OCULUS | Easyfield®

Perimeter

OCULUS®

We focus on progress

OCULUS Easyfield®

The right choice for all your needs

The OCULUS Easyfield® is a full-fledged compact perimeter capable of performing standard automated perimetry of the central visual field up to 30° eccentricity. It has been designed for the combined use as visual field screener and perimeter, offering features usually available only in large units. The spherical bowl with 30 cm (11.81") radius is enclosed into an ergonomically movable cone equipped with a distance adapted lens. The Easyfield® conforms to the Goldmann standard and fulfills the ISO-12866 norm for perimeters.

Measurements of the Easyfield® are carried out using an LED grid with 135 fixed test locations, including the common 30-2, 24-2 and 10-2 patterns. The novel SPARK test strategy leads to faster and more stable threshold tests providing improved diagnostic capabilities. Besides the standard field indices the Easyfield® delivers evaluations of the innovative Glaucoma Staging Program (GSP) and the classifications provided by the Glaucoma Staging System (GSS 2).

Advantages

- **Fast:** Shorter examination times even for threshold tests
- **Compact:** No completely dark room required thanks to the closed construction
- **Lightweight:** Minimal footprint and maximal transportability
- **Robust:** Easy to service in the absence of moving parts
- **More than screening:** Supra-threshold and threshold tests
- **Comprehensive perimetry:** Advanced test strategies, unique evaluation tools, efficient progression analysis.

Models

Easyfield® S
The standard award-winning design with up-to-date features

Easyfield® C
Designed for increased comfort with an adjustable, stylish double chinrest

reddot award

Building on a proven design

Ergonomic and patient-friendly

Hardware Facelift

- The redesigned double headrest with translucent lateral eye shields allows measurements without an eye-patch, saving precious time in the preparation for the test.
- The completely new, vertically adjustable double chinrest (Easyfield® C only) improves the quality of examinations by sensibly increasing the comfort of the patients.
- The stylish design of the chinrest is adapted to the ergonomically movable perimeter cone for complete versatility.
- The high resolution camera for better video control image of the patient's eye improves the reliability of exams.
- A spring-loaded double mount offers increased stability for the correction lens holder.
- Standard USB interface offers connectivity of the OCULUS Easyfield® with any external Windows computer, hence network integration is straightforward.

> Translucent lateral eye shields

> Double chinrest

> Attachable correction lens holder

Standard Automated Perimetry

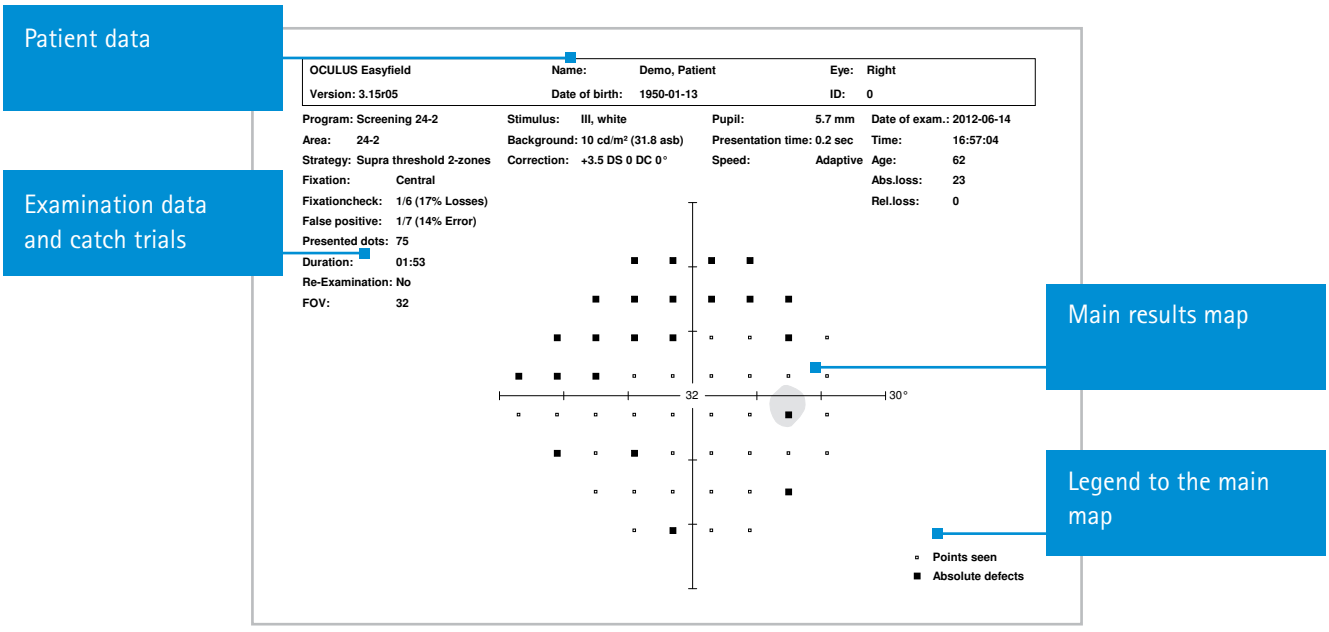
Screening

Screening with the OCULUS Easyfield® is most commonly carried out by performing supra-threshold examinations of the central visual field. During these examinations the presented stimulus is always brighter than the one matching the normal threshold value corresponding to the patient's age in the given location. Screening programs have shorter duration and are easier to complete. As a result, an overview of the visual field is obtained, without numerical dB values, but with the identification of peculiar locations.
The Easyfield® employs threshold oriented supra-threshold strategies with 2 or 3 zones, recognizing absolute or absolute and relative defects, respectively. The predefined "Screening 24-2" program uses a 2 zones strategy and takes slightly more than a minute per eye to accomplish. Customized screening programs using different test patterns or strategies can be easily created in the device software, with the possibility to adapt to any special requirement.

Threshold measurements

The most complete information about the visual field can be obtained by determining sensitivity threshold values in all locations of a test pattern using strategies for threshold measurements. The OCULUS Easyfield® perimeter offers various ways for threshold measurements:

- Full Threshold: The classical 4-2 dB staircase strategy using two reversals in the patient's answer to deliver a threshold value.
- Fast Threshold: Bracketing strategy using variable steps and taking advantage of already measured locations.
- CLIP[1]: Strategy using stimuli with continuously increasing luminance. Threshold value is assigned the moment the stimulus is perceived.
- SPARK[2]: Fast and averaged threshold strategy based on statistical correlations between threshold values measured in different locations.



> *Printout of a screening examination*

[1] CLIP – Continuous Light Increment Perimetry
[2] SPARK is not an acronym, the name of the strategy was inspired by the appearance of the stimuli during perimetry

Result Printout

All information at a glance

Patient data

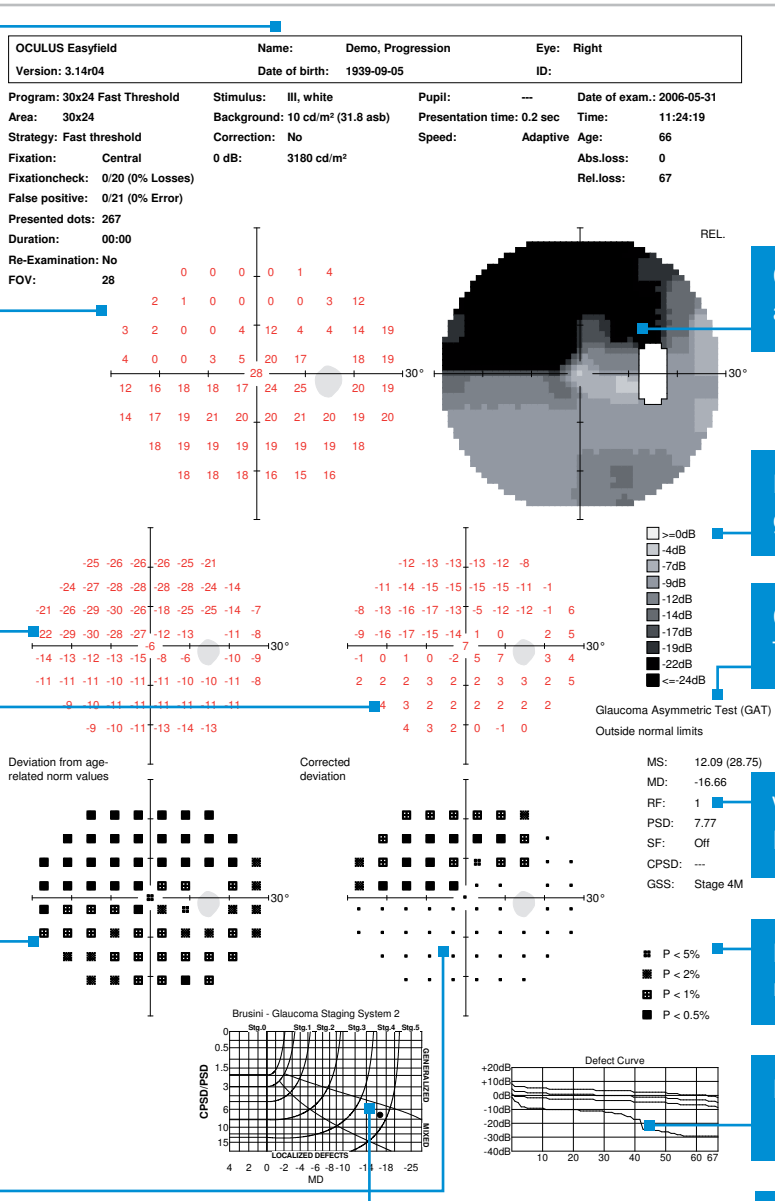
Measurements:
The threshold values measured for each location in dB

Total deviation map:
Difference between the measured threshold values and age related normal values

Pattern deviation map

Total deviation probability map

Pattern deviation probability map



Grayscale map: absolute or relative

Legend for the grayscale map

Glaucoma Asymmetric Test (GAT)

Visual field indices: MS, MD, RF, PSD, SF, CPSD, GSS

Legend for probability maps

Defect curve

GSS2 plot

> *Printout of a threshold examination*

Fighting Glaucoma

Measurement – Assessment – Progression

Increased Precision: The new SPARK threshold strategy

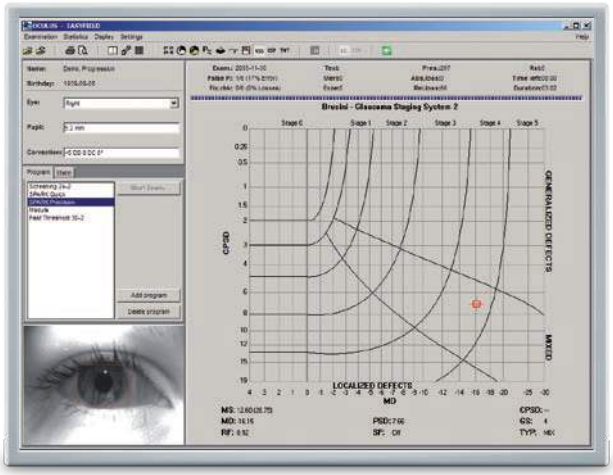
The SPARK[1] strategy is based on statistical relationships between threshold values corresponding to different locations in the glaucomatous visual field , derived after analyzing more than 90,000 perimetric examinations. The large amounts of available statistical data make fast and very precise measurements of the threshold values in the central visual field possible. The ingenious modular structure of the method in four phases allows a diversified use of the SPARK strategy in the clinical practice:

- SPARK Precision is the full-fledged version of SPARK. The complete visual field examination of glaucoma patients is performed in 3 minutes per eye; the averaged results of the four phases present an outstanding stability and repeatability, making possible an improved progression analysis. The strategy is available as an additional option for Easyfield®.
- SPARK Quick is the strategy for follow-up or screening examinations. Only 1:30 minutes per eye are necessary.
- SPARK Training is ideal for patient training. This 40 seconds measurement can also be used for screening.

The SPARK strategy is fine-tuned for use in clinical examinations of glaucoma patients. In order to be used in suspected neurological pathologies, alternative versions of the above methods, labeled SPARK-N, are available for the OCULUS Easyfield®.

Advanced assessment: Glaucoma Staging System (GSS 2)

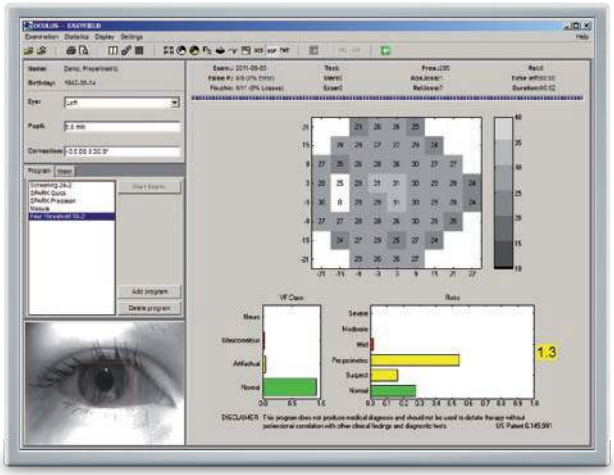
The Glaucoma Staging System[2] classifies the visual field results using the values of the mean defect (MD) and the pattern standard deviation (PSD or CPSD). The representative point of the examination is placed on a diagram according to the values of the perimetric indices. The diagram displays clearly separated regions for different diagnostic stages related to the advance of the disease (Stage 0 – Stage 5); at the same time, generalized, localized and mixed defects are distinctly identified.



> *Display of the GSS 2 assessment*

[1] M. González de la Rosa, J Glaucoma 2012

[2] P. Brusini, S. Filacorda, J. Glaucoma (2006) 15: 40–46



> *GSP results display*

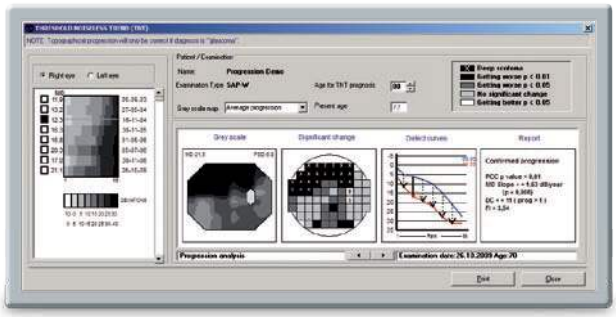
Beyond field indices: Glaucoma Staging Program (GSP)

This novel evaluation module performs a thorough assessment of individual visual field findings using modern algorithms of pattern recognition. Besides the unique contribution to early glaucoma diagnosis, GSP[1)] can substantiate the clinical evaluation of test results. The GSP classification is optimized to reproduce glaucoma expert opinions. The database of GSP includes correlations with the whole clinical picture (including structural changes); this information enables GSP to evaluate the risks for the presence of different glaucoma stages starting from the visual field findings.
Intuitive Green-Yellow-Red color coding helps in fast and reliable interpretation of the findings. The striking novelty of GSP consists in its capability to identify both glaucoma suspect patients and patients with possible pre-perimetric glaucoma using only the measured threshold values.

Efficient progression analysis: Threshold Noiseless Trend (TNT)

The TNT[2)] software module objectively evaluates changes over time in visual field results. Combined with the fast SPARK strategy, it increases considerably the sensitivity for detecting progression in early glaucoma.

- TNT displays a concise report of the progression analysis with a summary of the most relevant parameters (MD slope, p-values, etc.).
- TNT can distinguish between cases of diffuse or focal progression according to the value of the "Focality Index" (FI).
- TNT uses multiple statistical criteria in establishing progression.
- TNT presents a prediction about the expected visual field for a chosen patient's age.



> *TNT main display*

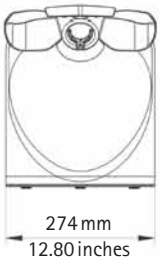
1) D. Wroblewski et al, Graefes Arch Clin Exp Ophthalmol 2009
2) M. González de la Rosa and M. González-Hernandez, Br. J. Ophthalmol. 2011; V.T Diaz-Aleman et al., Br. J. Ophthalmol. 2009

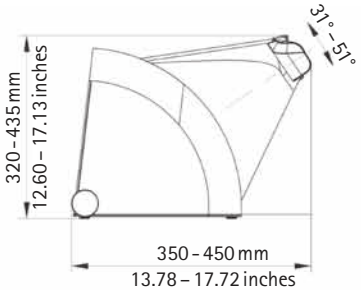
Technical data
OCULUS Easyfield®

Static Perimetry	
Programs	Pre-defined glaucoma, macula, screening and neurological tests User-defined tests
Strategies	SPARK Quick, OCULUS Fast Threshold, Full Threshold (4/2), CLIP Optional: SPARK Precision Age adapted suprathreshold screening (2-zone, 3-zone, quantify defects)
Test patterns	30-2, 24-2, 10-2, hemisphere, quadrant, user defined
Reports	Glaucoma Staging System 2 (GSS2), Glaucoma Staging Program (GSP), Progression report Threshold Noiseless Trend (TNT)
Result display	Grayscale, dB values (absolute/relative), symbols, probabilities, 3D plot
Specifications	
Perimeter bowl radius	r = 30 cm (11.81")
Stimulus size	Goldmann III
Stimulus luminance range / increments	0.03 – 3,180 cd/m² (0.1 – 10,000 apostilbs) / 0.1 log steps
Background luminance	10 cd/m² (31.4 apostilbs)
Examination speed	Adaptive, fast, normal, slow, user defined
Stimulus color	White
Maximum eccentricity	30°
Fixation control	CMOS camera, through central threshold, Heijl-Krakau (over the blind spot)
Patient positioning	Measurement head with adjustable angle of inclination, adaptable double chinrest (Easyfield® C only), double headrest
Device weight with accessories	6,8 kg (15 lbs) / 4,6 kg (10,2 lbs)
Electrical operating voltage	All normal voltages from 100–240 V
Interface	USB, RS232/V24, SubD
Hand control unit (optional)	Monitor: Colour LCD display with touch-screen Storage: min. 40,000 examinations, data transfer to PC for backup and networking Printer: Integrated thermal printer
Software	Device control, backup, patient management and print software (Windows™) Built-in networking, easy EMR-integration, DICOM compatibility
PC requirements	Operating system: Windows® XP or higher

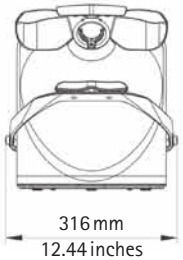
CE in accordance with Medical Device Directive 93/42/EEC

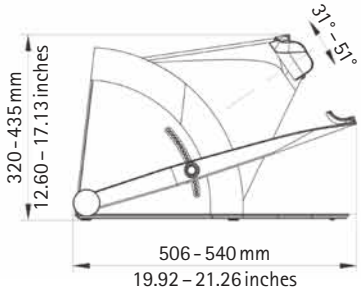
Easyfield® S





Easyfield® C





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OCULUS is certified by TÜV according to DIN EN ISO 13485/DIN EN ISO 9001

Specification, accessories and design are subject to change without notification and may vary depending on region.

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