GAMMA
SCIENTIFIC
™

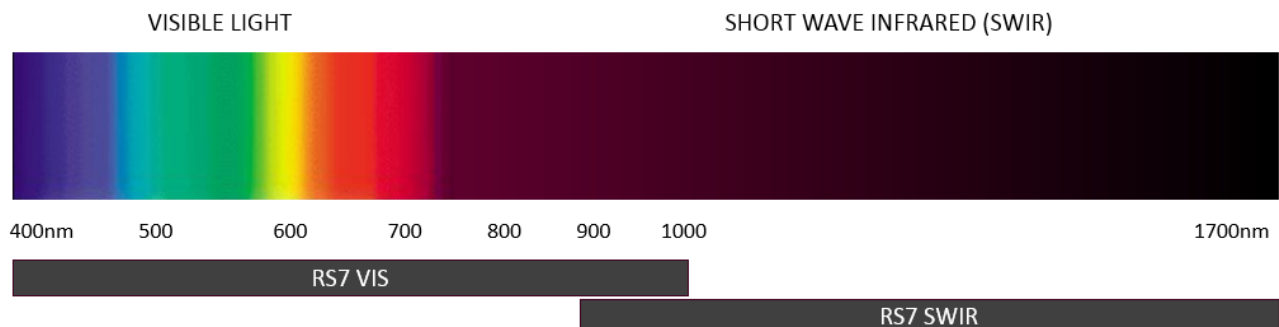## SpectralLED® RS-7 Series Digital Tunable Light Sources

Gamma Scientific is proud to introduce the latest innovation in uniform intensity light sources. The SpectralLED® family of tunable light sources incorporate up to 35 discrete wavelengths for synthesis of commercially available light sources or based on spectra that you import. The platform is easily adaptable for automated test systems and production line integration, with integrated optical feedback and temperature control to ensure rock-solid stability and consistent results.

Unprecedented Resolution and Accuracy
For Camera and Image Sensor Calibration

Standard and Custom Configurations Include

- Large Output Port – Exit Ports Ranging From 150mm to 600 mm or More
- Fiber Optic Output – Flexible Illumination Where Space is Limited
- Wafer Probe – Directly Replaces Lamp-based Sensor Testers
- Baffle Output – User-adjustable f-number Ranging from f/1 to /f4
- Wide Field of View – Up to 180° Field of View with < 97% Uniformity
- Light Booth – Enables CRI Experimentation, Analysis and Optimization

VISIBLE LIGHT   SHORT WAVE INFRARED (SWIR)

400nm   500   600   700   800   900   1000   1700nm

RS7 VIS

RS7 SWIR

UNMATCHED ACCURACY

In addition to our exceptional technical and functional capabilities, Gamma Scientific is ISO/IEC 17025 accredited by NVLAP (NVLAP lab code 200823-0), so you can trust the NIST-traceable calibration that comes programmed into every SpectralLED® source.

KEY FEATURES & BENEFITS

- 35 Discrete LED Wavelengths Covering the Visible and NIR -- Unprecedented Resolution and Accuracy
- Powerful Synthesis Engine -- Quickly Simulate any CIE Illuminant or X-RITE™ (Macbeth™) Color Patch
- Flexible Interface -- Built-in RMS Spectral Fitting for Simulation of Any User Imported Spectra
- Easily Adaptable -- for Automated Test Systems and Production Line Integration
- Pure DC Constant Current Drivers -- Accurate Output in Real Time
- On-board TEC and Optical Feedback -- Precise LED Temperature and Wavelength Control
- ISO/IEC 17025 Accredited by NVLAP (NVLAP lab code 200823-0) - Superior Wavelength and Color Accuracy

Incorporating the latest LED technology available, the RS7 VIS series, comprised of 35 discrete wavelength LEDs, delivers a nearly continuous spectrum from 380nm to 1000nm. This allows for an unprecedented color gamut and applications otherwise impossible for traditional halogen or LED light sources.

The SpectralLED® SWIR series employs LED's at 9 discrete wavelengths from 900nm to 1700nm in the Short-Wave Infrared portion of the spectrum, providing a fully programmable spectra with highly uniform and stable output.

INDUSTRY APPLICATIONS

- Camera and Image Sensor Calibration

- Ambient Light Sensor Calibration

- Photodiode Detector Responsivity

- OEM Camera Manufacturing

- Spectrum/Illuminant Simulation

- Diagnostic Medical Imaging

- Technical and Industrial Photography

CIE 1931 Chromaticity Diagram

Legend: CIE1931, SpectralLED Gamut
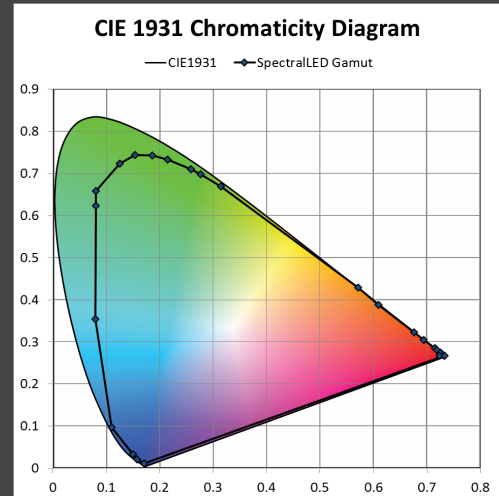
Unlimited Spectra Possibilities

- Independent 16-bit control on all channels, provide virtually infinite spectral profiles

- More channels, brightest output, highest accuracy & most powerful features available

- No external software is required; the device firmware controls RMS fitting, stores calibration data and allows for custom presets

- Direct integration into your process via USB and RS-232 interfaces.

### Unmatched Accuracy and Reliability

- Pure DC constant current driver with floating differential sensing

- Zero flicker or uncertainty in the drive current

- Integrated optical feedback controls optical output power to within a fraction of a percent

- On-board thermal management maintains LED temperature for stable and precise wavelength control, even at high drive currents

Replace multiple instruments with a single device. With a fully spectrally tunable output, all you need is one SpectralLED® to generate any spectral power distribution. Whether it be blackbody, daylight, fluorescent, LED, or something completely unique.
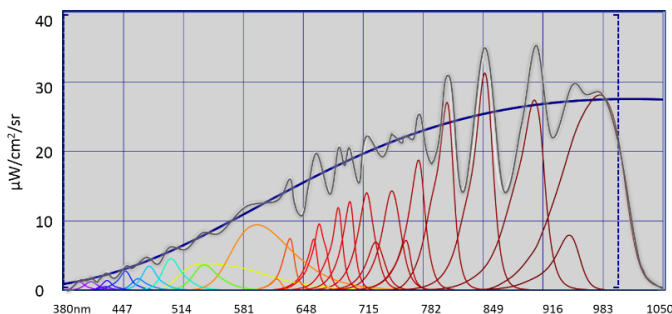
Illuminant A (Blackbody 2856K)

Simulation using RMS Spectrum Fitting. Target (Blue) Output (Gray)
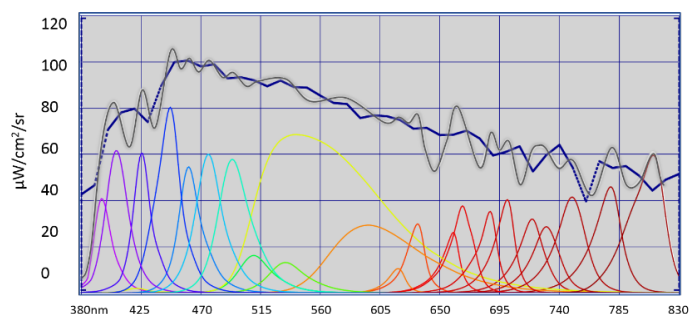
Illuminant D65 (Daylight 6500K)

Simulation using RMS Spectrum Fitting. Target (Blue) Output (Gray)

MEASUREMENT APPLICATIONS

- White Balance
- Quantum Efficiency
- Spatial Non-Uniformity
- Pixel Defects
- Cross Talk
- Vignetting Correction
- Sensitivity
- Responsivity
- Signal-to-Noise
- Linearity
- Saturation
- Exposure
- Dynamic Range
- Hyperspectral Imaging

Spatial Non-Uniformity Testing for Array Sensors

Locate sensor pixel defects or response variation using the highly uniform output in a variety of optical geometries. Whether you need a radiance or an irradiance light source, there is a configuration perfectly suited for your application.
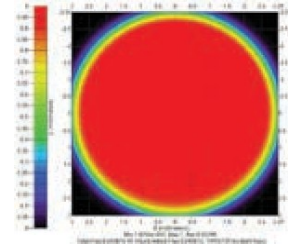
Linearity, Responsivity & Quantum Efficiency

Accurately characterize sensor parameters with high dynamic range. Using a proprietary calibration technique and high precision optical feedback, receive unsurpassed sensor performance data. This makes it the perfect choice for characterizing an unknown sensor's performance.
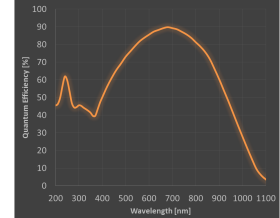
An all Solid-State Alternative to Lamp-based Monochromators

By sweeping through individual LED channels, the SpectralLED® can emulate a traditional monochromator light source. With no moving parts and no halogen input illumination, the solid state SpectralLED® is the clear choice for demanding applications.

KEY SPECIFICATIONS	RS-7-VIS	RS-7 -SWIR
Spectral Range	380 nm to 1,000 nm	900 to 1700 nm
Spectral Output	35 discrete LED channels Visible resolution ~ 15nm, NIR resolution ~ 50 nm (typical channel spacing)	9 discrete LED channels SWIR resolution ~ 50 nm (typical channel spacing)
Spectral Bandwidth	Typical VIS of 20nm and NIR of 50nm FWHM	Typical of 50-100nm FWHM
Illumination Stability	≥ 99.99% after 50 ms radiance or 2 sec spectrum	≥ 99.99% after 50 ms radiance or 2 sec spectrum
Illumination Accuracy	± 1% Absolute, NIST traceable	± 3% Absolute, NIST traceable
Spectral Accuracy	± 1 nm centroid wavelength	± 2.5 nm centroid wavelength
Color Accuracy	CIE 1931 x,y ± 0.003	N/A
Supported Operating Systems	USB drivers for Windows, OSX and Linux via FTDI virtual COM port Legacy RS-232 serial port for integration (no OS required)	
CONFIGURATIONS	RS-7 -VIS	RS-7- SWIR
RS-7-1 Benchtop	75mm output port with integral integrating sphere	75mm output port, Gold coated integrating sphere
RS-7-2 Large Output Port	Exit ports ranging from 150mm to 600 mm	
RS-7-3 Fiber Optic Output	One or more fiber outputs with distal end collimation	
RS-7-4 Wafer Probe	Directly replaces lamp-based systems	
RS-7-5 Baffle Output	150mm output with user adjustable f/number of f/1, f/2, f/3 or f/4	
RS-7-6 Wide Field of View	75mm output port with up to 180° field of view	
RS-7-7 Light Booth	CRI experimentation, analysis & optimization	

Specifications are subject to change without notice