

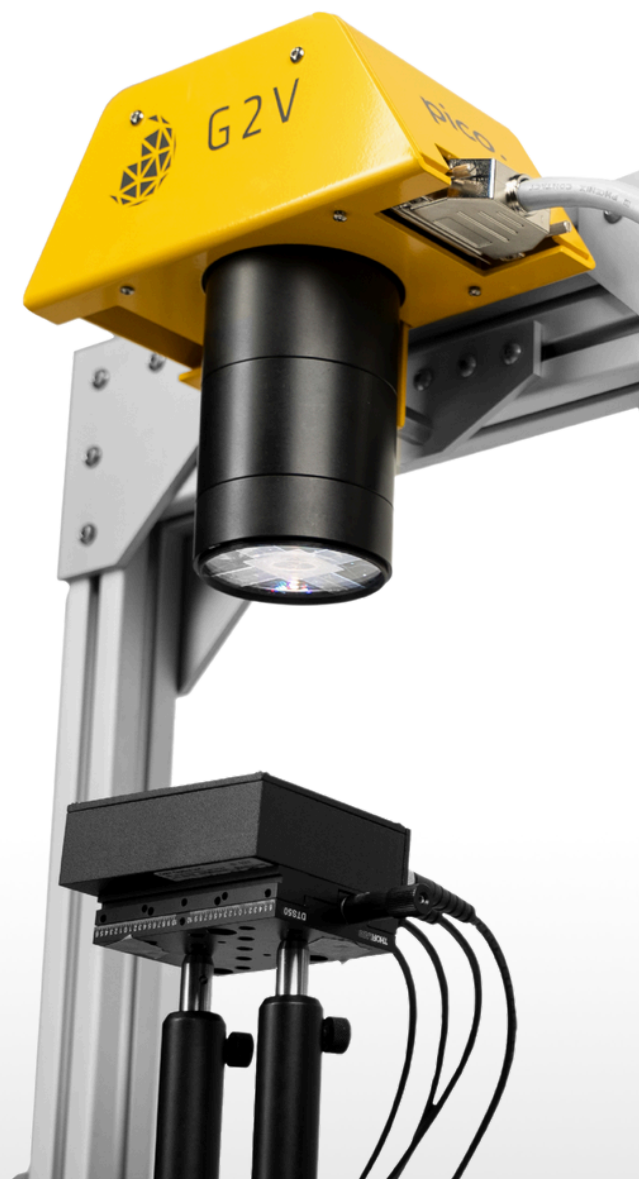


**G2V**

*ENGINEER THE SUN*

## **LED SOLAR SIMULATOR PRODUCTS BROCHURE**

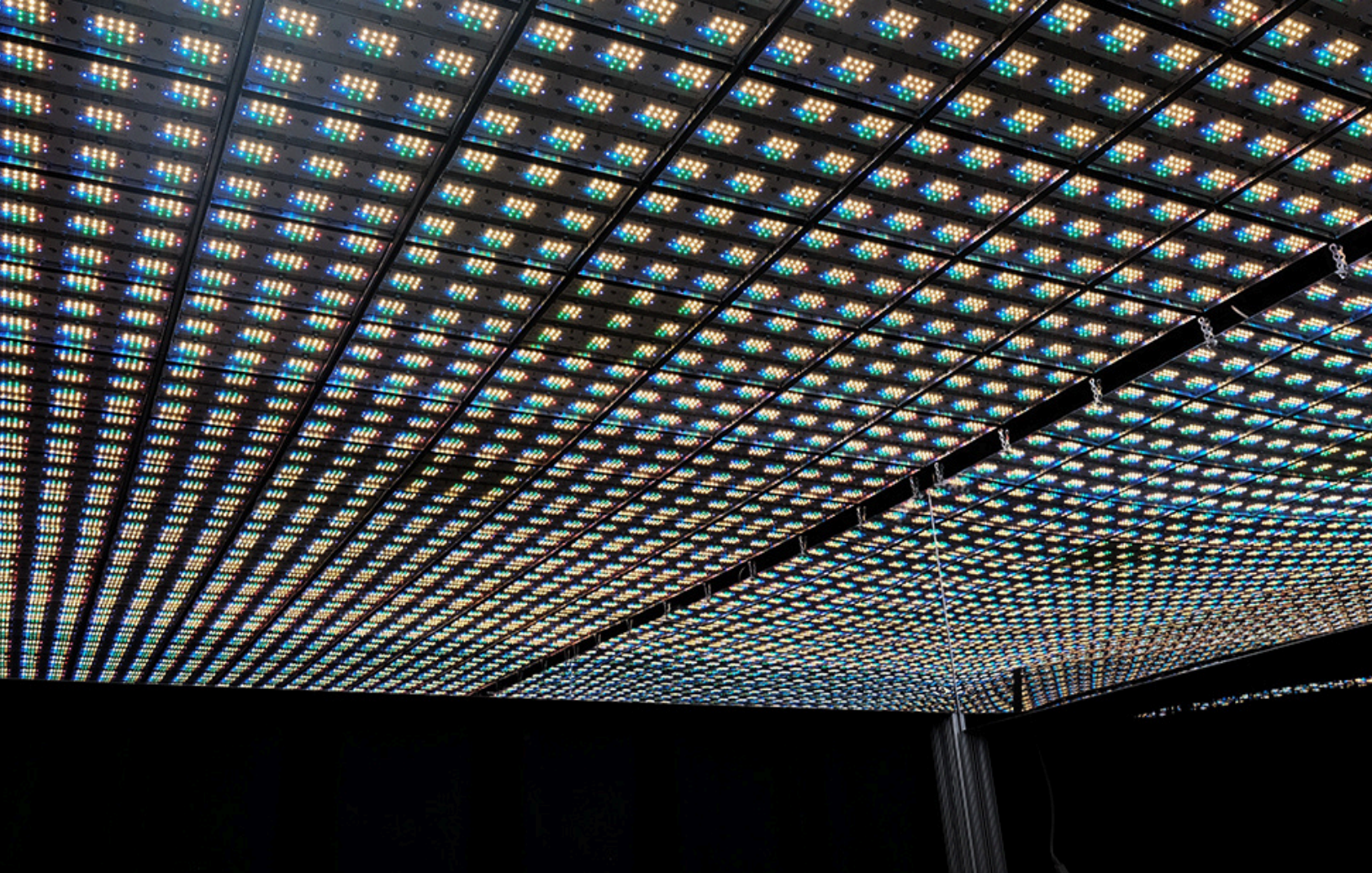
Engineered Sunlight™ for the Pico & Sunbrick



## CONTENTS

3	<a href="#"><u>LED illumination</u></a>
4	<a href="#"><u>Pico small area solar simulator</u></a>
6	<a href="#"><u>Pico solar simulator KLMNO (350 nm - 1500 nm)</u></a>
7	<a href="#"><u>Pico One-Click Sun software</u></a>
8	<a href="#"><u>Pico add-on modules</u></a>
9	<a href="#"><u>Pico specifications</u></a>
11	<a href="#"><u>Sunbrick large area solar simulator</u></a>
13	<a href="#"><u>Sunbrick specifications</u></a>





## BENEFITS OF LED ILLUMINATION



Minimal  
warm-up time



No bulb  
replacement



No explosive  
bulb failure



No manual  
calibration

LEDs are solid-state devices that require minimal maintenance, nor do they have the hazards related to pressurized gas lamps.

LED solar simulators provide enhanced functionality including dynamic output that enables a greater breadth of research capabilities in a wide variety of fields such as solar energy (photovoltaics), aerospace, photochemistry, material testing, wearables, and more.





# pico.<sup>TM</sup>

## CLASS A+AA **SOLAR SIMULATOR**

The Pico provides world-class controllable illumination, complete with software-controlled spectra and traceable calibration—all with no bulbs, filters, or moving parts.

The Pico can replicate the standard solar spectra, including AM1.5G and AM0 to AM10, with a button. It can also account for geography, season, and specific times of day with our One-Click Sun<sup>TM</sup> proprietary software. Minimal warm-up time and long LED lifetimes mean the Pico is both nimble and built to last.



Photonic Solutions Ltd  
Edinburgh  
EH14 4AP  
+44 131 664 8122  
[www.photonicsolutions.co.uk](http://www.photonicsolutions.co.uk)





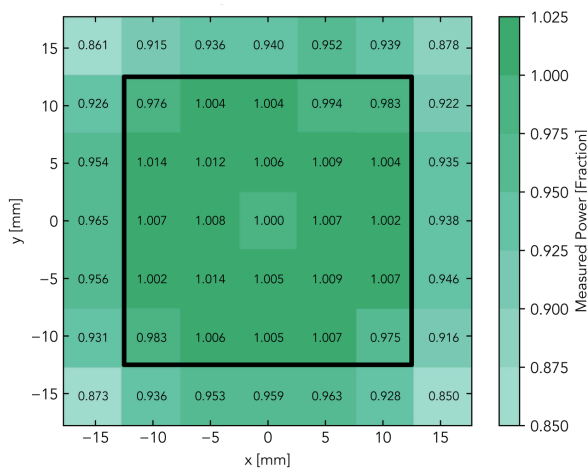
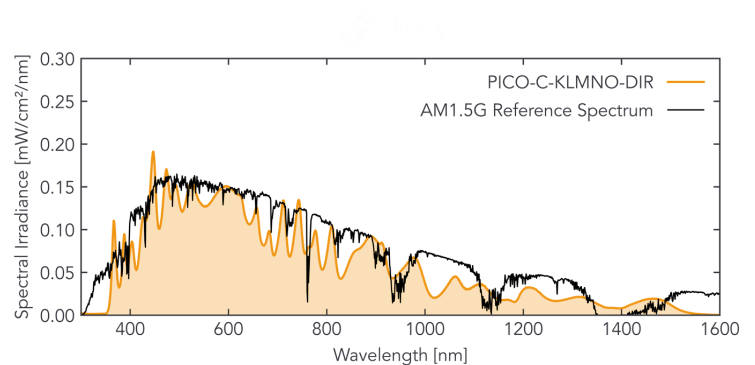
# CLASS A+AA

The standards that govern solar simulation are JIS C 8904-9, IEC 60904-9:2020, and ASTM-E927, and are used to determine the quality and accuracy of a solar simulator's illumination.

## Class A+ Spectral Match

The spectral match is a measure of accuracy between the output of a solar simulator and a target spectra. It is evaluated using the amount of light produced within specific wavelength bands compared to the standard spectra and reported as a "spectral mismatch".

G2V Optics Picos produce an AM1.5G spectral mismatch < 5%, exceeding the ASTM E927 Class A standard by a factor of 5x.



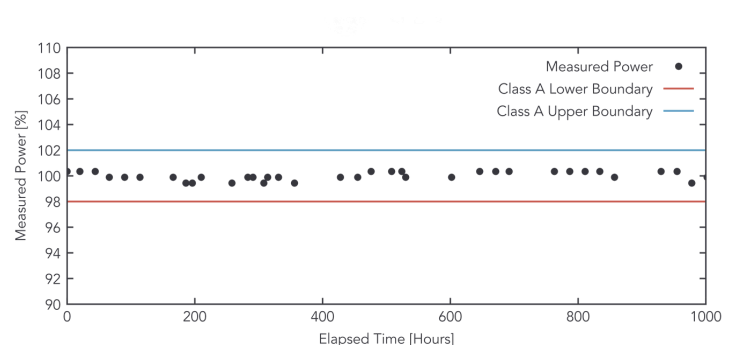
## Class A Spatial Non-Uniformity

Spatial non-uniformity describes the distribution and consistency of irradiance over an area. It is calculated from the difference of the maximum and minimum irradiance values in an area.

With a Pico, you receive one sun-equivalent irradiance with a spatial non-uniformity < 2% in a 2.5 cm x 2.5 cm square area.

## Class A Temporal Instability

Temporal instability measures the consistency of light output over a period of time. The Pico's short-term temporal instability (STI) (over 100 seconds) is < 0.1%, and its long-term temporal instability (LTI) (over 1000 hours) is < 2%, exceeding IEC 60904-9 Class A requirements for STI and LTI, as well as the general Class A temporal instability requirements of ASTM E927 and JIS C 8904-9.



Photonic Solutions Ltd  
Edinburgh  
EH14 4AP  
+44 131 664 8122  
[www.photonicsolutions.co.uk](http://www.photonicsolutions.co.uk)



# PICO SOLAR SIMULATOR KLMNO (350 NM - 1500 NM)

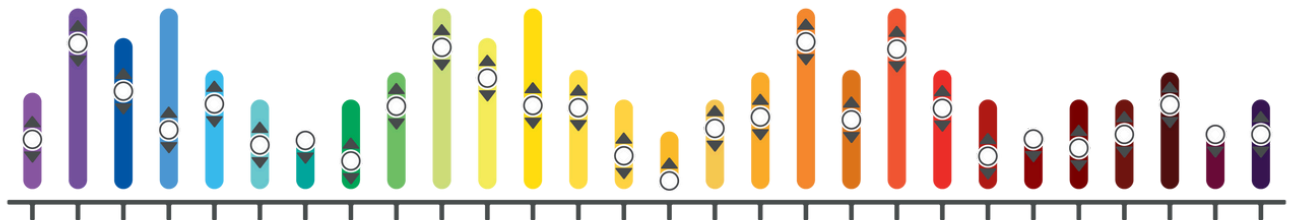


## Pico LED Solar Simulator

With our Pico Solar Simulator KLMNO (350 nm - 1500 nm) your work just became easier. Our tunable Class A+AA LED solar simulator will include the Pico, power supply, power connections, and Variable Control Software, such as One-Click Sun and our Python API as standard.



## VARIABLE MODULE INCLUDES:



Enables complete programmable intensity control of 32 tunable channels for arbitrary spectral design. Load programmable spectral presets from AM0-AM10 and AM1.5G. Enjoy the freedom to save, download, and load your own spectral functions.



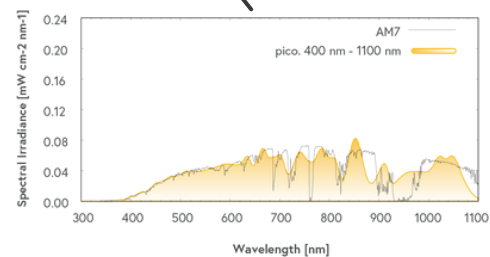
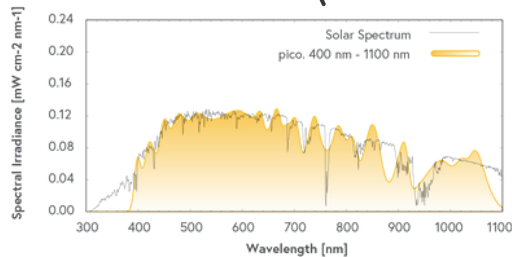
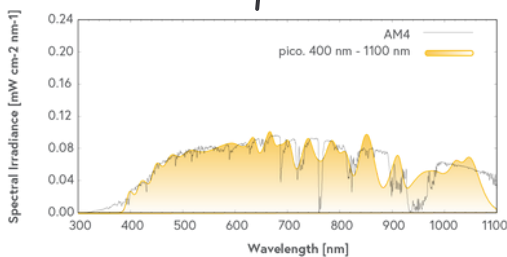
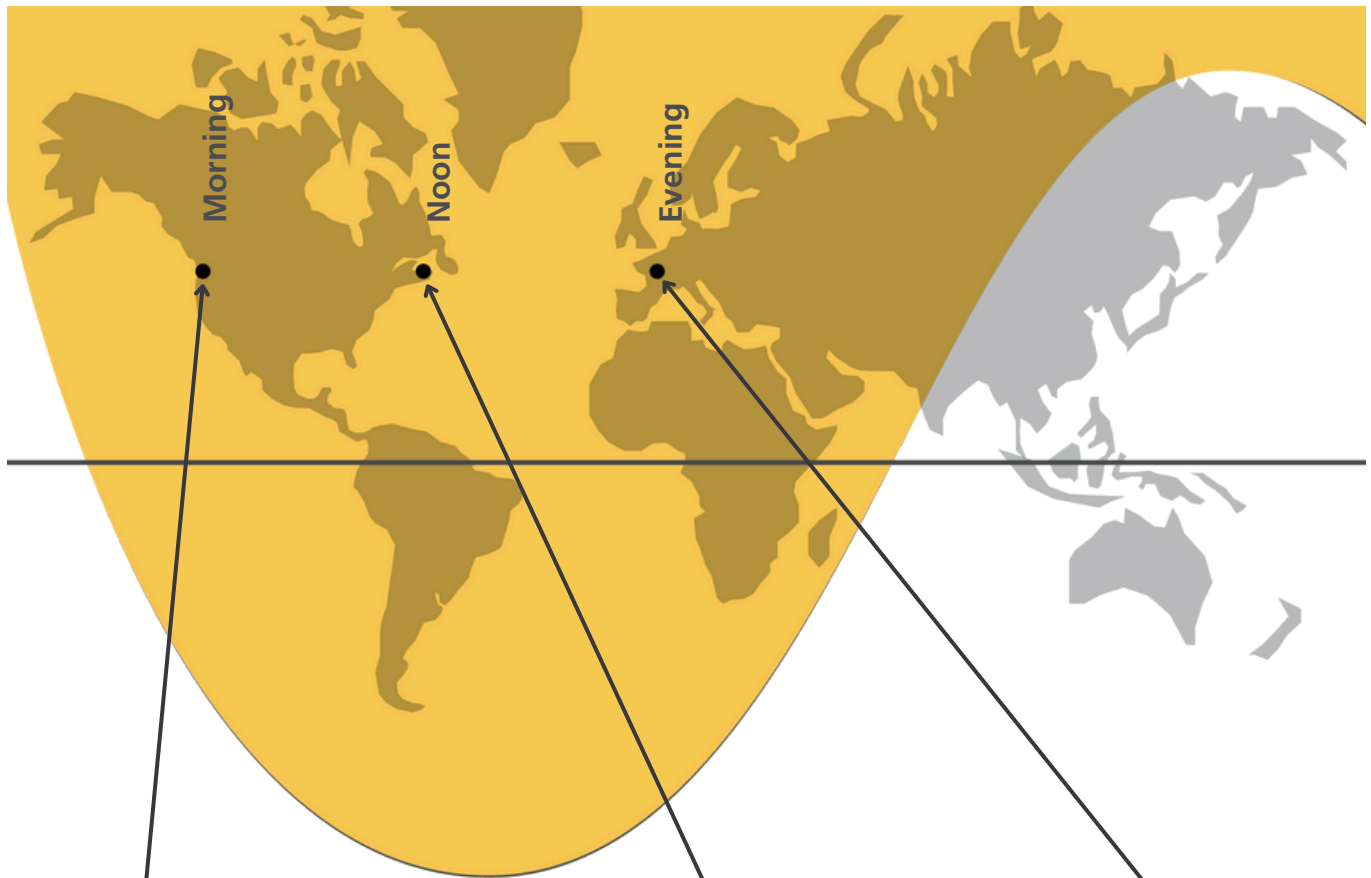
Photonic Solutions Ltd  
Edinburgh  
EH14 4AP  
+44 131 664 8122  
[www.photonicsolutions.co.uk](http://www.photonicsolutions.co.uk)





## ONE-CLICK SUN

One-Click Sun™ software enables users to replicate irradiance and spectrum based on geography, season, and time of day. Our software was crafted to be simple, accurate, and easily configurable. Select any point in the world to within 1° Latitude/Longitude, and let our software simulate a realistic day-night cycle, at up to 500x regular speed.



Photonic Solutions Ltd  
Edinburgh  
EH14 4AP  
+44 131 664 8122  
[www.photonicsolutions.co.uk](http://www.photonicsolutions.co.uk)



# PICO. ADD-ON MODULES



## IV UPGRADE MODULE

Offering plug-and-play power conversion efficiency measurement and report generation for solar cell characterization, the IV Module includes software as well as an integrated source-meter unit (providing between -13 V and +13 V with 16 bit resolution, and between -30 mA and +30 mA with 4  $\mu$ A resolution). The IV Module seeks measurement precision, as the module seeks your target voltage through an iterative process until converging and generating a high-accuracy IV pair. Automated analytical approximations fit the data and then report key solar cell parameters. Allowing you to measure IV Characterization, Efficiency, Voc, Isc, Im, Vm, FF, Shunt and Series R.



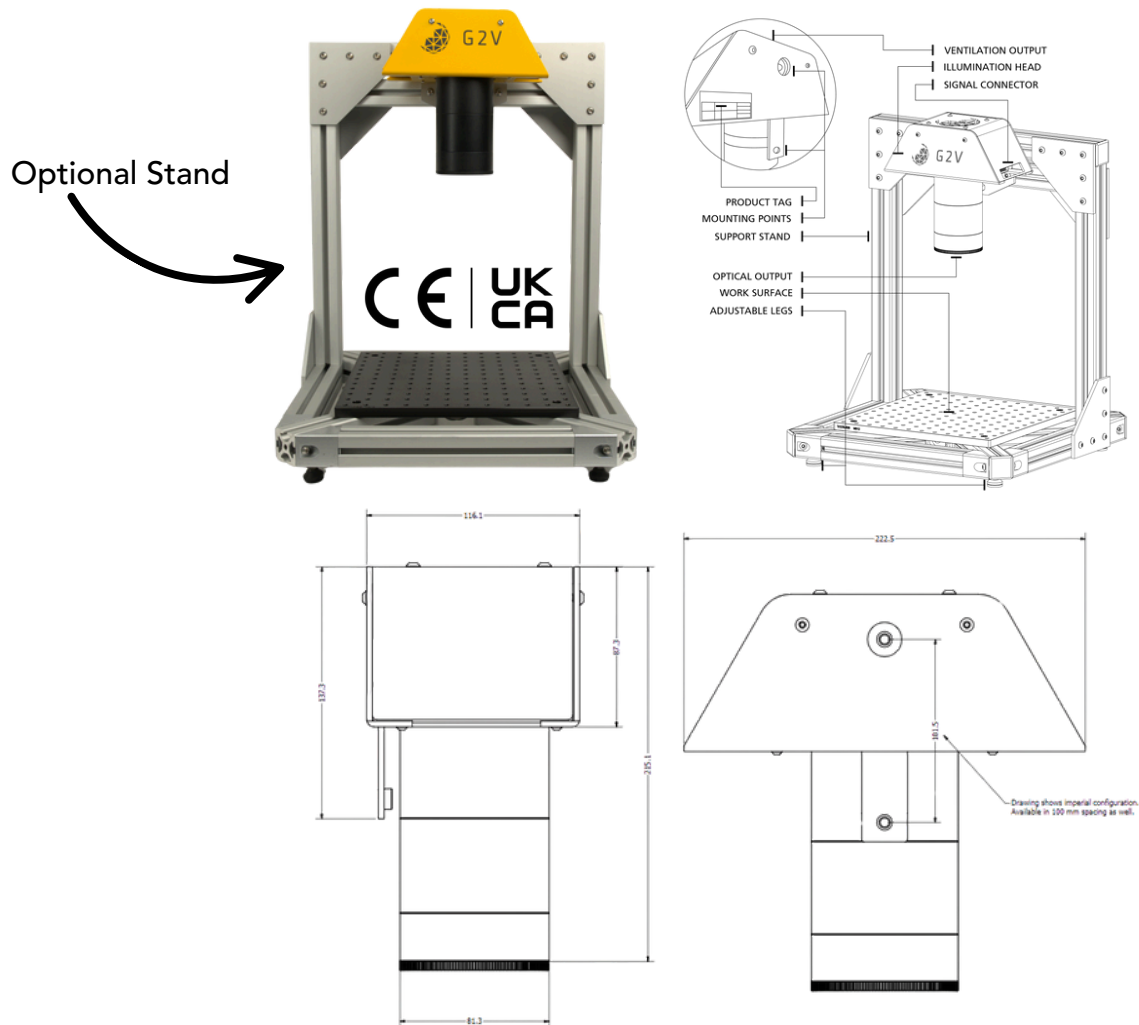
## LOW-RESOLUTION EQE UPGRADE MODULE

The low-resolution EQE provides wavelength-resolved measurements of your solar cell's performance under active conditions. With individual narrow-band LEDs providing arbitrary perturbation strengths and utilizing a low-noise, variable-gain amplifier with variable integration times, the module can detect and amplify device currents over 16,000 times, allowing for the rapid approximation of device responsivity curves. Low-res EQE Characterization Wavelength-resolved measurements of your device's quantum efficiency under active conditions for 30 channels



Photonic Solutions Ltd  
Edinburgh  
EH14 4AP  
+44 131 664 8122  
[www.photonicsolutions.co.uk](http://www.photonicsolutions.co.uk)

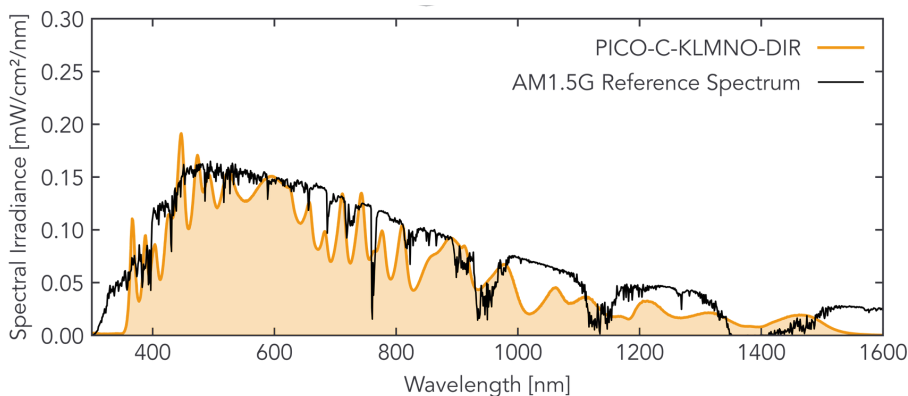




Specifications	KLMNO
ASTM E927 / IEC 60904-9 / JIS C 8904-9	Exceeds Class A+AA IEC Specifications
Spectral Mis-match	<5% (2x better than the standard)
Spatial Non-uniformity	<2% (meets the standard)
Temporal Instability	<0.1% STI (2x better than the standard) <2% LTI (meets the standard)
Spectral Range	350 nm - 1500 nm
Working Distance	7 cm
Tuneable Channels	32
Calibrated Output Irradiance (1.0 suns AM1.5G)	87.9 mW/cm^2

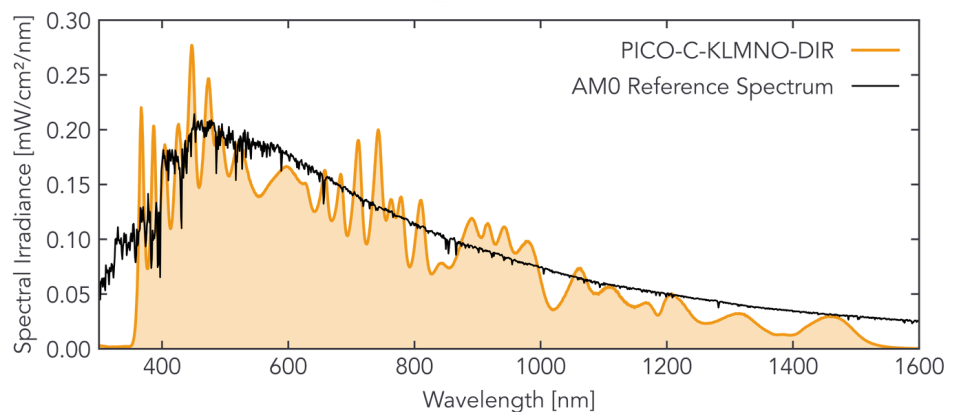


General Specifications	Value	Units	Notes
Type of Solar Simulator	Steady-state	N/A	Uses continuous-wave LEDs
Mounting Configuration	Two M6-threaded holes separated by 100 mm	N/A	
Intensity Adjustment Range	0 - 110	%	0.1 - 1.1 suns AM1.5G in 0.1 increments
Class A Illumination Area	2.5 x 2.5	cm	
Safe Operating Temperature	15 - 40	°C	
Angle of Emission	< 30	°	Directed
Illumination Head Size	(21.5 x 22.3 x 11.6)	cm	
Weight	2.2	kg	4.4 lbs (illumination head)
Unit Lifetime	10,000	hours	Expected minimum lifespan
Warranty	2	year	Optional extension available



**PICO. - AM1.5G 1.0 SUNS  
(KLMNO)**

**PICO. - AM0 1.0 SUNS  
(KLMNO)**





# sunbrick.™

## LARGE AREA SOLAR SIMULATOR

### THE SUNBRICK MAKES LARGE-AREA SOLAR SIMULATION **QUICK & EASY**

With world-class controllable illumination, software-controlled spectra and traceable calibration—all with no bulbs or filters.

The Sunbrick can accommodate a wide range of applications with its modular design, allowing Sunbrick arrays to be mounted in a grid pattern to provide high-quality solar replication over very large areas.

The Sunbrick outshines the competition through its exceptional light quality, durability, ease of use, and ability to integrate into the most advanced research.

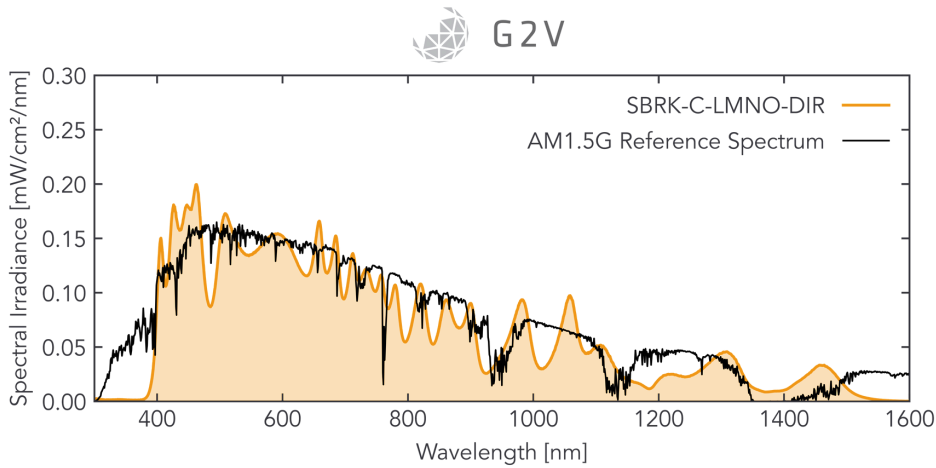


**\*Mirrored Stand Required on Page 14**





## EXCEEDING CLASS A



Sunbrick offers users a high precision spectral mismatch of <5%, exceeding the ASTM-E927 Class A standard by a factor of 5.

## MODULAR SCALABILITY

With its innovative tileable design, the Sunbrick is scalable to whatever illumination area you require. Each brick illuminates a Class A uniform 20 cm x 20 cm area at a 50 cm working distance.

Multiple Sunbricks are easily mounted and networked together in arrays to provide illumination as large as required.

All Sunbrick arrays have a Class A illumination area bounded by a 2.5 cm edge effect leaving the center fully illuminated for any size of array. (eg. a 2x2 array will illuminate 45 cm x 45 cm, a 2x3 array will illuminate 45 cm x 70 cm.)

## CUSTOM

Configurations available

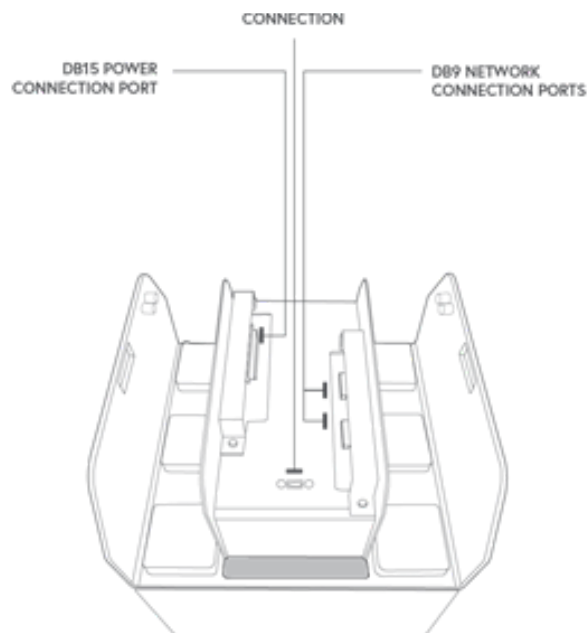
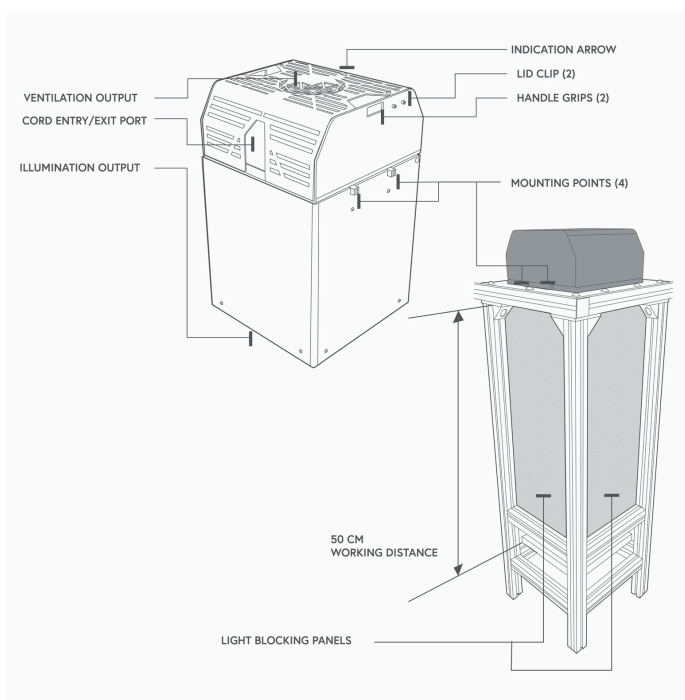






# sunbrick.™

## SPECIFICATIONS



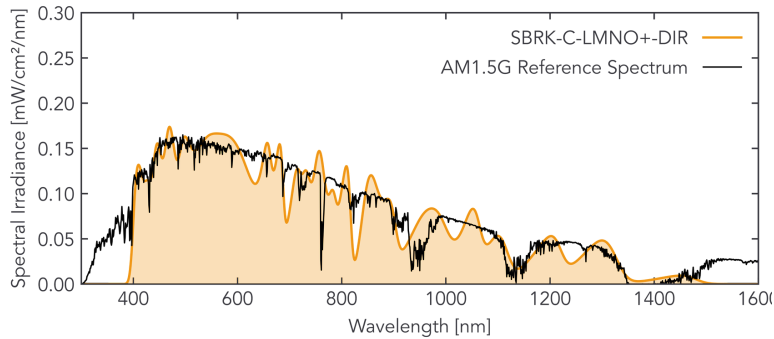
SPECIFICATIONS	BASE	BASE - UV	BASE - NIR	BASE - NIR+		
ASTM E927 / IEC 60904-9 / JIS C 8904-9	Exceeds Class AAA Specifications					
Spectral Mis-match	<5%	<5%	<5%	<5%		
Spatial Non-uniformity	<2%	<2%	<2%	<2%		
Temporal Instability	<0.1%	<0.1%	<0.1%	<0.1%		
Spectral Range (nm)	400 - 1100	350 - 1200	400 - 1500	400 - 1500		
SKU Spectral Code	LMN	KLMN+	LMNO	LMNO+		
Tuneable Channels	34	35	29	36		
Calibrated Output Irradiance (1.0 suns AM1.5G)	75.9	82.3	84.7	84.7		
GENERAL SPECIFICATIONS	VALUE			UNITS	NOTES	
Type of Solar Simulator	Steady-state			N/A	Uses continuous-wave LEDs	
Mounting Configuration	Vertical in stand			N/A		
Intensity Adjustment Range	0 - 110			%	0.1 - 1.1 suns AM1.5G in 0.1 increments	
Class A Illumination Area	20 x 20			cm	400 cm <sup>2</sup>	
Nominal Working Distance	50			cm	Coplanar with mirror edges	
Safe Operating Temperature	15 - 40			°C		
Angular of Emission	< 30			°		
Ambient %Relative Humidity	30 - 60			%		
Size	25 x 25 x 39			cm	Does not include mounting stand	
Weight	10			kg	Does not include mounting stand	
I/O Connectors	Micro USB B			N/A		
I/O Comm/Control Protocol	Serial			N/A		
Software Compatibility	Windows 7 or later			N/A		
Network Connector	D89, male			N/A		
Power Connector	D15, male			N/A		
Unit Lifetime	10,000			hours	Expected minimum lifespan	
Warranty	2			year		
SKU LEGEND FOR SPECTRAL REGIONS						
Spectral Code	K	L	M	N	O	
Spectral Range (nm)	350 - 400	400 - 700	700 - 900	900 - 1100	1100 - 1500	



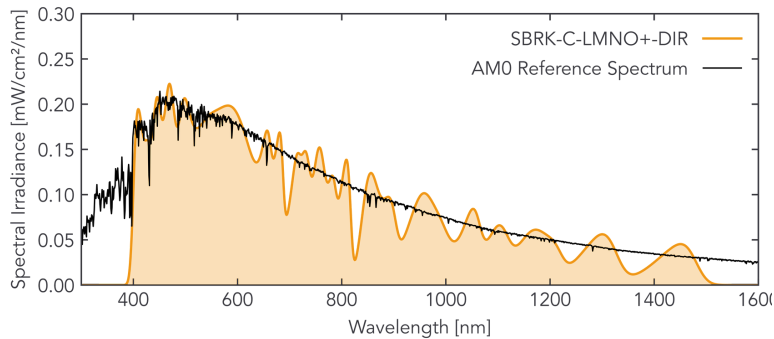
# sunbrick.™

## SPECIFICATIONS

### SUNBRICK - AM1.5G 1.0 SUN (LMNO+)



### SUNBRICK - AM0 1.0 SUN (LMNO+)



### INCLUDED



#### Variable Module

Software enables control of up to 36 tunable channels and includes our Python API and LabView DLL.

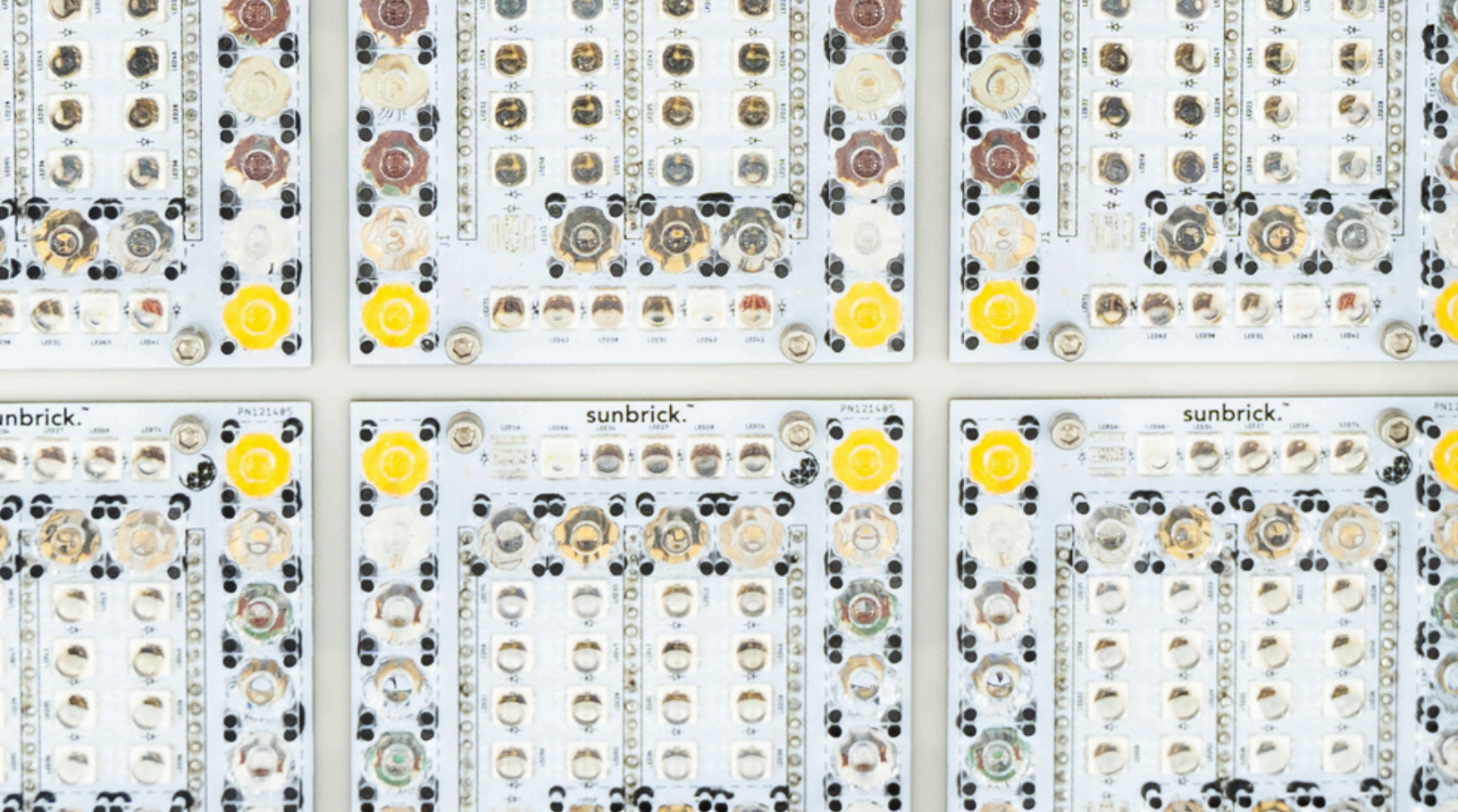


Strong aluminum structure that supports your Sunbrick for optimal functionality.



**\*Mirrored Stand Required**





## WHO WE ARE

G2V Optics (G2V) was founded to apply innovative technology and data-driven, collaborative design toward solutions for this generation's global issues. Starting with the highest precision spectral replication ever produced, G2V now provides a suite of advanced lighting products to push the boundaries of research in renewable energy, aerospace, material science, and innovative industries requiring quality light.

Our software-controlled, adjustable-spectra LED solar simulators enable researchers to unlock the potential of tomorrow's solar-powered devices. Our highly-configurable lights accommodate a wide variety of test applications and setups by replicating geographic conditions of sunlight anywhere on Earth or beyond.

**When spectral precision matters for your research, let G2V Engineer the Sun™.**



Photonic Solutions Ltd  
Edinburgh  
EH14 4AP  
+44 131 664 8122  
[www.photonicsolutions.co.uk](http://www.photonicsolutions.co.uk)



**G2V**

*ENGINEER THE SUN*

**G2V Optics Inc.**

[www.g2voptics.com](http://www.g2voptics.com)

[info@g2voptics.com](mailto:info@g2voptics.com)

This brochure was published in 2025. For the latest G2V Optics news, product information, and events, please visit our website or social media accounts.