NIDEK

Optical Coherence Tomography / Fundus Camera

RSD-1 Duo™

Eye Care Data Management Platform

EyeLink™



THE ART OF EYE CARE

Streamline image capture, screening, and your workflow.

—Precise imaging, universal operation, flexible usage.

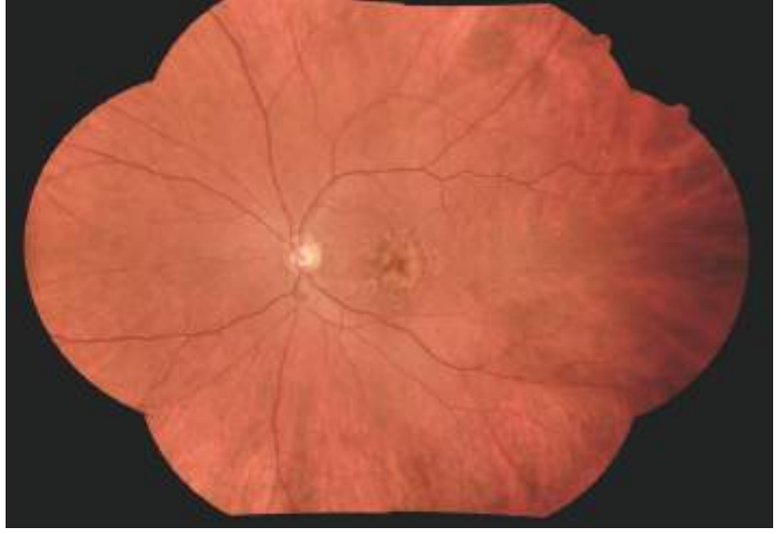
The RSD-1 Duo delivers higher efficiency across the entire clinical workflow —from image capture and screening to data management.

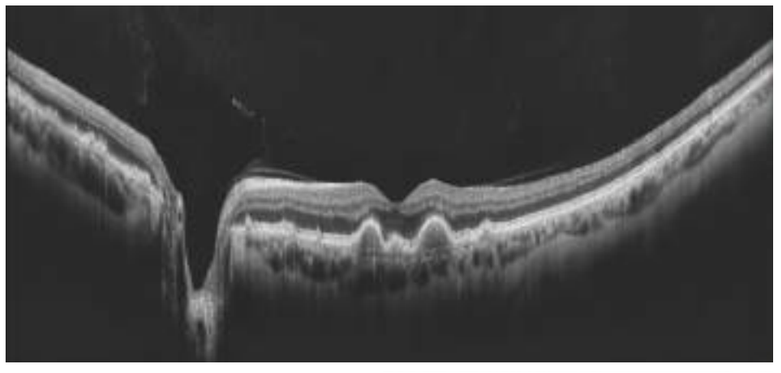
A fully automated, intuitive operation enables fast, consistent imaging, reducing operator workload while shortening image capture time for patients. The slit-scan technology achieves clearer fundus imaging and improves the proportion of successful image captures even in difficult cases, while enhanced OCT image quality with wide scan size supports efficient screening.

With flexible installation, PC-free operation, and expanded connectivity options, the system adapts seamlessly to a wide range of clinical environments and workflows.

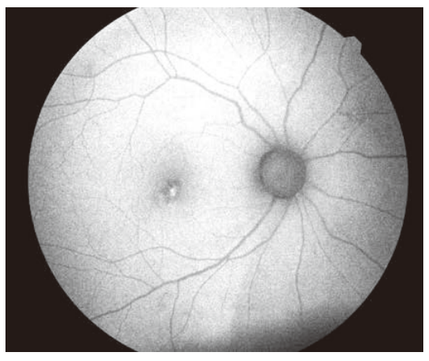
- Fully automated OCT+FC
- Slit-scan fundus photography
- OCT/OCT-A denoise
- Axial length compensation analysis
- FAF
- 15 x 10 mm retina map



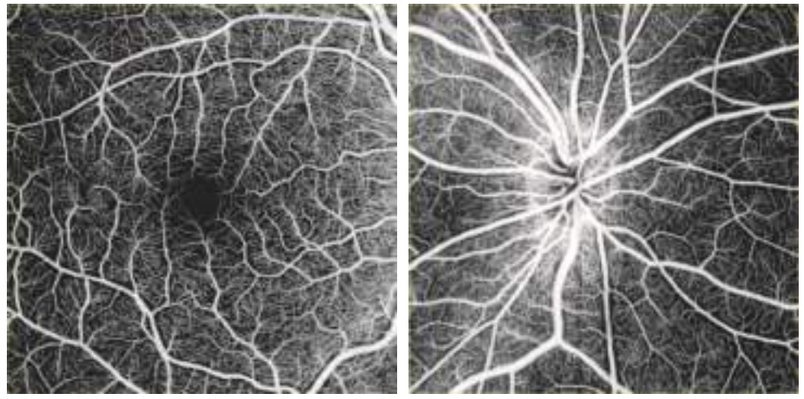


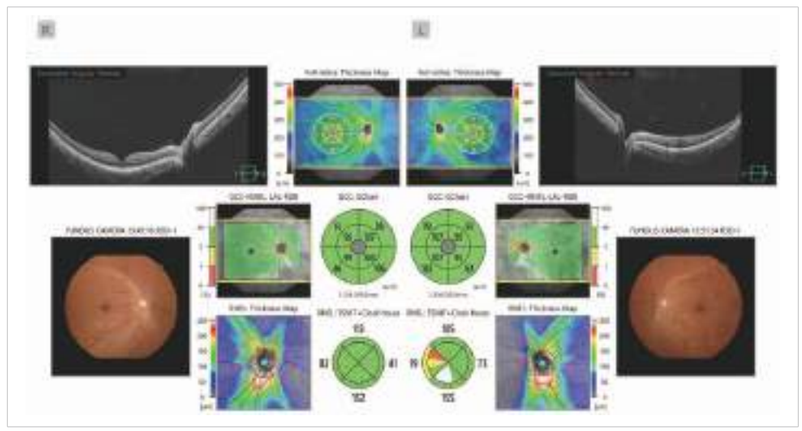






RSD-1 Duo™





Flexible operation and installation





Five auto functions achieving universal operation

The five auto functions allow anyone to simply capture images. The RSD-1 Duo continuously captures OCT and fundus images and switches to small pupil mode automatically when needed, enhancing clinical workflow.

Auto pupil detection & alignment

▼

Auto small pupil mode

▼

Auto focus & optimizing

▼

Auto image capture

▼

Auto shift to the other eye

Manual capture override as required

Automatic functions permit complete image capture in most instances, but manual joystick operation is available to support image acquisition in rare, difficult cases.
Based on your needs, some auto mode options can be turned off. Additionally, the operator can switch to manual operation in the middle of auto capture.



Space-saving design

The continuous range of tilt/swivel of the screen enables placement of the device anywhere in an examination room; installation against a wall or in a corner is now possible.



Installation aligned in an exam room

The RSD-1 Duo enables fundus image capture through small pupils (min. ø2.0 mm), facilitating image capture under various room conditions and layouts.

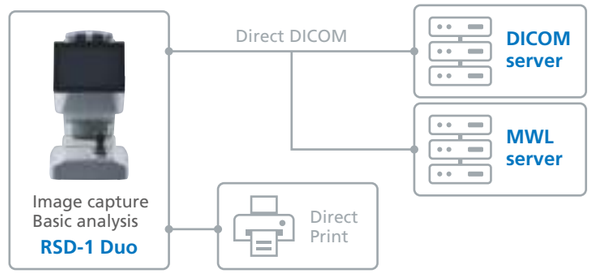


Flexible data management

More options for connectivity allow flexible data management.

1. Standalone / Direct DICOM

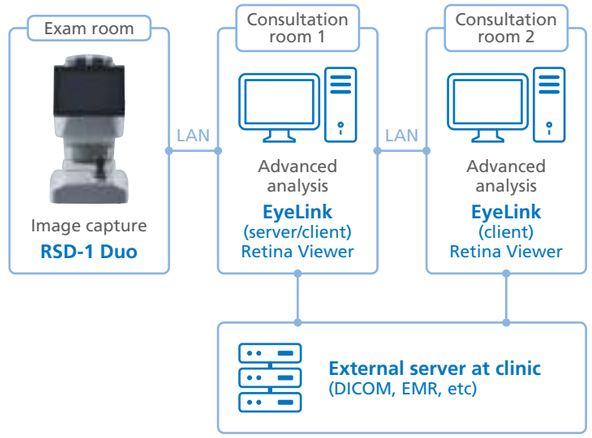
The RSD-1 Duo alone can provide basic analysis reports and print them out.
Direct DICOM connectivity accommodates seamless data integration with PACS and EMR without an external PC.



2. RSD-1 Duo + EyeLink / DICOM

The images captured with the RSD-1 Duo can be automatically sent to EyeLink for advanced analysis. EyeLink stores all patient data on its server, enabling multiple PCs throughout the clinic to access the data, review images, and perform analysis using the dedicated viewer application, Retina Viewer.





Macula

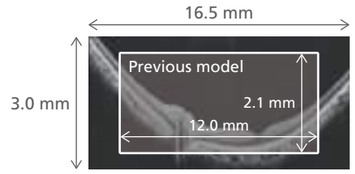
RSD-1 Duo™



Image after B-scan denoise
Macula line: 16.5 mm / Scan depth: 3.0 mm

Wide and deep B-scan

With the RSD-1 Duo, a single B-scan image clearly presents the area from the optic nerve head to the temporal vascular arcade, and the 3.0 mm depth B-scan imaging readily captures the oblate retinal shape of myopic eyes.



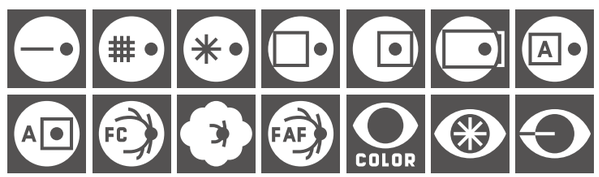
B-scan denoise delivers image-averaging quality from a single frame

With deep learning of a data set of images averaged from 120 images, this denoising technique provides high-definition images comparable to a multiple-image-averaging technique. When working without EyeLink, the RSD-1 Duo can denoise a selected single B-scan image.

Single-frame B-scan image | Image after B-scan denoise

Selectable OCT scan patterns

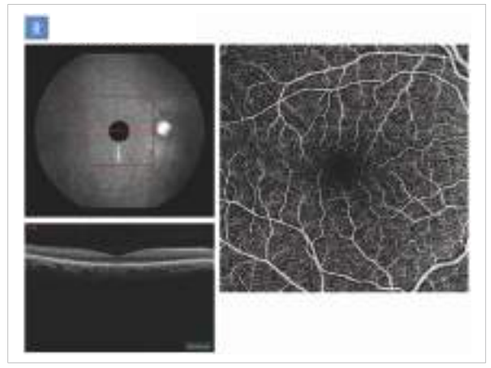
A wide range of scanning patterns allows selection of scans that suit the retinal region and ocular pathology.



Enhanced OCT-Angiography with advanced imaging algorithm

Complex OCT signal Difference Analysis Angiography 2 (CODAA 2), improves contrast, allowing for enhanced imaging. The high-definition OCT-Angiography (optional) enables greater clinical use of noninvasive imaging of retinal vascular diseases, reducing dependence on contrast dye tests.

Scan size
- Macula map: 6 x 6 mm
- Disc map: 6 x 6 mm



Single-scan OCT-A image

Retina Viewer for EyeLink™

Retina Viewer for EyeLink* performs various, advanced analyses on the OCT/OCT-A images captured with the RSD-1 Duo.

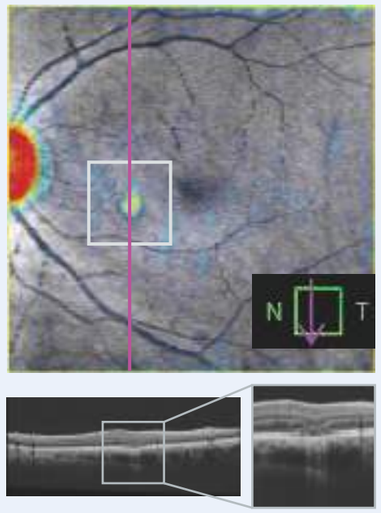
*EyeLink is not included in the RSD-1 Duo, sold separately. Retina Viewer is optional software for EyeLink.

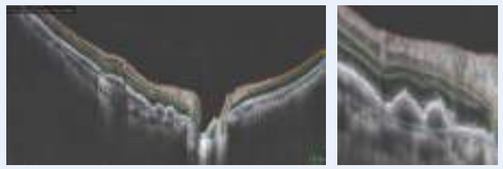
Structural Normality Map (SN Map) facilitating rapid interpretation

The SN Map detects and highlights structural abnormalities including subtle retinal changes. This function clearly indicates a region of interest, layer by layer, and enhances clinical efficiency by reducing interpretation time.

Deep learning segmentation (DL segmentation)

Less affected by a lesion or image contrast, the DL segmentation detects the edge of each layer on a B-scan image. Based on this highly precise segmentation, the SN Map can show subtle changes.





OCT-A quantitative analysis functions for rapid assessment

Vessel area density (VAD) map

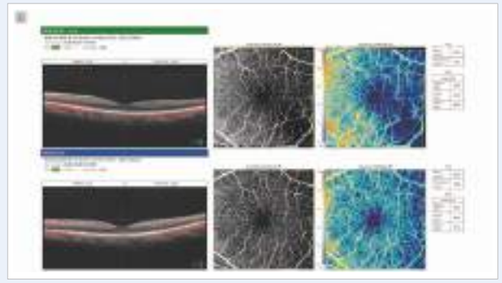
Quantification of vessels in each layer provides metrics to assess disease progression and the effects of treatment.

Autodetection of FAZ and shape analysis

Foveal Avascular Zone (FAZ) is automatically detected, and shape metrics are provided for rapid assessment.

Comparison for follow-up assessment

Clinicians select two images for comparison. This functionality enables the assessment of pre-/post-treatment and chronological changes on the follow-up visit.



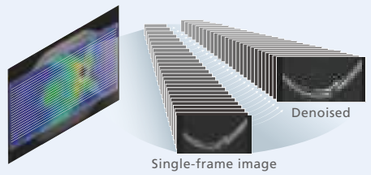
OCT-A comparison display with VAD map and FAZ analysis



Image after OCT-A denoise

B-scan/OCT-A denoise ensures image quality and efficiency

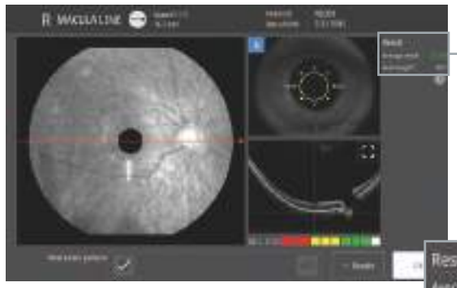
The B-scan denoise license for EyeLink (optional) applies denoise on all scan images. It reduces the time for image acquisition for staff and patients while providing high quality images for clinicians.
The optional OCT-A denoise license generates images equivalent to averaging five separate acquisitions. Detailed visualization of microvasculature supports confident interpretation and reduces the risk of missed findings.



Single-frame image

Glaucoma

RSD-1 Duo™



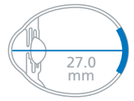
Glaucoma analysis in myopia

The long axial length reference database (LAL-RDB)*1 presents analysis with axial length compensation, facilitating for more accurate glaucoma assessment in patients with axial myopia. The RSD-1 Duo automatically switches to this database as required, by using the axial length*2 which is a parameter for scan width correction.

Result	
Average result	
Axial length*	26.0

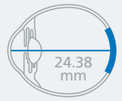
Depending on this value, an optimal database is automatically selected.
- Less than 26 mm: Reference database*3
- 26 mm or longer: Long axial length reference database

Sample case:
Patient with 27.0 mm axial length*2



Scan width:
16.9 mm x 13.5 mm

Scan width for normal eye
(Gullstrand eye model)

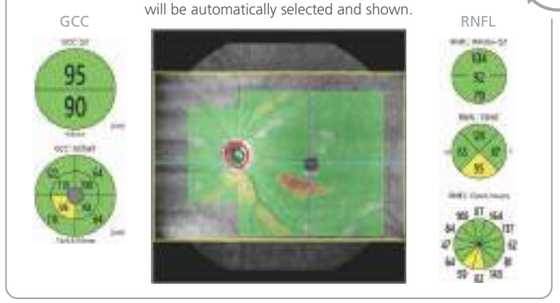


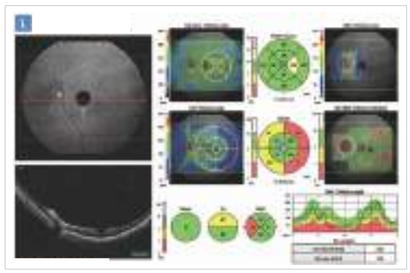
Scan width:
15.0 mm x 12.0 mm

Switchable

Long axial length reference database will be automatically selected and shown.

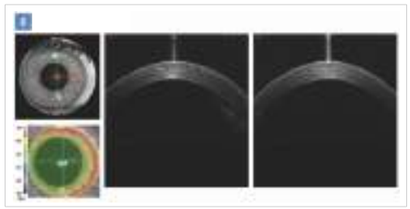
The regular **reference database** can be shown if required.





Retina map for combined diagnosis of the disc and macula

The retina map captures both the disc and macula in a single shot. Reference database analysis is performed for both the RNFL and GCC on a single OCT image, facilitating efficient diagnostic screening.



Anterior segment OCT

The optional anterior segment adapter enables observation and analysis of the anterior segment. The RSD-1 Duo can overlay a color thickness map on the captured anterior image.

*1 Data was collected from a sample of Asian patients.
*2 The value of the axial length is obtained based on the results of the OCT image capture and differs from the actual measured value of the axial length.
*3 Data was collected from a sample of Caucasian and Asian patients.

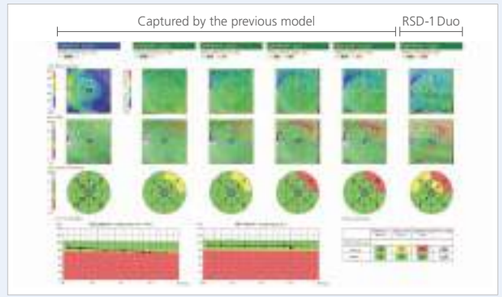
Retina Viewer for EyeLink™

Retina Viewer for EyeLink* performs various, advanced analyses on the OCT/OCT-A images captured with the RSD-1 Duo.

*EyeLink is not included in the RSD-1 Duo, sold separately. Retina Viewer is optional software for EyeLink.

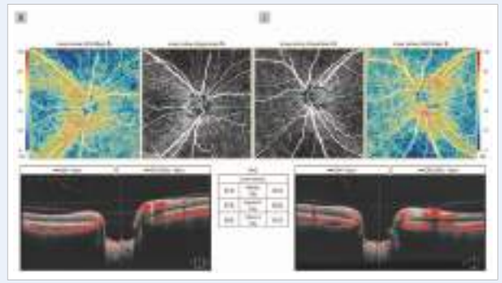
Follow-up analysis with automatic image registration

Even for maps with different scan sizes and/or orientations, chronological changes can be displayed automatically at the same location. Data from the previous model and RSD-1 Duo can also be combined and presented at the same location for follow-up analysis.



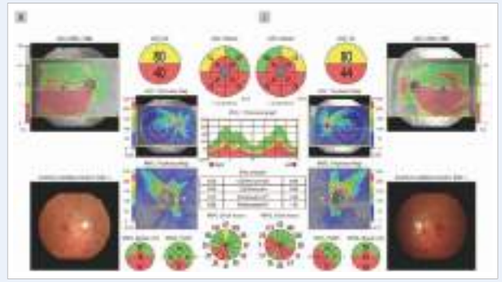
ONH blood flow quantification for evaluating glaucoma progression

Disc (ONH) OCT-A with the density map enables quantitative analysis, providing metrics to assess glaucoma progression, evaluate treatment effects, and even detect early signs of glaucoma.



Retina map for comprehensive bilateral glaucoma screening

The retina map within the Retina Viewer offers a centralized glaucoma assessment, consolidating bilateral data and fundus imaging into a single, comprehensive view.



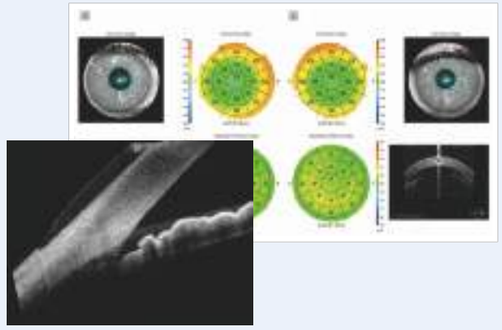
Analysis of anterior segment

Anterior chamber angle (ACA) analysis

This feature helps clinicians detect eyes at risk of angle closure and assess changes in ACA caused by glaucoma progression or treatment effects.

Pachy map and epithelium map

Pachy map visualizes the thickness of all corneal layers, and epithelium map analyzes epithelium thickness. These maps allow early detection and pre-/post-evaluation of corneal diseases.

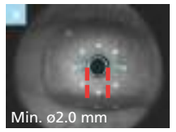


Fundus

RSD-1 Duo™

High-contrast imaging even for challenging cases

The advanced slit-scan technology delivers high-contrast, high-definition images with fewer artifacts and shadows. Despite room-light conditions and pupil constriction, it achieves a higher imaging success rate, including in cases previously considered difficult, such as cataracts or small pupils (min. ø2.0 mm).



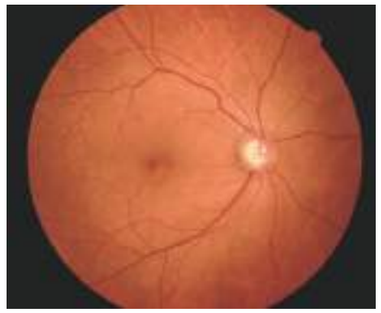
Consistent wide imaging

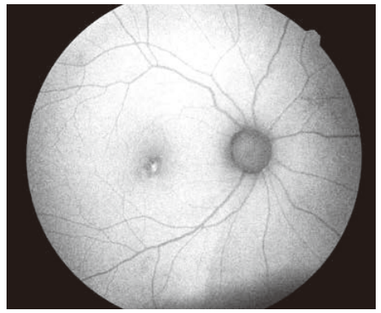
The RSD-1 Duo captures up to 50° wide fundus images (converted to 74° at the center of the eye). Even in auto small pupil mode, the angle of view remains 50°, ensuring consistent performance for every patient.

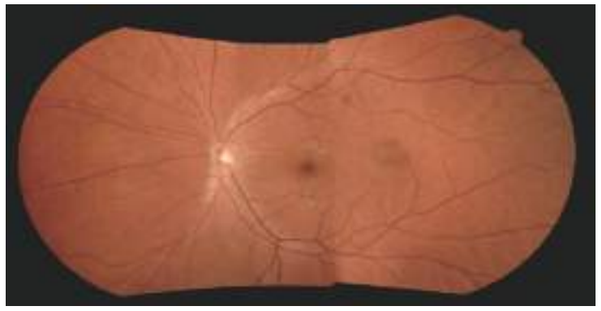
Fundus autofluorescence (FAF) for evaluating RPE*

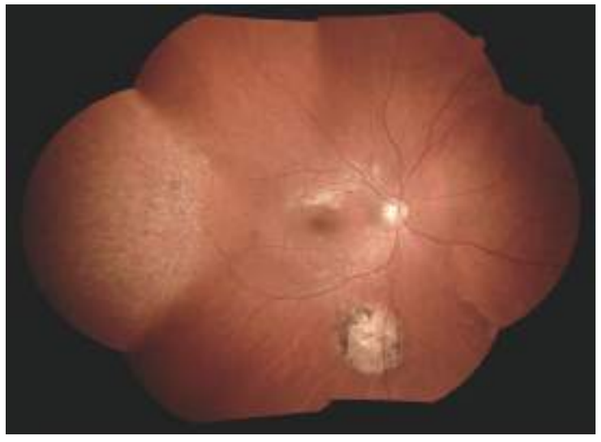
The FAF function is an advanced screening feature that enables non-invasive evaluation of the RPE without contrast dye.

*Available for the FAF model









PanView—Panorama imaging like never before

Seamless auto-composite panorama imaging delivers stunning clarity, far surpassing the previous model. The RSD-1 Duo can complete panorama composition quickly on the device, reducing operator time and effort. With the ability to automatically combine up to seven shots, the RSD-1 Duo produces expansive panoramic fundus images of up to 98° (converted to 145° at the center of the eye).

EyeLink™

EyeLink* files the fundus images captured with the RSD-1 Duo.

*EyeLink is not included in the RSD-1 Duo, sold separately.

Disc and cup measurement

Disc and cup size and C/D ratio can be displayed on the fundus images, allowing quantitative evaluation.

Image processing

Contrast, gamma, brightness, and color can be adjusted as needed.

Function overview – RSD-1 Duo / EyeLink + Retina Viewer

Function	RSD-1 Duo		EyeLink	
	Standalone	Direct DICOM	Without DICOM connection	With DICOM connection*1
Patient management and image capture				
Patient registration	On the device	←	On the device or EyeLink	←
Search/selection of patient – Exam start – Image capture	On the device	←	←	←
Confirmation of the captured image	On the device	←	←	←
Save location				
Patient information	Device*2	Device*2 / DICOM server*3	EyeLink server	EyeLink server / DICOM server*3
Exam data	N/A	DICOM server*4	EyeLink server	EyeLink server / DICOM server*4
Report	Device*5	Device*5 / DICOM server	EyeLink server	EyeLink server / DICOM server

Function		RSD-1 Duo	Retina Viewer for EyeLink*6
Analysis			
Basic analysis		Available	N/A
Advanced analysis (including both eyes and follow-up analysis)		N/A	Available
Segmentation method		Rule based	Deep learning based
Scan width correction		Available	←
RDB/LAL-RDB		Available	←
B-scan denoise		Available (only a selected B-scan image which is exported to the report*7)	Optional (All B-scan images*8)
OCT-Angiography denoise		N/A	Optional (All slabs)
Anterior segment analysis	Cornea radial	Image display, corneal thickness map	Image display, corneal thickness measurement
	ACA line	Image display	Image display, angle measurement (manual)

*1 Optional DICOM Communication License is required.
*2 Data for up to 10,000 patients can be stored on the device. Once the limit is exceeded, the oldest data is automatically deleted.
*3 Patient data is transmitted to the DICOM server together with the exam data. Patient information is not stored independently.
*4 For OCT-A, a raw image is not supported.
*5 Data for up to 500 reports can be stored on the device. Once the limit is exceeded, the oldest data is automatically deleted.
*6 Retina Viewer is optional software for EyeLink. When connected to EyeLink and Retina Viewer, all analyses are performed and displayed only on the Retina Viewer.
*7 A B-scan image must be selected from all the scanned images for denoising and saving. Once saved, a different image cannot be selected.
*8 All scanned images can be denoised and reviewed even after saving.

RSD-1 Duo™ specifications

OCT	
Principle	Spectral domain OCT
Optical resolution	Z: 7 µm, X-Y: 20 µm
Scan width	Line: Up to 16.5 mm (X), 15.0 mm (Y) Map: Up to 15.0 (X) x 10.0 mm (Y)
Scan depth	3.0 mm
OCT light source	SLD, 880 nm
Scan speed	70,000 A-scans/s
Image averaging	Up to 30 images (macula line), 50 images (ACA line)
Minimum pupil diameter	ø2.5 mm (ø3.0 mm or larger is recommended.)
Scan patterns	Macula line, macula multi, macula radial macula map, disc map, retina map
Optional	macula map angio, disc map angio, cornea radial, ACA line
Device analysis	
Retina	Segmentation of 4 retinal layers OCT analysis correction parameter Scan width correction Full retina thickness map GCC thickness map RNFL thickness map RDB/LAL-RDB percentile map (GCC, RNFL, GCC+RNFL) B-scan denoising (only selected line)
Reference database (RDB)*1	
Axial length	Less than 26 mm
Age	20 years to under 80 years
Scan pattern	Macula map, disc map, retina map
Long axial length reference database (LAL-RDB)*2	
Axial length	26 mm to less than 29 mm
Age	20 years to under 60 years
Scan pattern	Macula map, retina map
Fundus camera	
Type	Non-mydriatic fundus camera, color, FAF*3
Capture principle	Slit scan
Camera	Built-in 12-megapixel CMOS camera
Light source	LED (red/green/blue)
Minimum pupil diameter	ø2.0 mm (small pupil mode)
Angle of view	Up to 50°
Common specification	
Working distance	24.9 mm (OCT / fundus camera) 20.0 mm (anterior OCT), 58.7 mm (color anterior eye image)
Dioptric compensation	-20 to +20 D total
Internal fixation lamp	LED
Device movement range	87 mm (right/left) 32 mm (up/down) 46 mm (forth/back)
Chinrest movement	62 mm (up/down, motorized)
Auto alignment	Pupil detection, X-Y-Z directions
Auto shot	Available
Networking	External PC, DICOM
Display	Tiltable 10.1-inch color LCD, 1280 x 800 pixels (WXGA)
Power supply	100 to 240 V AC, 50/60 Hz
Power consumption	220 VA
Dimensions/mass	303 (W) x 519 (D) x 566 (H) mm / 28 kg 11.9 (W) x 20.4 (D) x 22.3 (H) in / 62 lb
Optional accessories	Anterior segment adapter, external fixation lamp, OCT-A dongle

*1 Data was collected from a sample of Caucasian and Asian patients.
*2 Data was collected from a sample of Asian patients.
*3 Available for the FAF model

EyeLink™ specifications

Indications for use	Eye Care Data Management Platform EyeLink is a software system intended for use to store, manage, process, measure, analyze and display patient data and clinical information from computerized diagnostic instruments through networks. It is intended to work with compatible NIDEK ophthalmic devices.
Function	System installation System maintenance User information management User authentication Patient information management Exam data transportation Exam data management Exam request management Deleted exam data management
Networking	External PC, DICOM, NAVIS-EX
System requirements	
Operating system	English version: Windows 11 Pro Windows 11 IoT Enterprise Windows 11 Enterprise
Display	1920 x 1080 pixels (FHD) or higher
Standard accessories	Microsoft SQL Server Express EyeLink server EyeLink client License Authenticity Certificate - Server License: 1 - Session(s): 4 - Device Connection License (NIDEK): 4
Optional accessories	DICOM Communication License HL7 Communication License Retina Viewer - B-scan denoise license - OCT-A denoise license

Retina Viewer specifications

Software analysis	
Retina	Deep learning (DL) segmentation Scan width correction Full retina thickness map GCC thickness map RNFL thickness map RDB/LAL-RDB percentile map (GCC, RNFL, GCC+RNFL) Disc analysis Follow-up analysis Structural Normality Map OCT-A quantitative analysis B-scan denoise* OCT-A denoise*
Anterior	Corneal thickness map Corneal epithelium map Angle measurement
System requirements	
Operating system	English version: Windows 11 Pro Windows 11 IoT Enterprise Windows 11 Enterprise
Display	1920 x 1080 pixels (FHD) or higher
GPU	NVIDIA, 4 GB or more

*Optional

The angle of view measured at the center of the eye: The angle of view measured at the center of the eye is a reference value obtained by converting the field of view specified in ISO 10940:2009 into an angle subtended by the endpoints of the captured area at the center of a simplified eye model. Note that this conversion is based on a simplified approximation and therefore differs in definition from the field of view specified in ISO 10940:2009. The angle of view measured at the center of the eye differs from the actual field of view for image capture.

The field of view of the panorama image: The field of view of the panoramic composition is defined as the single-shot field of view, in accordance with ISO 10940:2009, and the maximum angle that accounts for gaze deviation induced by internal fixation guidance. The actual field of view of the panoramic composition may vary depending on patient fixation, imaging conditions, and image composition parameters.

Product/model name: Optical Coherence Tomography RSD-1
Eye Care Data Management Platform EyeLink
Brochure and listed features of the device are intended for non-US practitioners.
The availability of products differs from country to country depending on the status of approval.
Specifications may vary depending on circumstances in each country.
Specifications and design are subject to change without notice.
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