Espion Profile Multifocal

The Espion multifocal ERG system software and hardware has been developed by Diagnosys LLC to provide an easy to use clinical system for combined spatial and temporal information on retinal function. The default 61 and 103 elements (max 243 elements) are available with both short and long M-sequences. The full M-sequence test takes 8 minutes to perform with variable configurable segments lengths.

Stimulus features

• Both eyes can be tested simultaneously
• Ultra-wide field stimulus (90 degrees)
• Variable size, scale and type of stimulus:
  Hexagonal/dartboard/square stimulus patterns
• Extendable stimulus period using filler frames
• Variable size, location and color of fixation cross
• Variable M-sequence length tailored to hex count
• Testing can be stopped periodically to rest the patient

Hardware features

• 5 Channel headbox with industry-first 32-bit amplifiers
• 32” LCD wide angle monitor custom-designed to minimize luminance artifact and electrical noise
• Brightness 1000 cd/m2, Contrast ratio 1000:1
• Integrated Power Supply Isolation Unit
• 3 system configurations:
  Stand-alone, cart-mounted with power lift table (shown right)
  Stand-alone, bench-mounted (overleaf)
  or integrated into the Espion System
Espion Profile System

Headbox features
- 5 isolated channels can be acquired simultaneously (32 bit ADC)
- Low pass and high pass filtering
- Digital filtering when processing signal

Software features
- Full integration with Espion software
- Easy setup of multifocal protocols
- Print preview and customizable print layout templates
- Export data

Run-time features
- Real time trace display during testing
- 50Hz/60Hz mains removal option
- Noise level monitoring
- Adjustable real-time blink rejection-rejected blink data is re-recorded, not simply replaced by 'best-guess' data
- Smart data averaging
- Patient fixation monitoring through built in camera application
- Protocol fixation parameters can be adjusted before test run

Analysis features
- Display results as trace array, 2D/3D surface plot and latency plot
- Show all plot types simultaneously
- Show left eye, right eye or both simultaneously
- View, scale and average traces + restore to original trace values
- Display trace array with amplitude density or latency values
- Plot results vs. normals, raw recorded data or combinations
- Show viewing angles on all scaled 2D plots
- View, scale, change color-code and rotate surface plot
- Colorplot for latency, amplitude, amplitude density, surface variation and normal variation
- View response timings in color-coded plot
- Hotspot view and modify marker position for implicit times and amplitudes
- Standard manual analysis (single response, group response)
- Group analysis of traces (default or customized groups)
- Scaling with normalized density or density
- View raw data for a test

Database features
- Username and password security option
- Different user authorization levels
- Industry standard SQL relational database
- Client/Server facility to link across the net or through a local network
- Automatically generated and time-stamped audit trail
- Automatic database backup option
- Built-in password security with support for CFR 21 part 11
- Normative database available

Espion Profile VEP and PERG
Optional VEP and PERG round out the Espion Profile multifocal system to create an ideal instrument for neuro-ophthalmology applications. The large, bright screen coupled with the 32-bit acquisition system produces VEP and PERG responses of unprecedented clarity. The screen has been highly engineered to minimize the luminance artifact that makes most LCD screens unsuitable for use as VEP stimulators.

Stimulator Features
- Calibrated luminance and color
- Max resolution of 1366 x 768
- 75 Hz Frame Rate
- 6 bit Color/Luminance control
- Luminance > 1000 cd/m²
- Checkerboards, bars, gratings as standard with single pixel resolution
- Optional partial checkerboard square removal
- Full field, half field, quarter field patches
- Variable size/color/type fixation spot (center only)
- Full control of reversal rate and onset/offset with frame accuracy
- Adjustable trigger timing

Software Features
- Standard ISCEV protocols supplied
- Support for all standard ISCEV tests including Pattern Reversal VEP, Onset/Offset Pattern VEP and Pattern ERG (PERG)
- New protocols can be defined for both clinical and research systems
- Automatic rejection, peak/trough detection and measurement
- SQL relational database supporting multi-client/server environments
- No limit to number of records stored
- Multiple operator modes, for different levels of access
- Built in password security with support for CFR 21 part 11

Desktop Option
The Diagnosys Profile multifocal ERG/Pattern system is also available in a desktop mounted version.
Data Acquisition

The data acquisition system is based around a fast DSP microprocessor that controls and synchronizes data acquisition and stimulator timing independently from the PC. The system is comprised of 5 differential DC coupled amplifiers (prevent AC amplifier lockup) with the following specification:

- **Industry-first 32 bit resolution (<1nV LSB)**
- Fully isolated
- Input range +/- 2.5V max; +/-625 mV default
- Automated internal calibration
- Integral anti-alias filter
- Differential channel input gain matching better than 0.01%
- Ultra low noise <1μV RMS
- Input impedance greater than 10^9 ohms
- CMRR greater than 110dB at 50/60Hz
- 4kHz internal sample frequency
- Automatic impedance monitor measures each input including ground, not just each channel
- All filtering is performed digitally

Control Computer Option

- Touchscreen panel PC, Rugged Laptop, Laptop, or Desktop PC configured to current highest hardware standard available at time of purchase
- USB optical mouse and keyboard included

Power Isolation

The Espion Profile System incorporates transformers required to isolate ancillary equipment such as a monitor or printer so they will meet medical leakage current standards. No cumbersome external transformers are needed.