064	W/cm²	$7.69e^{-11}$ - $1.54e^{-1}$	**ILT-ILT5000**	**ILT-SED033/F/W**
400 - 1064	W/cm²	$4.00e^{-9}$ - $7.00e^{-2}$	**ILT-ILT2400**	**ILT-SED033/F/W**
400 - 1064	W/cm²	$8.00e^{-8}$ - $7.00e^{-2}$	**ILT-ILT1000/F/W Flat Response Irradiance Monitor**	
400 - 700	W/cm²	$2.00e^{-10}$ - $1.00e^{-1}$	**ILT-ILT5000**	**ILT-SED033/F/HMR/W**
400 - 700	W/cm²	$2.7e^{-8}$ - $1.00e^{-1}$	**ILT-ILT2400**	**ILT-SED033/F/HMR/W**
250 - 400	W/cm²	$2.33e^{-8}$ - $2.33e^{+0}$	**ILT-ILT5000**	**ILT-SED005/WBS320/W**
250 - 400	W/cm²	$1.00e^{-7}$ - $1.00e^{-1}$	**ILT-ILT2400**	**ILT-SED005/WBS320/TD**
250 - 400	W/cm²	$2.00e^{-6}$ - $1.00e^{+0}$	**ILT-ILT1005/WBS320/W UV Irradiance Monitor**	
850 - 1700	W/cm²	$4.00e^{-11}$ - $3.00e^{-2}$	**ILT-ILT5000**	**ILT-SED007/W**
850 - 1700	W/cm²	$2.00e^{-9}$ - $3.00e^{-2}$	**ILT-ILT2400**	**ILT-SED007/W**
850 - 1700	W/cm²	$4.00e^{-8}$ - $3.00e^{-2}$	**ILT-ILT1007/W NIR Irradiance Monitor**	
200 - 4200	W/cm²	$2.00e^{-5}$ - $1.00e^{-1}$	**ILT-ILT5000**	**ILT-SED623/K9**
200 - 4200	W/cm²	$2.00e^{-5}$ - $1.00e^{-1}$	**ILT-ILT2400**	**ILT-SED623/K9**
200 - 40.000	W/cm²	$2.00e^{-5}$ - $1.00e^{-1}$	**ILT-ILT5000**	**ILT-SED624/K9**
200 - 40.000	W/cm²	$2.00e^{-5}$ - $1.00e^{-1}$	**ILT-ILT2400**	**ILT-SED624/K9**

Application: High gain, very low light levels
Common source: Photon counting, chemical reactions, phosphorescence

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
250 - 600	W/cm²	$1.05e^{-12}$ - $1.05e^{-5}$	**ILT-ILT5000**	**ILT-SPM068/QNDS3/W**
250 - 600	W/cm²/sr	$1.37e^{-11}$ - $1.37e^{-4}$	**ILT-ILT5000**	**ILT-SPM068/QNDS3/R**

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Detector selection by application
Phototherapy

Application: UVA measurements, eczema, vitiglio, psoriasis light treatment

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
315 - 390 nm	W/cm²	$2.00e^{-10}$ - $1.00e^{-1}$	**ILT-ILT5000**	**ILT-SED033/UVA/W**
315 - 390 nm	W/cm²	$2.0e^{-8}$ - $2.00e^{-1}$	**ILT-ILT2400**	**ILT-SED033/UVA/W**

Applications: UVB measurements, eczema, vitiglio, psoriasis light treatment

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
265 - 332	W/cm²	$3.0e^{-7}$ - 0.1	**ILT-ILT5000**	**ILT-SED240/UVB-2/W**
265 - 332	W/cm²	$6e^{-6}$ - $1.00e^{-1}$	**ILT-ILT2400**	**ILT-SED240/UVB-2/TD**
280 - 315	W/cm²	$5e^{-9}$ - 1	**ILT-ILT5000**	**ILT-SED270/UVB-2/TD**
280 - 315	W/cm²	3.0 - 1	**ILT-ILT2400**	**ILT-SED270/UVB-2/TD**

Applications: Narrow UVB source, Philips UVB lamp

Spectral range [nm CW]	Units	Dynamic range	Radiometer	Detector
312	W/cm²	$2.00e^{-8}$ - 20	**ILT-ILT5000**	**ILT-SED005/TLS312/W**
312	W/cm²	$2.00e^{-6}$ - 20	**ILT-ILT2400**	**ILT-SED005/TLS312/TD**

Applications: Bili blankets, bili belts, bili light sources, bilirubin light source, jaundice treatment, Hyperbilirubinemia

Spectral range [nm]	Units	Dynamic range	Radiometer	Detector
370 - 515	W/cm²	$1.40e^{-10}$ - $2.86e^{-1}$	**ILT-ILT5000**	**ILT-SED033/TBLU/W**
370 - 515	W/cm²	$1.43e^{-8}$ - $5.00e^{-2}$	**ILT-ILT2400**	**ILT-SED033/TBLU/W**

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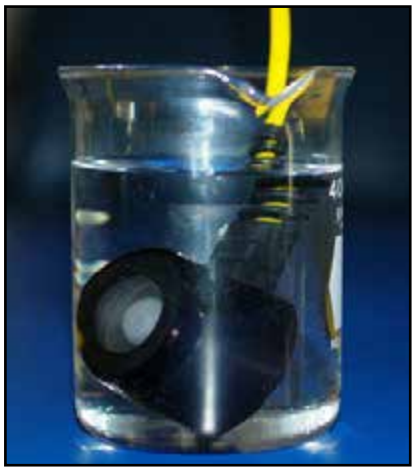
SUD detectors
for underwater light measurements

Most of the SED series detectors (for ILT2400 and ILT5000) are available in underwater SUD versions.

Every underwater detector is pressure tested to 40 meters depth (60 psi). The 'WU' quartz diffuser is required to withstand the pressures of underwater use. Filters are optional, with O-ring seals between all filter rings.

SUD detectors come with a 3, 5 or 30 m long, water-blocked cable. The anodized aluminum components provide excellent corrosion resistance to salt water for all weather durability.



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Useful tools
Measurement units

In which unit do you want to measure?

Radiometrie / Radiometry		
Deutsch	**Englisch**	**Einheit**
Strahlungsmenge	Radiant energy	J [Ws]
Strahlungsleistung Strahlungsfluß	Radiant power or flux	W
Strahlstärke	Radiant intensity	W/sr
Strahldichte	Radiance	$W/sr/m^2$
Bestrahlungsstärke	Irradiance	W/m^2

Radiometry is the detection and measurement of light waves in the optical portion of the electromagnetic spectrum which is further divided into ultraviolet, visible and infrared light.

Photometrie / Photometry		
Deutsch	**Englisch**	**Einheit**
Lichtmenge	Luminous energy	lm s
Lichtstrom	Luminous flux	lm s
Lichtstärke	Luminous intensity	cd [lm/sr]
Leuchtdichte	Luminance	cd/m^2
Bestrahlungsstärke	Illuminance	lx [lm/m^2]

Photometry is the measurement of the visible light portion of the electromagnetic spectrum, sometimes called the optical spectrum, encompasses wavelength approximately 400 to 700 nm containing most of the colors discernible to the human eye. However, the human eye is not equally sensitive to all wavelengths of light, being most sensitive to green at 555 nm under normal lighting conditions than to other wavelengths.

Photon / Photon		
Deutsch	**Englisch**	**Einheit**
Photonenanzahl	Photon energy	
Photonenstrom	Photon flux	1/s
Photonenstrahlstärke	Photon intensity	1/(s sr)
Photonenstrahldichte	Photon radiance	$1/(s\ sr\ m^2)$
Photonenbestrahlungsstärke	Photon irradiance	$1/(s\ m^2)$

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Benefit from our expertise

Our portfolio covers a large variety of application areas and products:

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- Cryogenic temperature control
- Cryostats
- Helium gas purifier
- Helium liquefiers
- Helium recovery and liquefaction plants

Electron microscopy
- Correlative AFM and SEM
- Stages, detectors and cameras
- Sample preparation systems
- In Situ TEM solutions
- Benchtop SEM

Imaging
- Hyperspectral imaging
- Scientific cameras:
  sCMOS, CCD, EMCCD, high-speed, infrared, EUV, x-ray
- X-ray analytical microscope

Life sciences
- High-throughput cellular imagers
- Optical tweezers
- SPR spectrometers

Light & laser
- Laser accessories
- Light measurement technology
- Light sources for scientific applications
- Photo lithography systems
- Solar simulators

Materials science
- Coating systems
- Ellipsometers
- Furnace for chrystal fabrication
- Magnetometers
- Nanopositioning devices
- Nanoindenters
- Particle size analyzers
- Profilers
- Systems to measure physical properties

Optics
- Optical filters VUV to FIR
- Broadband polarizers and beam splitters

Spectroscopy
- Monochromators
- Detectors
- Spectrographs
- Imaging spectrometers


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spectrum

Fachinformation von LOT-QuantumDesign Darmstadt

AttoMap – Analytisches µXRF-Mikroskop der nächsten Generation

Specim IQ – Hyperspektralkamera „To Go"

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Spektroskopie

Twice a year, we give first-hand information on our latest products and applications in our English journal Spectrum. We provide the German spectrum four times a year.

TÜV PROFI CERT ISO 9001 73 100 337

As a sign of our high quality awareness, we are ISO-9001 certified. For the same reason, we only offer products of carefully controlled quality standards.

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