Henson

Leading the field

TOPCON Healthcare

SEEING EYE HEALTH DIFFERENTLY

Optimized perimetry for practitioners and patients

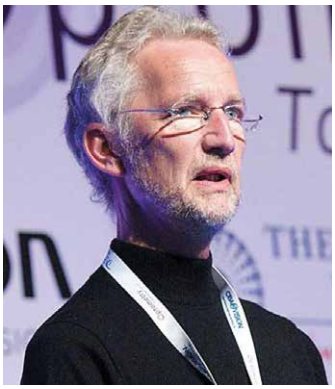
THE HENSON STORY

Over 30 years of innovation

The Henson brand is driven by three clear principles: innovation, improving operator efficiency and ensuring patient comfort. These have motivated us since the launch of our first screener in 1986 and continue to do so to this day with the Henson 9000 Perimeter.

When Professor Henson invented the CFS 2000 it was the world's first computerized, multiple-stimulus, supra-threshold perimeter. Its release revolutionized the way in which visual field tests were performed. It produced a standard printout and allowed the electronic storage of results for future recall or transfer to other computers. By introducing the concept of extending tests the CFS 2000 also made life easier for patients, by shortening tests for those who were at low risk of glaucoma, thereby speeding up practice workflow, too.

Our desire to constantly improve our products is driven both by Professor Henson's expertise as a respected academic and his close understanding of practitioner needs, first from his time as a practicing optometrist and then as a clinical academic at Cardiff University, Manchester University and Manchester Royal Eye Hospital. This has also allowed the Henson range to claim some notable firsts. In 1993 the Henson CFA 4000 became the first perimeter to allow operators to retest and/or add points during a visual field test for improved specificity. In 2009, ZATA was the first threshold test to use prior test data for threshold tests, reducing test times and making tests more manageable for patients.



Professor David Henson: innovating in the field of perimetry since 1986.

To improve sensitivity to small central defects, often missed by 24-2 tests[1], the Smart Supra test allows the operator to include an additional 32 test locations in the central 10 degrees. This 86 point test can be completed in ~3.5 minutes.* In addition, the Smart Supra test uses supra-threshold increments based upon probability limits, thus providing pattern and total deviation probability map outputs similar to those seen in threshold tests.

Today, the Henson 9000 is the first choice of UK optometrists and has a growing install base within optometry and ophthalmology worldwide.

When you choose Henson you choose ground-breaking innovation that will benefit you and your patients.

*Test times are approximations only and will differ according to patient response time and level of loss.

Henson 9000

With innovative tests for detecting and monitoring changes to visual fields, a full suite of analytical tools (including progression analysis), networking capabilities and a compact, modern, low maintenance design, the Henson 9000 offers a lot to practitioners.

HENSON 9000 PERIMETER

All you would expect from your field analyzer, and more

Our commitment to innovation ensures that we can respond to the latest research to provide a perimeter that always benefits you and your patients.

Smart Supra

Smart Supra was uniquely developed in response to recent research which showed that 24-2 test patterns miss a large number of early field defects.[1] Smart Supra can be extended beyond its 24-2 pattern with an additional 32 test locations in the central 10 degrees in a 3.5 minute test. Its standard 26 point screening test can be completed in less than one minute.*

ZATA

Our intelligent alternative to SITA, ZATA can start a threshold test from prior patient data. It uses smart threshold-related terminating criteria to optimize test performance and includes powerful tools for analyzing progression. Tests (24-2) can typically be completed in as little as 2.5 minutes per eye,* providing clear benefits to operator and patient alike.

*Test times are approximations only and will differ according to patient response time and level of loss.

Supporting operator efficiency

Our intuitive user interface with context-sensitive help supports ease-of-use for all staff and reduces training requirements. Operators also benefit from fast, easy, single-click access to the Henson Windows-based database.

Improving patient experience

The unique facility to re-test locations, add new locations or extend tests, without having to start from scratch, not only supports operator efficiency but improves specificity and reduces false positive test outcomes.

Compact design

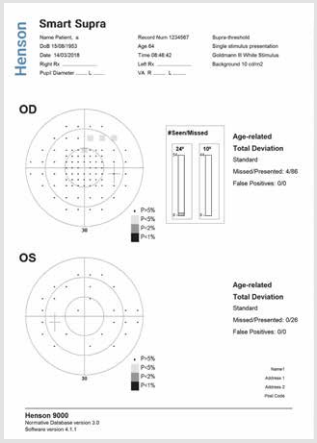
The ergonomic, relatively small size of the Henson 9000 is ideal for space-constrained environments and allows for flexible positioning in any consulting room.

More as standard

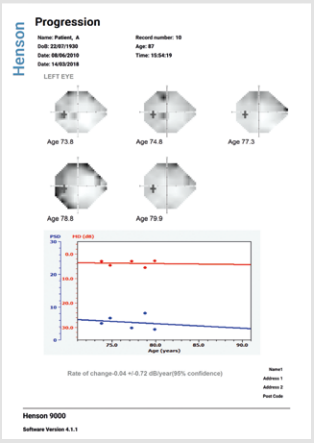
Full facilities for networking, linking to practice management systems and importing and exporting historic patient data are all available as standard.

Commitment to innovation

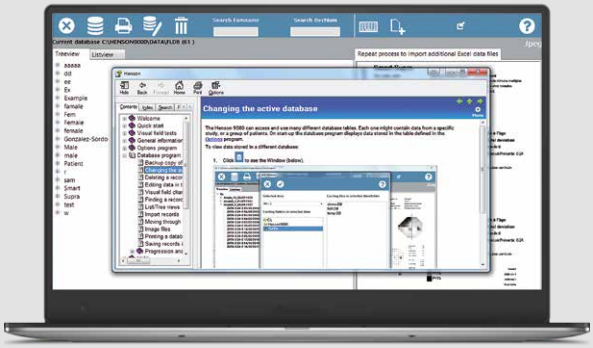
From designing the first computerized, multiple stimulus, supra-threshold perimeter in 1986 to pioneering a new visual field test in 2018, we have always been committed to innovation for the benefit of practitioners and their patients.



Smart Supra printout

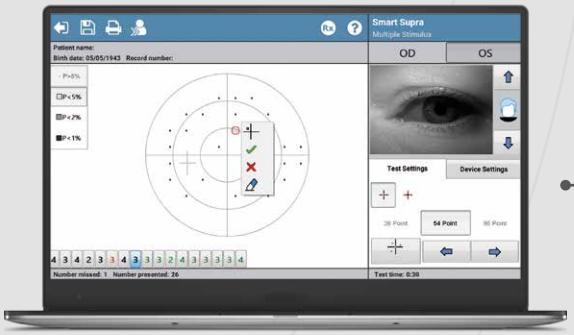


ZATA Progression printout



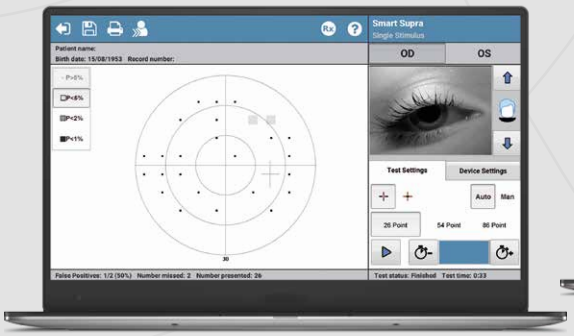
Context-sensitive help supports operator efficiency

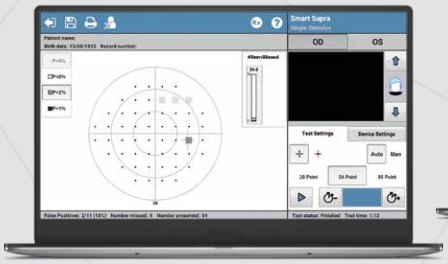
Full facilities for networking available as standard

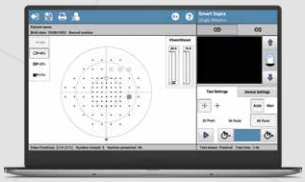


The ability to add/re-test points during Smart Supra tests reduces false positives and improves spatial mapping

Step 1 Step 2 Step 3







Henson Smart Supra can auto-extend from 26 points to 54 points (24-2 pattern) and manually extend further to include an extra 32 points in the central 10 degrees (total of 86 points), while ZATA can extend from the 24-2 to the 30-2 test pattern.

ZATA uniquely starts threshold tests for existing patients using values from the most recent test in the Henson 9000 database

LEADING THE FIELD

Innovating to improve workflow and patient experience

Drawing on the core principles of the Henson brand, our suite of visual field tests – for both detecting and managing loss – use a number of unique innovations to deliver an intuitive and efficient user experience for operators, while ensuring ease-of-use for patients too.

Flexibility for operator and patient

Minimizing confusion and response errors for older patients, while offering enhanced test speed for low risk ones, multiple stimulus is often a patient's preferred choice and can be completed in under 30 seconds; single stimulus is also available for fully-automated testing.

Enhanced sensitivity and specificity

Henson Smart Supra uses locations from the 24-2 pattern to improve compatibility and its 86 point test includes 32 additional test locations in the central 10 degrees. It also allows operators to retest or add points during any test, reducing false positives and improving spatial mapping.

Convenience of auto-extending tests

Saving valuable time for operators and patients, Smart Supra can auto-extend, as required, from 26 points (Screen) to 54 (24-2) and be manually extended from 54 points to 86 points, adding an additional 32 points within the central 10 degrees.

Unique use of prior data

Operators can load prior ZATA threshold test values from existing patient records, enabling tests to start nearer threshold. This helps negate false positive (unseen) responses in the early stages of a test by patients with established loss thereby reducing anxiety, too. It can also speed up test times, benefiting patients and enhancing workflow.

Responding to the latest developments

Our connections with current eyecare professionals and researchers allow us to deliver innovative solutions fast for the benefit of practitioners and patients.

SMART SUPRA: THE BEST OF SUPRA-THRESHOLD AND THRESHOLD PERIMETRY COMBINED

Probability-based supra-threshold increments with increased sampling in the central 10 degrees

The Henson 9000 now includes a unique supra-threshold algorithm designed to provide a solution to the three main problems affecting visual field tests today (see below).

Smart Supra increases sensitivity to shallow defects in the central field by using probability-based supra-threshold increments, as opposed to the fixed ones used in standard supra-threshold tests. The use of probability-based increments means that the supra-threshold increment increases with eccentricity, accounting for the known issue of increased variability at eccentric locations. Adding 32 additional test locations from the central 10 degrees to the 24-2 test locations (86 point pattern) further increases the likelihood of detecting small central defects that can be missed with the 24-2 test pattern when used in isolation.[1]

As a result, Smart Supra is fast. Its 26 point initial phase (sufficient to screen low risk patients) can be completed in under a minute, while the 86 point pattern (which adds 32 additional test locations from the central 10 degrees to the 24-2 test locations) takes around 3.5 minutes.*

The three main problems with current visual field tests

- High variability at moderate to severely damaged test locations (<20 dB)[2,3]
- Poor sensitivity to small central defects when testing with the 24-2 test pattern
- Long test times only get longer with the inclusion of more test locations

The three solutions from Smart Supra

Smart Supra replaces the need to test at locations below 20 dB where variability is so high that meaningful measures of threshold are not attainable [Fig.1]. It does so by setting the threshold increment according to the normal variability found at each location** allowing it to test at levels which have a 95, 98 and 99% probability of being seen [Fig. 2].

Smart Supra includes 32 additional points in the central 10 degrees in response to recent research showing that small central defects can be missed by 24-2 field tests.[1]

Smart Supra is fast even with three levels of testing. Its easy, in-test extension from 26 points (~1minute) to 54 points (24-2), then 86 points (3.5 minutes) as required, allows Smart Supra to test more points in less time.

The three key benefits of Smart Supra

Smart Supra improves clinic workflow – fast test times increase patient throughput enabling more efficient day-to-day practice management.

Smart Supra adds 32 additional points in the central 10 degrees. The test pattern and probability-based increments increases sensitivity in the previously under-sampled central 10 degrees.

Smart Supra generates globally accepted data – printouts include pattern deviation and total deviation probability maps similar to those produced by threshold testing.

*Test times are approximations only and will differ according to patient response time and level of loss.
**Derived from an age-normative database within the Henson software.

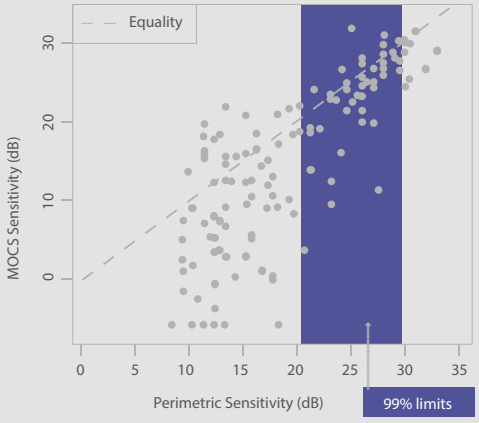


Figure 1: Test re-test variability at different levels of loss, redrawn from Gardiner.[3]

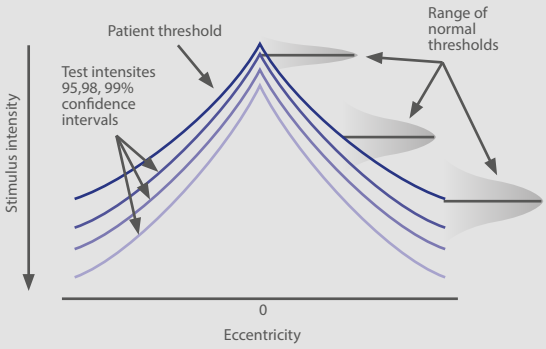
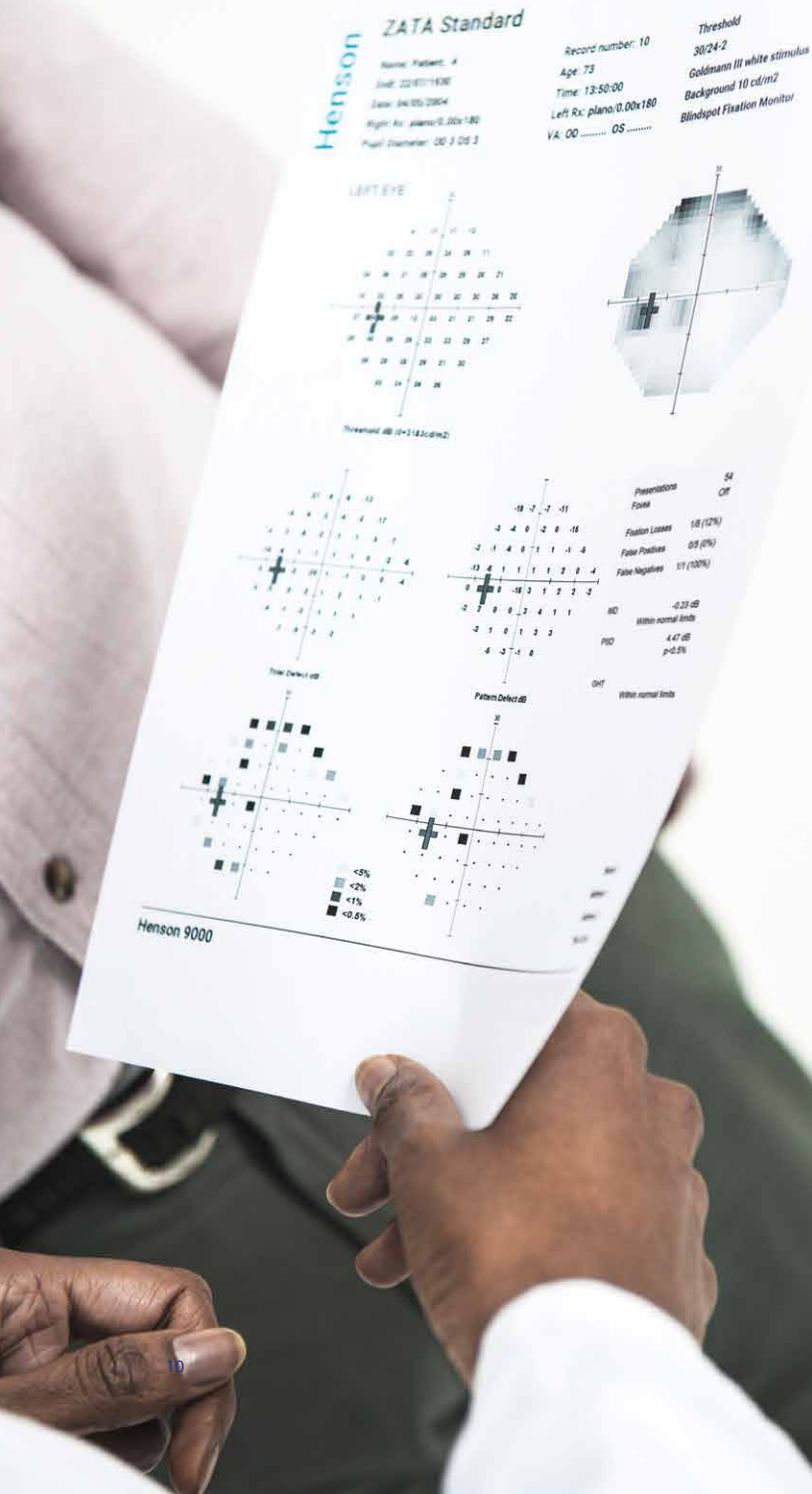
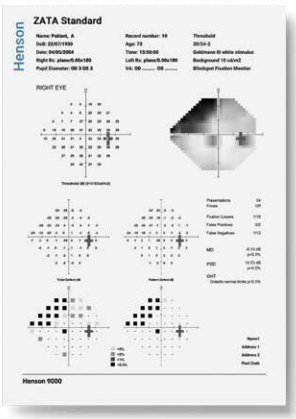
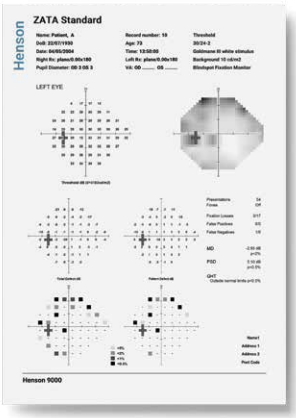
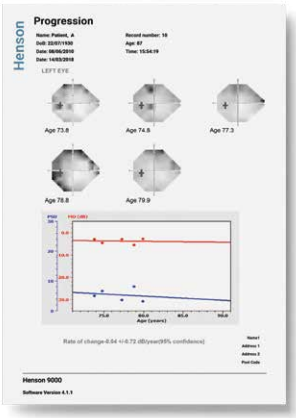


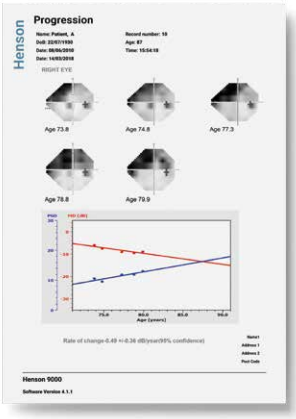
Figure 2: Test levels based on 95, 98 and 99% probability of being seen by an age-matched eye with no visual field loss.


Henson
ZATA Standard
Record number: 10
Age: 73
Time: 13:50:00
Left Rx: plano/0.00x180
VA: OD ..... OS .....
Threshold
30/24-2
Goldmann III white stimulus
Background 10 cd/m2
Blindspot Fixation Monitor
LEFT EYE
Presentations 54
Fovea Off
Fixation Losses 1/8 (12%)
False Positives 0/8 (0%)
False Negatives 1/1 (100%)
MD -0.23 dB
Within normal limits
PSD 4.47 dB
p<0.5%
GHT Within normal limits
Pattern Deviation dB
<5%
<2%
<1%
<0.5%
Henson 9000


Henson
ZATA Standard
RIGHT EYE
Henson 9000


Henson
ZATA Standard
LEFT EYE
Henson 9000


Henson
Progression
LEFT EYE
Age 73.8
Age 74.8
Age 77.3
Age 78.8
Age 79.9
Henson 9000


Henson
Progression
RIGHT EYE
Age 73.8
Age 74.8
Age 77.3
Age 78.8
Age 79.9
Henson 9000

MANAGEMENT WITH ZATA THRESHOLD TESTING

Further to the advantages of Henson Smart Supra, the Henson 9000 also offers a threshold test for the detection and monitoring of visual field loss .

The Zippy Adaptive Threshold Algorithm (ZATA) developed by Professor David Henson uses the more efficient Bayesian method to derive threshold values. Bayesian methods were first introduced into perimeters in the SITA algorithm of the Humphrey Field Analyzer. ZATA further developed this method with reference to research demonstrating enhanced variability at test locations with depressed sensitivity.[3,4] As a result, the ZATA test can typically be completed in as little as 2.5 minutes per eye.* The fast test speeds are also due to the unique way in which ZATA uses prior patient data.

5 reasons to choose ZATA

ZATA speeds up threshold testing through better use of prior test data

In instances where patients have been tested previously, ZATA will build on this prior data for subsequent tests, rather than starting a new test from age normative data, as is common in other perimeters. This helps negate false positive responses early in a test by patients with established loss and serves to reduce patient anxiety, too, by reducing the number of unseen presentations. It can also speed up test times – benefiting patients and enhancing practice workflow.

ZATA does not just use single terminating criteria

ZATA varies the terminating criteria to give more accurate thresholds at damaged and neighboring locations. This reduces test times, both for patients with advanced visual field loss and for those with no loss at all.

ZATA uses looser terminating criteria in severely damaged locations (<10 dB)

ZATA does not attempt an accurate measurement of thresholds below 10 dB where variability is high and attempts at accurate measures do not yield any useful additional data.

ZATA allows both 24-2 and 30-2 stimulus patterns in a single test

Via a simple 'extend' facility operators can extend the 24-2 test pattern to a 30-2 test pattern during or at the end of each test so avoiding the need to retest the 24-2 locations if later opting for a 30-2 test.

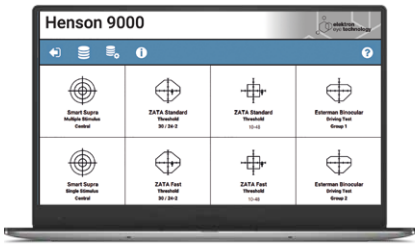
ZATA uses the standard printout for universal compatibility

The standard print format is used to aid interpretation and comparison with data from other perimeters. The Henson 9000 software also allows users to switch between multiple views – threshold, grayscale, or defect values – on screen at the end of each test.

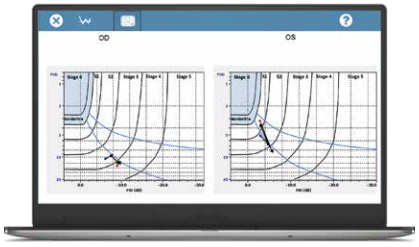
*Test times are approximations only and will differ according to patient response time and level of loss.

PUTTING IT INTO PRACTICE

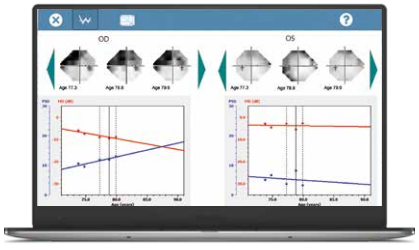
We understand that our equipment must fit seamlessly into your practice and processes. We have designed a low maintenance, compact perimeter for flexible positioning with networking facilities available as standard. Our suite of tests and associated analytical techniques give you all the information you need to support the best patient outcomes.



Henson 9000 home screen



Progression GSS2 user interface



ZATA Progression line plot user interface

Small footprint allows for flexibility of positioning – the Henson has a compact footprint (W 440 x D 400 x H 452 mm) and sits easily on a standard instrument stand. The software runs on a separate device (touch screen, desktop or laptop), giving you more placement flexibility than is available from perimeters with fixed operator display screens.

Full networking support – the Henson 9000 application can make full use of the networking facilities within Windows® as standard. There is no need to purchase additional software to enable this. The Henson software can utilize the network for printing or to allow storage of the database, backup or output files on a network drive, enabling the sharing of test data between units. Networking also allows remote practice management systems to pass patient details to the Henson tests. The results of the tests can be stored in multiple locations as JPEG, PDF or DICOM images.

Fast, intuitive, multi-lingual software means minimal training time – our software has been designed to be fast and easy to use. There are no extended start-up times with single touch operations for most actions. We also offer context-sensitive help in multiple languages.

All the visual field tests and analytical tools you need

You have all the tools you need to detect and monitor functional loss with our range of supra-threshold and threshold tests, as well as monitoring the whole visual field with the Esterman binocular driving tests (Groups 1 & 2).

Our Smart Supra results are designed to be compatible with threshold results, while our ZATA results include all recognized global indices (mean deviation, pattern standard deviation and hemifield) plus threshold and grayscale, total deviation and pattern deviation values.

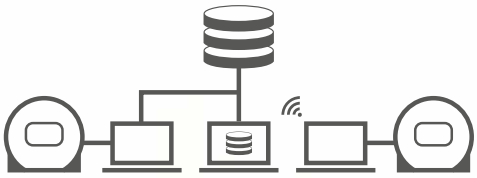
Our progression analysis tools display global indices (mean deviation and pattern standard deviation) against the age of the patient and the mean deviation rate of change displayed with confidence levels.

Progression data can also be presented on Glaucoma Staging System II (GSS2). Using both the mean deviation and pattern standard deviation is better than using either index in isolation.

Our ZATA threshold test includes a foveal threshold measurement facility as standard.

Benefit from low maintenance costs – robust, solid-state electronics with degradation free light sources ensure the maintenance costs for your Henson 9000 are minimal year-on-year.

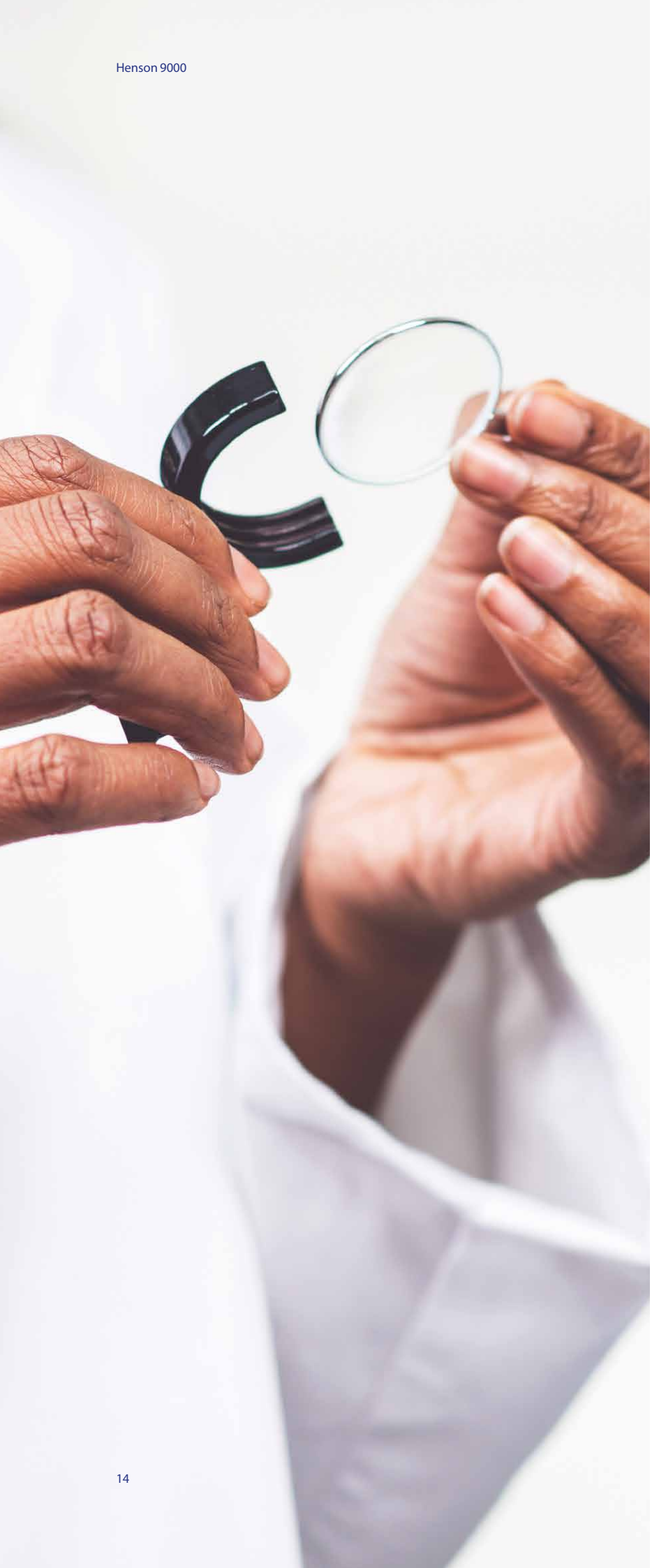
With the flexibility of using either a touch screen, laptop or desktop computer the Henson 9000 is convenient and easy to use.



The Henson 9000 application can make full use of the networking facilities within Windows® as standard with no need for additional software.

Single touch operation for most actions along with context-sensitive help make the Henson 9000 easy to use for operators.

The Henson 9000 software supports 11 different languages.



References

1 De Moraes CG, Hood DC, Thenappan A, Girkin CA, Medeiros FA, Weinreb RN, Zangwill LM, Liebmann JM. 24-2 Visual Fields Miss Central Defects Shown on 10-2 Tests in Glaucoma Suspects, Ocular Hypertensives, and Early Glaucoma Ophthalmology. 2017 Oct;124(10):1449-1456. PMID: 28551166

2 Henson DB, Chaudry S, Artes PH, Faragher EB, Ansons A. Response variability in the visual field: comparison of optic neuritis, glaucoma, ocular hypertension, and normal eyes. Invest Ophthalmol Vis Sci. 2000 Feb;41(2):417-21. PMID: 10670471

3 Gardiner SK, Swanson WH, Goren D, Mansberger SL, Demirel S. Assessment of the reliability of standard automated perimetry in regions of glaucomatous damage. Ophthalmology. 2014 Jul;121(7):1359-69. PMID: 24629617

4 Gardiner SK, Mansberger SL. Effect of Restricting Perimetry Testing Algorithms to Reliable Sensitivities on Test-Retest Variability. Invest Ophthalmol Vis Sci. 2016 Oct 1;57(13):5631-5636. PMID: 27784065

Henson 9000 Perimeter: Technical specification

Test specifications	
Visual field test range	60° (monocular) / 160° (binocular)
Visual field testing distance	25 cm
Stimulus intensity (maximum)	10,000 asb
Background illumination	31.5 asb
Stimulus duration	200 ms
Stimulus size	Goldmann III
Stimulus colour	White
Test method	Standard Automated Perimetry (SAP)
Screening tests/patterns	
Smart Supra - single stimulus	26, 54 and 86 point tests (incorporating the 24-2 test pattern)
Smart Supra - multiple stimulus	26, 54 and 86 point tests (incorporating the 24-2 test pattern)
Esterman (Driving)	Groups 1 (120 point) and 2 (124 point) (EU standard)
Customized tests	Test locations can be manually added to all Smart Supra screening tests
Threshold tests/patterns	
ZATA Standard - threshold central	10-48**; 24/30-2 (extendable in-test)
ZATA Fast - threshold central	10-48; 24/30-2 (extendable in-test)
Average test times*	
Smart Supra – single stimulus	~1 min (26 points); ~3.5 minutes for fully extended 86 point test.
Smart Supra – multiple stimulus	Under 30 seconds (26 points)
ZATA (24-2)	~2.5 minutes per eye
ZATA Fast (24-2)	~ 2 minutes per eye
Fixation control	
Fixation target	Single or 4-point LED diamond pattern
Heijl-Krakau	Yes (ZATA)
Video eye monitor	Yes
Software features	
Patient management database	MS Windows® compatible; networkable
Practice management integration	EMR compatibility (parameter passing and text file)
Languages	English, Chinese, French, German, Italian, Japanese, Norwegian, Portuguese, Brazilian Portuguese, Spanish (Latin America), Spanish (Peninsula)
Hemifield analysis	Yes
Progression analysis	Yes
HFA data import	Yes
Connectivity	
DICOM	Yes (images)
Ethernet	Yes, via connected computer
Database backup	Removable, network or cloud storage
Dimensions	
Weight (kg)	13.5
Size, W x D x H (mm)	440 x 400 x 452
Classification	
Medical device	Class I
Applied part	Type B
Control device	External PC / laptop / tablet running MS Windows® Professional, v.8, and above
Patient unit inputs/outputs	C13 mains input; Patient Response Button; 2 x USB Type B connector
Electrical requirements	85 – 263 V AC, 50/60 Hz, 60 VA
Optional printer	Any compatible with controlling computer

* Test times are approximations only and will differ according to patient response time and level of loss.

**The 10-48 pattern presents 48 stimuli on a 3 degree square matrix, displaced 3 degrees from the horizontal and vertical mid-lines, within the central 10 degrees.

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