

KMScreen Digital Hess & Harms screen

KMScreen includes the following program

- A. KMScreen a digital system for mapping the position of extraocular muscles in 15 degree inner field and 25 degree and / or 30 degree outer field, according to Hess and Harm's method.
- B. Binocular field of single vision. A program for mapping of the single-vision field.
- C. Prismograph: A program for calculating the oblique angles of prism treatment and performing glasses prescriptions with prism

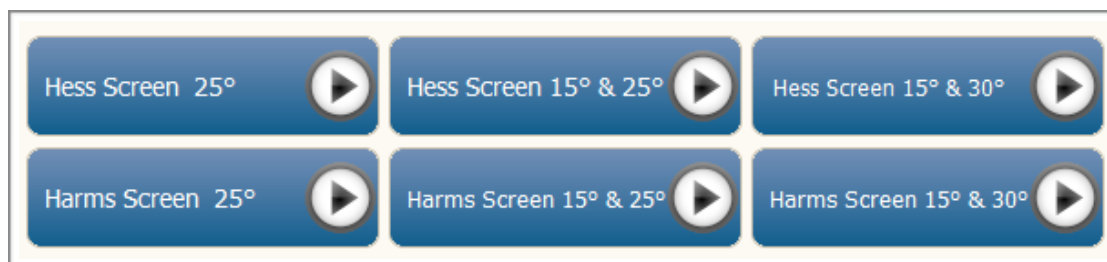
Hardware specifications

1. A 14 inch laptop with HD screen resolution (1920x1080 pixels).
2. Operating system: Windows 10 (64 bit)
3. An LED screen on the minimum 55 inch size. With 55 inch screen we can document up to 25 degree deviations. With, for example, 65 inch screen we can document up to 30 degree outer field.

Software features

There are several different types of tests that you can choose to test the patients with. Which test we choose depends on the patient's diagnosis and the treatment we intend to carry out.

The following tests are included.



Examination according to Hess method:

1. **Hess screen 25 degrees.** This program is used to **quickly** map, the position / deviation of the extra-ocular muscles, and make a diagnosis at eg emergency eye clinic receptions or neurology receptions. The examination can be supplemented, with diplopia chart in nine gaze directions where the horizontal and vertical deviation and the torsion of the double images are plotted.
2. **Hess screen 15 & 25 degrees.** This program is always used when planning a strabismus surgery. Here one should always choose to also test diplopia tests for the vertical deviations. It facilitates the surgeons to decide which method / muscle to choose to operate.
3. **Hess screen 15 ° alternative 15 ° & 30 °.** This program is adapted to be tested only 15 degrees inner field when using 55 inch LED screen or 15 & 30 degrees when having a 65 inch LED screen.

Examination according to Harms method:

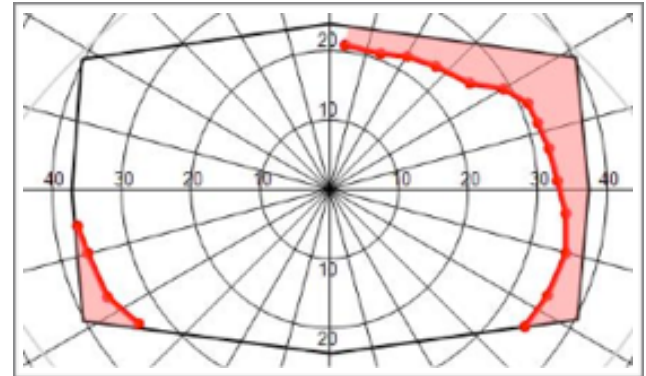
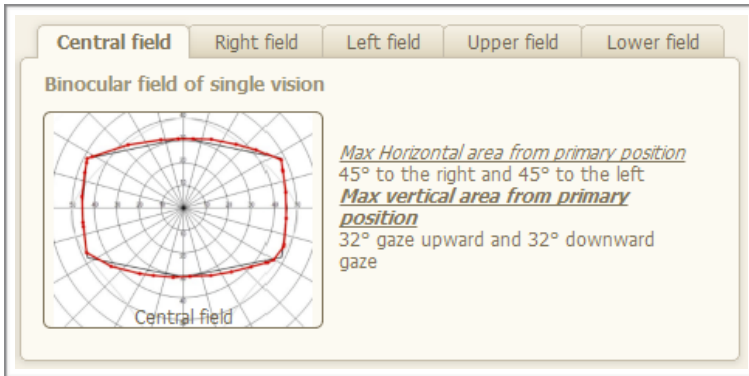
Harm's method is common among German-speaking countries. The advantage of Harm's method is that you test both the horizontal and vertical deviations (such as at Hess) but at the same time you test the torsion of the ocular muscles deviation.

In addition, it is easier to "catch" big over-functions that occur in old pares. The disadvantage is that each examination takes longer time and requires the healthcare personal to be more "active" as it requires keeping and turning the patient's head to the various fixation points. But both methods complement each other. The following Harms tests are included

1. **Harms screen 25 degrees.**
2. **Harms screen 15 & 25 degrees**
3. **Harms screen 15 & 30 degrees** (This test can be tested on both 55 & 65 inch LED screen)

Binocular field of single vision

With this test we can document the extent of the single-vision field on the patients who see double. This test is usually used in conjunction with vision acuity certificates for driving license rights and for following up a development of an ocular muscle paralysis.



Prismograph & Prism glasses prescription

With this program we can calculate the angle and strength of the prisms when combining vertical and horizontal prisms.

In conjunction, it is possible to prescribe eyeglass where the prism are stated.

Prescription		Distance Glass			PD:	NV-PD:
		SPH	CYL	AXIS	ADD	Comment
OD		+1	-0,75	12°		
OS		+1	-0,75	180°		

Prism Prescription: Distance Glass

OD 2.5 PD Base in/Base down at 323° OS 2.5 PD Base in/Base up at 143°

OD - Right

OS - Left

Prism Calculator

Select the type of horizontal and vertical strabismus and enter the correction prism diopters. Finish by clicking the button "Show the result"

Horizontal

Vertical

Total number of prism dioptres

The angle of the prism rotation

Prism correction for the Right eye

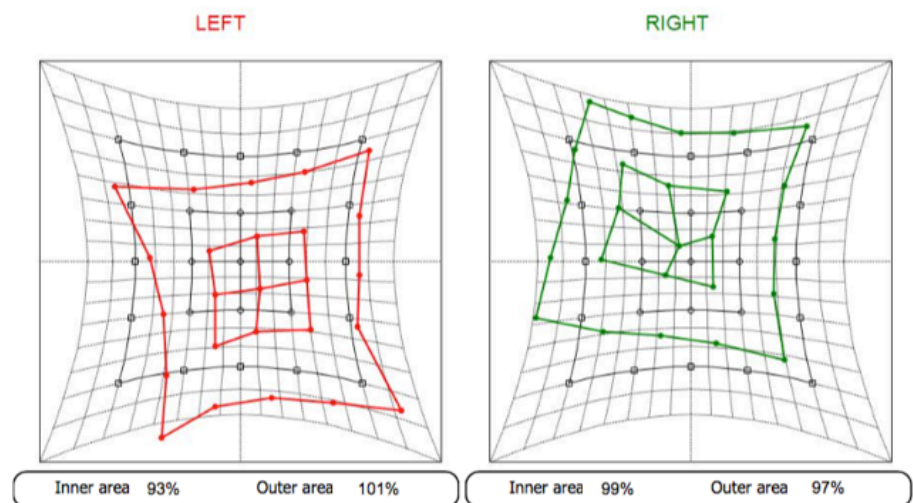
Prism correction for the Left eye

KMScreen test analysis and presentation

The test results for Harms- och Hess screen tests are analysed, stored and presented as follows

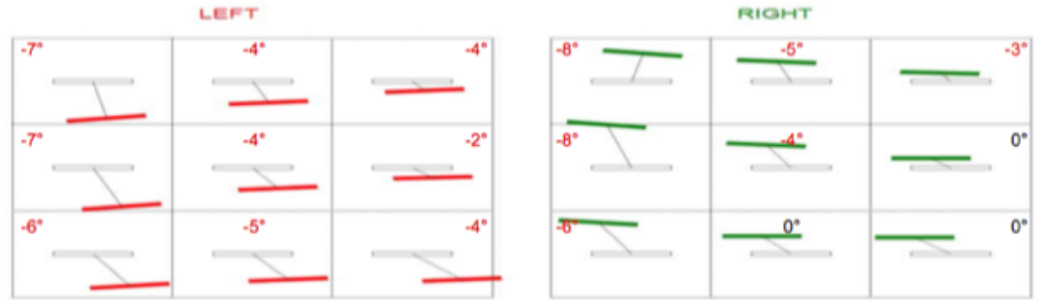
1. As a conventional Hess screen chart where the outer and inner fields (15 ° and 25 °) of both eyes are plotted. The charts of the two eyes are compared for position, size and shape.

2. The outer and inner field area of both eyes is measured in percent. You can compare the two outer fields to see if there is a concomitant or incomitant strabismus. Then, you can compare the outer area with the inner area of each eye to diagnose if there is a mechanical limitation of the muscles in the eye.



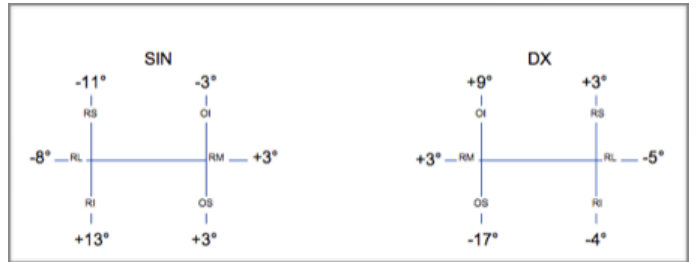
3. **Diplopia chart**

in nine gaze directions where the horizontal and vertical deviation and the torsion of the double images are plotted. The torsion is given in degrees.



4. **Ocular motility chart** where the deviation for each muscle is expressed in degrees

5. **Strabismus angle** (horizontal and vertical) in the nine cardinal positions of gaze. The angle is given in prism dioptres for fixing with the right eye and fixing with the left eye.



Sin						Dx					
to the left		Left fix		to the right		to the left		Right fix		to the right	
5^A Exo	19^A+VD	6^A Eso	12^A+VD	4^A Eso	5^A+VD	12^A Exo	15^A+VD	5^A Eso	9^A+VD	3^A Eso	6^A+VD
	-7^A		-4^A		-4^A		-8^A		-5^A		-3^A
14^A Eso	26^A+VD	11^A Eso	15^A+VD	5^A Eso	6^A+VD	5^A Eso	28^A+VD	7^A Eso	9^A+VD	9^A Eso	11^A+VD
	-7^A		-4^A		-2^A		-8^A		-4^A		0^A
21^A Eso	22^A+VD	14^A Eso	11^A+VD	11^A Eso	6^A+VD	17^A Eso	29^A+VD	15^A Eso	14^A+VD	9^A Eso	7^A+VD
	-6^A		-5^A		-4^A		-6^A		0^A		0^A

Background

KMScreen was developed at the paediatric and strabismus department of the Eye Clinic University Hospital in Lund Southern Sweden. The program code was developed by Orthoptist Konstantin Moutakis. KMScreen method were tested clinically by ophthalmology professor Malin Malmsjö together with her research team. The results were published in the Journal of the American Association for Pediatric Ophthalmology and Strabismus **JAAPOS**.

KMScreen is registered as a medical device on the Swedish Medical Agency