

VN415/VO425 Specifications



Contents

VN415 Specifications	1
1.1 Technical Standards:	1
1.2 System Requirements:	1
1.3 Included and Optional Parts.....	2
VO425 Specifications	3
1.4 Technical Standards:	3
1.5 System Requirements:	3
1.6 Included and Optional Parts.....	4
1.7 Electromagnetic Compatibility (EMC)	5

VN415 Specifications

1.1 Technical Standards:

Camera:	IEEE1394 FireWire®
Resolution:	640 x 480 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:	Google 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 google foam pads 302x216x131mm (LxWxH)
Tests:	Bithermal Caloric Test / Monothermal Caloric Test Spontaneous Nystagmus Test Positional Test Dix-Hallpike Test Sinusoidal Pendular Test (only with rotary chair) Step Rotation Test (only with rotary chair)

1.2 System Requirements:

Hardware:	Intel Core i5 processor 2.3 GHz or better Minimum 1 GB of RAM Laptop PC: One available 34 mm PCIe ExpressCard slot Desktop PC: One available PCI-ExpressCard slot Two USB 2.0 ports available (minimum) Either VGA, DVI HDMI, DisplayPort or Mini DisplayPort available for external monitor Monitor resolution 1024x768 or better
Software:	Windows®7 professional(32-bit or 64-bit) Microsoft.Net 2.0 Framework. Windows Installer 3.x

1.3 Included and Optional Parts

Included parts:

Installation CD
Combi goggle with 1 or 2 cameras
Disposable combi goggle foam pads – 1 box / 24 pieces
TI Instruments chipset PCI-Express 1394a FireWire® Card
TI Instruments chipset 34mm FireWire® PCEXpressCard with power supply
USB 2.0-connected foot pedal
OtoAccess™ database software
OtoAccess™ language pack 1.0
Operation manual
VNG Quick Guide & Multilingual CE Instruction
Booklets: How-to Guides (Tests) & Introduction to Videonystagmography
VNG PowerPoint

Optional parts:

Rotary Chair
Irrigator, water or air
EN415/EO425 ENG preamplifier
Additional foam for Combi Mask
LCD projector
Flat panel LCD TV
Digital Light Bar
Stand for flat panel LCD TV

VO425 Specifications

1.4 Technical Standards:

Camera:	IEEE1394 FireWire®
Resolution:	640 x 480 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:	Google 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 google foam pads 302x216x131mm (LxWxH)
Tests:	Bithermal Caloric Test / Monothermal 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)

1.5 System Requirements:

Hardware:	Intel Core i5 processor 2.3 GHz or better Minimum 1 GB of RAM Laptop PC: One available 34 mm PCIe ExpressCard slot Desktop PC: One available PCI PCIe ExpressCard slot Two USB 2.0 ports available (minimum) Either VGA, DVI HDMI, DisplayPort or Mini DisplayPort available for external monitor Monitor resolution 1024x768 or better
Software:	Windows®7 (32-bit or 64-bit) Microsoft .Net 2.0 Framework. Windows Installer 3.x

1.6 Included and Optional Parts

Included parts:

Installation CD
Combi goggle with 1 or 2 cameras
Disposable combi goggle foam pads – 1 box / 24 pieces
TI Instruments chipset PCIExpress 1394a FireWire® Card
TI Instruments chipset 34mm FireWire® PCEExpressCard with power supply
USB 2.0-connected foot pedal
OtoAccess™ database software
OtoAccess™ language pack 1.0
Operation manual
VNG Quick Guide & Multilingual CE Instruction
Booklets: How-to Guides (Tests) & Introduction to Videonystagmography
VNG PowerPoint

Optional parts:

Rotary Chair
Irrigator, water or air
EN415/EO425 ENG preamplifier
Additional foam for Combi Mask
LCD projector
Flat panel LCD TV
Digital Light Bar
Stand for flat panel LCD TV

1.7 Electromagnetic Compatibility (EMC)

Portable and mobile RF communications equipment can affect the VNG. Install and operate the VNG according to the EMC information presented in this chapter.

The VNG has been tested for EMC emissions and immunity as a standalone instrument. Do not use the VNG adjacent to or stacked with other electronic equipment. If adjacent or stacked use is necessary, the user should verify normal operation in the configuration.

The use of accessories, transducers and cables other than those specified, with the exception of servicing parts sold by Interacoustics as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the device.

Anyone connecting additional equipment is responsible for making sure the system complies with the IEC 60601-1-2 standard.

Guidance and manufacturer's declaration - electromagnetic emissions		
The VNG is intended for use in the electromagnetic environment specified below. The customer or the user of the VNG should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The VNG uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The VNG is suitable for use in all commercial, industrial, business, and residential environments.
Harmonic emissions IEC 61000-3-2	Not Applicable	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Not applicable	


Recommended separation distances between portable and mobile RF communications equipment and the VNG			
The VNG is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the VNG can help prevent electromagnetic interferences by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the VNG as recommended below, according to the maximum output power of the communications equipment.			
Rated Maximum output power of transmitter [W]	Separation distance according to frequency of transmitter [m]		
	150 kHz to 80 MHz $d = 1.17\sqrt{P}$	80 MHz to 800 MHz $d = 1.17\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.23\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.70	3.70	7.37
100	11.70	11.70	23.30
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
Note 1 At 80 MHz and 800 MHz, the higher frequency range applies.			
Note 2 These guidelines may not apply to all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

Guidance and Manufacturer's Declaration - Electromagnetic Immunity			
The VNG is intended for use in the electromagnetic environment specified below. The customer or the user of the VNG should assure that it is used in such an environment.			
Immunity Test	IEC 60601 Test level	Compliance	Electromagnetic Environment-Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	+6 kV contact +8 kV air	+6 kV contact +8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be greater than 30%.
Electrical fast transient/burst IEC61000-4-4	+2 kV for power supply lines +1 kV for input/output lines	Not applicable +1 kV for input/output lines	Mains power quality should be that of a typical commercial or residential environment.
Surge IEC 61000-4-5	+1 kV differential mode +2 kV common mode	Not applicable	Mains power quality should be that of a typical commercial or residential environment.
Voltage dips, short interruptions and voltage variations on power supply lines IEC 61000-4-11	< 5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT	Not applicable	Mains power quality should be that of a typical commercial or residential environment. If the user of the VNG requires continued operation during power mains interruptions, it is recommended that the VNG be powered from an uninterruptible power supply or its battery.

	(>95% dip in <i>UT</i>) for 5 sec		
Power frequency (50/60 Hz) IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or residential environment.
Note: <i>UT</i> is the A.C. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration — electromagnetic immunity

The VNG is intended for use in the electromagnetic environment specified below. The customer or the user of the VNG should assure that it is used in such an environment,

Immunity test	IEC / EN 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC / EN 61000-4-6	3 Vrms 150kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any parts of the VNG, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1,2\sqrt{P}$ $d = 1,2\sqrt{P}$ 80 MHz to $d = 2,3\sqrt{P}$ 800 MHz to 2,5 GHz Where <i>P</i> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <i>d</i> is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, (a) should be less than the compliance level in each frequency range (b) Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC / EN 61000-4-3	3 V/m 80 MHz to 2,5 MHz	3 V/m	

NOTE1 At 80 MHz and 800 MHz, the higher frequency range applies
 NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

^(a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the VNG is used exceeds the applicable RF compliance level above, the VNG should be observed to verify normal operation, If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the VNG
^(b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

To ensure compliance with the EMC requirements as specified in IEC 60601-1-2, it is essential to use only the following accessories:

Conformance to the EMC requirements as specified in IEC 60601-1-2 is ensured if the cable types and cable lengths are as specified below:

Essential performance

For this product the following is considered essential performance:

- To generate and present stimulus signals in the audio range as specified in the applicable IEC 60645 series in normal condition
- Record and store patient response