



VisuScience



Traditional Visual Electrophysiology **RetiMINER-P**

Economic Clinical Solution

Listen to the clinical

RetiMINER-P – Exquisite Work



Integrated Design

We have made the amplifier, stimulator and LCD pattern stimulator into one single host. There is only one power cord and one data cable in the whole system.

The integrated design has following advantages:

Space saving

Simple cable assortment

Easy for movement

Pattern Transformation



Though the pattern stimulator is black, it will not affect the effect of central retina flash stimuli for the following reasons:

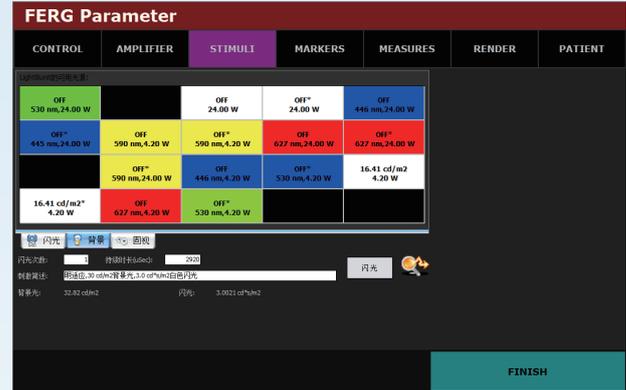
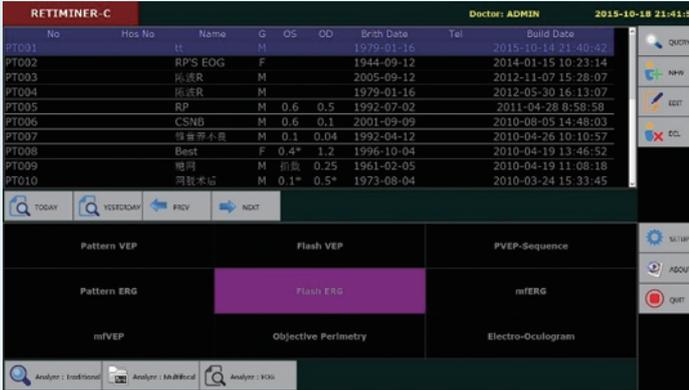
If the clinician rotates the top knob, the visor with diffuse reflection surface will cover the pattern stimulator and construct a complete Ganzfeld reflecting dome.

The visor has a build-in fixation led and 2 EOG LEDs. EOG test is supported.

RetiMINER™ Traditional Electrophysiology



Include all standard ISCEV programs:
PVEP, FVEP, PERG, FERG, EOG



Flexible Configuration – Customizable Program

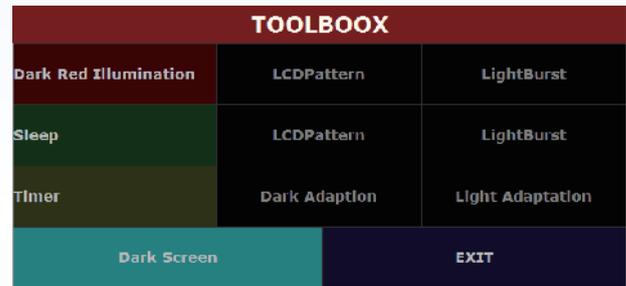
Administrator can customize test programs such as those special procedures designed for animal test. At the same time, other routine programs for human clinical use remains unchanged.



Offline Averaging & DSP

The clinician can manually remove those sweep signals that are not reliable after test. This is valuable for infants' test and medical legal claims.

The system provides full band-width raw signal. The clinician can design his own digital filter to process and average it. Facilitated by customizable digital filter and spectrum analysis, clinicians' scientific research will become much easier.



Utility

Dark/light adaption timer makes test process more automatic.

Dark red illumination provided by LightBurst® or LCDPattern® makes electrode setup easy. Specially designed dark red screen mode avoids devastation of dark-adaption.

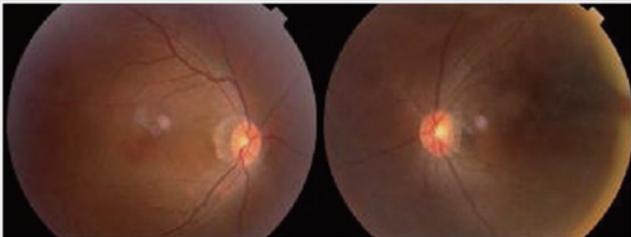
RetiMINER™ – Case Example

VEP - depend on functional integrity of central vision at any level of the visual pathway including the eye, retina, the optic nerve, optic radiations, and occipital cortex.

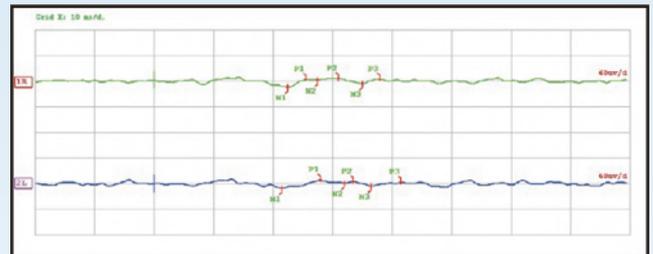
ERG/FERG – mainly reflect function of rod/cone and connected bipolar cells, rod/cone system can be isolated through dark/light adaptation.

PERG – represent function of ganglion cells when photo-receptor & bipolar cells works fine.

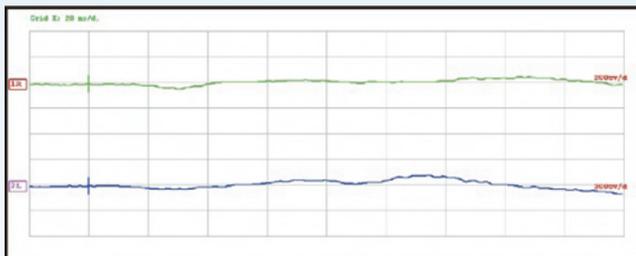
EOG - is an electrophysiological test of function of the outer retina and retinal pigment epithelium (RPE).



Fundus

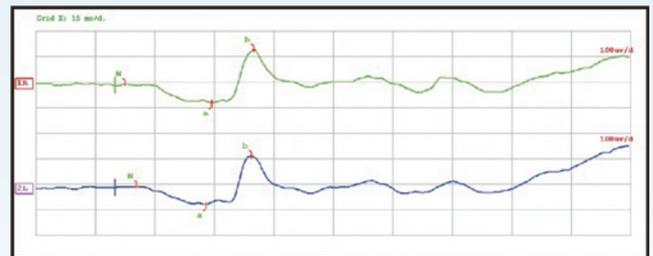


DA 3.0 OP: OU, no obvious signal.

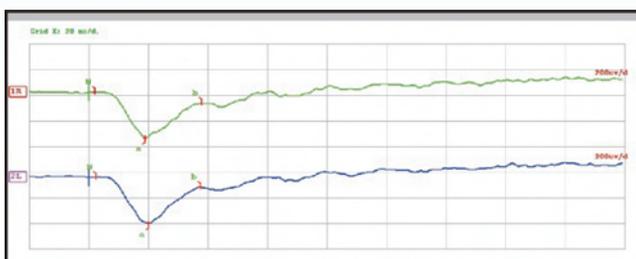


DA 0.01 ERG: OU, signal extinguished.

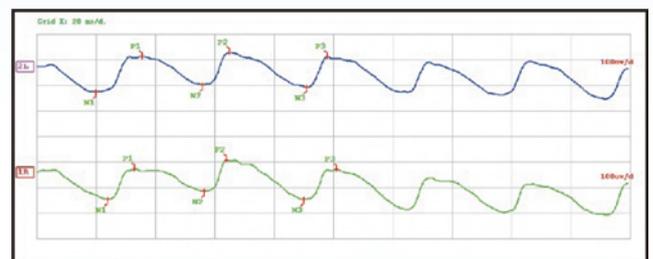
3 possible reasons: rod malfunction. bipolar (connect with rod) malfunction. rod-bipolar connection malfunction.



LA 3.0 ERG: flat a wave, b wave with little delay. For normal person, b wave is composed by on bipolar cell's response followed by off bipolar cell's. This b wave only includes off wave, his cone/on-bipolar did not work right.



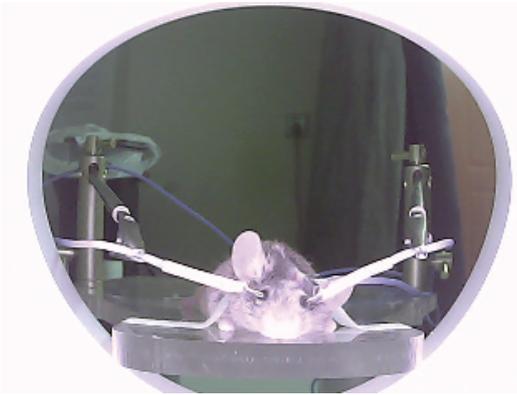
DA 3.0 ERG: Negative shape ($b < a$). The normal a wave prompt rod+cone works right. The reduction of b wave prompt malfunction of rod/cone to bipolar cells. 2 possible reasons left: malfunction of bipolar cells. rod/cone-bipolar connection malfunction.



LA 3.0 flicker: OU, slightly attenuated amplitude.

Conclusion: extinguished rod response, negative rod-cone response, no obvious signal found in OP, flat a wave, a little delay b wave in cone response. Test result highly recommends CSNB, in which on-bipolar and connection between rod-bipolar do not works right.

Fixation Monitor



RetiMINER-P provides fixation monitor for flash and pattern test:

- If the electrodes working properly ?
- Any unpredicted eye movement ?
- If the other eye was covered properly ?

(Just for VEP)

- Does the subject show fatigue ?



Dedicated VEP Electrode Set

Composed by: one bridge as active electrode, one ear clip as ground electrode, one disc as reference.

The VEP electrode dramatically simplify the test and make the whole process happier.

Animal Platform (Optional)

Suitable for mouse, rat, rabbit and other small animals; Equipped with rotating electrode clip, it can fix the electrode through any angle.



Specification

RETIMINER-P

AMPLIFIER

Input Impedance	$\geq 1000 \text{ M}\Omega$
CMRR	$\geq 115\text{dB}$
Input Noise	$\leq 4\mu\text{Vpp}$
Filter	Full real time digital filter, band-pass, band-stop, high-pass, low-pass, comb filter applies to every channel independently
A/D Resolution	24 bits
Port	Optical isolated USB 2.0
Power Supply	Li-ion battery, switch to USB power automatically when low battery

FLASH STIMULATOR

Light Source Color	White, Red, Green, Blue and any of their combination
Flash Luminance	Can produce $30\text{cd}\cdot\text{s}/\text{m}^2$ broad-band white flash in $< 4\text{ms}$
Flash Luminance Range	$0\text{-}100 \text{ cd}\cdot\text{s}/\text{m}^2$
Stimuli Mode	Single, Double, String, On/Off, on duration can be adjusted
Background Illumination	$0\text{-}500 \text{ cd}/\text{m}^2$
Stimuli Frequency	$0.01\text{-}200\text{Hz}$
Fixation & EOG	3 Fixation/EOG indicator, 64 adjustable intensity
Monitor	Infra-red camera

PATTERN STIMULATOR

Luminance	$0\text{-}200 \text{ cd}/\text{m}^2$
Contrast	$> 98\%$
Pattern Shape	Checkerboard, Horizontal/vertical stripes, rectangle, adjustable element angle
Stimuli Field	Full field, left/right/upper/lower half, up-down/left-right margin; $\frac{1}{4}$ left-top/right-top/left-bottom/right-bottom; horizontal/vertical center, $\frac{1}{8}$ center; Center circle with any angle; Field outside center circle with any angle.

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