RS-5B Programmable LED Light Sources
Gamma Scientific’s RS-5 Series of Uniform, LED light sources can take the place of numerous standard light sources for the calibration of your cameras, sensors and optical instruments.

RS-5 Series light sources simplify the calibration process by providing you with the ability to quickly set the exact color, intensity or spectral profile required for nearly any measurement. Each ten channel light source is custom built, with your choice of LED wavelength and color.

The Gamma Scientific RS-5B spectrally programmable digital uniform light source provides a versatile way to test and characterize CCD, CMOS, and other image sensors, cameras, and detectors.

The ten channel digital light source features spectral and color selections from the UV to near infrared, including broadband whites with your choice of LED color/wavelength. This allows the user to sculpt different standard illuminants or special color profiles (e.g. ColorChecker Color Rendition Chart profiles).

Together with a range of projector options, the system delivers near perfect linearity and uniformity, giving the sensor or camera engineer and manufacturer an unparalleled foundation with which to verify the quality and consistency of their components and products.
Features

- Light-source color selections from UV region to the near infrared, and broadband white
- Quickly set exactly the color, intensity or spectral profile required for almost any measurement
- Computer controllable with simple commands that can easily integrate into existing testers or new test systems
- Adjustable light-level setting to 1 part in 65,535 in absolute, NIST-traceable, radiometric and photometric units
- Near-perfect linearity and uniformity (less than 0.1% RMS over the 0 to 65,535 intensity range)
- Light-illuminance settling time less than 0.1 second
- 100x longer light-source lifetimes
- Nearly zero downtime – no lamp change required
- The system runs continuously for thousands of hours
- Enables a single operator with a single instrument to perform a series of highly accurate measurements in minutes
Since 1961 Gamma Scientific has produced LED, display and light measurement test solutions for production and R&D environments. Gamma Scientific instruments are trusted by leading global organizations that require high-speed, precision measurements and custom configurations for the most challenging environments. Gamma Scientific also operates a NVLAP accredited laboratory that performs LM-79/LM-80 LED testing and is ISO 17025 compliant. NVLAP Lab Code 200823-0.

To view the complete line of test and measurement solutions from Gamma Scientific, please visit our website at www.gamma-sci.com.

Industry Applications

- Camera and Image Sensor Calibration
- Smartphone OEMs
- Aerospace
- Vision Research and Color Science
- Diagnostic Medical Imaging
- Technical and Industrial Photography
- Design of Illumination Sources
- Camera Module Suppliers
- Ambient Light Sensor Calibration

Measurement Metrics

- White Balance
- Quantum Efficiency
- Spatial Non-Uniformity
- Pixel Defects
- Cross Talk
- Vignetting
- Sensitivity
- Responsivity
- ISO speed
- Linearity
- Gamma and Photon transfer
- Noise Equivalent Exposure
- Saturation Exposure
- Dynamic Range
- Signal-to-Noise
<table>
<thead>
<tr>
<th>Source Geometry</th>
<th>100 mm diameter extended source. Projection beam, Lambertian radiator, or uniform illuminator option. Up to 10 spectral channels.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral Output</td>
<td>Narrow or broadband configurations from 360 to 1100 nm. Custom spectrums/illuminants or CIE[x,y] gamuts by request.</td>
</tr>
<tr>
<td>Spectral Bandwidth</td>
<td>10-700 nm (can be narrowed on request).</td>
</tr>
</tbody>
</table>
| Linear Brightness Adjustment | 16 bits  
Resolution  
Dynamic Adjustment Range  
Signal to Noise ratio  
Non-linearity  
Radiometric  
Photometric  
Colorimetric  
CCT  
| Dynamic Adjustment Range | Depends on Spectrum (12 bits typical)  
< 1.0% RMS of full scale  
< 1.0% RMS of full scale  
< 1.0% RMS of full scale  
< 1.0% RMS of full scale |
| Signal to Noise ratio   |                                                                                                                                      |
| Non-linearity           |                                                                                                                                      |
| Radiometric             |                                                                                                                                      |
| Photometric             |                                                                                                                                      |
| Colorimetric            |                                                                                                                                      |
| CCT                     |                                                                                                                                      |
| Color Error             | 1.0 delta E (CIE 1994 JND units)  
vs. intensity 1.0 delta E (CIE 1994 JND units) |
| vs. CIE[x,y]            |                                                                                                                                      |
| vs. intensity           |                                                                                                                                      |
| Brightness Instability  | < 0.003 secs. for 1.0% brightness certainty  
< 1.0 secs. for 0.1% brightness certainty |
| Settling time           |                                                                                                                                      |
| Repeatability           | > 99.99% after settling                                                                                                              |
| Drift with temperature  | 0.005% of full scale/°C  
0.02% of full scale/°C |
| Radiometric offset      |                                                                                                                                      |
| Radiometric gain        |                                                                                                                                      |
| Long Term Drift         | 1% of full scale, combined OFFSET and GAIN                                                                                           |
| Maximum Control Rate    | 10 kHz (for 100% modulation)                                                                                                         |
| Absolute NIST-traceable accuracy | ± 3% of dial setting at full scale  
(±1% by request)                                                                 |

*Standard Operating Range for Gamma Scientific Instruments- Temperature: Minimum: 0°C (32°F) - Maximum: 35°C (95°F); Relative Humidity (Non-Condensing): Minimum: 20% - Maximum 70%

**The information contained in this data sheet is based on Gamma Scientific's internal evaluation and is subject to change at any time without notice

***Revised on August 18, 2015