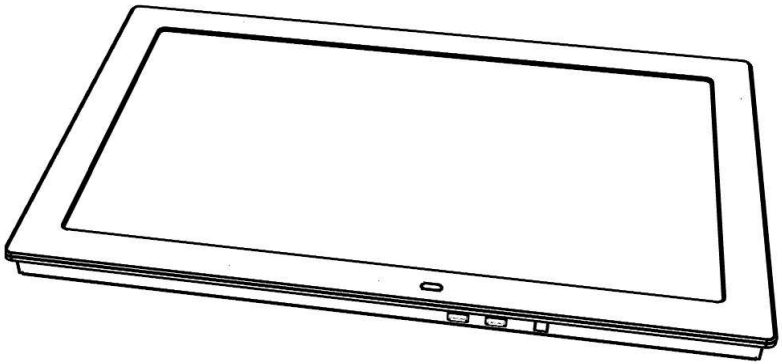
OPERATION MANUAL

CHART PANEL
TCP-2000P



WARNING !

Read this Operation Manual carefully before using the TCP-2000P for proper and safe operation. If you come up any question about this instrument or the Manual, ask your Tomey representative or local distributor.

- **Do not use this instrument by any procedures other than those specified in this Manual.**
- **Only well-trained or skilled personnel is allowed to operate this instrument.**
- **Keep the Operation Manual in a place where you can easily access while operating instrument.**

13-90013.03

TOMEY

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1. INTRODUCTION

Ophthalmic chart panel used for testing sharpness of patients view, refraction state and stereo vision of human eyes. Also for testing color recognition problems.

This OPERATION MANUAL describes the purpose, overall view and user maintenance of the TCP-2000P LCD CHART PANEL. This manual is intended for medical and technical personnel who will perform tests on patients.

If during operating the Chart Panel you have encountered problems which you can not solve, or LCD Chart Panel parameters are changed, please, in all these cases contact the manufacturer.

WARNING ! Only manufacturer's authorized personnel may carry out the technical servicing of the Chart Panel!

HINT ! When during normal operation TCP-2000P device responds to your remote control command with 1 (beep) signal, it means that you try to execute not allowed operation!

1.1. Safety precautions

Power connections

- Before connecting the DC external Power Supply of the chart panel to the mains outlet, check that the local voltage and frequency ratings corresponds with the ratings of the PSU.

External connection

- Do not connect any other external devices to the chart panel other than those specified by manufacturer.

Explosion Hazard

- Do not use the panel in the presence of flammable moistures.

Patient Safety

- Do not perform any testing or maintenance of the panel while it is being used on a patient.

Cleaning and Service

- Only trained personnel with proper tools and test equipment should perform test and repairs described in this manual. Unauthorized service may void the chart panel warranty.
- Switch the power off and unplug power supply before cleaning or service. Get rid of moisture completely before reconnecting to the mains outlet.
- Do not touch any exposed wire or conductive surface while cover is off and the chart panel is energized. The voltages present can cause injury or death.
- Perform electrical safety check and leakage current test after service.
- Do not use ammonia-, phenol- ,or acetone- based cleaners. These cleaners may damage the chart panel surface.
- Do not immerse chart panel in any liquid. Do not allow liquid to enter the device.
- Electrostatic discharge through the PCB may damage the components. Before replacing PCB, wear a static control wrist strap. Handle all PCB by their non conductive edges and use ant-static containers when transporting them.

Installation

- Do not put any objects on top of the chart panel.

Disposal

- Disposal of the device, or parts of it, should be done according to local environmental and waste disposal regulations. Do not dispose to the nature.

The manufacturer accepts no responsibility for any modifications made to the Chart Panel outside the factory.

2. TECHNICAL DATA

- Picture to Picture change time: 0,5s
- Adjustable refraction distance: 2 to 7m
- Background luminance: 200 cd/m2
- Auto off function: 5,10,15 min - adjustable
- Up to three user program (15 steps each) available
- Power supply: external,

  INPUT: 100 - 240 ~1.5A 50/60 Hz.

  OUTPUT: 12.0V 5.0A DC
- Classification: Class II
- Power consumption: 60W max.
- Operating temperature range: +5C to + 40C
- Storage temperature range: 0C to + 40C
- Air pressure: 70 to 106 kPa.
- Relative humidity: 90% max. , without condensation (operation and storage).
- Dimensions: 583 x 359 x 30 mm (Length/Width/Depth).
- Weight: 3,9 kg.
- VESA mount hole pattern: 100 x 100 mm
- No application part

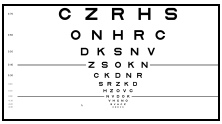
3. INSTALLATION AND USE

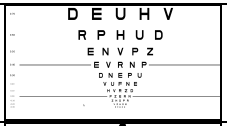
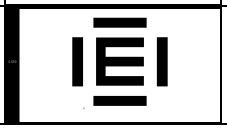
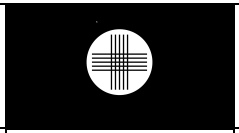
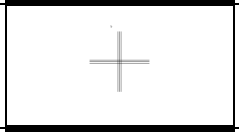
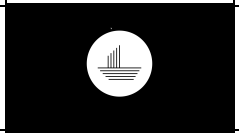
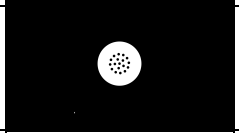
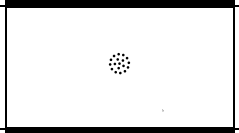
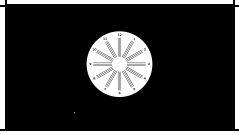
3.1. Package Content

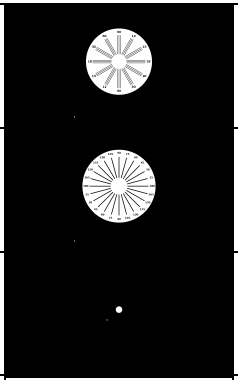
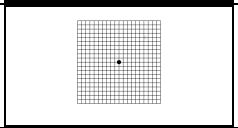
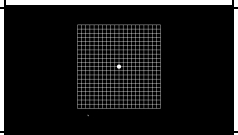
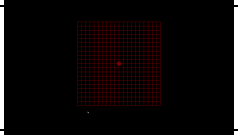
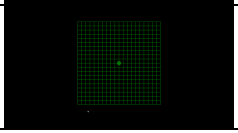
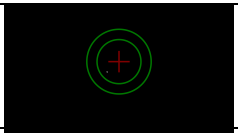
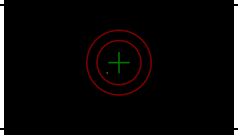
No	Spare part	Part Number
1.	IR remote	96-13002.01
2.	Power supply	06-50009
3.	Power cord 3m	06-48015
4.	Power cord 0,7m	06-49017
5.	Red – Green glasses	33-07012.01
6.	Polarizing glasses	33-07014.01
7.	Battery for remote control	06-35002
8.	Operating manual English	13-90013.xx
9.	Packing box and foams – replacement set	13-40100.01
10.	Children picture cards (set of 3)	13-74930.01
11.	Wall mount set	12-44150.01
12.	Installation manual	12-44300.01
13.	Glare test lamps – set*	13-52000.01

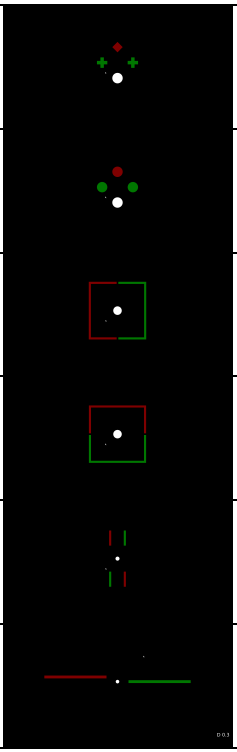
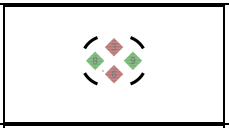
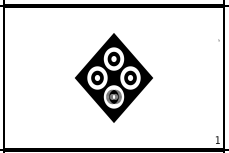
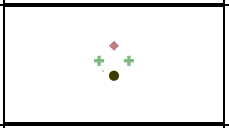
*optional, not included

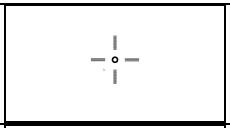
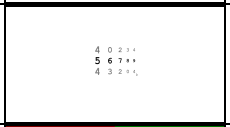
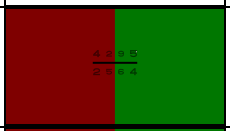
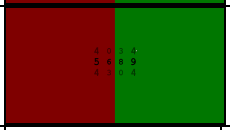
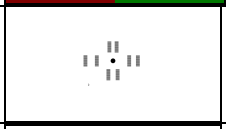
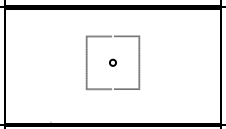
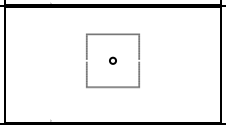
3.2. Available tests

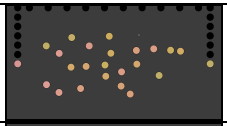
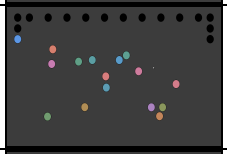
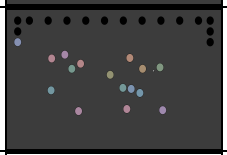
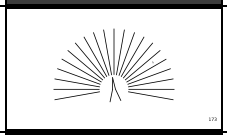
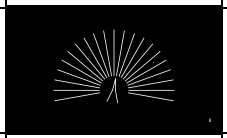
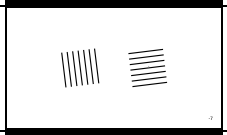
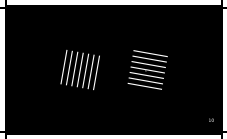
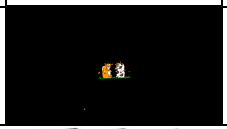
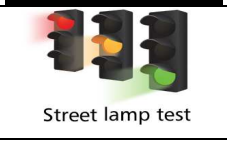
Description	Name of test		TCP-2000P
OPTOTYPES			
Snellen, LogMar, Snellen, modified, Snellen Contrast, DIN	Letters	Sloan	•
		Snellen	
		Cyrillic	
Snellen, LogMar, Snellen, modified, Snellen Contrast, DIN	Symbols	Standard	•
		Allen	
		Hands	
		HOTV	
		HYVA	
		Symbols	
		Pigassou	
Snellen, LogMar, Snellen, modified, Snellen Contrast, DIN	Numbers	Standard	•
		Numbers1	
		Numbers2	
		Digital	
Snellen, LogMar, Snellen, modified, Snellen Contrast, DIN	E Snellen		•
Snellen, LogMar, Snellen, modified, Snellen Contrast, DIN	C Landolt		•
	ETDRS chart 1 ETDRS chart 2 ETDRS chart R ETDRS Revised 2000 C1 ETDRS Revised 2000 C2 ETDRS Revised 2000 C3		•
	SNELLEN		•

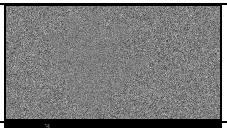
	Bailey-Lovie	•
	Osterberg	•
	Hearing Impared	•
	Crowding bars	•
	White-Black	
	Cross Grid	•
	Cross Grid (white)	•
	Grid (children)	•
	Cross Cylinder	•
	Cross Cylinder (White)	•
	Astigmatism Green	•

	Astigmatism Green	•
	Astigmatism Snellen	•
	Fixation point	•
	Amsler	•
	Amsler	•
	Amsler	•
	Amsler	•
Red-Green (Anaglyph tests)		
	Schober	•
	Schober	•
	Red- Green	•

	Worth	•
	Four dot	•
	Vertical Coincidence	•
	Horizontal Coincidence	•
	Stereo	•
	Fixation Disparity	•
Polarization tests		
	Duochrome balance	•
	Stereo circles	•
	Worth	•
	Phoria	•

	Phoria with fixation	•
	Accomodation balance	•
	Accomodation balance	•
	Accomodation balance	•
	Accomodation balance	•
	Minute Stereo	•
	Vertical Coincidence	•
	Horizontal Coincidence	•
Other tests		
 Driving tests	Driving tests	•
	Contrast Sensitivity	•

	100 Hue	•
	D15 saturated	•
	D15 desaturated	•
	FAN and Block	•
	FAN and Block	•
	FAN and Block	•
	FAN and Block	•
	Children images	•
	Animations	•
	Street Lamp Test	•

	SIRDS - Single Image Random Dot Test	•
	Ishihara	•
MASKS		
	single	•
	horizontal	•
	vertical	•
	polarization	•
	Red-green	•
	underlining	•
Communication, reports, multimedia, etc		
	video	•
	filemanager	•
	Reports	•
	WiFi	•
	iPad Communication	•
	slideshow	•
	Optotype randomization	•
PHOROPTERS		
	POTEC TCP-2002(A)	•
	POTEC TCP-2002(R)	•
	TOMEY TAP-1000E	•
	TOMEY TAP-1000C	•
	UNICOS UDR-700	•
	UNICOS UDR-800	•
	TC ACP8 (IS)	•

	TC ACP8 (H)	•
	TC ACP8 (B(F))	•
	TC ACP8 (B(M))	•
	TC ACP8 (B1(F))	•
	TC ACP8 (B1(M))	•
	TC ACP8 (F)	•
	TC ACP8 (C)	•
	TC ACP8 (C1)	•
	SN DR-900TC	•

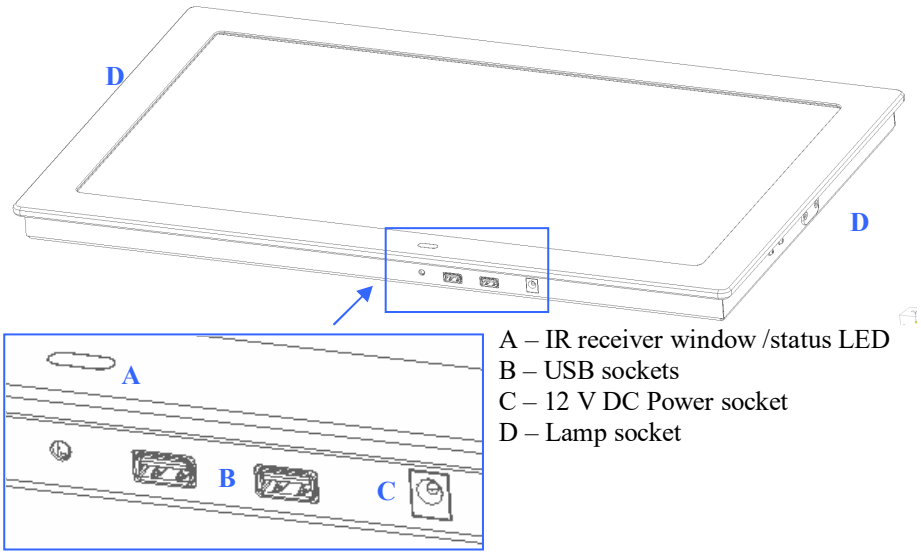
Table 1. TCP-2000P available tests.

3.3. Installation

To assure proper test conditions TCP-2000P Chart Panel should be mounted on the wall perpendicularly to patient's line of sights. The distance from panel to patient's eye can be adjusted from 2 to 7 meters, depending on test room conditions. There is possibility to change distance units from meters to feet (6,5 to 23,5 feet). For information on how to adjust the distance please refer to chapter 4.1.

To mount chart panel on the wall follow the 12-44300.01 Installation manual included in the wall mount set box.

3.3.1 Sockets / LEDs description

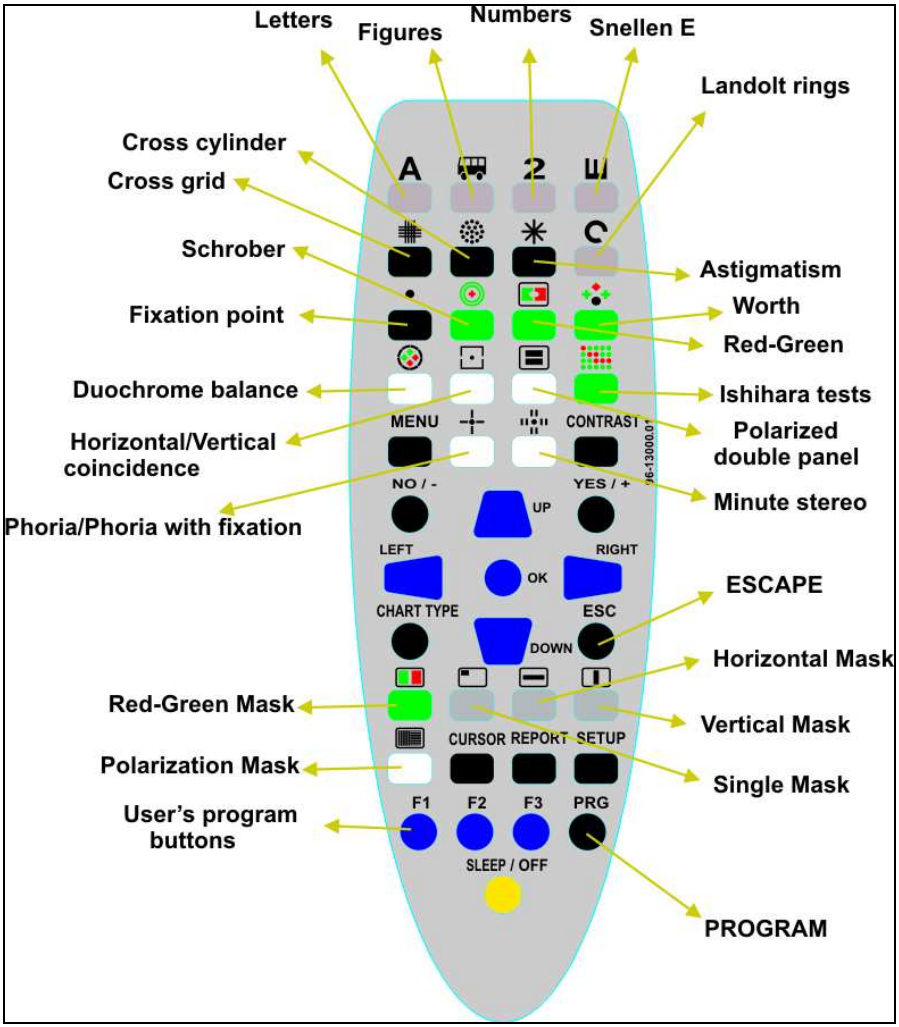


A – IR receiver window /status LED
B – USB sockets
C – 12 V DC Power socket
D – Lamp socket

The TCP-2000P Chart Panel is designed to operate on DC 12V provided by supplied external power supply.

3.4. How to operate chart panel with remote control.

All functions of Chart Panel are controlled via IR remote control. Picture 2 describes functions of remote control buttons.



Pic. 1. IR remote control.

3.5. Changing remote control channel.

When two or more units of the TCP-2000P systems are used in the same room, a device failure may occur due to interference if the same remote control channels are used. In such case, set different channels for each remote control. There are 3 remote control channels available.

The communication channel must be set at the same time for both the remote and the chart panel.

To change remote control channel please direct remote control toward main unit and press and hold simultaneously following 3 buttons.

PRG + SLEEP/OFF + F1 to select channel no 1.
PRG + SLEEP/OFF + F2 to select channel no 2.
PRG + SLEEP/OFF + F3 to select channel no 3.

Please keep button pressed until main unit will confirm channel change with two beeps.

WARNING ! Removing batteries from remote control will reset its current channel setting. It will be automatically set to channel no 1. If different channel was used before please perform channel selection procedure. Otherwise main unit will not respond to remote control commands.

WARNING ! Remote control channel is immediately changed when three buttons are pressed at one time. Main unit will change its channel only if you keep those buttons until you get two beeps conformation.

WARNING ! Channel 1 is Default factory setting.

4. CHART PANEL CONFIGURATION.

If TCP-2000P Chart Panel is securely installed in its operating position, connect the power cord to the panel first, then the plug power cord to the power outlet. Chart Panel will start automatically. Flashing LED in bottom right corner will indicate start-up process. The panel requires approximately 30 seconds for initialization. When the LED stops flashing and turns into green and the welcome screen is displayed, the Chart Panel is ready to use. Install battery into remote control unit and enter Configuration MENU to set-up Chart Panel options.

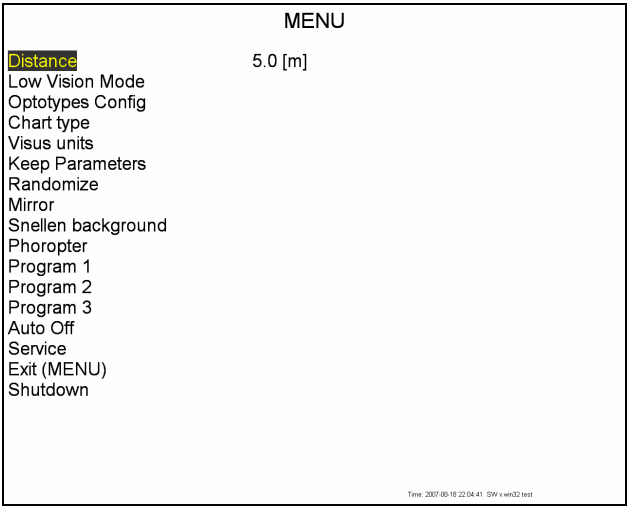
WARNING !

Before you start tests on patient you have to configure TCP-2000P properly. To acquire reliable test results it is necessary to set proper distance between patient and the Chart Panel. Please refer to chapter 4.1.

Configuration MENU

To enter Configuration MENU press **SETUP** button.

Following options are available:



Pic. 2. Configuration MENU

4.1. Distance

This option allows user to set proper distance between patient and TCP-2000P Chart Panel. It is crucial that this parameter is correctly set before first use of the Chart Panel.

1. Enter '**Distance**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to enable distance edit mode.
3. Use Up and Down Arrow to set required distance.
4. To store value press Left Arrow.

HINT !

You can also set distance with 1 meter step using YES/+ or NO/- buttons

4.2. Low Vision Mode

Optotypes available in this option are much bigger than standard ones, of visus units up to ft 20/3200

1. Enter '**Low Vision Mode**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to enter edit mode.
3. Use Up and Down Arrows to set edited parameter to '**Yes**' or '**No**' value.
4. Press Left Arrow to apply changes.

Example:

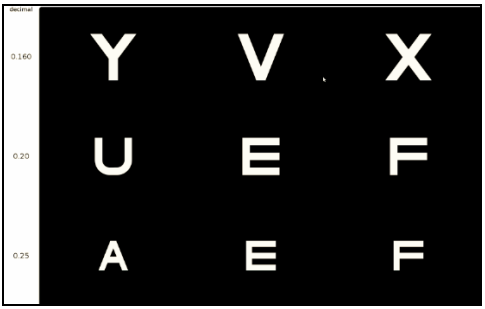
1. Enable **Low Vision** option.
2. Exit '**Menu'**
3. Press '**A'** button.
4. Press Arrow Up until you reach the biggest optotype. You will see a message:
   'Enabling Low Vision Mode. Move patient to 0,6m (2,3 ft).
   Press any key to con
   tinue.'
5. Move the patient to 0,6m (2,3 ft).
6. Press Arrow up, in top-left corner of the screen info 'LowVis' will show. This info indicates that the patient has to be 0,6m (2,3 ft) from the chart panel.

WARNING !

Low Vision Mode is not available in ETDRS and Standard Snellen Charts.

4.3. Optotypes Config

This option allows to choose optotype kind: letters/children/numbers and to turn on optotype negative mode



Pic. 3. Optotype Negative Mode

1. Choose **'Optotypes Config'** using Arrow Up or Arrow Down button.
2. Press right Arrow to enter **'Optotypes Config**'
3. Press Arrow Up or Arrow Down to choose optotype kind.
4. Press Arrow Up or Arrow Down button to select your favourite optotype kind.
5. Press Left Arrow to apply changes.
6. Select 'Previous Menu' using Arrow Up or Arrow Down to exit from **'Optotypes Config'**.

HINT !

You can also Exit from '**Optotypes Config**' by simply pressing '**Setup'** button.

4.4. Chart type – display mode (Snellen, LogMar Modified, Snellen Modified, Snellen Contrast chart type, DIN chart)

Option `**Chart type**` allows the user to work with Snellen Chart, LogMar Chart Modified, Snellen Chart Modified, Snellen Contrast or DIN Chart (please refer to chapters 5.2.1. , 5.2.2., 5.2.3. 5.2.4. and 5.2.5.).).

1. Enter '**Chart type**', using Arrow Up or Arrow Down button.

2. Press Right Arrow to enter edit mode.
3. Use Up and Down Arrows to select parameter '**Snellen Chart**', '**LogMar Chart Modified**', '**Snellen Chart Modified'** or '**Snellen Contrast**'.
4. Press Left Arrow to apply changes.

HINT !

Chart Type can be changed directly from IR remote. You can select chart type using 'CHART TYPE' button.

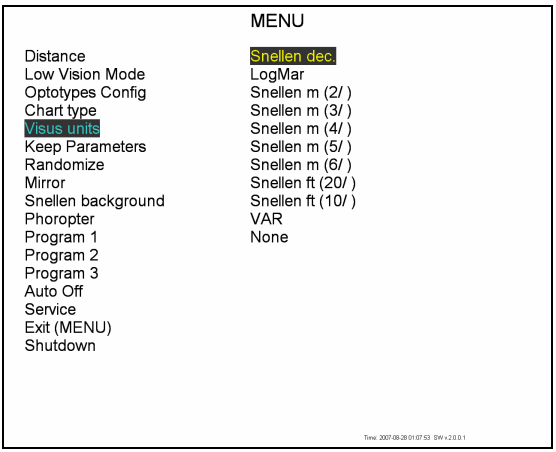
WARNING !

Changes made only with the IR remote are not stored. After restart of the chart panel chart type selected in the '**Menu'** will be active.

4.5. Visus units

Option Visus units allows selecting optotype description unit which is displayed right to the optotype chart.

1. Enter '**Visus units'**, using Arrow Up or Arrow Down button.
2. Press right Arrow, to display list of available units.
3. Press Arrow Up or Arrow Down button to select your favourite chart description unit.
4. Press Left Arrow to apply changes.



Pic. 4. Visus units

HINT !

Information about currently selected visus scale is continuously displayed on the left top part of the screen. Set '**Visus unit**' to '**None**' to hide this information.

4.6. Keep Parameters

When you activate this option, visus values (size), contrast, masks will not change when you switch to other chart types or tests.

Example:

Activate '**Keep Parameters**' option.
Press button '**A**' to select Letter chart.
Press two times Arrow Down to display smaller size of Letters chart.
Press '**2**' to select Number chart. Optotype size will not change to the biggest one but will stay at the same size level.

1. Enter '**Keep Parameters**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to enter edit mode.
3. Use Up and Down Arrows to set edited parameter to '**Yes**' or '**No**' value.
4. Press Left Arrow to apply changes.

4.7. Randomize

5. Enter '**Randomize**', using Arrow Up or Arrow Down button.
6. Press Right Arrow to enter edit mode.
7. Use Up and Down Arrows to set edited parameter to '**Yes**' or '**No**' value.
8. Press Left Arrow to apply changes.

HINT !

You can randomize any optotype by pressing Right or Left Arrow.

4.8. Mirror

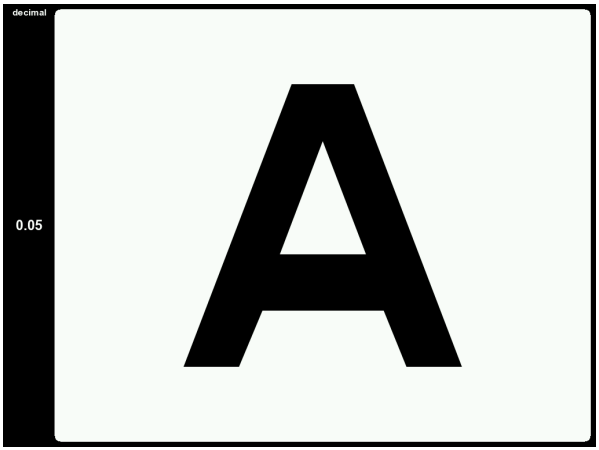
Option `**Mirror**` allows to display all tests in mirror presentation.

1. Enter '**Mirror**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to enter edit mode.
3. Use Up and Down Arrows to set edited parameter to '**Yes**' or '**No**' value.
4. Press Left Arrow to apply changes.

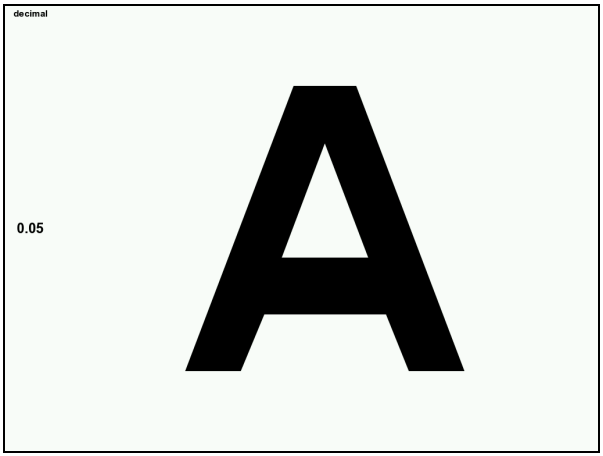
4.9. Snellen background

Option **'Snellen background'** allows to select black or white background for stripe with sharpness size.

1. Enter **'Snellen background**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to enter edit mode.
3. Use Up and Down Arrows to set edited parameter **''Black'** (black stripe) or **''White'** (white stripe).
4. Press Left Arrow to apply changes.



Pic. 5. Screen with black background



Pic. 6. Screen with white background

4.10. Phoropter

Set this option to 'Yes' when you use TCP-2000P Chart Panel together with phoropter. Adjust colours (see chapter 4.13.12.) to assure interpretability with the phoropter colour filters.

1. Select '**Phoropter**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to edit mode.
3. Use Up and Down Arrows to set edited parameter to '**Yes**' or '**No**' value.
4. Press Left Arrow to apply changes.

4.11. User defined programs - PROGRAM 1, PROGRAM 2, PROGRAM 3.

TCP-2000P Chart Panel allows the user to define his own programs. Each program is a sequence of up to 20 steps of charts, tests or eye anatomy pictures available from the panel. Masks and colour filters can be used in combination with charts. You can store 3 programs, each 20 steps long.

4.11.1. Programming Mode

To define your own program follow step 1 to 4:

1. Choose program you would like to edit using Arrow Up or Arrow Down.
2. Press Right Arrow, to enter Programming Mode.

Now you can start building your program sequence. Select test you want to add to current program (picture, tests or masks). To confirm your selection and add step to the program press '**F1**' button. Device will signal with message ' Item added to program, Press any key to continue' each properly added step of the program.

3. Press '**F2**' after program step has been stored to end programming process and store selected test into the memory of the chart panel.

Device will signal end of programming sequence with message 'Programming finished'.
You can enter Menu at any moment and change settings, e.g. children tests, chart type, etc.

4.11.2. Executing user's program

To execute user-defined program stored in device memory simply press '**F1**', '**F2**' or '**F3**' button.

Chart Panel will automatically display first test chart of the program you selected. In the bottom corners of the screen ◄ ► arrows are displayed, to inform that user program mode is executed. Green arrow indicates there is next/previous chart available, white – there are no more charts in given direction in the program.

Navigation:

1. Use right arrow button on the RC to move to the next chart of the program, left arrow to return to the previous chart.
2. To switch to other program or to restart selected program press respectively '**F1**', '**F2**' or '**F3**' button.
3. To exit program and return to normal operating mode press any other button than '**F1**', '**F2**', '**F3**', right/left Arrow.

NOTE!

When executing the program, you can get access to **additional options for given chart**, as those available in normal operating mode, as described below.

4. Press OK button - in the right bottom of the screen a red letter A is displayed.

4.1 Now you can use arrows, masks, ok, and +/- buttons as in normal operating mode for given chart.

4.2 To exit sub-mode to continue executing user's program press ESC button.

4.12. Auto-Off

This function allows user to preset time after which Chart Panel enters stand-by mode. You can set this time from 4 to 10 minutes.

1. Enter '**Auto-Off**' using Arrow Up or Arrow Down button.
2. Press Right Arrow to edit time for automatic auto off.
3. Use Up and Down Arrows to set required time.
4. To store selected value press Left Arrow.

NOTE !

Power OFF – new power saving feature.

TCP-2000P Chart Panel will turn itself off when not used after preset time. This time is set in factory to 4 hours. Service personnel can adjust it during installation to 30min, 1h, 2h, 3h, 4h or 8h, or turn this feature off completely, depending on the customer needs. If TCP-2000P is in off-mode LED on the front panel is also off. To restart TCP-2000P simply press any key on the remote control. Time needed for startup is approximately 45sec.

4.13. Service mode (Service)

1. Select '**Service** ', using Arrow up or Arrow down button.
2. Press right Arrow. Message 'Enter Access Code' will be displayed.

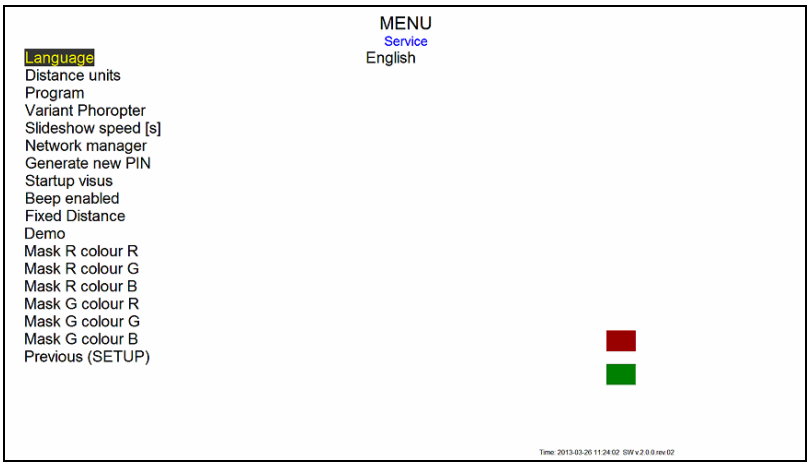
From the remote control type following sequence:

A A A A

If the incorrect sequence has been entered, message ‘Invalid service code. Press any key’ appears. To repeat password entering operation press any button and repeat procedure.

Service menu options:

1. Language
2. Distance units: meter, feet
3. Program
4. Variant Phoropter
5. Slideshow [s]
6. Network manager
7. Sharing manager
8. Network diagnostics
9. Generate new PIN
10. Startup Visus
11. LogMar line isolation
12. DIN line isolation
13. Beep enabled
14. Fixed distance enable
15. Fixed Distance
16. Date and Time
17. Demonstration mode (Demo)
18. Colour adjustment



Pic. 7. Service menu options

4.13.1. Language

From the **Language** menu you can select one of available languages for displaying messages.

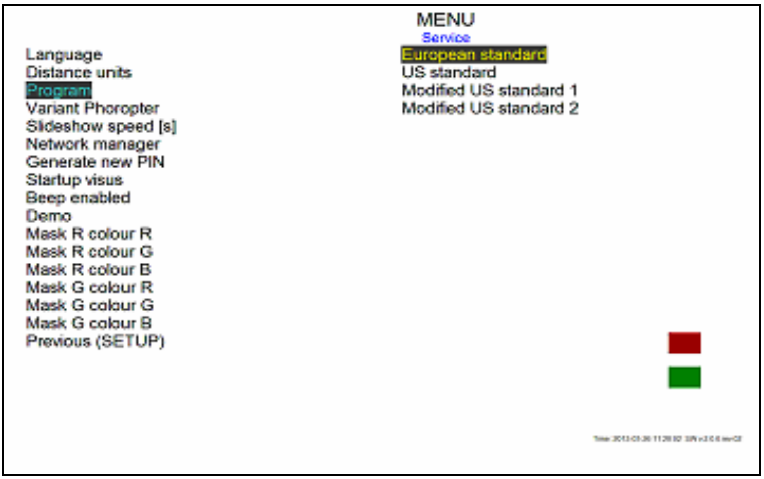
1. Select '**Language**' from the list.
2. Press right Arrow, to display list of available languages.
3. Press Arrow Up or Arrow Down button to move over language list.
4. Press Left Arrow to accept changes.

4.13.2. Distance units: meters, feet

1. Select '**Distance units'** from the list.
2. Press right Arrow, to enter distance units.
3. Press Arrow Up or Arrow Down to select '**meters**' or '**feet**'.
4. Press Left Arrow to accept changes.

4.13.3. Program

1. Select '**Program'** from the list.
2. Press right Arrow, to change 'Program'.
3. Press Arrow Up or Arrow Down to select program.
4. Press Left Arrow to accept changes.



Pic. 8. Programs

There are 4 types of programs with different visus size and with different set of optotypes.

DECIMAL	LOGMAR	20/ft	10/ft	6/m	5/m	4/m	3/m	2/m	VAR
0.006	2.20	3200	1600	950	800	630	480	320	-10
0.008	2.10	2500	1250	750	630	500	380	250	-5
0.010	2.00	2000	1000	600	500	400	300	200	0
0.013	1.90	1600	800	480	400	320	240	160	5
0.016	1.80	1250	625	380	320	250	190	125	10
0.020	1.70	1000	500	300	250	200	150	100	15
0.025	1.60	800	400	240	200	160	120	80	20
0.032	1.50	630	315	190	160	125	95	63	25
0.040	1.40	500	250	150	125	100	75	50	30
0.050	1.30	400	200	120	100	80	60	40	35
0.063	1.20	320	160	95	80	63	48	32	40
0.080	1.10	250	125	75	63	50	38	25	45
0.100	1.00	200	100	60	50	40	30	20	50
0.125	0.90	160	80	48	40	32	24	16	55
0.160	0.80	125	63	38	32	25	19	12.5	60
0.20	0.70	100	50	30	25	20	15	10	65
0.25	0.60	80	40	24	20	16	12	8	70
0.32	0.50	63	32	19	16	12.5	9.5	6.3	75
0.40	0.40	50	25	15	12.5	10	7.5	5	80
0.50	0.30	40	20	12	10	8	6	4	85
0.63	0.20	32	16	9.5	8	6.3	4.8	3.2	90
0.70	015	29	14	9	7.5	6	4.5	3	92
0.80	0.10	25	13	7.5	6.3	5	3.8	2.5	95
0.90	0.05	22	11	7	6	4.5	3.5	2.25	98
1.00	0.00	20	10	6	5	4	3	2	100
1.10	-0.05	18	9	5	4.5	3.5	2.5	1.75	102
1.25	-0.10	16	8	4.8	4	3.2	2.4	1.6	105
1.60	-0.20	12.5	6.3	3.8	3.2	2.5	1.9	1.25	110
2.00	-0.30	10	5	3	2.5	2	1.5	1	115

Table 2. Available sharpness degrees (European Standard program)

DECIMAL	LOGMAR	20/ft	10/ft	6/m	5/m	4/m	3/m	2/m	VAR
0.006	2.20	3200	1600	950	800	630	480	320	-10
0.008	2.10	2500	1250	750	630	500	380	250	-5
0.010	2.00	2000	1000	600	500	400	300	200	0
0.013	1.90	1600	800	480	400	320	240	160	5
0.016	1.80	1250	625	380	320	250	190	125	10
0.020	1.70	1000	500	300	250	200	150	100	15
0.025	1.60	800	400	240	200	160	120	80	20
0.032	1.50	630	315	190	160	125	95	63	25
0.040	1.40	500	250	150	125	100	75	50	30
0.050	1.30	400	200	120	100	80	60	40	35
0.063	1.20	320	160	95	80	63	48	32	40
0.080	1.10	250	125	75	63	50	38	25	45
0.100	1.00	200	100	60	50	40	30	20	50
0.125	0.90	160	80	48	40	32	24	16	55
0.160	0.80	125	63	38	32	25	19	12.5	60
0.20	0.70	100	50	30	25	20	15	10	65
0.25	0.60	80	40	24	20	16	12	8	70
0.32	0.50	63	32	19	16	12.5	9.5	6.3	75
0.40	0.40	50	25	15	12.5	10	7.5	5	80
0.50	0.30	40	20	12	10	8	6	4	85
0.63	0.20	32	16	9.5	8	6.3	4.8	3.2	90
0.80	0.10	25	13	7.5	6.3	5	3.8	2.5	95
1.00	0.00	20	10	6	5	4	3	2	100
1.25	-0.10	16	8	4.8	4	3.2	2.4	1.6	105
1.60	-0.20	12.5	6.3	3.8	3.2	2.5	1.9	1.25	110
2.00	-0.30	10	5	3	2.5	2	1.5	1	115

Table 3. Available sharpness degrees (US Standard program)

DECIMAL	LOGMAR	20/ft	10/ft	6/m	5/m	4/m	3/m	2/m	VAR
0.006	2.20	3200	1600	950	800	630	480	320	-10
0.008	2.10	2500	1250	750	630	500	380	250	-5
0.010	2.00	2000	1000	600	500	400	300	200	0
0.013	1.90	1600	800	480	400	320	240	160	5
0.016	1.80	1250	625	380	320	250	190	125	10
0.020	1.70	1000	500	300	250	200	150	100	15
0.025	1.60	800	400	240	200	160	120	80	20
0.032	1.50	630	315	190	160	125	95	63	25
0.040	1.40	500	250	150	125	100	75	50	30
0.050	1.30	400	200	120	100	80	60	40	35
0.100	1.00	200	100	60	50	40	30	20	50
0.20	0.70	100	50	30	25	20	15	10	65
0.25	0.60	80	40	24	20	16	12	8	70
0.285	0.55	70	35	21	17.5	15	10.5	7.5	73
0.33	0.45	60	30	18	15	12	9	6	76
0.40	0.40	50	25	15	12.5	10	7.5	5	80
0.50	0.30	40	20	12	10	8	6	4	85
0.66	0.18	30	15	9	7.5	6	4.5	3	91
0.80	0.10	25	13	7.5	6.3	5	3.8	2.5	95
1.00	0.00	20	10	6	5	4	3	2	100
1.33	-0.15	15	7.5	4.5	3.75	3	2.25	1.5	106
1.60	-0.20	12.5	6.3	3.8	3.2	2.5	1.9	1.25	110
2.00	-0.30	10	5	3	2.5	2	1.5	1	115

Table 4. Available sharpness degrees (Modified US Standard 1 program)

DECIMAL	LOGMAR	20/ft	10/ft	6/m	5/m	4/m	3/m	2/m	VAR
0.006	2.20	3200	1600	950	800	630	480	320	-10
0.008	2.10	2500	1250	750	630	500	380	250	-5
0.010	2.00	2000	1000	600	500	400	300	200	0
0.013	1.90	1600	800	480	400	320	240	160	5
0.016	1.80	1250	625	380	320	250	190	125	10
0.020	1.70	1000	500	300	250	200	150	100	15
0.025	1.60	800	400	240	200	160	120	80	20
0.032	1.50	630	315	190	160	125	95	63	25
0.040	1.40	500	250	150	125	100	75	50	30
0.050	1.30	400	200	120	100	80	60	40	35
0.066	1.15	300	150	90	75	60	45	30	41
0.100	1.00	200	100	60	50	40	30	20	50
0.133	0.85	150	75	45	37.5	30	22.5	15	56
0.20	0.70	100	50	30	25	20	15	10	65
0.25	0.60	80	40	24	20	16	12	8	70
0.285	0.55	70	35	21	17.5	15	10.5	7.5	73
0.33	0.45	60	30	18	15	12	9	6	76
0.40	0.40	50	25	15	12.5	10	7.5	5	80
0.50	0.30	40	20	12	10	8	6	4	85
0.66	0.18	30	15	9	7.5	6	4.5	3	91
0.80	0.10	25	13	7.5	6.3	5	3.8	2.5	95
1.00	0.00	20	10	6	5	4	3	2	100
1.33	-0.15	15	7.5	4.5	3.75	3	2.25	1.5	106
1.60	-0.20	12.5	6.3	3.8	3.2	2.5	1.9	1.25	110
2.00	-0.30	10	5	3	2.5	2	1.5	1	115

Table 5. Available sharpness degrees (Modified US Standard 2 program)

NOTE ! US program is the standard one.

NOTE ! Regardless of program type, in LogMar Modified Chart there are the same visus sizes.

WARNING ! The chart panel has to be restarted after you have changed program.

4.13.4. Variant Phoropter

It is possible to choose up to twelve various kind of phoropters working with TCP-2000P panel. Use arrows to select the right phoropter.

Variant Phoropter options:

1. POTEC TCP-2002(A)
2. POTEC TCP-2002(R)
3. TAP-1000E TOMEY
4. TAP-1000C TOMEY
5. UDR-700 UNICOS
6. UDR-800 UNICOS
7. TC ACP8 (IS)
8. TC ACP8 (H)
9. TC ACP8 (B(F))
10. TC ACP8 (B(M))
11. TC ACP8 (B1(F))
12. TC ACP8 (B1(M))
13. TC ACP8 (F)
14. TC ACP8 (C)
15. TC ACP8 (C1)
16. DR-900TC

4.13.5. Slideshow speed [s]

The TCP-2000P in file manager allows slideshow images by pressing two times 'OK' button on image file. The option 'slideshow speed' sets time between images.

4.13.6. Network manager

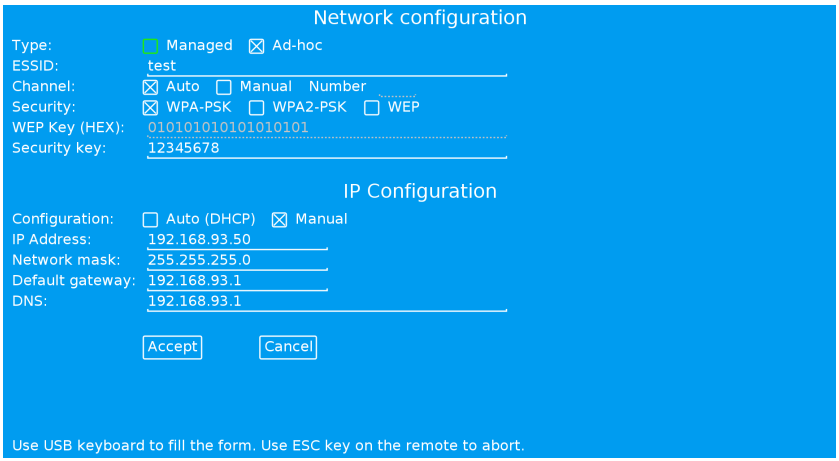
It is possible to connect the device into existing IT network or connect it with other computers.
With this option the results of the reports are available in computer network.

WARNING ! To connect the TCP-2000P to the network you need compatible Compact Wireless USB Adapter **(not included).**

For configuring the TCP-2000P network setup, you need to plug into USB ports:

- Compact Wireless USB Adapter
- USB keyboard (**not included**)

HINT ! Navigate between the setup fields using [TAB] key.
Mark / unmark a tic box using space bar.
Exit network configuration using [ESC] key on RC



WARNING ! To properly configure network connection it is necessary to have adequate knowledge on networking.
Therefore, network configuration should be carried out by specialized IT staff.

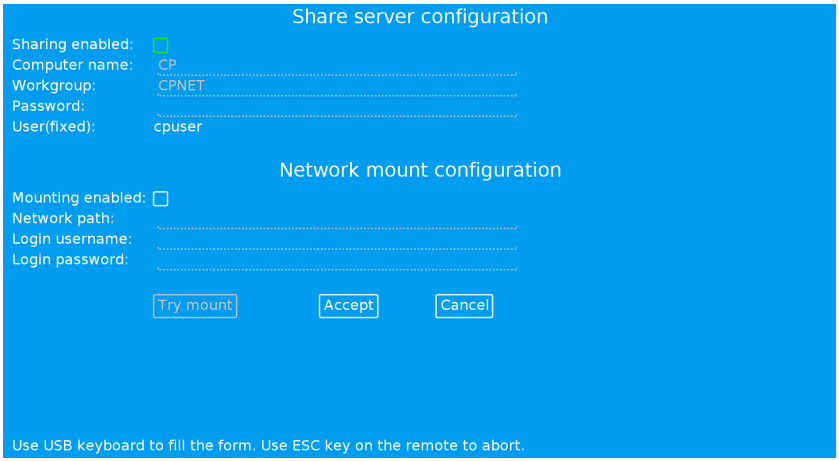
4.13.7. Sharing manager

'Sharing' option enables access to reports folder in the local network.

.

HINT !

Navigate between the setup fields using [TAB] key.
Mark / unmark a tic box using space bar.
Exit share configuration using [ESC] key on RC



WARNING !

To properly configure file sharing it is necessary to have adequate knowledge of network management. Therefore this should be carried out by specialized IT staff.

4.13.8. Network diagnostics

Detailed information about current network status.

4.13.9. Generate New PIN

Option of authorized connection with iPad for preview and printing reports
To generate new PIN press Right Arrow

.

HINT !

Information about current PIN is continuously displayed on the right bottom part of the service menu screen (AAAA code)

4.13.10. Startup Visus

1. Select '**Startup Visus'** from the list.
2. Press Right Arrow to enter
3. Press Arrow Up or Arrow Down to choose startup visus kind.
4. Press Left Arrow to apply changes.
5. Select 'Previous Menu' using Arrow Up or Arrow Down to exit from **'Startup Visus'**.

4.13.11. LogMar line isolation

This option allows to configure presentation of single line selected with the mask button on the LogMar charts. When enabled, only the line selected will be displayed, instead of underlining it.

1. Select '***LogMar line isolation'*** from the list
2. Press Right Arrow to enter.
3. Press Arrow Up or Arrow Down button to choose option YES or NO
4. Press Left Arrow to accept changes.

4.13.12. DIN line isolation

This option allows to configure presentation of single line selected with the mask button on the DIN charts. When enabled, only the line selected will be displayed, instead of underlining it.

1. Select '***DIN line isolation'*** from the list
2. Press right Arrow to enter.
3. Press Arrow Up or Arrow Down button to choose option YES or NO
4. Press Left Arrow to accept changes.

4.13.13. Beep enabled

The option allows turning off beep sound.

1. Select '**Beep enabled'** from the list.
2. Press right Arrow to enter.
3. Press Arrow Up or Arrow Down button to choose option YES or NO
4. Press Left Arrow to accept changes.

4.13.14. Fixed distance enable

HINT ! This option allow to fixed size of non optotype tests

1. Select '**Fixed distance enable'** from the list.
2. Press right Arrow to enter.
3. Press Arrow Up or Arrow Down button to choose option YES or NO
4. Press Left Arrow to accept changes.

4.13.15. Fixed distance

This option allows user to set fixed distance between patient and TCP-2000P Chart Panel.

1. Enter 'Fixed d**istance**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to enable distance edit mode.
3. Use Up and Down Arrow to set required distance.
4. To store value press Left Arrow.

HINT ! You can also set distance with 1 meter step using YES/+ or NO/- buttons

4.13.16. Demonstration mode (Demo).

Purpose of this mode is to present all TCP-2000P charts and tests at random cycle. This feature is mostly used during exhibitions and etc.

1. Select '**Demo**', using Arrow Up or Arrow Down button.
2. Press Right Arrow to run demonstration mode.
3. To exit demonstration mode press any button.

4.13.17. Colour adjustment (Masks)

Wavelength of red and green filters used in equipment like phoropter or set of test lenses vary depending on the manufacturer. **Colour adjustment** function is

designed to enable interpretability of TCP-2000P with devices purchased from different vendors.

Colour can be adjusted for phoropter and colour test filters or glasses independently. To adjust colour to test filters/glasses **Phoropter option** should be disabled, please refer to chapter 4.10. To adjust panel colours to the phoropter, **Phoropter option** should be enabled.

TCP-2000P allows setting colours to any required colour by modification of red/green/blue compound.

R - RED G – GREEN B - BLUE

WARNING !

- Colour modification effect is visible on two square polygons displayed in bottom right corner of the screen.
- It is recommended to adjust only RED compound value for the red polygon (colour mask) and only GREEN compound for the green polygon.
- Depending on Phoropter setting in the configuration menu you are adjusting panel colours for phoropter or colour glasses only.

To adjust colour intensity to the required level select with Arrow up/down button required colour compound, then press right Arrow to begin edition of the intensity. To modify colour value use up and down Arrow button. To accept and store the value press Arrow left.

4.14. Exiting Menu

Select '**Exit (SETUP)**' using Arrow Up or Arrow Down button.

1. Press Right Arrow to exit Service Menu. TCP-2000P will return to the last displayed test. Changes implemented will be saved after Chart Panel is turned off.
2. You can exit Service mode by simply pressing '**SETUP**' button. TCP-2000P will return to the last displayed test. Changes implemented will be saved after Chart Panel is turned off.
3. You can also exit from MENU using '**ESC**' button. In this case changes implemented will be saved only until Chart Panel is turned off.

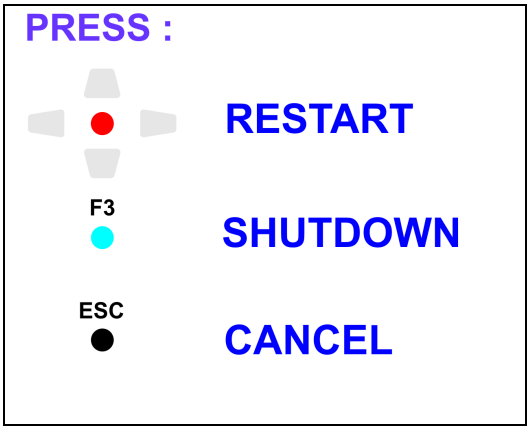
Each time you would like to return to higher level of Configuration Menu please select „**Exit (SETUP)**" and press the right Arrow or at any time **SETUP** button.

4.15. Shutdown system

Select '**Shutdown system**' using Arrow Up or Arrow Down button.

1. Press Right Arrow. Following screen will appear :

- Press '**OK**' button to restart application.
- Press '**F3**' button to shut down system.
- Press '**ESC**' button to cancel.



Pic. 9. Shutdown system

If you Press '**SLEEP/OFF**' button for about 6 seconds, above screen will also appear.

To start TCP-2000P simply press '**SLEEP/OFF**' button on the remote control.

5. TESTS

This chapter includes all detailed information regarding charts and tests available in TCP-2000P Chart Panel.

5.1. Standard optotypes

HINT !

When working with optotype charts you can at any time change contrast of the optotype. Use **'YES/+'** or **'NO/-'** buttons to set contrast level. Information about contrast used is permanently displayed on the right side of the screen. If there is no information about contrast displayed, it means it is set to 100%.

Navigating through optotype charts:

1. Press one of five top buttons on the remote control to display the biggest optotype chart possible of the selected type:

   A. letters

   B. pictures

   C. numbers

   D. Snellen E

   E. Landolt rings

5.1.1. Optotype sizes

1. After required chart has been selected, 20/400 ft (0,050 decimal) size of that optotype is displayed (unless option Keep Parameters is ON).
2. To display charts with optotypes of different sizes use Up and Down Arrows (Down Arrow – smaller optotypes, Up arrow – bigger optotypes).

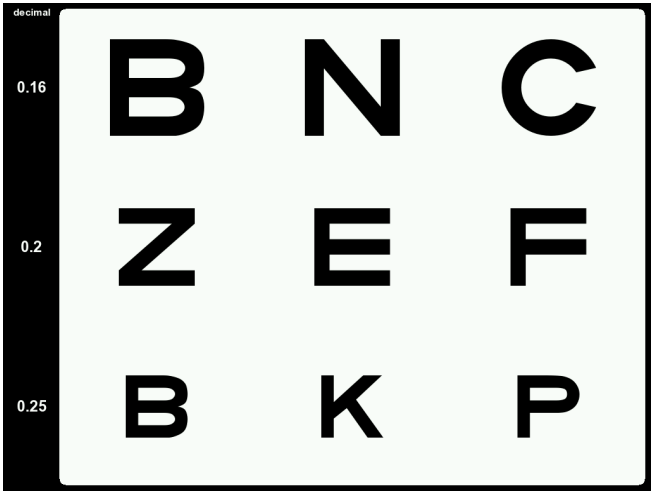
5.2. Chart types

There are 4 types of chart type presentations:

1. Snellen chart type
2. LogMar Modified chart type
3. Snellen Modified chart type
4. Snellen Contrast chart type

5.2.1. Snellen type chart presentation

The Snellen chart remains the most popular chart design among clinicians. A range of different optotypes can be displayed in Snellen. A single row or column can be shown and a range of masks is available to isolate specific letters or rows.



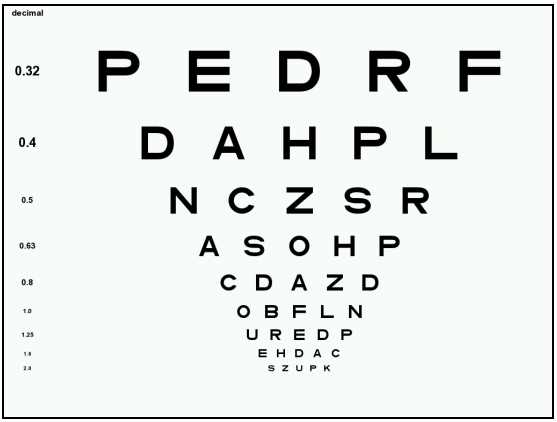
Pic. 10. Example of Snellen type chart

NOTE !

TCP-2000P Chart Panel always starts with 20/400 visus (0,050 decimal). The maximum size of the visus depends on distance setting.

5.2.2. LogMar Modified type chart presentation

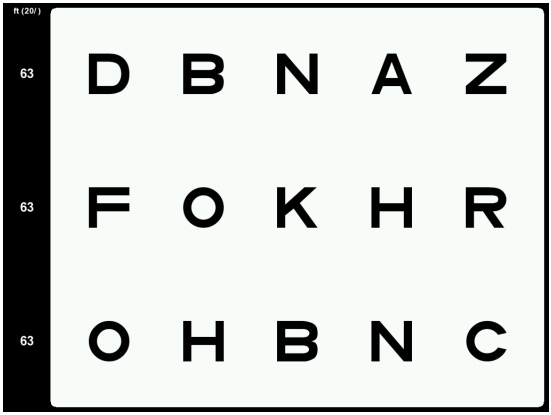
The LogMar Modified chart is a superior design to the Snellen chart. A wide range of optotypes can be displayed in LogMar Modified format.



Pic. 11. Example of LogMar Modified type chart.

5.2.3. Snellen Modified type chart presentation

A wide range of optotypes can be displayed in Snellen Modified format.



Pic. 12. Example of Snellen Modified type chart.

NOTE !

All signs on the screen have the same sharpness degree.
When you press contrast adjustment buttons then contrast changes in the same way for all rows.

NOTE !

More than one version of every stimulus displayed on the screen is always available. To view all available optotypes of a specific size, please use right and left Arrows.

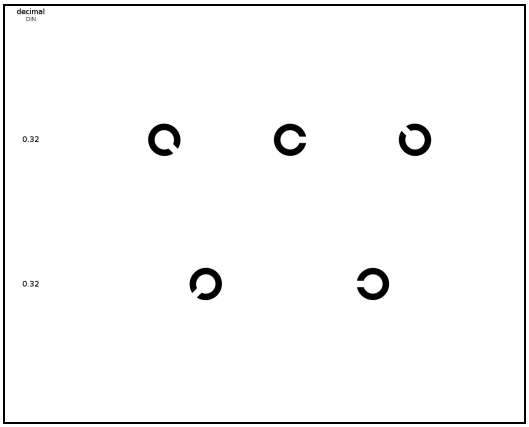
5.2.4. Snellen Contrast type chart presentation

Same as 'Snellen modified' but each line is displayed in different contrast level.

NOTE !

All charts on single screen have the same sharpness degree.

5.2.5. DIN type chart presentation



Pic. 13. Example of DIN type chart.

5.2.6. Reporting optotype tests

Please, refer to chapter 7 Report function

5.3. Black-white tests

To display one of black-white charts simply press button corresponding to its picture on IR remote. This will directly display selected chart.

Test name	Key description
Cross grid	
Cross cylinder	
Fixation point	
Astigmatism	

Cross grid test has three presentations. To change from one presentation to another press again  button or *Right/Left Arrow.*

Cross cylinder test has two presentations – with white or black background. To change from one presentation to another press again  button or *Right/Left Arrow.*

NOTE !

You can scale Cross Cylinder test up and down, from 50% to 200 %, with 10 % step.

1. Use cnt+ button to enlarge and cnt- button to reduce the test size.
2. To see actual test size press CHART TYPE buton
3. To reset to 100% size press OK button.

Astigmatism test has three presentations – one with hour description and two with angle description. To change from one presentation to another press again  button or *Right/Left Arrow.*

5.4. Red-green tests

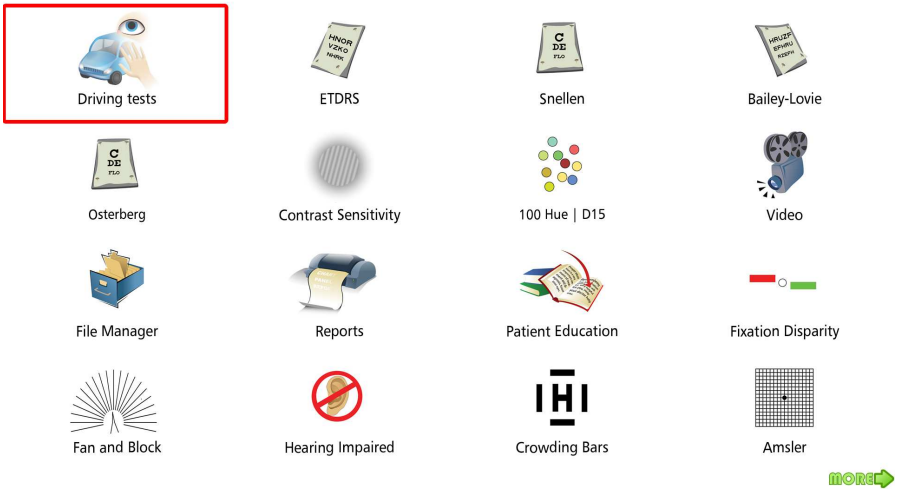
To display one of red-green charts simply press button corresponding to its picture on IR remote. This will directly display selected chart.

Test name	**Key description**
Schrober	
Red-Green panel	

- Schrober test has two presentations (colours reverse). To change from one presentation to another press again  button or Right/Left Arrow
- Red-Green panel has few a presentations. To change from one presentation to another press again  button or Right/Left Arrow

5.5. Other Tests

To enter **'Other Tests'** press MENU button.



Pic. 14. Other tests

- Fitness to Drive Test
- ETDRS Charts
- Standard Snellen Chart
- Bailey-Lovie Chart
- Osterberg
- Contrast Sensitivity Test
- 100 HUE / D15 Tests
- Video
- File Manager
- Reports
- Patient Education
- Fixation Disparity Test

- Fan and Block
- Hearing Impaired Mode
- Crowding Bars
- Amsler Tests
- Animations
- Street Lamp Test
- Colour Pictures For Children
- Stereo images
- Images of an eye.
- Description of the IR remote

How to navigate in 'Other Tests'?

1. Use Arrows to highlight one of available tests.
2. Press 'OK' button to enter the test that is selected.
3. To exit **'Other Tests'**, press any other test button.
4. To return to higher level press 'ESC' button.

- 16 options are visible on the screen. To move to the remaining one (IR remote description), go to option in the right-bottom corner and press Arrow Down or Right.

5.5.1. Fitness to Drive Test (optional)

There is installed 5 kinds of Fitness to Drive tests:
Visual Acuity (a standard optotype test, in accordance to 5.5..1.1),
and opdional driving tests:
Twilight Vision
Glare Sensitivity
Driving Contrast Sensitivity
Photostress Recovery Time

EU directives, 2006/126/CE and 2009/113/CE, changed the eligibility minimum requirements to obtain or renew driving license for people affected by visual diseases. These new provisions require the assessment of twilight vision, contrast sensitivity and glare sensitivity; in case of several renews or releases of driving licenses, the doctor is demanded to use simplified screening procedures in order to quickly identify patients with visual diseases requiring a specific assessment of the minimums prescribed by law. When one or more minimums lacks, a Local Medical Commission is competent to evaluate.

Drivers are divided into two groups in relation to the features of the vehicles they wish to license:
- Group 1: drivers of vehicles in A, B, B + E categories and in A1 and B1 subcategories
- Group 2: drivers of vehicles in C, C + E, D, D + E categories and in C1, C1 + E, D1 and D1 + E subcategories

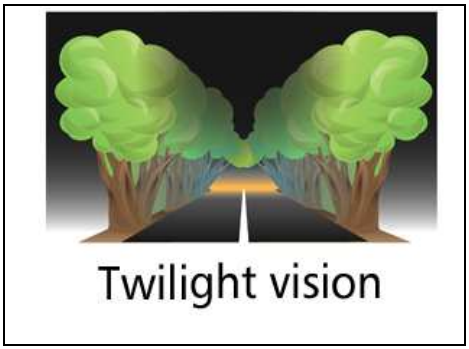
5.5.1.1. Visual Acuity

This test should be conducted with „Sloan Letters" optotype and at the distance of far vision tests. Patient is asked to recognize at least three or five letters of line with a single bare eye (or with correction), starting from the first line (0,1).

For driving licenses of group 1, in case of binocular vision, is required the reading of line 0,2 at least, with the worst eye (in this case, is required to read 0,5 line with the other eye. In case of monocular vision, is required the reading of 0,8 line at least. For driving license of group 2 is required the reading of 0,8 line at least, with the best eye and of 0,4 line with the other.

NOTE ! This test should be performed with standard optotype test. Please, refer to chapter 5.1

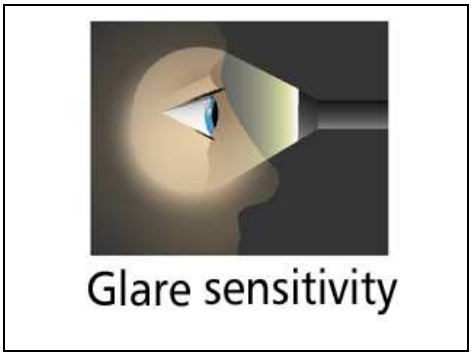
5.5.1.2. Twilight Vision Test



For Twilight Vision test the environment shall be obscured with a backlight luminance of 1 or 2 lux. The test is conducted in binocular vision. After an adjustment to the environment light for ten minutes at most, proceed to evaluate the twilight visual acuity, starting from 0,1 line showed by the optotype.

The binocular visual acuity shall be 0,1 for group 1 licenses and of at least 0,2 for group 2 licenses.

5.5.1.3. Glare Sensitivity Test



NOTE!

To conduct this test the additional lamps have to be necessarily installed to the panel.

The lamps are optional equipment and are provided separately – on request.
Installation instructions are supplied with the lamps.

In this test two lamps are situated both on the right and the left side of the chart panel. The lamps are switched on at the beginning of the test and switched off automatically after two minutes later. The lamp are provided separately.

The test should be conducted at the **distance of 1,5 meters**.

The backlight will be switched off when you choose the glare sensitivity test with the OK button. If the OK button will be pressed again, then backlight will be switched on and the test is starting, the patient should be asked, in binocular vision, to recognize the letters in the first or second line.

For the licenses of group 1, for passing the test is required reading at least two-thirds of the letters in the first line, corresponding to 0,1 in a maximum of one minute. For the licenses of group 2 is required the reading in the same range of a minute of the letters in the second line, corresponding to 0,2.

5.5.1.4. Driving Contrast Sensitivity Test

The test must be conducted in binocular vision, with bare eye or with correction in case of refractive vice. A line is considered read when two out three letters or three out five are correctly recognized. In case of subjects with lenses, affected by advanced preosbia a better correction with the addition of + 1.00 diopter might be needed.

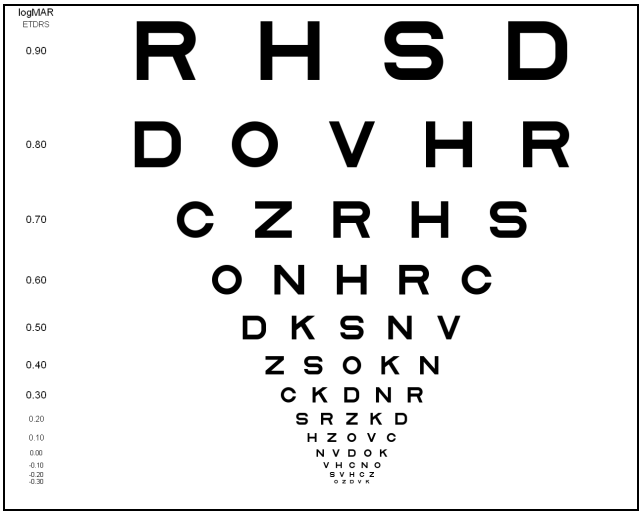
For the driving licenses of group 1 is required at least the reading of the line corresponding to the logaritmic value of 1,20 (Log. CS), indicating contrast threshold of about 6% (0,063).

For the driving license of group 2 is required at least a reading of the line corresponding to the Log. CS 1,50 indicating a contrast threshold of about 3% (0,032).

5.5.2. ETDRS Charts

There is installed 6 kinds of ETDRS tests:

Original Series ETDRS chart 1
Original Series ETDRS chart 2
Original Series ETDRS chart R
Revised 2000 Series ETDRS Revised 2000
Revised 2000 Series ETDRS Revised 2000
Revised 2000 Series ETDRS Revised 2000



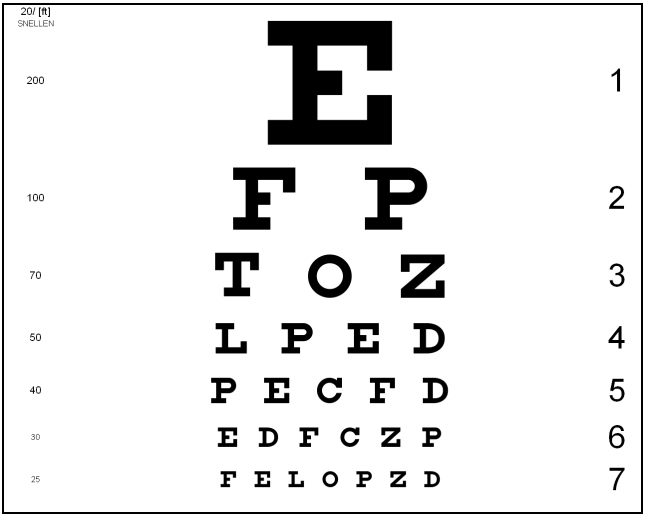
Pic. 15. ETDRS Chart

HINT ! In ETDRS Chart single and horizontal underlining, red-green mask are available.

HINT ! The report function is available for this test. Please, refer to chapter 7 Report function.

WARNING In ETDRS Chart Low Vision Mode is not available.

5.5.3. Standard Snellen Chart



Pic. 16. Standard Snellen Chart

HINT ! In Standard Snellen Chart single and horizontal underlining, red-green mask are available.

HINT ! The report function is available for this test. Please, refer to chapter 7 Report function.

WARNING In Standard Snellen Chart Low Vision Mode is not available.

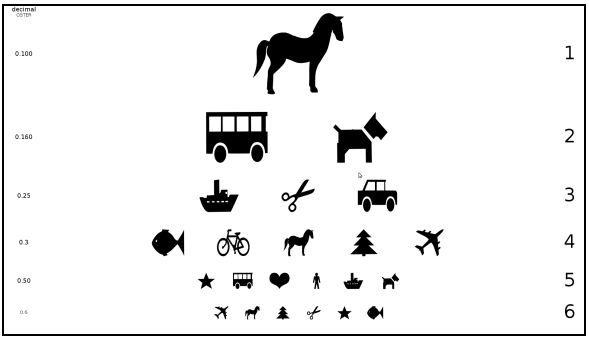
5.5.4. Bailey-Lovie Chart

HINT ! In Bailey-Lovie Chart single and horizontal underlining, red-green mask are available.

HINT ! The report function is available for this test. Please, refer to chapter 7 Report function.

WARNING In Bailey-Lovie Chart Low Vision Mode is not available.

5.5.5. Osterberg Chart



Pic. 17. Osterberg Chart

HINT ! In Osterberg Chart single and horizontal underlining, red-green mask are available.

HINT ! The report function is available for this test. Please, refer to chapter 7 Report function.

WARNING In Osterberg Chart Low Vision Mode is not available.

5.5.6. Contrast Sensitivity Test (CST)

It is possible to enter CST in two ways: from 'Other tests' and pressing 'CONTRAST' button. For more information on CST, please refer to chapter 5.8 Contrast Sensitivity Test

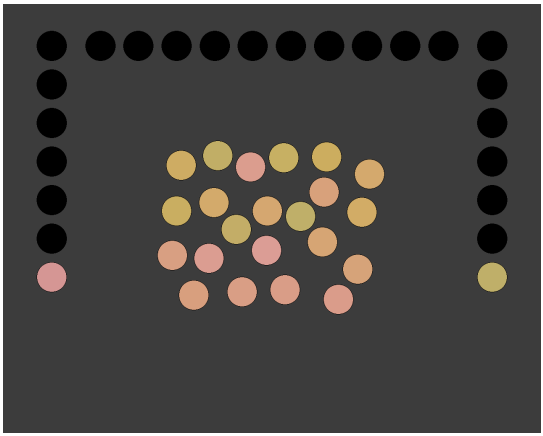
5.5.7. 100 HUE Test

The **100-Hue Test** is widely used in industries where colour decisions are critical. In a quick, precise and easy way the test determines colour vision abnormalities and checks patient's ability to make color discrimination. The test can also be used to determine eye diseases, diabetes, Parkinson's disease and the effects of various pharmaceuticals on colour vision.

How it Works:

WARNING **To do this test it is necessary to have USB mouse (not included) and plug it into USB port 1 or 2.**

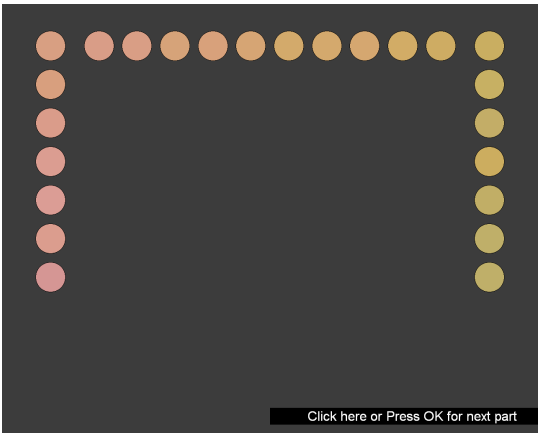
The patient is presented with 4 sets of colour dots (one at a time). In each set there are 21 colour dots in the centre of the screen and 2 pilot colour dots at either end of the row of 'holes' formed on the edge of the screen (see **Pic. 22.** 100 HUE Test)



Pic. 18. 100 HUE Test

The patient is asked to arrange the dots so that the colours/hues go smoothly from the first pilot colour dot to the last (see **Pic. 23.** 100 HUE Test). There is a predetermined sequence for each set. The closer the patient is to the correct sequence, the better his/her colour discrimination.

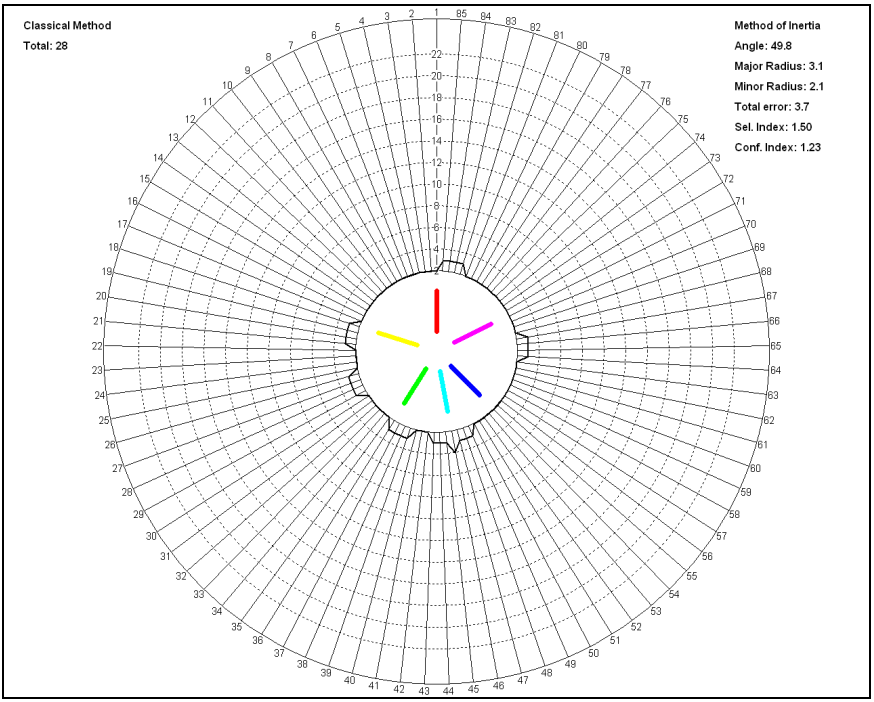
In order to arrange the dots the patient has to drag each dot from the centre of the screen (using a computer mouse) and drop it in an appropriate 'hole' on the edge of the screen. When all the dots in one set have been fitted, a message '**Click here or Press OK for next part**' appears at the bottom of the screen.



Pic. 19.100 HUE Test

In this way the patient goes through 4 sets of colour dots. When the fourth set has been arranged, a message '**Click here or Press OK to finish**' appears at the bottom of the screen.

When the whole test has been completed, a diagram with the results is generated.



Pic. 20. 100 HUE Test report

5.5.7.1. 100 HUE Report Function

For more information please, refer to chapter 7 Report function

5.5.8. D15 Saturated and D15 Desaturated Tests

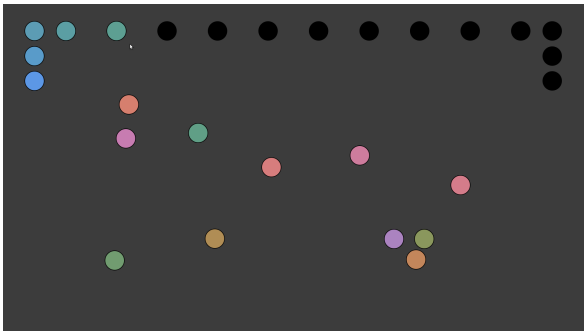
The **D15 Tests** is widely used in industries where colour decisions are critical. In a quick, precise and easy way the test determines colour vision abnormalities and checks patient's ability to make color discrimination. The test can also be used to determine eye diseases, diabetes, Parkinson's disease and the effects of various pharmaceuticals on colour vision.

How it Works:

WARNING

To do this test it is necessary to have USB mouse (not included) and plug it into USB port 1 or 2.

The patient is presented one set of colour dots. The set there are 16 colour dots in the centre of the screen and 1 pilot colour dot (see **Pic. 25.** D15 Saturated Test and **Pic. 26** Desaturated Test)



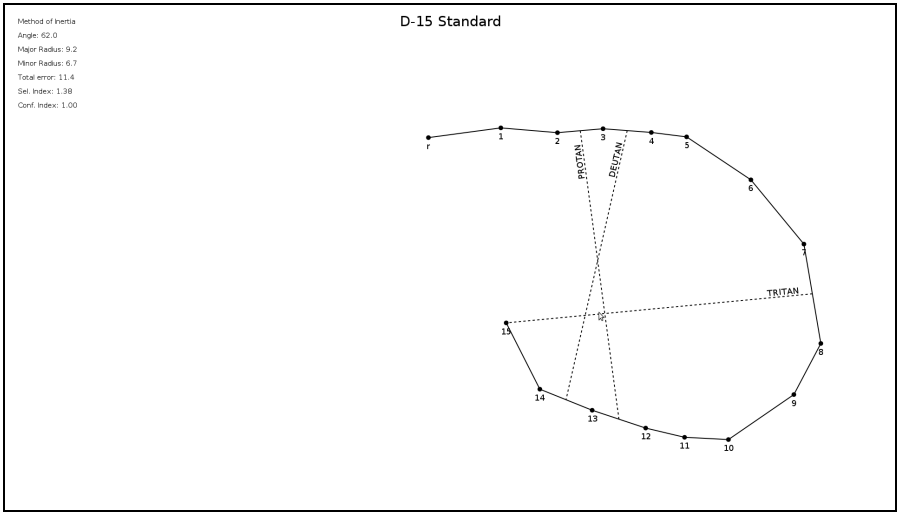
Pic. 21. D15 Test

The patient is asked to arrange the dots so that the colours go smoothly from the pilot colour dot. The closer the patient is to the correct sequence, the better his/her colour discrimination.

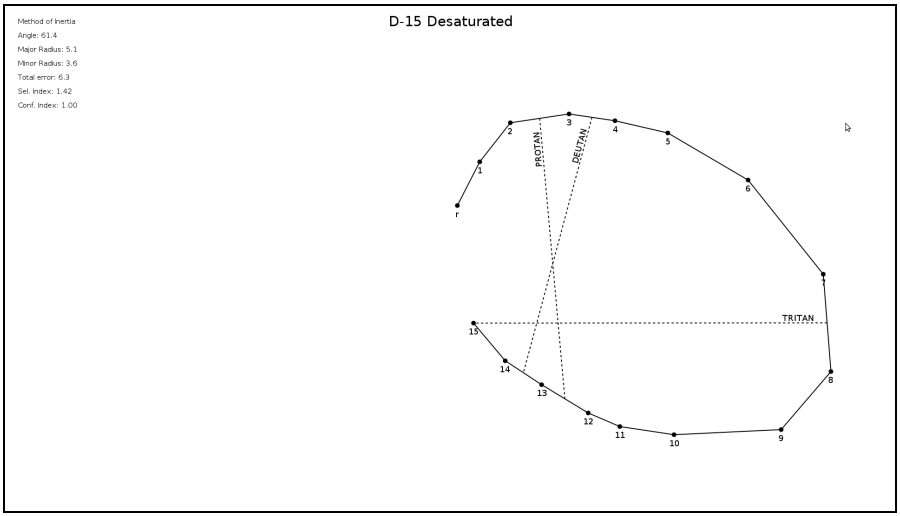
In order to arrange the dots the patient has to drag each dot from the centre of the screen (using a computer mouse) and drop it in an appropriate 'hole' on the edge of the screen. When all the dots in one set have been fitted, a message '**Click here or Press OK to finish**' appears at the bottom of the screen.

Pic. 22. D15 Test

When the whole test has been completed, a diagram with the results is generated.



Pic. 23. D15 Saturated Test report



Pic. 24. D15 Desaturated Test report

5.5.8.1. D15 Saturated and D15 Desaturated Report Function

For more information please, refer to chapter 7 Report function

5.5.9.Video

This option allows you to play video.

Please refer to chapters :

5.5.10 File Manager,
5.5.10.1 Entering File Manager Help.
5.5.10.2 Opening Removable Usb Pen Drive
5.5.10.3 Copying Files
5.5.10.4 Deleting Files
5.5.10.7 Video Function
5.5.10.8 Exiting From File Manager

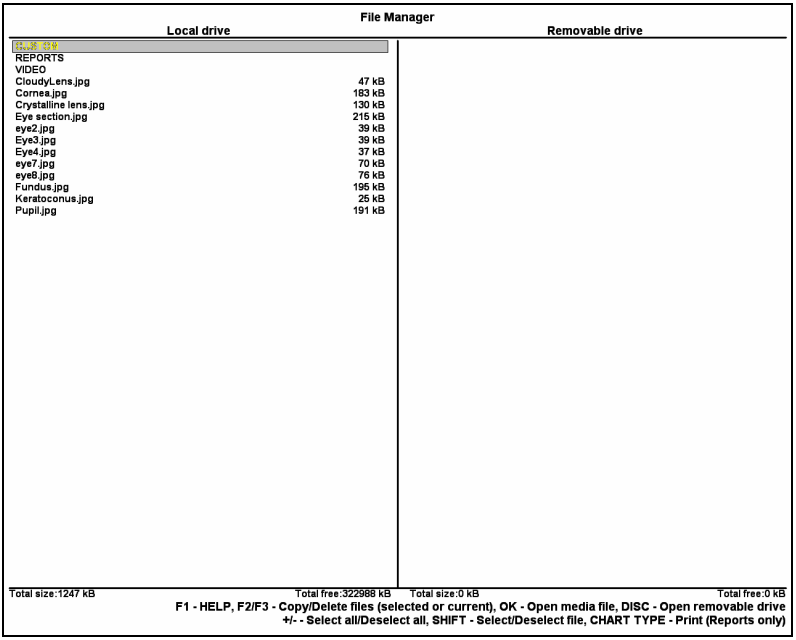
5.5.10 File Manager

File Manager allows the user adding, playing and deleting own videos, images and animations .

How to navigate in 'File Manager'?

To enter File Manager :

1. Use Arrows to highlight 'File Manager' and press **'OK'** button on the remote control.
2. Use Up/Down Arrows to choose option that interests you and press 'OK' button to enter it.



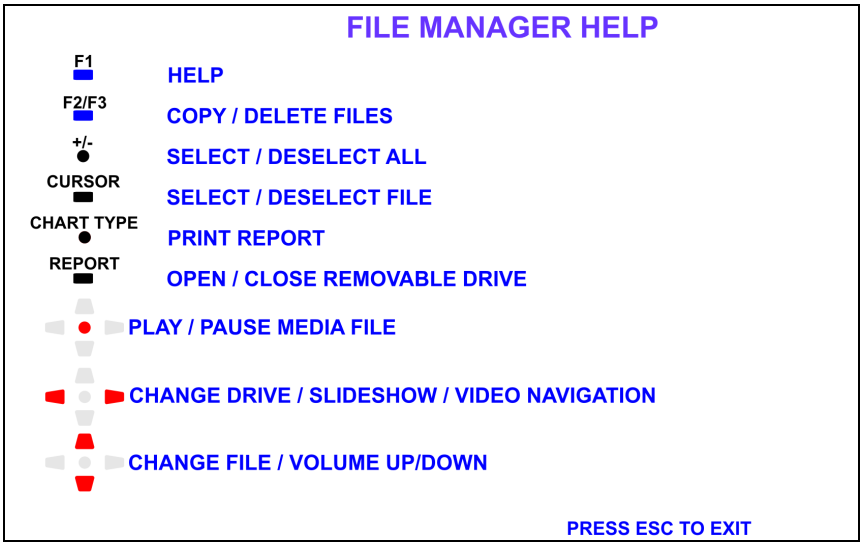
Pic. 25. File Manager

TOTAL SIZE: total media size (KB)

TOTAL FREE: total available space (KB)

5.5.10.1 Entering File Manager Help

1. Press ‘F1’ button to enter FILE MANAGER HELP



Pic. **26.** File Manager Help

2. Press ‘ESC’ button to exit from FILE MANAGER HELP

5.5.10.2. Opening Removable USB Pen Drive

1. Put USB PEN DRIVE into USB slot 1
   and press **REPORT** button.

5.5.10.3. Copying Files

1. Choose drive (Local drive or Removable USB Pen Drive) using

left-right arrows.

2. Select file using **up/down Arrows**, **Cursor** button (more files), **YES/+** button (all files)
3. Press 'F2' button to copy file.
4. Press 'OK' button to confirm copying or 'ESC' button to cancel.

WARNING ! After copying or deleting files you have to close USB PEN DRIVE using **REPORT** button.

5.5.10.4. Deleting Files

1. Choose Local drive.
2. Select file using up/down **Arrows**, **Cursor** button (more files) or **YES/+** button (all files).
3. Press 'F3' button to delete file.
4. Press 'OK' button to confirm deleting or 'ESC' to cancel.

5.5.10.5. Play/Pause Media File

1. Select file using up-down **Arrows**.
2. Press 'OK' button to show an image.
3. Press 'Esc' Button to go to File Manager.

5.5.10.6. Slideshow Images Function

This function is available only for jpg ,png, gif or animated gif file format.

1. Press 'OK' button to show an image/images.
2. Press once again 'OK' button to turn on slideshow images.
3. Press once again 'OK' button to turn off slideshow images.

5.5.10.7. Video Function

This option allows you to play video.

1. Select video file using arrow up or down.
2. Press ‘OK’ button to play video.
3. Press up or down button to adjust volume.
4. Use ‘**OK’** button to pause/play video.
5. Press right arrow to forward 10s.
6. Press left arrow to rewind 10s.
7. To exit video mode press ’ESC’ button.

HINT ! You can play video and show images also from USB PEN DRIVE.

WARNING To start the video for the first time it takes a few seconds.

5.5.10.8. Exiting From File Manager

1. Press ‘ESC’ button to exit from File Manager.

5.5.11 Reports

You can enter Report Manager directly from ‘Other Tests’. Reports are also available in File Manager (reports folder).

5.5.12 Patient Education

This option allows educating the patient about e.g. eye structure, methods of treatment etc.

HINT ! There is a possibility to add own presentations: images, video. Please, contact with the local distributor.

5.5.13 Fixation Disparity Test

Press '**OK**' button to enter Fixation Disparity Test.

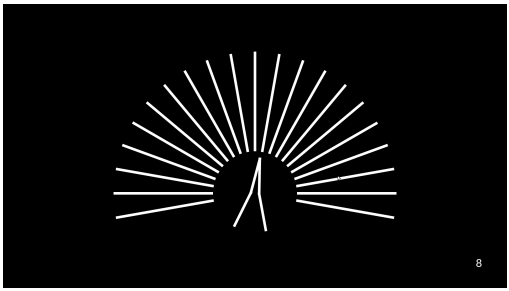
1. Press Arrow up or Arrow down to move the right or* bottom bar.
2. Press Arrow left or Arrow right to move the left or top bar.
   (* depending on the selected presentation - horizontal / vertical)
3. Press '**OK**' button to rotate red-green bars 90° clockwise.

HINT ! The report function is available for this test. Please, refer to chapter 7 Report function .

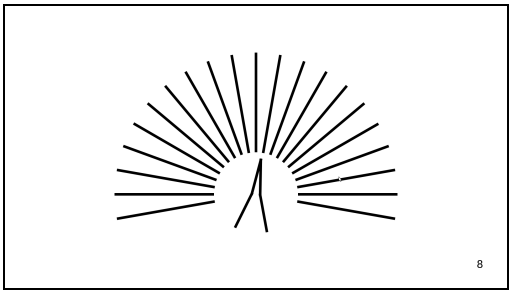
5.5.14 Fan and Block Test

Press '**OK**' button to enter Fan and Block Test. The Fan and Block test consists of two parts: **FAN (black and white)** and **BLOCK (black and white)**

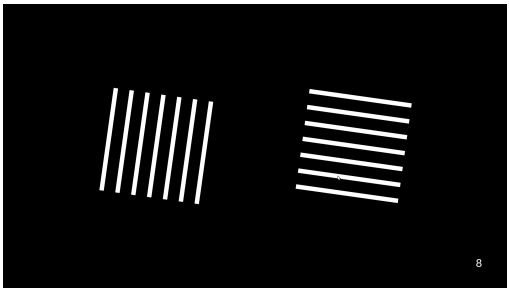
1. Press Arrow left or Arrow right to change angle with step 1°.
2. Press Arrow up or Arrow down to change angle with step 10°.
3. To change background press 'OK' button.
4. To change test between Fan and Block press 'CHART TYPE' button.



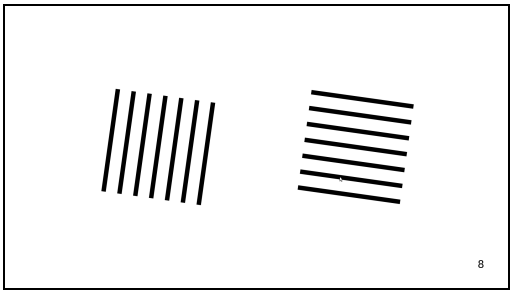
Pic. 27. Fan test (Black)



Pic. 28. Fan test (white)



Pic. 29. Block test (white)

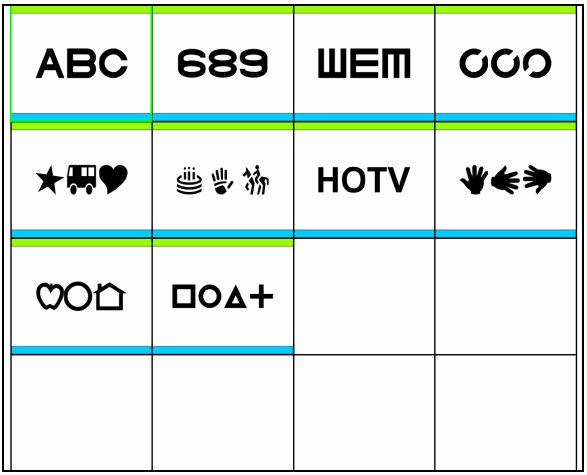


Pic. 30. Block test (white)

5.5.15. Hearing and Speaking Impaired Tests

The Chart Panel allows for communicating with hearing and speaking impaired patients not only during a regular examination, but also when they are being refracted. This mode is designed to enable giving instructions and asking questions of deaf patients. It also allows a proper examination of mute patients.
By displaying green and blue bars at the top and bottom of the display, the Smart Chart makes it a simple task to deliver questions and instructions to the patient. The meanings of these bars can be adapted by each practitioner, according to their needs and the level of patients' disability. Below, we present one way of asking questions and giving instructions. However, if it does not fit your style of examination, change and modify it to make it more useful for you. We also suggest you write down your instructions and present them to the patient before conducting any tests.

Tests available in Hearing and Speaking Impaired Mode:



Pic. 31. Hearing and Speaking Impaired Tests

- Sloan letters
- Numbers
- Snellen E
- Landolt Rings
- Standard pictures
- Allen
- HOTV
- Hands
- Symbols
- HYVA

Sample instructions for hearing and speaking impaired patients:

I. Instructions for patients being presented with: Sloan Letters, Numbers and Standard Pictures:

- When two bars, blue at the top and green at the bottom of the display are presented, the examiner is indicating to you that you are going to see two new choices.
- After you have seen both choices, you should decide which one seems clearer and better by pointing with your hand in the direction of the bar which represents the better choice (up or down). It may happen that neither choice seems perfectly clear. That is OK, simply choose which one seems better.
- If neither choice seems better than the other, indicate to both directions.
- The rest of the test will be conducted in this way.

NOTE !

With patients able to speak: When the optotype is presented, the examiner is asking you to read it (Letters and Numbers) or name it (Pictures).

II. Instructions for patients being presented with: HOTV test:

- When two bars, blue at the top and green at the bottom of the display are presented, the examiner is indicating to you that you are going to see two new choices.
- If you recognize choice one, you are asked to point to an appropriate letter from the chart received from the doctor.
- If you do not recognize choice one, point with your right hand to the side.

NOTE !

Professional charts are available from many distributors of visual acuity equipment. The chart can be simply a handout with big letters HOTV printed on it.

The examiners are free to apply to HOTV test the same procedure as with Letters, Numbers and Pictures, but matching technique seems to provide more precise answers.

To obtain more reliable results, matching technique can be applied also to Pictures and Numbers, as there are not many optotypes to choose from.

- If you recognize choice two, you are asked to point to an appropriate letter from the chart received from the doctor.
- If you do not recognize choice two, point with your right hand to the side.
- The rest of the test will be conducted in this way.

III. Instructions for patients being presented with: Landolt Rings, Snellen E or Hands:

- When two bars, blue at the top and green at the bottom of the display are presented, the examiner is indicating to you that you are going to see two new choices.
- You are asked to point in the direction to which it is 'open' (9 directions in case of Landolt Rings, 4 directions in Snellen E, 4 directions in 'Hands').

  e.g. if you see  , point to the right.

- You are asked to point in the direction to which it is 'open' (9 directions in case of Landolt Rings, 4 directions in Snellen E, 4 directions in 'Hands'.
- The rest of the test will be conducted in this way.

HINT !

The report function is available for this test. Please, refer to chapter 7 Report function.

5.5.16. Crowding Bars

There are 25 options of tests with crowding bars:

Pic. 32. Crowding Bars

1. To enter a test with crowding bars, choose one and press 'OK' button.
2. To display charts with optotypes of different sizes use Up and Down Arrows (Down Arrow – smaller optotypes, Up arrow – bigger optotypes).

- 16 options of tests with crowding bars are visible on the screen. To move to the remaining 8 tests, go to test in the right-bottom corner and press Arrow Down or Right.

HINT ! The report function is available for this test. Please, refer to chapter 7 Report function.

5.5.17. Amsler Test

There are three options of Amsler test:

- Black bars on white background
- White bars on black background
- Red bars on black background

Use left and right arrows to proceed from one test to another.

5.5.18. Animations

There is a wide choice of animations to enable testing children.

- Use left and right arrows to proceed from one animation to another.
- There is a slideshow feature available for children animations:

  1. Press '*OK*' button to to turn on slideshow.
  2. Press once again '*OK*' button to turn slideshow off.

5.5.19. Street Lamp Test

Press '**OK'** button to enter Street Lamp Test.

- Use the arrows to proceed the test.

5.5.20. Colour Pictures For Children

There is a wide range of colour pictures (showing different animals) to enable testing pre-school children. Animals appearing in the test are the most popular ones, to make testing of the youngest children possible.

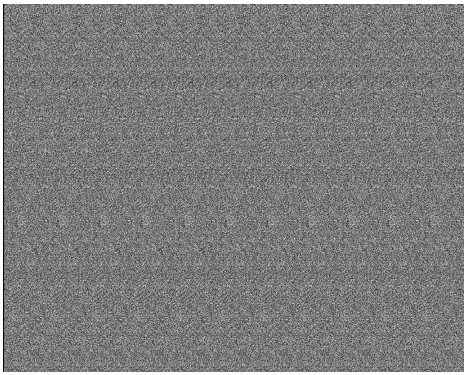
- Use left and right arrows to proceed from one picture to another.

5.5.21. Stereo Images

There are installed two kinds of stereo tests:

- SIRDS images (Single Random Image Dot Stereograms)
- Stereo circles test

5.5.21.1 SIRDS – Single Image Random Dot Stereograms



Pic. 33. SIRDS Image

Single Image Random Dot Stereograms (SIRDS, sometimes called Autostereograms) allow the viewer to perceive three dimensional information using one image.
Autostereograms represent one of the latest approaches to creating the illusion of three dimensions.

How to view Autostereograms ?

Most Stereogram pictures are usually generated so that if you look at (converge your eyes on) a position twice as far away as the picture, and focus on the picture, generally after a few minutes you see a surprising 3D image.
Most people find this extremely difficult for the first time. You have to focus on a point which is different from where you are looking. This is known as "de-coupling" your vision process. Instinctively people focus at the same point they are looking at, and this is the main obstacle in seeing images of this type.

There are many ways to teach this de-coupling to either yourself or to others, including (in almost no particular order):

NOTE !

It is generally easier to see Stereograms under bright light because your eye relies less on focus under harsh conditions. Another point, to see stereo images, you need to have "passable" use of both eyes. If you wear glasses try with and without them on. Some short-sighted people can see them easier without their glasses on (if they get closer to the picture).

METHOD 1 - The pull-back

Hold the picture (or move your face) so your nose is touching the picture. Most people can not possibly focus with something this close to their eyes, and they will be content with their inability to focus. With the picture up close, pretend that you are looking straight ahead, right through it. Now slowly pull the picture (or your face) away while keeping your eyes pointed straight ahead. If you do this slow enough, an image usually appears when the picture is at the correct distance.

METHOD 2 - The reflection

As mentioned above, with a reflective surface it is sometimes a lot easier to converge your eyes in the correct position. You simply focus on your nose or some central reflection in the picture, and wait until you focus on the image.

METHOD 3 - The wall, or the finger

Hold the picture so that it is half between you and a wall. Look over the top of the picture towards the wall, and focus on something such as a picture hook or mark. While keeping this "gaze" either slowly lift the picture or lower your eyes while keeping them converged on the wall.
A similar approach (but for cross-eyed viewing) is to stand arm's length away from the picture and put your finger on the picture. While slowly pulling your finger towards your face, keep looking at your finger, you will notice the picture becoming blurry, and at an intermediate position you will see the 3D image.

METHOD 4 - The see-through

If it is possible, photocopy the picture onto a transparency. Then focus through the transparency onto something twice as far away. This is similar to the above method except now you don't need to change the position of your gaze.

You can't see anything, what now ??

If you don't manage to see the amazing pictures hidden inside the autostereograms immediately, don't let it get you down. Your brain needs time to switch between 'NORMAL' vision to that of stereoscopic vision. Try not to force your eyes when focusing.

5.5.21.2 Stereo circles test

Stereo circles test has 9 presentations. To change from one presentation to another press Right/Left Arrow

STEREO TEST - CIRCLES		Reference Distance Constant 15 Minutes of Arc
Test	Correct Answers	Angle of Stereopsis at 16 Inches
1	Bottom	800 Seconds
2	Left	400 Seconds
3	Bottom	200 Seconds
4	Top	140 Seconds
5	Top	100 Seconds
6	Left	80 Seconds
7	Right	60 Seconds
8	Left	50 Seconds
9	Right	40 Seconds

Table 6. Stereo circles test information table

5.5.22. Eye pictures

As a standard there are installed only few Eye images.

5.5.23. Description of the IR remote functions

Enter this option to see a clear description of all buttons on the IR remote
.

5.6. Polarization tests

To display one of polarization charts simply press button corresponding to picture on IR remote. This will directly display selected chart.

Test name	Key description
Duochrome Balance	
Horizontal, Vertical Coincidence	
Polarized Double Panel	
Phoria	
Stereo	
Worth (polarazing)	

NAVIGATION:

- To change from one test to another press Down/Up Arrow
- To change polarization (left/right to right/left eye) press Right/Left Arrow

- Polarized Double Panel test has four presentations. To change from one presentation to another press again  button or Right/Left Arrow
- Phoria test has two presentations. To change from one presentation to another press again  button or Right/Left Arrow.

5.7. Ishihara tests

1. Press  to display first Ishihara test.
2. Press Right Arrow to display next test.
3. Press Left Arrow to display previous test.
4. Press Up Arrow to jump 10 tests forward.
5. Press Down Arrow to jump 10 tests backward.
6. Press  again, to display test hint.

5.8. Contrast Sensitivity Test

5.8.1. What is Contrast Sensitivity?

Contrast sensitivity is the visual ability to see objects that are not outlined clearly or that do not stand out from their background. A person with low contrast sensitivity can have such vision difficulties as:

- Difficulties with seeing traffic lights or cars at night
- Experiencing tired eyes while watching television
- Not seeing spots on clothes or dishes
- Not seeing whether a flame is burning on a stove
- Needing very bright light to read

5.8.2. Why is Contrast Sensitivity Testing so important?

A lot of people think the popular 20/20 letter chart is the best way to test everyday vision. Most letter charts, however, only measure a patient's ability to recognize black letters of different size on a white background, which is a high contrast situation. But life is also full of low contrast situations. People who have low contrast sensitivity might be able to read the small letters on a visual acuity chart but can still have difficulties recognizing objects at night or in a dark room. Unlike the letter charts, which measure the ability to see objects (or letters) of different

sizes, a contrast sensitivity test measures two variables, size and contrast. The ability to detect objects of different sizes at lower contrasts is expressed as a contrast sensitivity function (CSF). The test determines the person's contrast detection threshold, the lowest contrast at which a pattern can be seen.

Only standard letter tests combined with contrast sensitivity tests can provide the opticians with a complex knowledge about their patient's visual condition. What is more, Contrast Sensitivity Test can detect several diseases such as cataracts, glaucoma, amblyopia (also known as 'lazy eye'), AIDS, Alzheimer's, macular degeneration or diabetes.

5.8.3. How Contrast Sensitivity Test works?

Contrast sensitivity test (CST) shows circles (one at a time) containing sinusoidal gratings of 5 spatial frequencies with 8 contrast sensitivity levels each. **To make the test more reliable, the orientation of the gratings (vertical, horizontal, inclined 15 degrees clockwise, or inclined 15 degrees counter clockwise) is chosen at random.** The test consists of two parts:

- vertical
- horizontal

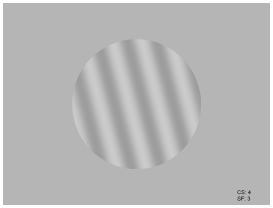
WARNING

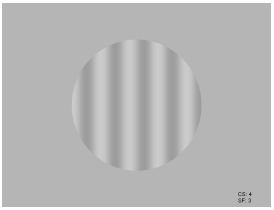
It is important that the practitioner marks the exact answer of the patient, **even if it is wrong**. Only then the result of the test is reliable.

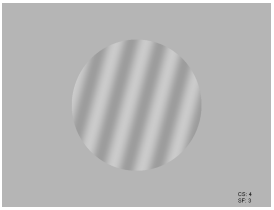
VERTICAL PART:

1. Press '**CONTRAST'** button to enter the test. The first circle is displayed. The patient has to recognize the direction of the top of each grating and name it: **left (picture 38a), vertical (picture 38b), right (picture 38c).**
2. Press '**Right Arrow**' if the patient's answer is '**right**'.
3. Press '**Left Arrow**' if the patient's answer is '**left**'.
4. Press '**Up Arrow**' or '**Down Arrow**' if the patient's answer is '**vertical**'.
5. Press '**NO/-**' button if the patient's answer is '**don't know**'.

There is a beep signal after each answer. Continue this procedure throughout the test. The information about the present contrast sensitivity and spatial frequency is displayed in the right-bottom corner.


Pic. 38a Left gratings,


Pic. 38b Vertical gratings,


Pic. 38c Right gratings.

The test starts at the lowest spatial frequency and goes through 8 levels of contrast sensitivity. Then the test proceeds to higher spatial frequencies.

Once the highest contrast sensitivity that the patient is able to identify is determined at each spatial frequency, the test proceeds to the remaining stimuli. When the vertical part of the test ends this info will appear:

End of first part of test
Press OK to finish or other key to continue

- If you press '**OK**' button, report will appear.

HINT !

The report function is available for this test. Please, refer to chapter 7 Report function.

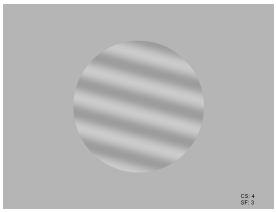
- If you press any other button, horizontal part will start.

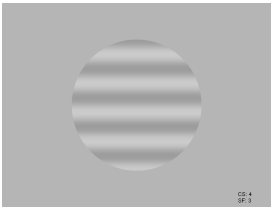
WARNING

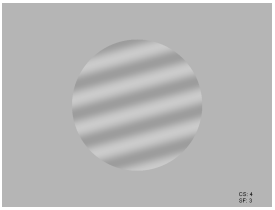
It is important that the practitioner marks the exact answer of the patient, **even if it is wrong**. Only then the result of the test is reliable.

HORIZONTAL PART:

1. The first circle is displayed. The patient has to recognize the direction of the top of each grating and name it: **down (picture 39a), horizontal (picture 39b), up (picture 39c).**


Pic. 39a Down gratings,


Pic. 39b Horizontal gratings,


Pic. 39c Up gratings.

2. Press '**Down Arrow**' if the patient's answer is '**down**'.
3. Press '**Left Arrow**' or '**Right Arrow**' if the patient's answer is '**horizontal**'.
4. Press '**Up Arrow**' if the patient's answer is '**up**'.
5. Press '**NO/-**' button if the patient's answer is '**don't know**'.

Continue this procedure throughout the test. The information about the present contrast sensitivity and spatial frequency is displayed in the right-bottom corner.

HINT ! To leave Contrast Sensitivity Test press **'ESC'** or press once again '**CONTRAST**' button.

5.8.4. Contrast Sensitivity Report Function

For more information please, refer to chapter 7 Report function.

5.8.5. Technical Data

1. In defining the contrast of sinusoidal gratings, the luminance of reference is the mean luminance of the peak waves. Therefore, modifications to the

contrast are obtained by concurrently varying the luminance of the light and dark bands as to keep the mean luminance unvaried.

mean L = (Lmax + Lmin) / 2
C = (Lmax – Lmin) / (Lmax + Lmin)
S = (Lmax + Lmin) / (Lmax – Lmin)
L – luminance
C – contrast
S – contrast sensitivity

Line	Spatial Frequency	Contrast Sensitivity							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Line A	1,5	4	7	12	20	35	70	120	170
Line B	3	4	9	15	24	44	85	170	220
Line C	6	5	11	21	45	70	125	185	260
Line D	12	5	8	15	32	55	88	125	170
Line E	18	4	7	10	15	26	40	65	90

Table 7. Values of the sinusoidal gratings.

5.9. Contrast Adjustment

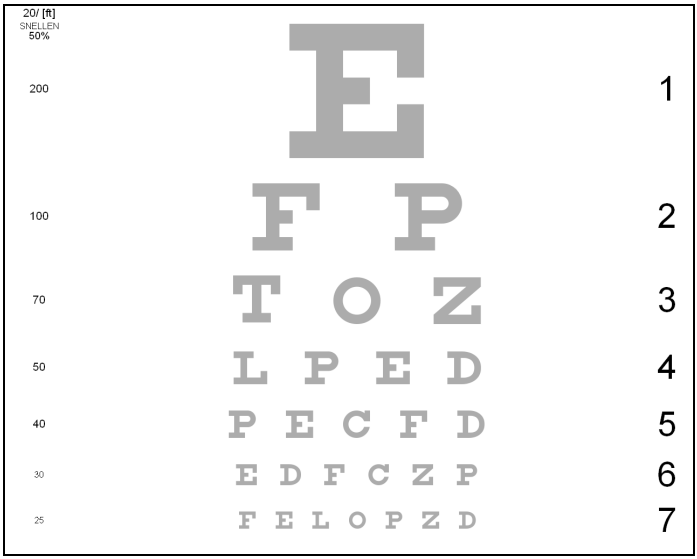
Each optotype chart can be displayed in required contrast. Contrast level can be adjusted from 100% to 1%.
Current contrast level is displayed continuously on the screen. If there is no percentage information that means contrast level is set to 100%.

HINT ! Contrast can be adjusted only for optotype Chart.

HINT ! Contrast adjustment works also with masks (vertical, horizontal, single, red-green, underlining).

1. Select any optotype chart. It will be displayed at 100%.

2. To change contrast level press **'YES/+'** or **'NO/-'**. For instance, to set contrast to 80% press **'NO/-'** button twice.



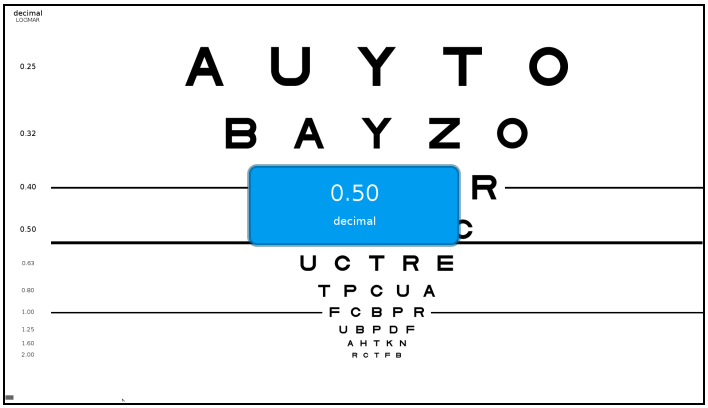
Pic. 40 Contrast test

6. MASKS

The TCP-2000P Chart Panel allows you to select underlining, vertical, horizontal, single optotype, and red-green mask over selected chart of optotypes. Masks are available only for optotype charts with more than one optotype for all Snellen type charts (Snellen, Snellen Modified, Snellen Contrast), Standard Snellen, ETDRS, and Bailey-Lovie Chart.

HINT ! Masks can be used with optotype charts only.

HINT ! If single, horizontal mask or underlining is on, it is possible to preview visus scale and value by pressing 'OK' button. Information is visible for a few seconds.



Information that TCP-2000P is in the mask mode is continuously displayed in the left bottom corner of screen. Depending which mask type you are using different shapes are displayed:

- square – single mask or underlining
- horizontal rectangle – horizontal mask or underlining
- vertical rectangle – vertical mask

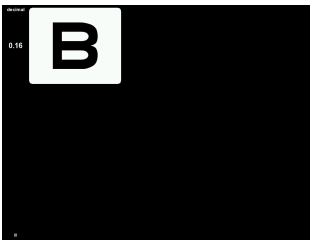
To switch off mask simply press button that corresponds to mask type you are currently using.

You can switch from one mask type to another without need of switching off current mask.

6.1. Single mask

Allows you to select single mask over selected chart of optotypes.

1. Press  to activate.
2. Use Arrows to move mask to the other optotype.
3. Press  again to deactivate.



Pic. 41 Single mask

6.2. Horizontal mask

Allows you to select horizontal mask over selected chart of optotypes.

1. To activate press  .
2. Use Arrows to move mask up and down.

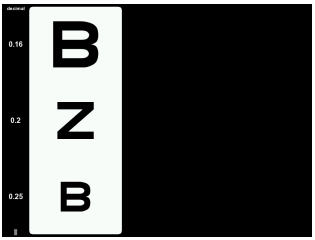
3. Press again  to deactivate.

Pic. 42 Horizontal mask

6.3. Vertical mask

Allows you to select vertical mask over selected optotype chart.

1. To activate press  .
2. Use Arrows to move mask in any direction.
3. Press again  to deactivate.



Pic. 43 Vertical mask

WARNING !

By default, masks are not available for LogMar Modified type chart, ETDRS chart and Standard Snellen chart (in 'Other Tests'). Instead there is an option of underlining:

- a single optotype (with  button)

- a line (with  button)

You can turn on single line presentation for these charts in service menu, see sections 4.13.11 and 4.13.12.

6.4. Red-green mask

Select any optotype chart.

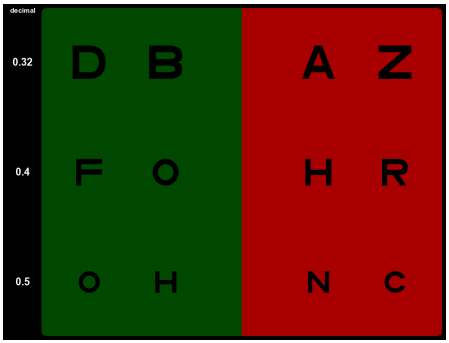
1. Press  to activate mask.
2. If you have red-green mask active you can still use Arrows to change optotypes.
3. Press again  button to change the colour of the mask.
4. Press  again to deactivate mask.

WARNING !

Red-green mask can be used only with optotype charts.

WARNING !

You can not display red-green mask over chart with only one optotype.



Pic. 44 Red-green mask

6.5. Polarization mask

There is no accessible polarization mask in TCP-2000P panel.

WARNING ! Polarization test will be activate by pressing button.

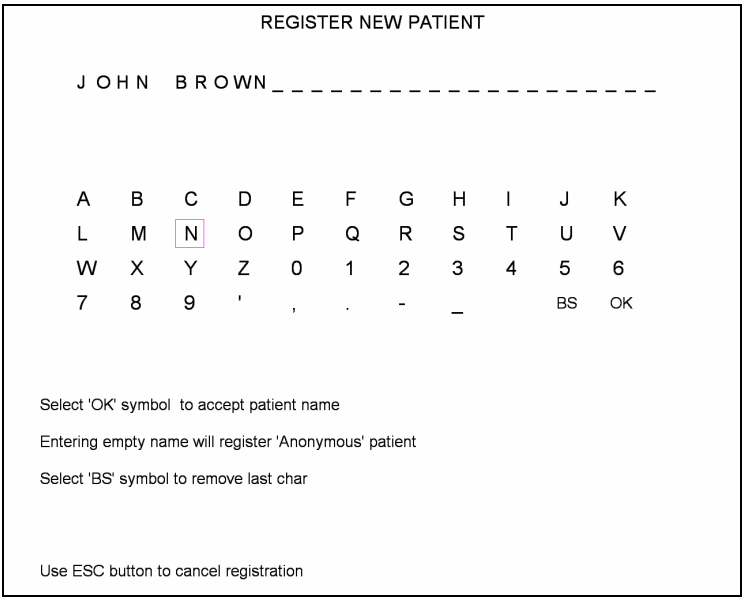
7. Report function

Report function is available for all Optotype Tests, Fixation Disparity Test and Contrast Sensitivity Test.

7.1 Inserting Patient Data

If you want to use report function you should register patient before the examination. To do this:

1. Press **REPORT** button to start a new patient examination. Keyboard will appear on the screen.



Pic. 45 Screen Keyboard

2. Enter patient's name using '**Arrows**' and confirming every letter with '**OK**' button on the remote control. After entering personal data of the patient, choose 'OK' field on the screen keyboard and press '**OK**' button on the remote control.

HINT ! If you enter patient's personal data, it will be visible every time you enter menu.

HINT ! If you don't want to enter patient's data, choose OK on screen keyboard and press **OK** button on the remote control.

HINT ! Information about patient's data is in the menu in a field called 'CURRENT PATIENT NAME,' at the bottom of the screen.
If the patient was registered without entering name data, there will be information: ANONYMOUS

HINT ! To cancel registration use **ESC** button.

After the new patient has been registered, the TCP-2000P will return to the last displayed test.

7.2 Optotypes Chart Report.

1. Choose an optotype test that interests you, e.g. press '**A**' button. Set contrast value for the test using **YES/+** or **NO/-** buttons.
2. Press '**CURSOR**' button. On the left side of the screen a blue vertical line will appear.
3. Using Arrows up and down change size of the visus. If the patient's answer concerning the optotype is correct, press twice '**OK**' button. Then the colour of the vertical line will change into green. This is an information that the patient can see the optotype correctly and that this visus for a particular contrast value was checked.
4. Change visus one level down. If the patient's answer concerning the optotype is correct, press twice '**OK**' button. If the patient can't see the optotype correctly, press '**OK**' button once. Then the colour of the vertical line will change into red. This is only an information for the medician that the patient did not recognize the optotype of particular visus and contrast level.

WARNING !

The result of the test is saved as a table. The smallest visus for a particular contrast level that the patient recognized is entered in the report. If the test was not done for a particular contrast, in the report table the information N/A will appear. Please see table 8.

SLOAN LETTERS - SNELLEN CHART

Eye tested: RIGHT, Smallest visus: 2.00

Contrast[%]	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	5.0	2.0	1.0
Visus	0.125	0.160	0.160	N/A	0.20	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 8. Table of report (Sloan Letters – Snellen Chart, Right Eye)

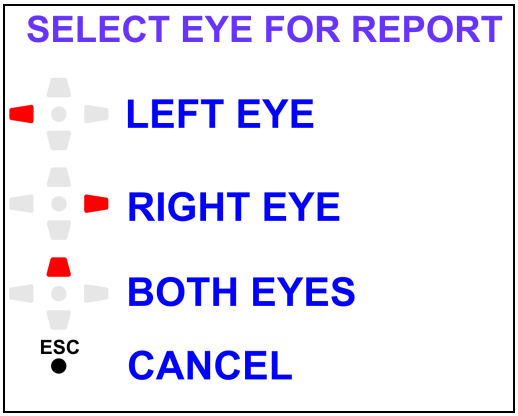
WARNING !

If you press again test button, the current result from this test is deleted.

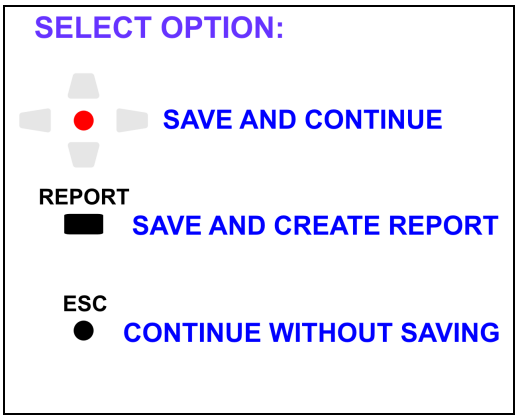
If you want to examine the patient on many contrast values, change the contrast using **YES/+** or **NO/-** buttons and examine the patient again.

When the complete examination for a particular test is conducted, the result of the examination should be saved.

5. Press **REPORT** button. A message 'SELECT EYE FOR REPORT' will appear. Continue according to the info on the screen and press:



6. When you have chosen the eye, following screen will appear.

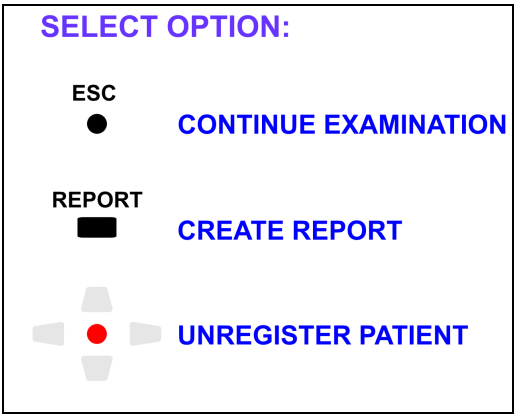


- If you want to save the result of the test and continue the examination, choose option **SAVE AND CONTINUE**. You can do the same test once

again either for the other eye or for both eyes. You can also do a different test.

- If you want to finish testing and create a report, choose option **SAVE AND CREATE REPORT.**
- If you want to cancel the operations, choose option **CONTINUE WITHOUT SAVING**

➢ If you have chosen option **CONTINUE WITHOUT SAVING**, following screen will appear.



- Press **ESC** button to continue examination
- Press **REPORT** button to generate a report of already done tests.
- Press **OK** button to unregister the patient.

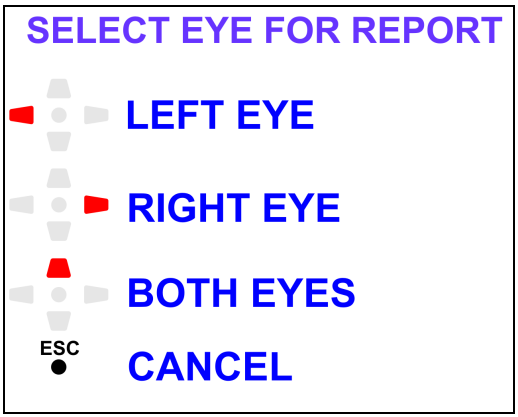
WARNING ! When you have generated a report, the current patient's data is deleted. If you want to test next patient, you have to register him/her.

7.3 Contrast Sensitivity Test Report.

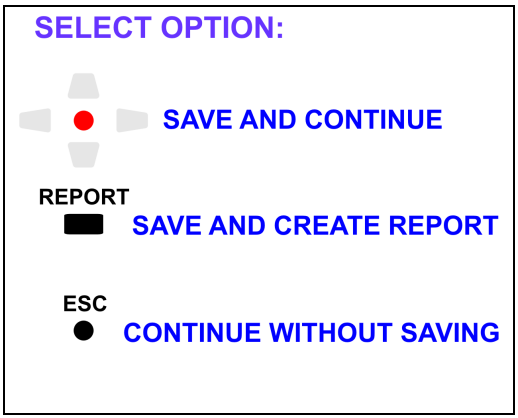
Please do Contrast Sensitivity Test according to instructions in chapter 5.8.3. How Contrast Sensitivity Test works?

When the report appears on the screen:

1. Press **REPORT** button. A message ‘SELECT EYE FOR REPORT’ will appear. Continue according to the info on the screen and press:



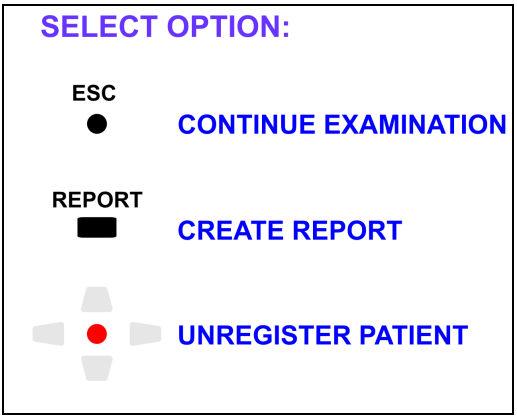
2. When you have chosen the eye, following screen will appear.



- If you want to save the result of the test and continue the examination, choose option **SAVE AND CONTINUE**. You can do the same test once again either for the other eye or for both eyes. You can also do a different test.

- If you want to finish testing and create a report, choose option **SAVE AND CREATE REPORT.**
- If you want to cancel the operations, choose option **CONTINUE WITHOUT SAVING**

➢ If you have chosen option **CONTINUE WITHOUT SAVING**, following screen will appear.



- Press **ESC** button to continue examination
- Press **REPORT** button to generate a report of already done tests.
- Press **OK** button to unregister the patient.

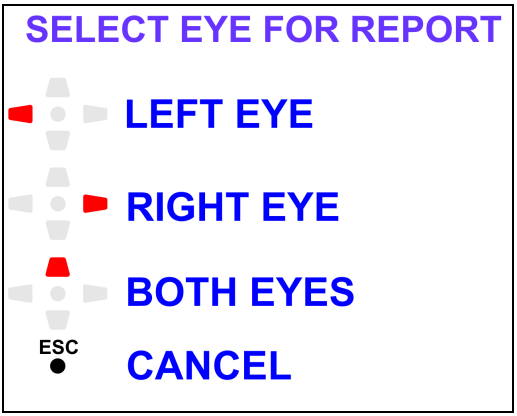
WARNING ! When you have generated a report, the current patient's data is deleted. If you want to test next patient, you have to register him/her.

7.4 100 HUE and D15 Tests Report

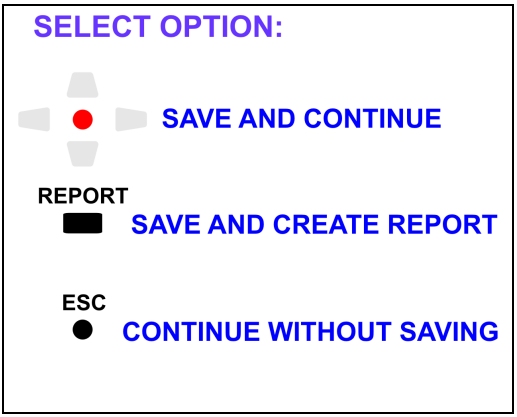
Please do 100 HUE | D15 Tests according to instructions in chapter 5.5.7 100 HUE Test, 5.5.8 D15 Saturated and D15 Desaturated Tests

When the report appears on the screen:

1. Press **REPORT** button. A message 'SELECT EYE FOR REPORT' will appear. Continue according to the info on the screen and press:

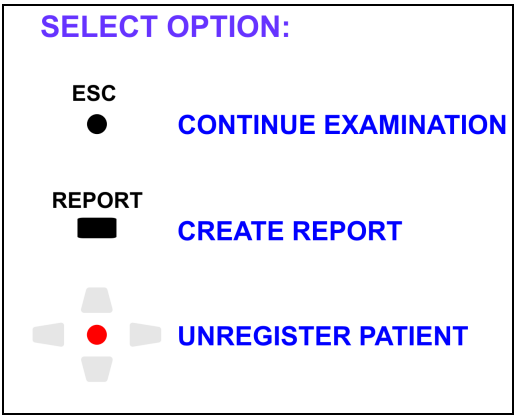


2. When you have chosen the eye, following screen will appear.



- If you want to save the result of the test and continue the examination, choose option **SAVE AND CONTINUE**. You can do the same test once again either for the other eye or for both eyes. You can also do a different test.
- If you want to finish testing and create a report, choose option **SAVE AND CREATE REPORT.**
- If you want to cancel the operations, choose option **CONTINUE WITHOUT SAVING**

➢ If you have chosen option **CONTINUE WITHOUT SAVING**, following screen will appear.



- Press **ESC** button to continue examination
- Press **REPORT** button to generate a report of already done tests.
- Press **OK** button to unregister the patient.

WARNING ! When you have generated a report, the current patient's data is deleted. If you want to test next patient, you have to register him/her.

Report will be generated as pdf file: **Patient_Name.pdf**
Each subsequent test report for already registered patient will have #NUMBER added in the name of the pdf: **Patient_Name#1.pdf**, **Patient_Name#2.pdf**, etc.

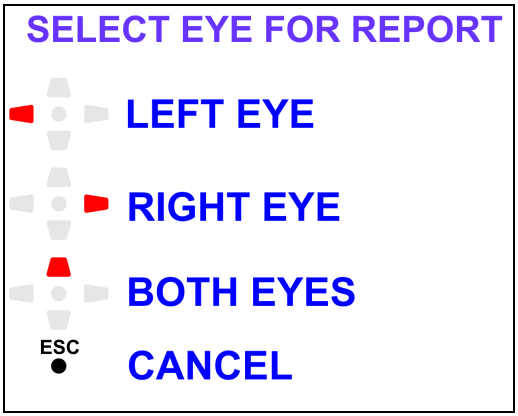
Reports are saved in chart panel permanently even after shut down of the device and they can be printed via iPad (or copied on removable USB Pen Drive. Please refer to chapters :

5.5.10 File Manager,
5.5.10.1 Entering File Manager Help.
5.5.10.2 Opening Removable Usb Pen Drive
5.5.10.3 Copying Files
5.5.10.4 Deleting Files
5.5.10.8 Exiting From File Manager

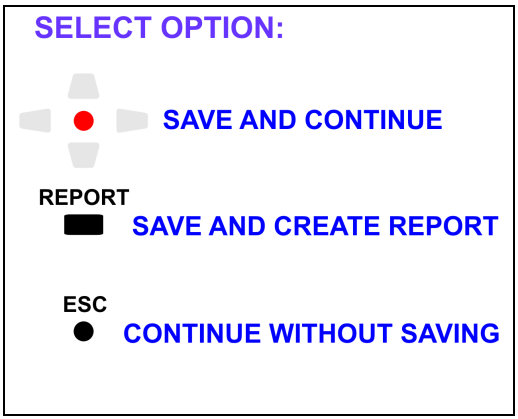
7.5 Fixation Disparity Test Report

Please do Fixation Disparity Test according to instructions in chapter 5.5.13 Fixation Disparity Test

1. Press **REPORT** button. A message 'SELECT EYE FOR REPORT' will appear. Continue according to the info on the screen and press:

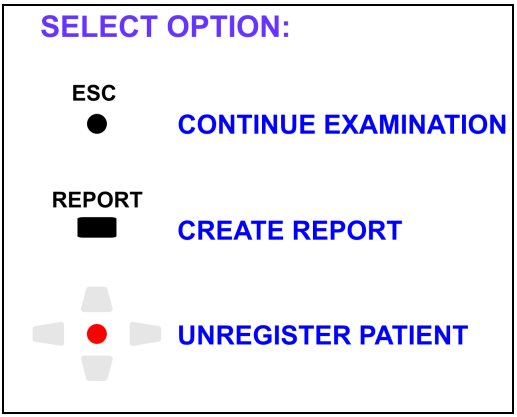


2. When you have chosen the eye, following screen will appear.



- If you want to save the result of the test and continue the examination, choose option **SAVE AND CONTINUE**. You can do the same test once again either for the other eye or for both eyes. You can also do a different test.
- If you want to finish testing and create a report, choose option **SAVE AND CREATE REPORT.**
- If you want to cancel the operations, choose option **CONTINUE WITHOUT SAVING**

➢ If you have chosen option **CONTINUE WITHOUT SAVING**, following screen will appear.



- Press **ESC** button to continue examination
- Press **REPORT** button to generate a report of already done tests.
- Press **OK** button to unregister the patient.

WARNING ! When you have generated a report, the current patient's data is deleted. If you want to test next patient, you have to register him/her.

Report will be generated as pdf file: **Patient_Name.pdf**
Each subsequent test report for already registered patient will have #NUMBER added in the name of the pdf: **Patient_Name#1.pdf**, **Patient_Name#2.pdf**, etc.

Reports are saved in chart panel permanently even after shut down of the device and they can be printed via iPad or copied on removable USB Pen Drive. Please refer to chapters :

5.5.10 File Manager,
5.5.10.1 Entering File Manager Help.
5.5.10.2 Opening Removable Usb Pen Drive
5.5.10.3 Copying Files
5.5.10.4 Deleting Files
2.5.10.8 Exiting From File Manager

7.6 Copying and Deleting Report

You can copy report in order to store it in archives on removable USB Pen Drive.

HINT ! When you are in report file manager you can press '**F1**' button to enter FILE MANAGER HELP.

Please refer to chapters :

5.5.10 File Manager,
5.5.10.1 Entering File Manager Help.
5.5.10.2 Opening Removable Usb Pen Drive
5.5.10.3 Copying Files
5.5.10.4 Deleting Files
5.5.10.8 Exiting From File Manager

7.7 Report preview

1. In '**Report Manager**' use **Arrows up/down** and highlight the report that you want to see.
2. Press '**OK**'.
3. Using **Arrows down/up,** scroll the page with the report.
4. Using **Arrows right/left**, go to next/previous page of the report.

WARNING ! It can take a few seconds to start previewing a report.

CHART PANEL REPORT

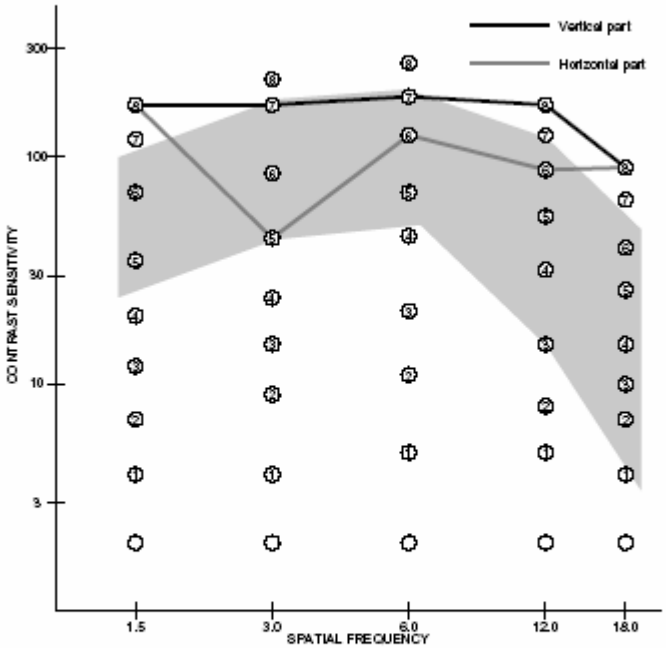
Patient: **JOHN KOWALSKY**

Date:

Visus scale type : decimal

CONTRAST SENSITIVITY TEST

Eye tested: BOTH



Answers Vertical: A=8, B=7, C=7, D=8, E=8

Answers Horizontal: A=8, B=5, C=6, D=6, E=8

Screen distance: 2.0 [ft]

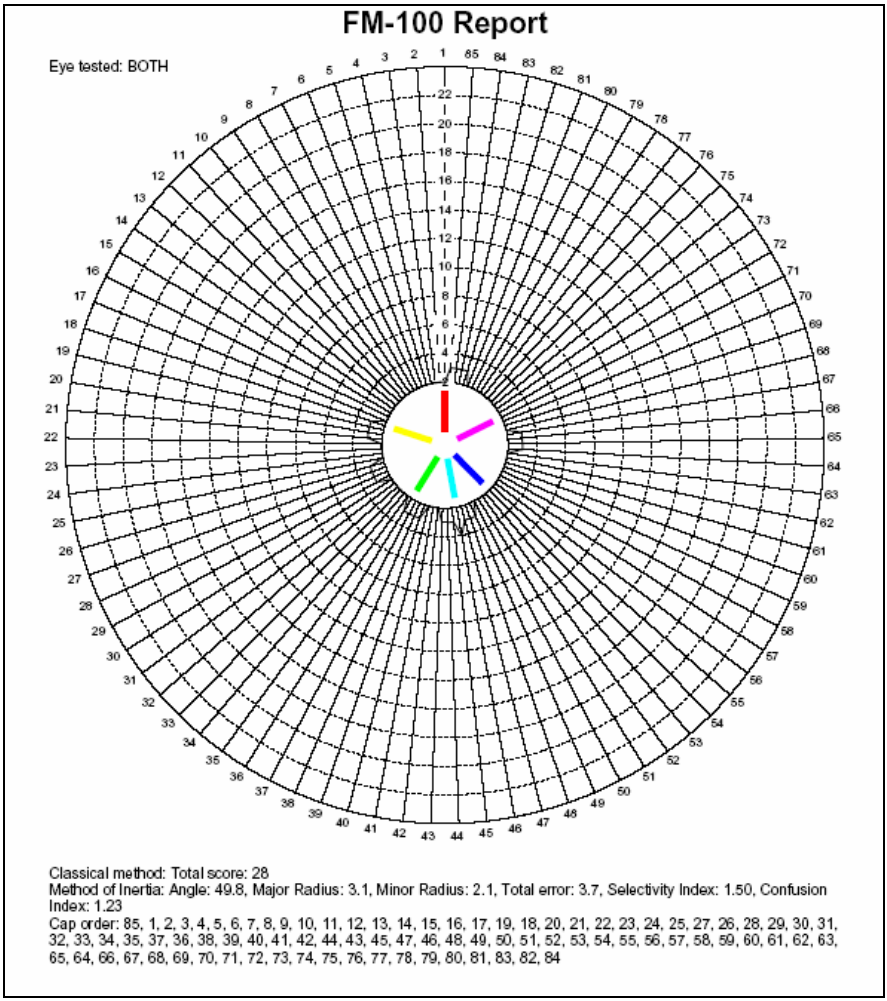
FIXATION DISPARITY

Eye tested: BOTH, at distance: 17.0 [ft]

Rotation[deg]	0	90	180	270
D	1.0	0.6	0.0	-0.7

SLOAN LETTERS - SNELLEN CHART

Eye tested: LEFT, Smallest visus: 2.00


FM-100 Report
Eye tested: BOTH
Classical method: Total score: 28
Method of Inertia: Angle: 49.8, Major Radius: 3.1, Minor Radius: 2.1, Total error: 3.7, Selectivity Index: 1.50, Confusion Index: 1.23
Cap order: 85, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 18, 20, 21, 22, 23, 24, 25, 27, 26, 28, 29, 30, 31, 32, 33, 34, 35, 37, 36, 38, 39, 40, 41, 42, 44, 43, 45, 47, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 82, 84

Contrast[%]	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	5.0	2.0	1.0
Visus	0.40	0.63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.160	0.20

SLOAN LETTERS - SNELLEN CHART

Eye tested: RIGHT, Smallest visus: 2.00

Contrast[%]	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	5.0	2.0	1.0
Visus	0.125	0.160	0.160	N/A	0.20	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Signature: .....

Pic. 46 Example Chart Panel Report

8. SOFTWARE VERSION

Information about current version of chart panel software is displayed in right bottom part of Configuration Menu screen.

9. TROUBLESCHOOTING

All possible failures are listed in table.

No	Failure	Cause	Action
1	TCP-2000P Fails to operate when connected to the mains (Power LED is OFF, no BEEP sound after power ON)	Power cord broken or power cord not connected or no voltage in mains. -Mother board or power supply defective.	-Check power cord -Check power cord connection -Check main voltage in wall socket. - Call service.
2	Device fails to operate (Power LED is flashing durin power-up process and then stays ON)	-LCD backlight broken -LCD screen broken or control electronics broken	- Call service. - Call service.
3	IR remote fails to operate	- Faulty battery - IR remote broken - IR receiver faulty - Mother board broken	- Check and replace battery - Replace IR remote - Call service. - Call service.
4	Message: Failed to start		Turn off Chart Panel by pulling of power plug. Wait two seconds and plug in power cord. If problem remains – call service.
5	Message: Fatal error		Turn off Chart Panel by pulling of power plug. Wait two seconds and plug in power cord. If problem remains – call service.

6	Message: Could not print document. IF PROBLEM PERSISTS CONTACT SERVICE	-Printer broken or power cord not connected or no voltage in mains. -Mother board or power supply defective.	-Check power cord -Check power cord connection -Check main voltage in wall socket. -Check printer Cable -Call service -Call service
7	Message: ERROR - FIRMWARE UPDATE FAILED		-Call service
8	Message: Copy error occurred Delete error occurred	-Broken Usb Pen Drive -No free space on USB Pen Drive -Mother board or power supply defective.	-Check or replace USB Pen Drive -Delete unused files -Call service
9	Message: Removable not opened	-Broken Usb Pen Drive -Mother board or power supply defective.	-Check or replace USB Pen Drive -Call service

10. WARNINGS

- Exercise care to locate the Chart Panel away from any hazardous sources.

- It has been tested to the following specification: EN 60601-1-2:2001+A1:2006 Medical electrical equipment. General requirements for basic safety and essential performance.

- Excessive interference may affect the Chart Panel operation. If it occurs the failure cause shall be removed.

- Fix the Chart Panel securely. If the Chart Panel falls down, do not use it because the absence of external damages does not mean there is no damage inside.

- Do not immerse in water.

- Do not sterilize or autoclave the Chart Panel.

- Do not expose the Chart Panel to direct sunlight.

- Do not place near heat source.

- Do not cover ventilation holes.

- Do not allow entry of fluids in the panel.

- External electromagnetic interference may cause the device to stop working. If above situation occurs during patient examination, this is not a threat to patient safety. Device should be restarted and examination must be conducted from the beginning.

11. CHART PANEL MAINTENANCE

11.1. Cleaning

- When carrying out cleaning, the CHART PANEL shall be switched off and disconnected from mains. After cleaning wait at least one minute before switching on the chart panel. Cleaning shall be carried out using a piece of cloth moistened with cleaning solution. Do not use organic solvents for the external cleaning of the Chart Panel such as petrol, alcohol etc.

- The Chart Panel shall not be turned over because the cleaning solution can enter it.

- The Chart Panel shall not be autoclaved.

- This Chart Panel is a high-precision optical instrument, which is made up of many electrical parts, therefore it is absolutely necessary that all care is taken during cleaning.

WARNING !

When any liquid is spilled onto the Chart Panel the device shall be immediately cleaned using a pad of gauze. After cleaning, check for the absence of liquid in the mains socket. The presence of liquid can cause shortening of the contacts. Clean the main socket using a dry pad of gauze and then reconnect the Chart Panel to the mains.

11.2. Repairs

- In order to ensure long life time of Chart Panel, it is necessary to check periodically its status and replace the parts if damaged.

- In the case on any fault of the Chart Panel immediately consult the Manufacturer or the dealer.

- Repairs of the Chart Panel or periodical part replacements must be done according to this Operation Manual.

- Disposal of the device, or parts of it, should be done according to local environmental and waste disposal regulations. Do not dispose to the nature. Do not send back to the manufacturer. Chart Panel components do not pose hazard to environment and can be safely disposed in accordance with hospital protocol.

11.3. Checking

- Manufactures recommend periodical checks, at least one a year, which entails a check up on the electrical safety parameters.

- Functional check – not less than once a year. It should be performed by biomedical technicians of the hospital.

12. WARRANTY

- The Manufacturer warrants the high-quality workmanship of the Chart Panel for a period of 24 month after the purchase date.

- The Manufacturer or its authorized representatives takes obligation to carry out the warranty repair of the Chart Panel or to replace it with an operational one in case the Manufacturer or its authorized representatives determines that the cause of Chart Panel's failure was related to the manufacturing process.

- If the Buyer find a defect in the Chart Panel during the Warranty period, he must report it and inform Manufacturer or its authorized representative within 30 days.

- A Chart Panel sent for testing, repair or replacement shall be submitted to Manufacturer or its authorized representative in its original or equivalent packaging. The Chart Panel is sent for repair and back at Buyer's expense.

- If no defect is found during testing, the Manufacturer or its authorized representative reserves the right to submit the invoice to the Buyer for the work carried out.

- This Warranty is not applicable to Chart Panel when failure was caused by violations of requirements of this Operation Manual, by mains voltage non-conformity to the requirements of IEC, by spills of liquid, by mechanical damages caused by shock or a Chart Panel being dropped, by Chart Panel damages during transportation, or when packaging is damaged.

Manufacturer:
FREY
05-502 Piaseczno
Wolodyjowskiego 38
POLAND

Distributor:
TOMEY GmbH
Wiesbadener Straße 21
90427 Nürnberg
GERMANY