



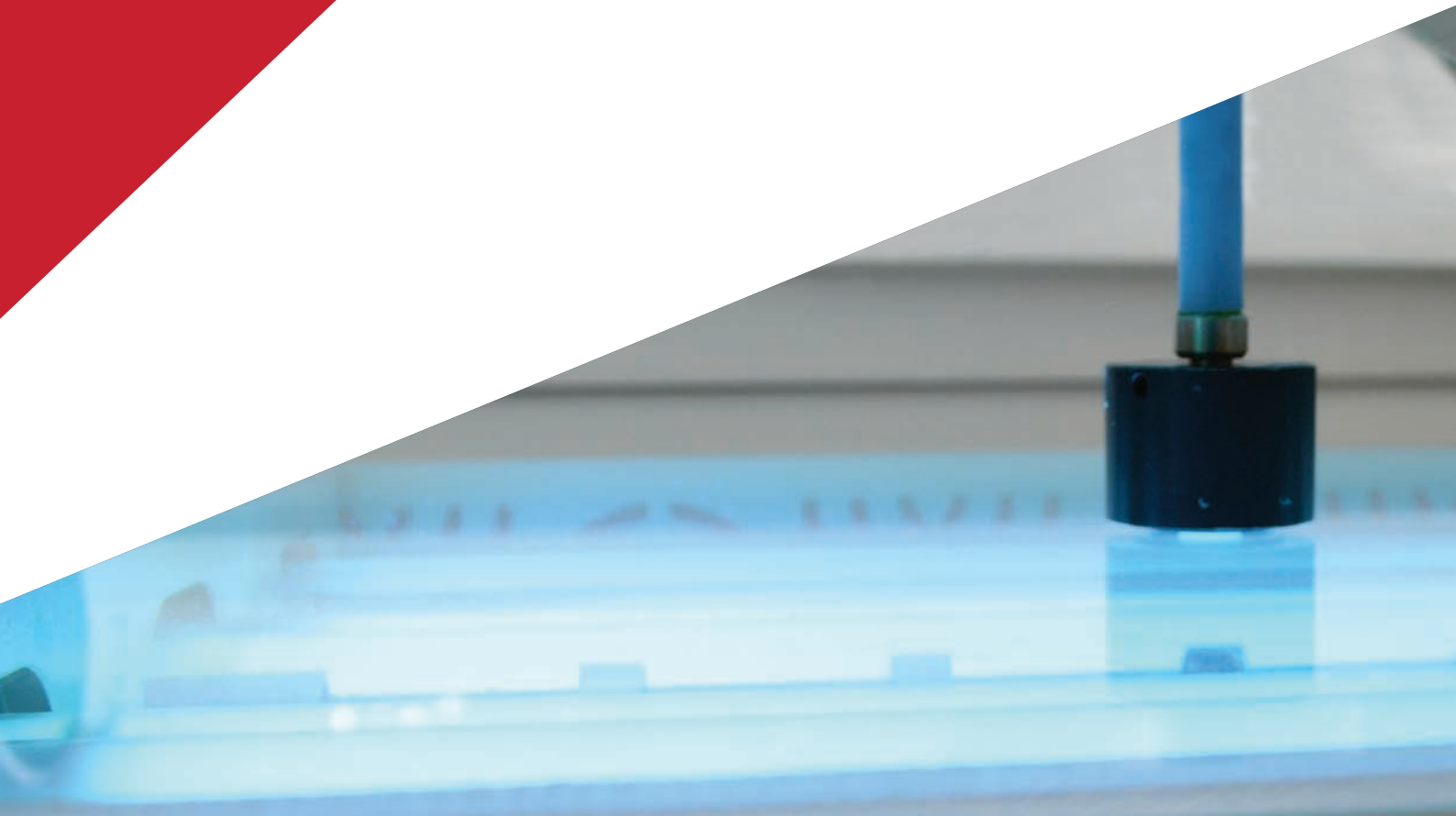
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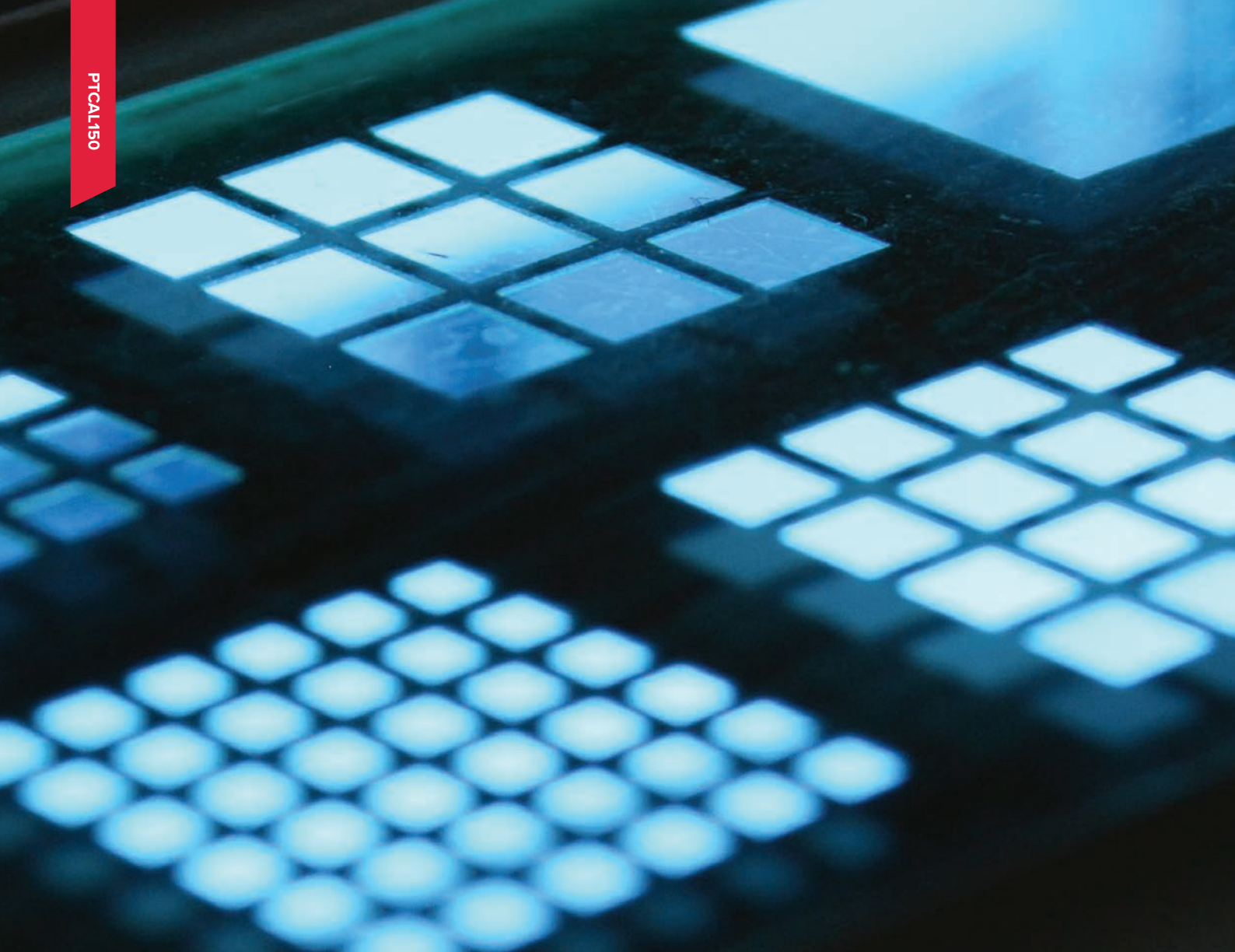
Light. Measurement. Excellence.



## **PTCa150**

Enabling Precision  
Dosimetry in  
Phototherapy & PDT

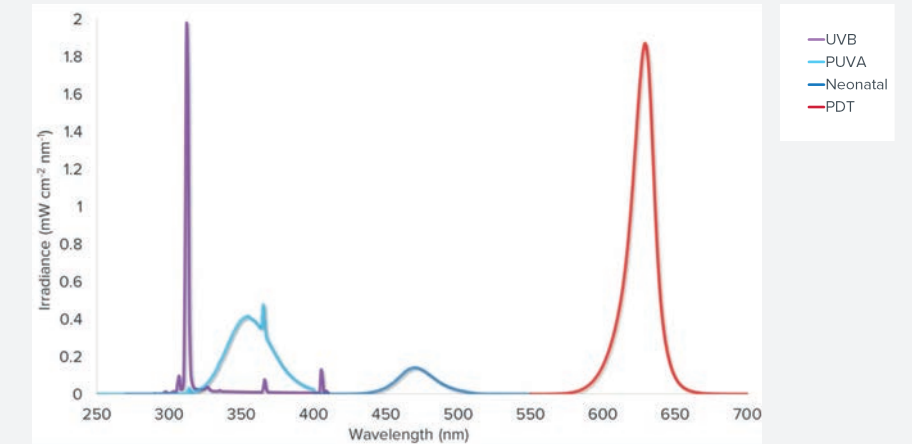




#### Source of Confidence in Phototherapy

Accurate determination of the spectral irradiance produced at the plane of the skin is the foundation of safe and effective phototherapy and PDT.

Safe and effective phototherapy and PDT relies on accurate dosimetry. Ensure the precise spectral irradiance measurement of all phototherapy sources with the PTCa1150 spectroradiometer. Benefit from the highest accuracy data on patient exposure and calibrate radiometers with confidence.



## Introduction

#### Superlative Spectral Analysis

Ultimate accuracy in spectral irradiance starts with a precision cosine-corrected diffuser and is assured with a double monochromator.

#### Tailored Spectral Coverage

A choice of UV and UV-vis configurations adapt the PTCa1150 to your individual phototherapy requirements.

#### Simple Calibration

Alignment-free calibration standards ensures your link to national metrology standards.

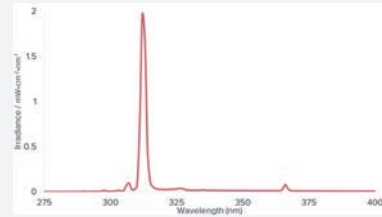
#### Full Automation

Fully automated over the USB interface, directly access spectral irradiance data and integrals appropriate for your application.

In hospitals and in clinical research, the PTCa1150 is trusted as the gold standard to determine the spectral irradiance of sources used in phototherapy and PDT.

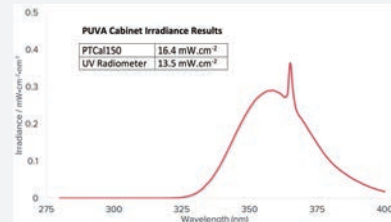
### 1. Direct Source Spectral Irradiance Characterisation

For ultimate measurement confidence and exploring novel sources in research.



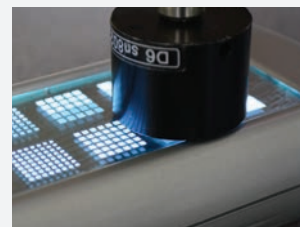
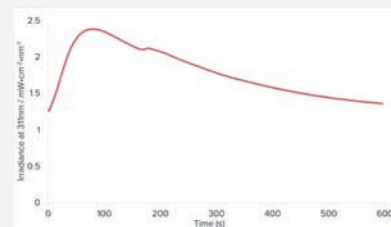
### 2. Calibrate radiometers for day to day use

Perform source-specific calibration of radiometers to provide confidence in regular source checks.



### 3. Determine warm-up characteristics

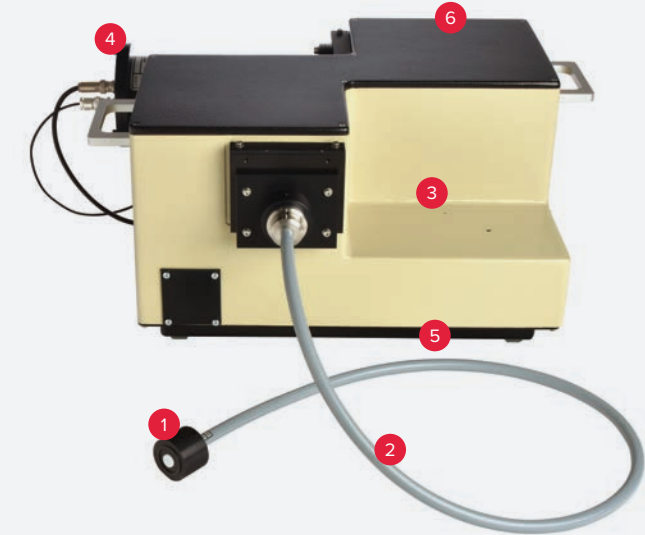
Guide the application of phototherapy with knowledge of the temporal variation of irradiance.



### Go Beyond the UV

With the UV-Vis configuration of PTCa150, characterise a wide range of sources in clinical use and research

Designed with leading optical components, the PTCal150 sets the benchmark for the precise spectral irradiance measurement of all phototherapy sources.



1

**Entrance optic**

A precision cosine-corrected transmission diffuser ( $t_s < 1\%$ ) ensures accurate collection of light from the entire hemisphere above the measurement plane.

3

**Double monochromator**

The un-rivalled stray-light rejection of a double monochromator ensures superlative spectral analysis.

2

**Fibre bundle**

A flexible fibre bundle couples light from the transmission diffuser to monochromator, ensuring ease of reaching the required measurement plane.

4

**Photomultiplier**

A selected S20 photocathode, end-window photomultiplier offers excellent noise performance and linearity.

5

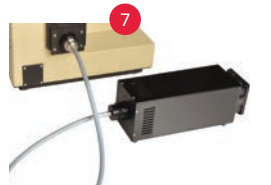
**Detection Electronics**

Built-in to the PTCal150 is a PMT high voltage supply and dual channel, six-decade picoammeter, offering an impressive dynamic range.

7

**Enclosed Calibration Standards**

Enclosed spectral irradiance standards, with NMI traceable calibration and entrance optic adaptors, allows quick and simple alignment-free calibration.



6

**Single Portable Unit**

Set in a single, robust housing, the PTCal150 can easily be transported between clinics and laboratories.

8

**Side View Entrance Optic**

For phototherapy products with limited access to the source, a side view entrance optic ensures you can measure in the correct plane.





### Accurate Spectroradiometry Starts Here

A precision cosine-corrected transmission diffuser ( $f_s < 1\%$ ) ensures accurate collection of light from the entire hemisphere above the measurement plane.

## Measurement Procedure

Accurate spectroradiometry in just a few steps with the PTCal150

### 1. Power on the PTCal150 and run Benwin+

- ▶ Get ready to launch a measurement over your spectral range of interest.

### 2. Calibration, your link to national metrology standards

- ▶ Simply connect the transmission diffuser to the enclosed irradiance standard, power on and run a calibration procedure.
- ▶ It is recommended to calibrate once at the beginning of a measurement session to minimise measurement uncertainty.

### 3. Set-up measurement of phototherapy source under test

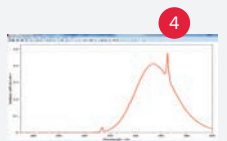
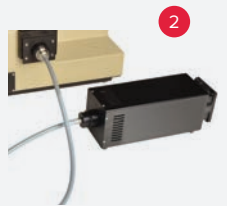
- ▶ Position the cosine-corrected transmission diffuser at the patient exposure plane.
- ▶ Where required perform alignment to find location of peak spectral irradiance.

### 4. Run a measurement

- ▶ Power on the source, an accurate spectral irradiance measurement is just a click away.
- ▶ A warm-up delay can be introduced before acquiring a spectrum.

### 5. View results

- ▶ The spectral irradiance result will unfold on screen.
- ▶ View pre-defined spectral integrals for quick and easy analysis.
- ▶ Export a measurement report or transfer the spectral data to your favourite platform.



Measurement	Value
UVA Irradiance	16.292437 mW cm <sup>-2</sup>
UVB Irradiance	0.073168935 mW cm <sup>-2</sup>

**Entrance Optic**

Entrance optic type	Benflect precision transmission diffuser (in-line or right angle configuration)	
Aperture diameter	10mm	
$f_2'$	<1%	
Coupling	Randomised pure fused silica fibre bundle, from 0.5m long	

**Monochromator**

Monochromator Type	Compact double monochromator, additive dispersion. Czerny-Turner mount	
Focal-length	150mm (each unit)	
Slits	Fixed, interchangeable	
Gratings	Grating pair, kinematically mounted, 33x33mm	
Stray light rejection at 10x FWHM from peak	10 <sup>-8</sup>	
Optical Performance/ Configuration	2400 g/mm (UV configuration)	1800 g/mm (UV-Vis configuration)
Spectral range	200-600nm	250-800nm
Typical bandwidth	1, 2 or 5nm	1, 2 or 5nm
Wavelength accuracy	± 0.15nm	± 0.20nm
Wavelength reproducibility	± 0.05nm	± 0.07nm

**Detector & Detection System**

Detector type	S20 photocathode end window photomultiplier tube	
Detector High Voltage	-750V (adjustable)	
Detector response range	200-850nm	
Detector dark current (typ.)	500pA	
Picoammeter current range	Sub 1pA to 100µA	
Picoammeter ADC resolution	> 14 ½ bit	
Picoammeter ADC integration time	100ms	

**General**

Interface	USB 2.0	
Software control	BenWin+ Windows application	
Operating System	From Windows 7	
Minimum HD/ RAM required	100MB/ 256 MB	
Overall dimensions	Approx. 395L x 315W x 250H (mm)	
Power	Mains input 110/220V 50/60Hz	

**Calibration Standard (200-300nm)**

Lamp type	Deuterium lamp	
Nominal lamp power and voltage	30W, 100 V	
Operating current	300mA DC	
Expected lifetime	2000h	
Power Supply	PSU_706 deuterium lamp supply	
Calibration type and wavelength range	Spectral irradiance at 5.5mm from plane of front face, 200-400nm (2nm steps)	
Calibration traceability	Physikalisch Technische Bundesanstalt (PTB, Germany)	

**Calibration Standard (250-800nm)**

Lamp type	Halogen lamp	
Nominal lamp power and voltage	150W, 24 V	
Operating current	6.300 A DC	
Expected lifetime	2000h	
Power Supply	PSU_610 current stabilised lamp power supply	
Calibration type and wavelength range	Spectral irradiance at 5.5mm from plane of front face, 250-800nm (5nm steps)	
Calibration traceability	Physikalisch Technische Bundesanstalt (PTB, Germany)	

**Ordering Information**

PTCal150_0001	PTCal 150 spectroradiometer (250-600nm)
PTCal150_0002	PTCal 150 spectroradiometer (200-600nm)
PTCal150_0003	PTCal 150 spectroradiometer (250-800nm)
PTCal150_0004	PTCal 150 spectroradiometer (200-800nm)

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