

Red night light Mitochondriak® with motion sensor

Spectral measurement · 21 October 2026 · Protocol **ML-2026-10-SENSOR**

Measurement date	21 October 2026
Performed by	Mitochondriak® Lab, Easy Light s.r.o., Slovakia
Instruments	certified spectrometer OHSP-350UVF (230–900 nm, 1 nm step) and a second certified spectrometer UPRtek CV600 with calibration certificate (380–780 nm, 1 nm step)
Conditions	dark room, no other light source
Distance source – sensor	10–15 cm
Power supply	built-in rechargeable battery (USB-C)
Units	spectral irradiance in mW/m ² /nm, illuminance in lx

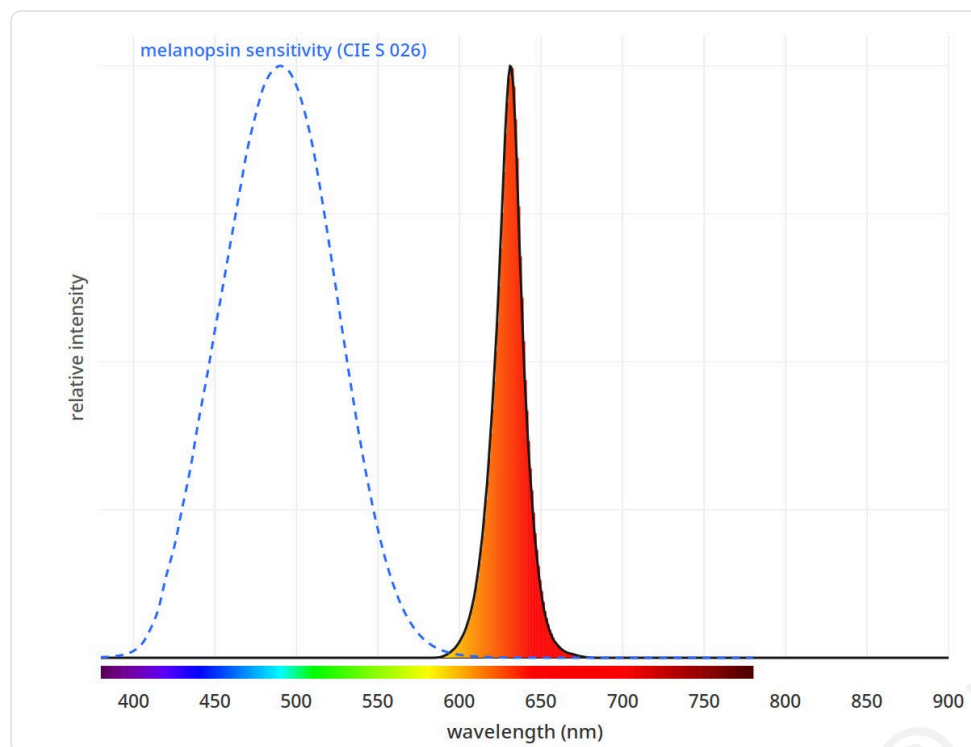
Summary

The red night light with motion sensor uses six red LEDs in a narrow band: spectral peak at 631 nm, FWHM only 18 nm. At 10–15 cm it gives 200–300 lx while the melanopic EDI stays below 1 lx. The blue and green components are practically 0 (below the instrument noise floor); at equal lux it sends a 240× weaker signal to the body clock than an ordinary white LED. The light is practically flicker-free.

Key results

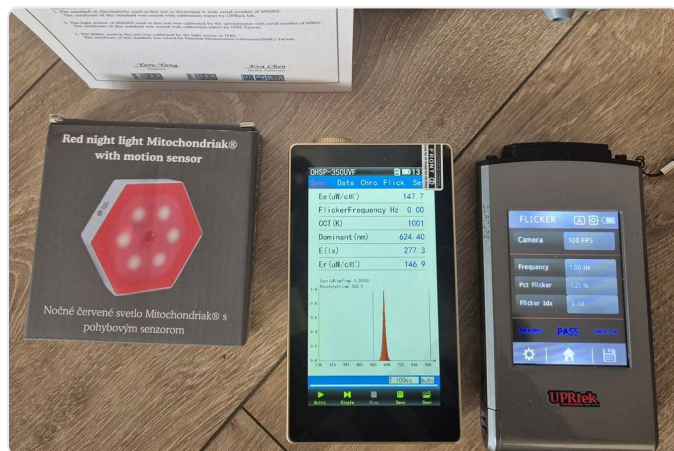
Parameter	OHSP-350UVF	UPRtek CV600
Spectral peak	631 nm	629 nm
Dominant wavelength OHSP-350UVF	624.4 nm	
Full width at half maximum (FWHM)	18 nm (622–640 nm)	20 nm (618–638 nm)
Spectral centroid	630 nm	626 nm
Energy share 600–700 nm	99 %	97 %
Energy share above 620 nm	86 %	76 %
Blue light below 500 nm	practically 0 (below the instrument noise floor)	
Blue and green light below 550 nm	practically 0 (below the instrument noise floor)	
Illuminance at ~10 cm	277.3 lx	301.5 lx
Irradiance 380–780 nm	1.48 W/m ²	1.40 W/m ²
Melanopic EDI (CIE S 026) calculated from the OHSP-350UVF spectrum	0.69 lx	
Melanopic ratio mel-DER ordinary white LED 0.608	0.0025	
Signal to the body clock (circadian rhythm) vs. an ordinary white LED at equal lux CIE S 026	240× weaker	
CIE 1931 chromaticity (x / y)	0.700 / 0.300	0.687 / 0.309
Colour purity OHSP-350UVF	100 %	
S/P ratio OHSP-350UVF	0.04	
Flicker UPRtek CV600	practically flicker-free – flicker index 0.00	

Spectrum



Spectrum: Red night light with motion sensor, OHSP-350UVF, 380–900 nm, normalised. Dashed blue line = melanopsin sensitivity (CIE S 026).

Measurement setup



Measurement setup: Red night light with motion sensor, Mitochondriak® Lab, 21 October 2026.

Flicker

0.00

flicker index

1.21 %

% flicker (UPRtek CV600)

Flicker is described by two quantities: percent flicker and flicker index. The lower they are, the smoother the light.

Measured (UPRtek CV600): flicker index 0.00, percent flicker 1.21 % – the lowest value of all measured lights. Result: practically flicker-free, well below the IEEE 1789 low-risk limit (< 8 % at 100 Hz).

On repeated measurements, percent flicker varies by tenths of a percent with the tilt of the instrument.

Data and citation

Full data at 1 nm (CSV, both instruments):

<https://mitochondriak-media.fsn1.your-objectstorage.com/products/red-night-light-sensor/measurements/mitochondriak-red-night-light-sensor-spectrum-data.csv>

Summary protocol of all measurements:

<https://mitochondriak-media.fsn1.your-objectstorage.com/blog/science/lab-2026-10/mitochondriak-lab-measurement-protocol-2026-10-en.pdf>

Citation: Mitochondriak® Lab (2026). Red night light Mitochondriak® with motion sensor – measurement protocol ML-2026-10-SENSOR, 21 October 2026. www.mitochondriak.com. Citation with attribution permitted.

Method

- Spectra:** certified spectrometer OHSP-350UVF (230–900 nm) and a second certified spectrometer UPRtek CV600 with calibration certificate (380–780 nm), both with a 1 nm step. Output: spectral irradiance $E(\lambda)$ in $\text{mW}/\text{m}^2/\text{nm}$.
- Illuminance:** $E_v = 683 \text{ lm}/\text{W} \cdot \sum E(\lambda) \cdot V(\lambda) \cdot \Delta\lambda$, where $V(\lambda)$ is the CIE photopic luminous efficiency function and $\Delta\lambda = 1 \text{ nm}$. The value calculated from the spectrum matches the instrument reading.
- Melanopic EDI** (equivalent daylight illuminance) per CIE S 026:2018: $E_{\text{mel}} = \sum E(\lambda) \cdot s_{\text{mel}}(\lambda) \cdot \Delta\lambda / 1.3262 \text{ mW}/\text{lm}$. In plain words: how many lux of daylight would send the same signal to the body clock. Technically: the D65 daylight illuminance with the same response of melanopsin in the retinal ipRGCs. mel-DER = melanopic EDI / illuminance. An international expert consensus (Brown et al., PLoS Biology 2022) recommends at least 250 lx during the day, at most 10 lx in the evening and at most 1 lx during sleep (melanopic EDI).
- Melanopic values** are calculated from the OHSP-350UVF spectrum (lower noise in the blue range, wider range). The UPRtek CV600 has a noise background of about $0.02 \text{ mW}/\text{m}^2/\text{nm}$ in the blue range, which for light without a blue component would add up to a small artificial contribution. Both instruments agree on the shape of the spectrum and the peak position (difference 2 nm).
- Bands:** energy shares below 500 nm (blue), below 550 nm (blue and green), 600–700 nm and above 620 nm are calculated from spectral irradiance in the 380–780 nm range; shares 700–900 nm and 780–900 nm from the 380–900 nm range (OHSP-350UVF). FWHM is the spectral width at half of the peak height; the centroid is the energy-weighted mean wavelength.
- Flicker:** percent flicker = $(\text{max} - \text{min}) / (\text{max} + \text{min}) \cdot 100 \%$; flicker index = area of the light waveform above its mean level / total area per period (IES). UPRtek CV600 in Flicker mode, OHSP-350UVF in Flick mode with 50 kHz sampling.
- Illuminance** is measured at one point at the stated distance, not as luminous flux in lumens (which requires an integrating sphere). For directional light it depends on the exact position and orientation of the sensor, so we report the values of both instruments. Values apply to the measured unit; negative noise values are clipped to 0.

Spectral table (5 nm step)

λ (nm)	OHSP-350UVF	UPRtek CV600	λ (nm)	OHSP-350UVF	UPRtek CV600	λ (nm)	OHSP-350UVF	UPRtek CV600
380	0	0.053	515	0	0.059	650	7.707	3.130
385	0	0.049	520	0	0.059	655	3.228	1.373
390	0	0.038	525	0	0.075	660	1.484	0.716
395	0	0.044	530	0	0.079	665	0.679	0.394
400	0	0.051	535	0	0.056	670	0.390	0.257
405	0	0.054	540	0	0.066	675	0.144	0.207
410	0	0.055	545	0	0.081	680	0.031	0.160
415	0	0.045	550	0	0.081	685	0.000	0.136
420	0	0.053	555	0	0.101	690	0	0.131
425	0	0.027	560	0	0.106	695	0	0.153
430	0	0.048	565	0	0.093	700	0	0.114
435	0	0.040	570	0	0.132	705	0	0.119
440	0	0.047	575	0	0.142	710	0	0.137
445	0	0.060	580	0	0.210	715	0	0.112
450	0	0.063	585	0.008	0.444	720	0	0.116
455	0	0.055	590	0.178	1.078	725	0	0.119
460	0	0.057	595	0.752	2.200	730	0	0.104
465	0	0.044	600	1.859	4.128	735	0	0.098
470	0	0.046	605	4.053	7.444	740	0	0.116
475	0	0.036	610	8.252	13.17	745	0	0.106
480	0	0.059	615	16.13	22.80	750	0	0.095
485	0	0.062	620	28.81	36.84	755	0	0.124
490	0	0.060	625	47.47	53.06	760	0	0.103
495	0	0.053	630	67.25	58.66	765	0	0.106
500	0	0.038	635	57.98	41.88	770	0	0.114
505	0	0.074	640	32.20	19.39	775	0	0.113
510	0	0.058	645	16.81	7.734	780	0	0.117

Spectral irradiance in $\text{mW}/\text{m}^2/\text{nm}$, distance ~10 cm. The UPRtek CV600 measures 380–780 nm. 230–375 nm (UV): 0 – below the instrument noise floor. 785–900 nm: 0 – below the instrument noise floor.