



**REF** **Adaptation Test**

**CE** Class I Medical Device

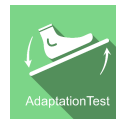
# User manual

## Distribution mode

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

 **VIRTUALIS**

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## DESCRIPTION

**Adaptation Test** is a skill assessment software for systems involved in balancing reactions, used to quantify the balancing reaction's adaptation ability following repeated destabilizing stimuli provided by dynamic force platforms.

## INDICATIONS

Assessment of balancing reaction adaptation in a person with or without balance disorders.

## CONTRAINDICATIONS

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

## FOR USE BY

Healthcare professionals: Physiotherapists; Ergotherapists; Neuropsychologists; ENT physicians; 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 3m<sup>2</sup> 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](mailto:qualite@virtualisvr.com)***



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## 1. GENERAL

### 1.1. Advice for use

Virtual Reality Immersion is a powerful tool, especially for optokinetic stimulation, optical flow, motorway simulations, dynamic SVV etc.

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)

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

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)
- Motion VR dynamic posturography platform

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

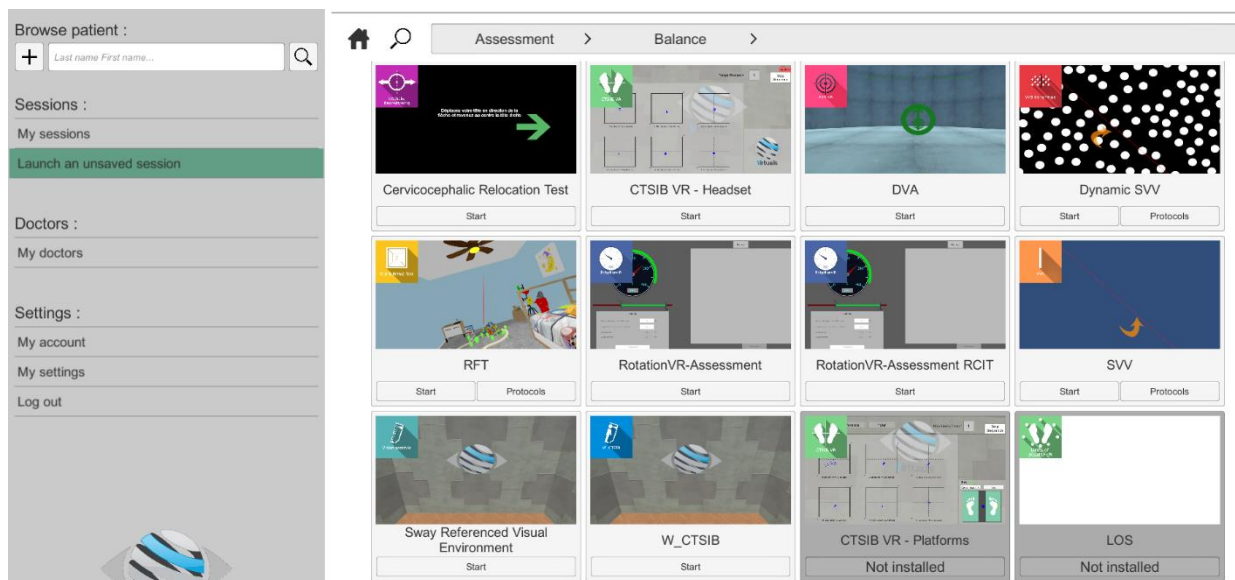
8 Go

## 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.

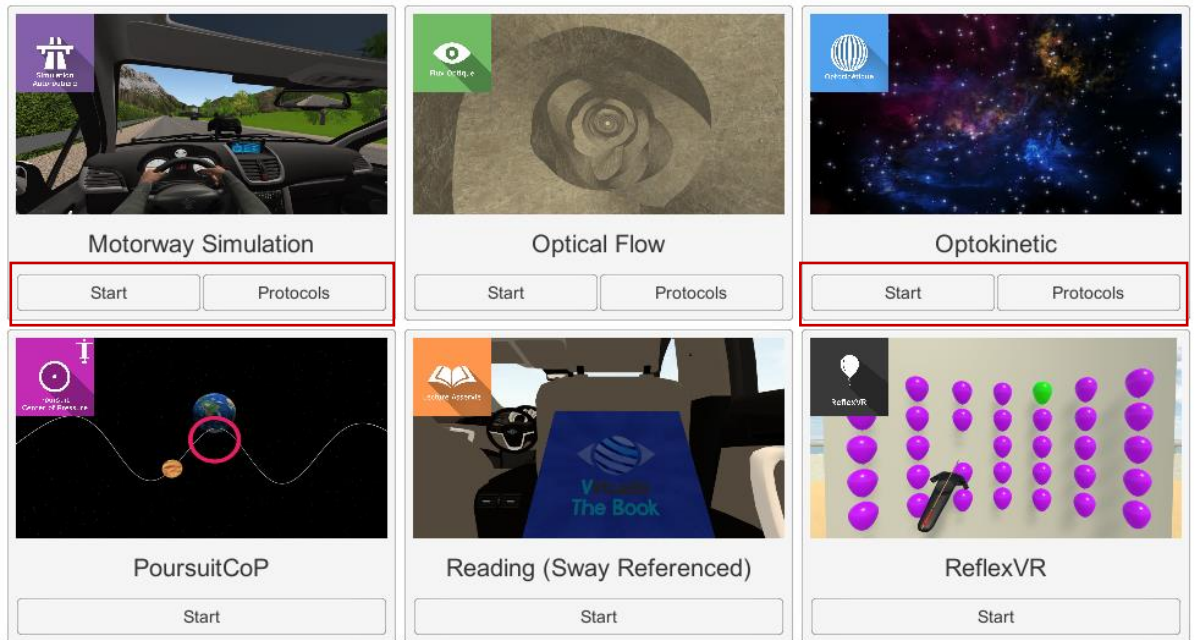
The softwares can be grouped according to criteria such as "Assessment" or "Rehabilitation" and then by pathology type: Neurology, Balance, Functional or Motion sickness.

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

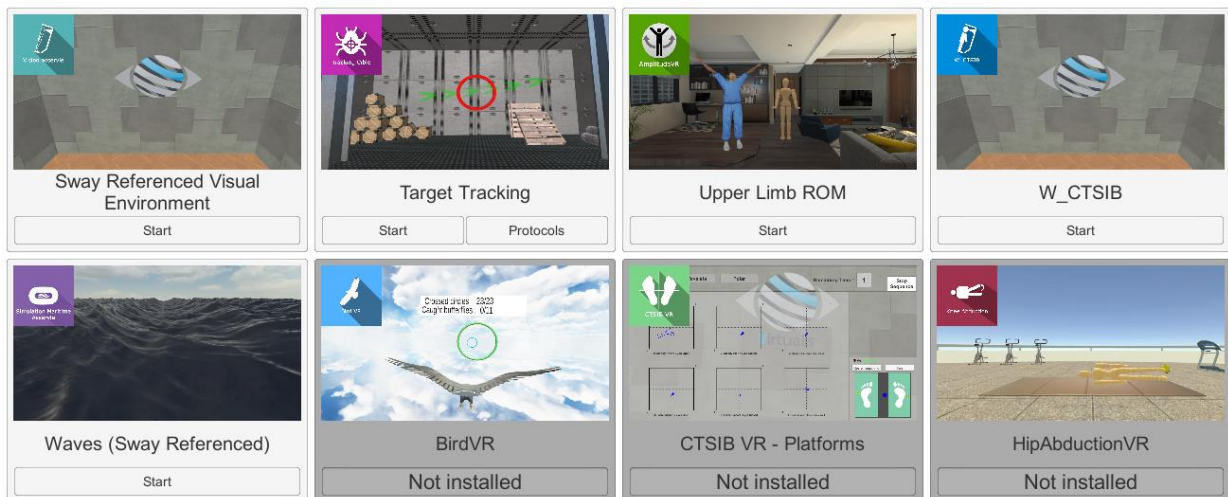


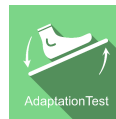
A number of softwares can be started either in **manual mode**, by directly clicking the "Start" button, or in **protocol mode** by clicking the "Protocols" button.

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.



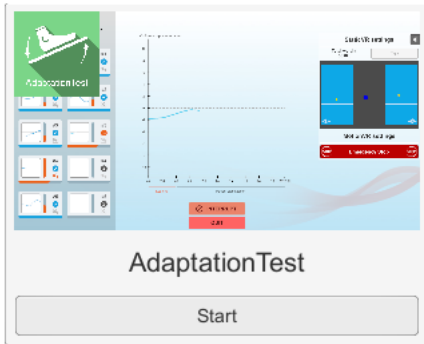
Softwares which are not included in your subscription package are grayed out. If you want to use them, please contact our sales department.





### 3. Adaptation Test

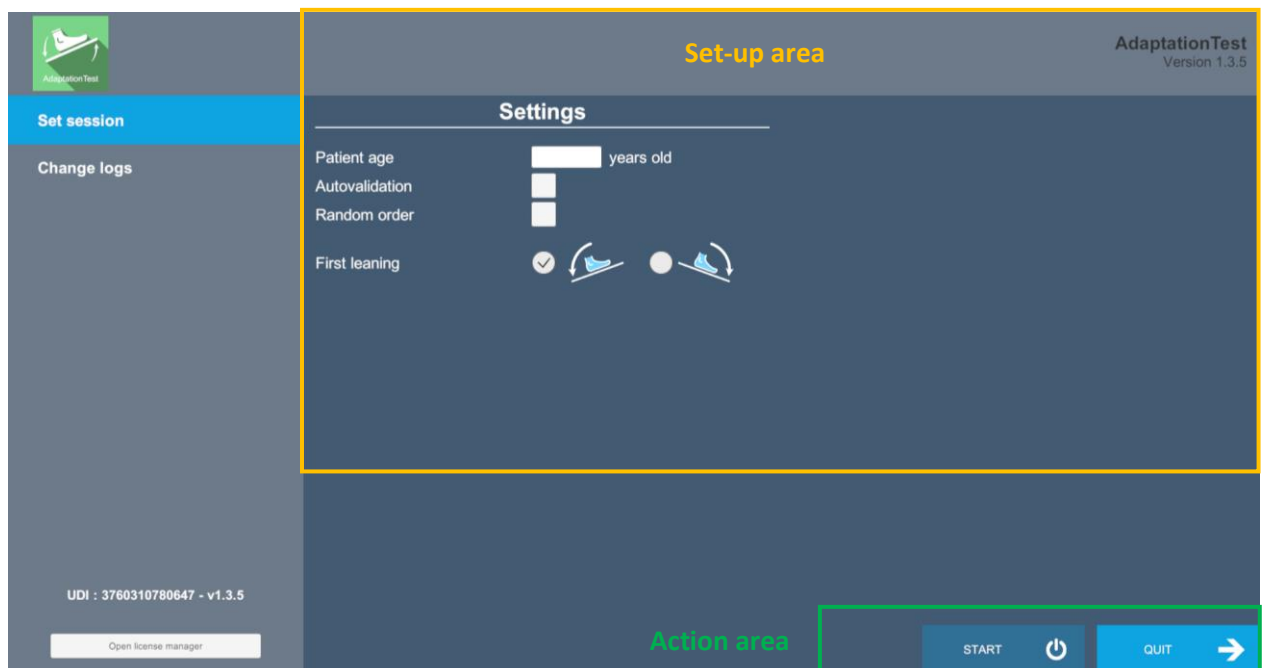
#### 3.1. Start interface



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

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.

The selected environment 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

Assessment of balance on a dynamic posturography platform.

The software assesses the patient's ability to adapt their balancing response when exposed to repeated floor tilting.

### 3.3. Installing the patient

Patient standing on dynamic force platform.

Positioning the patient on the platform:

- Center the patient's feet on the force platform.
- The medial malleolus of each foot should be directly centered on the horizontal line of the force platform.




**Warning:** It is recommended that all trials be performed with shoes removed, in order to get a standardized input of somatosensory system signals and to compare with the standard data set.

The dynamic force platform will tilt forward (in the direction of the toes) and backward, the direction of the first tilt can be selected at the start of the exercise.




The automatic sequence includes a repetition of five identical tilts in each direction. Between each movement, the platform returns to the horizontal position.

Ask the patient to remain as still as possible.

Select  and launch a series of tilts in the selected direction.

To stop a trial (if the patient starts to fall, etc.), simply press the

 button on the software interface.

Reposition and restart.



### 3.4. Session settings

The software's variable settings are as follows:

#### Patient age

Must be entered manually for each patient.

#### Autovalidation

Automatically validates each trial when the box is checked

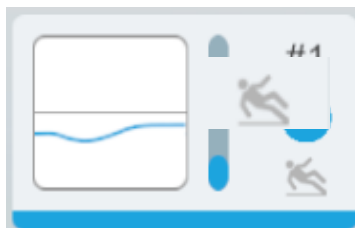
#### Random order

Activating this option is used to launch a random sequence of tilts after the first two tilts; the direction of the 1<sup>st</sup> movement can be selected using the "First tilt" option

#### First leaning

Is used to select the direction of the first tilt by selecting the required movement. By default, the first tilt is backwards.

During the recording of each trial, an orange light comes on and flashes; it turns blue once the recording has finished.



It is possible to indicate a fall by simply clicking the icon before moving on to the next trial.

## MotionVR settings

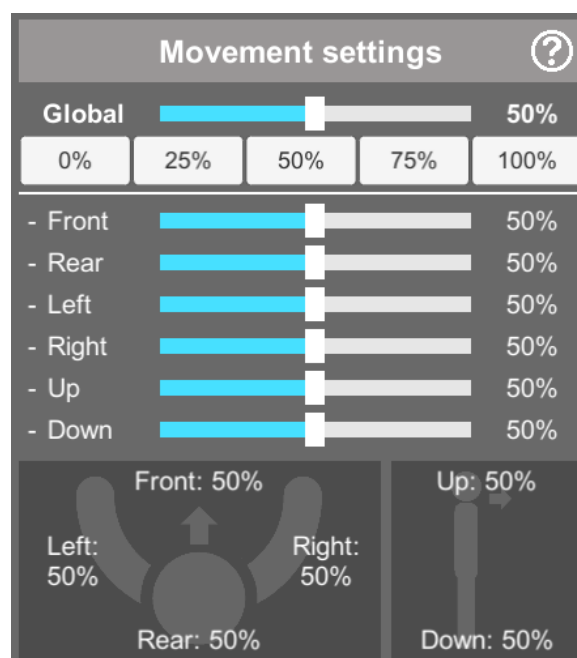
### Movement settings

Platform amplitude values can be defined either by using the cursor or by selecting one of the proposed values by simply clicking on the corresponding button.

You can select an overall or per-axis movement amplitude, the presets provide a smooth transition.

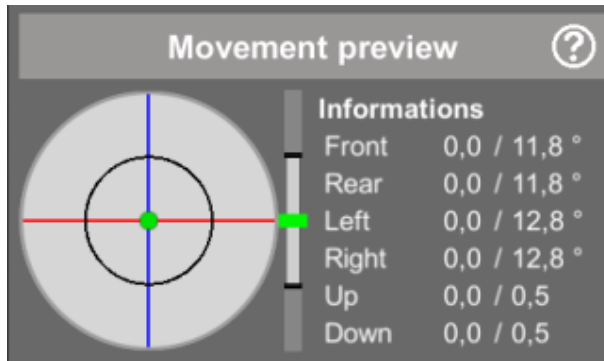
For example:

- To work in anteroposterior mode, reduce the left and right amplitude
- To work in mid-lateral mode, reduce the front and rear amplitude

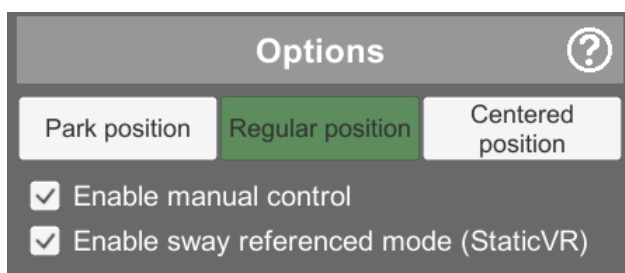


### Movement preview

This is used to view the platform tilt, height and amplitude settings (the action area is delimited by a black circle).



## Options



## Platform positions

**Park position:** forces the platform to ground level. The height of the platform is set to the minimum.

**Regular position:** allows the platform to move normally, as provided for in the software

**Centered position:** forces the platform into a horizontal position at its operating height

## Enable manual control

This is used to move around using the arrow keys on the keyboard and the "+" and "-" keys on the numeric keypad (up and down).

## Enable sway referenced mode (for StaticVR platforms)

The platform movement is coupled to the patient's center of gravity



If you press the emergency stop button, the platform will freeze in its current position.



A window opens and the following message appears



**Warning:**



Stopping the software or changing the window may cause the platform to reset to the default position and cause movement that could be dangerous for the patient. It is therefore advisable not to touch the computer again until you have secured the patient when the emergency stop is triggered.

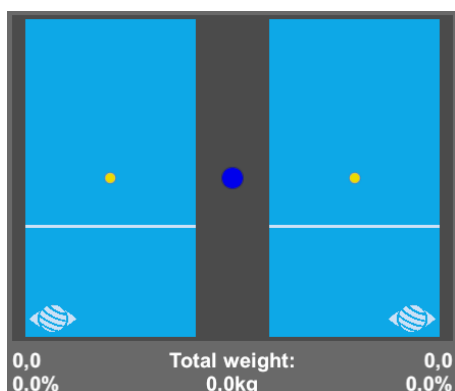
## StaticVR settings

### Raw data sent by the platforms

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

Blue dot: Overall Center of Pressure (CoP)

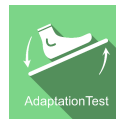
The weight distribution for each foot is displayed



### 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

The parameters measured are the swing energy or reaction force generated by the patient to minimize anterior / posterior swing.

## 3.5. Data processing

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