

■ MANUAL.

phorcontrol.

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Visual acuity systems by Block Optic are controlled by an extra Android based tablet (or mobile phone). To provide examiners the opportunity of a convenient face to face position, the offered tests are shown on that tablet as well.

One tablet can be used to control many available visual acuity devices.

Most of the functionality is accessible by the control tablet, so it is explained in the first part of this document. The following parts specify the existing acuity systems.

Ongoing research and development may have an effect on design and delivery contents. To ensure, the used software is up to date, it is strongly recommended to check for updates periodically.

The operating systems (in this case Android) may change with its version or hardware distributor. Therefore, shown example images may vary with the used system. If you have questions look on our homepage for a recent manual or contact our service team.

Software parameters

Title	PhorControl
Version	1.37, January 2019
Manufacturer	Block Optic Design GmbH Semerteichstr. 60 44141 Dortmund Germany

Intended use

PhorControl is used for convenient controlling of the visual acuity systems Miniphor 2, Polaphor Box and Polaphor HD.

Prohibited use

Not intended purposes are not allowed. Noncompliance may lead to damage or hazard and finally to a loss of guaranty.

The charts, that are displayed by the control software, are abstract and can not verify visual acuity.

Delivery contents

PhorControl is software only. If your acuity system is delivered with a control tablet, is specified on your delivery note.

If your system configuration changes or you have to re-install, look to the advices on chapter Installation and configuration, page 14.

Introduction

PhorControl is an application for Android Version 4.0 and above. It needs Bluetooth and Wifi to work properly. It is used to control the visual acuity systems Polaphor HD, Polaphor TV and Miniphor 2.

Graphical user interface

The graphical user interface is split into 3 areas.

Display area (1)

The display area shows a picture of the test that is actually displayed on the acuity system. The grey bar in the upper part of this area contains many symbols and abbreviations, which represent different functions. A detailed description can be found in the chapter „The display area in detail“ on page 7.

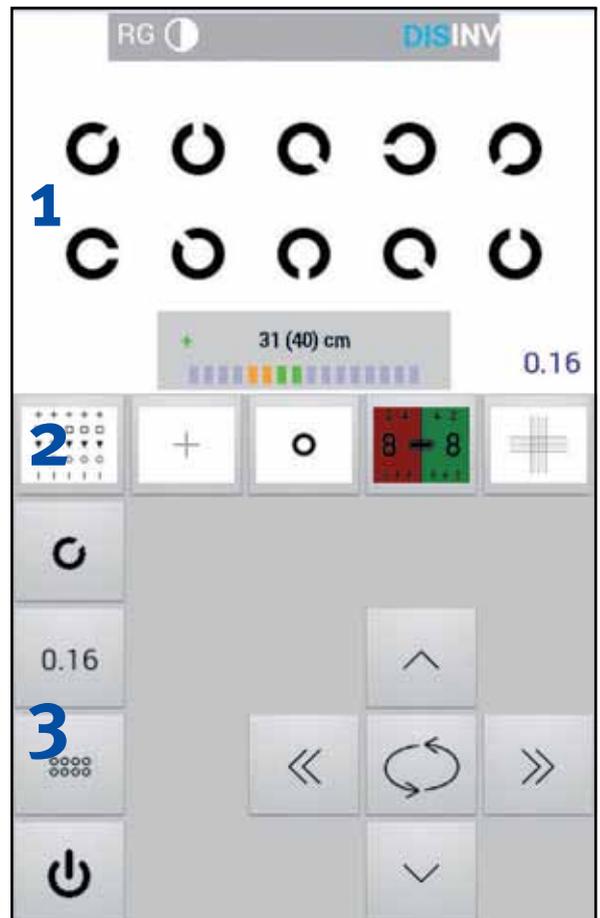
If a Miniphor is controlled the lower part of the display area shows a scale which stands for the actual refraction distance. It is described in detail in the chapter „Distance measurement“ on page 28

Quick selection area (2)

In this part of the screen the user can store his favourite tests and activate them with a tip. If not all stored tests are shown a wipe to the left or right will scroll through these tests. The quick selection area is discussed in detail in the chapter „The quick selection area in detail“ on page 8.

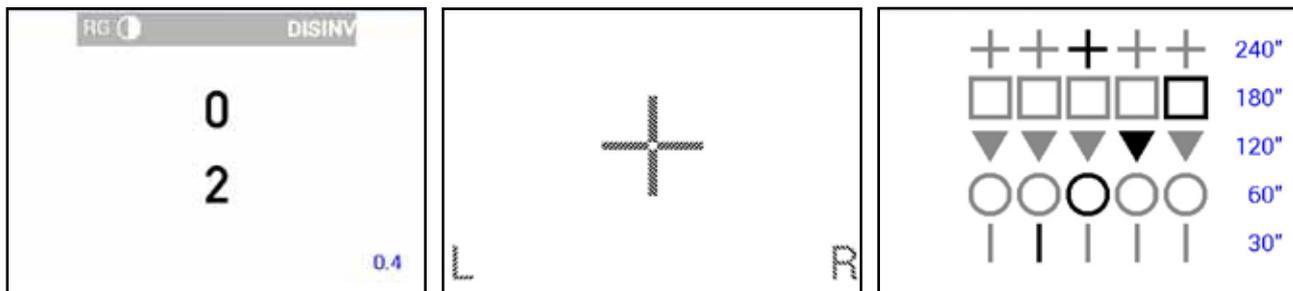
Control area (3)

The control area shows quick access buttons in the left column and test related buttons in the rest of it. Read the details in the chapter „The control area in detail“ on page 9.



The display area in detail

The display area shows the actual test displayed on the acuity system. Depending on additional functions like e.g. masking or randomization the picture is updated. If polarized tests are used, hatch patterns show which part of the test is seen by each eye. If a stereo test is shown, the user can see which symbol is shown three-dimensional and its orientation (front or back).



By tipping into the display area for a short time, a bar with different symbols and abbreviations will appear. Those are:



red / green overlay: the background is filled with with the mentioned colours like the monocular red / green test

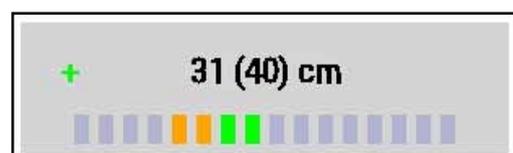


contrast on / off: the contrast of the shown optotypes can be in- or decreased with the additional buttons in the control area. The actual contrast is shown in percent and is calculated using Weber`s formula.



Distance measurement on / off: This option is only visible when a Miniphor 2 is controlled. A scale appears in the lower part of the display area which shows the actual distance between the patient and the Miniphor 2. The number in brackets is the nominal distance. Depending on the real distance in relation to the nominal distance the scale can move to „-“ (real distance larger than the nominal distance) or „+“ (real distance smaller than the nominal distance). The operator can see it as an indicator to remind the patient of the correct refraction distance.

A new nominal distance can be set by tipping on the real distance at any time.



To ensure a maximum of accuracy the patient must hold the Miniphor still and its surface must be perpendicular to the patient's line of sight. A small inaccuracy because of the ambient lighting or the patient's anatomy or hair style can't be excluded.

The distance measurement was concipated for a range of 30-60cm. Out of this area precision is lost. Distances of more than one meter are shown as „MAX“.



Invert on / off: The display of the optotypes is inverted.

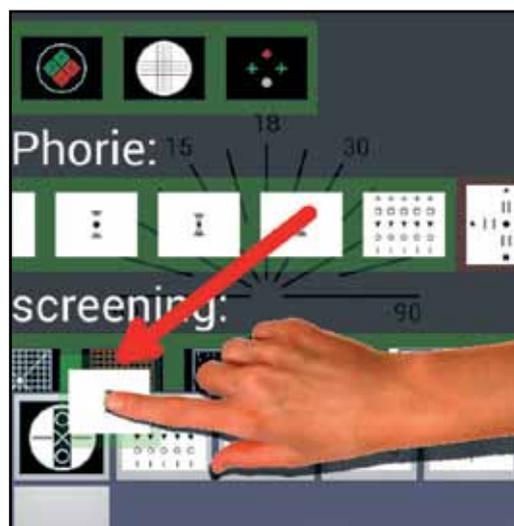
Touching the display area for a long time will open the settings window as described in „Settings“ on page 10.

If exactly two devices are paired with the control tablet a wiping gesture to the left or right will switch between these devices. The name of the active device is displayed at the bottom of the display area.

The quick selection area in detail

Tests that are used often can be stored in the quick selection area for convenience. Each available test can be stored here.

The selection of the desired tests is described in the chapter „Settings“ on page 10 under the menu item „favorite specials“. All available tests sorted into groups are shown there. A long tip on a test will separate it off the group. It can then be dragged to the desired position in the quick selection area. A long tip on a test icon in the quick selection area will separate it and it can be repositioned or moved out of the quick selection area.



The control area in detail

The control area consists of two parts: the buttons in the left column allow a direct selection of the optotypes, acuity steps and masks. A long tip on each button opens a window with the selection. The buttons on the right remind of a cross hair and allow a relative selection of the acuity steps and optotypes.



The upper button determines the sort of the optotypes. Available optotypes are Landolt rings, Snellen E's, numbers, letters and 2 sets of children pictures.



The button below determines the visual acuity size.



The button below sets the masks. Available are Show all (no mask), horizontal mask, vertical mask, single optotype.



The lower key puts the device into stand-by. Pushing the button while in stand by turns the screen on and restores the standard display. A long tip on the button also restores the standard settings.



The arrow keys up/down will change the sort of optotype.



The arrow keys left/right increase or decrease the acuity. Depending on the displayed acuity two tips on the button are needed to change the acuity size.

A long tip ignores the minimum amount of displayed optotypes and switches to the next acuity step directly.

The size of some special tests can also be changed with the arrow keys.

The function and appearance of the middle key depends on the various tests:



During refraction the optotypes are randomized.



With binocular tests the picture of the right and left eye is swapped. While displaying stereo tests the plane of the three-dimensional symbol is changed from front to back and vice versa.

Depending on the test additional keys can appear in the control area:

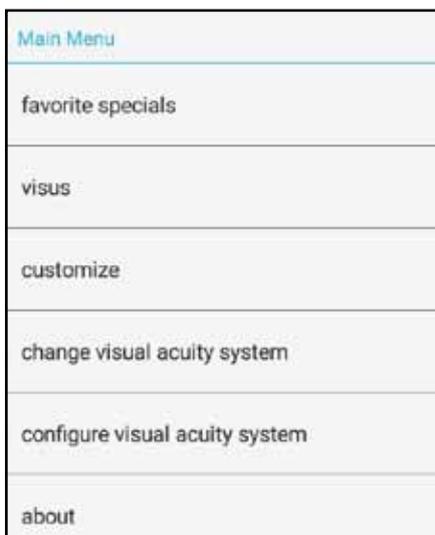


While using the contrast test the two shown buttons appear to decrease or increase the contrast. The buttons will vanish when the contrast test is quit in the display area.



When a sequence is started three additional buttons appear to control the sequence. Tipping the arrow keys show the next or previous programmed chart while the cross ends the sequence.

Settings



A long tip in the display area opens a window where the settings can be made.

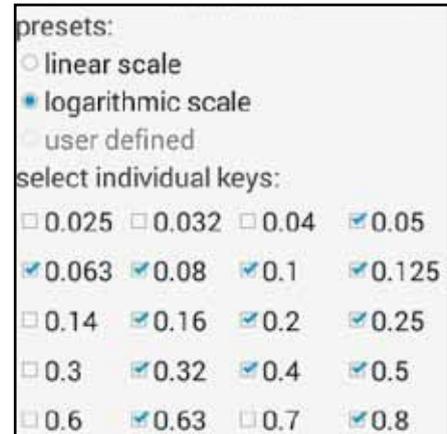
- The menu item „favourite specials“ opens a list with all available tests that can be moved to the quick selection area (see „The quick selection area in detail“ on page 8).

This is also the place where sequences can be created. A sequence is a defined order of tests. An example is the premade MKH sequence. To create a new sequence the REC button must be pressed. Next the sequence must be named. After confirming the button „start recording“ a filmstrip appears in the control area showing the status of the recording. Each test that should be added to the sequence must



be activated. This can be a standard test (consisting of optotype group, acuity size, mask and filter) or a special test. Once the test is activated a tip on the REC button stores it at the end of the sequence. Tipping the END button stops the recording and moves the sequence in the group sequences in the „favourite specials“ screen. From now on the sequence is treated like the other tests and can be moved to the quick selection area. When moving a sequence an additional wastebasket symbol appears, so it can be deleted on demand.

- „visus“ lets the operator define the acuity sizes during refraction. Two presets are available: linear and logarithmic. With the third option the operator can choose the desired acuity steps by selecting them



- Under the menu item „customize“ the user can change the appearance of the application. It is possible to adjust the background colour with the sliders color, brightness and saturation and to change the look of the buttons.

The buttons of the left column in the control area can show a constant value. That means this value doesn't change during refraction. With a tip on the buttons this value will be shown and the selection window will be hidden. A long tip on each button is necessary to open the selection window. It is an alternate way to navigate during the refraction.



- „change visual acuity system“ shows all paired devices. A tip on the desired device connects it with the remote tablet. Each device has its own profile, that means different tests may be available between a far- and a nearvision system. The tests in quick selection area are stored for each device separately.

If exactly two devices are paired with the control tablet a wiping gesture to the left or right will switch between these devices. The name of the active device is displayed at the bottom of the display area.

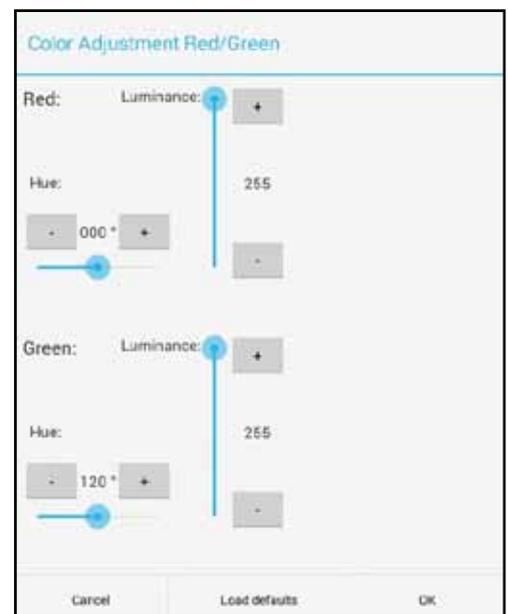


- „configure visual acuity system“ stores settings, which are important for displaying optotypes or special tests:

- Distance: the reading distance is set here in 10cm steps
- Screensaver: determines, which picture will be shown after a defined amount of time of inactivity
 - Activate after: the amount of time before the screensaver is activated
 - Switch dark after: the amount of time before the screen turns black
 - Allow standby after: the amount of the standby time
 - Initial presentation: determines, which optotypes and acuity steps are shown at startup

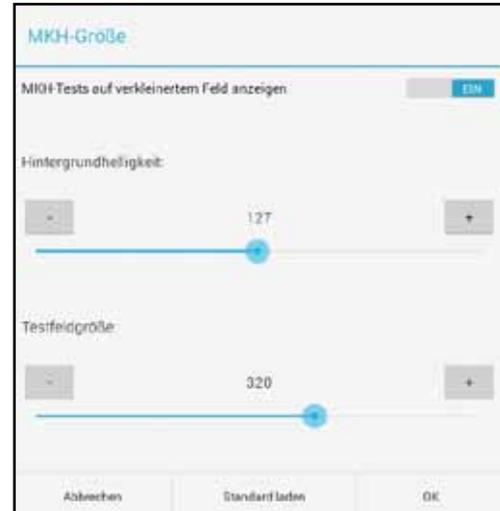


- Colour adjustment for red and green: each color can be adjusted separate for tests using R/G filters, Bichrome Balance Test or for monocular adjustment. For optimal results first adjust the hue value then the luminance level. A detailed example on how to adjust the colors with a Polaphor TV can be found on page 20.



- MKH-Frame: determines if the tests of the MKH sequence are shown in a box and what size this box has. The brightness of the box can also adjusted.

- Device Information: shows the serial number of the device, screen size. BT-MAC address and the software version of the device. If the device is connected to a wireless network with the internet, the lower button can be tipped for possible software updates.



- „About“ shows the software version of the PhorControl application. If connected to the internet, it is possible to search for a newer version of it.



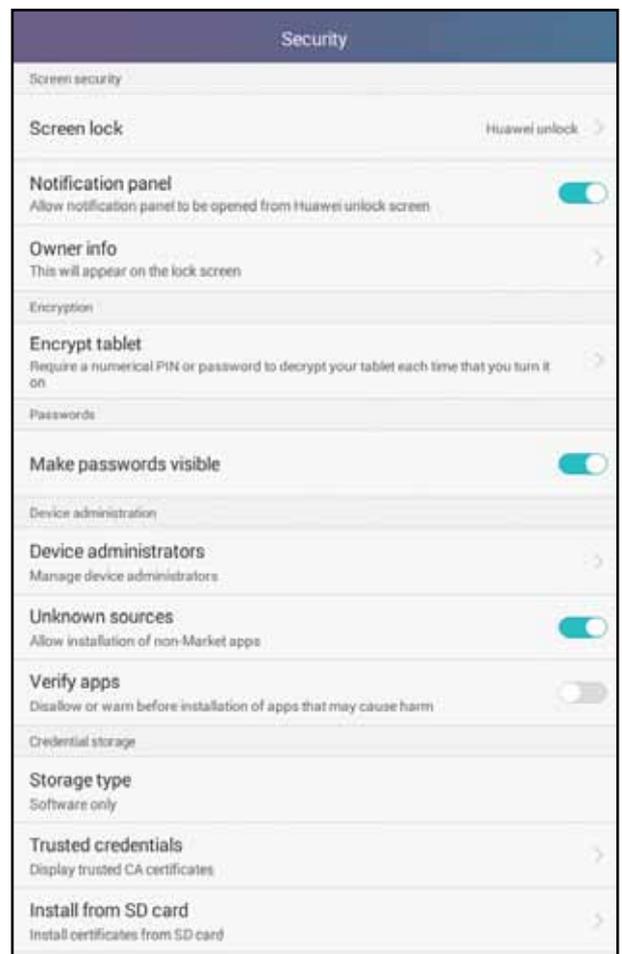
Recover to factory defaults

You may want to have a clean program, with all the default values, as it was delivered once. The Android Operating system offers this opportunity natively. Go to system configurations, applications and delete the App-Data. (The specifiers may vary with the manufacturer)

Attention: Do never delete the application data on the acuity system this way.

Installation and configuration

Condition for installing the control application on a tablet with android version 4.0 (or higher) is a permission of unknown sources in the system security settings.



Special note: The newest application can be downloaded from <http://downloads.block-optik.de/PhorControl/PhorControl.apk> or from the block-optic website.

During the installation process it is necessary to authorize an access to different system services. You need to confirm to proceed.

The menus may look different with other Android-Versions or tablet manufacturers. Look into the manual or contact your tablet distributor, if needed.

First connection

Before a connection of the control tablet to the visual acuity system can be established, it is essential to pair both bluetooth devices.

Pairing with Polaphor Box, Miniphor 2 and Polaphor HD

After booting the visual acuity device the software starts automatically and stays in front as long as it will be closed with direct access to the the device (and not by the control tablet).

By multiple touches on the touch-screen you can reach the Android home button on the lower margin of the acuity device. If you do not have a touch screen connect a USB-mouse and do this by multiple clicking.

Go to Settings (gearwheel) -> Bluetooth and click on the name of the acuity device at the top. A countdown starts. Until it is expired you open the same system menu on your control tablet, but the click on the search button, instead. After some seconds your acuity device should appear. After selecting it and confirmation on both devices the paring should be successful. Now both devices should be listed as paired devices on each others paired list.



First start of the control application

At the first start of the control app, a list of all paired devices starts. (After delivery) your device has the bluetooth name that is written on its label. It consists of a type-specifier followed by a serial number.

After selecting your acuity device, the control application builds up the connection and loads the device information. At the end the special tests are loaded and the current state is displayed.

The next time you start the control app, it will try to connect automatically to the last connected device, until you press configuration -> change device.

Special note: **If your acuity system is switched off, its bluetooth is switched off or it is out of reach, the control app will try to connect.**

Demo-Mode

For demonstration purposes the demo modes at the bottom starts a virtual acuity system. The functionality of this demo is highly reduced in comparison to real acuity systems. You must never use the control app for acuity testing directly.



PART 01.
PhorControl.

Software parameters

Title	Polaphor Box
Version	1.15, January 2015
Distributor	Block Optic Design GmbH Semerteichstr. 60 D-44141 Dortmund Germany

Introduction

The visual acuity system Polaphor TV consist of three components:

- 3D-Television, that can display an image that is intended to be separated with circular polarized filters.
- Polaphor Box, a small computer with pre-installed visual acuity software.
- Tablet with pre-installed PhorControl software.

The television and computer compose the visual acuity device, the tablet is the control device.

The use, which is not described in this manual threatens the guaranty. You should close the acuity software only for setting up WLAN and bluetooth.

Manipulation of other settings may decrease functionality enormously.

Attention:

Deleting the data of the visual acuity device destroys essential configuration settings and starting will not be possible any more. (In contrast: deleting application data on the control tablet might be reasonable, page 14)

After delivery, nearly all settings (including pairing) are done. You just need to mount it on the wall and set the distance and colour parameters (page 19).

If you need a re-installation anyway, read chapter Wiring and installation on page 24.

Powering on and off

The voltage supply for the computer is provided by the USB connector of the television, so that it is switched on together with your television, automatically. The boot process lasts some seconds and then you are ready to start the control application.

Switch the acuity screen to black by pressing the power button in the lower, left corner. Touching this button again starts the examination. To turn off the television and the control tablet, when you do not need them for a longer period of time.

Controlling

Control your visual acuity device with the control application, which is described in the first part of this manual.

Configuration of the visual acuity system

Open the configuration dialog, by clicking the tablets configuration button and then configure visual acuity system.

Local settings

Set up the visual acuity system to match to your examination room. Optotypes are scaled to the configured distance and can be mirrored, if you use a mirror. Results are displayed instantly.

Display

To increase the display life time, and save energy loss or just to show some pictures, you have the opportunity to set up a screen saver. Choose between its type (logo, photo or slide show) and select a time to start with it. In addition you can select a time, when the display should turn to black.

You have the opportunity to set the current shown test as first test of every examination by touching on. Leave this dialog and return after adjusting, if required.

Colour adjustments

Colour adjustments are important for tests that

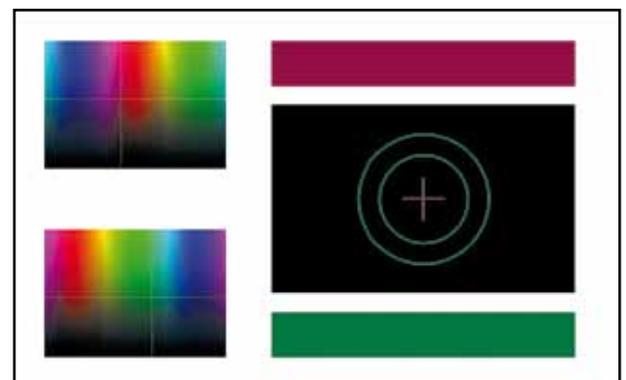
- need coloured filters for separation (like your phoropter or glasses may be equipped with)
- red and green tones for Bichrom Balance test or similar.
- red and green tones for other tests.

While adjusting the colours, a matching test is displayed on the visual acuity device and a new adjustment dialog on the control tablet.

Adjust each colour tone with the horizontal bar and the brightness with the vertical ones. You can use the buttons for fine tuning. On your acuity device, you can observe the place in colour space on the left and the example test between the set colours on the right.

Other adjustments that might be necessary:

- a correction of television specific parameters. Settings of your television can have negative effects, for instance: contrast, brightness, gamma or sharpness.
- the size of the MKH-test-field. (MKS-Test are made for a distance of 5,5m and have a size 32 cm x 32 cm. Adjust the grey value of the background of the test field)



Device information

In this area all parameters of your device are displayed.

Customization of the visual acuity device

Logo

With default setting the logo of the distributor is shown after 6 minutes of inactivity. To exchange this logo with a customized one do the following:

- make sure your pictures dimension is 1920x1080 pixel and is saved as “Logo.jpg” to root directory of an empty USB-stick.
- put the stick into the USB-connector of the running computer (not into the connector of the television).
- you will be asked if the picture should be imported to the device. To proceed, confirm with a mouse that is also connected to the computer.

Prior logos will be deleted. Remove the stick after the import.

Photo

To import a photo

- make sure your size dimension is 1920x1080 pixels and is saved as “Foto.jpg” to root directory of an empty USB-stick.
- put the stick into the USB-connector of the running computer (not into the connector of the television).
- you will be asked if the picture should be imported to the device. To proceed, confirm with a mouse that is also connected to the computer.

Prior photos will be deleted. Remove the stick after the import.

After the import of a photo you may display it with the screen saver. (more on page 23, Display).

3D-Photo

Three-dimensional pictures consist of 2 separate images in 1920x1080. Each one for a single eye.

The import is similar to the photo import:

- put the matching pictures as „FotoL.jpg“ und „FotoR.jpg“ to the root of an empty USB-Stick. L is correlated to the left eye and R to the right.
- put the stick into the USB-connector of the running computer (not into the connector of the television).
- you will be asked if the picture should be imported to the device. To proceed, confirm with a mouse that is also connected to the computer.

Prior 3d-photos will be deleted. Remove the stick after the import.

After the import a 3D-photo you can use them for 3D-tests. It is recommended, to put them

into your favorite special tests line (page 8).

Slide-show

A Slide-show may be set as screen-saver. You can also start it manually at any time, by clicking the slide show button.

The importing is similar to the import of a photo:

- put all pictures with a resolution of 1920x1080 pixels in jpg-format in the root of the USB-stick. If the display-order matters to you, make sure to name them in alphabetic order.
- put the stick into the USB-connector of the running computer (not into the connector of the television).
- you will be asked if the picture should be imported to the device. To proceed, confirm with a mouse that is also connected to the computer.

Prior slide-shows will be deleted, independent of the quantity of images. Remove the stick after the import.

Software-Updates

Dependent of your prospects you have two possibilities for updating your visual acuity device.

Internet-Update

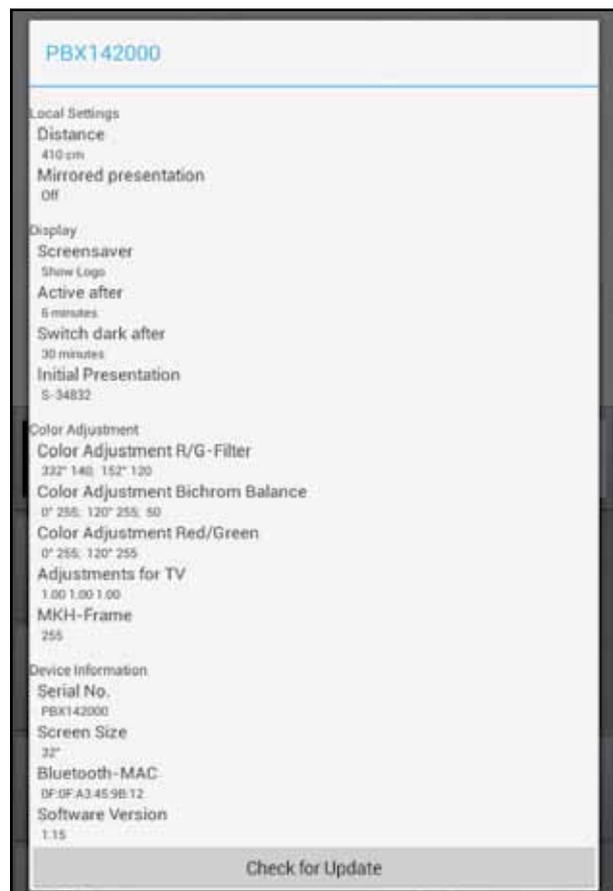
To check for updates easily, use the control tablet. For this, you have to assure WLAN at the visual acuity device is active (and connected to a reachable network with internet access) in the Android configuration. It is important that the acuity software is running. Start the control software on the tablet, navigate to Configure visual acuity system and touch Check for Update. Connecting and downloading from the server may last several minutes. The installation of the software needs to be confirmed with a USB-mouse, that has to be connected to one of the USB-connectors of the computer. This important security concept prevents your acuity system of malicious software. If a WLAN is not available, please continue with the following method.

Update with an USB-stick

Checking for an update is still possible like described before: configure visual acuity system and check for update, but (without an internet connection) downloading will fail.

If a new version is detected:

- download the current version with another computer to the root directory of an empty USB-stick.
- you can find it on our website or by typing in the address:
<http://downloads.block-optik.de/PolaphorBox/Update/Polaphor.apk>
- connect a USB-mouse to the visual acuity computer. And click right to stop the acuity software.
- connect the USB-stick to the other USB-connector of the visual acuity device.
- navigate with the File-Browser to to the USB-root-directory and click on Polaphor.apk. It is necessary grant all permissions.



Wiring and installation

The Polaphor Box is connected to the television by HDMI-wire and micro USB cable, as well. The box is mounted on the back of the television with Velcro tape.

To ensure a manual installation, a file explorer and an internet browser are pre-installed. Connect a mouse to control these programs.

The software installation is equivalent to the descriptions of chapter Software-Updates (page 23). If a WLAN connection is established you can download the software with the internet-browser of the box. In addition to the software, a configuration file is needed. It installs automatically if you have an internet connection or a connected USB-stick containing this configuration file in its root.

If this doesn't work, contact your distributor. The number, printed on the computers label might be needed.

To establish a bluetooth connection, pair the acuity device with an android mobile device. This is described on page 15.



PART 02.

Polaphor TV.

Software parameters

Title	Miniphor 2
Version	1.0, January 2017
Distributor	Block Optic Design GmbH Semerteichstr. 60 D-44141 Dortmund Germany

Introduction

The Miniphor 2 is an electronic acuity system for near vision, which is held by the patient. Touching the display areas is not necessary, because it is controlled by the operator. Continuous distance measurement ensures the correct reading distance. The additional 3D extension allows to show binocular tests with circular polarization. A docking station serves as a tray, which also charges the Miniphor 2.

The Miniphor 2 is controlled with a separate tablet and the application PhorControl, which is described on page 6.

Special note: Please also read the manual of the tablet manufacturer!

Attention: Deleting the data of the visual acuity device destroys essential configuration settings and starting will not be possible any more.

Description

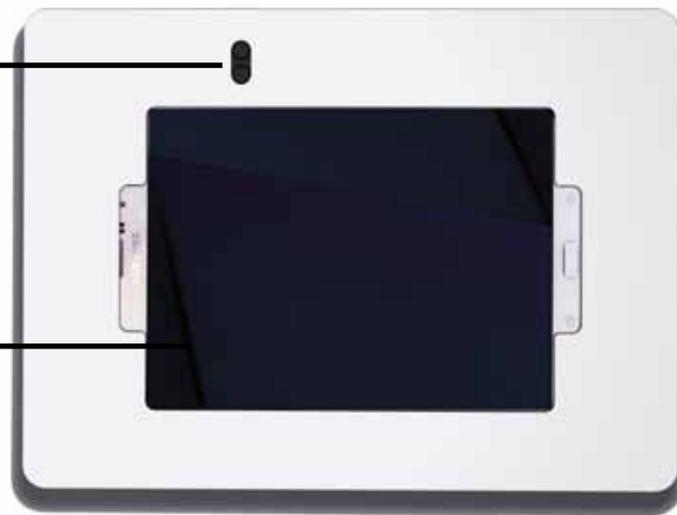
Miniphor 2:

On / Off button

Distance measurement

Display area

Charging contacts



Miniphor 2 with 3D extension:

Distance measurement

3D display area



Software-Updates

To download and install updates the Miniphor 2 must be connected with the internet via WLAN. PhorControl is responsible for checking and installing the updates (see „Settings“ on page 10).

Distance measurement

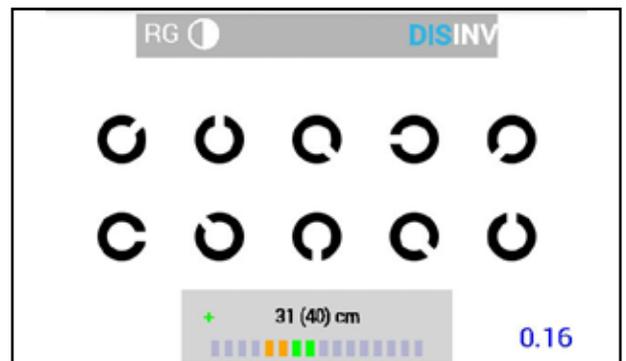
A reliable near refraction depends on either keeping the desired refraction distance or the knowledge of the actual distance. For this the Miniphor 2 always comes with distance measurement.

Turning the distance measurement on and off

Tipping the DIS function in the upper part of the display area turns the distance measurement on or off.

Usage

As soon as the distance measurement is activated the actual distance is shown. The number in brackets is the nominal distance and a scale indicates the deviance.



The nominal distance can be changed by tipping the actual distance. This distance then becomes the new nominal distance. All acuities rely on the nominal distance; the optotypes are scaled properly.

Accuracy

To ensure a maximum of accuracy the patient must hold the Miniphor still and its surface must be perpendicular to the patient's line of sight. A small inaccuracy because of the ambient lighting or the patient's anatomy or hair style can't be excluded.

The distance measurement was concipated for a range of 30-60cm. Out of this area precision is lost. Distances of more than one meter are shown as „MAX“.

3D extension

The separation of special tests in the Miniphor 2 is based on the anaglyphic method. As soon as the 3D extension is connected to the main housing the separation method changes to circular polarization. For all binocular tests the appropriate analyzers are needed now.

The separation method changes to red/green again if the 3D extension is removed from the housing.

Special note: **With the 3D extension attached the optical path is 12cm longer than without it. This value is already considered by the distance measurement.**

Docking station

The docking station is used for charging the Miniphor 2 between refractions. It must be placed precisely in the tray.

Special note: **Distance measurement is not possible during the charging in the docking station.**

Declaration of Conformity

EG-Konformitätserklärung Declaration of Conformity

Block Optic Design GmbH
Semerteichstr. 60
44141 Dortmund

erklärt hiermit, dass das nachstehende Produkt
declares that the following device

Bezeichnung **Miniphor 2**
Name

Geräteart **Sehtest nach DIN 58220 Teil 5**
Type

den Anforderungen der Richtlinie 93/42/EWG
meets the requirements of the directive 93/42/EC

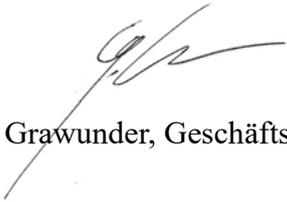
entspricht und unter Einhaltung folgender Normen
in compliance with the following directives

DIN EN 60601-1
DIN EN 60601-1-2
DIN 58220

Ort, Datum
Place, Date

Dortmund, den 04.04.2019

Name, Funktion
Name, Function


Jörg Grawunder, Geschäftsleitung

Device Specifications

Device Type	Polaphor HD Visual acuity system
Version	1.3, January 2016
Manufacturer	Block Optic Design GmbH Semerteichstr. 60 D-44141 Dortmund

Intended Applications

The Polaphor HD is used to examine the monocular and binocular acuity of the eyes. It is used for optometry and ophthalmology.

Unintended Application

Other applications as those described above are prohibited. During wrong practice unpredictable hazard can occur.

Scope of supply

The Polaphor HD can be delivered with various equipment. The actual scope of supply is listed in the detailed delivery note

Safety Remarks

a) Please read the instruction manual carefully and make yourself acquainted with all functions before you start to operate the device.

b) Don't change anything at the system by yourself as this might impact the safety and leads to the expiry of the warranty.

c) This system is not intended for use in areas with risk of explosions.

d) Do not operate the Polaphor HD if you observe visible damages. Breakdowns which have impact on the safety need to be repaired immediately. In this case, please contact an authorized service technician at Block Optic.

e) Please let all repairs of the Polaphor HD be done by a service technician authorized by Block Optic.

f) Only use original accessory parts for the Polaphor HD.

g) If the system will not be used for a longer period, please turn off the main switch and turn out the power plug.

h) Accessories which will be connected with the electric supply of the Polaphor HD need to be proven to comply with the appropriate DIN EN or IEC specifications. Furthermore all configurations have to comply with the requirements of the system standard DIN EN 60601-1-1 (IEC 601-1-1) and its modifications. Coupling of non-medical devices (e.g. dataprocessing devices) to a medical electronical system such as the examination unit must not lead to a safety degree for patient, user, and the environment which is beyond DIN EN 60601-1-1 (IEC 601-1-1) and its modifications. If the admissible leakage current is exceeded by the coupling, protective measures according to the system standard DIN EN 60601-1-1 (IEC 601-1-1) and its modifications need to be provided.

After installation or later modifications the system must not put any risk to the patient, the user or the environment.

Liability of Manufacturer

The device has been manufactured according to the latest technical development and acknowledged technical safety directives. Block Optic considers itself responsible for any impact on safety, reliability and performance of the device only if:

- **Mounting, extensions, readjustments, modifications or repairs are carried out by authorized persons,**
- **the electric installation of the concerned room complies with the requirements of VDE 0107 and**
- **the device is used according to the instruction manual.**

Responsibility of User

The user is responsible for:

- **compliance with standards for prevention of accidents and the directives for establishment, operation and application of medical devices (Medical Device Operating Directive)**
- **MPBetriebV),**
- **operation,**
- **maintenance,**
- **duly and safe condition of the product and**
- **storage of the instruction manual at the usage site.**

Warranty

The „Allgemeinen Verkaufs- und Lieferbedingungen“ of Block Optic are effective as the basic principle.

General information

The Polaphor HD is a visual acuity system of the next generation. A high-resolution flat panel monitor combined with a powerful computer form the basis for unlimited test possibilities.

You can switch easily through different visual acuity steps and even groups of optotypes by the clearly designed infrared remote control.

It is even possible to do refractions for official purposes with the Polaphor HD, because the display of the Landolt rings complies with the ISO 8596.

Many charts for monocular and binocular correction and for recognizing phorias come with the standard version of the Polaphor HD.

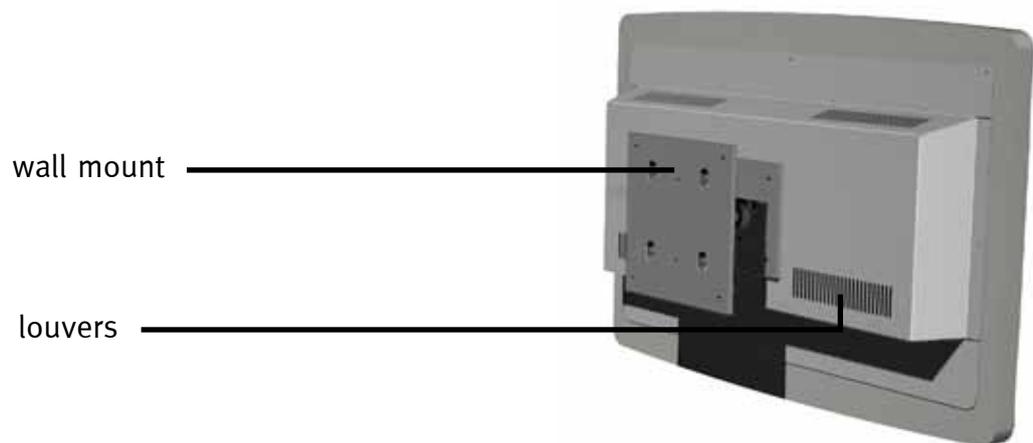
Because of the use of a computer new tests can be implemented into the Polaphor HD if desired.

The Polaphor HD box contains the visual acuity system Polaphor HD, the wall mount and the manual. A controlling device must be ordered separately.

Polaphor HD - front view



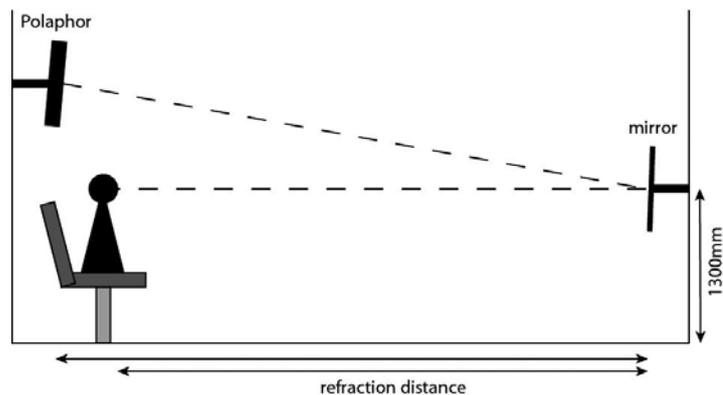
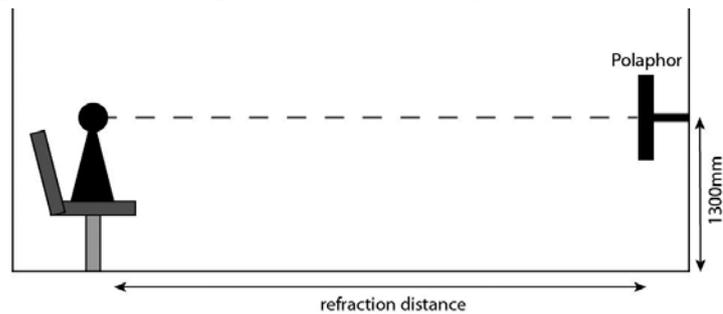
Polaphor HD – rear view



Mounting

Important for the correct mounting of the Polaphor HD is on the one hand the refraction distance and on the other hand the height to achieve a relaxed head position of the patient.

The Polaphor HD allows a refraction distance between 3,0 and 7,0 meters and must be adjusted individually for each refraction room. The size of the optotypes is calculated automatically for the entered distance. When choosing the height of the Polaphor HD, have in mind the average eye height of the sitting patients (about 130 cm).



Putting into operation

Connect the appliance plug with the appropriate female connector at the bottom of the Polaphor HD. The equipment is ready to use and can be turned on and off with the main switch.

Before the first use

Before the first use personal settings must be made in the menu of the Polaphor HD to achieve the correct results.

According to page 19 „Configuration of the visual acuity system“ the refraction distance must be selected. The optotypes, polarized tests and Schober test are automatically calculated dependend on the entered distance. For reliable and reproducible results the distance from the entrance pupil to the optotype must be measured.

Important! **To achieve best results with the special tests on a Polaphor HD Light it is necessary to adjust the colors red and green to the present filters (see part 02, color adjustments)**

The visual acuity system Polaphor HD is designed without any mechanic or movable parts. This results in a compact, wearing free and fail-safe instrument. Nevertheless, if a defect occurs please contact your local distributor with a detailed description of the malfunction.

Safety note

Only skilled service technicians are allowed to open the visual acuity system for maintenance or repairs.

Caution! **Do not pour any liquids over the device especially the louvers! Do not cover the louvers!**

Caution! **The use of the device is prohibited if the power cord is damaged!**

Important! **Keep in mind to turn off the Polaphor HD with the main switch every day.**

Care and maintenance

The surface has to be cleaned with a dry cloth. Never use aggressive detergents; the sensitive surface could be damaged !

Errors

description	possible causes	correctives
The display is dark	Connector plug missing	Connect the appliance plug with the socket and turn on the system..
	Fuse defect	Check the two fuses in the drawer of the main switch
	The Polaphor HD is in the stand-by mode	Press any key on the remote control for about 1 second.
The remote control doesn't work	Batteries are empty.	Change the batteries.
	The IR receiver is covered.	Make sure a free line of sight to the receiver is existing
The separation is not optimal	The Polaphor HD is not aligned.	Loose the screws on the ball joint and align the Polaphor HD
The wrong optotypes are shown or change autonomous.	Other instruments control the Polaphor HD.	A new coding of the remote control is required. Please contact the service hotline.

Software update

If connected to the internet, the Polaphor HD will periodically check for updates. Using Phor-Control a manual check is also possible. Navigate to Configure visual acuity system and touch Check for Update. Connecting and downloading from the server may last several minutes. The installation of the software needs to be confirmed with a USB-mouse, that has to be connected to one of the USB-connectors of the computer. This important security concept prevents your acuity system of malicious software.

If no internet is available, the software can be updated with a memory stick, which must be ordered at Block Optic. To update the Polaphor HD Software, the stick must be connected to the Polaphor HD. Turn on the device and wait a few minutes. After the update is completed, a message will appear. Turn off the Polaphor HD, remove the stick and start the device again.

Technical data

examination distance:	3,0 - 7,0 meters, in steps of 10cm
visible area:	about 530x297mm
frame color	similar to RAL 9016
color coordinates white (CIE):	x 0,31 / y 0,33
control:	Tablet, Android OS 4.0 and up, Bluetooth
dimensions (incl. wall mount):	W 642 mm / H 440 mm / D 235 mm
weight:	13,5 kg
main voltage:	230 V/50 Hz
power consumption:	60 watts active 10 watt stand-by
panel quality:	complies ISO 13406-2 / Class II
fuses:	primary: 2 x 3,15A T
maintenance and	
calibration intervals:	every 5 years
operation conditions:	
temperature of the environment	between +10°C and +40°C
relative humidity	between 30% and 75%
air pressure	between 800hPa and 1060hPa

Declaration of Conformity

EG-Konformitätserklärung Declaration of Conformity

Block Optic Design GmbH
Semerteichstr. 60
44141 Dortmund

erklärt hiermit, dass das nachstehende Produkt
declares that the following device

Bezeichnung Polaphor HD
Name

Geräteart Sehtest nach DIN 58220 Teil 3, Teil 5
Type

den Anforderungen der Richtlinie 93/42/EWG
meets the requirements of the directive 93/42/EC

entspricht und unter Einhaltung folgender Normen
in compliance with the following directives

DIN EN 60601-1
DIN EN 60601-1-2
DIN 58220

als Medizinprodukt der nachstehenden Klasse zugeordnet wurde
as a medical device of

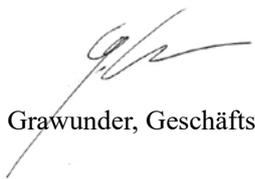
Klasse 1
Class 1



Ort, Datum
Place, Date

Dortmund, den 04.04.2019

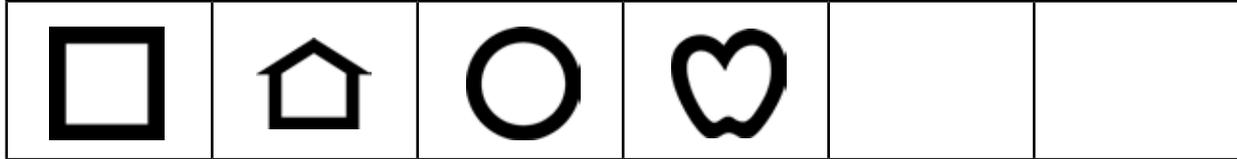
Name, Funktion
Name, Function


Jörg Grawunder, Geschäftsleitung

Software options and accessories

28 10 0000.48	POLAPHOR® children picture set B 18					
<ul style="list-style-type: none"> • collection of 6 pictures • acuity steps 0.05 - 2.0 • display format of the Polaphor will be kept 						
						
28 10 0000.9	POLAPHOR® children picture set Ni-DIT					
<ul style="list-style-type: none"> • collection of 6 pictures • acuity steps 0.05 - 2.0 • display format of the Polaphor will be kept 						
						
28 10 0000.29	POLAPHOR® children picture set Rossano					
<ul style="list-style-type: none"> • collection of 8 pictures • acuity steps 0.05 - 2.0 • display format of the Polaphor will be kept 						
						
						
28 10 0000.32	POLAPHOR® children picture set LEA					

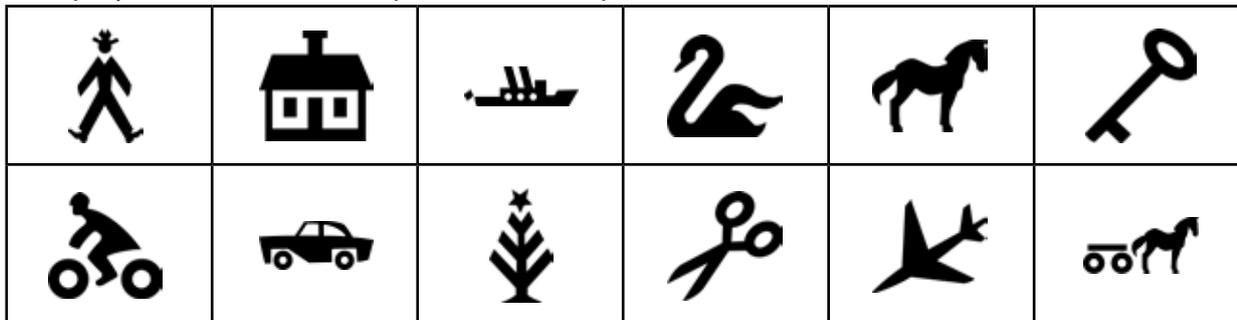
- collection of 4 pictures
- acuity steps 0.05 - 2.0
- display format of the Polaphor will be kept



28 10 0000.37

POLAPHOR® children picture set Oesterberg

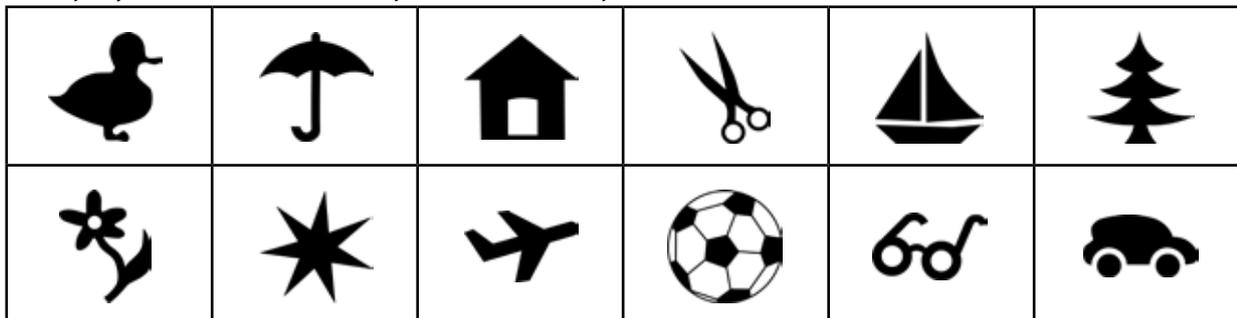
- collection of 12 pictures
- acuity steps 0.05 - 2.0
- display format of the Polaphor will be kept



28 10 0000.38

POLAPHOR® children picture set MO3

- collection of 12 pictures
- acuity steps 0.05 - 2.0
- display format of the Polaphor will be kept



28 20 0000.17

POLAPHOR® simulation of a Nidek CP-690 Type T

- display of 32 charts
- special features (e.g. randomizer, R/G overlay) still usable
- display format of the Polaphor can still be used

28 20 0000.18

POLAPHOR® simulation of a Nidek CP-690 Type DIN/ISO

<ul style="list-style-type: none"> • display of the Nidek's 32 charts CP-690 Type DIN/ISO • DIN/ISO conformance up to 5 meters • special features of the POLAPHOR® (e.g. randomizer, R/G overlay, etc.) still usable • display format of the POLAPHOR® can still be used 	
28 20 0000.19	POLAPHOR® simulation of a Topcon ACP-7 Type A
<ul style="list-style-type: none"> • display of the Topcon's 30 charts ACP-7 Type A • special features of the POLAPHOR® (e.g. randomizer, R/G overlay, etc.) still usable • display format of the POLAPHOR® can still be used 	
28 20 0000.28	POLAPHOR® simulation of a Topcon ACP-7 Type DIN
<ul style="list-style-type: none"> • display of the Topcon's 30 charts ACP-7 Type DIN • DIN conformance up to 5,5 meters • special features of the POLAPHOR® (e.g. randomizer, R/G overlay, etc.) still usable • display format of the POLAPHOR® can still be used 	
28 20 0000.21	Allocation of a serial port
<ul style="list-style-type: none"> • serial port for a connection to e.g. Möller Vistron 900+ • normal use of the Polaphor still possible with the IR remote control 	
28 20 0000.36	Allocation of a serial port, bluetooth connection included
<ul style="list-style-type: none"> • serial port including a Bluetooth connection (pair) for a connection to e.g. Huvitz HDR 7000 or Möller Visutron 900+ (control software for Visutron 900+ not included, for subsequent installation POLAPHOR must be send to manufacturer) • normal use of the POLAPHOR still possible with the IR remote control 	
28 20 0000.15	POLAPHOR® connection to automatic refractor Nidek RT-2100/RT-3100/RT-5100 T-Type
<ul style="list-style-type: none"> • hardware Add-On „Nidek CCG“ • communication cable, 10 meters • emulation of a CP 690 Type T with the Nidek control panel • normal use of the Polaphor still possible with the IR remote control 	
28 20 0000.39	POLAPHOR® connection to Topcon CV 5000
<ul style="list-style-type: none"> • simulation of an ACP 8 type A with the Topcon control panel * • communication is effected with Topcon IR emitter • normal use of the Polaphor still possible with the remote control 	

PART 04. Polaphor HD.

28 20 0000.42

POLAPHOR® connection to Huvitz HDR 7000

- simulation of a CCP-3100 with Huvitz control panel
- communication is effected with external CCG device
- normal use use of the Polaphor® still possible with the remote control

■ MANUAL.

phorcontrol.

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■ ■ ■ ■ **BLOCK OPTIC**