Mitochondriak® Advanced infrared panel

Spectral measurement, pulsing, flicker and EMF · 29 October 2026 · Protocol **ML-2026-10-ADVANCED**

Measurement date	29 October 2026
Performed by	Mitochondriak® Lab, Easy Light s.r.o., Slovakia
Device	Mitochondriak® Advanced infrared panel · 1,200 LEDs · 180 × 60 cm · 7 wavelengths 630–940 nm · touch screen
Mode	RED and NIR on, full intensity, continuous mode; pulsing measured separately at 10 and 100 Hz
Instruments	certified OHSP-350UVF spectrometer (230–900 nm, 1 nm steps), second certified spectrometer UPRtek CV600 with calibration certificate (380–780 nm, 1 nm steps), TES 1333 solar meter (400–1,100 nm), Cornet ED88 electrosmog meter and GQ Multifield EMF meter (commonly called a 3-meter: electric field, magnetic field and radio-frequency radiation)
Distances from the device face	30, 50 and 70 cm (recommended distance 50 to 60 cm)
Power supply	mains 230 V / 50 Hz
Units	irradiance in mW/cm² (1 mW/cm² = 10 W/m²), spectral irradiance in mW/m²/nm

Summary

The Mitochondriak® Advanced infrared panel has 7 LED types (wavelengths) in the red and near-infrared range: 630, 670, 760, 810, 830, 850 and 940 nm. The LEDs are distributed by biological effectiveness, not 1:1, so neighbouring bands overlap and not every wavelength has its own peak in the spectrum; the 940 nm band is determined from the spectrum and the solar meter. At 50 cm the total irradiance is 65.7 mW/cm² (certified spectrometers, 400–1,100 nm) and the TES 1333 solar meter reads 101.2 mW/cm². Of this, 23.3 mW/cm² is red (600–700 nm) and 42.4 mW/cm² near infrared (700–1,100 nm), a ratio of 36 % to 64 %. At 30 cm the total irradiance is 78.6 mW/cm² (solar meter 130.6 mW/cm²). Below 600 nm it emits nothing – there are no blue or green LEDs. The light does not actually flicker – zero flicker (flicker index 0.00, percent flicker 1.1–2.1 %, similar to sunlight), the optional pulsing at 0–10,000 Hz genuinely switches the LEDs on and off, and at 30 cm the electromagnetic field is at background level (0.1 µT, 0 V/m).

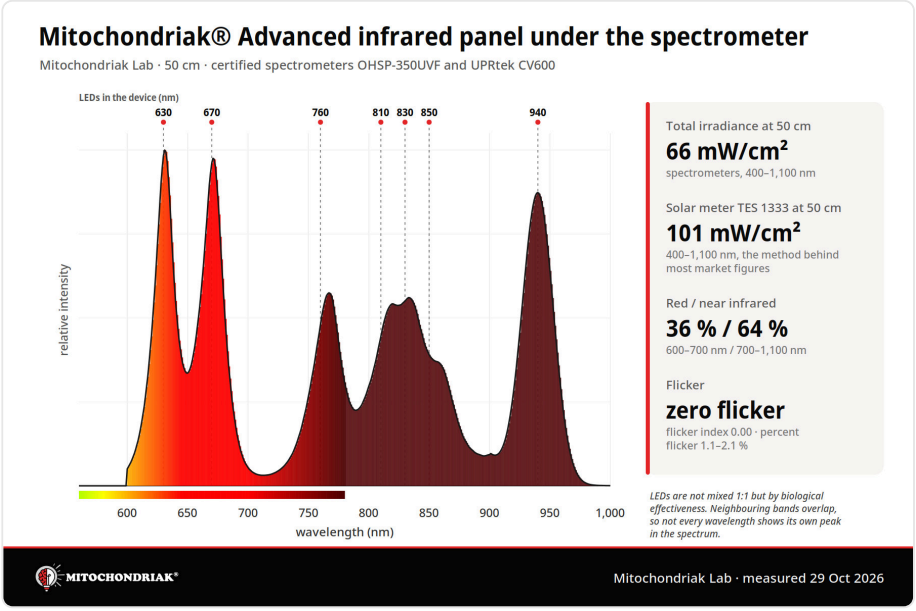
Key results

Parameter	30 cm market reference point	50 cm recommended distance	70 cm
Total irradiance 400–1,100 nm certified spectrometers OHSP-350UVF and UPRtek CV600; the part above 900 nm determined from the spectrum and the solar meter	**78.6 mW/cm²**	**65.7 mW/cm²**	**56.2 mW/cm²**
TES 1333 solar meter, 400–1,100 nm the method behind most irradiance figures on the market	**130.6 mW/cm²** 1,306.0 W/m²	**101.2 mW/cm²** 1,012.0 W/m²	**92.8 mW/cm²** 928.3 W/m²
Red 600–700 nm	**32.6 mW/cm²**	**23.3 mW/cm²**	**20.2 mW/cm²**
Near infrared 700–1,100 nm	**46.1 mW/cm²**	**42.4 mW/cm²**	**36.0 mW/cm²**
of which the 940 nm band (925–955 nm)	**16.2 mW/cm²**	**13.5 mW/cm²**	**11.6 mW/cm²**
Ratio red : near infrared	**41 : 59 %**	**36 : 64 %**	**36 : 64 %**
Below 600 nm (blue, green) no blue or green LEDs	**0 mW/cm²**		
Flicker two independent certified spectrometers, repeated measurements – does not actually flicker	**zero flicker · flicker index 0.00 · percent flicker 1.1–2.1 %**		
Pulsing (optional) LEDs genuinely switch on and off (PWM); mean irradiance roughly halved	**0–10,000 Hz · at 10 and 100 Hz modulation 96–100 %, index 0.46–0.47**		
Magnetic field (30 cm) Cornet ED88, LF600	**0.1 µT (1 mG) – background level**		
Electric field · radio-frequency radiation (30 cm) Cornet ED88	**0 V/m · 0.0001 mW/m² – background level**		

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Spectrum at 50 cm



Spectrum at 50 cm, OHSP-350UVF, 560–1,000 nm, normalised; zero below 600 nm.

Wavelengths (LED types)

The LEDs are not distributed 1:1 but in proportion to their biological effectiveness: more LEDs where the body absorbs light best, fewer at the complementary wavelengths. Every LED is semi-monochromatic – it emits a band about 20 to 30 nm wide. Neighbouring bands therefore overlap, and the less represented wavelengths have no separate peak in the spectrum; their light is part of the shared band and fully included in the measured irradiance. The measured peaks below are a supplement, not a list of wavelengths.

LED type	Range	In the measured spectrum (OHSP-350UVF)
630 nm	red	own peak at 631 nm
670 nm	red	own peak at 671 nm
760 nm	near infrared	own peak at 767 nm
810 nm	near infrared	own peak at 820 nm
830 nm	near infrared	own peak at 833 nm
850 nm	near infrared	overlaps with the neighbouring LED bands, no separate peak
940 nm	near infrared	own band 925–955 nm, the part above 900 nm determined from the spectrum and the solar meter

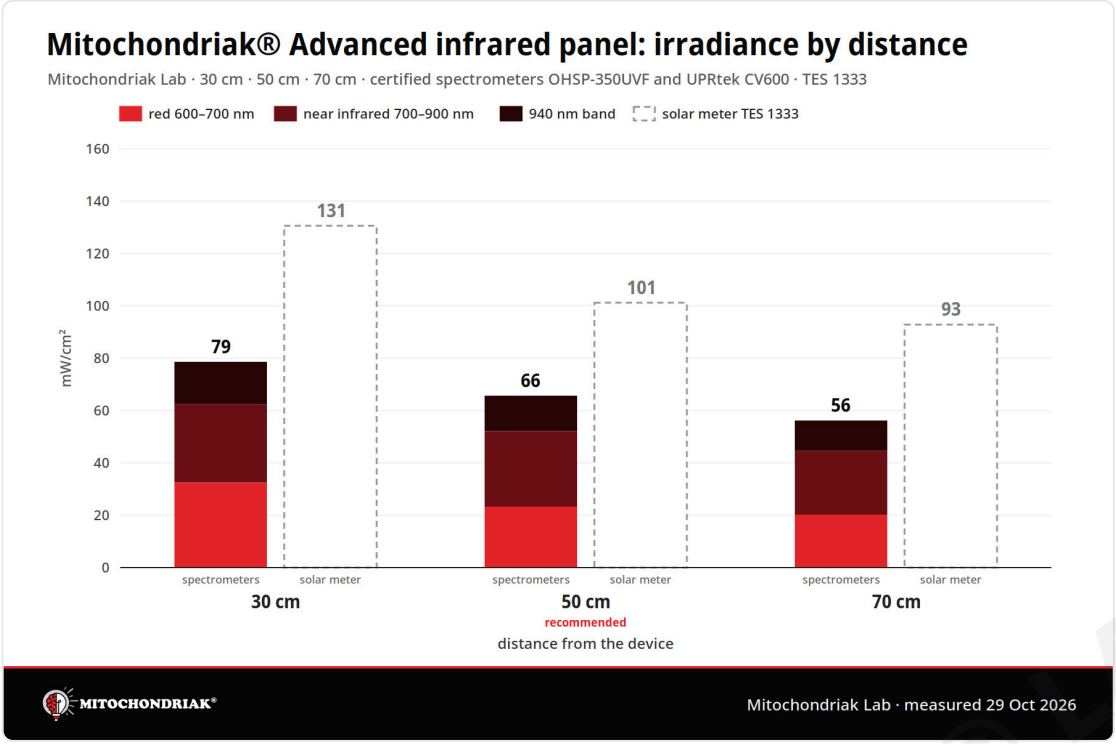
Supplement: measured spectral peaks at 50 cm

Band	Measured peak (OHSP-350UVF)	Full width at half maximum	Share of total irradiance
red	**631 nm**	**21 nm**	17.5 %
red	**671 nm**	**24 nm**	18.5 %
near infrared	**767 nm**	**31 nm**	14.8 %
near infrared	**820 nm**	**overlaps with the neighbouring 810–850 nm LEDs**	10.2 %
near infrared	**833 nm**	**overlaps with the neighbouring 810–850 nm LEDs**	17.2 %
near infrared	**940 nm (from spectrum and solar meter)**	**30 nm**	20.6 %

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Irradiance by distance



Total irradiance by distance: coloured bars = certified spectrometers (split into bands), dashed bars = TES 1333 solar meter.

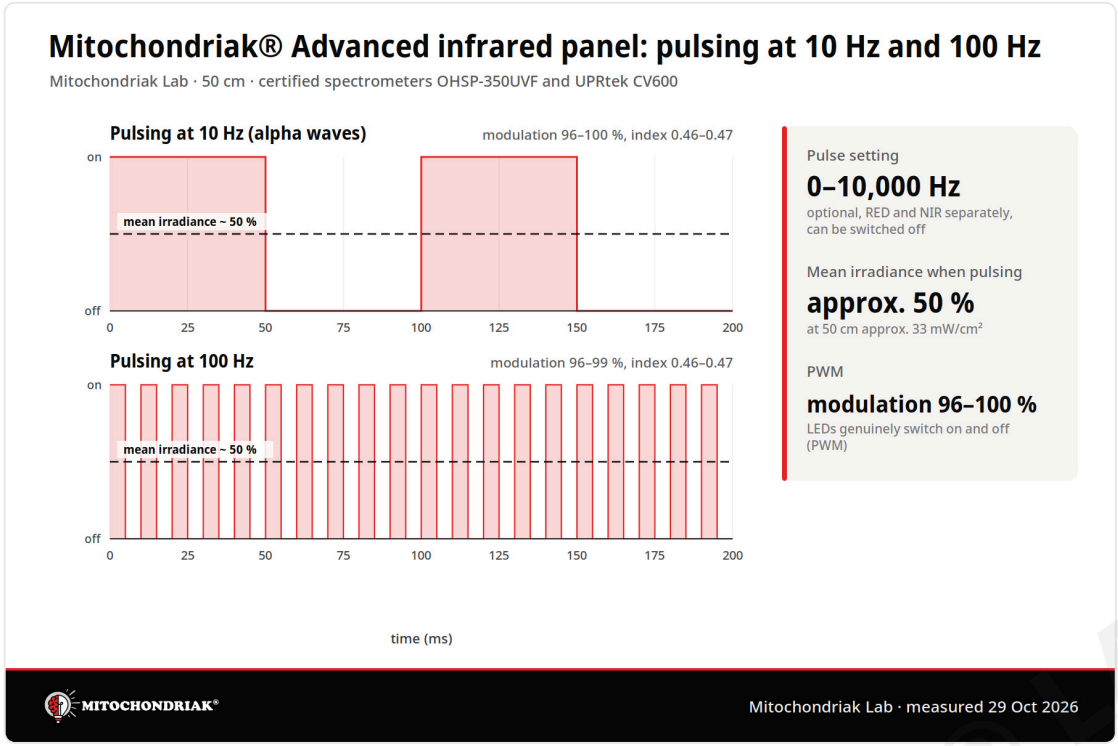
Quantity	30 cm	50 cm	70 cm
UPRtek CV600 / OHSP-350UVF, 600–780 nm (mW/cm²)	**33.5 / 41.2**	**32.8 / 31.9**	**26.3 / 27.7**
Mean irradiance when pulsing (mW/cm²)	**39.3**	**32.8**	**28.1**

Both certified spectrometers measure the same level in the shared 600–780 nm range; the differences reflect the sensor position in front of individual LEDs.

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Pulsing at 10 Hz and 100 Hz



Pulse waveform based on the measured values: the LEDs switch on and off, mean irradiance is roughly halved.

Pulsing is optional: it can be switched off or set anywhere from 0 to 10,000 Hz, including decimals, for RED and NIR separately. At 10 Hz (the alpha-wave frequency) and at 100 Hz both spectrometers measured a modulation of 96–100 % and an index of 0.46–0.47. The LEDs genuinely switch on and off (PWM) – this is not a brightness ripple. Mean irradiance when pulsing is roughly halved – approx. 32.8 mW/cm² at 50 cm. For the highest dose, use continuous mode; to work with the frequency of light, you have it under precise control.

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Flicker and electromagnetic field

0.00
flicker index

1.1–2.1 %
percent flicker

Our devices are flicker-free – zero flicker. Repeated measurements with two independent certified spectrometers confirm it (see the display photographs in this protocol). In flicker mode the UPRtek CV600 shows a frequency of 1 Hz because it cannot display zero; the OHSP-350UVF shows 0 Hz and a flat line with a modulation depth of 0.0 % (50 kHz sampling). Percent flicker is 1.1–2.1 % – a very small fluctuation, similar to sunlight – and the flicker index is 0.00. Conclusion: our infrared panels do not actually flicker. This is the result of driver quality that we tested and selected repeatedly.

0.1 µT
magnetic field at 30 cm

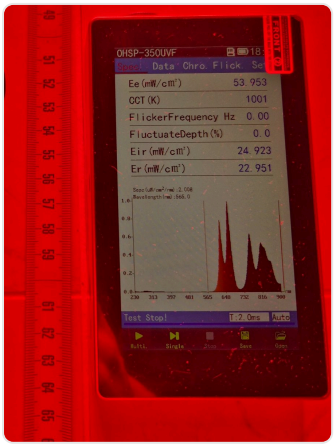
0 V/m
electric field

At 30 cm the Cornet ED88 electrosmog meter (LF600) showed a magnetic field of 0.1 µT (1 mG), an electric field of 0 V/m and radio-frequency radiation of 0.0001 mW/m². The GQ Multifield EMF meter (commonly called a 3-meter: electric field, magnetic field and radio-frequency radiation) showed, even at 10 cm, a magnetic field of 0.4 mG, an electric field of 0 V/m and radio-frequency radiation of 0.000 mW/cm². All values are at the normal background level of a household.

Comparison with the sun

On 29 October 2026 at around 15:00 the same TES 1333 solar meter measured 915.6 W/m² (91.6 mW/cm², 400–1,100 nm) in direct sunlight. Based on the shape of the ASTM G173 reference solar spectrum, approx. 56.5 mW/cm² of this falls in the 600–1,100 nm range (red 16.7, near infrared 39.6 mW/cm²). The Advanced delivers 65.7 mW/cm² in the same range at 50 cm – 116 % of that dose, without UV and without blue light. The comparison is a calculation from the measurement.

Display photographs



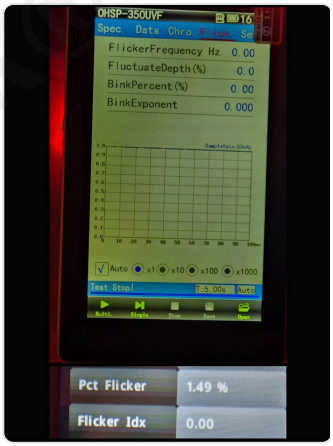
OHSP-350UVF at 50 cm.



UPRtek CV600 at 50 cm.



TES 1333 at 50 cm: 1,012.0 W/m².



Flicker: OHSP-350UVF 0 Hz, modulation depth 0.0 %; UPRtek CV600 flicker index 0.00.

Data and citation

Full data in 1 nm steps (CSV and XLSX, both spectrometers, all distances):
https://mitochondriak-media.fsn1.your-objectstorage.com/products/advanced/measurements/mitochondriak-advanced-spectrum-data.csv
https://mitochondriak-media.fsn1.your-objectstorage.com/products/advanced/measurements/mitochondriak-advanced-spectrum-data.xlsx

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Methodology

- **Spectra:** certified OHSP-350UVF spectrometer (230–900 nm) and a second certified spectrometer, UPRtek CV600, with calibration certificate (380–780 nm), both in 1 nm steps, sensor perpendicular to the device face on its axis. Both spectrometers are equivalent.
- **Band irradiance:** $E = \Sigma\, E(\lambda) \cdot \Delta\lambda$, $\Delta\lambda = 1$ nm (red 600–700 nm, near infrared 700–1,100 nm, total irradiance 400–1,100 nm).
- **Below 600 nm:** the device has no blue or green LEDs; in the spectra, totals and data the range below 600 nm is zero.
- **Part above 900 nm:** the tail of the 850 nm LEDs from the exponential course of the spectrum between 860 and 880 nm; the 940 nm LED band (30 nm full width at half maximum) determined from the 600–900 nm spectrum and the 400–1,100 nm solar meter via the solar meter/spectrometer ratio of a panel without 940 nm, verified at all distances.
- **The TES 1333 solar meter** is calibrated to the solar spectrum. With narrow LED bands it reads higher than the spectral integral of the spectrometers (1.6 to 1.8 times for devices without 940 nm); we give both values so they can be compared with market figures and with the spectral reality.
- **Flicker and pulsing:** UPRtek CV600 (flicker index and percent flicker), OHSP-350UVF in flicker mode (50 kHz sampling); flicker in continuous mode, pulsing at the 10 Hz and 100 Hz settings.
- **EMF:** Cornet ED88 electrosmog meter (LF600 magnetic field in µT/mG, electric field in V/m, radio-frequency radiation in mW/m²); GQ Multifield EMF meter (3-meter) at 10 cm.

Spectral table (5 nm steps, mW/m²/nm)

nm	OHSP 30 cm	OHSP 50 cm	OHSP 70 cm	UPRtek 50 cm
600	172.6	246.8	196.6	331.8
605	297.8	429.9	343.9	559.9
610	538.0	740.9	597.9	950.4
615	981.7	1,289.8	1,047.3	1,602.8
620	1,690.1	2,183.7	1,777.6	2,561.3
625	2,758.9	3,535.1	2,897.9	3,667.9
630	3,673.6	4,825.5	4,022.3	4,052.1
635	3,149.2	4,243.2	3,620.6	3,128.3
640	2,277.0	2,701.9	2,327.9	1,929.5
645	2,076.5	1,875.9	1,635.6	1,532.7
650	2,466.0	1,647.7	1,460.0	1,816.5
655	3,536.2	1,940.3	1,743.0	2,564.4
660	5,154.1	2,614.3	2,363.3	3,652.7
665	7,490.9	3,684.3	3,335.9	4,815.2
670	9,606.1	4,714.4	4,258.9	5,088.8
675	8,399.8	4,235.8	3,793.1	3,743.2
680	5,274.8	2,724.6	2,433.7	1,911.6
685	2,969.6	1,566.8	1,399.0	833.7
690	1,573.8	847.1	753.3	358.9
695	812.8	454.4	400.3	179.2
700	461.4	266.9	235.4	114.3
705	302.4	187.0	165.0	96.3
710	236.5	156.4	137.0	108.0
715	211.5	155.9	135.9	145.2
720	220.8	174.4	152.6	203.5
725	257.2	218.7	190.4	299.5
730	322.1	291.5	253.1	446.7
735	441.0	414.7	361.6	660.2
740	621.8	606.8	528.7	975.6
745	916.9	900.6	788.0	1,410.6
750	1,334.0	1,304.3	1,145.4	1,967.5
755	1,836.8	1,787.8	1,570.1	2,602.4
760	2,428.6	2,358.5	2,077.7	3,171.0
765	2,777.2	2,779.2	2,414.1	3,234.3
770	2,547.5	2,721.3	2,305.3	2,520.5
775	1,859.5	2,098.2	1,752.3	1,632.9
780	1,306.8	1,511.2	1,269.8	1,385.2
785	1,022.4	1,186.6	1,015.4	
790	957.7	1,106.1	974.0	
795	1,041.8	1,214.6	1,087.4	
800	1,241.8	1,454.7	1,306.9	
805	1,527.4	1,769.3	1,587.9	
810	1,873.0	2,178.4	1,948.8	
815	2,183.6	2,537.5	2,243.9	

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nm	OHSP 30 cm	OHSP 50 cm	OHSP 70 cm	UPRtek 50 cm
820	2,309.9	2,660.1	2,279.6	
825	2,440.1	2,637.8	2,167.6	
830	2,645.9	2,701.1	2,137.9	
835	2,773.1	2,734.3	2,083.7	
840	2,627.3	2,512.1	1,889.9	
845	2,422.6	2,156.8	1,652.9	
850	2,362.9	1,915.6	1,539.4	
855	2,409.3	1,822.3	1,520.1	
860	2,350.0	1,764.8	1,494.5	
865	2,002.0	1,529.1	1,306.7	
870	1,540.3	1,184.7	1,022.5	
875	1,127.0	873.4	745.8	
880	859.4	655.9	565.4	
885	688.8	530.7	453.5	
890	606.7	464.9	398.6	
895	567.4	436.4	383.1	
900	573.6	456.4	385.2	
905	554.5	447.8	379.7	
910	651.3	533.9	454.6	
915	994.2	823.9	703.7	
920	1,672.4	1,392.8	1,191.1	
925	2,681.6	2,237.3	1,914.3	
930	3,835.9	3,202.5	2,740.6	
935	4,776.4	3,988.6	3,413.7	
940	5,131.3	4,285.4	3,667.8	
945	4,740.2	3,959.1	3,388.5	
950	3,760.8	3,141.2	2,688.6	
955	2,562.1	2,140.2	1,831.8	
960	1,499.7	1,253.0	1,072.5	
965	755.8	631.7	540.8	
970	329.8	275.8	236.2	
975	126.4	105.9	90.8	
980	44.3	37.4	32.1	
985	15.8	13.5	11.6	
990	6.8	5.9	5.1	
995	3.9	3.4	3.0	
1000	2.7	2.4	2.1	

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