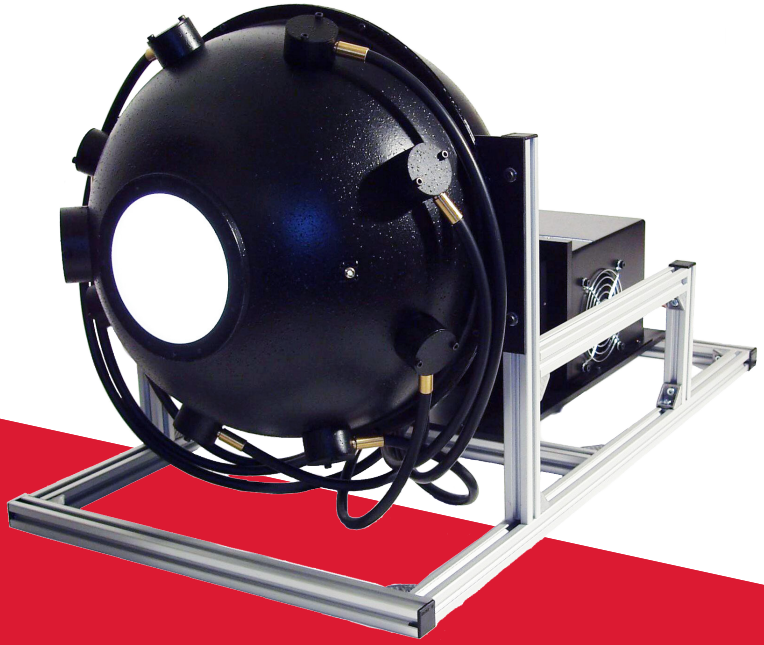
Light. Measurement. Excellence.

BENTHAM

ULS300

Variable Radiance
Uniform Light Source



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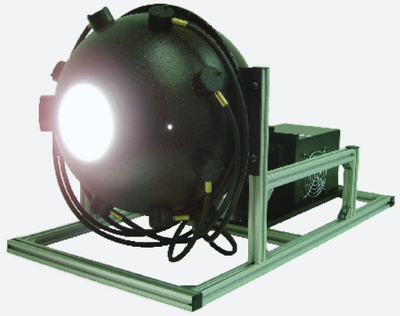
Achieving high quality images with sensors and cameras requires accurate uniformity analysis at the pixel level, particularly where wide-angle lenses are used. Let the unparalleled spatial uniformity of the ULS300 underpin your imaging system characterisation.

- Pixel normalisation
- Flat fielding
- Distortion correction
- Defect pixel analysis



Superlative Uniformity
A unique design based on external source and multiple fibre bundle illumination of the front hemisphere ensure ultimate spatial uniformity.

NMI Traceable Calibration
Supplied with spectral radiance calibration, impart NMI traceability to your measurements.

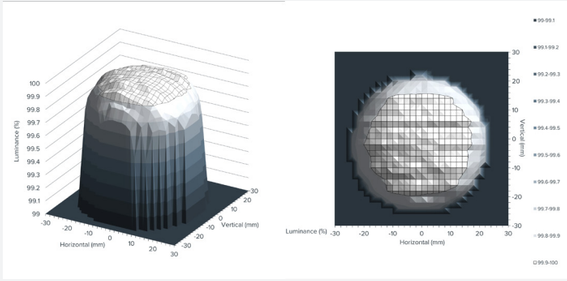
Variable Radiance
Tune the ULS300 to the levels you want with ease using a micrometer-controlled slit.

Constant Spectrum
Using a single source with micrometer slit attenuation, the spectral distribution of the ULS300 does not vary with radiance level.

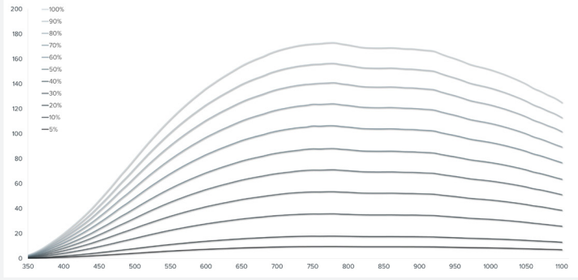
Introduction

The design of the ULS300 includes an external light source, bi-lateral slit attenuation and eight branch fibre bundle illumination of the front hemisphere. As radiance is varied, uniformity and spectral distribution remain constant.

1. Superlative Spatial Uniformity



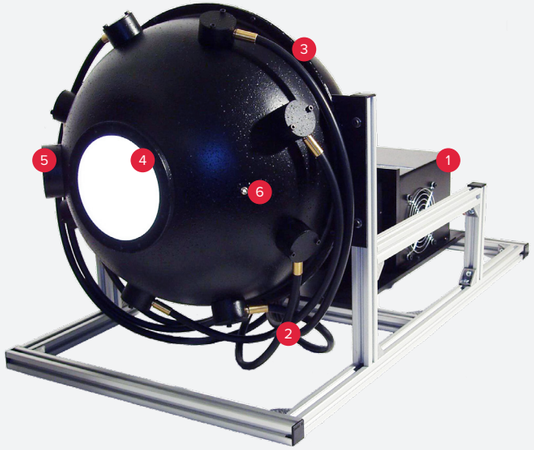
2. Constant Spectral Distribution



Measurement

Components

Achieving ultra-high spatial uniformity whilst maintaining high radiance levels requires a detailed optical design. With the ULS300 benefit from unparalleled spatial uniformity, continuously variable radiance and constant spectral distribution.



1

Single Source
An ellipsoidal reflector ensures maximised coupling from a stable 150W halogen lamp.

2

Fibre Bundle Delivery
Eight-branch fibre bundle to the front hemisphere ensures uniform light distribution in the integrating sphere and superlative uniformity.

3

Integrating Sphere
Coated with high, diffusely reflective barium sulphate, a 300mm diameter sphere offers uniform illumination, even over a 100mm diameter port.

4

Port
The 100mm port may be reduced to 50mm according to application, resulting in higher radiance levels.

5

Monitor Port
A monitor port DH400_VL photometric detector with ORM400 for real-time reporting of luminance (cd.m-2).

6

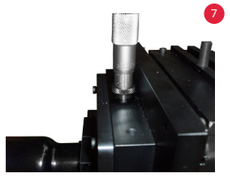
SMA Port
An SMA port allows coupling to an array spectrometer for optional spectral monitoring of the source.

7

Radiance Control
Micrometer-actuated, bi-lateral slits located between source and fibre allow for precise radiance control.

8

Radiance Stability
Excellent stability is guaranteed by constant current operation from the PSU_610 stabilised lamp power supply.



Specifications

Electro-Optical	
Lamp type	Grit-blasted quartz tungsten halogen lamp, G6.35 base
Nominal lamp power and voltage	150W, 24V
Operating current	6.3A
Expected lifetime	2000 hours
Coupling to fibre	Ellipsoidal reflector
Coupling to sphere	8-branch glass fibre
Sphere coating	$BaSO_4$
Sphere diameter	300mm
Window diameter	100mm (50mm reducer)
Variable radiance actuator	Micrometer controlled bi-lateral slit
Slit width range	0-10mm

Optical Performance	
Spectral range	350-2000nm
Peak spectral radiance (typ.) 100mm	170 $mW \cdot m^{-2} \cdot sr^{-1} \cdot nm^{-1}$ at 750nm
Peak spectral radiance (typ.) 50mm	285 $mW \cdot m^{-2} \cdot sr^{-1} \cdot nm^{-1}$ at 750nm
Luminance range (typ.) 100mm	0- 8500 $cd \cdot m^{-2}$
Luminance range (typ.) 50mm	0- 14500 $cd \cdot m^{-2}$
Correlated colour temperature (typ.)	3300 ±20K over full range
Chromaticity coordinates, CIE 1931 & 1976 (typ.)	x = 0.420, y = 0.410 u' = 0.240, v' = 0.520
Uniformity	0.05% over 100mm diameter aperture, independent of luminance setting

Calibration	
Measurement type	Spectral radiance
Wavelength range	350nm-800nm
Wavelength interval	5nm
Calibration frequency	Recommended after 200 hours burn-time
Traceability	Physicalish Technische Bundesanstalt (PTB, Germany)

Ordering Information

ULS300	
Connector	4mm socket
Dimensions	290L x 125W x 110H (mm)
Weight	10 kg

Power Supply	
Output voltage & current	0-10.4A in remote use Max Voltage: 26V
Resolution	0.1A local; 0.001A over SCPI protocol
Max output power	250W
Operating conditions	Ambient temperature: 0°C - +40°C Storage temperature: -20°C - +85 °C"
Drift	0.05% of rated output (Over an 8-hour interval with constant line, load and temperature, after a 30-minute warm-up period)
Temperature stability	30ppm/°C
Accuracy	±(0.04% +0.05A)
Output power ripple	<0.1%
Control	Front panel / USB (implementing SCPI protocol)
Front panel control features	Power on/off lamp, select pre-set current, define current
Connector	4mm socket
Display	LCD display of set current, actual current, lamp voltage, burn time and power
Dimensions	450L x 300W x 130H (mm)
Weight	5 kg
Power supply	Mains input 110/220V 50/60Hz

Part Number	Description
ULS300	Variable radiance uniform light source
PSU_610	Current stabilised lamp power supply
ORM400	Dual-channel picoammeter with display
DH400_VL	Precision photometric detector

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