

5. Calibration

In contrast to Electro-nystagmographic (ENG) devices using electrodes calibration is not absolutely necessary in a 2D VOG system to determine the amplitude of the eye movements in degrees. Your 2D VOG system has already been adapted to your 2D VOG mask ex factory. However, ex works calibration can never be exact, because with each patient you can have individual deviations (e.g. depth of the eye orbita). Therefore, 2D VOG allows you to perform an individual calibration for each patient.



Note

With tests where the position or velocity of a stimulus is not compared with the measured eye movements (e.g. spontaneous nystagmus test), calibration is not generally required. In these cases, the accuracy of ex works calibration is good enough.

Before performing a test where the eye movement is compared with a given stimulus of a known position or velocity (e.g. optokinetic test), you should calibrate the system.

The following table will help you to get an overview for which tests calibration is recommended:

Calibration not necessary	calibration required
<ul style="list-style-type: none"> – Spontaneous nystagmus test, – Caloric test, – Multi condition test 	<ul style="list-style-type: none"> – Optokinetic test, – Smooth pursuit test, – Saccade test – Gaze test

During the calibration, the patient is fixating various given points on a wall or monitor in succession while the eye position is being measured with 2D VOG.

5.1 Configuring Calibration

The calibration parameters can be set for each test. To do so, proceed as follows:

1. Open the test for which you want to configure the calibration.
2. From the 'Test' menu, choose the 'Configuratioh...' command or double click on the Test window.
→ The configuration dialog box of the test opens.
3. Select the *Calibration* tab.

5.1.1 Selecting the Calibration Pattern

For the calibration, 2D VOG offers you one 2-point and two 5-point calibration patterns. The best results are achieved using the 5-point patterns.

5.1.2 VisualLab Calibration

You can use your VisualLab to project the calibration points either on a monitor or - using a projector - to the wall. In this case, dots are positioned automatically while calibration is performed.



Note

Make sure that the geometric conditions of the test arrangement have been set correctly in the "*Geometry of VisualLab Projection*" dialog box.



See page B-9, „*System Setup VisualLab*“ for more detailed information.

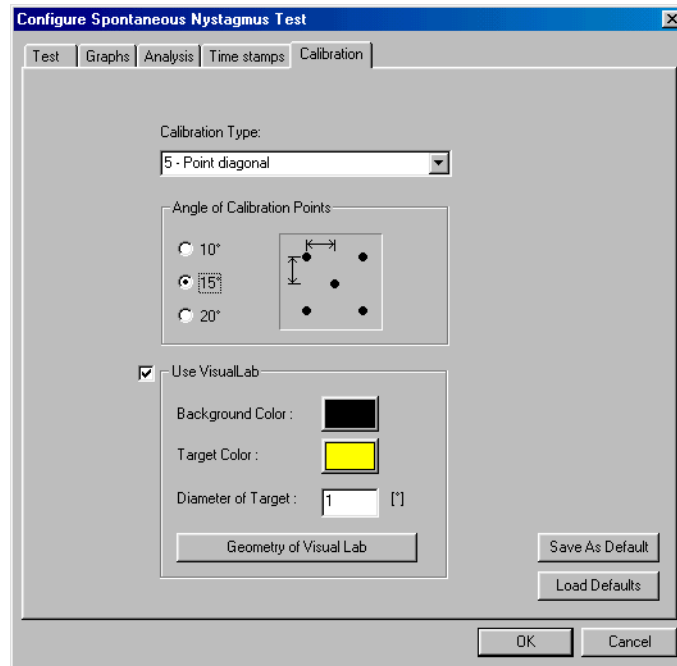


Fig. D-12: Configuring Calibration

To perform the calibration using the VisualLab, proceed as follows:

1. Select the USE VISUALLAB box.
2. In the BACKGROUND COLOR and TARGET COLOR fields, choose a color combination that will provide a good contrast on the wall.
3. In the DIAMETER OF TARGET box, choose a size as little as possible. But make sure that the point is still visible.

5.1.3 Calibration without VisualLab

To perform a calibration without the VisualLab module, the calibration points can be marked by using colored markings on a wall.

To do so, you have to calculate the position of these markings according to the environmental circumstances. shows an example of how the distances between the markings can be chosen if the distance between the patient and the wall is $1\text{ m} / 254''$.

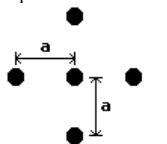
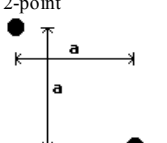
Calibration Type	Calibration Point Angles			
	10°	15°	20°	
5-point linear 	5-point diagonal 	$a = 7.1''$	$a = 10.6''$	$a = 14.2''$
2-point 		$a = 14.2''$	$a = 21.3''$	$a = 28.3''$

Fig. D-13: Example for marking distances, if the distance between patient and wall is $1\text{ m} / 254''$

5.2 Performing Calibration

After creating a test, you can perform the calibration before the measurement is started.



Note

You can also define that each time a particular test is started calibration is to be performed.

For more information see chapter „*Calibration before Each Test*“ on page D-55.

To perform the calibration, proceed as follows:



1. In the toolbar, click this button.
→ The *calibration* dialog box will open.

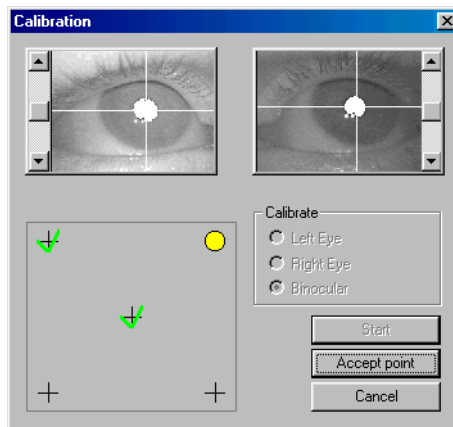


Fig. D-14: "Calibration" dialog box

The upper area of the dialog box shows the video images of the eyes that are being calibrated. If necessary, adjust the pupil threshold to achieve optimal eye detection (see page D-15).

2. Now ask the patient to look at the first calibration point and then select the desired calibration mode by clicking the [Automatic] or [Manual] button.

Automatic Calibration

If you are using this mode, the calibration algorithm will proceed automatically through the whole calibration sequence. Once a target point has been fixated well enough, the next target point will be displayed.

Manual Calibration

This mode should be used for patients that have difficulties in fixating the calibration points. For example, it may occur that the automatic fixation detection is not successful with patients showing excessive spontaneous nystagmus beating or with inattentive persons (e.g. children).

In this case, you can observe the video image of the calibrated eye on the screen. When you think the calibration point has been fixated exactly, click the [Accept Point] button.

- The lower area of the dialog box shows the point pattern. Each point to be fixated is marked by a yellow circle. Points that have already been successfully measured, are marked by a green tick.
3. Ask the patient to fixate the currently active calibration point. (If you are using the VisualLab module, only the active calibration point will be displayed.)
 - When calibration has been successfully terminated, the dialog box will be closed automatically.



Note

You can always stop a current calibration by clicking the [Cancel] button.

○ Calibration before Each Test

If you want to perform a calibration by default before starting a particular test, proceed as follows:

1. Create a new test of the desired type.
 - The test will be inserted in the Examination Tree, the test window is open.
2. In the 'Test' menu, select the 'Configuration...' command and double click in the test window.
 - The "*Configuration XXX Test*" dialog box will be opened.
3. Open the *Test* tab and check the PERFORM CALIBRATION box.
4. Click the [Save as Default] button.
 - The calibration will be included in the measurement procedure. Each time when a measurement is started the "*Calibration*" dialog box will be opened.



Note

Within a complete examination, calibration is necessary only once. If calibration has already been performed during a prior test, 2D VOG will load these values. In this case, the calibration dialog box won't be opened.



However, if the mask has been slipped down or removed since the last calibration has been performed, you have to repeat the calibration. In this case, start the calibration by hand by clicking this button in the toolbar.

