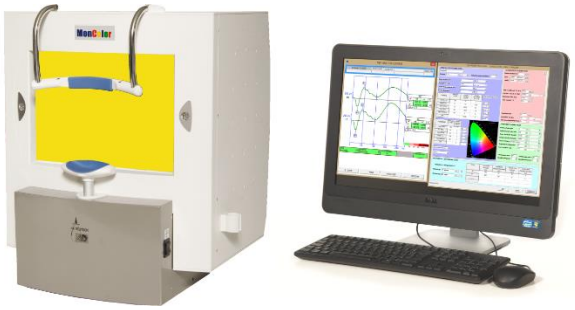
Vision Monitor
MonColor
GANZFELD VISUAL STIMULATOR

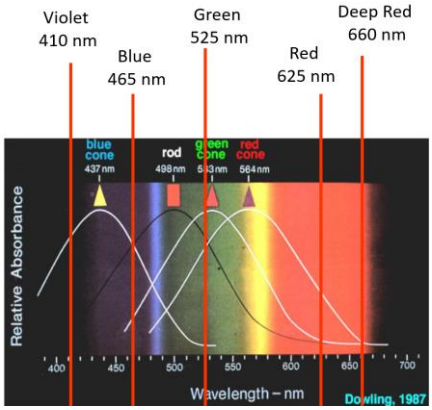


Technical specifications

MonColor is made of a hemispherical screen illuminated with light emitting diodes.

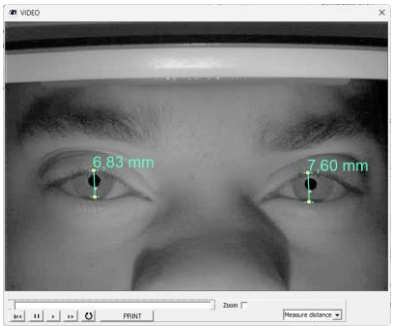
MonColor combines light sources with 5 different wavelengths. These sources can be combined and each of them is programmable over a wide dynamic range by steps of 0.5 dB, thus providing a great flexibility for the control of the spectrum and luminance of the background and stimulation.

The duration of flashes can be programmed from 2 ms up to 5000 ms by steps of 1 ms.

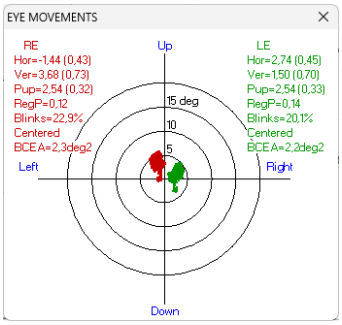


	Violet	Blue	Green	Red	Deep red	Sum
Central wavelength (nm)	410	465	525	625	660	
Maximum luminance (photopic cd/m²)	3.2	400	1600	960	700	3660
Minimum luminance (photopic cd/m²)	3.2×10^{-4}	2.0×10^{-7}	1.8×10^{-6}	3.4×10^{-7}	7×10^{-2}	
Dynamic range (dB)	40	93	89	95	40	

A near infra-red illumination (940nm) and a video camera are used to monitor eye movements, pupil size and the opening of eye lids. The video from the camera can be recorded throughout the entire exam. It can also be analyzed to provide measurements of the pupil size and eye fixation.



Video recording
with measurement of the eye lid opening



Pupil and eye fixation report
generated at the end of the exam

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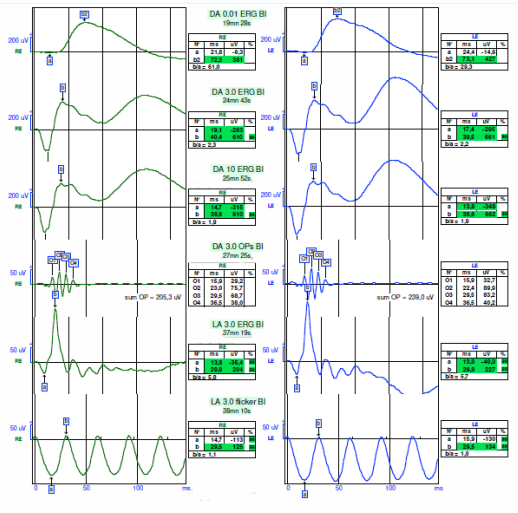
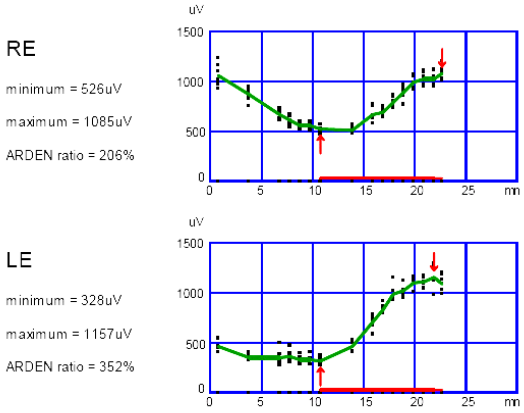
Vision electrophysiology applications

MonColor once connected to the bioelectric amplifier can perform flash ERG and VEP as well as sensory EOG exams.

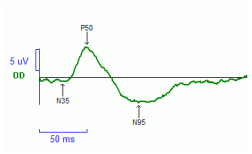
It is compatible with the ISCEV standard and can also perform advanced tests such as S-cone, PhNR, ON-OFF and double flashes.



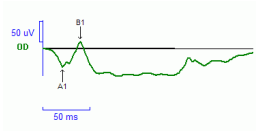
Standard report for flash ERG



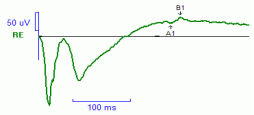
Standard report for sensory EOG



S-cone response



ON-OFF response



Double flash response

Dark and light adaptation applications

Full field stimulus threshold (FST)

MonColor allows the evaluation of light sensitivity threshold using ganzfeld stimulation after dark adaptation (scotopic FST). Threshold is measured with an 8-4-2-1 staircase strategy, the patient having to press the response button when perceiving stimulation. The tests can be white or with red and blue colors, allowing to assess whether the response is mediated by cones or rods photoreceptors.

Photo aversion test (PAT)

The purpose of this examination is to determine the discomfort threshold of photophobic subjects.

The luminance of the test increases gradually, in steps of 1 dB, the patient having to press the response button when he/she can no longer bear the level of luminance. The test is repeated several times for a pre-programmed duration and the final threshold is the average of the responses obtained during this time.

The video is recorded throughout the duration of the examination and the lid opening can be measured from this video.

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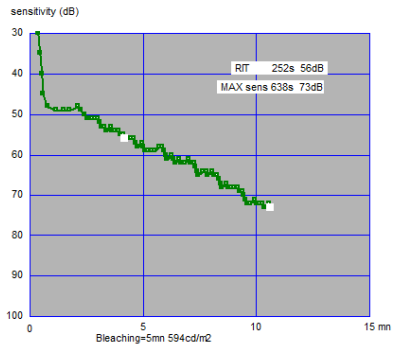
Dark adaptation after light bleaching

This examination allows the study of the dynamics of recovery of sensitivity to light after light bleaching. It begins with a 5-minute glare performed in ganzfeld (full field) conditions. The patient is then placed in total darkness and presented with tests with the task of pressing the response bulb as soon as he perceives them. The test luminance is reduced when the patient responds; otherwise, it is increased. The first part of the curve corresponds to the recovery of the cones and is followed by that of the rods.

The result analysis determines the alpha point (breaking point between the recovery of the cones and that of the rods), the time necessary to have a start of recovery of the rods (rod intercept time or RIT) and the maximum level of sensitivity reached over the course of the exam.



Dark adaptation curve in a normal subject

Programmable bleaching level (up to 3660 cd/m^2) and duration.

Programmable stimulus color, duration and period.

Pupillometry applications

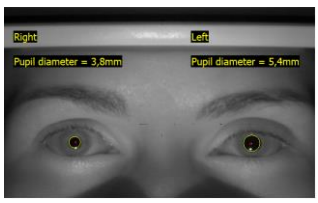
This examination performs measurements of pupil size under several levels of controlled illumination:

- high photopic (100 cd/m2)
- high mesopic (1 cd/m2)
- low photopic (10 cd/m2)
- low mesopic (0.1 cd/m2)

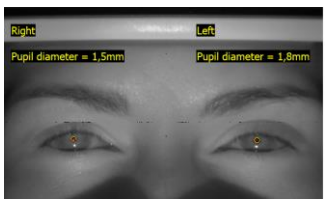
It can also perform the analysis of the temporal response of the averaged response of successive visual stimuli (light flashes).

It provides an automated quantification of the following parameters:

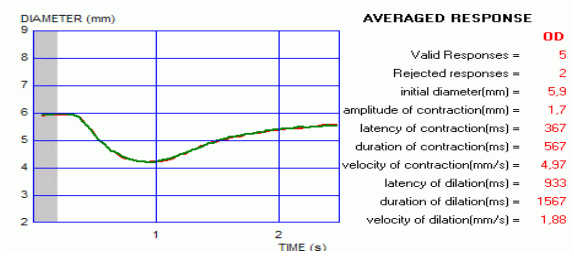
- resting diameter, amplitude of constriction,
- velocities of constriction and dilation,
- latency of constriction



scotopic



high photopic



average response to flash

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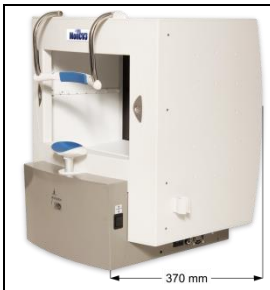
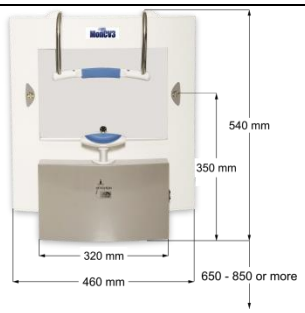
Combination with the Vision Monitor system

The MonColor stimulator is part of the Vision Monitor system. It can be combined with the MonPackONE and the MonCvONE stimulators to add visual function testing capabilities such as pattern and multifocal ERG, static and kinetic perimetry, eye movement recording

An external monitor (OLED or LCD monitor) can be connected to the MonColor for the generation of pattern stimulations (PERG and PVEP) as well as for tests of contrast sensitivity

Specifications





Electrical specifications : classe I - type B
Power requirements : 230V, 0.7A or 110V, 1.4A, 50 or 60Hz.
To prevent electric shock, the instrument must be plugged into an earth grounded outlet.
Weight
25 kg (without PC, printer and electric table)
Interface
Connects to a standard PC via two USB2 cables.

Options

Vision electrophysiology exams

- Flash ERG and VEP exam — PVM-EL
- Sensory EOG exam — PVM-ES

Options

- Electric table — HVM-TABLE
- High speed camera (200Hz) — HVM-camera 200
- Video and eye movement recording (during visual field and other exams) — PVM-CF

Vision psychophysical exams

- Dark adaptometry exam (ganzfeld dark adaptometry, FST and PAT) — PVM-AO

Eye movement exams

- Pupillometry exam — PVM-PU

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