SynthiColor™ Spectral Programming Software

PRODUCT SUMMARY

The SynthiColor™ Software package equips the RS-5B spectrally programmable light source with easy-to-use interactive programmability and control. SynthiColor brings together all the incredible spectral and colorimetric capabilities of the RS-5B light source into a single, fully interactive, Windows application. User-defined spectrums, colors, and illuminants can be interactively created using the SynthiColor software in conjunction with an RS-5B digital light source.

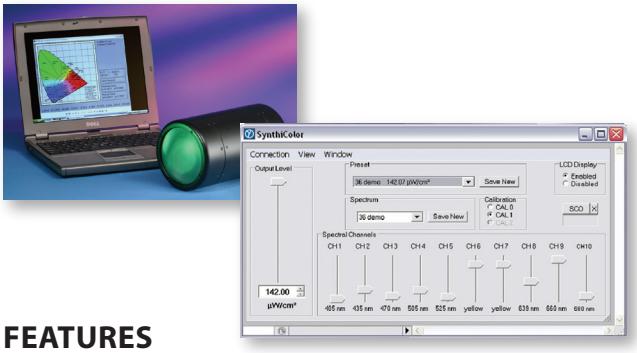
SynthiColor communicates directly with any RS-5B source connected to the serial port of a host PC. SynthiColor provides PC-based spectral synthesis, data handling and storage, spectral and colorimetric metrics, as well as high speed matrix optimization routines — and all in a single 'point and click' Windows application which is both real-time and interactive.

Spectrums can be created by the user either through simple Windows slider controls, or by importing user-defined spectral data. Spectrums can be saved, recalled, displayed, and quantified with regard to their spectral and colorimetric characteristics. Individual spectral profiles can be imported, matched, and displayed using adjustable matching and illuminant criteria; and can even conserve 'whiteness' and 'lightness' references across different spectral profiles (L*a*b* color space).

SynthiColor and an RS-5B source combine to form an integrated spectral programming and generation system. This gives the camera or imager systems designer unparalleled depth and versatility with which to quantify the performance and quality of products.

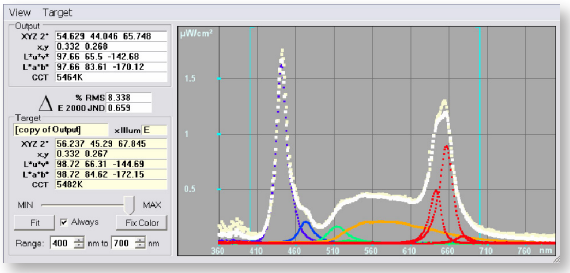
A comprehensive range of highly accurate electro-optical measurements can be performed in just a matter of minutes.

EXAMPLE: The GretagMacBeth™ ColorChecker. The entire chart can be produced under a variety of standard illuminants, including conservation of the relative luminance levels between the individual tiles of the chart. Owing to the independent 16 bit digital control of the RS-5B spectral channels, an almost limitless range of small colorimetric and radiometric variations on the 24 chart spectrums can be invoked at will — an impossibility for passive reflective targets. And of course, all of this is done with guaranteed NIST-traceable accuracy from Gamma Scientific.



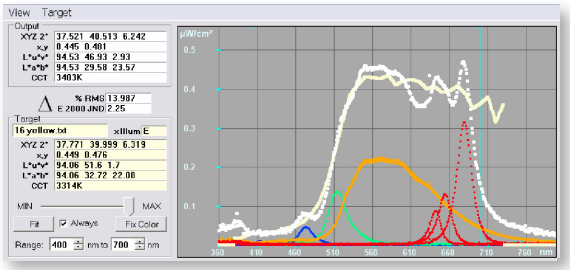
FEATURES

- *Create, save, and recall spectrums and colors.*
- *Emulate natural and man-made illuminants, such as lamps, emissive materials, and other sources.*
- *Produce unusual spectral profiles for special applications, not possible with ordinary lamps.*
- *Produce colors using calibrated radiometric and/or photometric power levels.*
- *Adjust spectral and/or colorimetric characteristics while maintaining constant radiometric or photometric power.*
- *Convolve and generate user-defined spectral distributions with standard or custom illuminants.*
- *Invoke hyperfine changes in color and/or spectral content which are beyond visual detection.*



APPLICATIONS

- *Photometric, radiometric, and colorimetric calibration of imaging systems.*
- *Design of illumination sources.*
- *CMOS, CCD, and other imager performance measurements: such as non-linearity, spectral response, electronic gain, signal/noise ratio, color reproduction error.*



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SPECIFICATIONS

Spectral and Colorimetric Programming	Delivered with up to 10 independent spectral or color channels.
Spectral output range	360 – 1000 nm (depends on LEDs installed)
Spectral/color channel bandwidth	10 – 500 nm (depends on LEDs installed) (can be narrowed by special request)
Reference illuminants	E, C, A, D65, D50, and user-defined
Reference white	User defined tristimulus ratios and lightness references
Color gamut	Depends on LEDs installed
Spectral and Color Metrics	
NIST-traceable units	Irradiance, radiance, illuminance, luminance, joules, lumens
Color coordinates	CIE[xy], [L*u*v*], [L*a*b*], and tristimulus values
Correlated Color temperature	°Kelvin
Spectral and Colorimetric Optimization	Uses matrix, nonlinear, and iterative methods to synthesize spectrums or colors which exhibit minimal metameric behavior.
Spectral/color matching window	10 – 640 nm wide: centered anywhere in the 360 – 1000 nm range.
Spectral matching error	Reports the % R.M.S. error between the target spectrum and the output spectrum.
Color difference error	Reports the color difference between the target spectrum and the output spectrum in JND units [CIE 2000 Delta E].
Data Import/Export	User programmed spectrums can be saved and recalled. User defined spectral data (.xls) can be loaded and matched
Graphical Display	
Spectral channel power adjustment	Windows slider control
Total output power adjustment	Windows slider control
Preset spectrum names	Text input field
Calibration number	Point/click button
CIE standard observers	Displays the three tristimulus response curves (2° and 10°)
Individual spectral channels	Displays the spectral output distribution for each channel
Target spectral distribution	Displays the desired spectral output distribution
Output spectral distribution	Displays the actual spectral output distribution
Spectral optimization range	Delimits the range to be spectrally matched
Spectral matching error report	Displays the %R.M.S. error between target and actual spectral output.
Tristimulus values report	Displays 0-100 for each of the three tristimulus regions
Reference illuminant	Displays the reference illuminant spectral distribution
Reference white	User defined tristimulus ratios and lightness reference
Correlated Color Temperature	Displays the target and actual CCT in °Kelvin
Color coordinates	Displays the coordinates as CIE[xy], [L*u*v*], and [L*a*b*]
Color difference error report	Displays the color difference between the target and the actual spectral output in JND units [CIE 2000 Delta E].

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