

## Binocular Autorefractor



reddot award 2014  
winner



### Short Manual 2

### “Preparing and performing a measurement”

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This manual is a supplementary short manual. For general information about your Plusoptix device, such as its intended use, basic handling, technical information, maintenance, service, and warranty information, please refer to the user manual that was delivered with your device. This user manual can also be downloaded on our homepage [www.plusoptix.com](http://www.plusoptix.com), under support.

## List of further supplementary short manuals

1. Adjusting settings and setting up WLAN
2. Preparing and performing a measurement
3. Viewing the measurement results
4. Entering, retrieving or deleting patient data
5. Documenting measurement results electronically
6. Documenting measurement results on paper
7. Exporting back-ups and reports (only plusoptiX A12C and A16)
8. Downloading software updates
9. Troubleshooting malfunctions and measuring interruptions

## 1 Preparing for a measurement

### 1.1 Preparing the measurement area



The measurement is carried out using infrared light, which is also contained in sunlight and in the light of bulbs and halogen spotlights, for example. This infrared light is invisible to the human eye and completely safe.



To obtain correct measurement values, it is important to avoid disruptive sources of infrared light in the examination room. Close curtains, roller blinds and shutters to block out the sun's rays.



Turn off all light sources that produce heat. This does not mean that the examination room should be dark. Cold light sources, such as energy saving bulbs and neon lights, do not affect the measurement values.

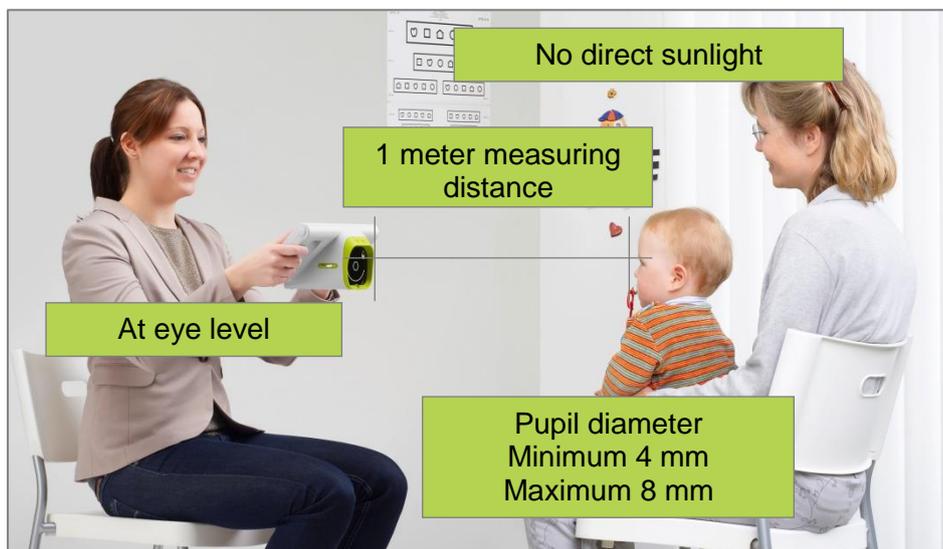


Figure 1: Measuring environment

The child must look at the Plusoptix Binocular Autorefractor in order for a measurement to be taken. Make sure that the child is sitting straight and its head is not turned over their shoulder. The child's knees and nose should be facing the camera.

The attention of infants is steered towards the Plusoptix Binocular Autorefractor by playing a special warble sound. However, this only works if the child is not distracted by other people or objects in the examination room. Close the door of the examination room and avoid any attention-grabbing activities, such as walking around and clicking your fingers. Do not use any additional fixation aids!



**Note:**

The attention span of infants is very short. You can use the fact that the examination room is unfamiliar to the infant to your advantage. An attention-grabbing warble sound and the child-friendly Plusoptix smiley face in this unfamiliar environment will always arouse interest. Avoid any lengthy conversations with the parents before the measurement.

## 1.2 Entering or retrieving patient data

A measurement can be performed anonymously or by indicating patient data (1). More information about entering or retrieving data in the internal patient database can be found in supplementary short manual 5 and 6.

If no patient data is entered or no saved patient data is selected, the measurement is performed under an anonymous consecutive patient ID. The patient ID has the following structure:

<last 4 digits of the serial number>--<consecutive number>--<date>--<time>

You have the following options for entering the patient data (see supplementary short manual 4)

- Entering and retrieving patient data before the measurement
- Entering and retrieving patient data after the measurement
- Importing patients from the EMR software before the measurement



**Note:**

The “plusoptix A12R” has no internal patient database. After the measurement a single line to enter patient data will be portrayed, where you can fill in individual patient data. These data will also be portrayed in the screening report and on the self-adhesive label.

## 1.3 Selecting the measurement mode

After you have set the time and date, the home page will be displayed every time you turn the “plusoptix A12” on again.

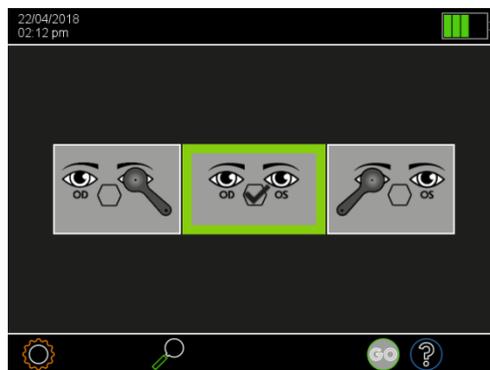
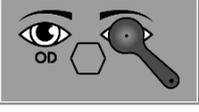


Figure 2: Home page

Choose the measuring mode by touching one of the following buttons:

 <p>Monocular measurement: Measurement of the right eye (OD)</p>	 <p>Binocular measurement: Measurement of the left (OS) and right eye (OD) simultaneously</p>	 <p>Monocular measurement: Measurement of the left eye (OS)</p>
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Start the measurement directly after selecting the measuring mode.



## 2 Performing a measurement

### 2.1 Preconditions for a successful measurement

- a) The measuring distance is correct:

The measuring distance must be between 95 cm and 105 cm. Check whether the camera image on the screen is in focus. You must be able to see the individual hairs on the eyelids or the eyelashes clearly on the camera image.

- b) Patient is not looking at the camera

The Plusoptix Binocular Autorefractor and the eyes of the patient must be aligned with one another. The patient must look at the nose of the smiley face. For this reason, an attention grabbing warble sound is emitted at the beginning of the measurement.



**Note:**

The attention span of infants is very short. You can use the fact that the examination room is unfamiliar to the infant to your advantage. An attention-grabbing warble sound and the child-friendly Plusoptix smiley face in this unfamiliar environment will always arouse interest. Avoid any lengthy conversations with the parents before the measurement.



**Note:**

If a child is not looking at the nose of the smiley face during the measurements, this can cause a termination of the measurement or inaccurate measurement values of the gaze symmetry. For this reason, do not use any other external fixation aids!

- c) Both of the patient's pupils should be completely visible

The pupils must not be covered by eyelids, eyelashes or hair, for example. Check whether both pupils can be seen completely on the screen and whether they are encircled in green.

- d) The pupil diameters must be between 4 and 8 mm



**Note:**

If a red error message is displayed, an action recommendation is also displayed below it. More information is available in supplementary short manual 9.

## 2.2 Starting the measurement and adjusting the Plusoptix Binocular Autorefractor

- Hold the Plusoptix Binocular Autorefractor at eye level to the child, about 1.2 meters away. The measuring distance is one meter, but it requires practice to correctly estimate this measuring distance in one go. It is easier to hold the device somewhat further away at the start of the measurement and then slowly move it towards the child.



**Note:**

The screen in the plusoptiX A12 models is fixed at a 45° angle to the camera axis. Tilt your wrists downwards to align the camera. For the plusoptix 16 model, you do not need to tilt your wrists downwards.



Figure 3: Aligning the plusoptiX A12 model

By touching the flashing “GO” button (1) or pressing the trigger, you will start the camera and a warble sound will be heard. You can now see the camera image on the screen.



**Note:**

A started measurement can be aborted by touching the screen.

- Adjust the Plusoptix Binocular Autorefractor so that both eyes can be seen on the screen and then slowly move the Plusoptix Binocular Autorefractor towards the patient until the camera image can be seen in high-definition on the screen. Firstly, the pupils will be surrounded by white squares (the image is still very blurred), then with red and finally with green circles (see Figure 8 on the next page).

1)

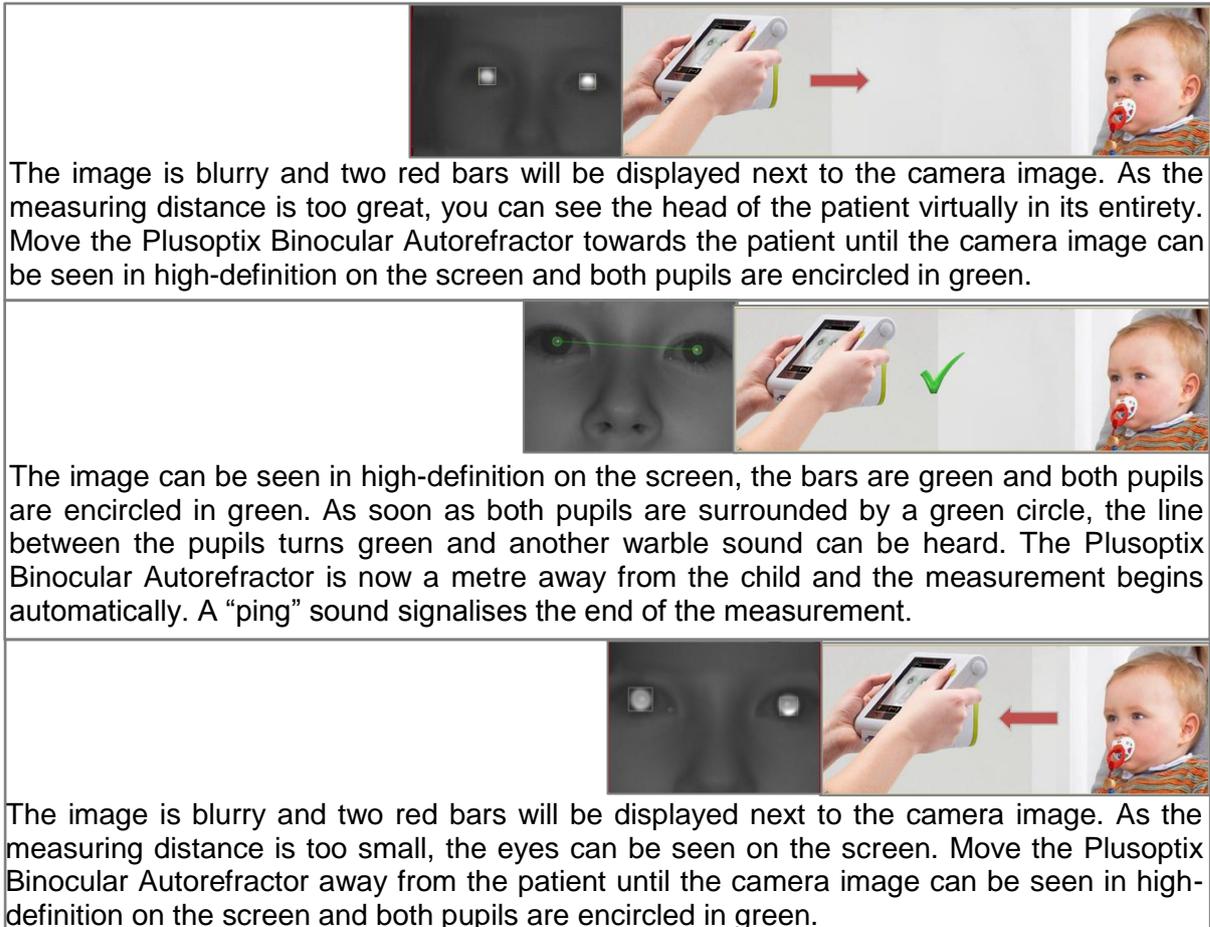


Figure 4: Detecting the correct measuring distance