



DEPISTEO VT1 USER MANUAL



VT1 Master GT Edition

VT1 Master Edition

VT1 Essential Edition



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1. Introduction

1.1. List of supplied elements

The following elements should be found inside the packaging:

- VT1
- External medical power plug
- USB lead (for computerized versions only)
- VT1 software installation CD with user manual included (for computerized versions only)
- Driver remote control (for remote control versions only)
- Cloth for cleaning lenses
- Forehead rest
- Response forms CD (for remote control versions only)
- Information sheet
- Scoring pad (for remote control versions only)

1.2. Presentation

We recommend reading these instructions thoroughly before use.

This user manual is intended for VT1 operators, whatever the chosen model (VT1 Master GT Edition, VT1 Master Edition and VT1 Essential Edition).

Only a practitioner can direct a patient to an ophthalmologist in order to confirm the VT1 results obtained. The ophthalmologist will perform further tests to prescribe visual correction or surgical intervention.

The VT1 is a screening device designed by DEPISTEO for the exploration of visual function. The VT1 currently operates with two driving modes, depending on the model (refer § 1.4):

- Remote control version
- Computerized version

Designed for maximum ergonomics, the VT1 is equipped with a detector that detects the position of the patient's forehead. Once the patient is correctly positioned, the test begins.

The VT1 is designed to progressively adapt the patient to different light levels depending on the type of test performed. Tests can be performed on three light levels:

- High photopic
- Low photopic
- Mesopic (dusk light)

Depending on the version, the practitioner can parameter sequences in order to define which tests are to be performed systematically, depending on needs. The VT1 is equipped with several optical effects and mirrors to perform near (13in/33cm), intermediate (23.6in/60cm) and far (20ft/6m) vision tests. Tests can also be performed in monocular or binocular vision. For computerized versions, results are recorded directly onto the computer. For remote control versions, results are recorded on response forms.

Innovative solutions have considerably reduced the weight of the device and expanded the range of available tests requiring no operator manipulation of the device. The device also integrates the latest high technology: a lighting principle that preserves slide quality over time.

The VT1 offers the following assets:

- Compact size
- Light-weight equipment
- Portability
- Ergonomic use
- Quick testing
- Programming and automation to create test sequences according to patient risk
- Elimination of yellowing of slides
- Optimization of computer connectivity
- Option of performing several visual acuity tests to avoid voluntary or involuntary memorizing of optotypes
- Device set-up for vehicle-driver tests
- Performing visual tests with corrective or progressive lenses
- Performing tests in low photopic light for photo-sensitive patients
- Parametering test sequences to customize tests
- Performing far, near and intermediate vision tests

1.3. Technical features

Technical features:	
Storage temperature	32 - 122°F (0 – 50°C)
Operating temperature	59 - 95°F (15 – 35°C)
Humidity	75% maximum
Altitude of operation	<6561.7ft/ <2000m
External power plug	Input: 100-240VAC 50-60Hz 0.6A Output: 12VDC 2.08A (medical class)
Power supply	12VDC from supplied external medical plug (refer § 1.1)
Power absorbed	24W
Standard	EN 60601-1, EN 60601-1-2
Medical class	Class I
Applied part	Type B
Marking	CE
Dimensions	19.7x10.6x9.8 in (50x27x25cm)
Weight	10.7 lb/4.850kg

Optical features:	
Lighting system	16 white LEDs and diffuser system
Lenses	Far vision: (20 ± 0.3)ft (6.0 ± 0.1)m Intermediate vision: (23.6 ± 0.2)in (60.0 ± 0.5)cm Near vision: (13.0 ± 0.1)in (33.00 ± 0.25)cm Hyperopia lenses: +1 diopter
Lighting conditions (nominal values)	High photopic (160 candelas) Low photopic (80 candelas) Dusk mesopic (3 candelas) Conform to NF EN ISO 8596 standard

Test features:	
Reactivity	Time between 2 neighboring tests: 700ms Time to pass from one slide to another: 1sec
Average test time	Routine test: 3 mins In-depth test: 5 mins

1.4. VT1 range models

	VT1 Master GT Edition	VT1 Master Edition	VT1 Essential Edition
Acuity			
Landolt rings	•	•	•
Letters	•	•	•
Children acuity	•		
Supplementary Tests			
Glare Sensitivity	•		
Glare Resistance	•		
Contrast Sensitivity	•	•	
Children Vertical and Horizontal Phorias	•		
Adult Vertical and Horizontal Phorias	•	•	•
Fusion	•	•	•
Astigmatism	•	•	
Depth Perception	•	•	•
Ishihara Type Colors Test	•	•	•
Amsler Grid	•	•	•
Hyperopia Test	•	•	•
Horizontal and Vertical Visual Field	•	•	•
Features/ Functions			
Distance			
Far Vision	•	•	•
Intermediate Vision	•	•	•
Near Vision	•	•	•
Luminosity			
High Photopic	•	•	•
Low Photopic	•	•	•
Mesopic (dusk vision)	•	•	
Operating Mode			
Computerized	•	•	
Remote controlled		•	•

1.5. Serial number labels

Serial number labels display the following information:



CE marking directive 93/42/EEC



Type B applied part



The device should not be discarded with general household waste. Return it to the manufacturer for disposal



Consult the accompanying documents

SN

Serial number



Manufacturer identification

2. Safety

2.1. General

Caution:

- Never dismantle or interfere with the device without the authorization of the manufacturer. Only DEPISTEO After Sales Service and trained distributors are qualified to work on the equipment
- The VT1 should be returned regularly for annual maintenance to DEPISTEO After Sales Service or your distributor
- Use only the leads and power plugs supplied by DEPISTEO
- It is highly recommended to store and transport the VT1 at a temperature of 32 - 104°F (0 - 40°C). If a change in atmospheric conditions occurs, wait a while until there is no condensation on the optics before using the device
- Do not expose the device to vibrations or excessive shocks
- Do not wet the device. Protect it from all liquid projections. Never wash the VT1 under running water or spray directly with liquids
- If accidentally damaged (fall or shock), send the device to DEPISTEO After Sales Service, or to your distributor, if trained by DEPISTEO for maintenance
- If the device no longer maintains a stable position, or has degraded, return it to DEPISTEO After Sales Service, or to your distributor, if trained by DEPISTEO for maintenance
- If any elements of the device degrade, the device should be returned for checking, to DEPISTEO After Sales Service, or to your distributor, if trained by DEPISTEO for maintenance
- Repetitive visual defects appearing in every patient should signal a possible problem with the device
- The device should not be used in the presence of anesthetic gases
- The VT1 remote controls should only be used with the device, and vice-versa
- If the device or its accessories degrade visibly, contact DEPISTEO After Sales Service or your distributor
- The device should sit on a flat and stable surface
- If a multi-adaptor is used, no other electrical device or multi-adaptor should be connected to the device
- The device should be positioned so as to leave the power plug free, in case of emergency

2.2. Operator

The VT1 is reserved for the use of health professionals.

For computerized versions, the operator must be trained in the basic rules of computers and shall take all precautions against the risk of software pirating, disclosure of confidential data, viral attacks or incorrect handling.

Particular care shall be taken to back up recorded data as often as possible, on a reliable support. DEPISTEO recommends daily back up.

As a reminder to operators, the VT1 software is delivered with a license contract stating the software conditions of use. This license is granted for installation and use at one work station. All new installations require the purchase of extra licenses.

2.3. Medical contraindications

Patients suffering from the following medical contraindications are not permitted to perform vision tests:

- General contraindications: photosensitive persons should not perform screening tests in high photopic
- Contraindications related to glare: all photosensitizing medication

All persons performing the glare test must be informed of the risks related to certain photosensitizing medication. Ensure the patient does not suffer from the following pathologies (non-exhaustive list):

- albinism
- cystinosis
- keratoconjunctivitis
- surgery
- inflammation
- traumatism

Ensure the patient has not undergone refractive surgery less than three months previously.

Example of list (non-exhaustive) of illnesses requiring photosensitizing medications:

Non-steroidal anti-inflammatories

Antibiotics: Cyclines, Macrolides, Quinolones, Sulphamides

Cardiology – Angiology: Antiarrhythmics, Antihypertensives

Neurology – Psychiatry: Neuroleptics, Antidepressants, Hypnotics, Sedatives

Allergology (anti-histamines)

Metabolism and Nutrition: Oral Antidiabetics, Hypolipidemics

Infectiology, Parasitology: Antituberculosis drugs, Antimalarials, Antileprosy drugs, Systemic antivirals

Cancerology and Hematology

Otorhinolaryngology

Gynecology

Gastroenterohepatology

Rheumatology

2.4. Precautions before tests

The device operates on the basis of binocular fusion. The operator must ensure the patient has adequate fusion to perform the test. Before all tests, the operator should ask the patient if he or she generally wears glasses or contact lenses. Photosensitive patients may perform the tests in low photopic, for more comfortable testing.

The patient should be placed in an environment adapted to tests. Ensure there is no intense lighting that may reflect on the VT1 optics, particularly for the glare test, where strong lateral light sources would disrupt the test. Do not place the device near a window. For the glare test, the user must inform the patient of the test procedure. During the test, always explain which optotypes the patient is in the process of studying (e.g. number of lines, letters, etc.).

The medical personnel must ensure the patient is calm when performing the test and that he or she has understood the aim of the screening. The operator controls the VT1 back-lighting, which progressively increases in intensity so the patient becomes accustomed to the light levels. The operator may drive the VT1 in low photopic for patient comfort. The operator should ensure the patient leaves the room safely after performing the glare test (no visual problems, headache or fatigue).

2.5. Interpretation of results

- Patient results should always be accompanied by an explanation from the practitioner
- The VT1 may not be used for medical treatment. It can under no circumstances be used as the basis for medication prescriptions, pre- or post-surgical diagnoses, or any other type of prescription
- The VT1 may not be used to determine the aptitude of an individual to perform a certain task. This can only be established by the doctor responsible for the tests, in conjunction with other medical expertise
- The VT1 is a screening device for visual problems. Only an ophthalmologist is qualified to confirm VT1 results, in conjunction with other tests, to prescribe correction or surgical intervention

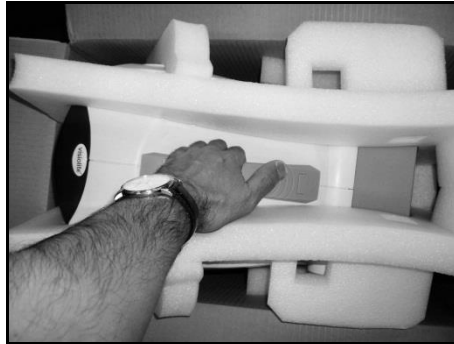
3. Equipment and Installation

3.1. Installation procedure

3.1.1. Opening the box

After removing the compartment containing the accessories, lift the VT1 by the handle as indicated below.

We strongly advise conserving all the original packaging of the VT1 for maintenance operations.



3.1.2. Nomenclature



1 Body

The VT1 body contains all the functional elements.

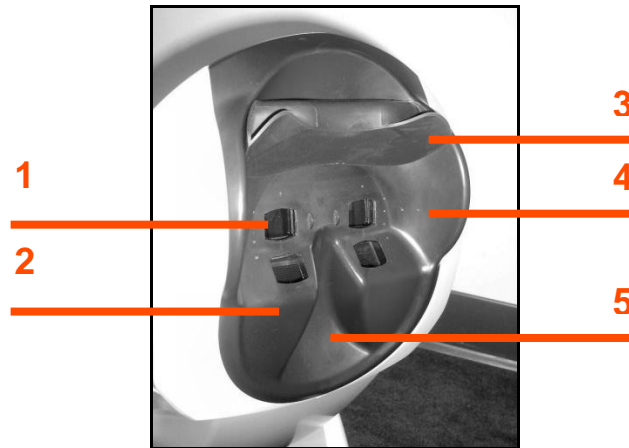
2 Mask

Far and near vision lenses are integrated into the mask, which is adapted to the average patient morphology.

3 Base

The VT1 base is ballasted to ensure stability of the instrument however the body is inclined.

The elastomer gum coating prevents the VT1 slipping, and avoids scratching the table surface.



Face mask

1 Far vision lenses

2 Near vision lenses

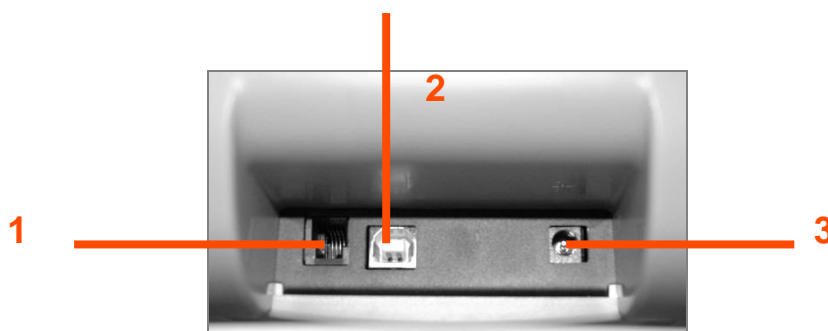
3 Removable forehead rest piece

A removable elastomer piece is positioned on the forehead rest. An electro-sensitive sensor indicates the patient's forehead is in contact with the forehead rest, via a VT1 light display. When the forehead is correctly positioned on the forehead rest, the patient should not feel any discomfort.

4 Peripheral field

A number of small holes are visible around the lenses. These light guides are for the visual peripheral field test.

5 Nose position



Back – Connection support

1 RS232 connector lead or remote control

2 USB lead

3 Power supply

3.1.3. Connection



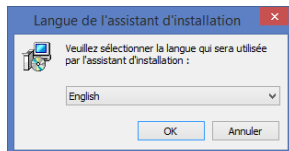
- Incline the device to the connection position.
- Thread the leads via the back of the VT1 between the base and the body.
- Firstly connect the control leads (USB lead or remote control) then the mains adaptor lead.
- Reposition the VT1 to work mode, taking care not to jam the leads.
- Plug the mains adaptor into the wall socket.
- **Caution, for computerized versions:**
- Do not connect the VT1 to the computer before the software is installed (refer § 3.2).

3.2. Operating systems

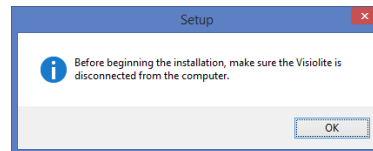
Windows XP, Windows Vista, Windows 7, Windows 8

3.3. Software installation (computerized version)

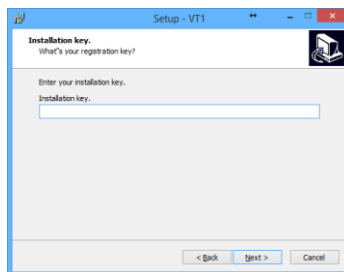
For computerized versions, the operator must have administration rights on the workstation. From the CD Rom root directory, run the "SetupVT1.exe" file; not necessary if it is set-up for automatic running.



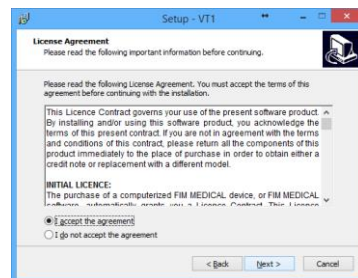
1. Temporary Welcome Screen



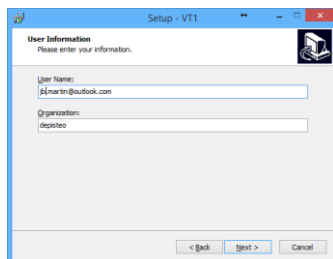
2. Recommendation Screen



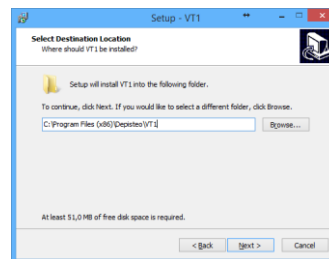
3. Enter serial number
from the back of the CD jacket



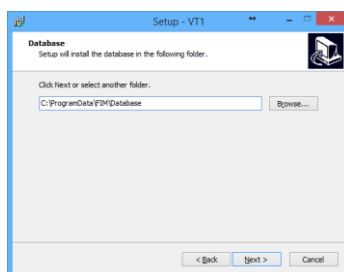
4. License agreement



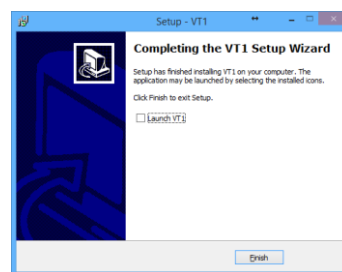
5. User information



6. Enter software installation destination



7. Enter database destination



8. Validate Finish



An icon is placed on the Windows desktop to run the software.

3.3.1. PC connection

After installation, use the USB lead to connect the VT1 to the PC. If installation is correct, the device should immediately be recognized.

If not, disconnect the VT1 and manually run drivers installation found on the CD in “**Drivers**” directory. Double click on CP210xVCPInstaller.exe and follow the instructions.

Then connect the VT1 which should be recognized immediately by the operating system.

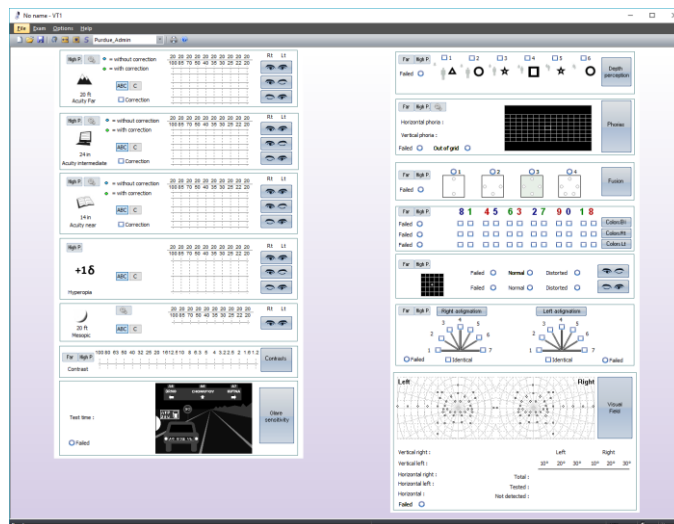
3.3.2. Uninstallation

To uninstall VT1 go to the “Start” menu, “Control Panel”, “Add/Remove program”. Uninstall the VT1 software and the drivers “Silicon laboratories CP210x USB to UART bridge”.

Caution: Before uninstalling the driver, ensure that no software is using it.

3.3.3. First run

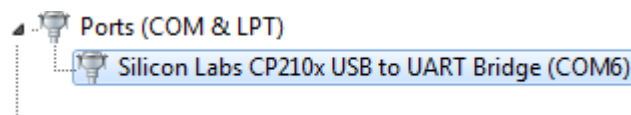
The following screen appears:



A light on the bottom right of the screen indicates whether the VT1 is correctly connected:

- Grey light: no connection
- Red light: searching
- Green light: connection established

If there is a connection problem, the light goes to grey again: check in Windows Device Manager that the device has, in fact, been recognized. This appears in the Ports section (COM and LPT) under the name **Silicon laboratories** CPS10x USB to UART Controller.



3.3.1. Test before use

Check that the VT1 is driven by the software and the tests displayed are those desired.

Initially a small red or green symbol representing a head appears on the bottom right of the screen:

- Green if the patient's forehead is correctly positioned against the forehead rest
- Otherwise grey

Tests are exposed only if the forehead is detected by the sensor.

Click on any key and check that the VT1 motor starts and displays the correct test.

3.4. Procedure to stop the device

3.4.1. Software version

To stop the VT1 safely, close the software and disconnect by unplugging the power plug at the back of the device.

3.4.2. Essential remote control version

To stop the VT1 safely, wait a moment until the device goes on standby (remote-control LEDs off). Then unplug the leads.

3.4.3. LCD remote control version

To stop the VT1 safely, press on the "Distance" key for 3 seconds. The device and the remote control will switch off. Then unplug the leads.

3.5. Backup/restore

3.5.1. Presentation

The backup/restore function protects users against loss of data and configurations in the event of a computer breakdown.

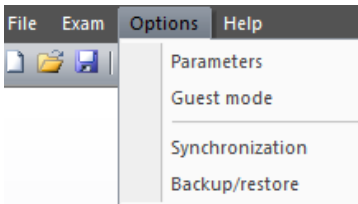
This function also accelerates and facilitates use in a pool of several Visiolite® devices.

3.5.2. Backup

Backup enables recovery of all the elements required for Visiolite® function. Elements backed up:

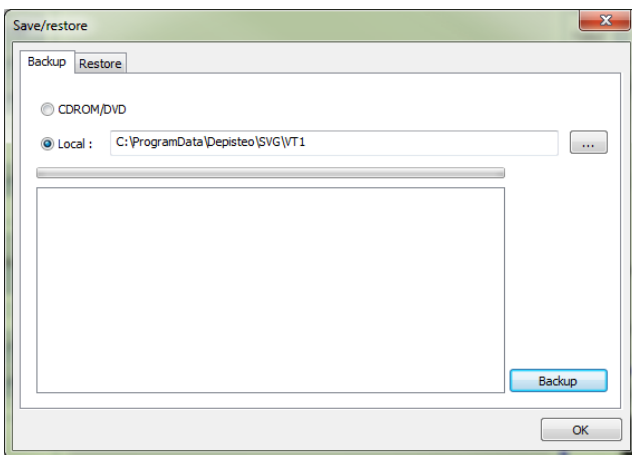
- Data base
- Configuration files
- Sequences
- Instructions
- Scoring
- Executable files

To backup, go to the **Options** menu then **Backup/restore**.



Choose backup mode:

- In a directory
- On a CD/DVD (*caution: the Windows burning tool must be installed*)



Click on **Backup**.

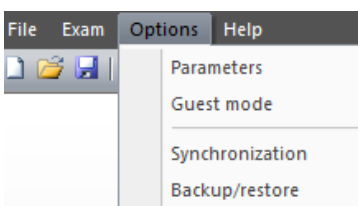
3.5.3. Restore

Restore enables recovery of the backed up files of all the elements required for the Visiolite® software.

Elements restored:

- Data base
- Configuration files
- Sequences
- Instructions
- Scoring
- Executable files (except executable Visiolite itself).

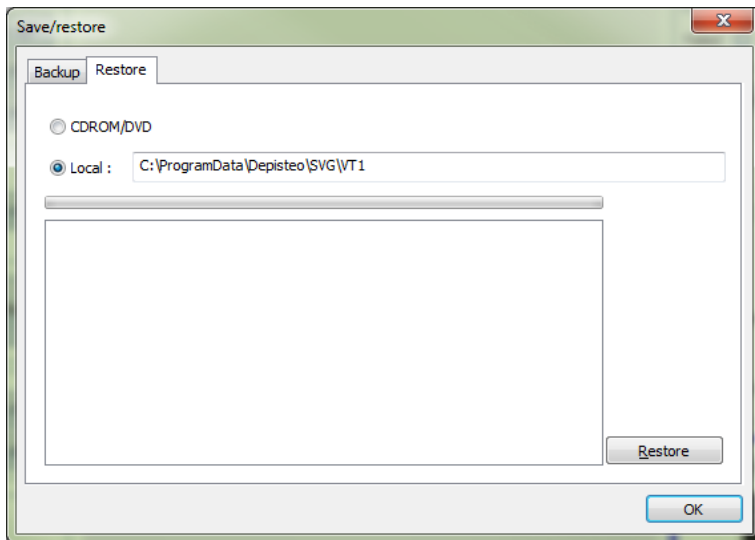
To perform a restore, go to the **Options** menu then **Backup/restore**.



Click on the **Restore** tab.

Choose backup mode:

- Then a directory
- Then a CD/DVD



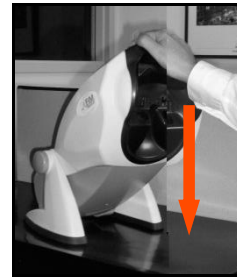
Click on **Restore**.

4. Use

4.1. Raise/lower VT1 body



- Hold the base of the VT1 with one hand.
- With the other hand, raise the body of the device without forcing.



- Press gently on the upper part of the VT1.

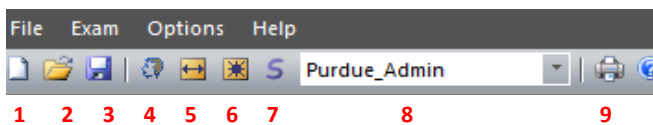
Comment: It is recommended to place the patient's hands on the test table and avoid placing the fingers into the inclination system.

4.2. Software use

4.2.1. Description of menus

4.2.1.1. Tool bar

Use the tool bar to run the other software functions.



1 New file

2 Open

3 Record

4 Identification

5 Positioning

6 Permanent lighting

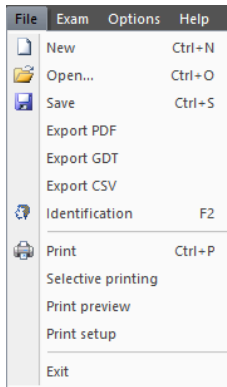
7 Run a sequence

8 List of sequences

9 Print

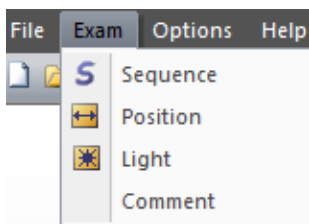
4.2.1.2. Menu bar

Use the drop-down menus to perform other actions not available from the main screen.



Functions:

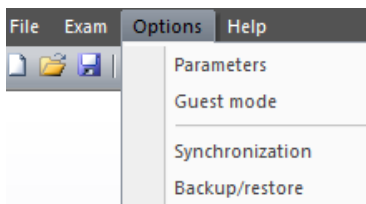
- Manage a test
- Access identification
- Export
- Print



Functions:

- Run the chosen sequence
- Positioning of patient
- Permanent lighting
- Add a comment

Comments can be input by the operator and printed and recorded with the test in the data base.



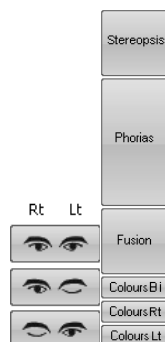
Functions:

- Parametering
- Configuration of guest mode
- Synchronization
- Backup/restore

Use **Guest mode** to parameter interfacing of the VT1 with external software, in order to exchange data.

4.2.2. Manual mode

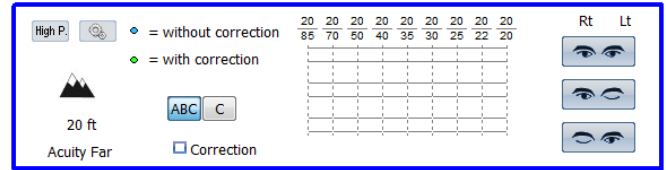
The VT1 can be driven from the main screen. Use the command keys to choose a test and input patient response.



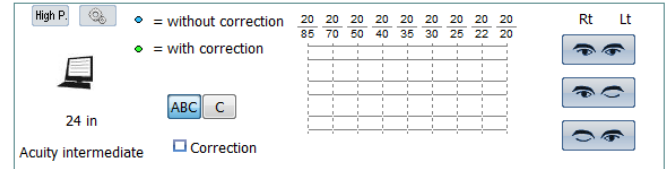
Command Keys

4.2.2.1. Choice of distance

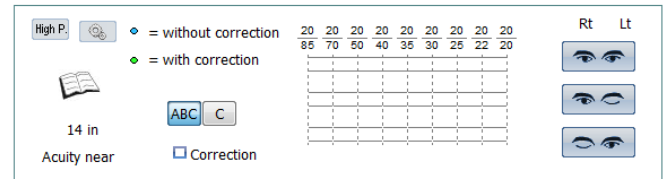
Far Vision



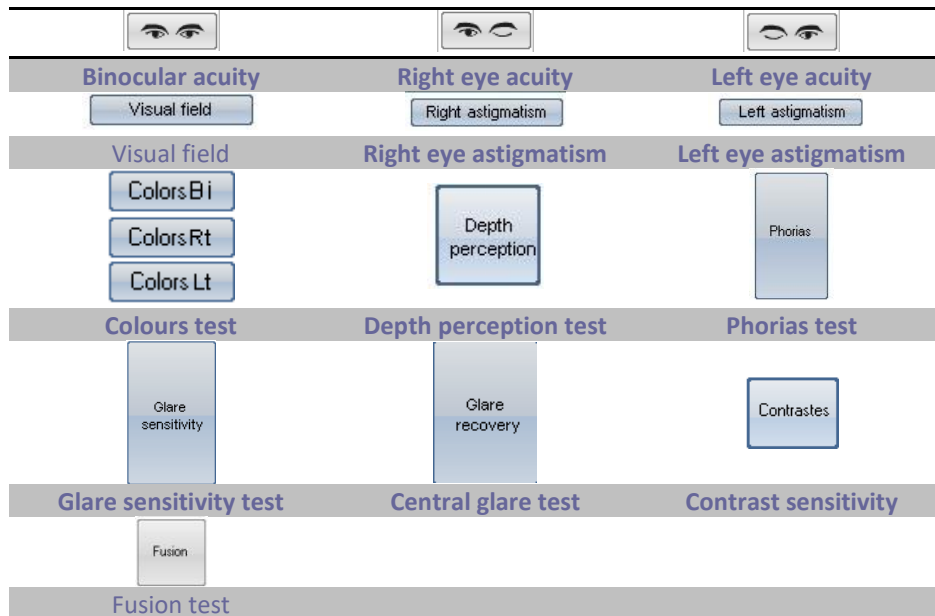
Intermediate Vision



Near Vision



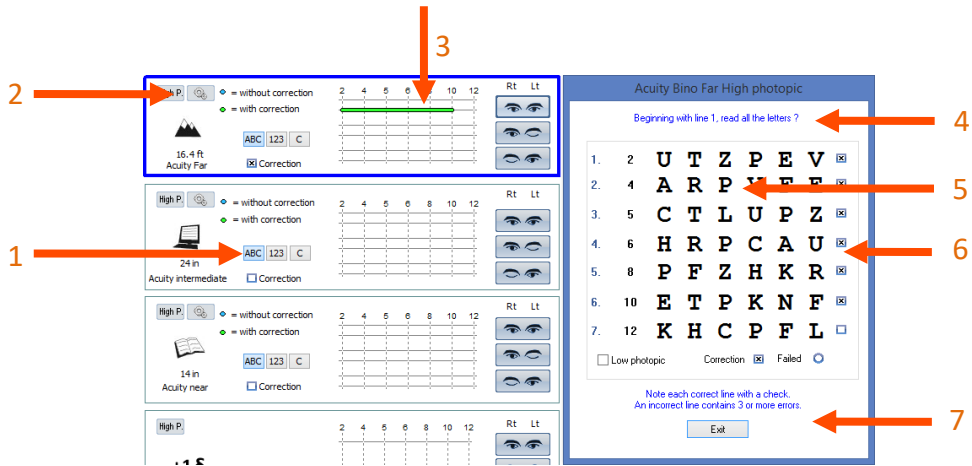
4.2.2.2. Command keys



4.2.2.3. Patient response

As soon as the command key is pressed, the device positions itself on the corresponding test and the window appears, to input patient responses.

Example with visual acuity:



1 Test choice

2 Lighting choice

- High Ph. – daylight
- Low Ph. – low daylight
- Mesopic Ph. – dusk light

3 Patient response

4 Patient instruction

5 Expected responses

6 Check boxes

7 Operator instruction

In this example, the operator reads the instructions to the patient. The window gives the expected responses and the operator checks the boxes when the line of letters has been read.

4.2.2.4. Grey areas

Grey areas give an indication of the optimum response but cannot in any case determine normality or aptitude for a specific occupation or to perform a certain task.

These areas cannot be used for an individual's interest or for discrimination purposes.

Only the conclusions of the doctor responsible, in conjunction with other medical expertise, and depending on the task, can establish aptitude.

As this is a screening test, the results cannot in any case be used for medical treatment, pre-or post-surgical diagnosis, or for any sort of prescription.

4.2.2.5. Peripheral field

- Ask the patient to focus on the central dot.

Peripheral field stimuli can be scanned manually or semi-automatically.

In both cases, the operator must have the patient response before proceeding to the following stimulus.

4.2.2.5.1. Manual mode

- Click on the desired stimulus and wait for the patient response.
- If the patient responds correctly, click "Validate".

If the patient does not respond correctly, the stimulus flashes for the time pre-set in visual field parametering and goes to red.

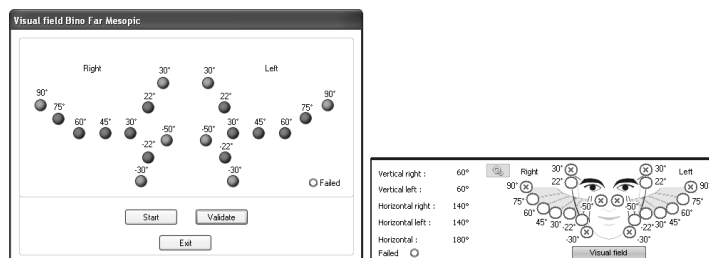
The angles tested will appear on the response form.

4.2.2.5.2. Semi-automatic mode


- Click "Start".

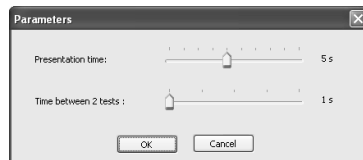
The program activates the stimuli from the outside to the inside of the field, until the limits are defined.

- When the patient responds correctly, click "Validate" or press on the space bar.



Presentation time of luminous stimulation, as well as time between two tests can be parametered as follows:

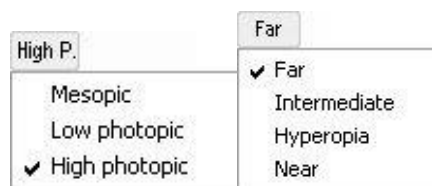
- Click Parameters key 



- Set the time

4.2.2.6. Settings

For all tests, lighting and optical mode can be adjusted by clicking on the following keys:



4.2.3. Automatic mode

The VT1 software can pre-program tests.

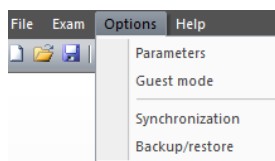
4.2.3.1. Use of sequences

To use a sequence, proceed as follows:

- Choose the desired sequence from the list of sequences in the tool bar.
- Click “S” on the tool bar or press the keyboard “Space” bar.
- Use the space bar to go from test to test.

4.2.4. Parametering

The software can be parametered as follows:

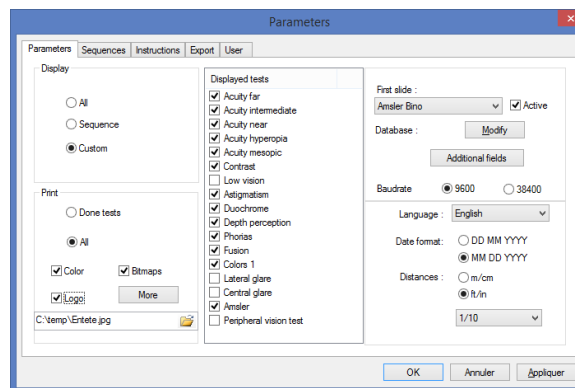


- Click “Options” menu.
- Click “Parameters”.

4.2.4.1. Display and print parameters

- Click “Parameters” tab.

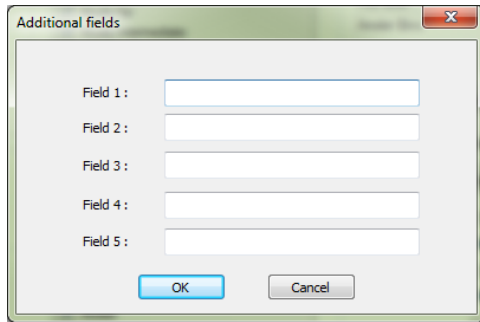
The following window appears:



- Parameter display and print modes.
- Choose the first test to appear when the software is run.
- If necessary, change the data base path.

- Add additional fields required for identification in the data base.

1. Click on the button to open the window to add fields.



- 2.
3. Click on the OK button to validate and close the window.

CAUTION: Choice of fields is definitive. A backup performed with these fields should always be opened with these same fields. The name can be changed but it cannot be destroyed.

- Choice of distances unit (m/cm or ft/in)

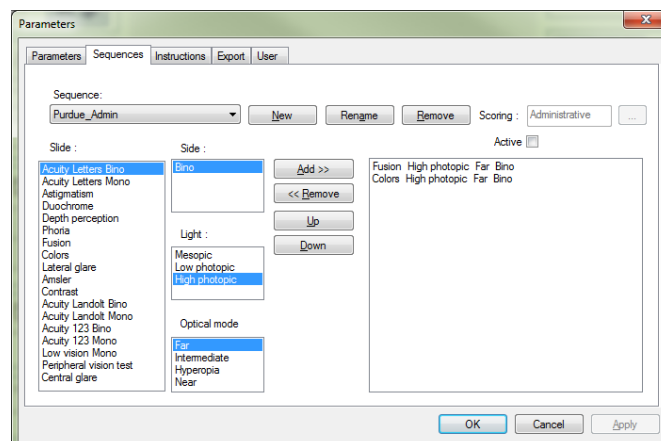
- Choice of type of visual acuity:

1. Tenth
2. Snellen 16.4ft
3. Snellen 6m

4.2.4.2. Parametering sequences

- Click “Sequences” tab.

The following screen appears:



Firstly, create a new sequence by clicking “New”.

The name of this list can be modified at any time by clicking “Rename”.

Unwanted sequences can also be deleted.

The left-hand column named “Slide” contains a list of tests the VT1 can perform.

Use the three center lists to set all the parameters for each test.

Use “Add” or “Remove” to choose the tests you wish to program in each sequence.

“Up” or “Down” keys set the order of tests to be performed.

The right-hand column indicates the tests list and order of the created sequence.

Once established, click “OK” so that the sequence appears in the scroll-down list, accessible from the tool bar.

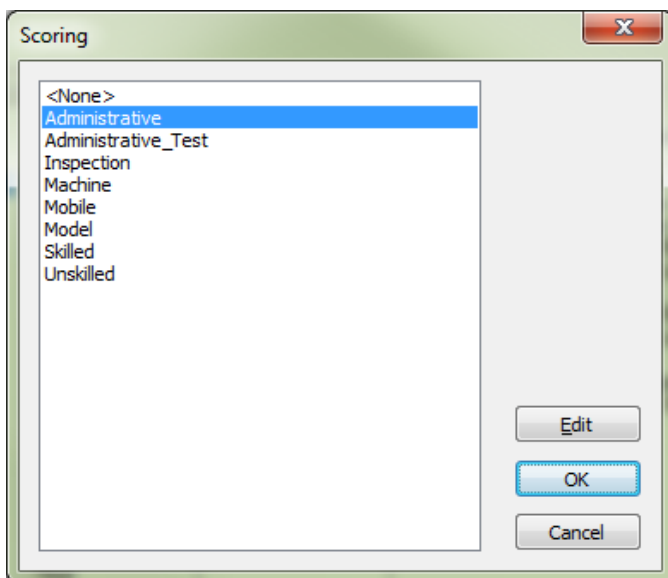
4.2.4.2.1. Scoring:

For each sequence, an active Scoring can be added. Scoring fixes the minimum and maximum limits for one or several tests, defined by either the user or by default in the software.

To choose a Scoring, select the sequence chosen in the scrolling list.

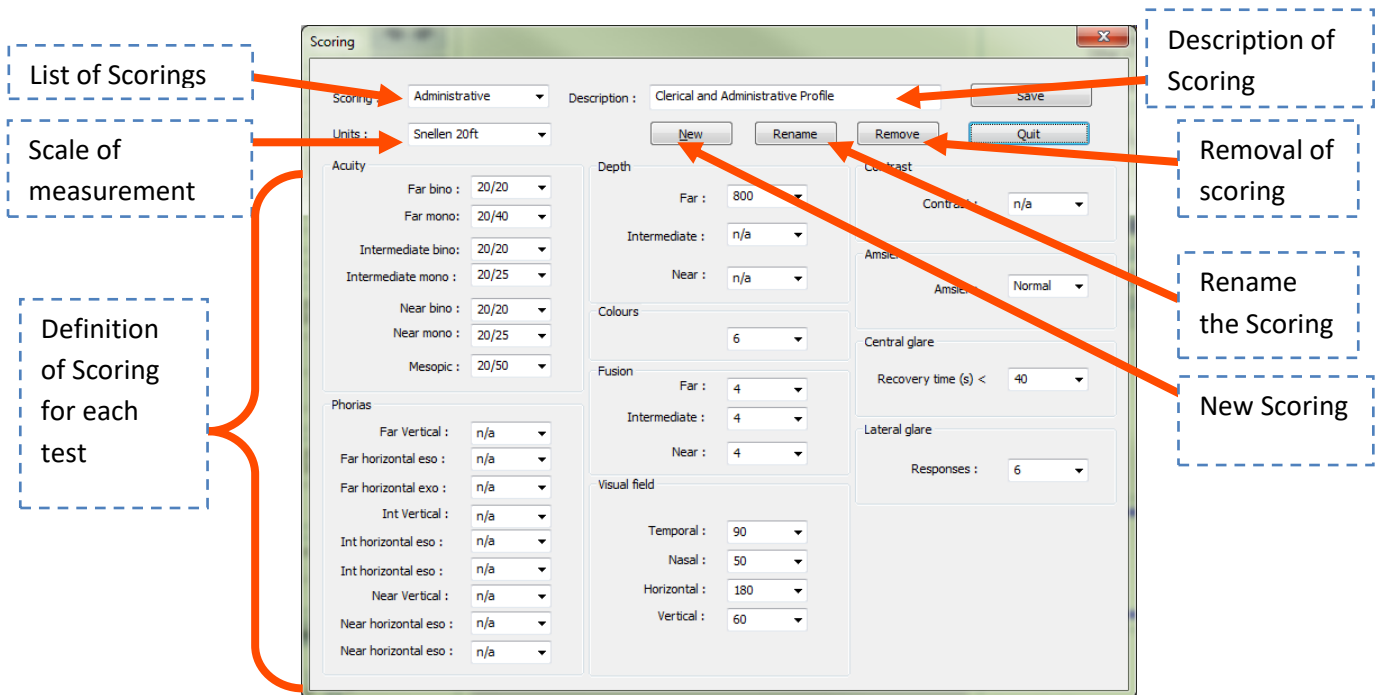
Then click on the **Active** box.

Click on the ... button to choose the Scoring.



Use this window to create or edit Scoring.

To edit, create or delete a Scoring, click on the **Edit** button, which opens the Scoring management console.



Use the **OK** button to validate the screen.

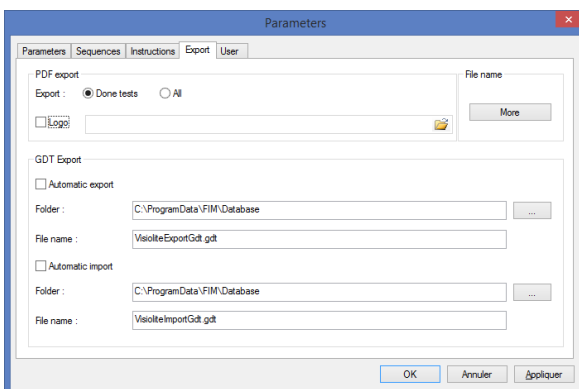
4.2.4.3. Export parametering

4.2.4.3.1. Presentation

Export mode exists in several formats to create a file readable by software other than the Visiolite®. Possible exports:

- PDF (Adobe® format)
- GDT (Specific format)
- CSV (Export compatible with Excel)

Only PDF and GDT exports require configuration.



4.2.4.3.2. PDF export

PDF export

Export : Done tests All

Logo

File name

For PDF export, configure only what the software exports:

- Tests done
- All the tests

The logo that will appear on the PDF file can also be chosen (*e.g. your company logo*).

Click on the **Advanced** button to open a window to parameter:

- Automatic recording (*defined if the recording in PDF is done at the same time as another, standard recording*)
 - No
 - Guest mode
 - Always
- The backup folder (*define the PDF file recording folder*)
 - Database
 - Other
- Name of the file (*define the file name: possibility of using global variables such as:*)
 - [First name]
 - [Last name]
 - [Date]
 - [Time]
 - [ID]

PDF export

Automatic recording

No
 Guest mode
 Always

Backup folder

Database
 Other

File format

VisioliteExport.pdf
 Fields

4.2.4.3.3. GDT export

GDT Export

Automatic export

Folder : ...

File name :

Automatic import

Folder : ...

File name :

GDT export is an export in a specific format. In the configuration of this format, you can choose:

- If the export is done automatically
- The folder of the exported file
- The name of the GDT file exported
- If the import is done automatically
- The folder of the imported file
- The name of the imported GDT file

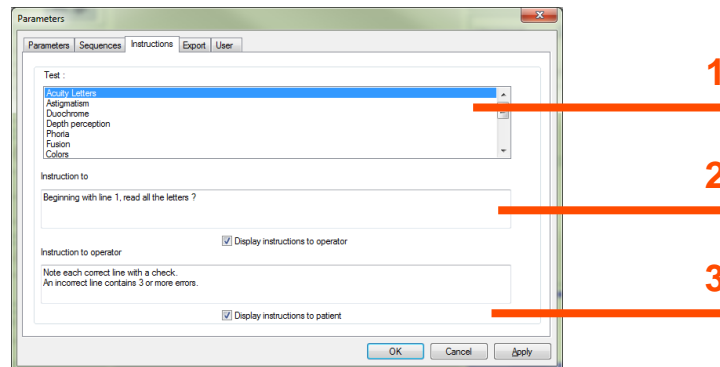
Note: Do not begin to configure an export if you are not sure of the format used.

4.2.4.4. Parametering instructions

Each test window has two instruction fields: one for the patient and one for the operator. These instructions can be modified.

- Click “Instructions” tab.

The following window appears:



1 Tests

2 Patient instruction

3 Operator instruction

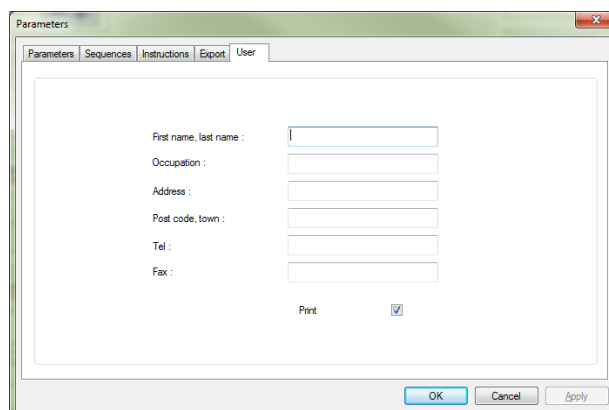
- Select a test from the top window then set the operator and patient instructions.

4.2.4.5. Operator parametering

Use operator parametering to configure the fields that concern the user. These fields can be printed out.

Relevant fields:

- First name, last name
- Occupation
- Address
- Post code, town
- Telephone number
- Fax number



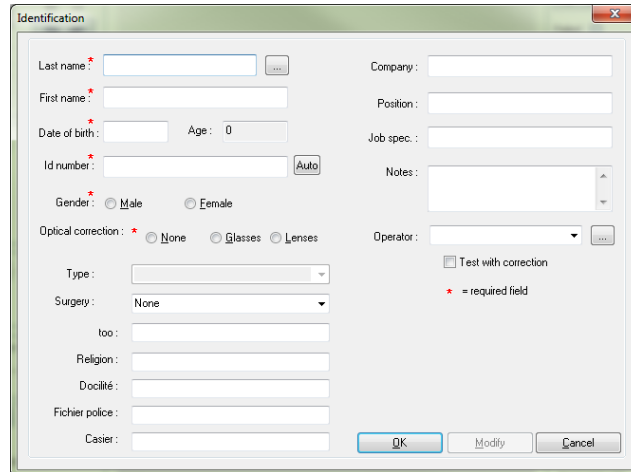
4.2.5. Data base

Patient data (first name, surname ...) as well as the tests, are stored in a data base.

4.2.5.1. Patient identification

- Click "Identification" key.

The following window appears:



Fields with a red asterisk are compulsory for recording.

Note: Additional fields created during configuration of the software are placed in this window. Up to five additional fields may be added.

4.2.5.2. Recording

Use "Record" to store the test in progress if all the compulsory identification fields have been filled in.

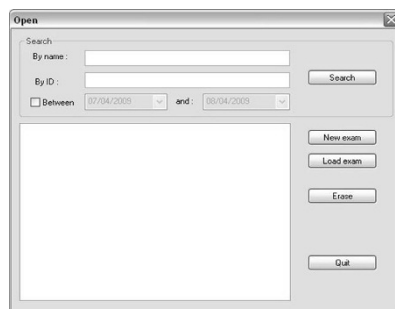
If the operator attempts to exit the software without recording a test, an alert appears.

4.2.5.3. Recover a file

To locate patient data already recorded, proceed as follows:

- Click "Open".

The following screen appears:



In the "Name" box, type the first letters of the patient's surname.

- Click “Search”.

The list of names starting with these letters appears.

- Select the patient.
- Click “New exam”.

The data is automatically entered into the identification screen.

Patient search can also be carried out by identification number or by recording date.

4.2.5.4. Recall a test

To view a previous test, or to print it, the operator can recall a file (refer § 4.2.5.3). Proceed as seen previously: a small + sign is displayed beside the patient surname, indicating the tests were performed. Click on the + sign.

A list of dates and times is displayed.

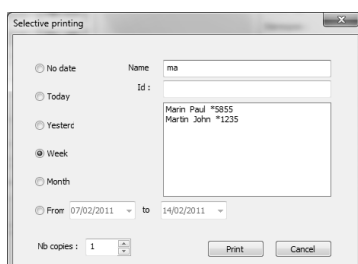
- Double click on one of the dates, or click “Load exam” to display the test performed.

4.2.5.5. Print

- Simply click “Print” to print out test results.

4.2.5.6. Selective printing

Use selective printing (File menu, Selective printing) to print tests according to the following criteria:



- No criteria
- Today
- Yesterday
- Week
- Month
- Manual selection

4.3. Essential remote control use

The VT1 Essential Edition remote control is ergonomic and very user-friendly. Each key of the remote control corresponds to a test, and each key is associated with a light for the test displayed in the VT1.



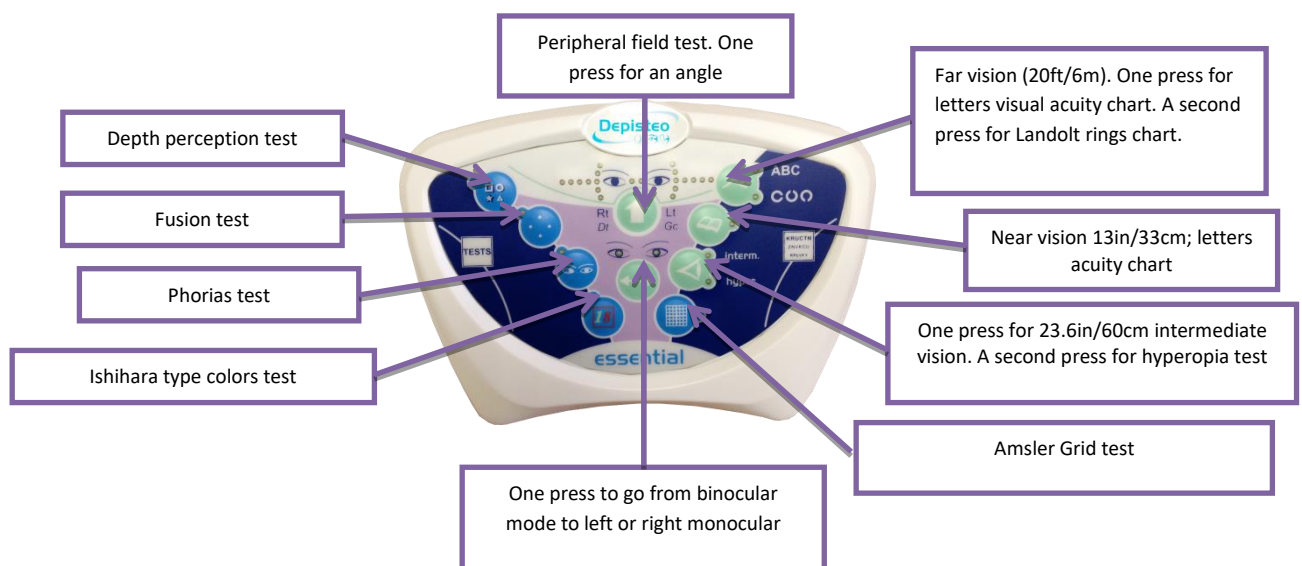
The remote control lead connector is an RJ11 type. Click the connector into the intended socket.

To unplug the lead, push down on the tongue and slowly pull out the lead. The Essential remote control should not be connected to the VT1 Essential.

Reminder: The Essential remote control should only be connected to the VT1 Essential.

As soon as the RJ11 lead and the mains are connected, the VT1 initializes in a few seconds, and automatically positions itself on the far vision (20ft/6m) visual acuity test in binocular mode. The VT1 is ready to use.

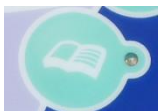
The right side of the remote control is for visual acuity tests. The left part is for extra tests.



4.3.1. Begin a test

To begin a test, simply click on the test you would like to perform.

Example: visual acuity test in near vision (13in/33 cm).



One press on this key positions the VT1 on the near vision acuity chart. A light beside the key lights up to confirm your test choice.

4.3.2. Binocular and monocular mode

At any moment the test allows, you can switch from binocular mode to monocular mode by clicking on the following key:



Binocular



Left monocular

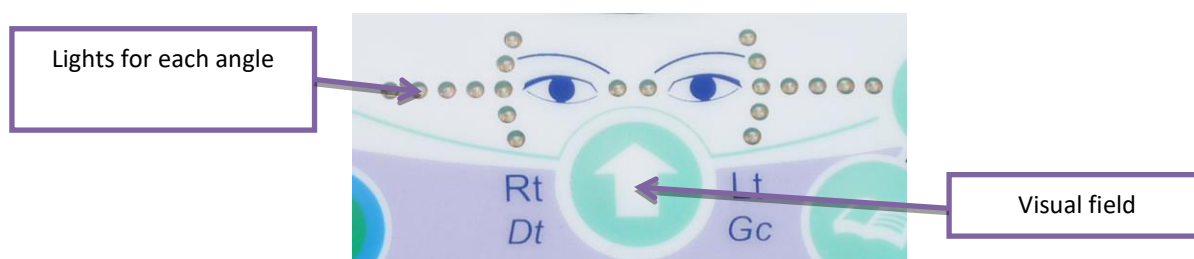


Right monocular

The lights above the keys indicate the mode selected.

4.3.3. Visual field

To begin a visual field test, press on the key indicated below. A first light representing an angle lights up. Then each press tests the next angle, which is represented by a light. As such, the horizontal and vertical fields are tested. The test begins by testing the extremities.



4.3.4. Standby

After several minutes without use, the VT1 remote control goes on standby mode. To reactivate, press any remote control key, or touch the VT1 forehead rest.

4.3.5. VT1 Essential Edition remote control response forms

The form is required to note the results given by the patient. This is only supplied with the remote control, on the CD-ROM supplied with the VT1, and can be printed as required.

If a copy is given to the patient or a third party, photocopy the original.

The form is composed of three parts:

- Patient identification
- Doctor conclusions and comments
- Tables or boxes to check according to patient response

The grey areas on the response form indicate the optimum response but cannot in any case determine normality or aptitude for a specific occupation or to perform a certain task. These areas cannot be used for an individual's interest or for discrimination purposes.

Only the conclusions of the doctor responsible, in conjunction with other medical expertise, can establish aptitude. As this is a screening test, the results cannot in any case be used for medical treatment, pre-or post-surgical diagnosis, or for any sort of prescription.

The response form gives the operator the expected response, and also the possibility to adapt the questions to ask the patient, depending on the type of test.

Vision Tester 1 - Response form

Identification No :		Test date : / /		Time :		Tester :	
Last name :		First name :		Date of birth : / /		Gender : <input type="checkbox"/> Female <input type="checkbox"/> Male	
Company :				Position :		Risk :	
Optical correction : <input type="checkbox"/> None <input type="checkbox"/> Glasses <input type="checkbox"/> Lenses		Test done with correction : <input type="checkbox"/> Yes <input type="checkbox"/> No		Correction type :			
Glasses type : <input type="checkbox"/> Single focal <input type="checkbox"/> Bifocal <input type="checkbox"/> Trifocal <input type="checkbox"/> Progressive <input type="checkbox"/> Other :		Eye surgery : <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes, what ? :			

Contrast sensitivity Grey areas = awaited responses
Check visual acuteness in vision of day with a ● and visual acuteness in night vision with a X

Distance	Children	ABC	Landolt rings	Test	Visual Acuity
Far vision 20 ft Acuity 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R L 	
Intermediate vision 24 in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R L 	
Near vision 13 in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R L 	
Astigmatism Right Left <input type="radio"/> Identical <input type="radio"/> Failed <input type="radio"/> Identical <input type="radio"/> Failed					
Glare sensibility : <input type="radio"/> Failed Glare resistance : Recovery time : <input type="radio"/> Failed					

Stereoscopic vision <input type="radio"/> Failed 	Hyperopia (+1 dioptre) R L <input type="radio"/> Clear vision <input type="radio"/> Not clear vision 	Phorias 4 = Exophoria Other = Hyperphoria 5 = Orthophoria 6 = Esophoria <input type="radio"/> Failed <input type="radio"/> Off grid
Fusion <input type="radio"/> Failed 		
Dyschromatopsies Ishihara type : numbers <input type="radio"/> Failed 		
Amsler R L Normal grid Distorted grid <input type="radio"/> Failed Other : 	Peripheral field <input type="radio"/> Failed 	

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www.depisteo.com

Conclusion :

4.4. Master Edition LCD remote control use

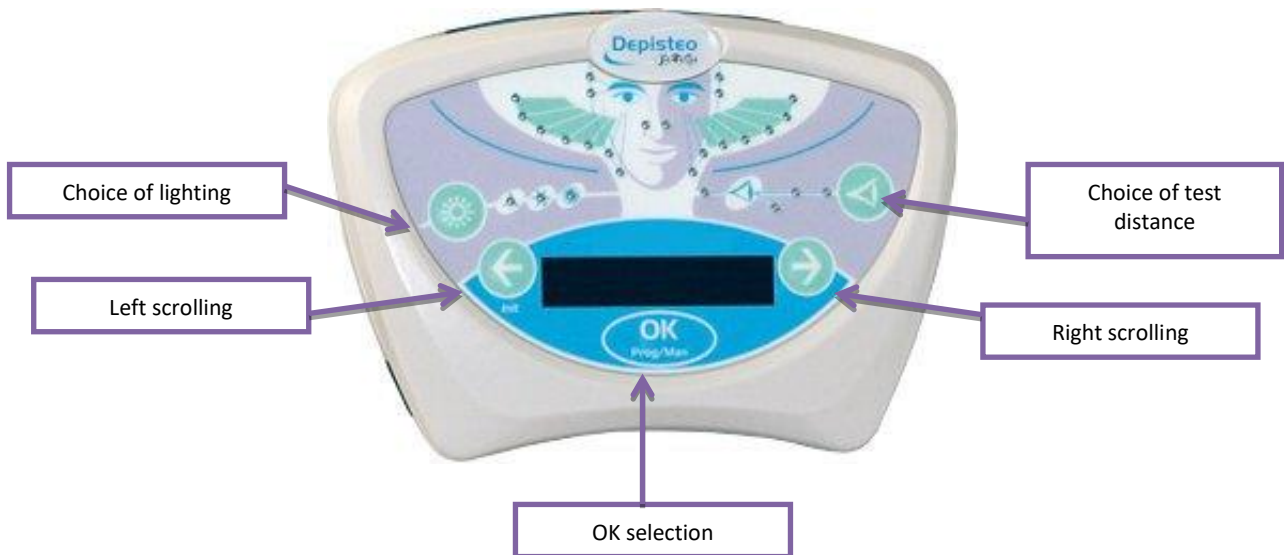
The VT1 LCD remote control has a micro-controller to choose from 7 operating modes.

The remote control lead connector is an RJ11 type; insert it into the intended socket. To unplug the lead, push down on the tongue and slowly pull out the lead.

Reminder: the remote control should only be connected to the VT1.



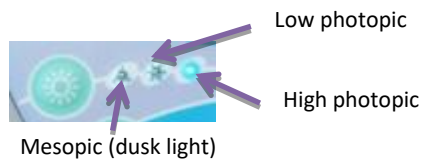
As soon as the RJ11 plug and the mains are connected, the remote control LCD screen lights up and displays a mode of use for the VT1. The VT1 is ready for operation after a few seconds of initialization.



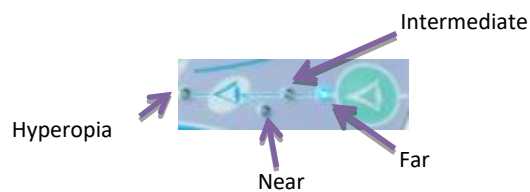
4.4.1. Keys

At any time during a test, lighting and distance may be modified:

- Lighting



- Distance

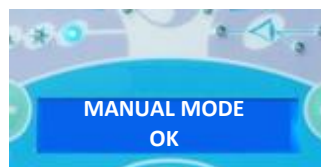


4.4.2. Forehead presence

A blinking light indicates the patient's forehead is not in contact with the forehead rest.

4.4.3. Begin a test

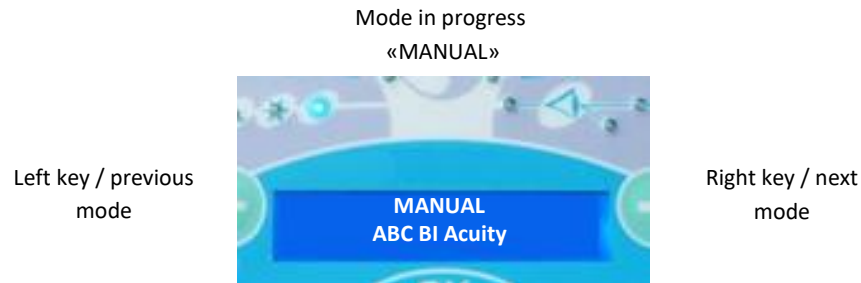
As soon as it is switched on, the last mode used appears.



Use MANUAL mode to scroll through all the tests proposed. However, no patient profile would justify a test as complete as this. It is thus preferable to use programmed tests.

4.4.4. Choose a mode

To scroll through the tests of the selected mode, use the left and right arrows. Go from one mode to another by pressing on the right or left arrow.



To select the displayed mode, click "OK".

4.4.5. Perform a test

Once the mode is chosen, go from one test to another with the right key, which displays the following test. Return to the previous test by pressing on the left key.



4.4.6. Visual field

When the remote control displays the visual field test, press "OK". Use the right and left arrows to change lighting. To exit the test, press "OK" again.



20 horizontal and vertical visual field LEDs

4.4.7. Standby

After several minutes without use, the VT1 remote control goes on standby mode. To reactivate, press any remote control key, or touch the VT1 forehead rest.

4.4.8. Remote control response form

The form is required to note the results given by the patient. This is only supplied with the remote control, on the CD-ROM supplied with the VT1, and can be printed as required.

If a copy is given to the patient or a third party, photocopy the original.

The form is composed of three parts:

- Patient identification

- Doctor conclusions and comments
- Tables or boxes to check according to patient response

The grey areas on the response form indicate the optimum response but cannot in any case determine normality or aptitude for a specific occupation or to perform a certain task. These areas cannot be used for an individual's interest or for discrimination purposes.

Only the conclusions of the doctor responsible, in conjunction with other medical expertise, can establish aptitude. As this is a screening test, the results cannot in any case be used for medical treatment, pre-or post-surgical diagnosis, or for any sort of prescription.

The response form gives the operator the expected response, but also the possibility to adapt the questions to ask the patient, depending on the type of test.

Vision Tester 1 - Response form

Identification No :		Test date : / /		Time :		Tester :	
Last name :		First name :		Date of birth : / /		Gender : <input type="checkbox"/> Female <input type="checkbox"/> Male	
Company :				Position :		Risk :	
Optical correction : <input type="checkbox"/> None <input type="checkbox"/> Glasses <input type="checkbox"/> Lenses Test done with correction : <input type="checkbox"/> Yes <input type="checkbox"/> No				Correction type :			
Glasses type : <input type="checkbox"/> Single focal <input type="checkbox"/> Bifocal <input type="checkbox"/> Trifocal <input type="checkbox"/> Progressive <input type="checkbox"/> Other :				Eye surgery : <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, what ? :			

☉ Contrast sensitivity Grey areas = awaited responses
Check visual acuteness in vision of day with a ● and visual acuteness in night vision with a X.

Distance	Children	ABC	Landolt rings	Test	Visual Acuity
Far vision 20 ft <small>☉ Acuity 2</small>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R L 	 1 2 2 3 4
Intermediate vision 24 in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R L 	
Near vision 13 in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R L 	
Astigmatism Right Left <input type="radio"/> Identical <input type="radio"/> Failed <input type="radio"/> Identical <input type="radio"/> Failed		Glare sensibility : <input type="radio"/> Failed Glare resistance : Recovery time : <input type="radio"/> Failed			

Stereoscopic vision <input type="radio"/> Failed 	Hyperopia (+1 diopter) R L Clear vision Not clear vision <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Phorias 4 = Esophoria Other = Hyperphoria 5 = Orthophoria 6 = Esophoria <input type="radio"/> Failed <input type="radio"/> Off grid
Fusion <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> Failed	Dyschromatopsies Ishihara type : numbers <input type="radio"/> Failed R L 	
Amsler R L Normal grid Distorted grid <input type="radio"/> Failed Other : <input type="radio"/> Failed	Peripheral field <input type="radio"/> Failed 	

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Conclusion :

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5. Tests Description

5.1. Visual acuity test

Visual acuity is a criterion for quality of vision; the power of the eye to distinguish detail.

Visual acuity is determined by the identification of black symbols on a white background, called optotypes.

Hyperopia test is an acuity test with the addition of one diopter, to screen for hyperopia.

The VT1 uses several different visual acuity charts that:

- Vary the optotypes so as to avoid voluntary or involuntary memorization
- Test illiterate persons
- Test morphoscopic vision (recognition of shapes)
- Test the power of separation (recognition of a detail)

Different charts test binocular and monocular vision.

The choice and shape of symbols is rigorously defined to increase efficiency of optotype identification.

An acuity test, or chart, contains 10 levels of visual acuity (10 lines): 20/20, 20/22, 20/25, 20/30, 20/35, 20/40, 20/50, 20/70, 20/85 and 20/100.

A level of visual acuity is presented by 6 distinct optotypes regrouped on the same line.

The different levels of acuity presented constitute the acuity scale.

A number corresponding to the line number is represented on the left of each line.

A level of visual acuity is validated as soon as 4 of 6 optotypes of this acuity are correctly identified.

For the remote controlled version, the operator notes this acuity on the response form.

20/100	1	C H A P V E
20/85	2	U Z T L E K
20/70	3	T P Z F K V
20/50	4	A R P V F E
20/40	5	H P E T Z K
20/35	6	C T L U P Z
20/30	7	H R P C A U
20/25	8	P F Z H K R
20/22	9	E T P K N F
20/20	10	K H C P F L

Binocular acuity letters

20/100	1	PHCVZE	1	UZTLEK
20/85	2	TPZFKV	2	PFZHKR
20/70	3	CHVFRL	3	KRUCTN
20/50	4	KCLRHE	4	ZNVKCU
20/40	5	AUJTPH	5	RPLVFT
20/35	6	CHAPVA	6	CHAPVE
20/30	7	NJVRZK	7	JKNTUP
20/25	8	JRLHUE	8	FVTKZA
20/22	9	ZTNFKV	9	TUJZFH
20/20	10	UHACRK	10	NCHJRA

Monocular acuity letters

1	20/200	▲						
2	20/100	○	+					
1	20/70	▬	★	♥				
2	20/50	♥	+	☾				
3	20/40	★	☾	○	▬			

Binocular acuity Kindergarten charts

1	20/30	★	+	○	♥	▬
2	20/20	☾	♥	☪	★	+

Binocular acuity Kindergarten charts

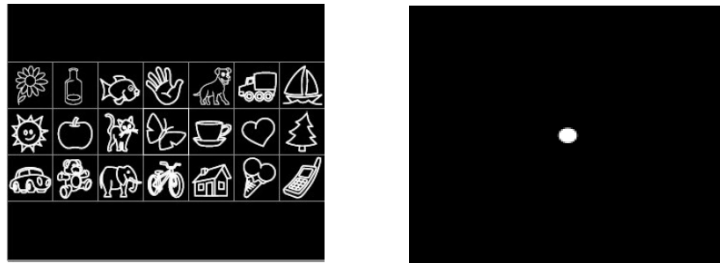
20/100	1	○○○○○○
20/85	2	○○○○○○
20/70	3	○○○○○○
20/50	4	○○○○○○
20/40	5	○○○○○○
20/35	6	○○○○○○
20/30	7	○○○○○○
20/25	8	○○○○○○
20/22	9	○○○○○○
20/20	10	○○○○○○

Binocular acuity Landolt rings

20/100	1	∩∩∩∩∩∩	1	∩∩∩∩∩∩
20/85	2	∩∩∩∩∩∩	2	∩∩∩∩∩∩
20/70	3	∩∩∩∩∩∩	3	∩∩∩∩∩∩
20/50	4	∩∩∩∩∩∩	4	∩∩∩∩∩∩
20/40	5	∩∩∩∩∩∩	5	∩∩∩∩∩∩
20/35	6	∩∩∩∩∩∩	6	∩∩∩∩∩∩
20/30	7	∩∩∩∩∩∩	7	∩∩∩∩∩∩
20/25	8	∩∩∩∩∩∩	8	∩∩∩∩∩∩
20/22	9	∩∩∩∩∩∩	9	∩∩∩∩∩∩
20/20	10	∩∩∩∩∩∩	10	∩∩∩∩∩∩

Monocular acuity Landolt rings

5.2. Children phorias test



5.2.1. Purpose

The phorias test measures parallelism of the ocular axes at physiological rest for children. All phorias (heterophoria) translate as eye strain (asthenopia), notably in intense conditions (screen work). Eventually heterophoria, along with fatigue, can become diplopia (double vision). This test is particularly interesting for screening latent heterophorias.

5.2.2. Interpretation limits

This test is only significant when visual acuity in the right and left eyes is practically identical. This test cannot be interpreted with large differences in acuity between the two eyes. In this case, the heterophoria would not be due to eye strain, as the best eye takes over and becomes dominant.

5.2.3. Definition

A grid containing different symbols is presented to the left eye while a dot is presented to the right eye. Without neutralization of one of the images by the brain, the two images should superimpose. Localization of the white dot on one of the numbered zones of the grid qualifies the type of phoria: the grid is sized so as to reveal an esophoria of 6 diopters, an exophoria of 6 diopters and a hyperphoria of 1 diopter.

5.2.4. Patient instructions

On which image is the dot blinking?

- Note the response on the response form.

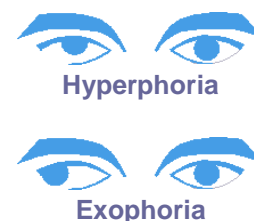
5.2.5. Expected responses

Those that appear on the response form.

The VT1 software measures the deviation.

If the white dot or the grid is not perceived, the brain has neutralized one of the images.

If the dot is perceived outside of the grid, the heterophoria is over 6 diopters.



With this test, the VT1 can completely dissociate the two eyes, indirectly performing a well-known test, the

cover test, but more easily and accurately. As such, when the patient attempts to dissociate the dot and the grid, their convergence function will be used. The dot will move in the opposite direction to that of the heterophoria. This direction is noted.

The yellow arrows can be used to ⁽¹⁾: drag-and-drop the arrow in the grid. A right-pointing arrow indicates initial movement of the dot (and thus of the eyeball) from inside to out — ESOPHORIA. A left-pointing arrow indicates initial movement of the dot from outside to inside — EXOPHORIA.

- ➡ **Caution:** Dot movement is often fleeting, or non-existent (orthophoria): the questions should prepare the patient to indicate the movements of the dot in relation to the grid as soon as the test is presented and before the dot comes to rest⁽²⁾.

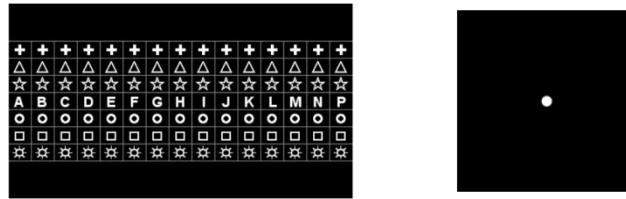
To render this test more sensitive, the VT1 presents the grid and the dot successively, with a slight time difference.

- ➡ **Caution:** This test cannot be interpreted if there is an important difference between the two eyes. Also, ensure the patient does not close an eye during the test.

⁽¹⁾Tick “dynamic phorias” option in the set-up parameters so that the arrows appear.

⁽²⁾When the dot does not move, simply click on the area where it is seen in the grid.

5.2. Adult phorias test



5.2.1. Purpose

The phorias test measures parallelism of the ocular axes at physiological rest.

All phorias (heterophoria) translate as eye strain (asthenopia), notably in intense conditions (screen work).

Eventually heterophoria, along with fatigue, can become diplopia (double vision). This test is particularly interesting for screening latent heterophorias.

5.2.2. Interpretation limits

This test is only significant when visual acuity in the right and left eyes is practically identical. This test cannot be interpreted with large differences in acuity between the two eyes. In this case, the heterophoria would not be due to eye strain, as the best eye takes over and becomes dominant.

5.2.3. Definition

A grid containing different symbols from top to bottom (plus sign, triangle, star, letter, circle, square and sun) and letters from left to right (from A to P) is presented to the left eye while a dot is presented to the right eye. Without neutralization of one of the images by brain, the two images should superimpose.

Localization of the white dot on one of the numbered zones of the grid qualifies the type of phoria: the grid is sized so as to reveal an esophoria of 7 diopters, an exophoria of 7 diopters and a hyperphoria of 1.5 diopters.

5.2.4. Patient instructions

On which symbol can you see the dot? Which letter is vertically associated to the symbol?

- Note the response on the response form.

5.2.5. Expected responses

Those that appear on the response form.

The VT1 software measures the deviation.

If the white dot or the grid is not perceived, the brain has neutralized one of the images.

If the dot is perceived outside of the grid, the heterophoria is over 7 diopters.

If the white dot is perceived:

- In zone H, the ocular axes are parallel (orthophoria)
- In zone left to H, the ocular axes have a tendency to diverge horizontally (exophoria)
- In zone right to H, the ocular axes have a tendency to diverge horizontally (esophoria)



With this test, the VT1 can completely dissociate the two eyes, indirectly performing a well-known test, the cover test, but more easily and accurately. As such, when the patient attempts to dissociate the dot and the grid, their convergence function will be used. The dot will move in the opposite direction to that of the heterophoria. This direction is noted.

To render this test more sensitive, the VT1 presents the grid and the dot successively, with a slight time difference.

- **Caution:** This test cannot be interpreted if there is an important difference between the two eyes. Also, ensure the patient does not close an eye during the test.

5.3. Contrast sensitivity test



Contrast sensitivity test

5.3.1. Purpose

Demonstrates a decrease in contrast sensitivity. Contrast sensitivity is typically a retinal function and a decrease can indicate an alteration of the retina. It is also decreased in certain diseases such as cataracts and chronic glaucoma.

Decrease in contrast sensitivity is physiological in night vision.

The acuity level of this test is constant (20/100). Only the contrast decreases with each letter, from 100 to 1.2 % like this:

100	80	63	50	40
32	25	20	16	12.5
10	8	6.3	5	4
3.2	2.5	2	1.6	1.2

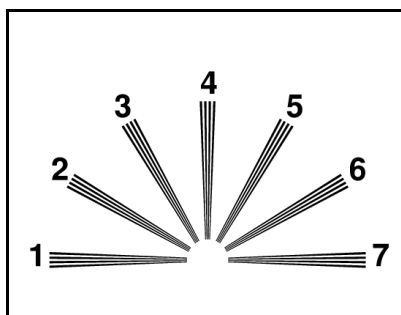
Contrast sensitivity (%)

5.3.2. Patient instructions

“From the first line, read all the letters”.

- Check the response

5.4. Astigmatism test



5.4.1. Purpose

Astigmatism is an important source of eye strain, particularly in intense conditions or poor lighting (screen work or night driving with glare from oncoming vehicle lights).

5.4.2. Definition

The astigmatism test is composed of an astigmatic dial with 7 branches numbered from 1 to 7.

5.4.3. Prerequisite

This test should be performed in monocular mode.

The operator should look at each of the branches consecutively.

5.4.4. Patient instructions

Are some of the lines blacker or clearer?"

- Note the responses on the response form.

5.4.5. Expected responses

If the patient perceives some branches less clear, or greyer, than others, the eye is probably astigmatic.

Normally all the branches should be perceived in the same way. A branch that is clearer in direction 4 indicates vertical or direct astigmatism. On the contrary, if the branches are clearer in directions 1 and 7, this indicates horizontal or inverse astigmatism. These directions indicate different optical strength in the particular meridian, as the corneal astigmatism is toric, rather than perfectly spherical.

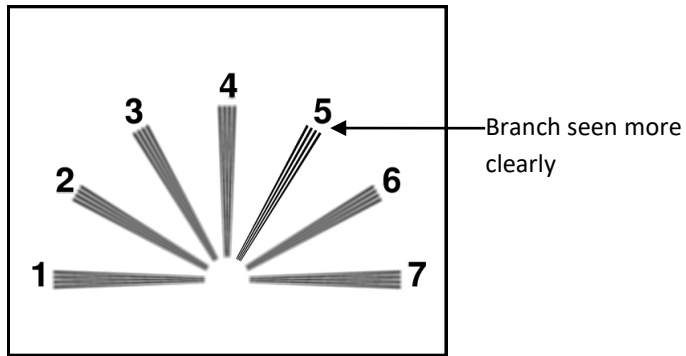
A 'clearer in directions 1, 4 and 7' response is thus impossible, and the VT1 operator is alerted by a question mark. Generally, in these cases, after repeating the test with clear instructions, the response would be interpreted as 'identical'.

"Oblique" astigmatism also exists and is more difficult to correct, sometimes persisting despite correction. In this case, the response would be given in either the 2 or 3 meridian, or the 5 and 6. A simultaneous response: 2, 3, 5, 6 is impossible.

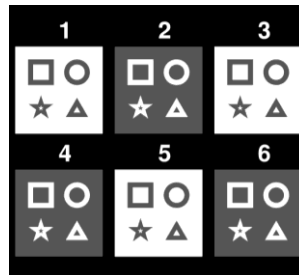
Sometimes a meridian astigmatism is only detected by varying focal length. Astigmatism could thus be tested in near vision, or after addition of the hyperopia lens in far vision. Of course, detection for astigmatism in near or intermediate vision is useless, if it is present in far vision.

Lastly, this device only screens "regular" astigmatisms. Other, "irregular" astigmatisms, notably on corneal scars, are screened by ophthalmologists.

5.4.6. Perception example



5.5. Depth perception test



5.5.1. Purpose

To qualify depth perception acuity.

This test can be useful, for example, for forklift operators who require precise docking of loads, or for perception of distances in vehicle driving.

5.5.2. Interpretation limits

Depth perception results from the brain integrating two slightly differently-positioned images. This test is only possible if both eyes have identical, or nearly identical, visual acuity and normal convergence (at least normal fusion). This test is impossible when there is an important difference in acuity between the two eyes, or disparity of fixation. However, total absence of depth perception acuity cannot be deduced so easily. Physiologically, even with low acuity in one eye, even to the point of simple light perception, and normal acuity in the other eye, depth perception vision is made through cerebral compensation. In theory, only one-eyed individuals cannot have depth perception vision.

5.5.3. Definition

Depth perception is screened with 6 separate, numbered boxes. Each box contains 4 shapes: a square, a circle, a star and a triangle.

For each box, one of the shapes has a binocular horizontal disparity, expressed in arcseconds (1 arcsecond = $1^\circ/3600$). This causes a stereoscopic parallax in relation to the three other shapes in the box. Consequently, this shape should be perceived by the patient in front of, or behind, the three other shapes. The value of binocular disparity is different for each box: large for the first box and decreasing by half for each consecutive box.

Normal depth perception acuity should perceive the disparities of all the tests.

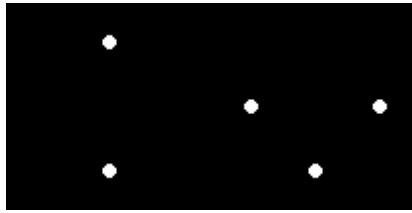
Box	1	2	3	4	5	6
Disparity (in arcseconds)	200"	100"	70"	50"	40"	25"
Expected responses	Triangle	Circle	Star	Square	Star	Circle

5.5.4. Patient instructions

"Certain shapes seem to be behind or in front of the others; give the answer for groups 1 to 6".

- Note responses on the response form.

5.6. Fusion test



5.6.1. Purpose

To check binocular vision.

Fusion is the ultimate phase in binocular vision. As for phorias, fusion requires good visual acuity in each eye. In the case of phoria anomaly, fusion can be obtained by stimulating the oculomotor muscles, which will correct the phorias. Failure of this test signifies anatomical impossibility of convergence, which is found in extreme cases of strabismus.

A fusion problem (which can range from fixation disparity to suppression of one of the two images) can be an important source of eye strain during screen work. The patient should see four dots for the test to be successful.

5.6.2. Definition

A group of white dots is presented to the patient with different patterns for each eye.

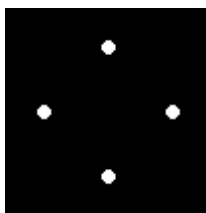
5.6.3. Patient instructions

“How many white dots can you see?”

- Note the response on the response form.

5.6.4. Expected responses

- 4 points perceived indicates fusion: the brain correctly superimposes the two images coming from each of the eyes
- 2 points perceived indicates suppression: the brain neutralizes the image coming from the right eye
- 3 points perceived indicates suppression: the brain neutralizes the image coming from the left eye
- 5 points perceived indicates diplopia: the brain is unable to correctly superimpose the two images coming from each eye



Normal perception

5.7. Age-related macular degeneration (ARMD) / Amsler grid

5.7.1. Purpose

Screening for central visual field deficiency.

5.7.2. Definition

The test is composed of a grid on a black background with a central white dot.

The user should focus on the central white dot.

5.7.3. Prerequisite

This test must be performed in monocular mode.

5.7.4. Patient instructions

“Are the horizontal and vertical lines perfectly straight?”

“Are any of the areas deformed?”

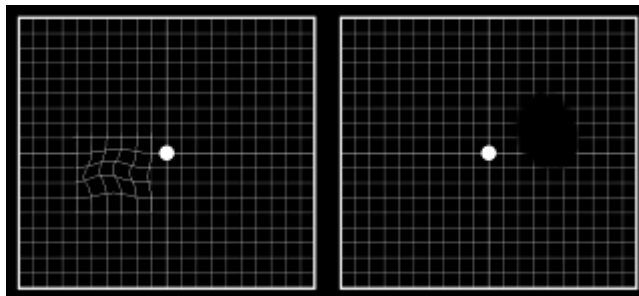
“Do any holes or black areas appear inside the grid?”

➤ Note the response on the response form.

5.7.5. Expected responses

- Distortion of lines, or metamorphopsia, could be associated with age-related macular degeneration
- An area in which the lines disappear is associated with macular scotoma (blind spot)

5.7.6. Perception examples



5.8. Color perception test

5.8.1. Purpose

Chromatic deficiency screening. As well as exploration of congenital dyschromatopsias (as in the Ishihara type tables), this test offers the possibility of exploring acquired dyschromatopsias.

These tests are particular in that they screen problems of color vision in shaded areas and in the blue-yellow axis. These areas are not explored with the classical Ishihara test, which only explores the red-green axis, essentially affected in congenital deficiencies of color vision.

The blue-yellow axis is predominantly affected in acquired dyschromatopsias, in particular those of toxic origin, of which this is an early sign. Moreover, this test is more sensitive due to the presentation of shades of colors, close to neutral, allowing for device luminosity, calibrated for this type of test (high photopic mode).

5.8.2. Definition

The test presented is a pseudo-isochromatic of the Ishihara type.

Color perception is checked using 6 distinctly numbered boxes.

Each box, or plate, is composed of a matrix of dots of variable height, shade and color.

Areas of similarly-colored dots are defined to form numbers. A number composed of two digits appears in each box. Colors are chosen so that an abnormality in the perception of colors makes it difficult to recognize certain numbers.

The total tests present 12 lines of chromatic confusion in the three axes:

- Protan (red)
- Deutan (green)
- Tritan (blue-yellow)

In all the six numbers presented, each number indicates a line of confusion.

E.g. within the number 81, failure to recognize the digit 8 indicates a tritan (blue) type deficiency, characteristic when the cones of the superficial layer of the retina are affected.

Failure to recognize the digit 1 indicates a deficiency of the deutan (green) type, which may be seen when the deep layers of the cones of the retina are affected, as the "4" of 45 tends to indicate a deficiency of the protan (red) type, when the same deep layers are affected.

These screening findings are summarized in the table on the following page.

5.8.3. Prerequisite

This test should be performed in high photopic mode. However, if the patient tested is blinded (blue-eyed people are subject), it can be performed in medium photopic mode, but never in low photopic mode.

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The test should be performed in MONOCULAR vision. It requires acuity of at least 20/25. If acuity is lower, any abnormality of color vision should be confirmed in intermediate or near vision (if the patient has a better acuity at these distances).

5.8.4. Patient instructions

“Read the colored numbers in each box”.

- Note the response on the response form.

Reading grid expressed in terms of tendency:

Box 1		Box 2		Box 3		Box 4		Box 5		Box 6	
8	1	4	5	6	3	2	7	9	0	1	8
tritan	deutan	protan	tritan	deutan	protan	tritan	deutan	protan	tritan	deutan	protan

5.8.5. Interpretation limits

Responses do not constitute a formal diagnosis, merely a trend.

All types of abnormality can be present in the same patient, each abnormality expressed more or less completely.

As such, for example, expression of a protan type deficiency can range from a simple abnormality with confusion of shades in the red-green axis (protanomaly) to complete blindness to the color red (protanopsia).

Responses are expressed as tendencies and conclusions are not drawn on one test only.

Only the repetition of tests during successive examinations can confirm or invalidate this tendency, in particular with exposure to solvents, or in the presence of a progressive pathology such as diabetes.

This test should be interpreted with caution in patients over 40 years of age, for who color vision can be altered normally.

5.9. External and central visual field test

The Visiolite offers two types of visual field tests: external and central visual fields.

Definitions

5.9.1. External visual field

Area from temporal horizontal field to nasal horizontal field for each eye, and from left temporal to right temporal for both eyes. Area of vertical field.

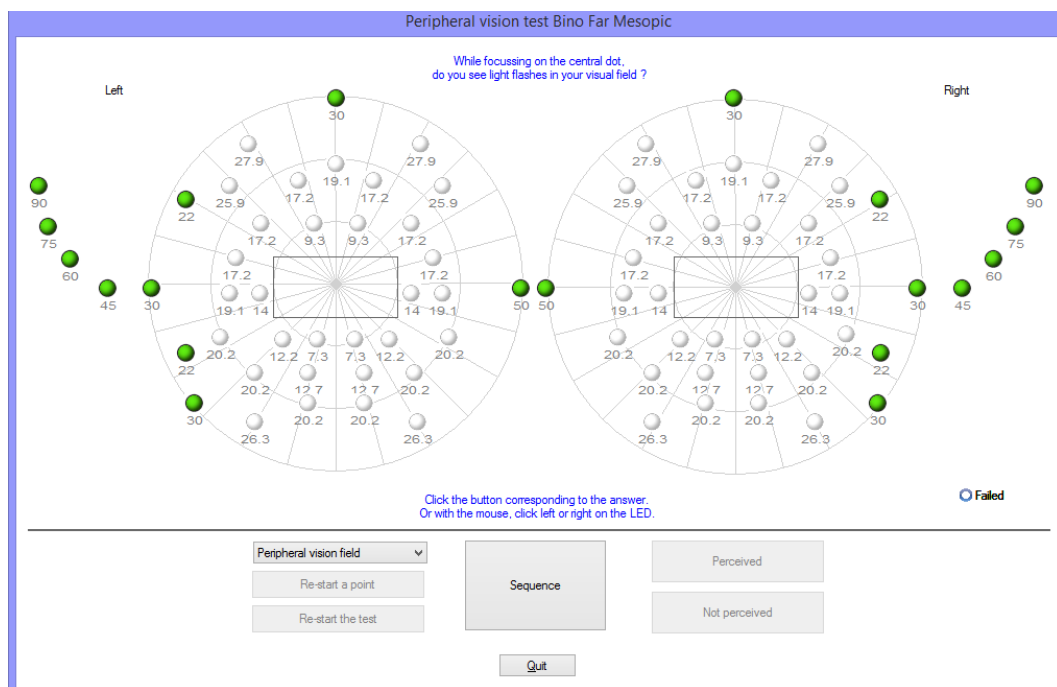
Horizontal field features

Angles tested on temporal side	90°, 75°, 60°, 45°, 30°
Angles tested on nasal side	50°
Total for one eye	140°
Total binocular	180°

Vertical field features

Angles tested	30°, 22°, -22°, -30°.
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Arrangement of external field stimuli



5.9.1.1. Purpose

Measures aptitude for vehicle or engine driving. An evaluation of the amplitude of the horizontal and vertical visual field is required by certain laws (road rules).

5.9.1.2. Use in manual mode

Select the test from the list.

Click on the stimulus to test.

Click the «detected» or «not detected» button depending on whether the patient detects the stimulus or not.

5.9.1.3. Use in automatic mode

Select the test from the list, then click «sequence» to run the automatism.

When the patient responds, click the «detected» button.

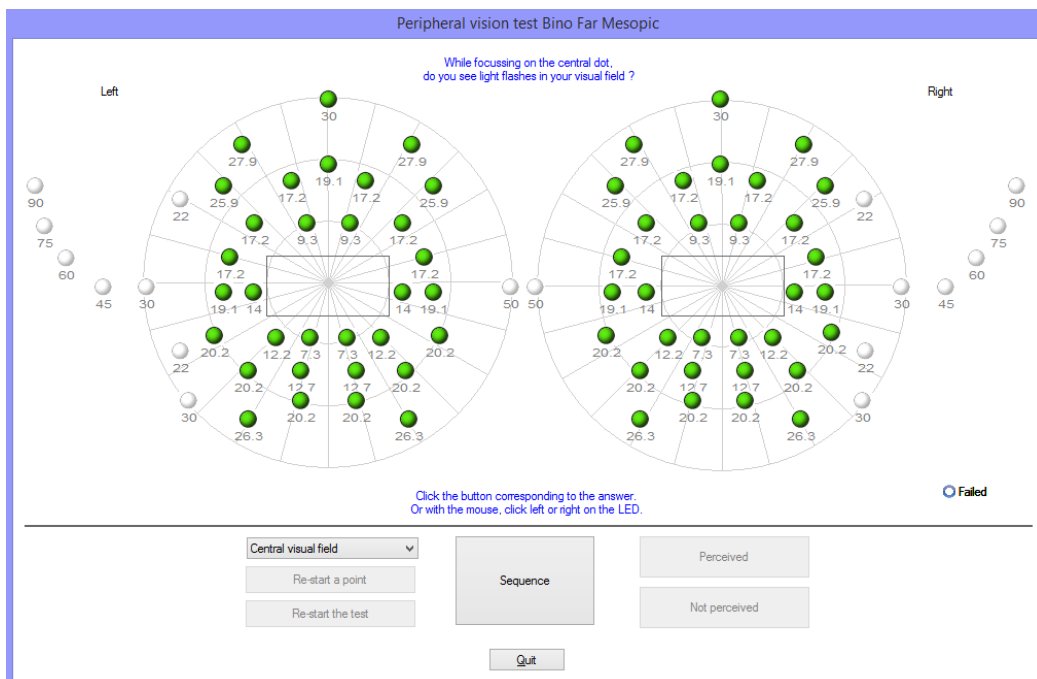
If the patient does not detect the stimulus, click the «not detected» button.

NB: The sequence of the external field test is semi-random. The programme tests firstly the points furthest from the eye, then closest to it. The test stops when the visual field area of each eye is measured.

5.9.2. Central visual field

- Detects visual defects in a given radius (10°, 20°, 30°).

Arrangement of central field stimuli



5.9.2.1. Purpose

Measures aptitude for vehicle or engine driving. An evaluation of the amplitude of the integrity of the central visual field is required by certain laws (road rules).

5.9.2.2. Use

Select the test from the list and click «sequence» to run the automatism.

When the patient responds, click the «detected» button.

If the patient does not detect the stimulus, click the «not detected» button.

5.9.3. Patient instructions





“While focussing on the central dot, do you see light flashes in your visual field?”

- Note the response on the response form.

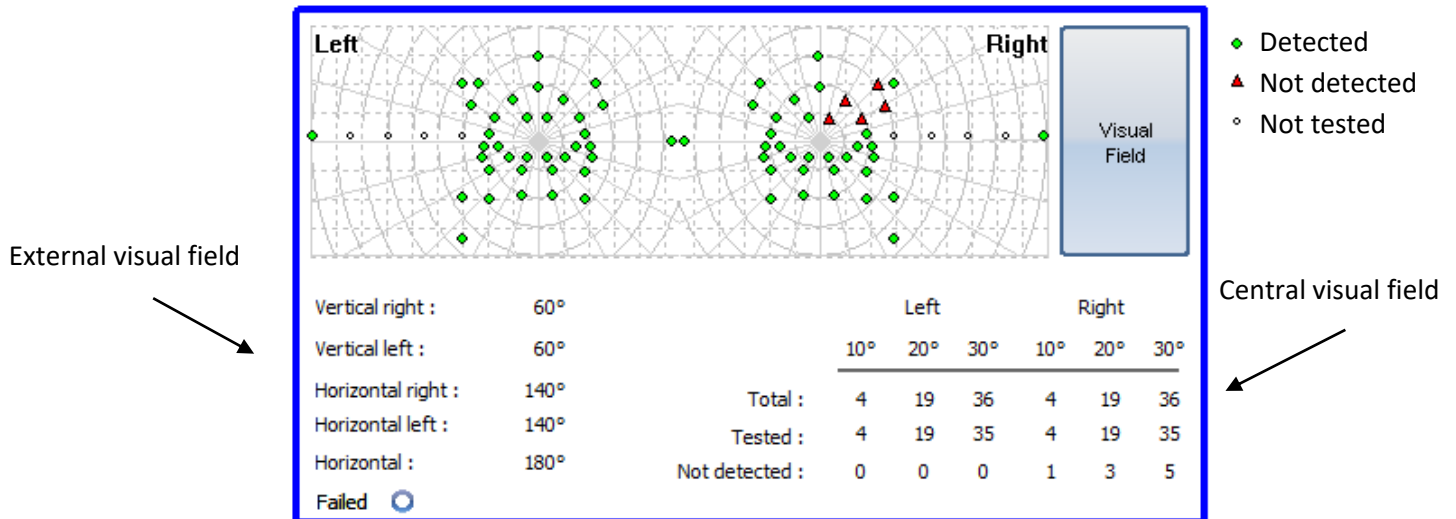


Caution: if the patient wears glasses, the frames may alter the visual field.

5.9.4. Significance of stimuli in the test window

-  Detected
-  Not detected
-  Not tested
-  Not part of the sequence

5.9.5. Results



5.9.6. Limits

This test is not intended to completely explore the visual field.

Its main aim is to determine certain aptitudes; it does not serve to establish a diagnosis even if, in certain cases, screening is successful. Specialist diagnostic tests exist for this purpose (Goldman perimeter, etc ...).

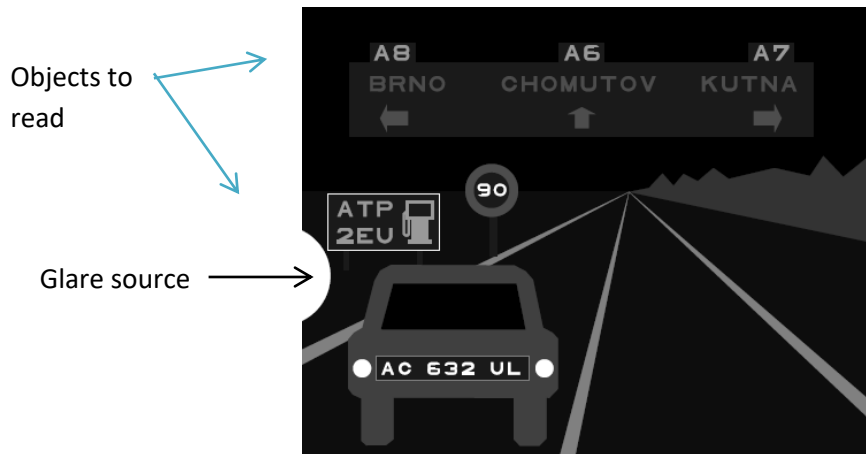
An abnormal result should be interpreted with care, particularly for the nasal visual field (the shape of the nose could impede visibility of the light signal). In the lateral visual field, the patient's glasses frames may be a hindrance.

5.10. Glare sensitivity test (*Master GT version*)

- ➔ **Caution:** The glare sensitivity test may hold risks for the patient. Don't forget to take into account any medical contraindications (refer § 2.3).

5.10.1. Purpose

The glare sensitivity test provides rapid screening by simulating the disturbance caused by lights when passing a vehicle at night.



Glare sensitivity test

The optotypes are designed so that the patient is not able to guess the words without reading them. Words chosen are either:

- **random letters**
- **or names of Czech Republic towns**

The size of characters is acuity: 20/63 and 20/50 so as not to render this test more difficult.

The positioning of objects in the driving scene is important. These are positioned in several places with different contrasts, so as to simulate the difficulties in vehicle-driving conditions.



Different angles of positioning of objects to identify

5.10.2. Principle

A driving scene composed of different objects and different contrasts is displayed. The glare source comes from the left-hand side of the scene. The patient names the objects seen closest to the light source and the operator notes the responses.

5.10.3. Operator and patient instructions

“Name each element that you see in the scene”.

- Click on the objects seen

5.11. Glare resistance test (Master GT version)

- ➔ **Caution:** The glare resistance test may hold risks for the patient. Don't forget to take into account any medical contraindications (refer § 2.3).

5.11.1. Purpose

The glare resistance test is only for information. It is secondary to the sensitivity test presented in § 5.10. This test measures the recovery time of the patient's vision when submitted to a high source of light.

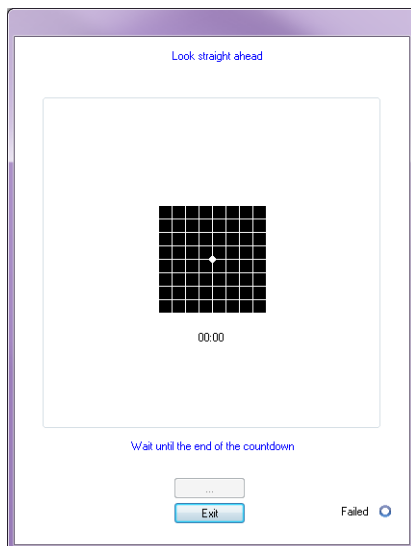
5.11.2. Principle

This test requires a precise protocol, integrated in this option. After a few seconds of adaptation, the software presents firstly a visual acuity test based on the "Binocular Mesopic Letters". The patient is blinded for 10 seconds. The device then displays a visual acuity test based on the "Binocular Mesopic Numbers". The aim is to measure the recovery time of the patient's visual acuity.

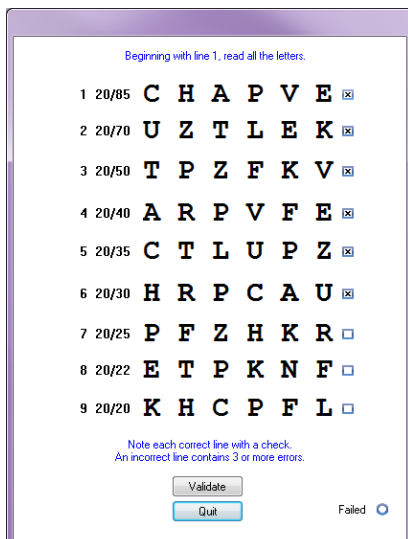


5.11.3. Patient instructions

Instructions are given by the software over the course of the test. Series of screens displayed by the VT1:



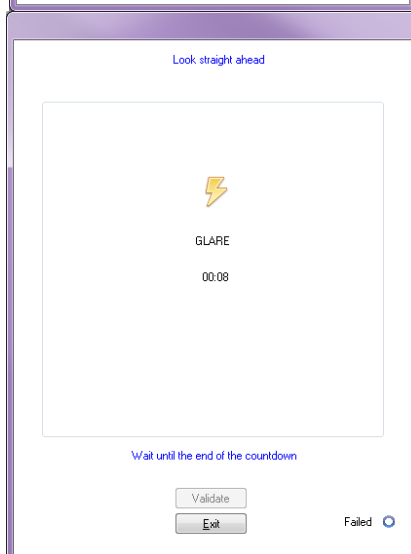
Patient adaptation in mesopic light over ten seconds.



Measurement of visual acuity in mesopic light after period of patient adaptation.

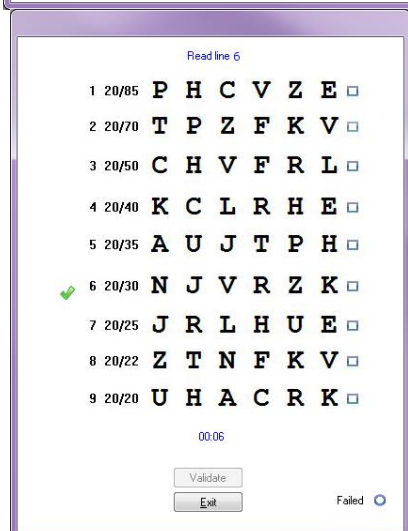
The operator notes the best patient acuity.

Note: If the patient demonstrates difficulty with a line, it is preferable to directly choose the line above.



The Amsler grid is used on the patient so as to induce a scotoma. The glare lasts for 10 seconds.

The operator should insist that the patient focus on the central circle.

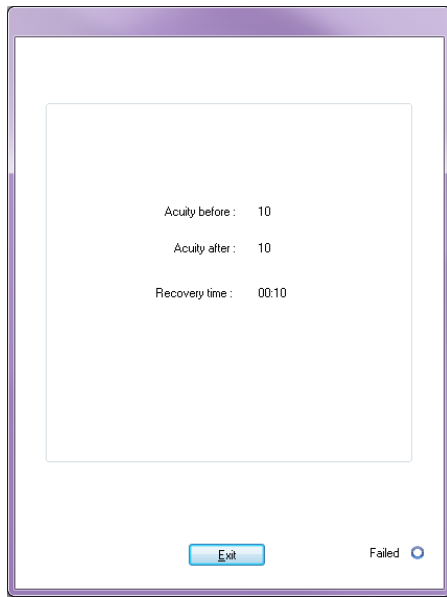


Final test phase.

The patient's visual acuity is evaluated on the basis of numbers presented in mesopic light. The aim is to measure the recovery time and to avoid memorization of the first test performed.

The operator notes the best acuity.

Note: Do not continue longer than two minutes.



Display of results.

6. Cleaning and Maintenance

6.1. Removable forehead rest cleaning

For hygienic measures, all the VT1 surfaces in contact with the skin (housing, mask, forehead rest) should be disinfected after each test. The removable forehead rest should systematically be cleaned after each use with a damp cloth and a bactericide solution. DEPISTEO recommends the use of Bactinyl™ 5M.

If the forehead rest is damaged (ripped, etc...), contact your distributor or DEPISTEO for a replacement.

- **Caution: Never sterilize the VT1 or its accessories.**
- **Caution: Never wash the VT1 under running water or directly spray it with any sort of liquid.**

6.1.1. Remove forehead rest

- Simply pull it off.

6.1.2. Replace forehead rest

- Press on it.
- Clips located at the bottom.

6.2. Clean the housing

The VT1 housing can be cleaned with a damp cloth and a bactericide solution. DEPISTEO recommends the use of Bactinyl™ 5M.

6.3. Clean the lenses

To avoid scratches, the external surface of the lenses should be regularly cleaned with a soft wipe used for glasses.

Do not press down on the lenses.

- **Caution: DO NOT use a bactericide solution to clean the lenses, as this will remove the anti-reflective coating.**

6.4. Clean the peripheral field holes

- Do not clean.
- Remove dust with a soft cloth.

6.5. Annual service

Different forms of maintenance to keep the VT1 in an optimal operational state are recommended.

During annual servicing, the following operations are performed by DEPISTEO After Sales Service, or by your distributor (if trained by DEPISTEO personnel for maintenance):

- Checking device general functions
- Cleaning optics
- Checking and cleaning tests band
- Checking and minor repairs of mechanical and electronic elements
- Checking and calibration of central and lateral LEDs (only for VT1 Master GT Edition)

This maintenance can be requested by the customer or by DEPISTEO if preventive operations are deemed necessary for correct functioning of the device.

6.6. Warranty

Within the framework of the contractual warranty of two years, only repairs are covered. The warranty is only applicable if normal and usual conditions of use are respected. During annual servicing, a certain number of preventive operations are performed; breakdowns following annual service are not covered by the warranty.

7. What To Do If?

7.1. No noise when switched on

- Check it is plugged into the power supply.
- Check the light on the power plug is on.

7.2. Normal switch-on noise but screen light remains grey

- Check USB connection and driver installation.

7.3. Error message appears at recording

7.3.1. "Identification incomplete"

Fields marked with a red asterisk in the identification panel are compulsory for recording.

7.3.2. "Operation must use updateable query"

This message is due to a problem of writing access rights on that computer. The administrator must give all tree structure rights, where the data base is found, to the operator.

7.4. Patient identification file found but not the tests

- Click "+" on the left of the patient's name in the "Open" dialogue box.

7.5. VT1 light does not come on

- Check power supply connection.
- Check the patient's forehead position on the forehead rest.

7.6. Glare and motor drive seem weak

- Check you are using the recommended power plug.

8. Declaration of Conformity



*Thank you for reading this manual.
If you require further information, please don't
hesitate to contact us.*

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