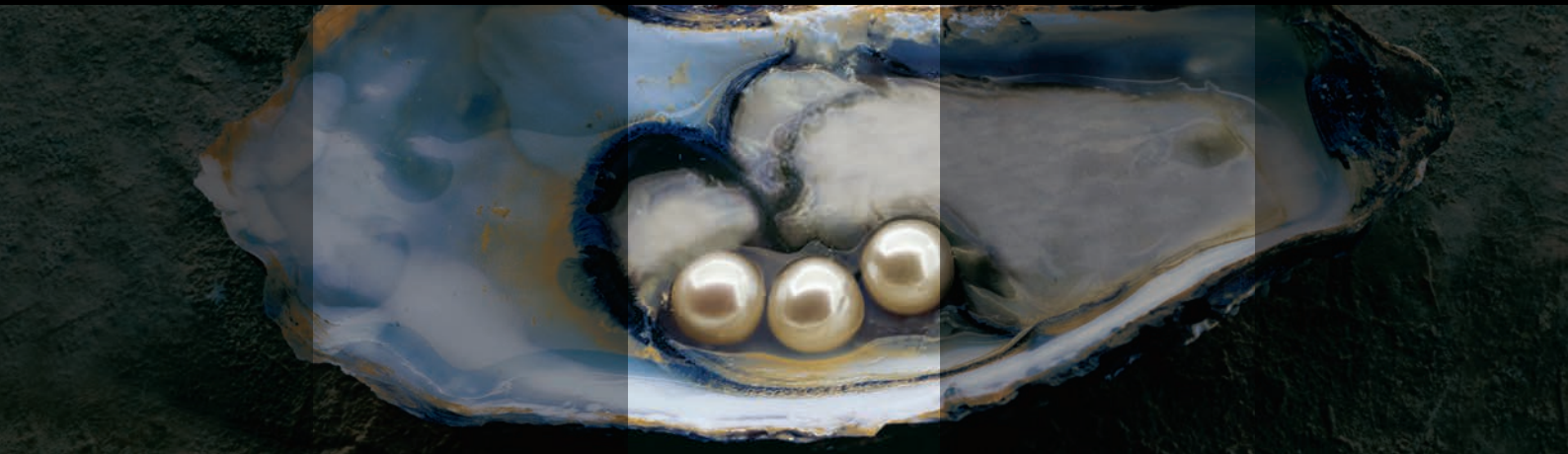# Three pearls in one shell

Heidelberg Retina Tomograph

HRT

HEIDELBERG ENGINEERING

HRT – the practice builder

HRT for every practice

■ **Multiple applications:**
   Glaucoma
   Retinal Edema
   Cornea/Conjunctiva

■ **Easy handling**

■ **No dilation**

■ **Laptop or PC**

■ **Single or shared use**

■ **Practice-builder**

The Heidelberg Retina Tomograph (HRT) is a confocal laser scanning system for imaging of the anterior and posterior segments of the eye. It comprises three modules which can be used independently or combined with each other.

The major routine clinical application is analysis of the optic nerve head structure for glaucoma diagnosis. A second application is in diabetes for the location and quantification of retinal edema. And with the Rostock Cornea Module, the HRT is converted into a confocal microscope for in vivo assessment of the cornea and conjunctiva.

Worldwide, more than 7.000 HRTs support physicians and optometrists in diagnosis and followup. Their long-term experience has confirmed the high diagnostic value of HRT examinations, based on highly reproducible measurements. Both 2- and 3-dimensional images are acquired with high resolution and without data interpolation.

Built-in quality controls enable the user to evaluate image quality during and after the acquisition. The HRT is a tried-and-tested, versatile technology you can rely on.

One platform – three applications

The Heidelberg Retina Tomograph is a multi-diagnostic platform offering non-invasive assessment of ONH, retina and cornea.

Glaucoma Module

The new HRT is the single most powerful technology to help you assess, diagnose and manage glaucoma. The new Glaucoma Probability Score (GPS) gives an objec-tive, user-independent, structural assessment of the optic nerve head using artificial intelligence and ethnic-specific databases. Enhanced progression analyses identify and track areas of statistically significant change over time to assess glaucomatous progression. These tools increase physician confidence in detecting real, clinically significant changes in optic nerve head structure.

Retina Module

Diabetic retinopathy is the leading cause of visual impairment and blindness in the western adult population. The Retina Module automatically locates and quantifi-es edema. Physicians appreciate this quick and noninvasive method to assess diabetic macular edema, central serous retinopathy, cystoid macular edema, occlusive diseases and macular holes. The Retina Module is the only means to pre-cisely quantify change of retinal edema over time.

Cornea Module

In vivo imaging of cornea, limbus and conjunctiva can be made. One micron resolution gives high definition analysis and superb detail of corneal structures in real time and the ability to evaluate and monitor corneal pathology, pre- and post-op. LASIK, kerato-plasty or corneal health of contact lens wearers. In addition, endo-thelial cell counting as well as intra-corneal pachymetry can be performed.
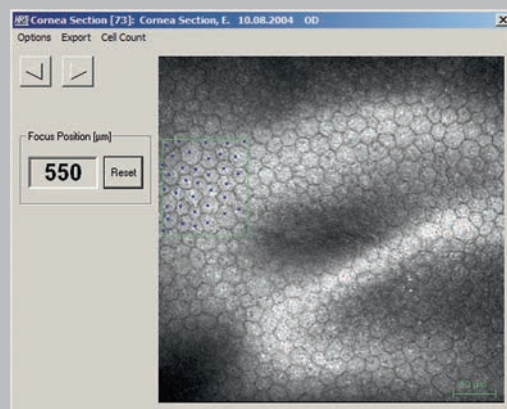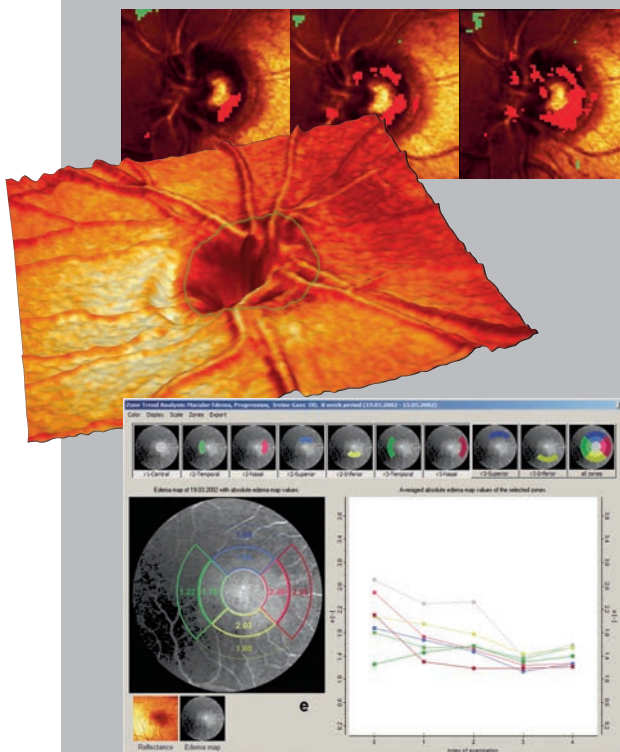
Versatile and portable

Maximum space utilization

Compact & portable design

The new compact HRT platform is ideal for different practice environments as well as shared use. The HRT is now notebook or PC enabled, using the latest FireWire technology.

A new ergonomically designed notebook table offers an elegant look, but also convenient access for both physician and patient, including those in wheelchairs. Alternatively, the HRT can be used with a standard PC and table.

An optional carrying case slides over the scanning head, enabling easy and secure transportation between offices.

A modular
software system

*Solutions for
digital practice
management*
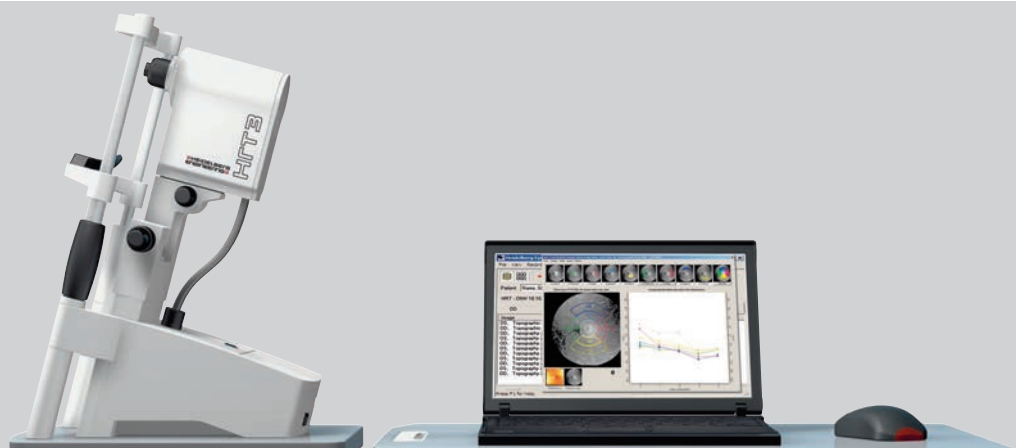
Heidelberg Eye Explorer

The software of all laser-scanning and OCT* devices from Heidelberg Engineering are based on the Heidelberg Eye Explorer (HEYEX) operating system. The HEYEX covers all basic functions of the patient database and patient file.

Software for acquisition and analysis

Besides the full software (image acquisition and viewing) provided with each device, a separate viewing software is available for each software module, enabling users to access all images and patient data.

Participants of telemedicine-projects (shared practices etc.) which do not have an HRT in their practice can use the viewing software to import, analyze and archive data.

The HRT is email-enabled to transfer patient results electronically as jpg or bmp files, making exchange of paper printouts a method of the past.

HRT in network environments

HRT can be used stand-alone or within network environments.

For parallel use of the software on several computers within a network, additional networking licenses can be obtained. These network licenses cover all modules installed on the network.

Image Capture Module

The Image Capture Module enables the import of digital images or documents from other devices (fundus cameras, OCT, perimeter etc.) into the Heidelberg Eye Explorer patient file. The patient file organizes patient's images centrally, allowing for easy access, diagnosis and printing reports.

Connection to practice-management software

The HEYEX operating system can be connected to patient management software systems (IFA, Medistar, Turbomed and others). This enables quick and convenient import of patient data into the digital patient file. Should your patient management system currently not offer connection with the HEYEX, we will be happy to make the data exchange program available to your provider free of charge for implementation. Please contact our support hotline for further information.

* in preparation

Configurations
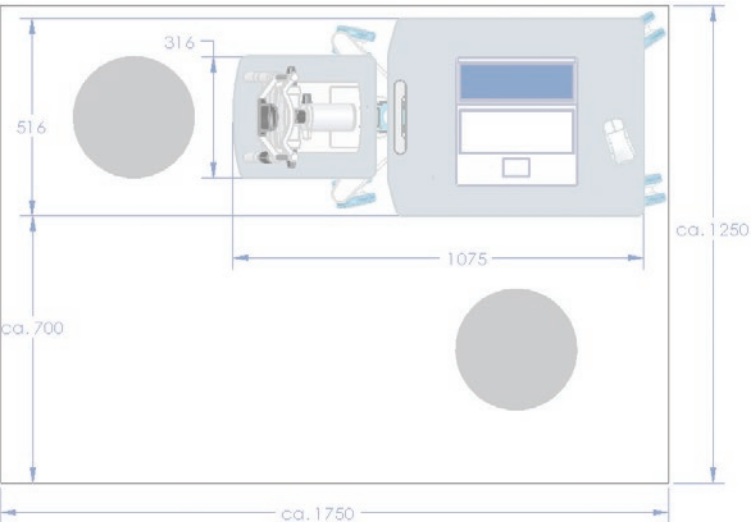
*Maximum necessary space
for HRT system (in mm)*

	Configuration for practices			Configuration for hospitals
	Single practice	**Shared use**		
		Base set*	Mobile set*	
HRT	●		●	●
Laptop	●	●		
PC, monitor, mouse, keyboard				●
Ext. hard drives for archiving	●	●		●
CD-RW	●	●		●
Printer	●	●		●
Table	●	●		PC tabel
Carrying case	Accessory		●	Accessory
Footswitch	Accessory	Accessory		Accessory
Ext. fixation lamp	●		●	●
Netzwork license				Accessory

∗ Base set for each practice, mobile set is shared/transported between practices.

HRT system application modules (any combination possible):

- ■ **Glaucoma**
- ■ **Retina Edema**
- ■ **Confocal Microscopy of the Cornea and Conjunctiva**

Specification for Examinations of the Posterior Segment

Field of view	15° x 15° (transversal)
Depth of focus	1,0 to 4,0 mm (automatic)
Focus range	-12 to +12 dpt. (sphere), -6 to +6 dpt. (cylinder; astigmatism lenses)
Pupil diameter	>= 1 mm
Image acquisition time	1–6 seconds per 3-D image
Optical resolution	Approx. 10 µm (transversal) x 300 µm (longitudinal)
Digital resolution	10 µm/pixel (transversal) x 62 µm/pixel (longitudinal)
Image size	3-D image: 384 x 384 x 16 to 384 x 384 x 64 pixels
Data volume	4–6 MB (compressed) per eye
Reproducibility	Height measurements ± 20 µm
Laser	Diode laser, laser class 1
Wavelength	670 nm
Ports	2 IEEE 1394 (FireWire/i.LINK) power outlet 12 V each, 1.5 A for laptop/PC and external hard disc drive; port for footswitch, port for RCM objective and CCD-camera
Power supply voltage	110–230 V~, 50/60 Hz
Operation temperature	10 °C–40 °C / 50 °F–104 °F

System components

- ■ Heidelberg Retina Tomograph with internal and external fixation lamp, headrest incl. 3-axis adjustment and acquisition button, astigmatism lens set -6 to +6 diopters.
- ■ **Practice configuration:** Laptop incl. CD-RW, 1 ext. hard disc drive 160 GB, mouse, ink-jet printer, wireless connection; laptop table: height adjustable, symmetric for right or left setting, printer shelf, table top in grey; foot in light grey.
- ■ **Hospital configuration:** PC incl. CD-RW, 17"-monitor, mouse, keyboard, ink-jet printer, 2 external discs, 250 GB each; closed PC table, height adjustable (66–112 cm), right/left setting, table top in beech, foot aluminium/dark grey

Accessories

Footswitch, carrying case, viewer-software (Glaucoma, Retina or Cornea), networking license, Image Capture Module Software, Remote Service Module, extended warranty

PC requirements for viewer software

CPU: Intel Pentium II, 1 GHz (minimum), graphic card: min. resolution 1024 x 768, 16 bit, operation system: Windows 2000 (SP 4 recommended), or Windows XP (SP 1 recommended), monitor: min. resolution 1024 x 768

Available for practice management software:

CSP med, Fidus, IFA, Medistar, Duria, SEDOC, VIP Vision, WinPro, NextGen, IPRO, Turbomed, Dr. Notes, Medisoft

Dimensions and weight:

HRT camera: 24 x 47 x 30 cm, 12 kg

Laptop table: 52 x 108 x 77 cm, 35 kg

PC table: 69 x 113 x 75 cm, 64 kg

Carrying case: 30 x 35 x 54 cm, 5 kg

This product is manufactured under one or more of the following patents: US 5,170,276; DE 41 03 298 C2; EP 0 498 280 B1; WO0195790A1.

FireWire is a registered trademark of Apple Computer, Inc.

i.LINK is a trademark of Sony Corporation

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