OCULUS Easyfield®
Perimeter

OCULUS®

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 chin rest

reddot award

Building on a Proven Design

Ergonomic and patient-friendly

Hardware facelift

- The redesigned double head rest 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 chin rest (Easyfield® C only) improves the quality of examinations by sensibly increasing the comfort of the patients.
- The stylish design of the chin rest 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 Easyfield® with any external Windows computer, hence network integration is straightforward.

Translucent lateral eye shields

Chin rest

Attachable correction lens holder
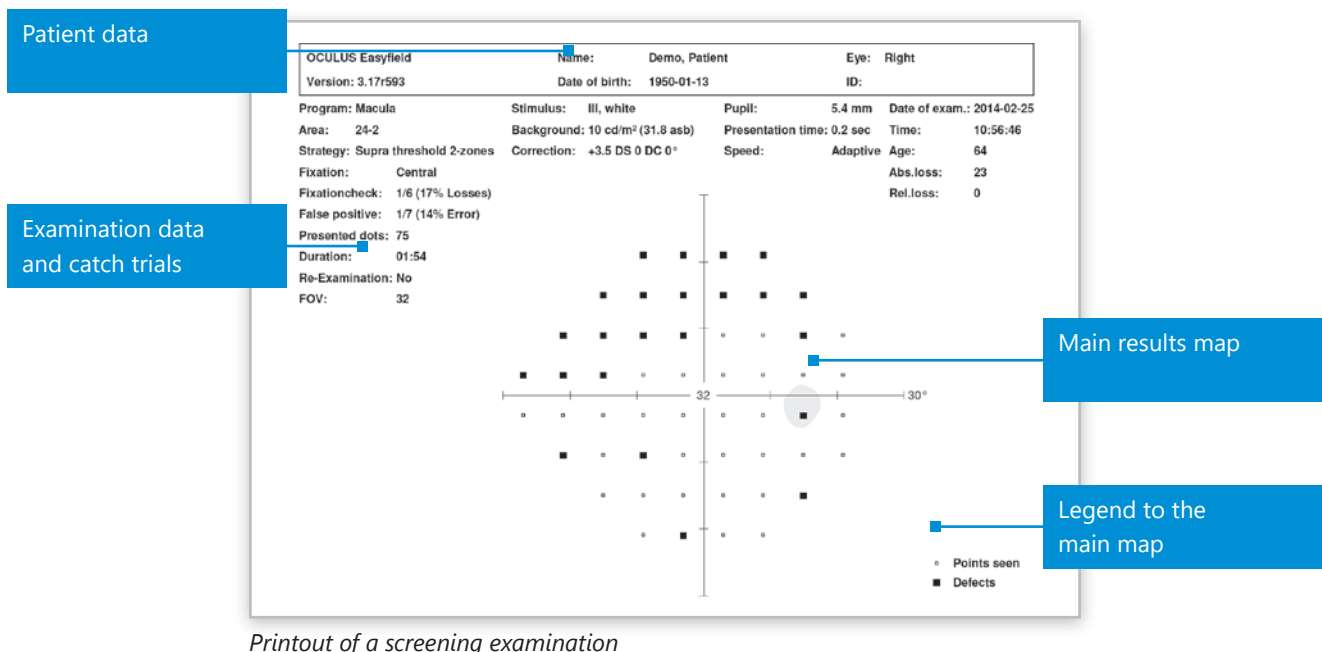
Standard Automated Perimetry

Screening

Screening with the 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 defects 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 Easyfield® perimeter offers various threshold measurement procedures:

- **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.
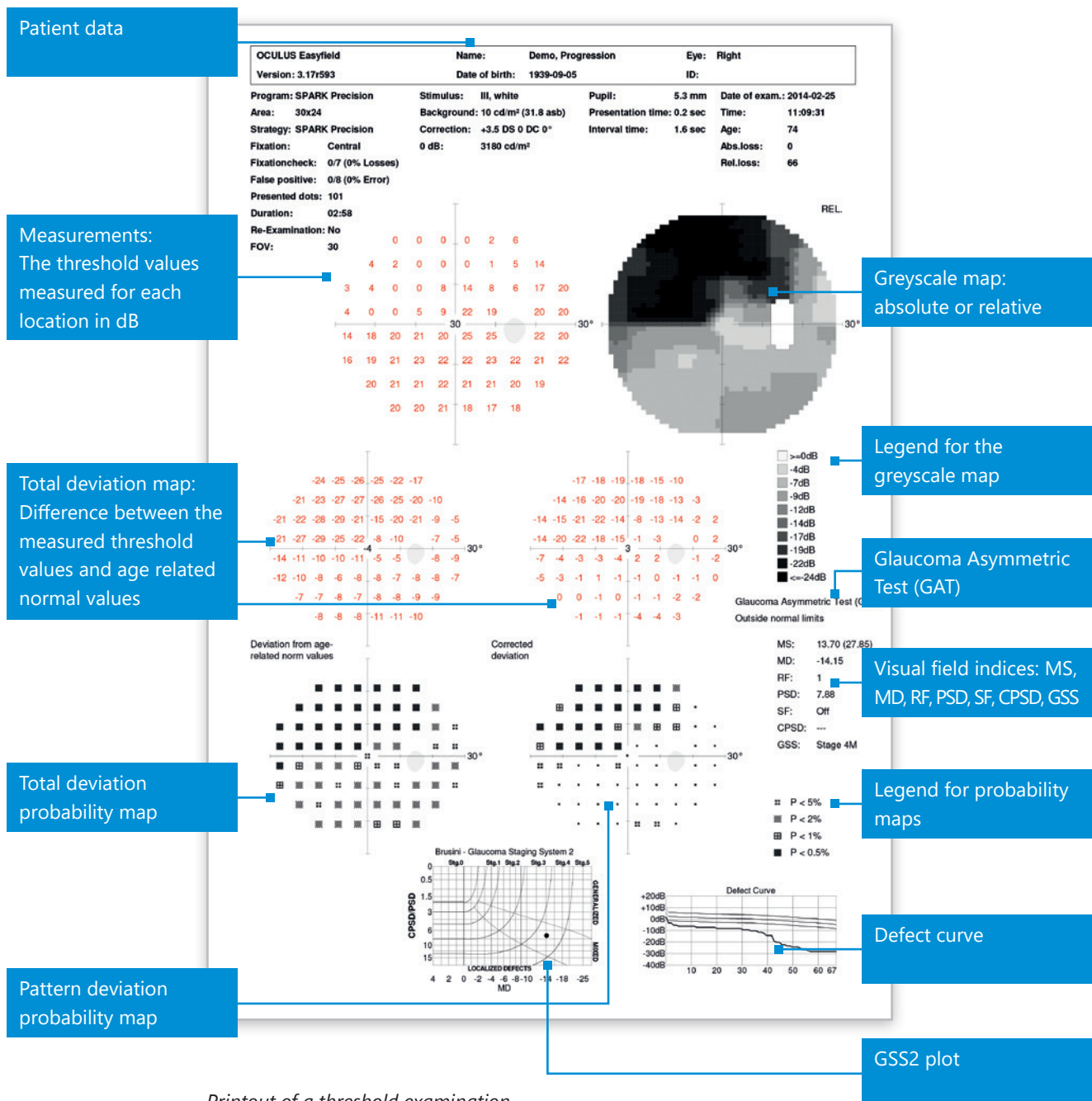
Patient data

Examination data and catch trials

Main results map

Legend to the main map

OCULUS Easyfield	Name:	Demo, Patient	Eye:	Right
Version: 3.17r593	Date of birth:	1950-01-13	ID:	

Program: Macula	Stimulus: III, white	Pupil: 5.4 mm	Date of exam.: 2014-02-25
Area: 24-2	Background: 10 cd/m² (31.8 asb)	Presentation time: 0.2 sec	Time: 10:56:46
Strategy: Supra threshold 2-zones	Correction: +3.5 DS 0 DC 0°	Speed: Adaptive	Age: 64
Fixation: Central			Abs.loss: 23
Fixationcheck: 1/6 (17% Losses)			Rel.loss: 0
False positive: 1/7 (14% Error)			
Presented dots: 75			
Duration: 01:54			
Re-Examination: No			
FOV: 32			

- Points seen
- Defects

Printout of a screening examination

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

Total deviation probability map

Pattern deviation probability map

Greyscale map: absolute or relative

Legend for the greyscale map

Glaucoma Asymmetric Test (GAT)

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

Legend for probability maps

Defect curve

GSS2 plot

OCULUS Easyfield

Name:	Demo, Progression		Eye:	Right
Version: 3.17r593	Date of birth:	1939-09-05	ID:	

Program: SPARK Precision	Stimulus:	III, white	Pupil:	5.3 mm	Date of exam.: 2014-02-25
Area: 30x24	Background:	10 cd/m² (31.8 asb)	Presentation time: 0.2 sec		Time: 11:09:31
Strategy: SPARK Precision	Correction:	+3.5 DS 0 DC 0°	Interval time:	1.6 sec	Age: 74
Fixation: Central	0 dB:	3180 cd/m²			Abs.loss: 0
Fixationcheck: 0/7 (0% Losses)					Rel.loss: 66
False positive: 0/8 (0% Error)					
Presented dots: 101					
Duration: 02:58					
Re-Examination: No					
FOV: 30					

REL.

Legend for the greyscale map:
- >=0dB
- -4dB
- -7dB
- -9dB
- -12dB
- -14dB
- -17dB
- -19dB
- -22dB
- <=-24dB

Glaucoma Asymmetric Test (G...)
Outside normal limits

MS:	13.70 (27.85)
MD:	-14.15
RF:	1
PSD:	7.88
SF:	Off
CPSD:	---
GSS:	Stage 4M

Deviation from age-related norm values

Corrected deviation

Legend for probability maps:
- P < 5%
- P < 2%
- P < 1%
- P < 0.5%

Brusini - Glaucoma Staging System 2

Defect Curve

Printout of a threshold examination

Focus on Glaucoma

Measurement – Assessment – Progression

## Speed, precision and reliability: the SPARK threshold strategy

The SPARK[1] strategy is based on statistical relationships between threshold values found for different locations in the glaucomatous visual field. These relationships have been derived from more than 90 000 perimetric examinations, providing high statistical significance and allowing for fast and very precise threshold measurements in the central visual field. The four-phase structure of SPARK makes it a versatile tool for clinical practice:

- SPARK Precision is the full-fledged version of SPARK. Comprehensive visual field examinations of glaucoma patients can be performed in just 3 minutes per eye. Averaging the results over all four phases ensures a high degree of reliability and reproducibility for improved progression analysis.

- SPARK Quick is the perfect strategy for follow-up and screening examinations. The procedure only takes 90 seconds per eye.

- SPARK Training is ideal for patient training. This 40-second measurement can also be used for screening.

- The SPARK strategy is fine-tuned for use in clinical examinations of glaucoma patients.

Defect assessment: Glaucoma Staging System (GSS 2)

The enhanced Glaucoma Staging System[2] classifies visual field results using the values of the mean defect (MD) and the pattern standard deviation (PSD or CPSD). The examination result is represented in the diagram by a point whose position is determined by the values of the perimetric indices. The diagram displays the severity of the detected visual field defects (Stage 0 – Stage 5) as well as their type (localized, generalized or mixed).
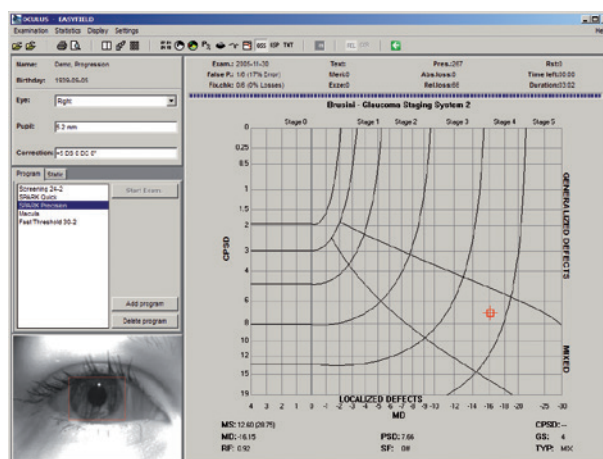
Display of the GSS 2 assessment

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[1]   M. González de la Rosa, J Glaucoma 2012
[2]   P. Brusini, S. Filacorda, J. Glaucoma (2006) 15: 40–46
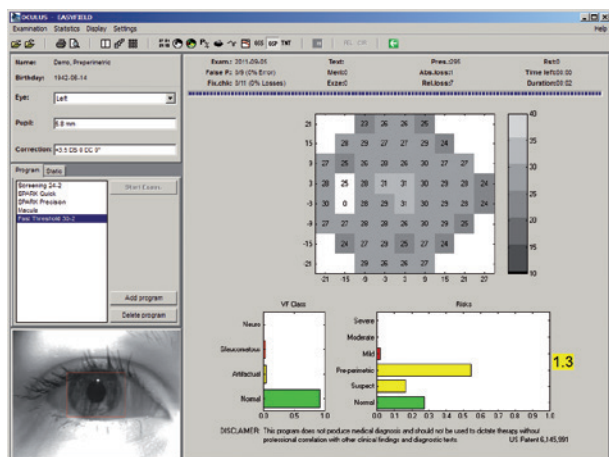
GSP results display

Beyond field indices: Glaucoma Staging Program (GSP)

This novel evaluation module performs a thorough assessment of individual visual field findings using machine learning for pattern recognition. Besides its unique contribution to early glaucoma diagnosis, GSP[1] can substantiate the clinical evaluation of test results.

GSP assigns each test result to a visual field class using an algorithm optimized to match evaluation by a glaucoma expert. In addition, the database of GSP includes correlations with the whole clinical picture (including structural changes). This information enables GSP to evaluate the degree of risk for the presence of different glaucoma stages on the basis of visual field findings.

Intuitive green-yellow-red colour 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 nothing but 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 based on the value of the "Focality Index" (FI).
- TNT uses multiple statistical criteria in establishing progression.
- TNT presents age-related predictions on the visual field.
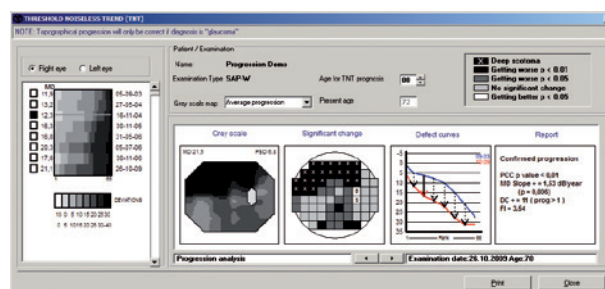
TNT main display

[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
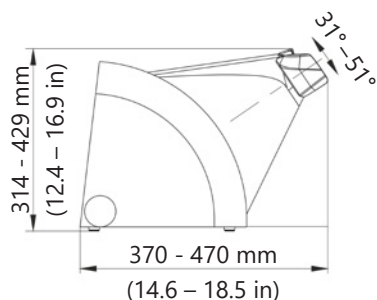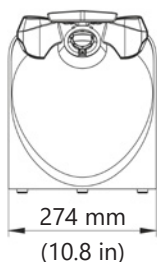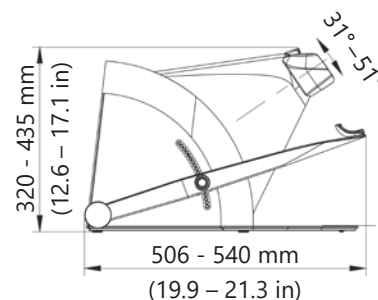
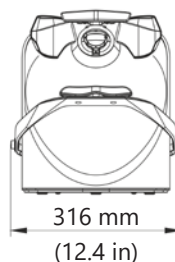# OCULUS Easyfield®
Technical Data

Static perimetry	
Programs	Pre-defined glaucoma, macula, screening and neurological tests User-defined tests
Test patterns	30-2, 24-2, 30x24, 10-2, customized patterns
Strategies	Threshold strategies: SPARK Quick, CLIP, OCULUS Fast Threshold, Full Threshold (4/2) Optional: SPARK Precision Age adapted suprathreshold screening (2-zone, 3-zone, quantify defects)
Examination speed	Adaptive, fast, normal, slow, user-defined
Fixation control	Through central threshold, Heijl-Krakau (using the blind spot), live video image
Result display	Greyscale, dB values (absolute / relative), symbols, probabilities, 3D plot
Reports	Enhanced Glaucoma Staging System (GSS2), Glaucoma Staging Program (GSP), Threshold Noiseless Trend (TNT) progression report

Specifications	
Perimeter bowl radius	300 mm
Max. eccentricity	30°
Stimulus size	Goldmann III
Stimulus colour	White
Stimulus duration	200 ms / user-defined
Stimulus luminance range / increments	0.03 – 3 180 cd/m² (0.1 – 10 000 asb) / 1 dB
Background luminance	10 cd/m² (31.4 asb)
Patient positioning	Measurement head with adjustable angle of inclination, adaptable chin rest (Easyfield® C only), double head rest
Software	Device control, patient management, backup, and print software (Windows®) Built-in networking, easy EMR-integration, DICOM compatibility
Interface	USB

Technical specifications	
Dimensions (W x D x H)	Easyfield® S: 274 x 370 – 470 x 314 – 429 mm (10.8 x 14.6 – 18.5 x 12.4 – 16.9 in) Easyfield® C: 316 x 506 – 540 x 320 – 435 mm (12.4 x 19.9 – 21.3 x 12.6 – 17.1 in)
Weight	Easyfield® S: 4.6 kg (10.1 lbs) Easyfield® C: 7.4 kg (16.3 lbs)
Power supply	12 V DC, 3.34 A, 40 W max.
Voltage	80 – 264 V AC
Frequency	47 – 63 Hz
Recommended computer specifications	Intel® Core™ i5, 500 GB SSD, 8 GB RAM, Intel® HD Graphics, Windows® 10

CE

Easyfield® S

274 mm
(10.8 in)

314 - 429 mm (12.4 – 16.9 in)

31°–51°

370 - 470 mm
(14.6 – 18.5 in)

Easyfield® C

316 mm
(12.4 in)

320 - 435 mm (12.6 – 17.1 in)

31°–51°

506 - 540 mm
(19.9 – 21.3 in)

WWW.OCULUS.DE

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