

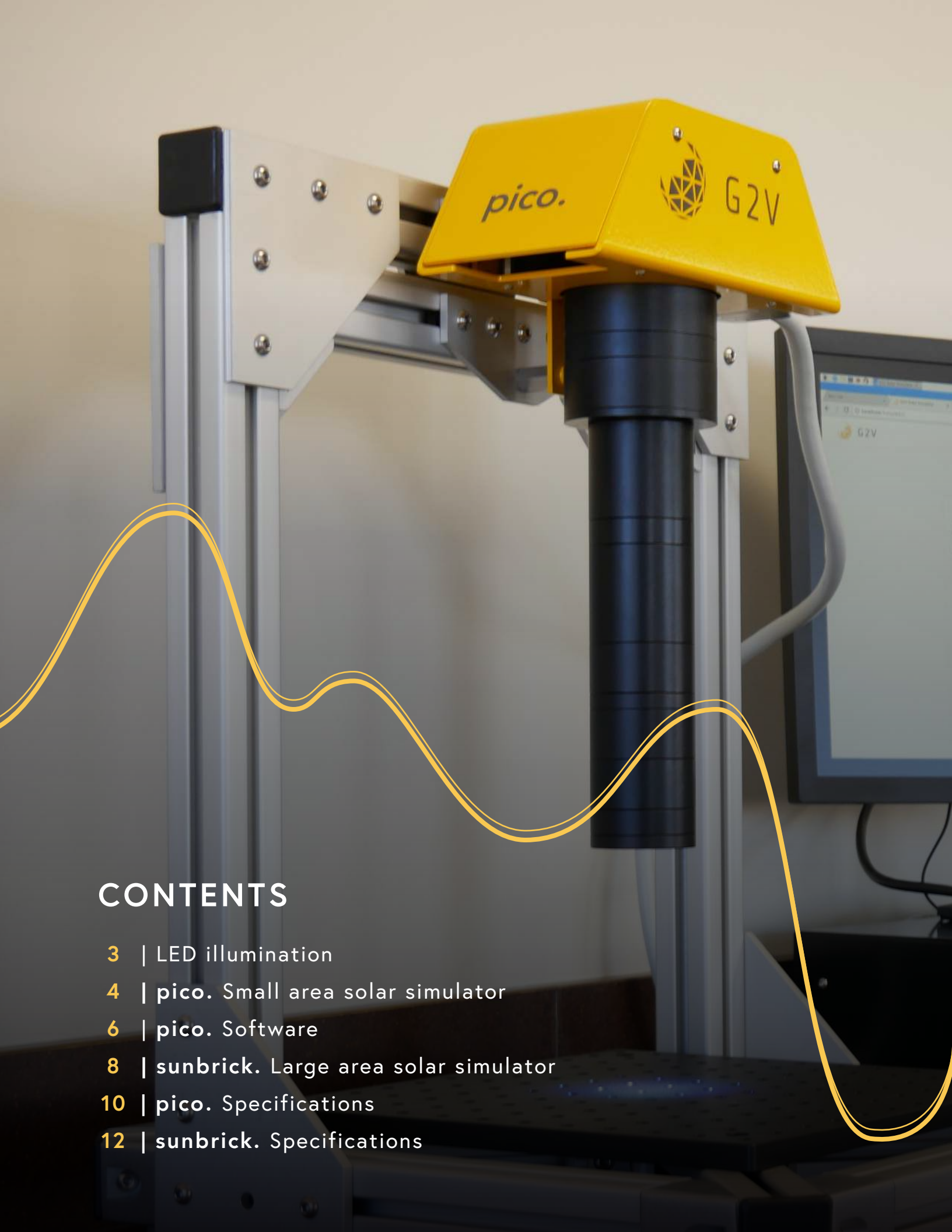


G2V

LED SOLAR SIMULATION

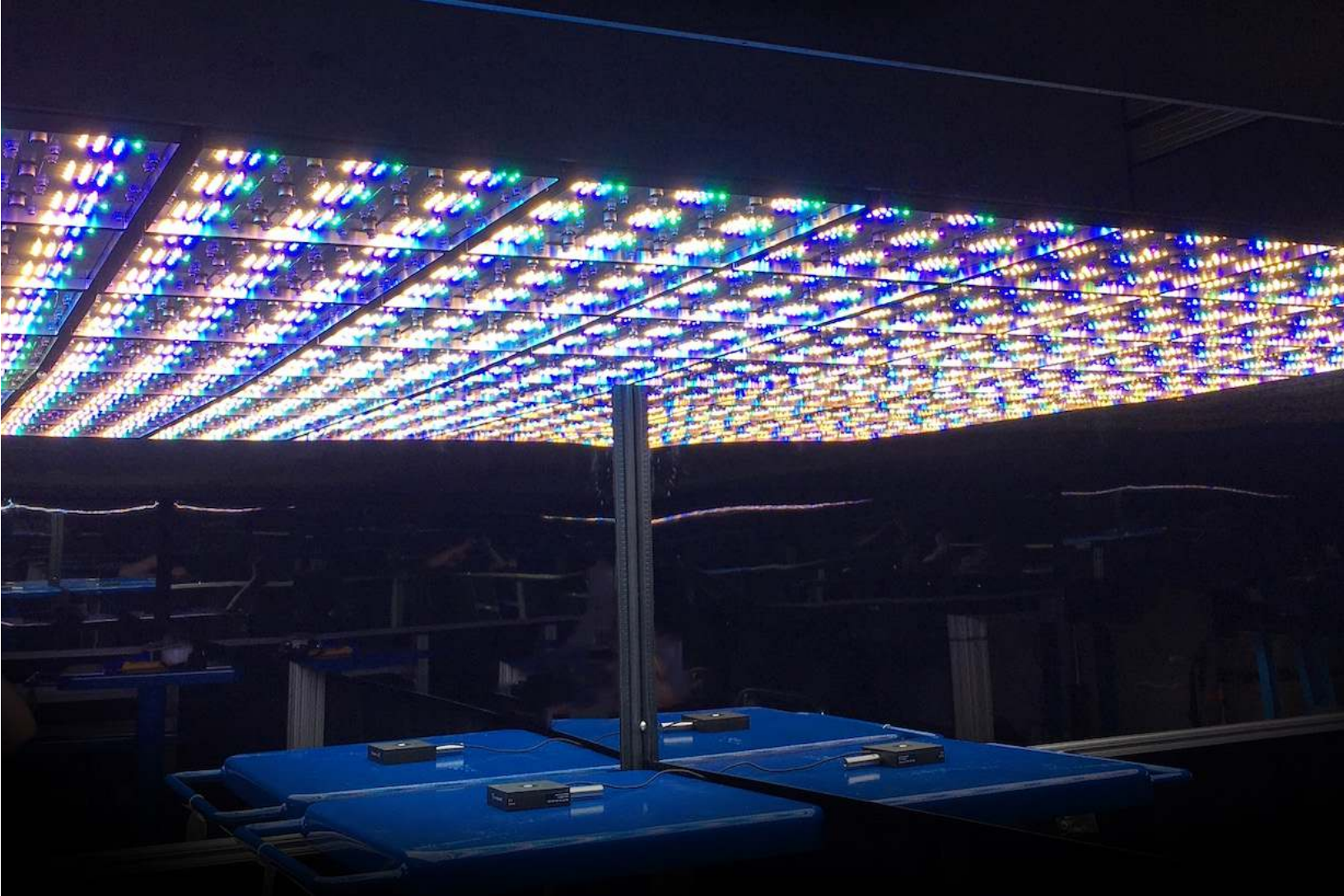
Class AAA Engineered Sunlight™

Precision testing tools for research labs



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BENEFITS OF LED ILLUMINATION



Minimal
warm-up time



No Bulb
Replacement



No Explosive
Bulb Failure



No Manual
Calibration

LEDs are solid-state devices that don't require maintenance, nor do they have the hazards related to pressurized lamps. LED Solar Simulators provide enhanced functionality, such as dynamically variable output, that better meets the experimental needs of solar energy researchers.



pico.™

SMALL AREA SOLAR SIMULATION

G2V has crafted the Pico to provide truly controllable illumination, complete with software-controlled spectra, traceable calibration, all with no bulbs, filters, or moving parts. Our Pico solar simulator can replicate any terrestrial or extraterrestrial solar spectrum including AM1.5G, and AM0 – AM40. It can also account for geography, season, and specific times of day with our One-Click Sun™ proprietary software.



Directed Optics



Lambertian Optics



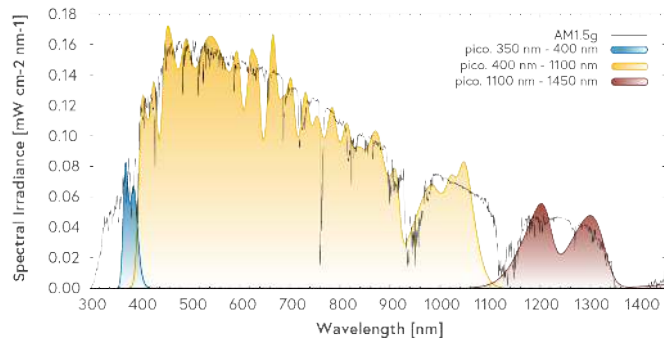
CLASS AAA

The standards that govern solar simulation are JIS-C8912, IEC 60904-9, and ASTM-E927-10, and are used to determine the quality and accuracy of a solar simulator's illumination.



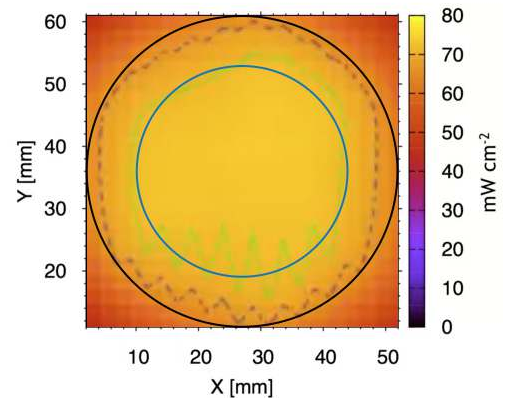
Class A Spectral Match

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 "spectral mismatch". All G2V Pico models produce a **AM1.5G spectral match that exceeds ASTM E927 by a factor of 5x.**



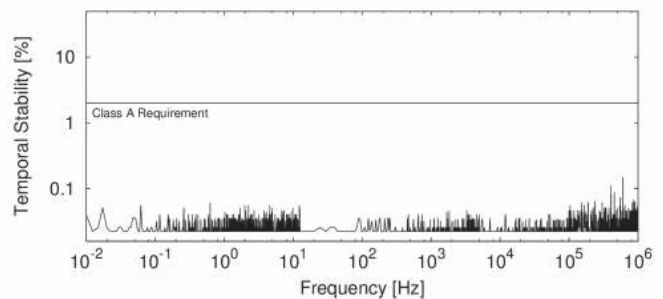
Class A Spatial Uniformity

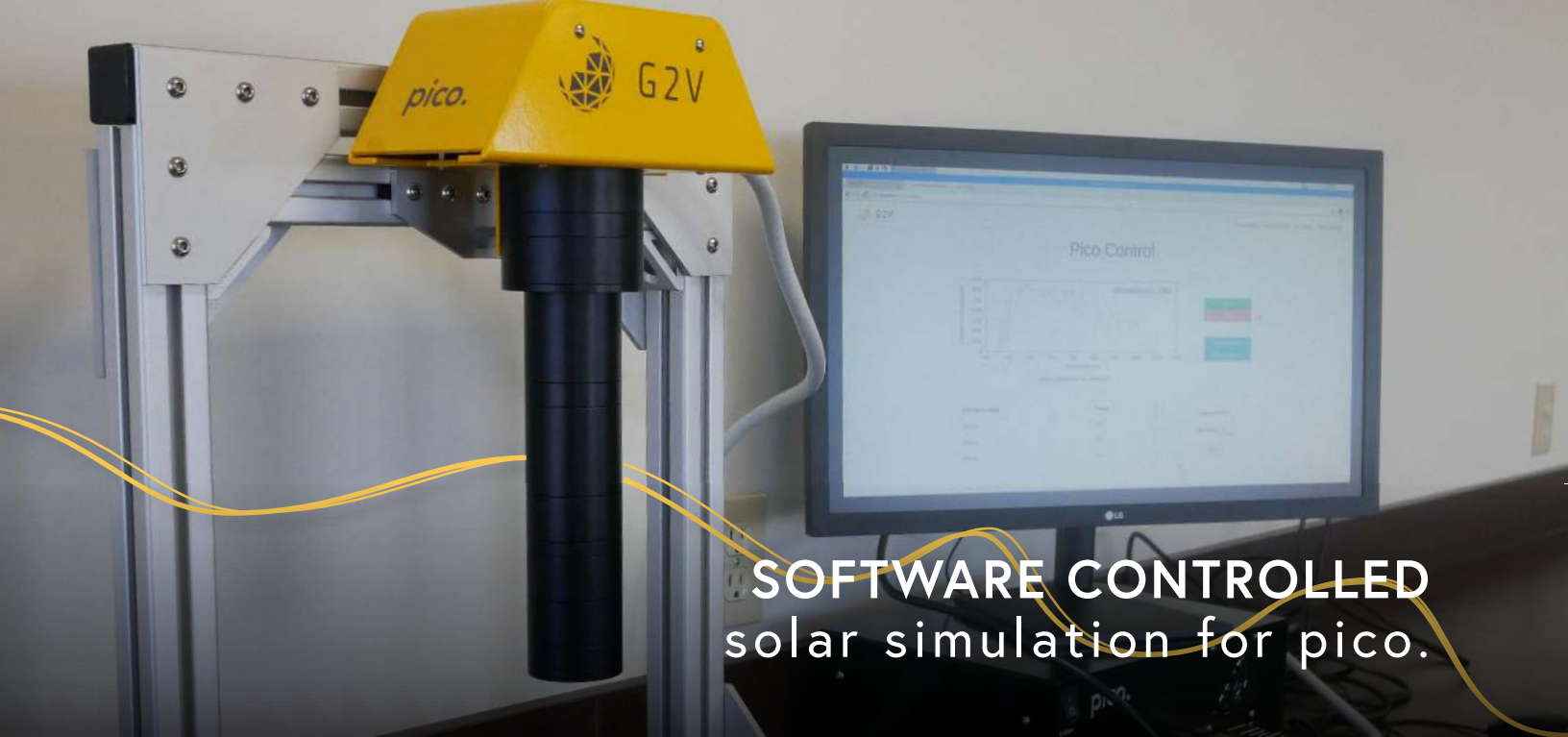
Spatial uniformity describes the distribution and consistency of irradiance over an area. The parameter is reported as "spatial non-uniformity" and is calculated from the difference of the maximum and minimum irradiance values in an area. With a Pico, you receive **one sun-equivalent irradiance with a spatial non-uniformity < 2%.**



Class A Temporal Stability

Temporal stability is the consistency of light output over a period of time. The Pico's temporal instability of 0.2% **exceeds Class A requirements by a factor of 10x.**





SOFTWARE CONTROLLED solar simulation for pico.



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 μ 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 including Efficiency, V_{OC} , I_{SC} , FF, and R_{SH} .



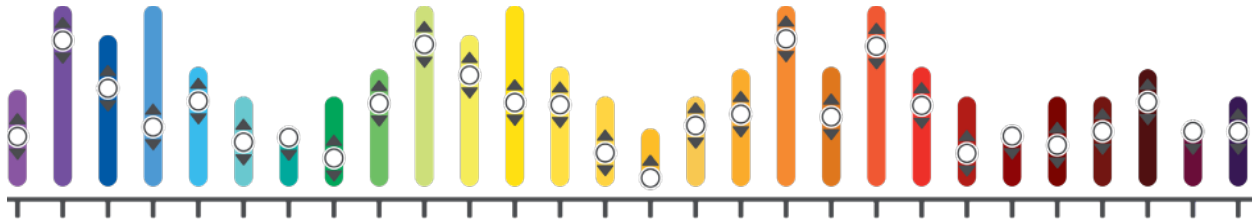
LOW-RESOLUTION EQE UPGRADE MODULE

The low-resolution EQE provides wavelength-resolved measurements of your solar cell's performance under active conditions, with up **26 probe wavelengths providing arbitrary perturbation strength**. Run with a low-noise variable-gain amplifier with variable integration time, the module can detect and amplify device currents over 16,000x.





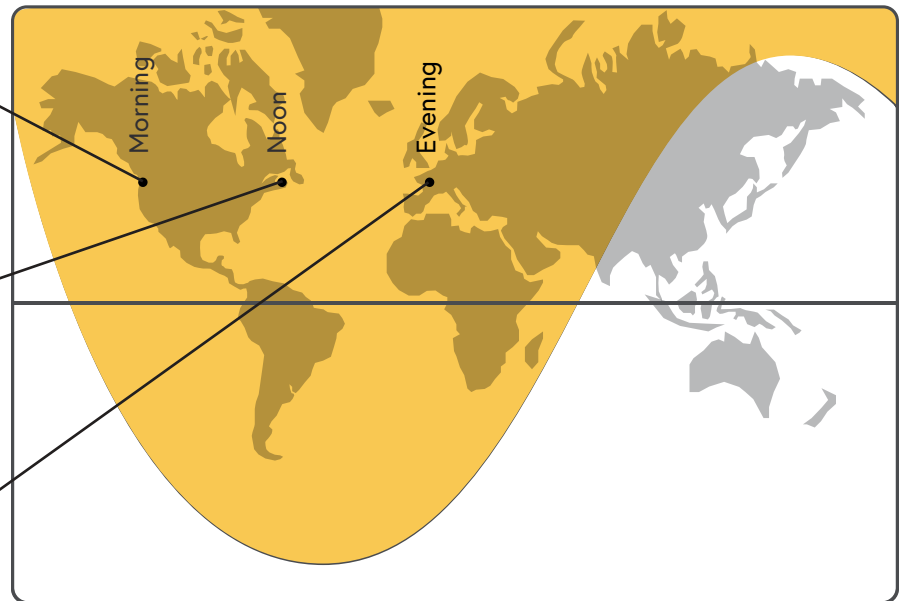
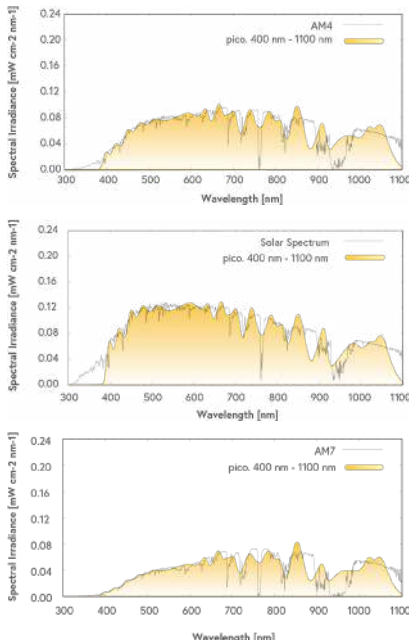
VARIABLE UPGRADE MODULE



Enables complete programmable intensity control with up to **26 tunable channels** for arbitrary spectral design. Load programmable spectral presets from AM0-AM10, AM1.5G, or AM1.5D. Enjoy the freedom to save, download, and load your own spectral functions.



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 10 Latitude/Longitude, and let our software simulate a realistic day-night cycle, at up to 500X

sunbrick.™

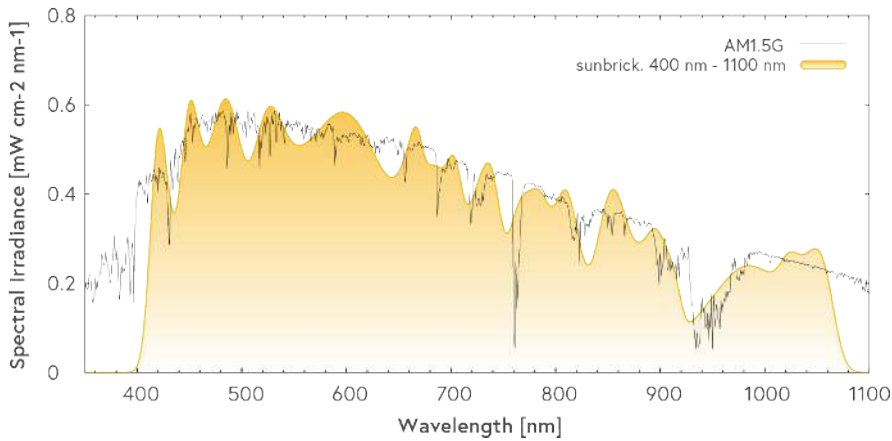
LARGE AREA SOLAR SIMULATION

The Sunbrick uses the same solar replication technology proven in the Pico. Using advanced LED-driven illumination, the Sunbrick makes large area solar simulation quick and easy with no requirements for bulb replacement or field calibration. It also has minimal warm-up time. The Sunbrick can accommodate a wide range of working areas with its modular design. Whether you need illumination in a confined space or in your entire testing facility, the Sunbrick can provide the high-quality solar simulation solution you need.





EXCEEDING CLASS A



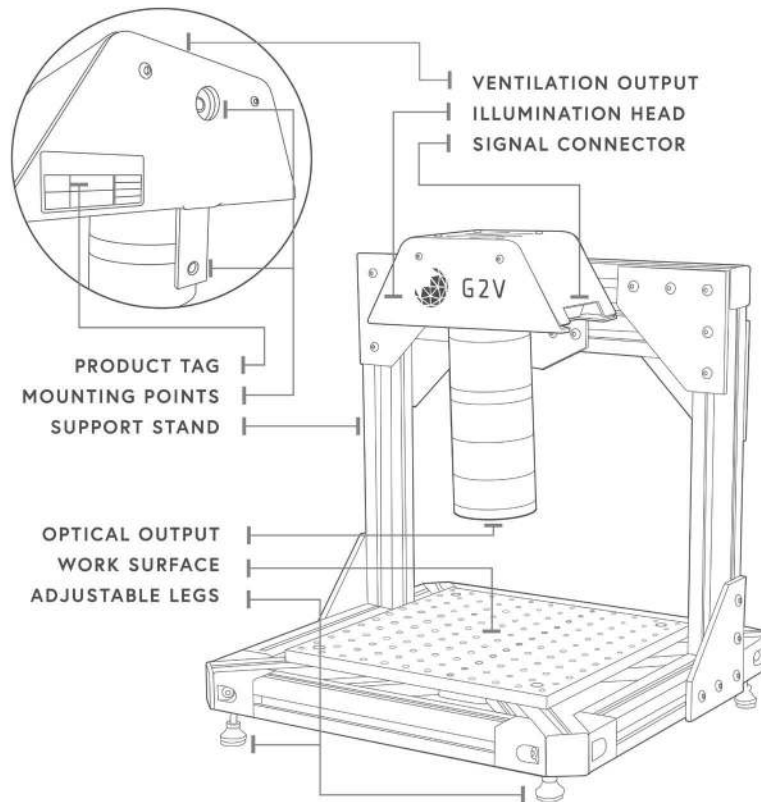
Sunbrick offers users a high precision spectral mismatch of <5%. Exceeding ASTM-E927 Class A rating by 5X.

TILEABLE

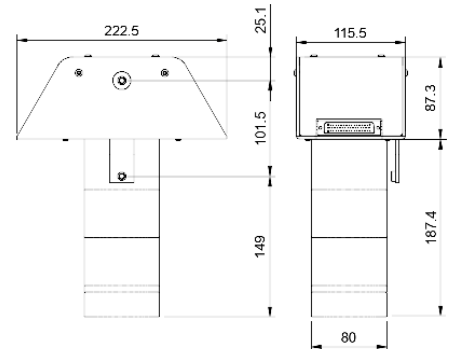
Advanced Engineered Sunlight™ for larger illumination area requirements. With its innovative tileable design, the Sunbrick is scalable to whatever illumination area you require without sacrificing spectral match, uniformity, or temporal stability. Each brick illuminates a 25 x 25 cm area with a 50 cm working distance. Multiple Sunbricks are easily mounted and networked together in arrays to provide illumination as large as required. A 16-brick array (4x4) provides a solution for a 1m² area, with larger-scale custom configurations easily achievable.

CUSTOM
Configurations
Available

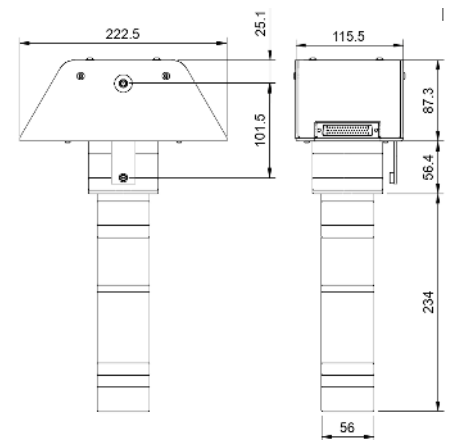




LAMBERTIAN OPTICS



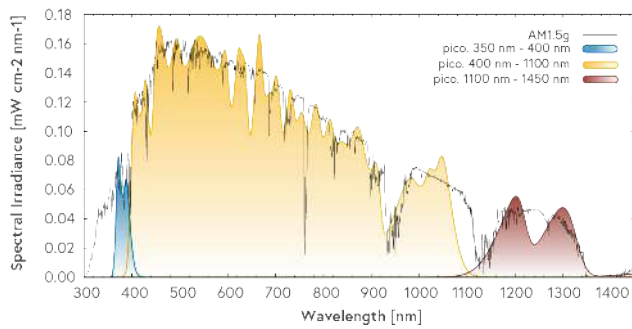
DIRECTED OPTICS



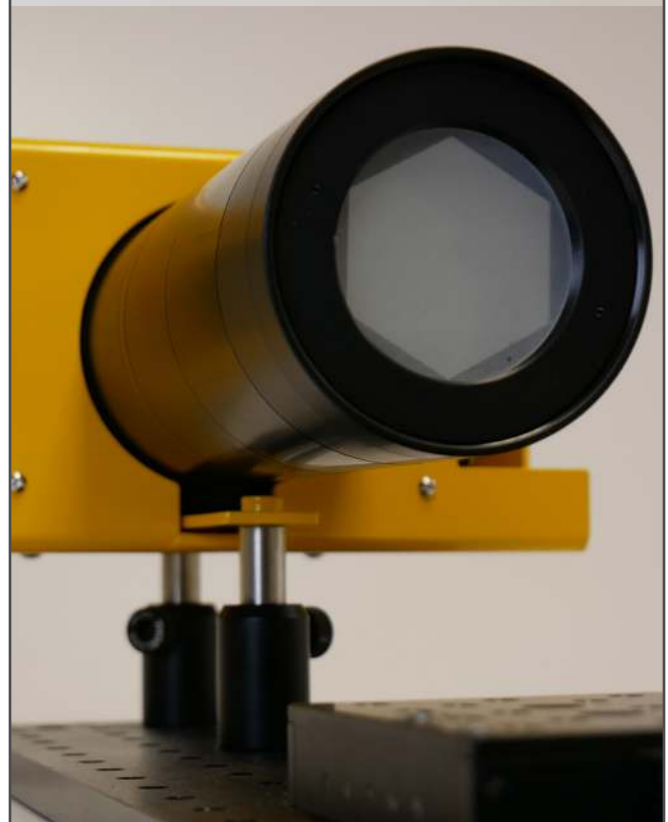
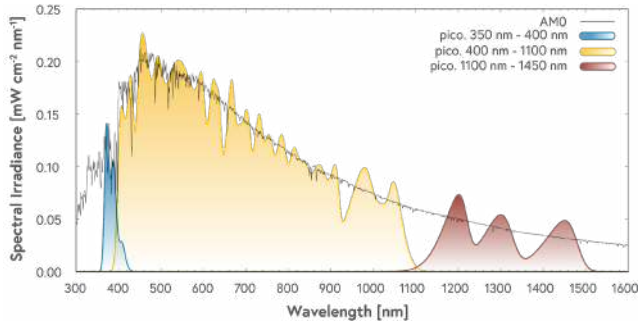
SPECIFICATIONS	LAM-BASE	DIR-BASE	DIR-BASE-UV	DIR-BASE-UV-NIR	DIR-BASE-NIR
ASTM E927 / IEC 60904-9 / JIC C8912	Exceeding Class AAA specifications				
Spectral Mis-match	<5%	<5%	<5%	<5%	<5%
Spatial Non-uniformity	< 2%	< 2%	< 2%	< 2%	< 2%
Temporal Instability	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%
Spectral Range (nm)	400 - 1100	400 - 1100	350 - 1100	350 - 1450	400 - 1450
SKU Spectral Code	LMN	LMN	KLMN	KLMNO	LMNO
Working Distance	1 cm	7 cm	7 cm	7 cm	5 cm
GENERAL SPECIFICATIONS					
Technology	Continuous-wave (CW) solid-state light emitting diodes (LEDs)				
Illumination Area	9 cm ² (hexagonal illumination)				
Irradiance	0.1 - 1.1 suns equivalent intensity				
Input Voltage	90 VAC - 240 VAC, 50 Hz - 60 Hz				
Power Use	< 200W				
Plug & Power Supply	Configuration specific to geographic region				
Materials	Powder coated aluminum				
Mounts	1/4 - 20 or M6 Adapters				
Weight	2.0 kg / 4.4 lbs illumination head, 2.8 kg / 6.2 lbs control box, 22.5 kg / 50.0 lbs support stand				
Warranty	2 years				
SKU LEGEND FOR SPECTRAL REGIONS					
Spectral Code	K	L	M	N	O
Spectral Range (nm)	350 - 400	400 - 700	700 - 900	900 - 1100	1100 - 1450



PICO - AM1.5G



PICO - AM0



AVAILABLE UPGRADES



Variable Module

Enables control of up to 26 tunable channels and includes One-Click Sun™ Software.



EQE Module

Provides wavelength resolved measurements of your device's quantum efficiency under active conditions.



IV Module

Power conversion efficiency measurement and report generation for solar cell characterization.



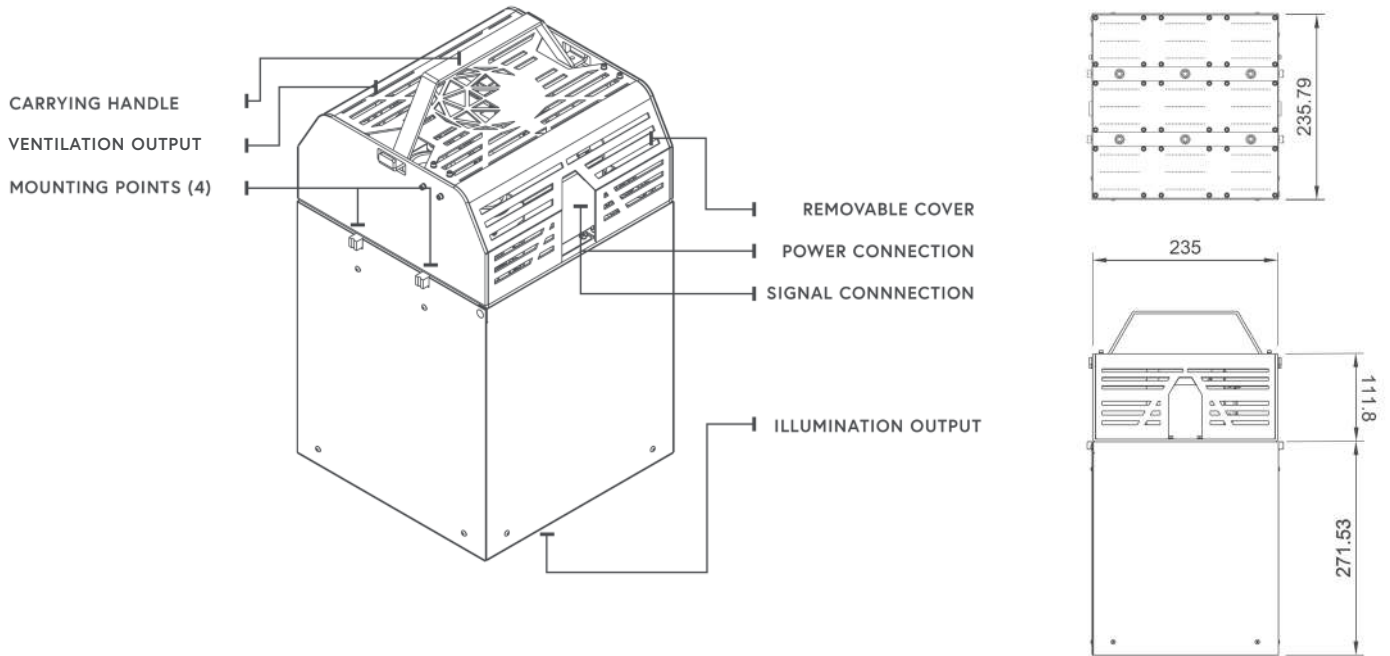
Support Stand

Strong aluminium structure that supports your Pico for optimal functionality.

If you would like to learn more about G2V Optics, any of our products, or pricing please contact us at info@g2voptics.com or +1.877.428.0428. If you want to see the most recent pricing of G2V Optics Pico please visit g2voptics.com/pico



sunbrick.™ | SPECIFICATIONS

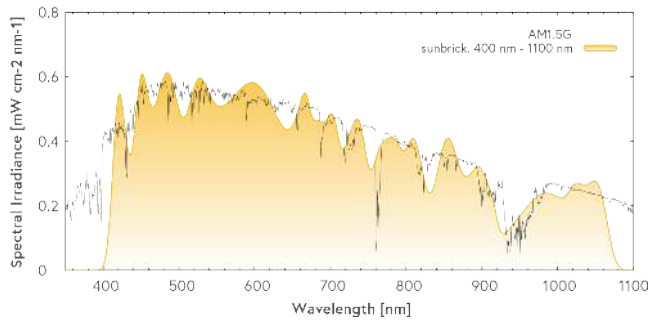


SPECIFICATIONS	VISIBLE	BASE	BASE-UV	BASE-NIR	
ASTM E927 / IEC 60904-9 / JIC C8912	Class AAA	Exceeds Class AAA	Exceeds Class AAA	Exceeds Class AAA	
Spectral Mis-match	<25%	<5%	<5%	<5%	
Spatial Non-uniformity	< 2%	< 2%	< 2%	< 2%	
Spectral Range (nm)	400 - 700	400 - 1100	350 - 1100	400 - 1450	
SKU Spectral Code	L	LMN	KLMN	LMNO	
GENERAL SPECIFICATIONS					
Technology	Continuous-wave (CW) solid-state light emitting diodes (LEDs)				
Working Distance	50 cm (may include reflective walls)				
Illumination Area	625 cm ² (25 cm x 25 cm)				
Irradiance	0.1 - 1.1 suns equivalent intensity				
Input Voltage	48 VDC				
Power Use	250 W per unit				
Plug & Power Supply	Configuration specific to geographic region and array size				
Materials	Powder coated aluminum, brushed aluminum				
Support	Aluminium				
Weight	10.0 kg / 22.1 lbs per Sunbrick unit				
Warranty	2 years				
SKU LEGEND FOR SPECTRAL REGIONS					
Spectral Code	K	L	M	N	O
Spectral Range (nm)	350 - 400	400 - 700	700 - 900	900 - 1100	1100 - 1450

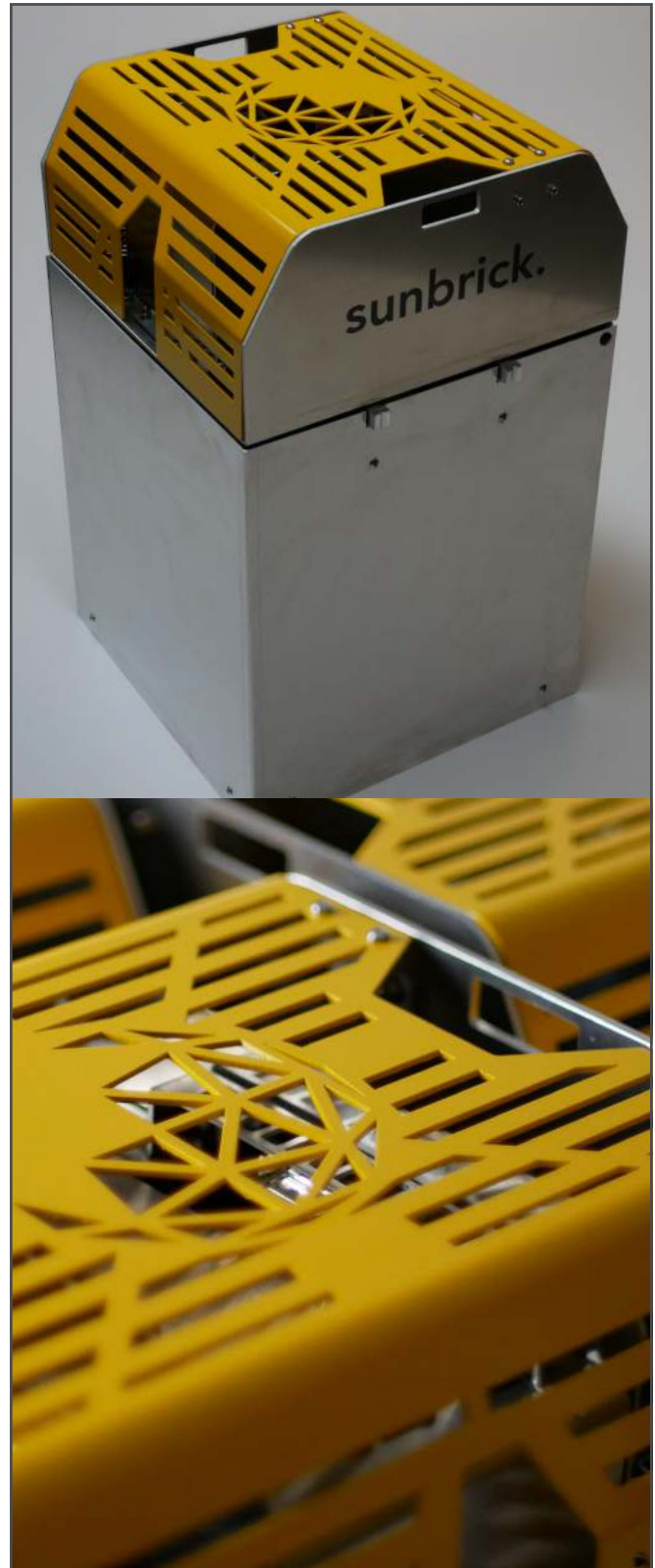
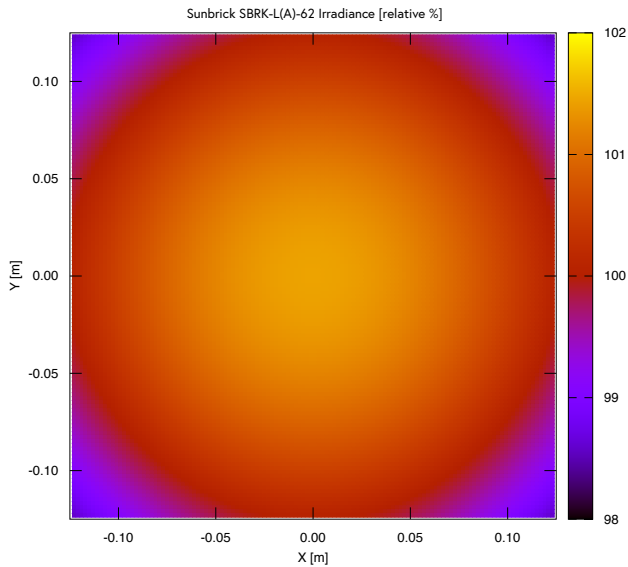


sunbrick.™ | SPECIFICATIONS

SPECTRAL PLOT



UNIFORMITY PLOT



INCLUDES

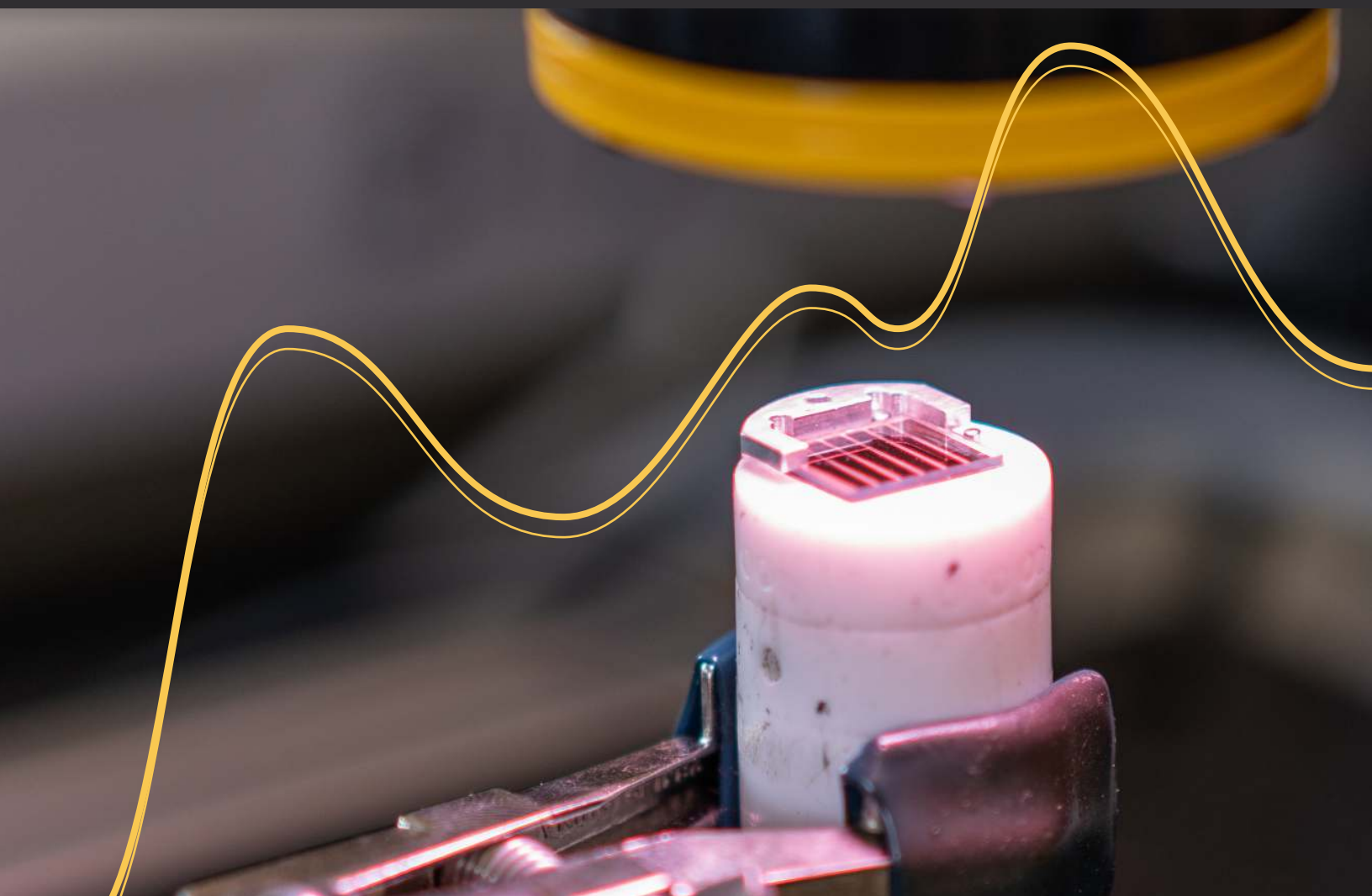


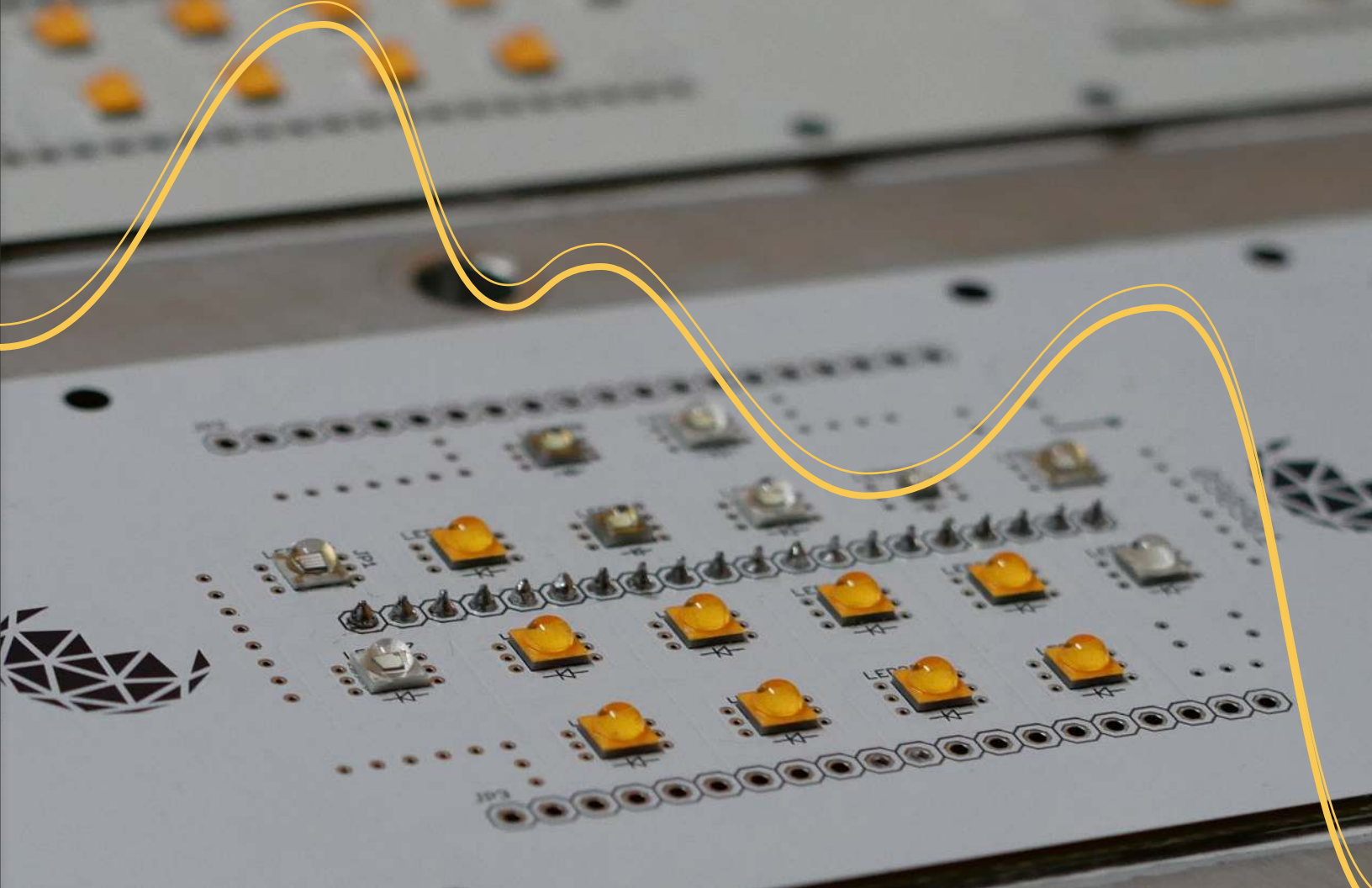
Variable Module

Enables control of up to 20 tunable channels

If you would like to learn more about G2V Optics or any of our products, please contact us at info@g2voptics.com or +1.877.428.0428. If you want to see the most recent pricing of G2V Optics Sunbrick please visit g2voptics.com/sunbrick

The sun powers all of the life on Earth.
Engineering its energy and light to
invent, test, and apply technology for the
betterment of humanity is crucial.





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, monitoring, and data science products** to push the boundaries of renewable energy research, material science, and modern horticulture.

Our software-controlled, adjustable-spectra LED solar simulators enable researchers to unlock the potential of tomorrow's solar powered devices. Our closed-loop horticulture systems maximize output and chemical content by replicating geographic conditions, monitoring, analyzing, and adjusting in real-time. **When spectral precision matters for your research, let G2V Engineer the Sun™.**



G2V

ENGINEER THE SUN

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This brochure was published in 2019. For the latest G2V Optics news, product information, and events, please visit our website or social media accounts

