2021

VideoFrenzel

V 1.905

Manual

Table of Content

Attention!

Device does not have FDA or CE approval and should be used for educational and demonstration purposes

1. General

1.1 Intended Use

VideoFrenzel is a more advanced and accurate device for eye movements observation in comparison with well-known Frenzel goggles. VideoFrenzel consists of mask with infrared cameras, connected with laptop via usb. The eyes are displayed on the monitor in enlarged size. The mask has soft foam pad, which snugs softly against patient's face, ensuring complete darkness and being comfortable at the same time. VideoFrenzel could be used in all standard vestibular tests: spontaneous nystagmus, gaze fixation nystagmus, saccads, smooth pursuit, positional and positioning tests ets. It's easy to perform test without visual fixation, such as head shaking test and test of spontaneous nystagmus vision denied, as the cover provides total darkness for the patient. VideoFrenzel makes it easy to record eye movements and the image of situation camera at the same time, which is extremely useful in diagnosis and treatment of patients with benign paroxysmal positional vertigo.

1.2 Device specifications

General

Weight	480g
Dimentions (glasses)	250x100x110mm
Cable length	4m
Connection	2 x USB 2.0
Power supply	5V, 350mA

System requirements

- Windows 7 or 10
- CPU: Intel Core i5, 4 cores, 2GHz (better Core i7, 4 cores)
- 2xUSB to connect Goggles and external camera
- RAM: 4 GB.
- SSD is desirable
- Monitor with a resolution of at least 1280x800 pixels
- 100 Mb disk space for the program, some gigabytes for results storage

1.3 Device package

- Mask with built-in video cameras and cover
- Disposable face pads - 20pcs
- Webcam (general view camera)
- USB Type C to 3xUSB A hub
- Microfiber cloth for cleaning mirrors and camera lenses
- USB flash drive with software distributive

1.4 Device detailed description

Device consists of the following parts (Fig. 1):

1 Mask

2 Built-in IR cameras for pupil observation

3 Mirrors embedded in the mask

4 Mask cover completely darkening the patient's eyes.

5 Disposable face pad, attached to the mask with Velcro

The mask connects to the laptop via USB cable.

Fig 1. Device detailed

2. Preparation for work

2.1 Software installation

Following steps should be performed to install VideoFrenzel:

Insert supplied flash drive and copy the folder /VFSetup on the hard disk Run VFSetup.exe, follow the instructions. You will need to select the interface language and program location (default path is C:\Program Files (x86)\VideoFrenzel\)

Copy the entire folder /VFSetup from the flash drive

After installation of VideoFrenzel it should be proposed to install VLC media player (to playback recorded video). You can use any other player that supports h.264 decoding as well.

Adobe Acrobat Reader must be also installed on your PC, it is available for download at https://get.adobe.com/ru/reader/.

Both programs are free, distributives are available on the flash drive supplied.

2.2 System setup and device connection

To start working with the device you need:

- attach the face pad to the mask (velcro). The pad should be positioned symmetrically and don't block the patient's eyes

- connect goggles to the laptop via USB

- connect external camera to the laptop if necessary

- clean camera lenses and mirrors with microfiber cloth if necessary

- turn on the laptop and start the VideoFrenzel program

For the weak systems it may be advisable to disconnect the laptop from the Internet, disable the antivirus and close all applications which load CPU and thus slow down the program

Two important notes on connecting VideoFrenzel to PC

I. Running VideoFrenzel program without connected glasses is impossible, following message will appear on the screen:

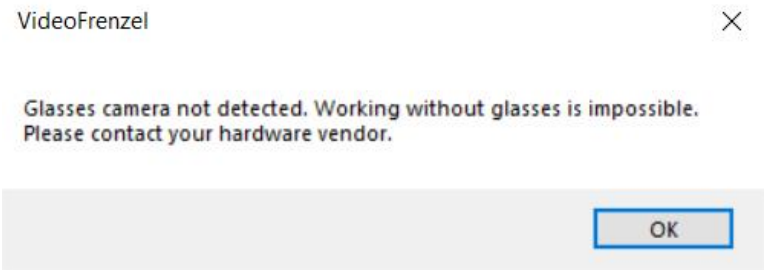


Fig 2. Running VideoFrenzel program without connected Goggles is impossible

II. Connecting both VideoFrenzel glasses and external web-camera to the laptop via supplied USB-hub (see figure 2) is not possible, Windows will not recognize both cameras simulaneously.

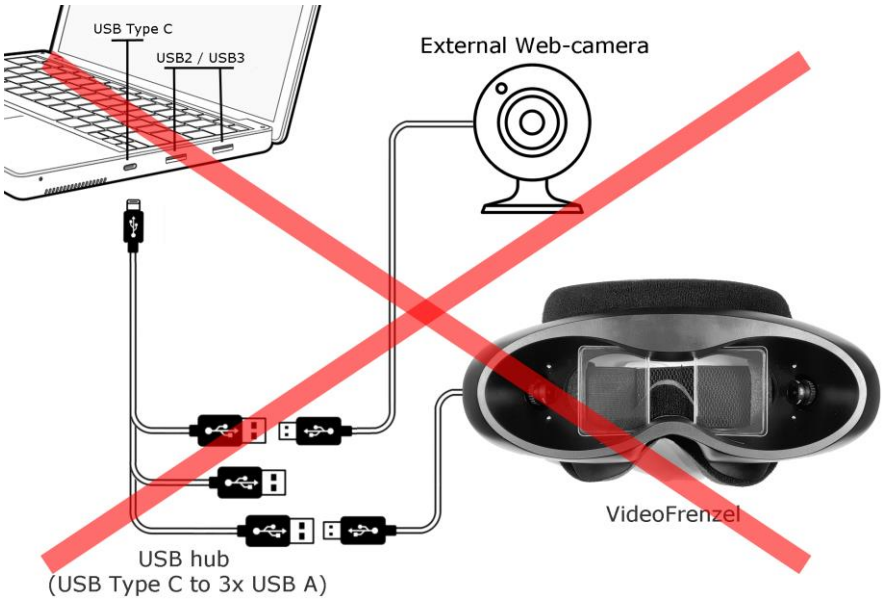


Fig 3. Connecting both VideoFrenzel glasses and external web-camera to the laptop via supplied USB-hub (see figure 6 below) is not possible

3. Working with the device

3.1 Program interface

On the first first launch user the user is offered to accept the license agreement. Main program window is depicted in Figure 4.

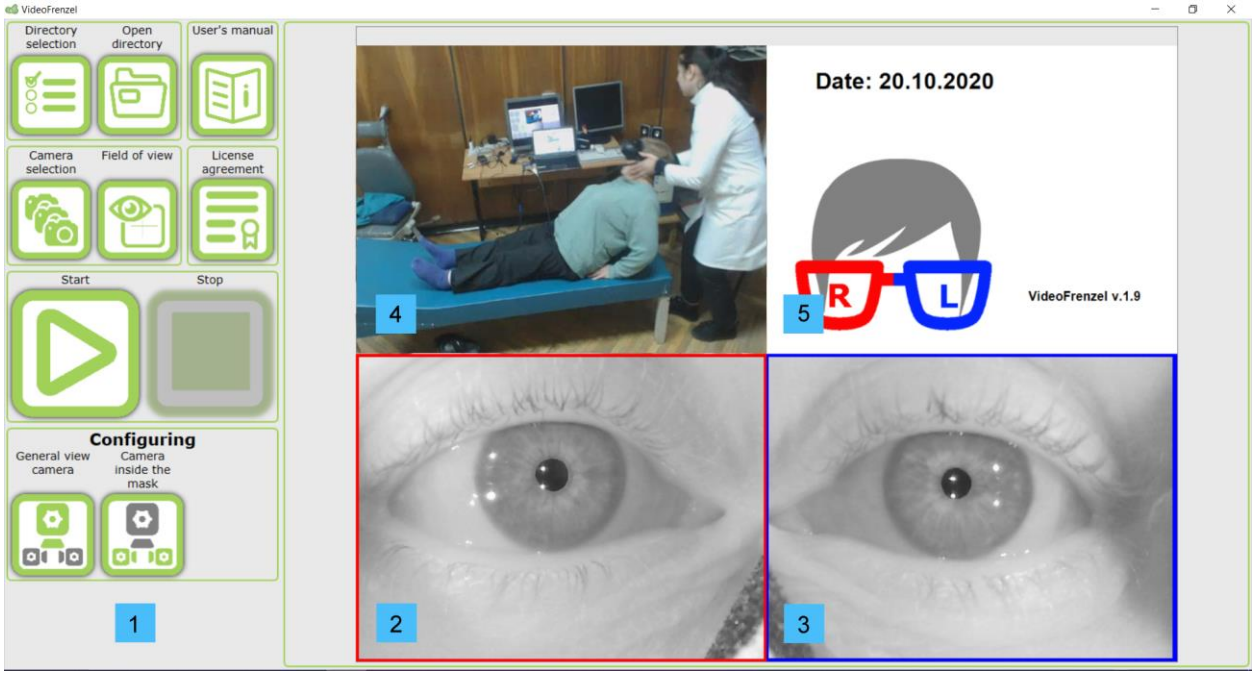


Fig 4. Main program window

Designations in Figure 4:

1. Settings and controls
2. Right eye view
3. Left eye view
4. External camera view
5. Date and recording time

3.2 Settings and controls

1. «Directory selection» button

Standard dialog for specifying the folder location for video files. Program creates folder "My Documents/VideoFrenzel" by default

2. «Open Directory» button

Opening the folder with video files recorded by VideoFrenzel

3. «Manual» button:

VideoFrenzel manual should be opened with Adobe Acrobat Reader

4. «Licence agreement» button:

Licence agreement should be opened in a separate window

5. «Camera selection» button

Dialog box with the list of all cameras found in the system appears on clicking this button (Figure 5). User have to assign general view camera.
As a general view camera one can use the web-camera supplied with the device, the laptop's integrated camera or any other web-camera that supports a resolution 640x480 at 30fps

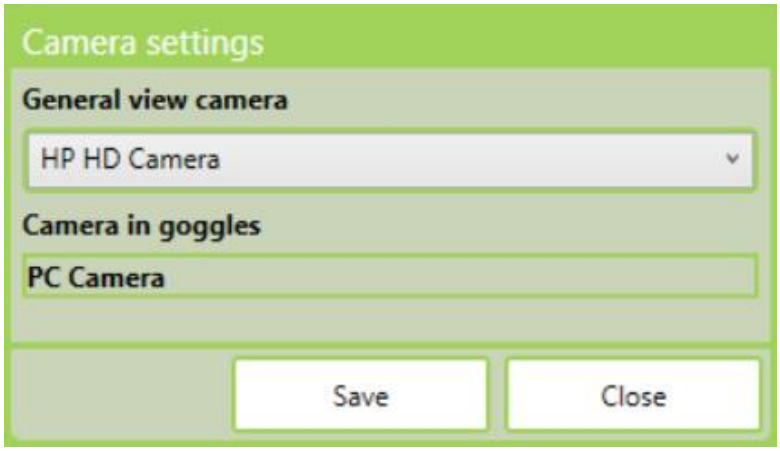


Fig.5. Camera selection window

Click «Save» button after choosing the cameras. Selection will be stored.

6. «Adjusting the field of view» button

Selecting image fragments for subsequent recording. Left-click on the pupils in turn, so that they are in the center of the frame. Settings saved on clicking «Apply» button

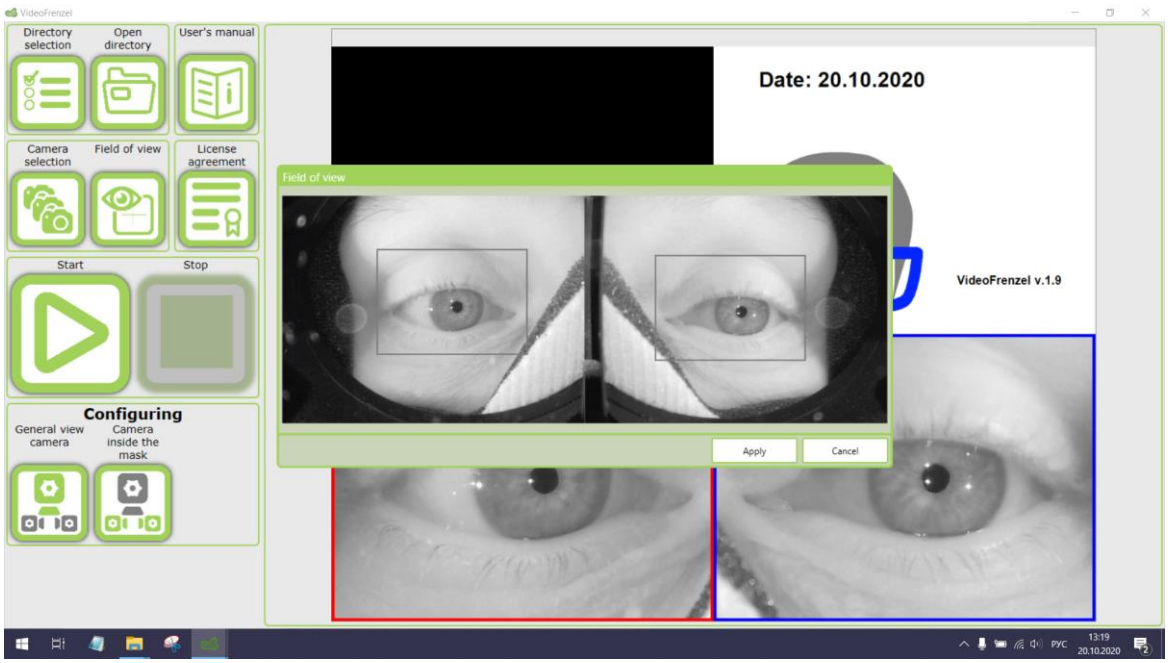


Fig. 6. Adjusting the field of view

7. «Start» button

Video recording starts. Video file will be stored in the folder specified in the «Directory selection» settings. The program first shows the name and file path in the dialog box:

All buttons except for the «Manual» button are inactive during recording.

Double-clicking on the image of any camera puts the program in full-screen eye view, see figure 7.
This mode allows you to see the eyes at maximum magnification. It is especially useful when working with small monitors.

You can return to the standard display mode by double-clicking or pressing ESC.

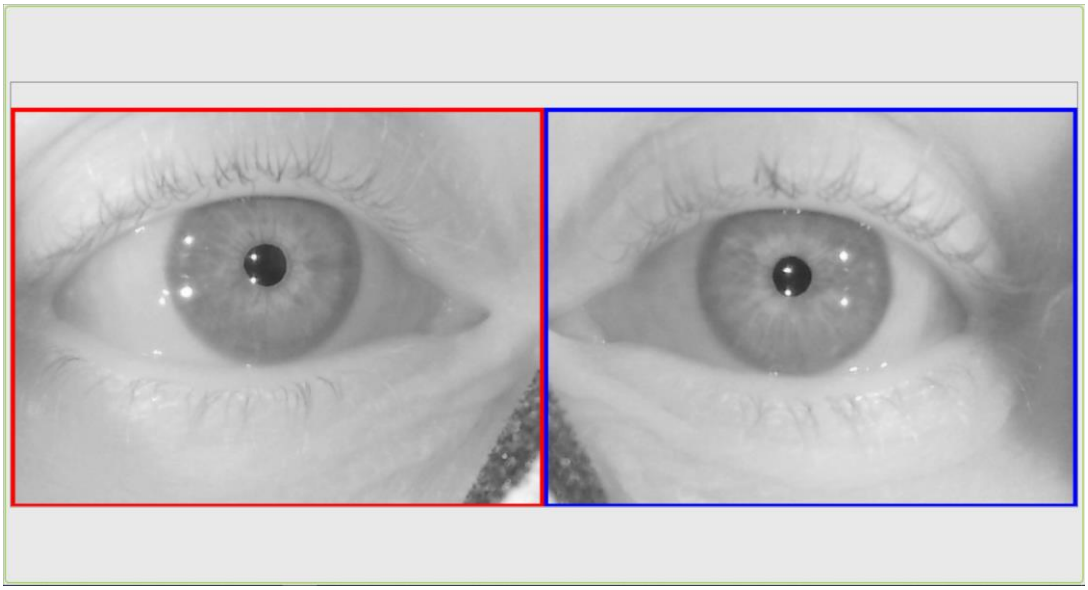


Fig 7. Full screen mode

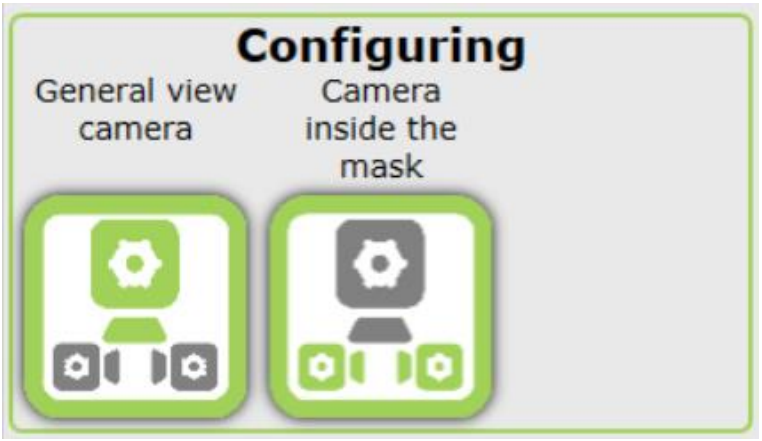
8. « Stop» button

On pressing this button the recording ends and the device turns into normal mode.

Recorded video file is encoded by codec h.264 with extension *.avi.
You can use installed VLC player or any other media player that supports h.264 decoding.

9. Camera configuring menu.

"General view Camera", "Camera inside the mask" buttons



Standard Windows dialog for setting camera parameters appears on clicking one of these buttons.

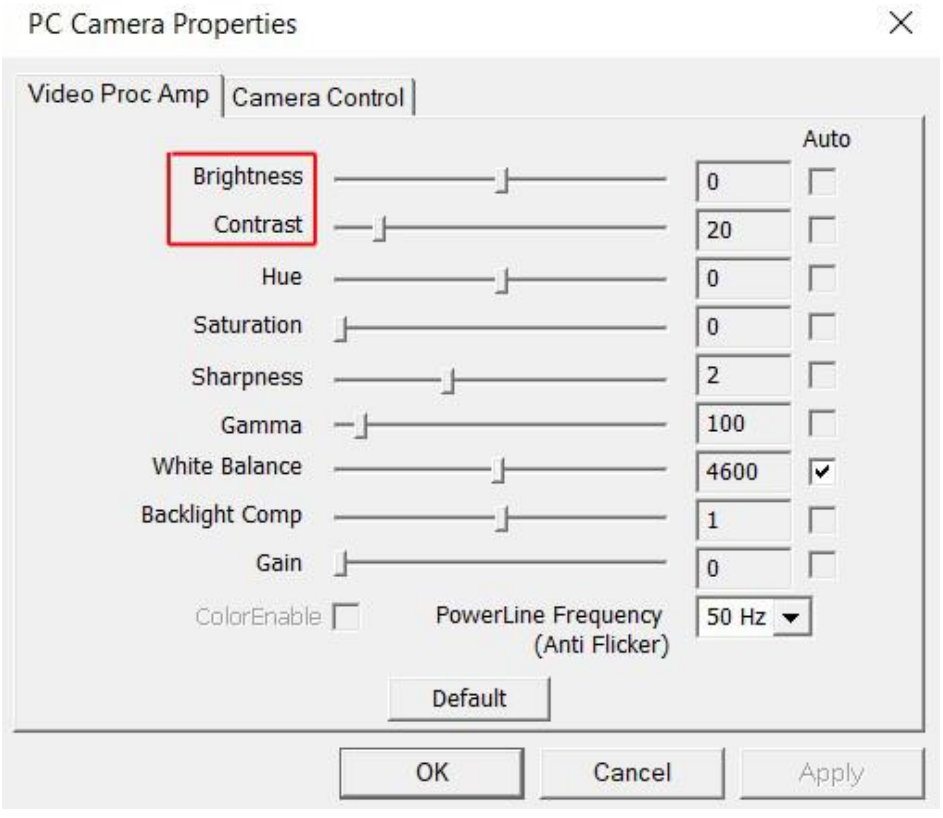


Fig 8. Camera control dialog

Combining “Contrast” and “Brightness” parameters (the “Video Proc Amp” tab), one need to achieve the desired contrast and brightness of the image. Changing settings in “Camera Control” tab is not necessary in most cases.

Parameter setting dialog of general view camera supplied with VideoFrenzel is similar to those from eyes cameras settings. The default settings are suitable for most cases.

4. Focal length adjusting

The glasses are supplied with a focal length set to sharply display the patient's pupils. However, it is sometimes necessary to adjust the focal length slightly. Adjustment is done by turning the lens by hand or tweezers.

Figure 9 shows the direction of lens rotation.

Fig. 9: Direction of rotation of the lens to remove or approximate the boundaries of the sharply imaged space

Necessary direction of lens rotation could be determined by moving a small object (pencil) closer and farther from the mirror (place it on the rear side of glasses where the patient's pupils are).
Rotate the lens step by step at small angles (5 degrees), controlling the actual focal length.

5. Care and Maintenance

Use antiseptic (isopropyl alcohol) wipes to clean the device's surfaces.

Wipe mirror surfaces and camera lenses with a microfiber cloth.

Always disconnect the USB cable during the cleaning process, and be careful that no fluid is entering the inside of the instrument.