oculera

# Everything about Oculera Visual Field Examination

# FEATURES

## Low cost

Significantly cuts the traditional perimetry equipment cost. You can purchase the device or pay a monthly fees to adjust your own economical plan.

## Low maintenance

Thanks to the compact design, your perimetry service will not be affected by any maintenance or calibration service. Simply return your device and we will replace the whole hardware.

## High mobility

Only weighs 500 grams. Does not require any connection or secondary device to run anywhere you desire.

## Easy to use for the patients

Patients are not required to sit and place their heads still during the test. Any chair to lean and relax will do the trick. oculera lowers the accuracy loss due to poor ergonomics.

# FEATURES

## Does not require an eye patch

The virtual reality technology allows the examination to test both eyes at the same time. So long for the eye patches and sour eyes.

## Does not require a dark room

As soon as the patients put the device on their heads, they are isolated from the environment and enter a virtual dark room. Now your waiting room (or wherever you wish) becomes a fully fledged dark room.

## Digital Use

You can start the test from your computer, tablet or phone wherever you want, and access the test results of the patients from any device with internet connection.

# FEATURES

## Intended for use in diagnostics and therapeutic services.

Commonly, it is used in ophthalmology services for glaucoma patients because an early diagnosis of the disease is successfully possible with this technique. Also the techniques are useful for neuro-ophthalmic diseases.

## Classifed as Class IIa CE certified medical device

Oculera VFA is the first CE certified Class IIa medical device as a VR Perimetry.

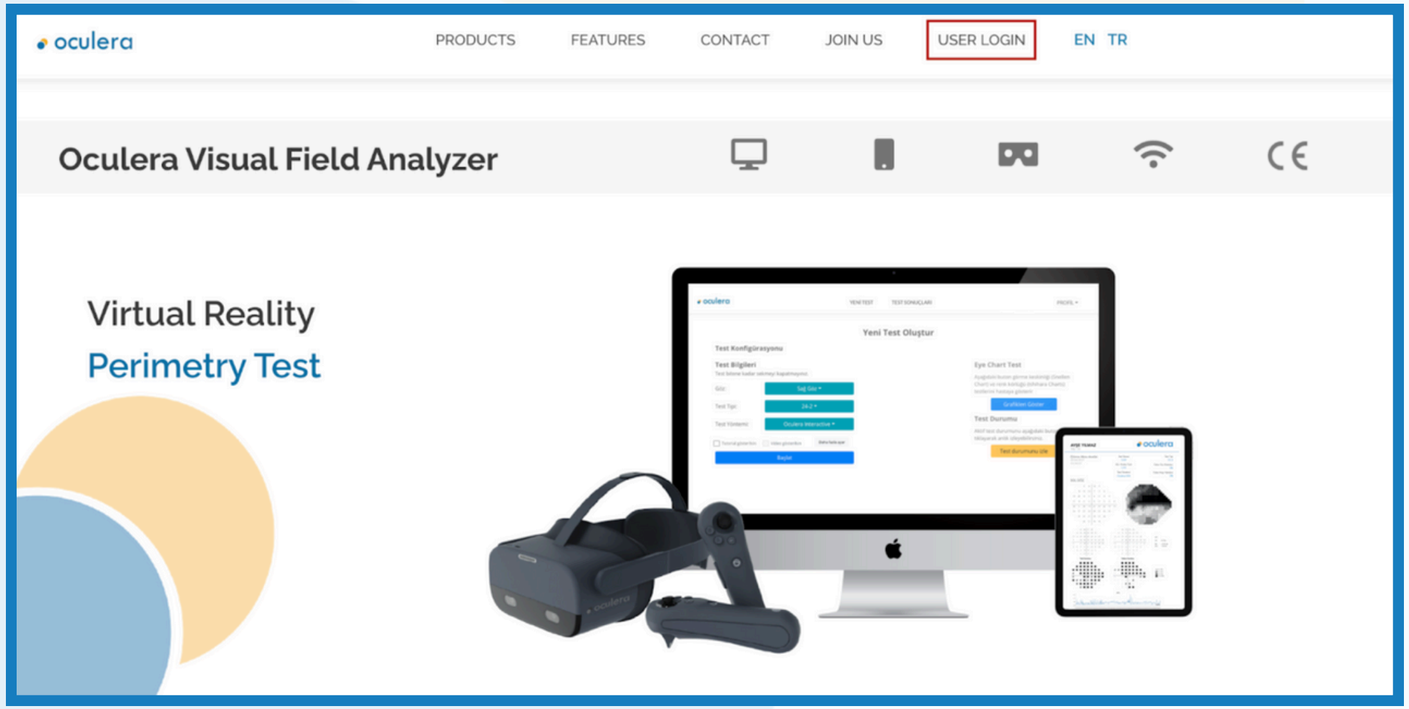
## UKCA marked medical device

Oculere VFA  is currently registered in the UK.

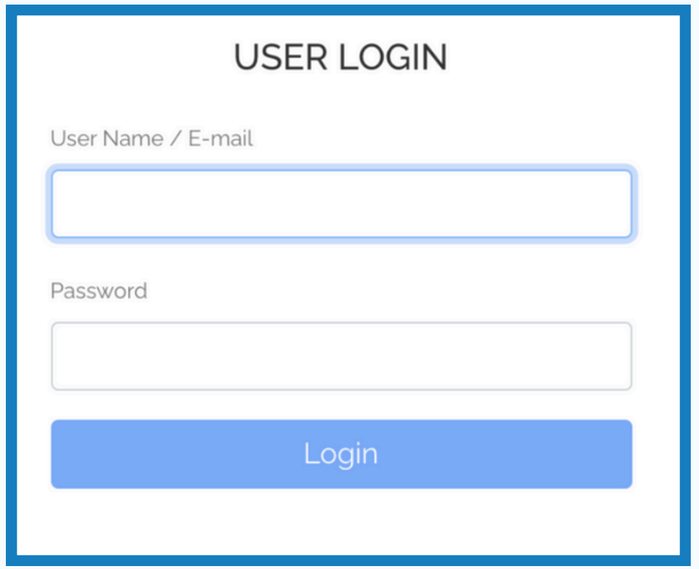
# POSITIONING THE HEADSET


- An image is presented to the patient before the test to check whether the head is properly placed.
- If the headset is positioned properly, each letter can be identified on the screen.
- Green Wifi logo must be seen at the bottom right.
- Battery level must be **at least 15%**.

# TESTING

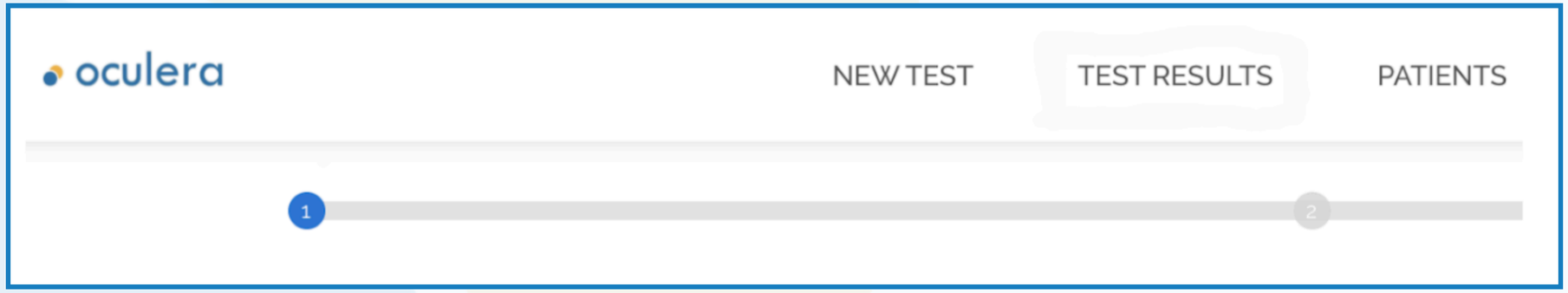



"User Login" button on the **www.oculera.health** home page is clicked to go to the login page.



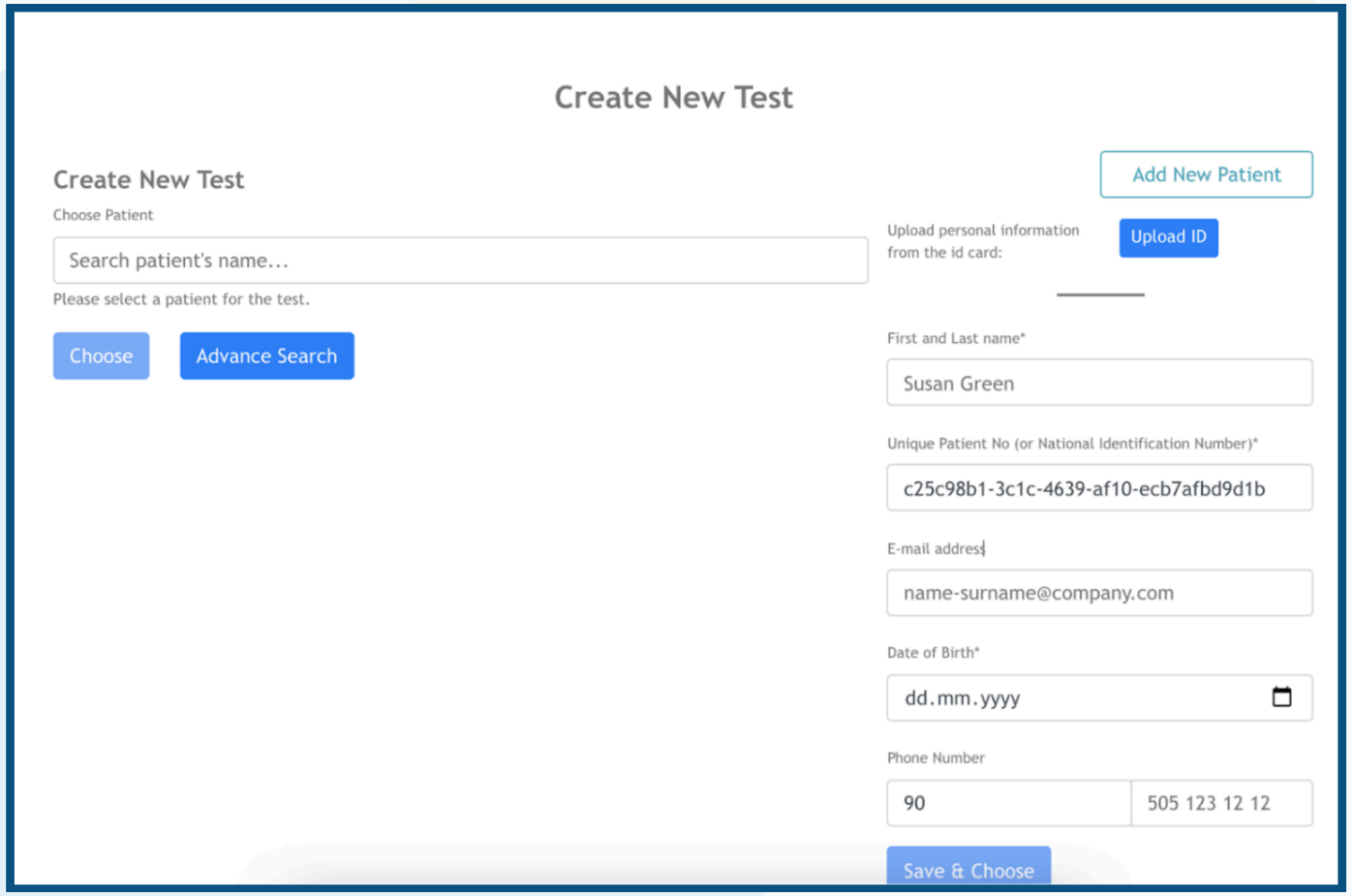

The user name and password are entered and the product main portal is accessed.

# TESTING



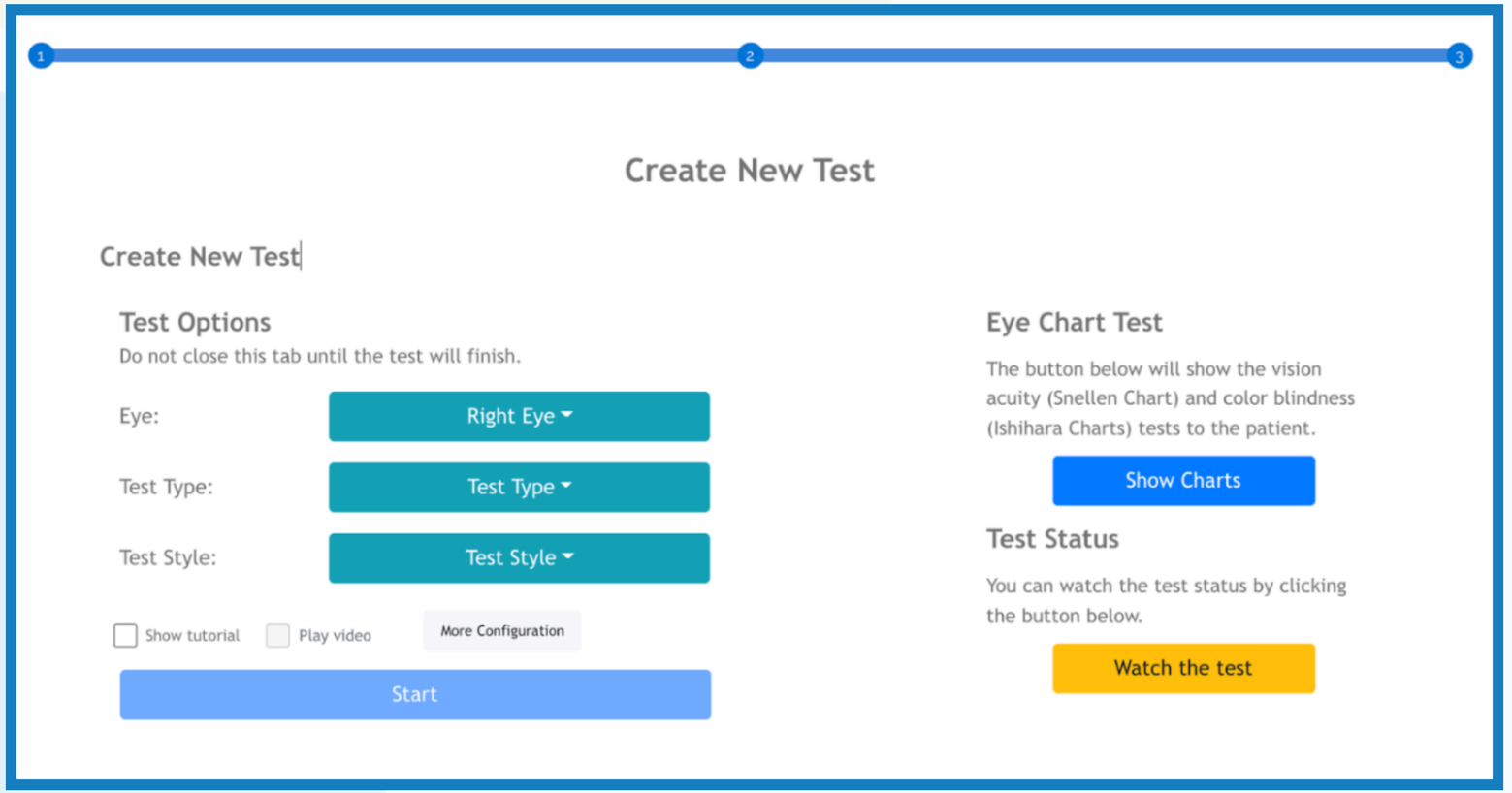

- The page automatically opens on the **“New Test”** screen. On this screen, a new patient can be registered or an existing patient can be selected.
- The **"Test Results"** button is used to see the old test results.
- The **"Patients"** button is used to see the patient information and search in detail.

# TESTING



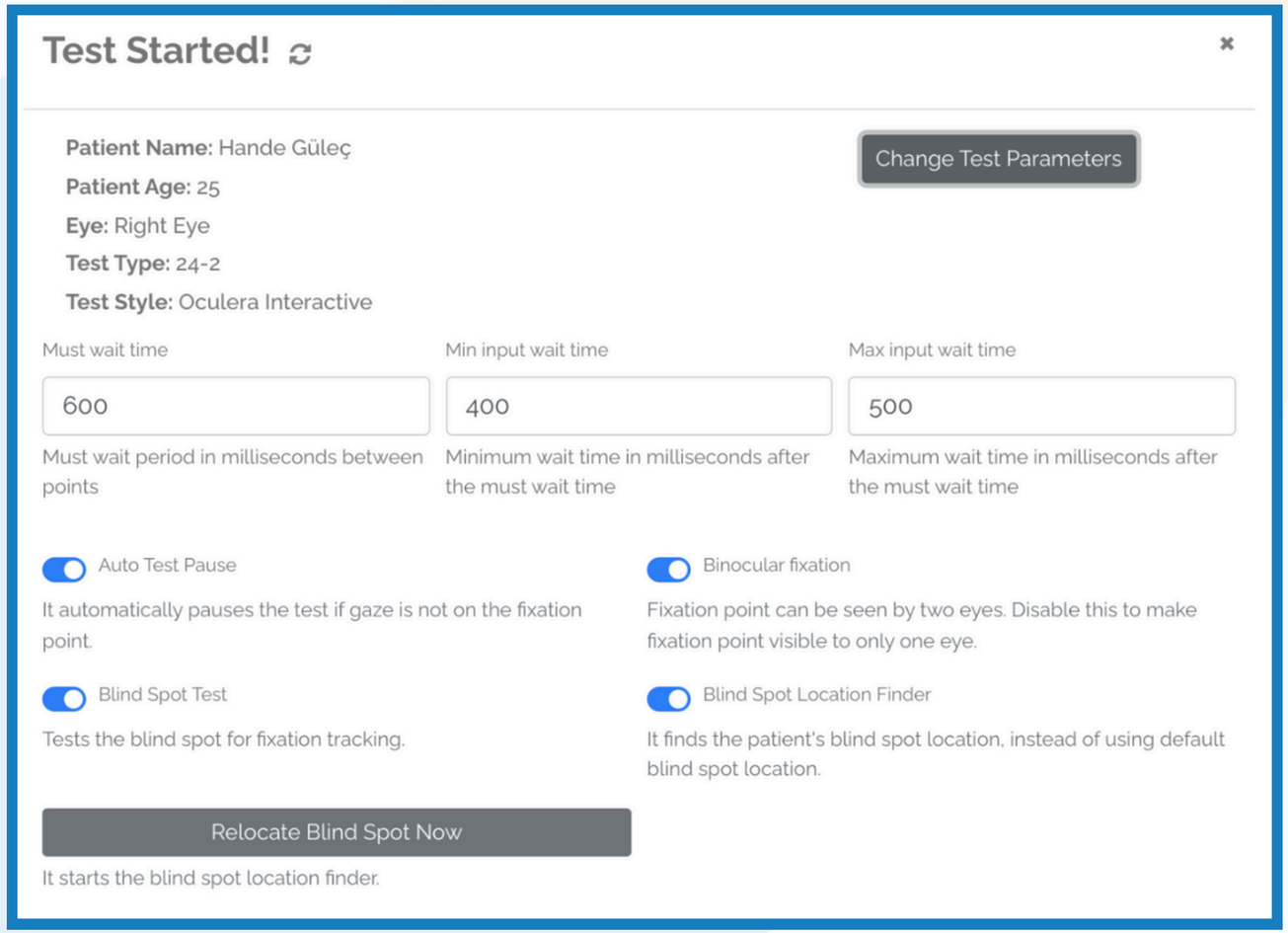

- In the new test screen, previously registered patients can be selected by searching in the search bar.
- For a new patient registration, the **"Add New Patient"** button on the right side of the page is clicked and the registration form below is filled. In this form, the first and last name part and the date of birth are mandatory fields, while other information is optional.

# TESTING




Test parameters are selected on the final test start screen.

# TESTING




- After the test starts, the test progress window will open.
- Some test parameters can be changed during the test by clicking the **“Change Test Parameters”** button.
- The test duration and the compilation percent are shown along with the test results in real-time.

# OCULERA
# VISUAL FIELD ANALYZER


Test Types | Reliability Scores | Test Algorithms | Academical Studies | Test Results

| Test Type | Field | Test Pattern | Extent of Visual Field Tested / Number of Points Tested | Application |
|---|---|---|---|---|
| **10-2** | Narrow | Nonocular points | 10 degrees/68 point grid | Macula, retinal, neurological, advanced glaucoma |
| **24-2** | Medium | Nonocular points | 24 degrees/54 point grid | Glaucoma, general, neurological |
| **30-2** | Wide | Nonocular points | 30 degrees/76 point grid | Glaucoma, retinal, neurological, general |
| **Binocular (Esterman)** | Wide | Nonocular points | 120 degrees bitemporal/ 120 points | Assessment of visual field in both eyes together (binocular vision) Functional disability |
| **C-40** | Wide | Nonocular points | 30 degrees/40 points | Glaucoma, general, neurological |
| **FF-120** | Wide | Nonocular points | 55 degrees/120 points | Glaucoma, general, neurological |

# TEST ALGORITHMS

## Full Threshold

- The Full Threshold strategy is widely recognized as a standard method in static threshold perimetry, especially prevalent in clinical trials involving glaucoma.
- It tests all points with a fixed brightness and goes up and down according to the responses.
- The duration of the test typically ranges from 5 to 15 minutes for each eye.
- Test Patterns are: 10-2, 24-2, 30-2

# Fast Tracking

- Fast Tracking Test is similar to a well-known algorithm called **Tendency Oriented Perimetry**.
- The test takes 1-2 minutes per eye.
- It can be used for screening purposes.
- The recommended test pattern for the Fast Tracking Test is 24-2.
- 10-2, 24-2 and 30-2  can be used with this strategy.
- Excludes False Negative and Fixation Loss calculations to accelerate the test duration.
- Incorporates automated pauses with eye tracking to maintain test precision under various conditions.

## Oculera Interactive

- It is recommended in terms of duration and performance in patients' tests.
- It is an optimized testing strategy to get the most accurate and detailed result in a short time.
- It uses 4 dB and 2 dB steps and was designed to replace the Full Threshold program.
- The average test duration for Oculera Interactive is 3-8 minutes per eye.
- It can be used with 10-2, 24-2, and 30-2 test patterns.

## Supra-threshold

- Suprathreshold perimetry testing is a type of visual field test used primarily to screen for defects in the visual field, and it is also utilized for various practical evaluations such as disability measurement, assessing driving eligibility, and general vision examination.
- It is used in binocular and central-40, central-60, and full field-120 tests.

## Binocular

- The binocular test algorithm has a 120-degree horizontal and 90-degree vertical range of points.
- It has 120 points in total.
- It takes about 1-2 minutes per eye.

# RELIABILITY SCORES

## Blind Spot Test (Fixation Loss)

Blindspot testing relies on known blind spot locations to ensure proper headset placement and maintain patient focus during tests. Stimuli sent to the blind spot assess parameters, with correct perception indicating accurate settings. If the blind spot is visible, test reliability decreases, due to fixation loss.

## Eye Tracking Graph

Eye tracking graph shows eye movements during the test. Upper peaks respresent deviations from the fixation point. Negative values show the blinks.

## False Negative

Recorded when a patient does not respond to brighter stimuli where a duller stimulus has already been seen. High false negative scores indicate that the patient is fatigued, inattentive, a malingerer or has genuine significant visual field loss.

## False Positive

The number of positive answers obtained during these ‘listen’periods and the listen time are re- corded and together called ‘listen time data’. from:

(An improved method to estimate frequency of false positive answers in computerized perimetry

Jonny Olsson’, Boel Bengtsson2,Anders Heij12and Holger Rootzen3)

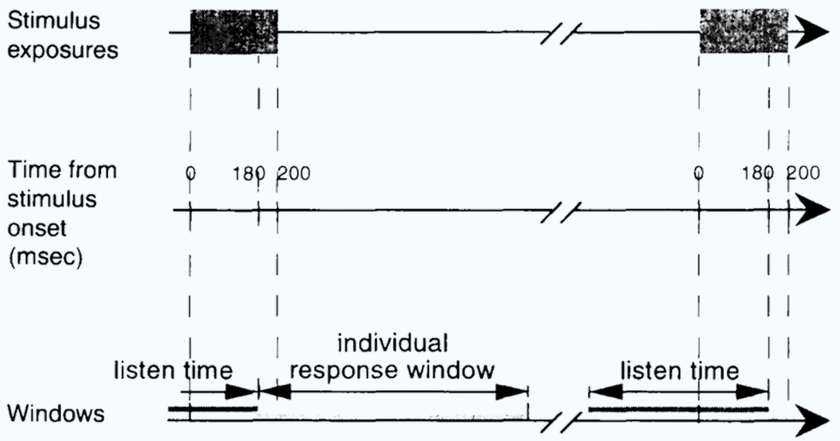
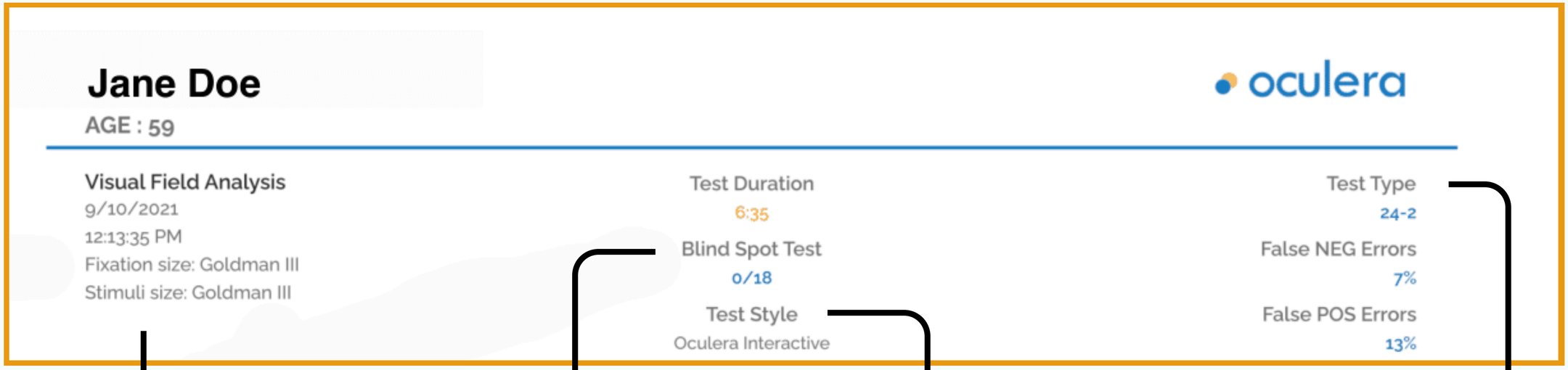



**Fig. 1.** Time window showing listen time used for determining false positive answers, and response window when responses are expected. First listen time window starts immediately after onset of a stimulus and ends 180 ms later. Second listen time window starts after a fixed time after end of response window and continues into next listen time window associated with subsequent stimulus.

## Comparison of a Virtual Reality-Based Visual Field Device (Oculera) with Humphrey Visual Field Analyzer in Glaucoma Patients and Healthy Individuals:

“A good correlation was found between standard automatic perimetry and Oculera. Oculera MD results were comparable to HFA II MD results. Oculera may be a useful alternative in clinical practice for functional testing in glaucoma patients. It also offers convenience as it is portable and can be applied at home.”




This plot shows the deviation of the patient's result from that of age-matched controls at each test location.

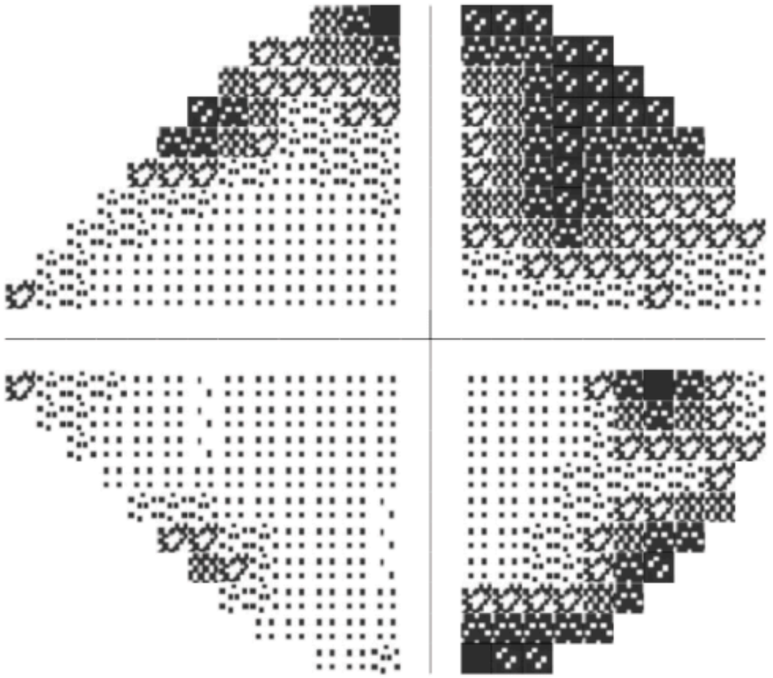
Blind spot test is performed to calculate fixation loss ratio during the test.

Oculera Interactive algorithm is an iteration of SITA-Standard. The level of resolution and accuracy are set to be on par with SITA-Standard. Moreover, average test duration is 30% shorter than SITA-Standard, with an average of 4.5 mins.

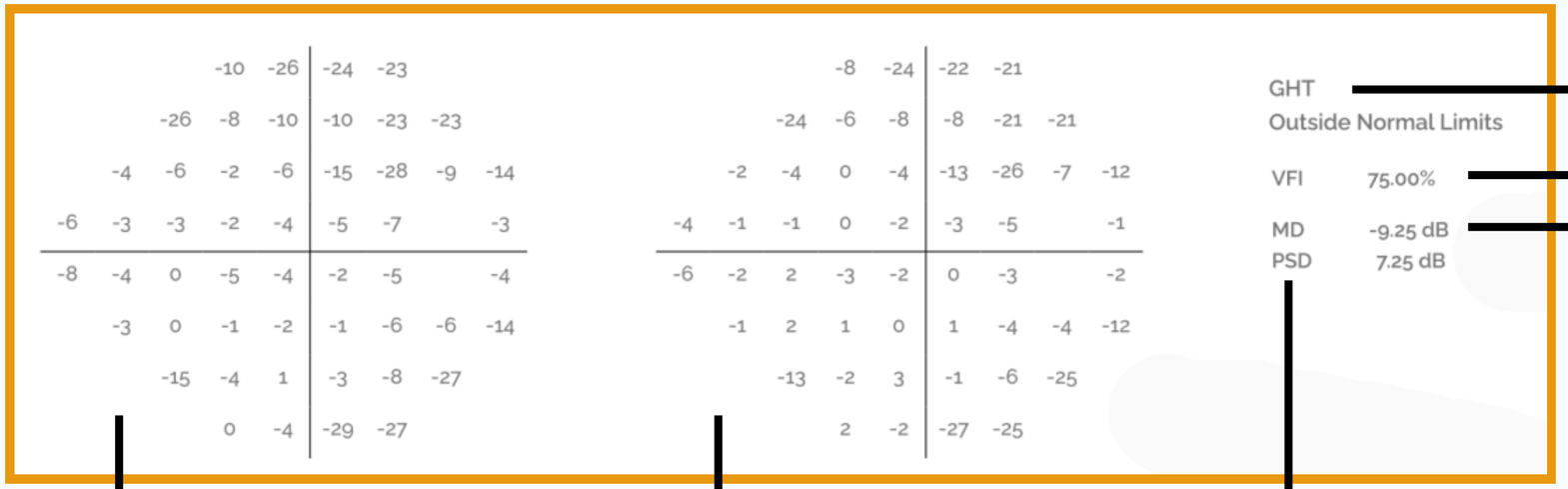
Test types can be 10-2, 24-2, 30-2.

Right Eye

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 17 | 0 | 2 | 3 | | |
| | | 2 | 21 | 19 | 18 | 5 | 4 | |
| | 24 | 24 | 28 | 25 | 15 | 2 | 20 | 14 |
| 20 | 26 | 28 | 29 | 28 | 26 | 24 | 19 | 26 |
| 18 | 25 | 31 | 27 | 28 | 30 | 26 | 0 | 25 |
| | 26 | 30 | 30 | 30 | 30 | 25 | 24 | 15 |
| | | 14 | 26 | 31 | 27 | 22 | 3 | |
| | | | 28 | 25 | 0 | 2 | | |



The grey scale plot graphically demonstrates regions to visual field loss by displaying regions with decreased sensitivity in darker tones.




**G**laucoma **H**emifield **T**est notation is a meta data calculated by using other parameters such as MD, PSD, Raw data etc. The result is completely generalized and tells if the patient is healthy or not.

**V**isual **F**ield **I**ndex expresses the visual field status as a percent of a normal age-adjusted visual field.

**M**ean **D**eviation is the average of these deviations across all test locations.

**P**attern **S**tandard **D**eviation measures irregularity by summing the absolute value of the difference between the threshold value for each point and the average visual field sensitivity at each point.

This plot shows the deviation of the patient's result from that of age-matched controls at each test location.

This plot is similar to total deviation plot except that it is adjusted for any generalized depression, such as that caused by a cataract or miosis.


Eye tracking graph shows eye movements during the test. Upper peaks respresent deviations from the fixation point. Negative values show the blinks.

# OTHER FEATURES

## DICOM

Test results can be export in DICOM format. It is adaptable for all the available EMR systems.

## Offline Mode

The device will be used without an active internet connection. The connection between the computer and the headset will be established via cable.