

CHARTR® VNG/ENG



INNOVATION IN PRACTICE



VNG CHARTR ENG

Dizziness remains one of the most common complaints presented to physicians. As many as 40% of all adults have episodes with enough intensity or frequency to prompt a visit to their doctor's office.

CHARTR VNG **BREAKTHROUGHS IN BALANCE** and ENG are primary diagnostic tools for investigating the source of dizziness. Monitoring eye movements can reveal abnormalities within the balance system. Your diagnostic capabilities for peripheral and central nervous system disorders are greatly enhanced by the clinical information provided by VNG and ENG.

CHARTR Systems

DESIGNED FOR EASE-OF-USE
AND DIAGNOSTIC SIGNIFICANCE

- Robust, well-proven software
- Efficient data capture and effective analysis
- Backed by ICS training and support

ICS keeps the innovation coming—introducing digitized video recording with VNG

CHARTR VNG (videonystagmography) measures and records eye movements through video image processing—eliminating the need for electrodes. Seeing the video images of the eyes in real time together with the scrolling tracing has added new dimensions of diagnostic information. And now, video recordings of eye movements (video clips) can be captured digitally allowing you to review them easily and immediately, e-mail them to colleagues or use them for communication and education. You get high-quality digital recordings without the space requirements, cost and storage/retrieval inefficiency of analog recording. The digital recordings are annotated with patient name, test name, test date and time and additional notes.

The VNG system uses high-tech video goggles with infrared cameras, providing noise- and drift-free eye position data. Our new generation goggles have been designed to be light, sturdy, and comfortable. And, they have the flexibility to fit most facial shapes and to properly test both eyes. VNG software is the same as that used for the ENG system and results are stored in the same database.



CHARTR® VNG

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TOOLS TO
ENHANCE YOUR
DIAGNOSTIC
PROCESS

DISORDER DIAGNOSTICS

Showcasing the industry standard

CHARTR ENG (electronystagmography) measures and records eye movements using electrical signals from the eyes. ENG has been and remains the most widely used test of the vestibular system. ENG complements VNG by adding the capability of testing some patients who cannot be tested using VNG. And, it remains the clinical standard.



CHARTR® ENG

Integrating capabilities and conserving space

ICS's CHARTR VNG, ENG and EP (evoked potential) and even OAE (otoacoustic emissions) can be combined in the same computer. Integration offers cost-effective purchasing options. If you already own an ICS system, consider adding another modality. Ask your distributor about all of the advantages of integration—including space conservation. Or, call ICS today.

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medical

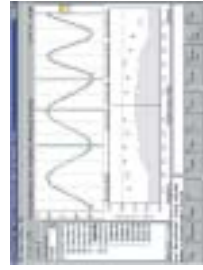
Rely on CHARTR Systems for proven results

ICS Medical is the most experienced eye movement testing company in the world. Built on this experience, the CHARTR VNG and ENG Systems provide proven algorithms for slow phase velocity, saccade and tracking analyses. Results can be graphically compared to normative data validated through statistical analysis as well as years of clinical use. Comprehensive, customized reports are automatically produced in a format that is readily understood by knowledgeable clinicians.

ICS Medical was also the first to provide computer-based testing and continues to lead by offering the first Windows-based eye movement testing system. Now, ICS Medical is the first to offer digitized video recording—opening up whole new diagnostic and treatment possibilities. Other innovations, such as database storage of results from multiple test modalities and technical comments with guidance to clinicians on test validity, are offered as a part of ICS's commitment to developing valuable uses of technology. Only ICS can offer a completely integrated system comprising optical and caloric stimulators controlled by the same processor that records, analyzes and reports the clinical information.



DIGITAL VIDEO RECORDING Record and store eye movements with ease. Clips provide clear documentation in association with tracings and patient records. Digital video recording adds a new dimension to data interpretation and is key for BPPV.



TRACKING After removal of saccadic corrections, the speed of the eyes is compared to the speed of the target. Operator intervention during analysis is available but usually not necessary. Results are compared graphically to normal values.



SLOW PHASE VELOCITY Nystagmus slow phase velocities that meet fine-tuned criteria are measured and graphed by the system. Operators can override and modify where required. Caloric weakness and directional preponderance are calculated and displayed.

Both CHARTR VNG and ENG Systems are manufactured within an ISO 9001 certified quality system and meet applicable safety standards.

Video Goggles

Dual mode (see-through and vision-denied) four channel/two camera goggles can be used for all applications, including oculomotor and non-oculomotor testing. Newly redesigned goggles are light, sturdy, and comfortable to wear. The goggles are flexible, fitting a wide variety of face shapes and eye spacing.



DIGITAL VIDEO CLIPS Digital video clips can be readily retrieved and replayed. The clips can be used to compare within or across patients, transmitted via e-mail to colleagues or used for teaching.

Quad Display

optional (not shown)

Quad display monitor with VCR and room camera provide and capture additional displays of each eye, a room view, images from the computer, or optional text for additional annotation and patient observation.

9" Monitors

optional (not shown)

Two monochrome monitors display images of the patient's eyes—enhancing available data.

Caloric Stimulator

optional (not shown)

ICS's own air or water caloric stimulator can be integrated with the system for reliable, accurate stimulation.

Computer Monitor

A large display shows test options, eye position data and associated text and graphic information. When using VNG, the video images of the eyes can be "popped up" for clear visualization of the eyes, adding new dimensions of diagnostic information.

Light Bar

Calibration and oculomotor targets are controlled by the system. An ultrasonic range finder measures the distance from the patient for accurate test results.



CHARTR VNG/ENG Systems include

- Computer PC-compatible processor, high capacity hard drive, high speed CD-RW, floppy drive, Windows operating software
- Computer Monitor, Keyboard, Mouse
- Isolation Transformer
- Light Bar
- Hewlett-Packard Color Deskjet Printer

VNG Also includes:
Video Goggles

ENG Also includes:
Electrodes/Starter Kit

Optional

- Rolling Cart
- Quad Display with VCR and room camera (VNG only)
- Two 9" Monitors (VNG only)
- Caloric Stimulator (air or water)
- Exam Table



SPECIFICATIONS

SYSTEM CAPABILITIES

Inputs	ENG	2 or 4
	VNG	2 eyes <i>equivalent to 4 inputs</i>
Low Pass Filter	ENG	30 Hz
Coupling		DC response
Input Offset Voltage	Range ENG	± 20 mV ± 300 mV <i>for systems combined with CHARTR EP</i>
	CMRR ENG	90 dB minimum with 1K impedance imbalance
	IMRR ENG	130 dB minimum
	Noise ENG	5 microvolt peak-to-peak maximum with input shorted
Resolution	ENG	16 bit, 0.6 microvolt/bit <i>12 bit with hardware offset for systems combined with CHARTR EP</i>
	VNG	0.1 degree typical
Sampling Rate	ENG	60 Hz, 120 Hz or 240 Hz
	VNG	60 Hz
Modes of Testing	ENG	Eyes open or closed
	VNG	With vision (for external targets) or eyes open in darkness (uses light-occluding cover)
Range of Eye Position Tracked	ENG	± 30 degrees horizontal ± 30 degrees vertical
	VNG	± 30 degrees horizontal ± 28 degrees vertical
	VNG	
Video Goggles	VNG	
Linearity		1% full scale (H), 1.2% full scale (V)
Input Power		120/240 VAC @ 50/60 Hz

SAFETY The CHARTR VNG/ENG System, including the monitor, printer and isolation transformer, is designed to meet medical power isolation standards and other applicable medical standards. Meets UL544, UL2601, CE marked (certified to meet IEC 601-1).

[CAUTION] Federal law restricts this device to sale by or on the order of a licensed physician



OPTICAL STIMULUS LIGHT BAR INCLUDED

Patient-to-bar Distance	4 feet
Ultrasonic Range Sensing	Measures patient-to-bar distance
Target Position	Gaze targets ± 30 degrees
Pursuit and Saccades	± 16.7 degrees computer controlled
Target Size	Less than $\frac{1}{2}$ degree of arc
Brightness	Software controlled
Optokinetic	6 targets
Rotation	90 degrees <i>horizontal or vertical presentations</i>

COMPUTER

Processor	PC compatible
Hard Disk	High capacity
Floppy Drive	Standard
CD-RW	High speed
Power Supply	230 watts minimum
Graphics	SVGA color

COMPUTER PERIPHERALS

Monitor	LCD flat screen
Printer	HP Color DeskJet <i>others optional</i>
Keyboard	PC standard
UPS	600 VA <i>optional</i>

SELF-DIAGNOSTICS

Electrode Test	ENG Validates patient's electrode connections
System Test	Built-in system diagnostics are appropriate to the specific configuration

SIZE (WXHxD) & WEIGHTS

MCU-90	8 x 15 x 17 inches 22.2 x 38.1 x 43.2 cm 25 lbs 9 oz 11.5 kg
Light Bar <i>not including mounting brackets</i>	59 x 5 x 3 inches 150 x 18 x 13 cm 15 lbs 7 kg
T-600 Isolation Transformer	8 x 5 x 7 inches 20.3 x 12.7 x 17.8 cm 12 lbs 5.5 kg
Video Goggles	VNG 15 oz 0.43 kg

Unequaled Customer Service

All ICS Medical customers receive unlimited access to technical and operational assistance from the professional ICS support staff.

With every system purchased, ICS Medical helps you maximize your investment by providing installation and set up, on-site training, advanced training at ICS's facility, a full hardware warranty, software updates and discounts at ICS Medical sponsored courses during the first year.

After the first year, you have the option to purchase programs that include software updates, hardware assurance including loaned equipment, interpretation assistance and discounts on courses (domestic customers only).

It's ICS's innovative approach to customer service—support that is a part of the products we sell. We want to ensure that those products provide valuable diagnostic information for as long as you own them.



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