

VNG

Balance Testing



VN415 / VO425
- Complete solutions



Interacoustics®

leading diagnostic solutions

VNG

Balance Testing

Balance Testing with VNG

Video Nystagmography provides ideal conditions for the observation, measurement and analysis of eye movements. It saves time, reduces costs and avoids the problems of myogenic and electrical noise. These advantages make VNG an attractive clinical procedure for testing balance disorders.



Interacoustics offers two VNG solutions, each with increasing scope:

- VN415 is the basic VNG platform with standard protocols for Spontaneous Nystagmus, Bithermal Caloric, Positional and Dix-Hallpike testing.
- VO425 offers the same test protocols as VN415 and additionally expands into oculomotor tests with standard protocols for Gaze, Saccade, Smooth Pursuit and Optokinetic testing.

Both systems can be delivered in monocular or binocular camera configurations.

Rotational testing and VNG

The rotatory stimulus is more powerful than e.g. the caloric stimulus and equals the stimuli experienced by the patient in everyday situations. Rotational testing is therefore a reliable test of the vestibulo ocular reflex.

Rotational testing has clear advantages over caloric testing. It is the only way to assess patients with a compensated unilateral lesion or with bilateral vestibular lesions (e.g. ototoxic damage).

Off Vertical Axis Rotational (OVAR) testing enables unilateral testing and may often eliminate the need for caloric testing. OVAR testing is optionally available as an upgrade package for the Nydiag Rotary Chair.

The Nydiag Rotary Chair provides precisely controlled and reproducible stimuli, a full test battery, a number of convenient features when testing and includes software with user definable tests.

The Combi Goggle



The VN415/VO425 FireWire® VNG systems incorporate the industry's leading goggle design. The Combi goggle is light weight with a direct FireWire® connection to a laptop or desktop computer. It has an easy fitting magnetic cover to allow for both occluded and unoccluded measurements and a built in fixation light to simplify

testing. With adjustable mirrors and vertical, horizontal and focus adjustments for each camera, the fit is ideal for all patients regardless of skull size.

The disposable foam cushions allow a sanitary solution for each patient and provide a comfortable, secure and light tight fit.



How common is dizziness and imbalance?

According to the National Institute of Health "Over 90 million Americans, age 17 and older, have experienced a dizziness or balance problem."

Dizziness occurs in approximately 1.8 percent of young adults and more than 30 percent of the elderly. Every year, one-half of the population age 65 and over experience falls.

As stated by the Vestibular Disorders Association, children can experience the same vestibular disorders as adults.

Benign paroxysmal positional vertigo (BPPV) in children is typically associated with physical trauma and can result from accidents, falls, or sports injuries. BPPV has also been observed following cochlear implantation. Vestibular neuritis or labyrinthitis occurs in children, as well as ototoxicity. Children that experience ototoxicity can have severe imbalance, falls, and visual-motor problems, including oscillopsia (bouncing vision).



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Balance Testing VN415

VN415 – Vestibular analysis

The VN415 is designed for convenient computer aided analysis of position and caloric tests. Rapid data transfer technology enables very high quality video and precise measurements with all results stored in the OtoAccess™ database. The system also includes functions for printing reports and sharing data.

Connect and go testing

Start the software, place the goggles on the patient and you are ready to test. The ease of use of the VN415 is a major factor in its success. There is no bulky equipment to get in the way.

High quality video and analysis

The VN415 performs real time analysis. Rapid data transfer (105 Hz binocular, 174 Hz monocular) allows much more data to be analysed, giving very precise measurements and outstanding video quality.

Vestibular test battery

The VN415 test battery includes Spontaneous Nystagmus, Dix-Hallpike, Position and Bithermal Caloric tests. You can design your own test protocols and load these with a single mouse click.

Remote controlled tests

It is possible to step through the tests using a remote device. This can either be a USB connected footswitch or an infrared hand held device.

Video recording

The video from each test can be recorded and stored in full on the associated storage device (typically a hard drive) where it is linked to the results in the database record. The only limit to the size of the recording is the capacity of the recording device.

When the session is reviewed, the recording will be available for replay in normal, fast or slow mode. There is also the option to review the recording one beat at a time.

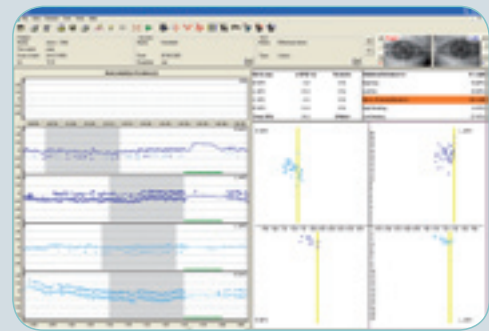
The recording can be exported in AVI format for consultation or teaching purposes. Various sound file formats are available to include sound recording together with the video.

Other features

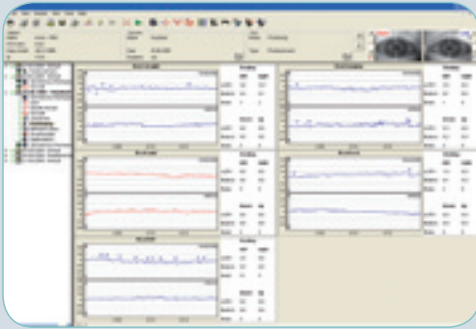
- Multi-language interface
- Nystagmus edit function
- Compact & convenient hardware
- Integration with Nydiag 200 rotary chair
- Tester comments recorded with results
- Short automated calibration
- User-defined tests
- Diagrams and statistics calculated automatically in real time
- High quality printouts of all analyses and selected raw data
- Coloured printed reports for each test.

Related products

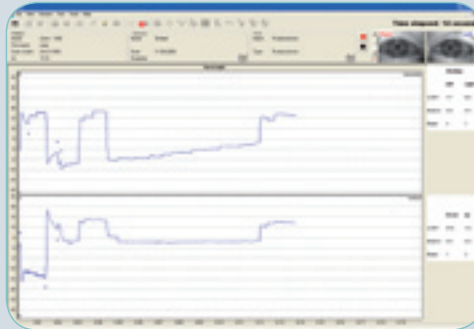
- Eclipse with Vestibular EP



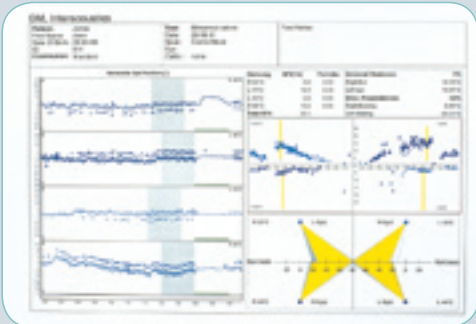
Caloric Irrigator test window



Positional test window



Positional test window
(enlarged during data acquisition)

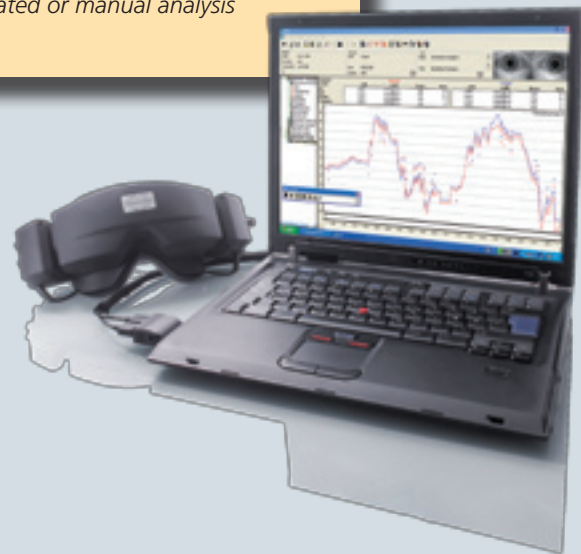


Example of printout of Caloric test

- VN415**
- Fast eye-tracking (105Hz binocular, 174Hz monocular)
 - Real time analysis
 - Automated 10 second calibration
 - Automated or manual analysis

Standard	Mean	SD	Min	Max	Page 1/1
Acoustic/Audiogram					
Left	200	1000	1000	1000	
Right	200	1000	1000	1000	
Speech/Audiogram					
Left	200	1000	1000	1000	
Right	200	1000	1000	1000	
Speech/Caloric					
Left	200	1000	1000	1000	
Right	200	1000	1000	1000	

Example of printout of numerical statistical data
(4 tests per page)



VNG

Balance Testing VO425

VO425 – Vestibular & Oculomotor analysis

The VO425 is designed for clinics that carry out detailed balance evaluations. It contains all the features of the VN415 plus computer aided analysis of oculomotor tests. Rapid data transfer technology enables high quality video and precise measurements, with all results stored in the OtoAccess database. The system also includes functions for printing reports and sharing data.

Software generated ocular stimuli

Full field of view visual stimuli are software generated from your laptop or PC connected to a video projector or an LCD screen. The digital stimuli are ideal for both pediatric and adult populations and include several default patterns, e.g. stripes, chessboards and cartoons for the kids. In addition you can import your own stimuli patterns.

Complete balance testing

Tests include automated calibration, Spontaneous Nystagmus, Gaze, Tracking, Saccade, Positional, Dix-Hall-Pike, Bithermal/monothermal Caloric. You can easily design your own test protocols and load these with a single mouse click.

Automatic or manual analysis

The system produces highly accurate test results, but you can switch to manual edit mode in all tests to overrule the automatic analysis. In manual edit mode the examiner can add or delete nystagmus marks, change slopes and define alternative areas of analysis.

Remote controlled tests

It is possible to step through the tests using a remote device. This can either be a USB connected footswitch or an infrared hand held device.

Sharing results

The VO425 is designed to facilitate collaboration. All results are stored in the OtoAccess™ database with abilities for printing detailed colour reports. Results and recordings can also be exported.

Video recording

The video from each test can be recorded and stored in full on the associated storage device (typically a hard drive) where it is linked to the results in the database record. The only limit to the size of the recording is the capacity of the recording device.

When the session is reviewed, the recording will be available for replay in normal, fast or slow mode. There is also the option to review the recording one beat at a time.

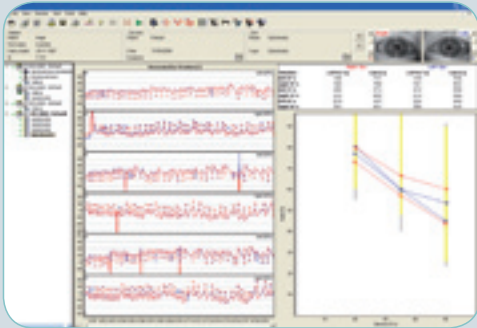
The recording can be exported in AVI format for consultation or teaching purposes. Various sound file formats are available to include sound recording together with the video.

Other features

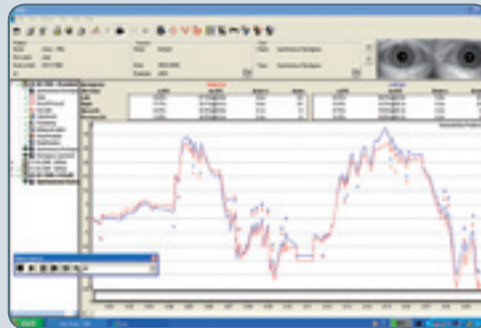
- Sleek portable design
- Fully randomized combined vertical and horizontal saccade protocol
- Detailed oculomotor testing
- Customizable
- Monocular or binocular
- ANSI standard compliant
- Real time analysis
- Synchronized video playback
- High speed resolution at up to 174 Hz

Related products

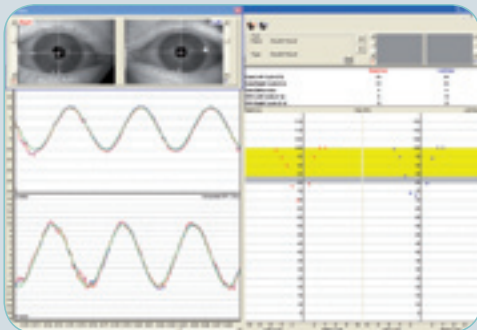
- Eclipse with Vestibular EP



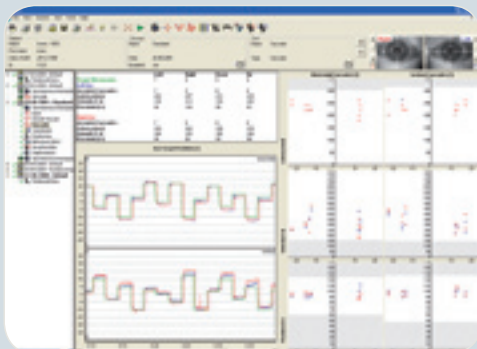
Optokinetic test window (only VO425)



Video playback



Eye view mode in Smooth Pursuit test window (only VO425)



Saccade test window (only VO425)

VO425

- Fast eye-tracking (105Hz binocular, 174Hz monocular)
- Software generated ocular stimuli
- Real time analysis
- Automated 10 second calibration
- Full field of view visual stimuli
- Automated or manual analysis



USB footpedal



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Balance Testing

Nydiag Rotary Chair

Rotational testing is more sensitive than caloric testing even though both are typically used during a full balance assessment.

Rotational testing produces fewer false negatives than caloric testing and is the only test suitable for compensated unilateral lesions and bilateral vestibular lesions.

Rotational testing also avoids all the accessories required for caloric testing and is therefore preferred by many patients. Some patient groups (e.g. children) will often accept rotational testing but reject calorics.

Authentic rotational stimulus

The physiological rotatory stimulus is similar to that which the patient will experience in daily life and up to 100 times stronger than that achieved with the non physiological caloric stimulus. This makes rotational testing particularly suitable for VOR testing.

Vestibular Rehabilitation

The Nydiag Rotary Chair can play an important role in monitoring the compensatory processes of vestibular rehabilitation therapy. It can chart the vestibular healing process by utilizing a wide range of frequencies and acceleration rates.

Accuracy, convenience and flexibility

The Nydiag Rotary Chair provides precisely controlled and reproducible stimuli. You have full control over acceleration, velocity and amplitude and can easily design and configure your own tests

A full test battery

A full test battery is included with the chair, including the sinusoidal pendular test, a velocity step rotational test, sinusoidal harmonic acceleration test (SHAT) and step rotation test.

Space-saving design

The Chair allows you to carry out all tests in a minimum of space. In addition to rotation tests, it reclines easily to allow caloric testing with easy access to both ears. And it can also open out completely and act as a flat bench for positioning tests.

Future safe design

The Nydiag Rotary Chair has 18 maintenance-free, FireWire® compatible slip rings. This enables maximum data transmission from the VNG cameras and also gives excellent expansion possibilities for new technologies or test requirements.

Other features

- Calibration free
- USB connection to PC or laptop
- Control box integrated in socket
- Velocity up to 200°/s
- Acceleration/deceleration up to 100°/s²
- Windows® XP control system

Nydiag Rotary Chair

- FireWire® compatibility
- Space saving
- USB connection



VNG

Nydiag Specifications

The Nydiag 200 rotary chair is controlled via USB-connection through the RCControl-program. The following functions are available:

- set position
- set speed
- sinusoidal movement for pendular and SHAT-test
- triangular movement for pendular test
- rotation tests e.g. velocity step

Technical data:

Maximum speed	200 deg/s
Maximum acceleration	100 deg/s ²
Max. patient weight	135 kg for full specification, 150 kg with reduced specs.
Reclining backrest	Manually operated from 0 deg (horizontal) to 90 deg (sitting)
Slip rings	18 FireWire® compatible slip-rings
Emergency stop	Emergency stop button disconnects the motor power
Patient alarm button	Sends an alarm signal to the computer and stops the rotation
Weight	175 kg
Weight incl. package	190 kg
Dimensions	90 cm x 70 cm x 160 cm
Dimensions incl. package	100 cm x 75 cm x 190 cm
Power supply	110-230 V~ (50/60 Hz)/ 4A max
Options:	Off-axis movement, ± 10 cm max

The rotary chair complies with the CE-regulations



Sinusoidal Pendular test window
(only with rotary chair)



StepRotation test window
(only with rotary chair)

Read more here:
www.interacoustics.com/com/VNG



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VO425 Specifications

Technical Standards:

Camera: IEEE1394 FireWire®

Resolution: 640 x 240 Pixels

Images: 105 images per second binocular, 174 images per second monocular

Safety Standards: IEC 60601-1 (General Safety), IEC 60601-1-1 (System Safety), IEC 60601-1-2 (EMC)

Physical Specifications:

Goggle Weight
with one camera

- 240g (non-occluded view)
- 320g (occluded view)

with two cameras

- 305g (non-occluded view)
- 385g (occluded view)

Dispensing box with 24 pcs. of Disposable Goggle Foam pads

- 302 x 216 x 131mm (L x W x H)

Tests:

Bithermal Caloric Test
Spontaneous Nystagmus Test
Positional Test
Dix-Hallpike Test
Gaze Test
Smooth Pursuit Test (Tracking)
Saccade Test
Optokinetic Test
Sinusoidal Pendular test (only with rotary chair)
Step Rotation test (only with rotary chair)

System requirements:

Hardware:

Intel Core 2 Duo processor 1.8 GHz or better
Minimum 1 GB of RAM
Laptop PC: One 34 mm PCExpressCard slot available
Desktop PC: Texas Instruments chipset PCI FireWire® board with dual 6-pM ports
Two USB ports available
One VGA port available
Monitor resolution 1024 x 768 or better

Software:

Windows®XP SP2 Operating System
Microsoft .Net 2.0 Framework
Windows Installer 3.x

Included Parts:

Installation CD
Combi goggle with 1 or 2 cameras
Disposable combi goggle foam pads -1 box/24 pieces
Infrared remote control
USB Footpedal
H. 34mm FireWire® PCExpressCard with Power Supply
Otoaccess™ database software and OtoAccess™ language pack 1.0
Operation manual
VNG Quick Guide
Multilingual CE instruction

Optional Parts:

Rotary chair
Irrigator, water or air
Additional foam for Combi Mask
LCD projector

VNG

VN415 Specifications

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Resolution: 640 x 240 Pixels

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Positional Test
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Sinusoidal Pendular test (only with rotary chair)
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Monitor resolution 1024 x 768 or better

Software: Windows®XP SP2 Operating System
Microsoft .Net 2.0 Framework
Windows Installer 3.x

Included Parts: Installation CD
Combi goggle with 1 or 2 cameras
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LCD projector

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Leading diagnostic solutions

Interacoustics – the best choice

With over 40 years of experience, Interacoustics is dedicated to supplying its customers with the best possible solutions for their audiologic needs. This is accomplished by maintaining a continuous dialogue with healthcare professionals working in all sectors of audiology. Our equipment meets the highest possible engineering standards and we provide design know how that can only come from close contact with clinical practice.

Solutions on every scale

Designing equipment for every size of clinic in so many countries puts us in the unique position of being able to offer solutions that fit your requirements exactly. Audiometry, tympanometry, electrophysiology, hearing aid testing, balance investigation are all within our scope and can be integrated to suit your needs.

Design for diagnosis

We design equipment to make testing and interpretation easier. This means better interfaces, well designed screen layouts, printed reports and interaction over networks with databases and electronic records systems. In most cases, you can configure the settings and layout yourself.

Support worldwide

The Interacoustics name is not only your guarantee of quality and functionality, but also for support. We operate in over 100 countries worldwide through a well coordinated network of distributors and service centres to ensure that you receive total support and service.



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Products in this group:

- VO425
- VN415
- Nydiag Rotary Chair

Related products:

- Eclipse VEMP



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