



REF

Center of Pressure Pursuit

CE Class I Medical Device

User manual

Distribution mode

Available for direct download at
<http://virtualisvr.com/espace-client/>
Use under license

 **VIRTUALIS**

Avenue de l'Europe - 34830 CLAPIERS - Tel. 09 80 80 92 91



DESCRIPTION

CENTER of PRESSURE (CoP) PURSUIT is an immersive 3D simulation software based on virtual reality technology, meaning a person can be immersed in a digitally created artificial world. **CoP Pursuit** is a software for active rehabilitation of the lower limb by moving the patient's center of pressure using StaticVR posturography platforms.

INDICATIONS

Functional rehabilitation of body weight transfer and pressure in orthopedic, neurological, rheumatological or traumatic contexts of the lower limb and

CONTRAINDICATIONS

Epileptic patients, children under 15 years of age, pregnant women

FOR USE BY

Healthcare professionals: Physiotherapists; Ergotherapists; Neurologists; PM&R physicians (Physical Medicine & Rehabilitation), etc.

Research Centers: CNRS, CHU, INSERM, etc.

WARNINGS AND CAUTIONS

During sessions, stay close to the patient in order to anticipate any loss of balance or discomfort caused by the use of virtual reality.

Define a working area of about 3m² to allow for risk-free movements.

Take a 10 to 15-minute break every 30 minutes of use.

Potential adverse effects are those due to the use of Virtual Reality, namely vomiting, malaise, dizziness, syncope.

The accessories required to use the software may emit radio waves that can interfere with the operation of nearby electronic devices. If you have a pacemaker or other implanted medical device, do not use the product until you have taken advice from your doctor or the manufacturer of your medical device.



Any serious incident should be notified in writing to qualite@virtualisvr.com



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1. GENERAL

1.1. Advice for use

This type of rehabilitation must be undertaken progressively, especially in Virtual Reality where the stimulation is much more "powerful" than with traditional optokinetic stimulators.

These stimulations have the potential to cause a number of disorders: Vasovagal syncope, epileptic seizures, migraines, etc. (Despite a test phase on more than 2000 patients. Similarly to previous generation optokinetics, caution is required)

The contraindications are identical: Mainly epilepsy and migraines.

As postural reactions can be spectacular, it is VERY STRONGLY advised to place patients in a safe environment and to stay close to them throughout the session.

It is also recommended to increase the duration and intensity of the stimulation very gradually, after an initial short session to check the patient's tolerance to this type of stimulation.

Virtualis declines any liability for any disorders suffered by patients during or after use of its software.

1.2. Hardware and minimum configuration requirements

Hardware required to use the system:

- VR Ready PC
- VR System: HTC VIVE, HTC VIVE Pro or compatible system
- Lighthouse bases (HTC VIVE tracking)
- XBOX 360 Joysticks
- StaticVR Posturography Platforms
- USB HUB

In order to install and use our virtual reality applications, we recommend a configuration equal to or higher than the following system requirements:

Technical Minimum Requirements

GPU

NVIDIA: Gen9 GTX 970 / Gen10 GTX 1060
AMD Radeon: R9 290 / RW 480 / Vega 56

CPU

Intel: i5 4590
AMD: FX 8350 / Ryzen 1400

Operating System

Windows 7 SP1

RAM

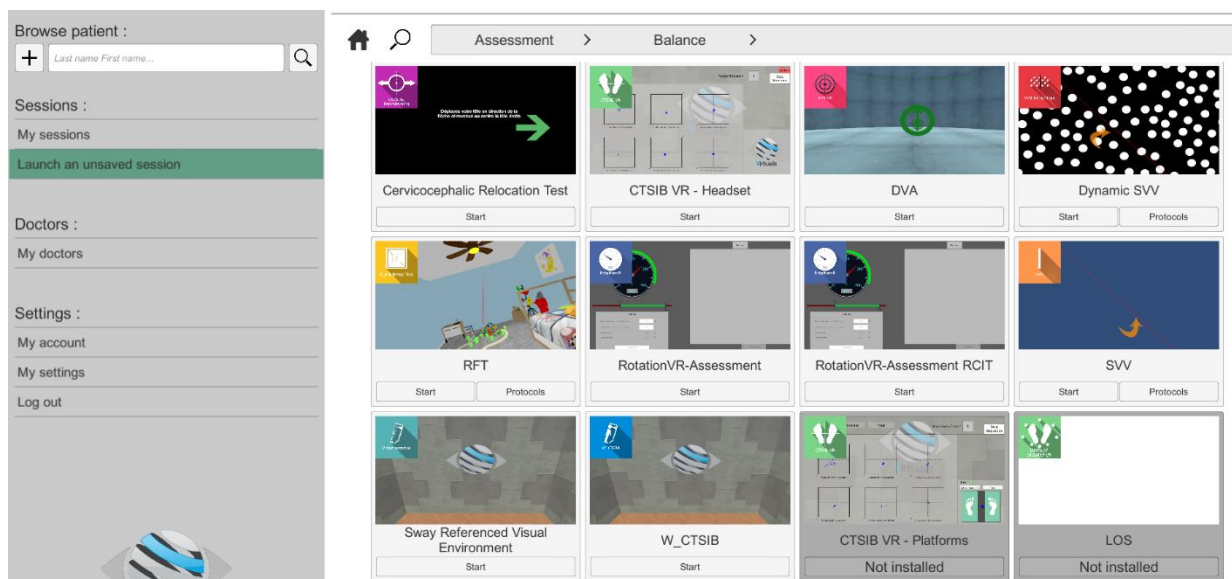
8 Go

2. USE OF PATIENT MANAGEMENT

Once connected to the Patient Management software, you get to the home page. It is from this home page that you will be able to start your VR software as well as other Patient Management features.

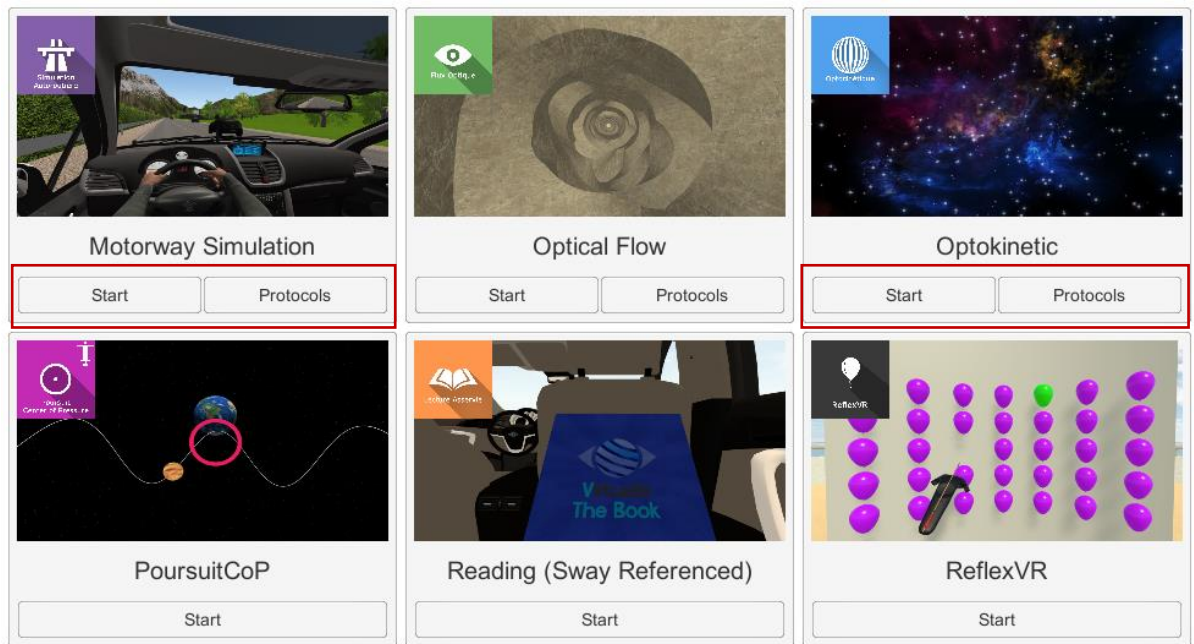
The softwares can be grouped according to criteria such as "Assessment" or "Rehabilitation" and then by pathology type: Neurology, Balance, Functional or Motion sickness.

You can start or switch from one software to another from the home page by clicking the corresponding "Start" or "Protocols" button.

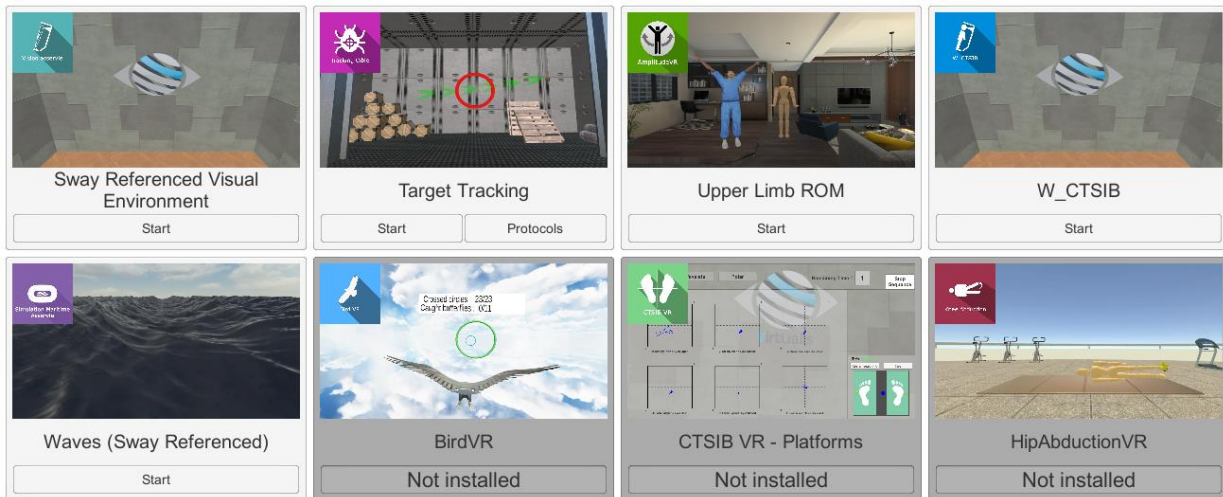


A number of softwares can be started either in **manual mode**, by directly clicking the "Start" button, or in **protocol mode** by clicking the "Protocols" button.

The **manual mode** allows users to select settings for each environment. The **protocol mode** offers several sessions with different difficulty levels to test and gradually accustom patients to the VR environment.

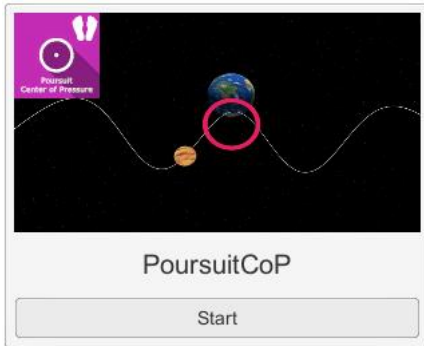


Softwares which are not included in your subscription package are grayed out. If you want to use them, please contact our sales department.



3. CENTER OF PRESSURE PURSUIT

3.1. Start interface



When launching the software in **manual mode** ("Start" button), it opens a launch interface consisting of a module selection menu on the left, a set up area on the right and an action area at the bottom right.

Depending on the module selected in the left menu, the set up area shows the various possible settings / information.

The general Patient Management menu can be accessed from the start interface by simply clicking the "quit" button located in the action area or by pressing the "escape" key on the keyboard.

The software is launched by simply clicking the "start" button in the action area.



Once this button has been pressed, the software is launched, taking into account the specified settings. You can also modify a number of settings after the software has been launched, using the mouse.

The Start / Quit buttons are used to play or stop the environment entirely to adapt the experience to the patient's perception.

Once an environment has been selected, it launches in the headset, and you can see and track what is happening in your patient's headset using the software window.



3.2. Software field of application

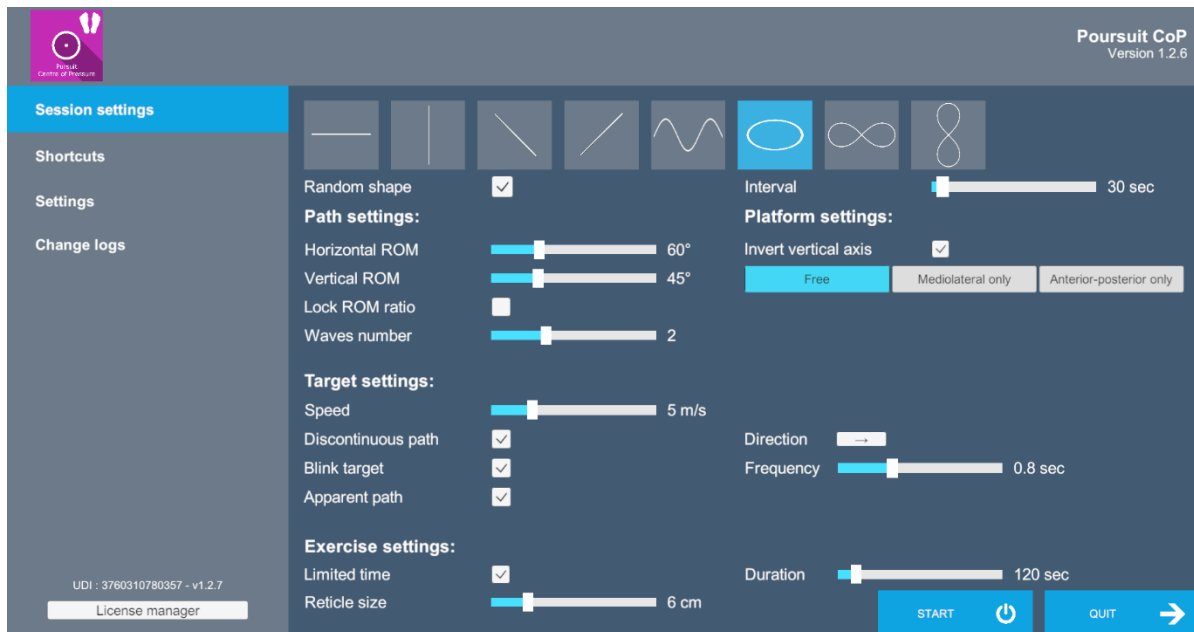
This software requires active movement of the patient's center of pressure. This results in a circular viewfinder moving in the virtual environment. During the exercise, the patient must maintain a moving target within this viewfinder. The trajectory, the moving speed and amplitudes of the target are defined by the practitioner.

The movement of the center of pressure is perceived by the StaticVR posturography platforms connected to the VR system. In order to visually guide the patient towards achieving the exercise, the viewfinder is green if the followed target is located at 100% within the viewfinder. Otherwise, it is red.

3.3. Installing the patient

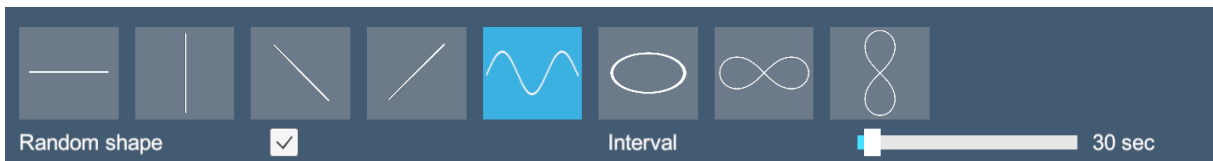
The exercise will be performed with the patient standing, with his feet on the StaticVR posturography platforms. In order to have a clearer view of supports, the patient must be barefoot. The feet must be parallel and the bimalleolar line aligned with the white horizontal line printed on top of the platforms.

3.4. Session settings



The software's variable settings are as follows:

Movement trajectory



There are several types of target paths available. Simply click the required path to select it. A random mode is used to generate a path and its animation setting completely randomly at a selected interval.

Path settings



Each predefined path shape can be customized by acting on settings such as the horizontal and vertical angle, the number of waves, etc.

Horizontal and vertical angles can be modified proportionally by checking the "Lock ROM ratio" box.

Target settings



The object's moving speed can be set using the cursor.

The exercise sequence is fully customizable.

By default, the target moves continuously back and forth if the geometric shape is open and back and forth if the shape is closed.

By checking the "discontinuous path" box, the movement will repeat a one-way movement in a single direction for open shapes and will reverse direction at each turn for closed shapes.

The object can remain displayed for the entire duration of the exercise or appear intermittently at a selected frequency by selecting the "Blink target" option.

The object path can be displayed or hidden by checking the "Apparent path" box.

Exercise duration

The exercise duration can be defined using a fixed time by checking the "Limited time" box and indicating the required value using the cursor, or using a free mode if the box is not checked.

Viewfinder size

The size of the viewfinder can be set with the cursor using the mouse.

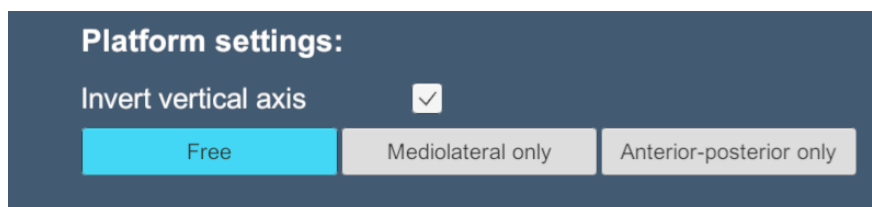
Platform settings

The target tracking mode is performed by direct tracking from the patient's center of pressure movements using the StaticVR posturography platforms.

There are three possible types of CoP movement capture:

- **Free**: the CoP movements are captured by the platforms along the antero-posterior and medio-lateral axes
- **Mediolateral only**: the CoP movements are captured by the platforms exclusively along the mediolateral axis
- **Antero-posterior only**: the CoP movements are captured by the platforms exclusively along the antero-posterior axis

You can select one of the modes by simply clicking the corresponding button



The "invert vertical axis" option reverses the movement direction of the viewfinder according to the pressures in the anterior-posterior axis.

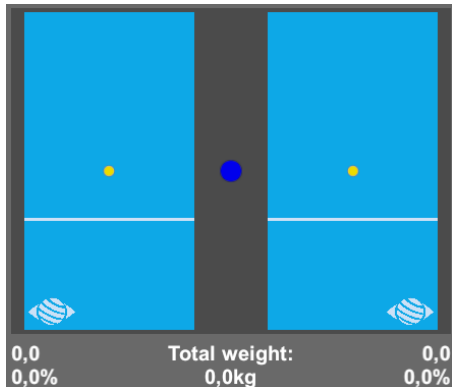
StaticVR settings

Raw data sent by the platforms

Yellow dots: Center of Pressure (CoP) of each foot

Blue dot: Overall Center of Pressure (CoP)

The weight distribution for each foot is displayed



Smoothed data & settings:

Tare

Platform reset (must be carried out when empty)

Smoothing

Smoothing force applied to the data

Sensitivity

Multiplier applied to the data received

Decrease to reduce motion sensitivity

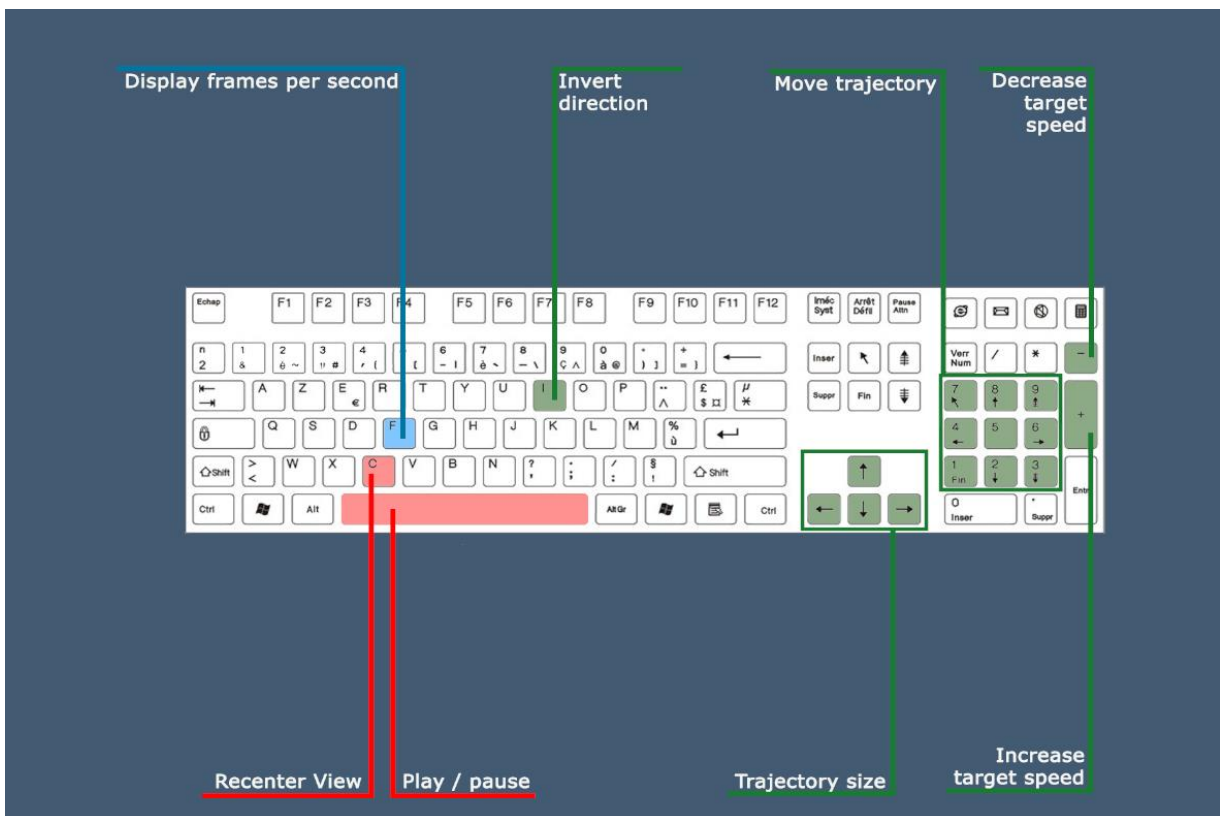
Score

At the end of the exercise, the user will get a score showing his achievement (accuracy).

3.5. Shortcuts

Keyboard or joystick shortcuts can be accessed in two ways:

- using the "Shortcuts" tab available in the launch interface
- in the software, by clicking the joystick icon in the upper right corner of the screen





3.6. Data processing

Data retrieval and analysis is done using the Patient Management software.