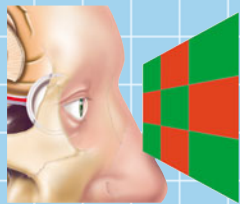
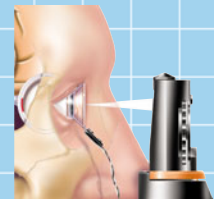




ColorBurst™ for ERG and flash VEP



Color Pattern Stimulator for VEP and PERG



MaculoScope™ for focal ERG

ColorDome ISCEV Test Compatibility

Maximal Combined Response - The ColorBurst can produce a white flash at intensities of at least 1500 ISCEV standard flashes (1500SF) and is also able to create colored flashes at intensities of at least 10SF

Oscillatory Potentials - Any single flash as described for the maximum combined response can be produced repeatedly for recording oscillatory potentials.

Single Flash RodResponse - The ColorBurst's scotopic mode creates dim stimuli especially for measuring rod-driven responses. It can produce short wavelength (blue -green) light at any intensity between 2SF and 2×10^{-7} SF with luminance resolution of 1% or better and calibrated for scotopic vision according to the CIE V'l spectral response function.

Single Flash Cone Response - Any single flash as described for the maximal combined response is delivered over a rod-suppressing background illumination. The ISCEV standard recommends a flash to background ratio numerically equivalent to 3 cd.s/m² (1SF) flash to 34 cd/m² background. The ColorBurst can achieve this ratio at 1SF and across the entire range of white and photopic color mode flash strengths.

30Hz Flicker Response - Flicker stimuli in white mode at luminance's up to 100 cd/m² or color mode at up to 200 cd/m² can be created. The flicker rate can be increased from the ISCEV standard of 30Hz, up to 500Hz (LED only).

Off Response - Steady light in white mode at luminance's up to 500 cd/m² or color mode at up to 100cd/m² can be turned on and off, or ramped (exponential, ramp, sine) as required to measure off responses.

Heterochromatic Flicker - Arbitrary variations in color, luminance, or both can be specified at millisecond intervals for over 1 second. Alternatively, color and intensity and an arbitrary duration may be defined per ms for up to 1000 and above different sequential presentations.

EOG - LEDs span standard 30 degrees visual angle, with reversal frequency of 0.5Hz. The 9 ColorDome EOG LEDs span up to 60 degrees visual angle and have programmable reversal rate. The background luminance covers the full range of diluted and undiluted pupil requirements reaching 500cd/m².

Additional Espion Components for Research Applications

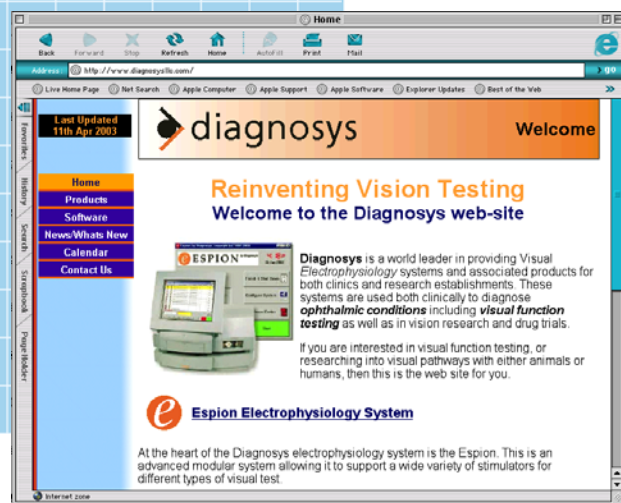
ColorBurst The ColorBurst is the hand-held mini-Ganzfeld stimulator of the Espion system. It produces a uniform field of light which is presented to the subject monocularly.

The color and intensity of the light are precisely controlled in real-time to create a range of visual stimuli, including flashes, flickers onset/offset and steady backgrounds. The ColorBurst fully supports all ISCEV Standard Ganzfeld test, with come pre-programmed, but it is capable of creating a far wider range of stimuli than are encompassed by the standards.

Pattern Stimulator The Espions Pattern Stimulator presents full-field pattern stimuli including checkerboards and gratings on a color CRT display. The stimulus has high-resolution color and contrast control and is fully calibrated. The ISCEV standard tests are pre-programmed, and the Pattern Stimulator is also capable of a wide range of more complex custom stimuli.

MaculoScope The MaculoScope is the ophthalmoscope stimulator of the Espion system. It produces the flickering circular stimulus which is a worldwide standard for focal ERG. The stimulus is projected directly onto the retina where it can be viewed and positioned by the examiner.

Please use our website to get more detailed information. The site is located at: <http://www.diagnosysllc.com>

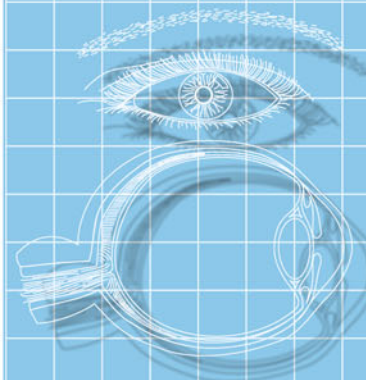
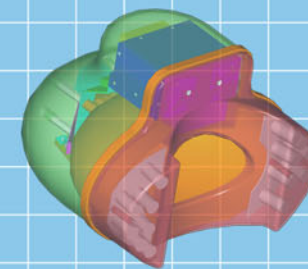


The Colordome is one of Diagnosys's Stimulators for Research and Clinical Applications

The new ColorDome, a full-field Desktop Ganzfeld contains many new and innovative features. Utilizing 100% electronic control, it contains a mixture of colored LEDs and xenon flash tubes to give it an incredible luminance and color range. No other Ganzfeld on the market today, comes anywhere close to providing the range, flexibility, compactness, and ease of use that the ColorDome brings to the market. The ColorDome can also be supplied as a standalone stimulator with full RS232 control for connection to existing 3rd party equipment.

Features

- Compact Size
- Weighs 7lb (3 Kg) without stand
- No mechanical parts for greater reliability
- All electronic control of color, luminance, and flash duration (LED only)
- 9 red Fixation/EOG LEDs with adjustable intensity. that span +/- 30 degrees horizontally
- Background and flash luminance created by Red, Green Blue, Amber LEDs
- Integral Xenon flash tube for bright flashes with full electronic control of intensity
- Luminance range from 3000cd.s/m² down to below 0.009 cd.s/m² in over 100,000 steps
- Integrated monochrome camera with infrared LEDs for luminance even in total darkness
- Full color modulation of background LEDs using definable wavetable
- Built-in dark adaptometer
- Xenon flash auto-calibrating system
- LED auto-calibrating system
- Flexible positioning with optional mounts
- Built in speaker for audio feedback during EOG and ERG tests
- Integral xenon filter holder



Espion Control Console

Diagnosys LLC has a strong reputation for producing high-quality research instrument systems that are being used in some of the worlds leading eye research institutes. This research includes early detection of glaucoma, evaluation of vitamin, drug, and genetic therapy for RP and other inherited diseases, evaluation of retinal implant, transplant, and translocation, and many others.



LED Unit

The system has two LED units, one mounted either side of the front port hole, which contains RED, GREEN, BLUE and AMBER LEDs. These can be adjusted for both duration and color electronically and cover a luminance range of approx. 10^7 producing flashes up to 20 cd.s/m^2 , or steady state backgrounds of 500 cd/m^2 . Control is provided by a constant current PWM circuit which provides an overall luminescence resolution of 1 part in 2.62×10^{12} . The circuit contains three rings of LEDs, a bright ring, a dim ring, and a low dim ring to achieve the vast luminance range and all rings are color calibrated. The LED spectral curves can be found on our web site [www.diagnosysllc.com].

Camera

The desktop contains an infrared camera and filter with additional infrared LEDs to illuminate the patient's eyes even during dark periods. The output of this camera may be viewed directly on the Espion screen via USB and also routed to a video monitor/recorder for real-time display of the patient's eye movements including blinks.

Speaker

The built in speaker can give an audible cue along with the LED cycle for EOG tests and also give an audible run up during ERG tests to help the patient prepare for the next flash.

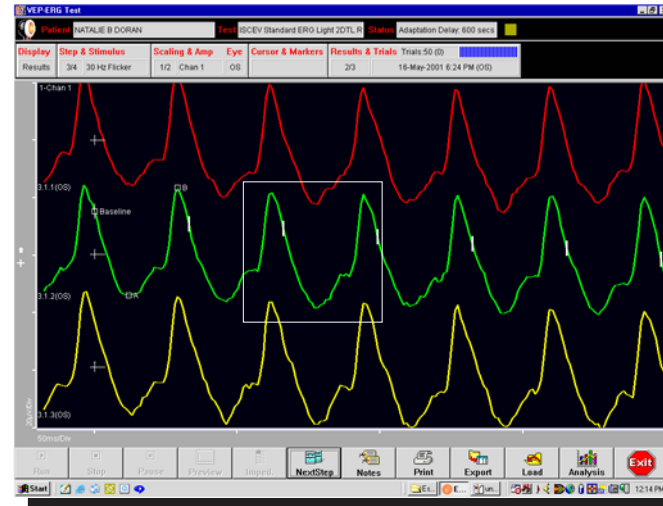
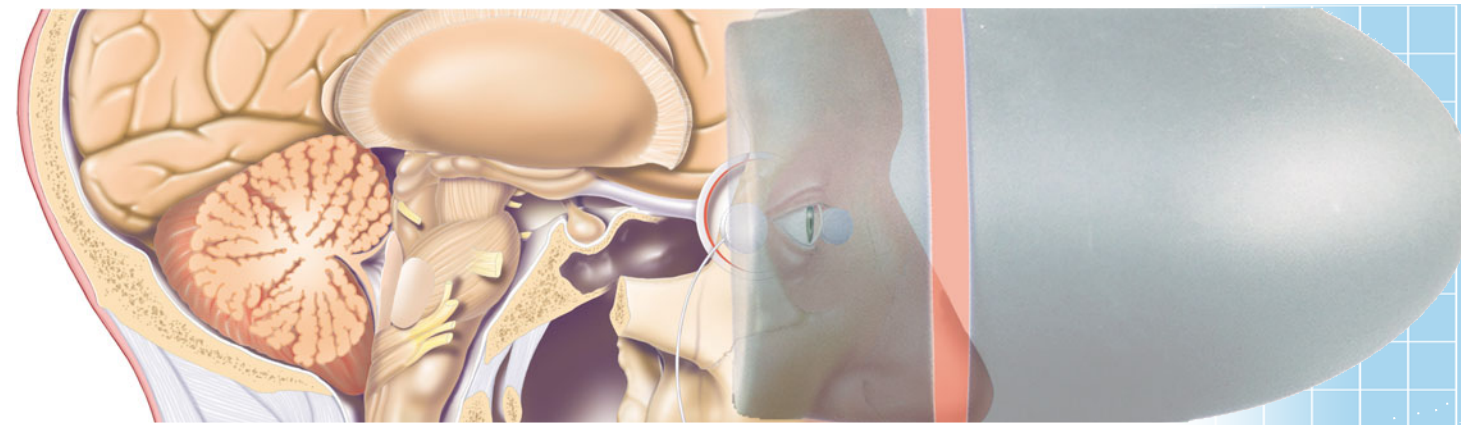
Fixation LEDs

LED Calibration

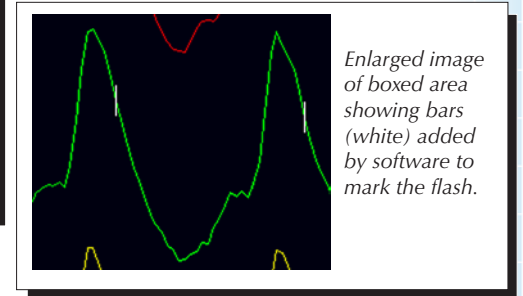
Dark Adaptometry

The desktop has a built-in dark adaptometer stimulator for dark adaptometry tests.

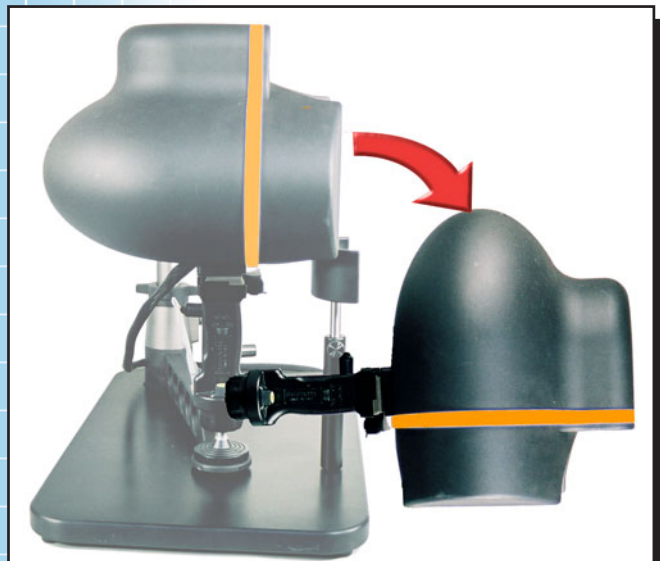
IR Illumination



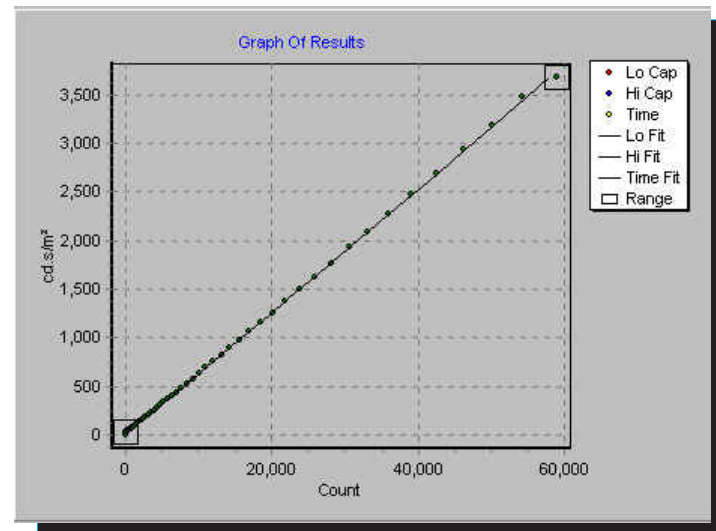
The Colordome LED array produces no electrical artifact, as shown in this 30 Hz Flicker response. Software markers applied to the center trace mark the stimulus. (Note: both images slightly enhanced to improve clarity.)



Enlarged image of boxed area showing bars (white) added by software to mark the flash.

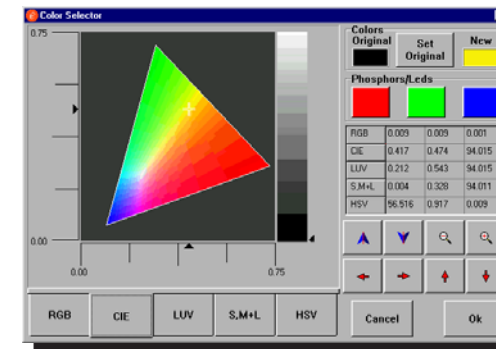


The ColorDome can be rotated to a wide range of positions including a downward facing configuration that can be used with reclining subjects.



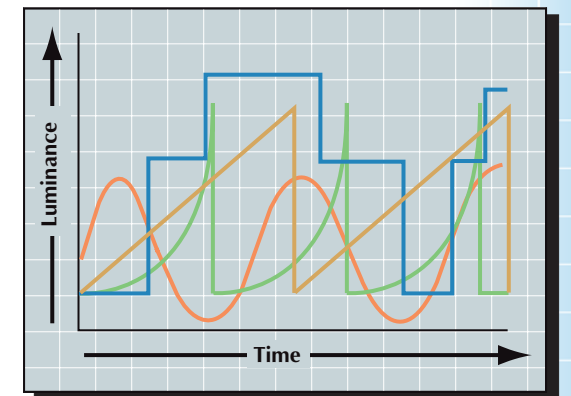
Xenon Flash Unit

Fully electronic with two flash tubes, it covers a wide range of luminance (approx. 10^6) with high linearity (see figure above). It uses a novel feedback system which monitors the light output and terminates the flash at the appropriate time. This technique creates flash duration's in the range 5µs to 2ms and has a built-in auto calibration system which will produce the same light regardless of tube wear. It does not support 30Hz flicker at light levels above 1 standard flash ($\sim 1.5 \text{ cd.s/m}^2$). The system does support "Bright flash" and "Double flash" experiments and even allows the user to create their own flash sequence.



Software Control

The software controls flash and background luminance intensity, color and duration with very precise resolution. Colors be any mixture of the three primaries selected by CIE coordinates, and intensities may be specified with a resolution of $1/64000$ of full-scale. Luminance can be specified in either scotopic or photopic units and flash intensities are entered in cd.s/m^2 units rather than dB for absolute precision. Stimulus output may be programmed to be a single flash, multiple flashes, sinusoidal, exponential, ramp (for onset/offset responses), and a user defined arbitrary waveform. User defined output includes the ability to specify the flash and background color and intensity on a per ms basis for an arbitrary length of time. The system allows user defined programs to include sophisticated expressions and variables to allow even the most complicated stimuli to be produced. The software can control dual ColorDomes simultaneously, each of which can be programmed independently.



The ColorDomes control software can reproduce different waveforms for each of the four color LEDs (Red, Green, Blue, and Amber) for durations as short as 1 ms up to a week in length. The waveform description can be generated by the user through a spreadsheet or you can have Diagnosys custom design one for you.