



# EIT<sup>®</sup> LEDCURE<sup>™</sup> RADIOMETERS



The LEDCure<sup>™</sup> series of radiometers from EIT is a new family of industrial radiometers designed specifically to accurately measure the energy generated by industrial UV LED systems.

## Total Measured Optical Response

LEDCure radiometers feature a patented “**Total Measured Optical Response**” which includes all optical components in the overall response of the instrument; not just the optical filter. The instrument response, which has been optimized for UV LEDs, is designated with an “L” (LED) band response followed by the center wavelength of the LED.

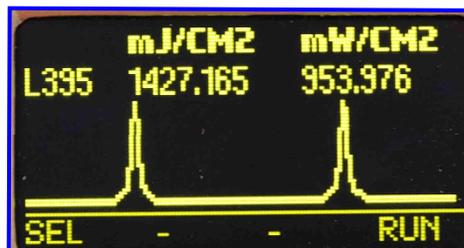
The **Total Measured Optical Response** in the LEDCure provides:

- Highly accurate readings run-to-run
- Very repeatable unit-to-unit matching
- Absolute values when evaluating different sources



L395 LEDCure<sup>™</sup>

The LEDCure is intuitive and easy-to-use. The instrument operates and displays information in the same way as EIT radiometers used for broadband sources. The LED Irradiance ( $W/cm^2$ ), Energy Density ( $J/cm^2$ ) and Irradiance Profile (Watts/ $cm^2$  as a function of time) are available on the display of the instrument.



**Top Left:** L385 LEDCure passed under one LED. Instrument type shown on display. **Top Center:** L395 passed under two LED arrays. **Top Right:** Reference Mode showing comparison to a saved Reference File. Watts are similar, speed or exposure time has changed.

**Bottom Left:** LEDCure Set up Screen. **Bottom Right:** LEDCure Instrument label showing unit type, band, range.

LEDCure Radiometers are also available as Profiling Radiometers in which the Irradiance Profile is transferred to a computer for further analysis and evaluation with EIT's UV PowerView<sup>®</sup> III Software.

# LEDCURE INSTRUMENT RESPONSIVITY

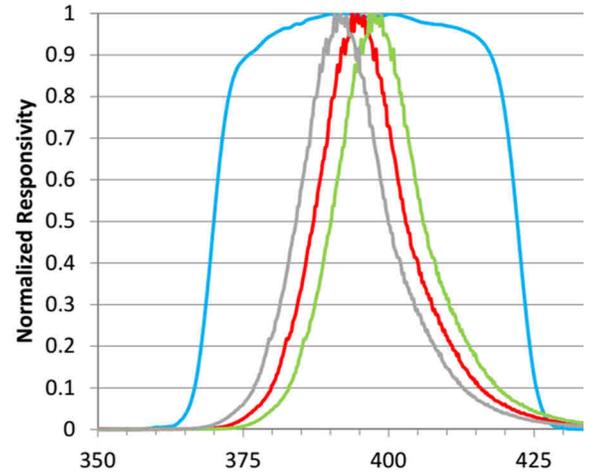
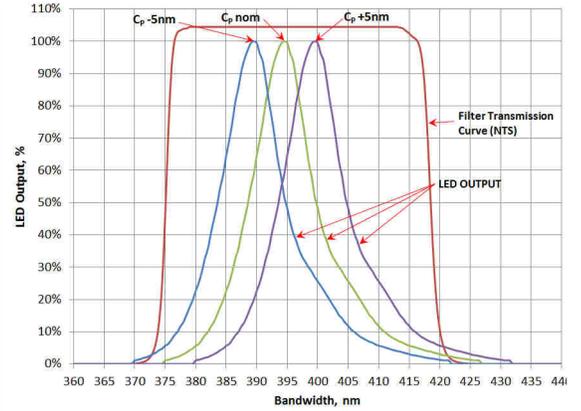
UV LEDs sold for industrial curing applications, typically specify a Center Wavelength (CWL) of  $\pm 5$  nm. Therefore, the CWL for a 395 nm source will fall between 390-400 nm. The actual distribution of UV energy at all power levels is determined by how the diodes are selected or 'binned'. Based on the energy distribution, instrument responsivity for a 395 nm LED would need to be 370-422 nm with a flat response across the top of the band. EIT has developed commercial instruments for several of the L-bands below. Contact EIT for the status and availability of the specific L-bands shown.

L Band	CWL (nm)	Range (nm)
L365	365	340-392
L385	385	360-412
L395	395	370-422
L405	405	380-432

Table: EIT L-Band Responses

Top Right: Theoretical Instrument Responsivity needed to cover variations in the CWL of a 395 nm source

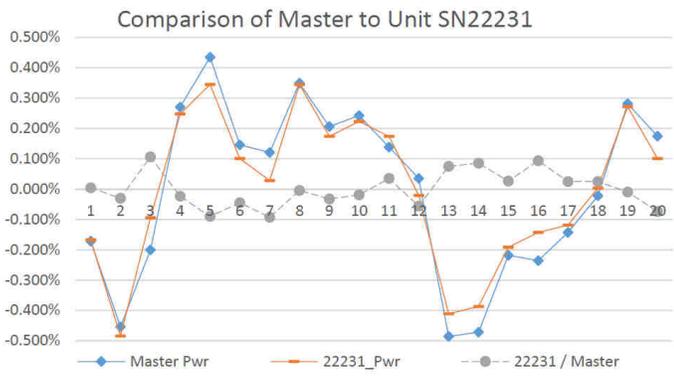
Bottom Left: Actual *Total Measured Optical Response* of the L395 Band with ALL optical components included



## TOTAL MEASURED OPTICAL RESPONSE /LEDCURE PERFORMANCE

UV radiometers use multiple optical components. The traditional industry approach has been to use only the optical filter response to describe the entire instrument response. EIT's *Total Measured Optical Response* is a new patented approach in which **ALL** optical components in the instrument optical path are included in the instrument response; not just the filter. The benefits of this response are:

- Highly accurate readings run-to-run
- Very repeatable unit-to-unit matching
- Absolute values when evaluating different sources



Repeatability testing over 20 runs showing excellent unit to unit matching. Overall variation of less than 1% showing changes in the LED source. Unit to unit variation is less than 0.2%. Testing performed at EIT

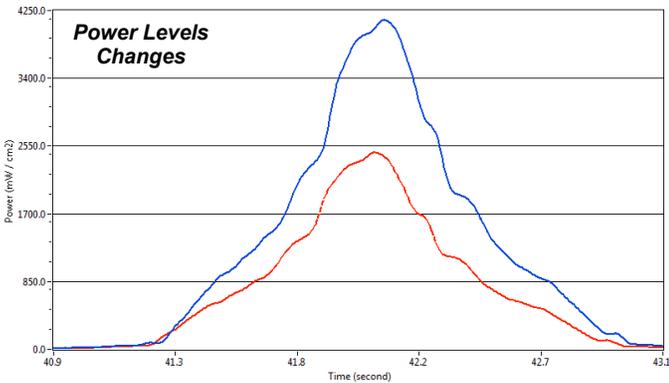
Working Distance (mm)	Primary Standard: Integrating Sphere (W/cm <sup>2</sup> )	LEDCure L395 (W/cm <sup>2</sup> )	Difference
5	9.01	9.23	2.4%
10	7.74	7.74	0.0%
15	6.66	6.63	-0.5%
20	5.74	5.83	1.6%
25	5.04	5.08	0.8%

Testing of LEDCure L395 to a primary standard at different distances. Testing performed by Excelitas-Lumen Dynamics Group

# LEDCURE PROFILER INSTRUMENTS/UV POWERVIEW® SOFTWARE III

The LEDCure is easy to use in the lab or production with the irradiance ( $W/cm^2$ ), energy density ( $J/cm^2$ ) and irradiance profile information available on the display. **Profiler** enabled versions of the LEDCure provide the same display information as a **Standard** unit with the added benefit of being able to transfer the data to a computer for analysis with EIT's UV PowerView Software® III. Profiler units allow comparison and identification of:

- Different sources, cure conditions, number of LEDs and readings over time
- The impact of changing the height and/or power of the LED
- Process speed and/or exposure time variations
- The performance of individual LEDs in multi-LED systems
- Maintenance needs before they impact product quality
- System changes over time with the comparison to stored files
- Cursors allow you to align files on top of each other as shown below
- Notes can be added to each file for a permanent record of cure conditions.
- PowerView III files are in a \*.tdms file format and can imported to Excel



Summary By Table				
	Sample File	Reference File	Difference	%
L395- Power (mW/cm2)	4132.961	2467.301	1665.660	67.5
L395- Energy (mJ/cm2)	2985.911	1798.217	1187.695	66.0
Enable cursors	ON			
Time	43.66			
Time - Ref	40.63			

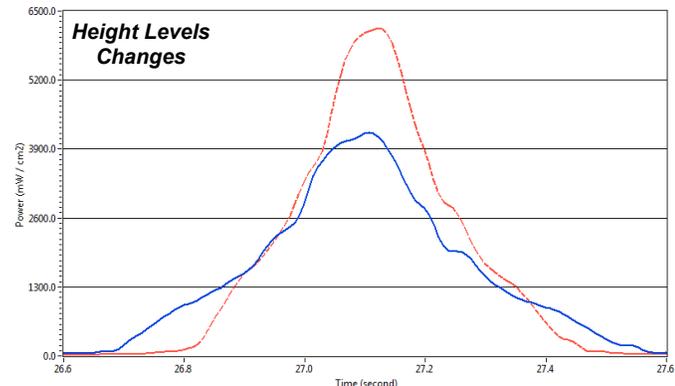
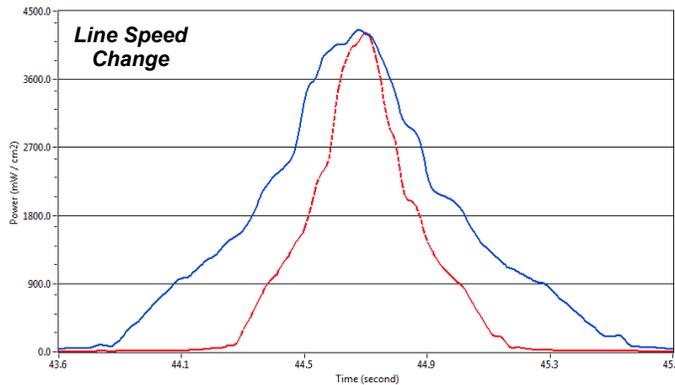
Above: **Data Table** in PowerView III

Left Top: Graph Display with LED at different **Power Levels**

Left Center: Graph Display with LED at different **Line Speeds**

Left Bottom: Graph Display with LED at different **Height Levels**

X-Axis = Time; Y-Axis = UV Irradiance ( $W/cm^2$ ) on each graph



	A	B	C
1	L395		
1215	4.152600765		
1216	4.199738026		
1217	4.215450764		
1218	4.193004131		
1219	4.132398605		
1220	4.035878658		
1221	3.90568924		
1222	3.757542372		
1223	3.598172426		
1224	3.423089743		
1225	3.227805138		
1226	3.050477982		
1227	2.922533035		
1228	2.850704193		
1229	2.785609484		
1230	2.664398432		
1231	2.462379932		
1232	2.242404222		
1233	2.076300383		

Info:

Model: LEDCurePlus2 Profiler  
 Board Temperature: 26  
 Battery Voltage: 1.40  
 Firmware Version: 5.01  
 Serial Number: 23536  
 Calibration Date: 2018-02-20  
 Smoothing Profiler:  
 Actual Sample Rate: 0.0  
 Date & Time: 2/21/2018 8:32:48 AM

	mJ/cm2	mW/cm2
L395:	3400.251	6181.763

Notes:

LED Power: 75%  
 Height: 0.5"  
 Line Speed: 30 FPM

Above: File information with unit information and the ability to add Notes

Left: PowerView III \*.tdms files can be imported to Excel

## LEDCure™ Product Specifications *(Specifications subject to change without notice)*

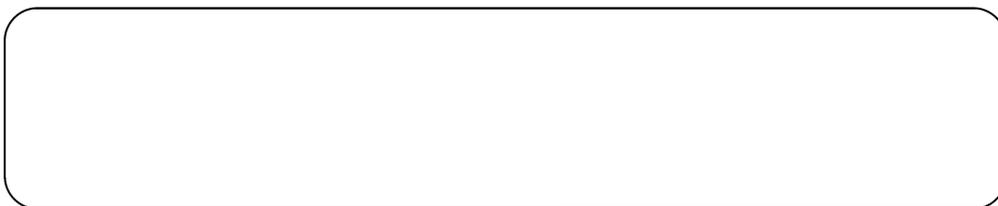
<b>L365 Spectral Response</b>	340-392 nm (FWHM, 50 nm; Tolerance ± 2 nm); Out of Band, 4 OD Blocking
<b>L385 Spectral Response</b>	360-412 nm (FWHM, 50 nm; Tolerance ± 2 nm); Out of Band, 4 OD Blocking
<b>L395 Spectral Response</b>	370-422 nm (FWHM, 50 nm; Tolerance ± 2 nm); Out of Band, 4 OD Blocking
<b>L405 Spectral Response</b>	380-432 nm (FWHM, 50 nm; Tolerance ± 2 nm); Out of Band, 4 OD Blocking
<b>Dynamic Range</b>	40 W/cm <sup>2</sup>
<b>Operating Range</b>	400 mW/cm <sup>2</sup> to 40 W/cm <sup>2</sup> Note: Operating Range provides best performance. Unit will “turn on” and display data at much lower irradiance values
<b>Spatial Response</b>	Approximately cosine
<b>Accuracy</b>	±10% of reading plus ±0.2% of full scale Typical ±5% or better
<b>Repeatability</b>	± 1-3% typical; dependent on source and equipment (conveyor) stability, unit alone better than 1%
<b>Smooth Modes</b>	Smooth ON: Effective Sample rate of 25 samples/second Smooth OFF: Effective Sample rate of 2048 samples/second Smooth PROFILER: Effective Sample rate of 128 samples/second
<b>Sample Rate for Profiling</b>	The LEDCure Profiler uses a fixed sample rate of 128 samples/second for profiling. For best matching between instrument display and PowerView Software® III values, use Smooth PROFILER mode
<b>Memory Capacity For Profiling</b>	The memory capacity of the LEDCure in Profiler Mode is sufficient to collect data for >100 minutes
<b>PowerView Software® III</b>	National Instruments LabVIEW based programming designed for Windows 7-10. Collected data stored in LabVIEW based *.tdms files
<b>Display</b>	Easy to Read, Yellow Text on Black Background, Display Brightness User Adjustable
<b>Operating Temperature</b>	0-75°C Internal temperature; withstands high external temperatures for short periods (audible alarm indicates when temperature has exceeded upper limit )
<b>Time-Out Period</b>	2 minutes DISPLAY mode (no key activity)
<b>Battery/Battery Life</b>	2 user-replaceable AAA Alkaline Cells, Approximately 20 hours with display on
<b>Instrument Dimensions and Materials</b>	4.60 x 0.50 inches; 117 mm x 12.7 mm (D x H), Aluminum & Stainless Steel
<b>Instrument Weight</b>	10.1 ounces (289 grams)
<b>Carrying Case</b>	Supplied with carrying case, cut polyurethane foam interior, scuff resistant nylon exterior cover, Size: 10.75 x 3.5 x 7.75 inches; 274 x 89 x 197 mm (W x H x D), Weight: 9 ounces (260 grams)

***Designed and manufactured in the USA, Patent Pending***

This equipment is in conformity with the following standards and therefore bears CE marking: IEC 61326-1:2005, EN55011: 1998, EN61000-4-2: 1995, A1: 1998, A2: 2001; EN 61000-4-3: 2002, A1: 2002, following the provisions of the applicable directives: 98/34/EEC and amendments, 89/336/EEC and amendments.



***For more information  
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