For Advanced Optic Diagnostics

OPD-Scan II ARK-10000

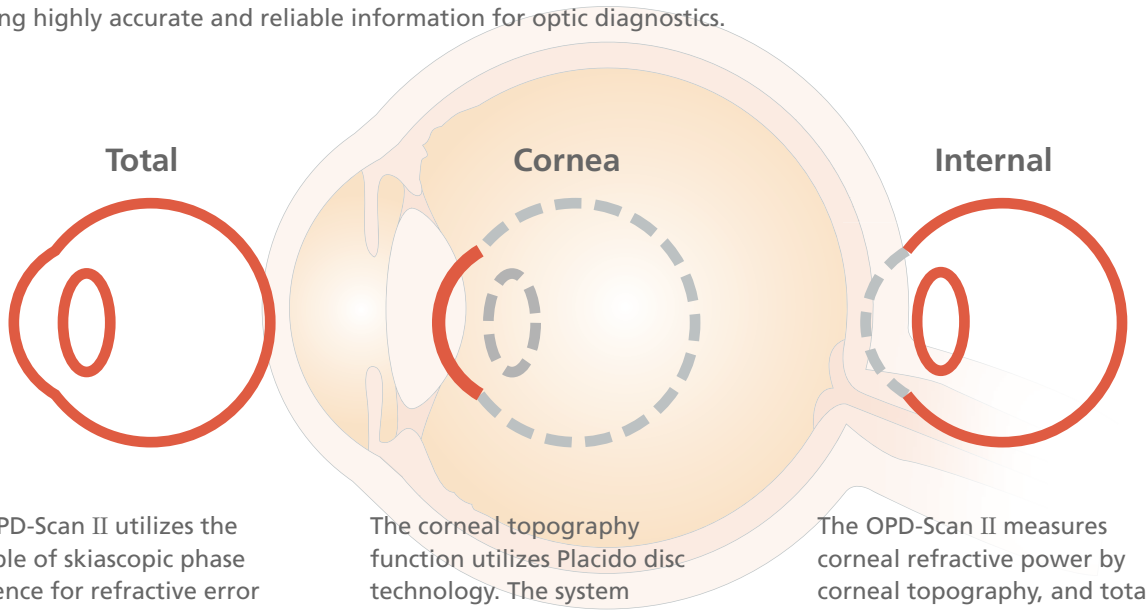
OPTICAL PATH DIFFERENCE SCANNING SYSTEM

NIDEK

Optical Path Difference Scanning System
OPD-Scan II ARK-10000

Accurate and Reliable Data for Optic Diagnostics

The NIDEK OPD-Scan II provides information on corneal topography, wavefront, autorefraction, keratometry and pupillometry in one unit, utilizing state-of-the-art imaging and analysis technology developed specifically to measure normal to highly aberrated eyes. The system offers a variety of data maps to provide information on the total refractive error, wavefront, corneal shape, internal aberrations and visual quality of the eye, allowing highly accurate and reliable information for optic diagnostics.

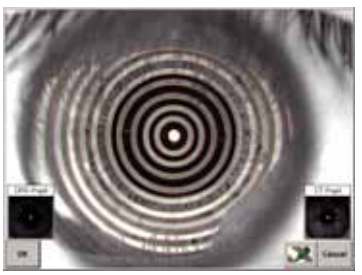


The OPD-Scan II utilizes the principle of skiascopic phase difference for refractive error map measurement. The retina is scanned with an infrared light slit beam, and the reflected light is captured by an array of rotating photo detectors over a 360° area.

Measurement Screen

Aberrometry Maps:
OPD
Wavefront Map
Zernike Graph
PSF

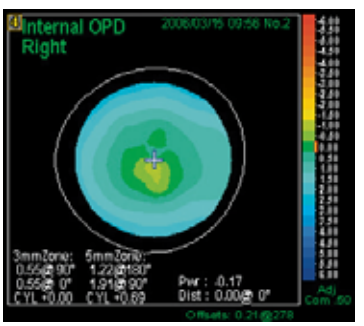
The corneal topography function utilizes Placido disc technology. The system captures the image of reflected rings of light from the cornea and analyzes thousands of data points to plot the corneal contour, shape and refractive power.



Placido Ring Image

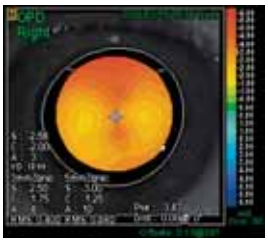
Corneal Topography Maps:
Axial Map
Instantaneous Map
"Refractive" Map
Elevation Map

The OPD-Scan II measures corneal refractive power by corneal topography, and total refractive error as the OPD map. The Internal OPD Map plot is created by subtracting the corneal refractive power from the total OPD to display in diopters the distribution of refractive error contained in the internal eye.



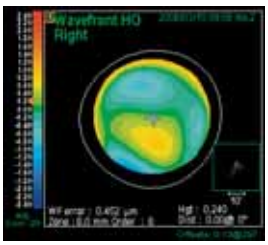
Internal OPD Map

Various Data Maps



OPD Map

The OPD (Optical Path Difference) map plots the refractive error distribution of total eye aberrations, lower and higher order, in Diopters. This map allows the clinician to easily determine the refractive status and visual quality of the eye with one quick look. **This map is unique to the NIDEK OPD-Scan II.**

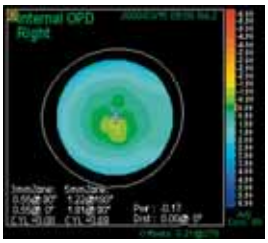


Wavefront High Order Aberration Map

This map shows specific high-order aberration components only, extracted from the total wavefront map. Plotted in microns, this map illustrates the location and degree of high-order aberrations in the eye.

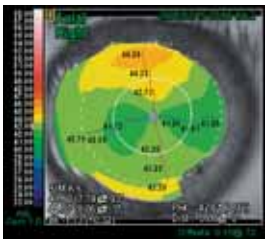
Zernike Graph

This graph plots all aberration components that make up the aberration profile of the eye, and shows the magnitude of each component such as spherical aberration, coma and trefoil. The graph is used to determine which aberration(s) dominate the aberrations structure of the eye and to what degree. This information may be cnnected to visual symptoms.



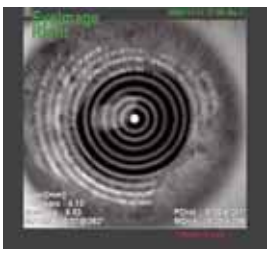
Internal OPD Map

This map shows the internal aberrations of the eye. It can be used to distinguish the effects of internal aberrations versus corneal or surface aberrations. For normal corneas, the map indicates the presence of internal astigmatism (especially, lenticular astigmatism), and shows the direct refractive effect of an IOL (such as tilt and haptic torque). **This map is also unique to the NIDEK OPD-Scan II.**



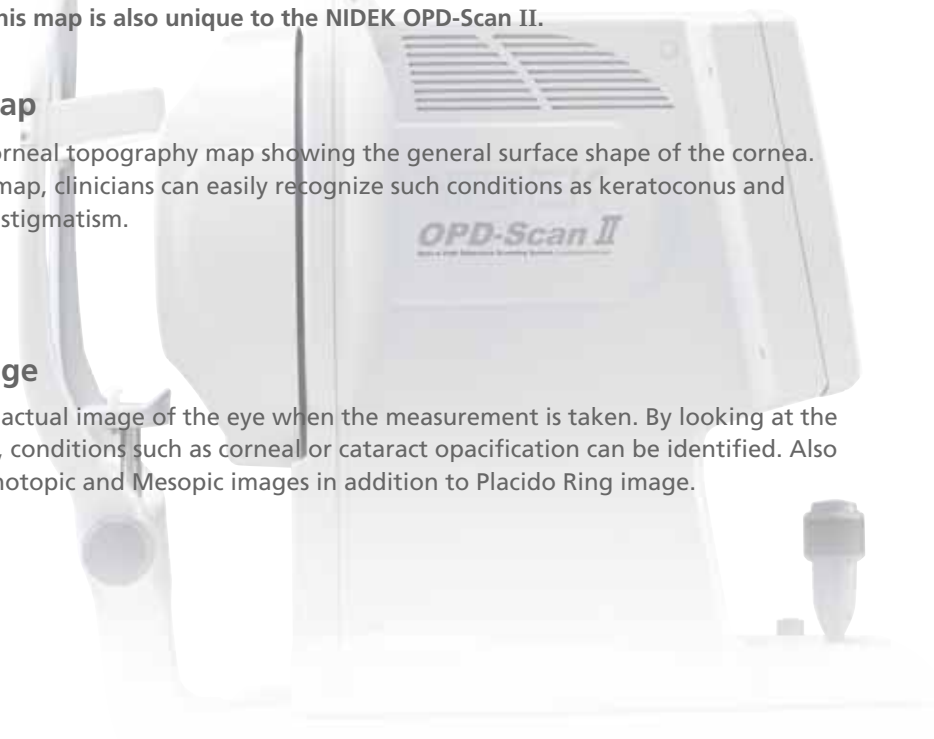
Axial Map

This is a corneal topography map showing the general surface shape of the cornea. With this map, clinicians can easily recognize such conditions as keratoconus and irregular astigmatism.



Eye Image

This is the actual image of the eye when the measurement is taken. By looking at the actual eye, conditions such as corneal or cataract opacification can be identified. Also displays Photopic and Mesopic images in addition to Placido Ring image.



Corneal Navigator (optional)

Corneal Navigator function can be integrated into the OPD-Scan II.

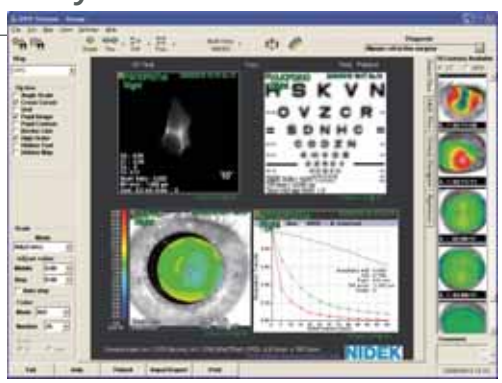
Utilizing various corneal parameters from topography, the Corneal Navigator automatically determines corneal features and shows by percentage the possibility of having a condition of normal (NRM), astigmatic (AST), keratoconus suspects (KCS), keratoconus (KC), pellucid marginal degeneration (PMD), myopic refractive surgery (MRS), hyperopic refractive surgery (HRS), and penetrating keratoplasty (PKP).
Instant analysis by the Corneal Navigator helps improve the quality of examination / diagnosis.

*The Corneal Navigator is developed in collaboration with Stephen D. Klyce, PhD & Michael K. Smolek, PhD.

Optional Software

OPD-Station Corneal / Refractive Analysis Software

The NIDEK OPD-Station software makes a variety of corneal / refractive analysis possible using advanced, unique and intelligent functions including the Holladay Summary and Corneal Navigator (optional).
The OPD-Station provides various maps such as the OPD HO Map, PSF, MTF, MTF Graph and Visual Acuity Chart in addition to OPD-Scan II maps. For wavefront maps such as the PSF and MTF, clinicians can select the target (OPD, Cornea, Internal) and also the type (Total, HO, Group) according to their needs.



OPD-Station Screen

Holladay Summary*

The "Holladay Summary" shows the patient where the aberrations are located and how they affect the quality of vision using the Wavefront, MTF, PSF and VA-chart simulations.

*Developed in cooperation with Jack T. Holladay, MD.

PSF Simulation

Calculates the Point Spread Function (PSF) based on the OPD data, and displays in simulation the distribution of the point spread. The Strehl Ratio serving as a metric of the visual quality of the eye is also displayed.

Retinal Image Simulation

Calculates the distortion of incoming light based on the results of PSF analysis, and displays the simulated retinal image of the projected chart. This simulation can be used in explanations to patients for informed consent.

OPD HO Map

Displays in diopters the high order aberrations and shows the refractive errors which cannot be corrected with glasses.

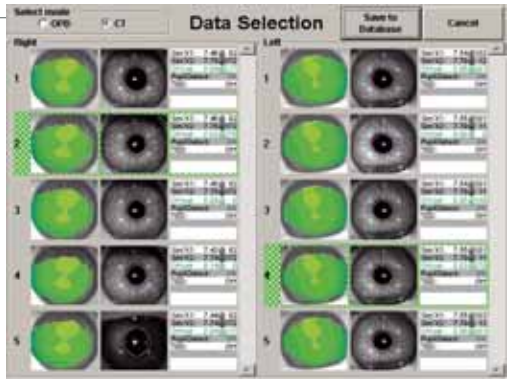
Averaging Multiple Exams

The OPD-Station creates an exam data average from multiple exams. Noise components such as tear film and fixation disparity are excluded, providing more stable and reliable data.

Features

Measurement Selection for Improved Reliability

The OPD-Scan II offers increased reliability of examination by automatically selecting the best measurement from multiple measurements, allowing a more reliable clinical decision



Measurement Selection Screen

Fast Processing Speed

The OPD-Scan II offers fast processing speed, minimizing stress in daily clinical use.

Improved Accessibility to a Patient Eye

With the improved forehead rest, it is easier to reach and keep the patient's eyelids open.

Improved Accessibility

Wide Measurement Range

Has the ability to measure high power Cylinder providing accuracy in irregular aberration measurements.
(Sphere -20.0 to +22.0D and Cylinder 0.0 to ±12.0D)

Easy Data Maintenance with a Detachable HDD

Patient data is saved to a detachable HDD, allowing quick and easy data transfer.

Network Capabilities

Data from the OPD-Scan II may also be analyzed at a remote location using the OPD-Station.

"The OPD SCAN II is the only instrument that couples Wavefront, Topography and Refraction into one unit. This allows the isolation of any optical problem to cornea or crystalline lens making it easy to decide if lensectomy or corneal surgery is the procedure of choice. It also provides the best data for Customized Corneal Refractive Surgery."

Jack T. Holladay, M.D., M.S.E.E., F.A.C.S.

"I see for the future the coupling of wavefront sensors with corneal topography devices for the optimal correction of aberrations in a patient's eye. "

Stephen D. Klyce, Ph.D.

Professor of Ophthalmology and Anatomy, Louisiana State University
Recipient of ASCRS 2000 Innovator's Award for contributions to the field of corneal topography and refractive surgery

OPD-Scan II ARK-10000 Specifications

Power Mapping Function	
Spherical Power Range	- 20.00 to + 22.00 D
Cylindrical Power	0.00 to ±12.00 D
Axis	0 to 180°
Measuring Area	2.0 to 6.0 mm diameter (4 zone measurement)
Measuring Points	1,440 points (4 x 360)
Measuring Time	< 0.4 seconds
Measuring Method	Automated Objective Refraction (Dynamic skiascopy)
Mapping Methods	OPD, Internal OPD, Wavefront Maps, Zernike Graph, PSF
Corneal Topography Function	
Measuring Rings	19 Vertical, 23 Horizontal
Measuring Area	0.5 to 11.0 mm dia. (r=7.9)
Dioptric Range	10 to 100 D
Axis Range	0 to 359°
Measuring Points	More than 6,800
Mapping Methods	Axial, Instantaneous, "Refractive", Elevation
Other Specifications	
Working Distance	75 mm
Alignment	X Y Z Automatic
Observation Area	14 x 8 mm
Display	10.4-inch Color LCD Touch Panel
Printer	Built-in Thermal type Line Printer for Data Print External Color Printer (Optional) for Map Print
Operating System	Windows XP Embedded
Dimensions & Weight	290 (W) x 524 (D) x 520 (H) mm / 25 kg 11.4 (W) x 20.63 (D) x 20.47 (H) " / 55 lbs.
Power Supply	100 / 120, 220 / 240 Vac 50 / 60 Hz
Power Consumption	170 VA
Optional Accessories	Corneal Navigator, OPD-Station Software, Color Printer

OPD-Station Specifications

Analysis and Map Display	
Corneal Topography	Axial, Instantaneous, "Refractive", Elevation, TopoClassifier* *With Corneal Navigator only
OPD	OPD, OPD HO, Zonal Refraction
Wavefront	Wavefront, Zernike Graph, PSF, MTF, MTF Graph, Visual Acuity
Others	Internal OPD, Target Refractive, Differential, Eye Image Asphericity index (Q, e, S)
Corneal Navigator (Optional)	8 kinds of corneal classification, Statistics
Pupillometry	Diameters, Distances, Contours (Photopic/Mesopic condition)
Minimum Computer Requirements	
CPU	Pentium III 1200MHz or higher
Free Disk Space	30 GB or more
Memory	256 MB or more (above 512 MB recommended)
Graphic	1024 x 768 pixels, 32 bit true color
LAN Port (RJ-45)	
CD-ROM Drive	
USB port	
OS	Windows XP

CE 0123

Corneal Navigator has not been cleared by the FDA for distribution in the United States.

*Specifications and design are subject to change without notice for improvement.

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