REF SQUAT VR

CE Class I Medical Device
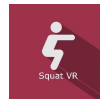
User manual

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

SQUAT VR is an immersive 3D simulation software based on virtual reality technology, meaning a person can be immersed in a digitally created artificial world. **SQUAT VR** is a rehabilitation software for thigh muscles and stabilizing muscles of the knee, pelvis, upper limbs and to work on sit-to-stand transfers. Self-stretching or jumps.

INDICATIONS

Lower limb disorders, upper limb disorders for push-ups (e.g. paraplegic patients), difficulty for sit-to-stand transfers. Spine rehabilitation by self-stretching.

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 softwares, 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.
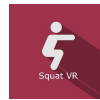
⚠️ *Any serious incident should be notified in writing to* **qualite@virtualisvr.com**

Table of Contents

1. GENERAL

1.1. Advice for use

These stimulations have the potential to cause a number of disorders: Vasovagal syncope, epileptic seizures, migraines, etc.

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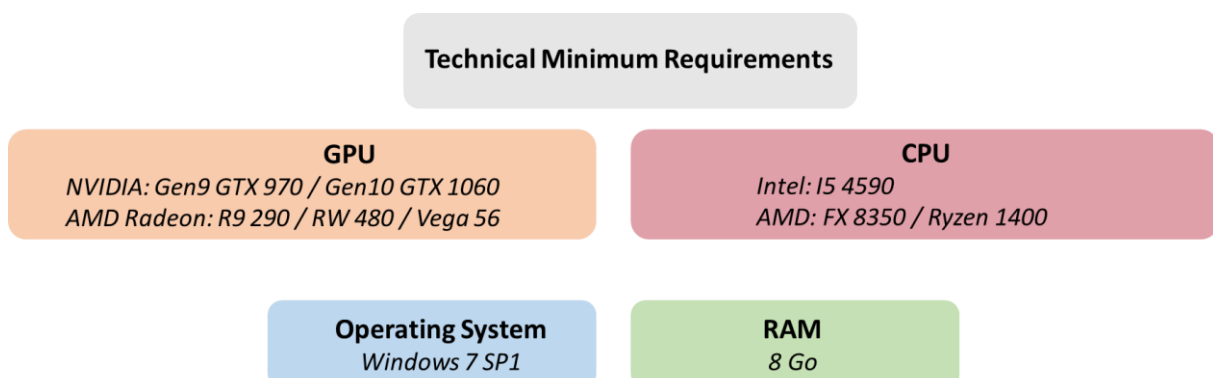
Virtualis declines any liability for any disorders suffered by patients during or after use of its software.

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
- 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.
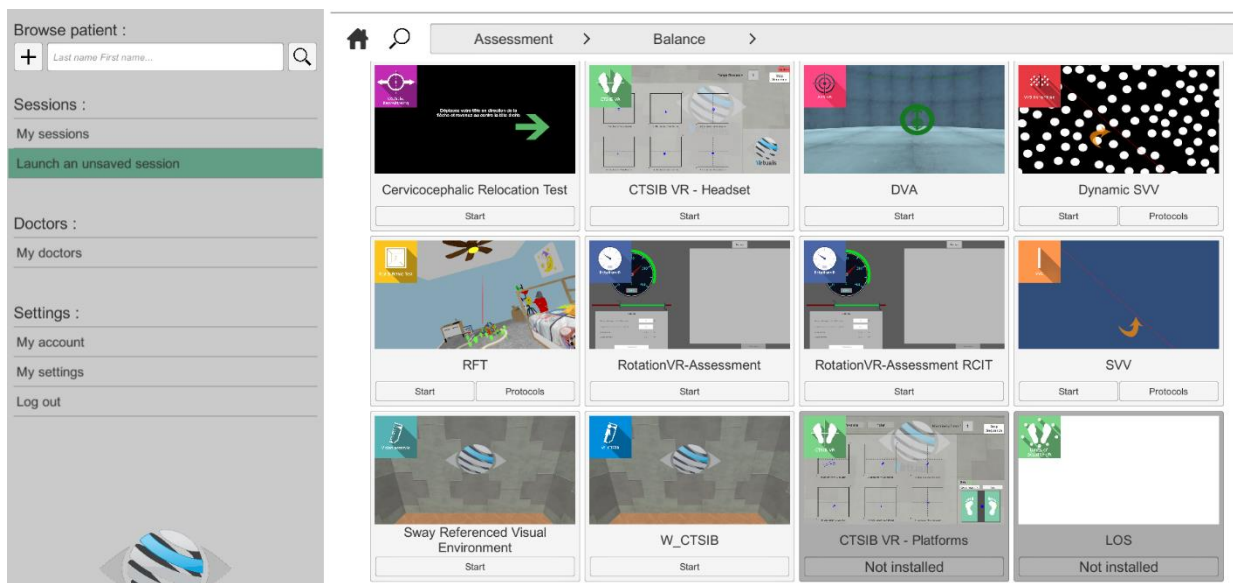

A number of softwares can be started either in *manual mode*, by directly clicking the "Start" button, or in *protocol mode* by clicking the "Protocols" button.

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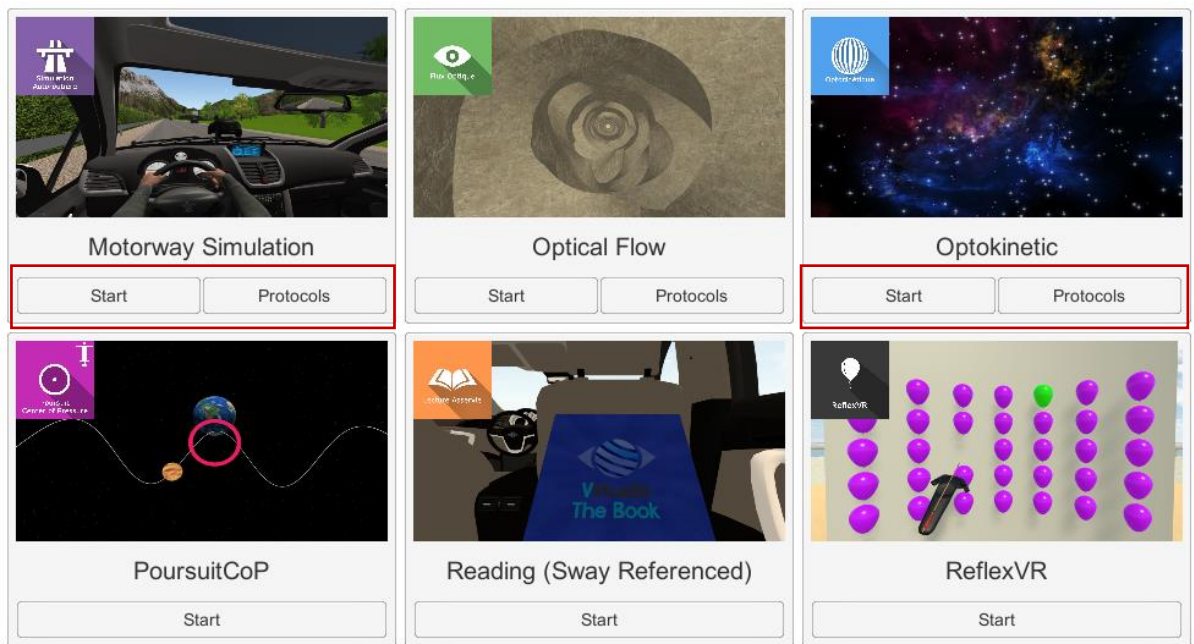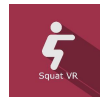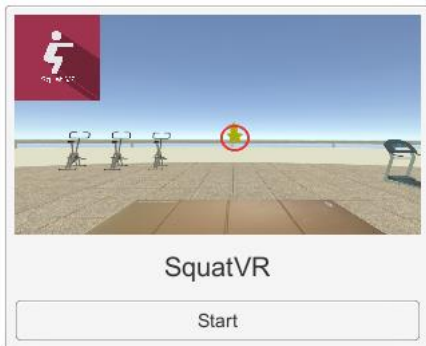
Softwares which are not included in your subscription package are grayed out. If you want to use them, please contact our sales department.
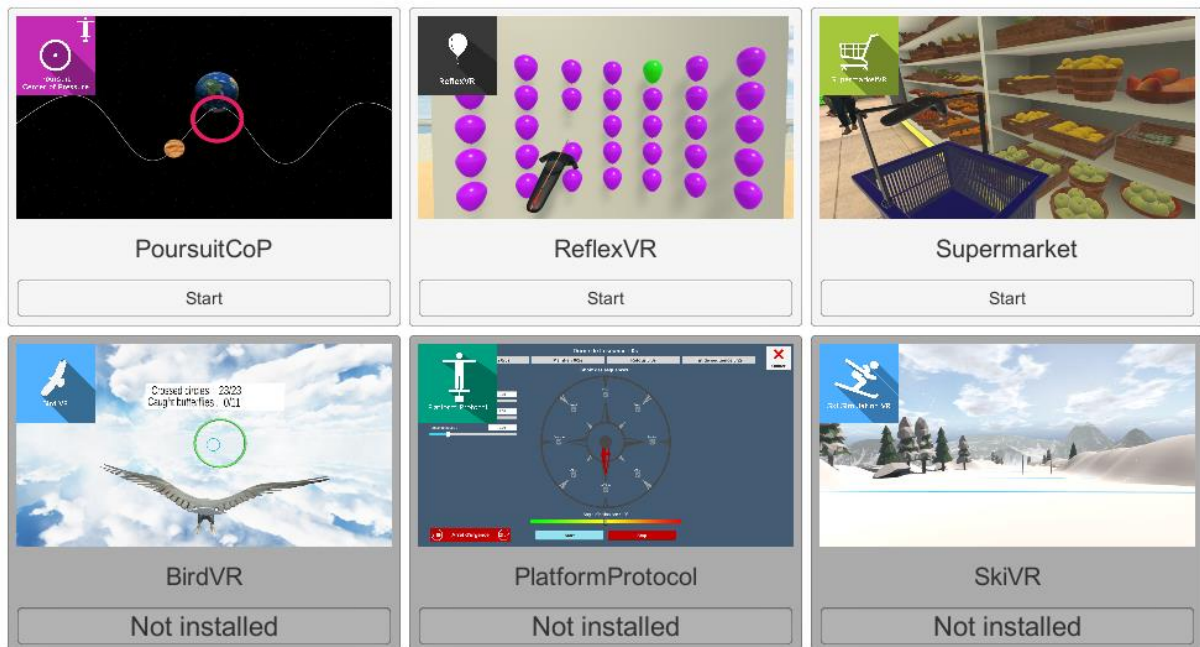
3. SQUAT VR

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 or the keyboard.

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 is used to work on the thigh muscles and stabilizing muscles of the knee and pelvis by following a target using a trajectory defined by the practitioner. The patient must keep the target within a viewfinder controlled by the patient's head position, while doing squats.
When the followed target is 100% inside the viewfinder, the viewfinder is green. Otherwise, it is red.
SquatVR can be used for push-up work (e.g. paraplegic patients) or for sit-to-stand transfers at low speed.

3.3. Installing the patient

Standing position: lower limb work

Seated: Work on the triceps brachii using push-ups, work on sit-to-stand transfers, work on self-stretching in seated position
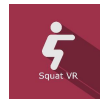
3.4. Session settings
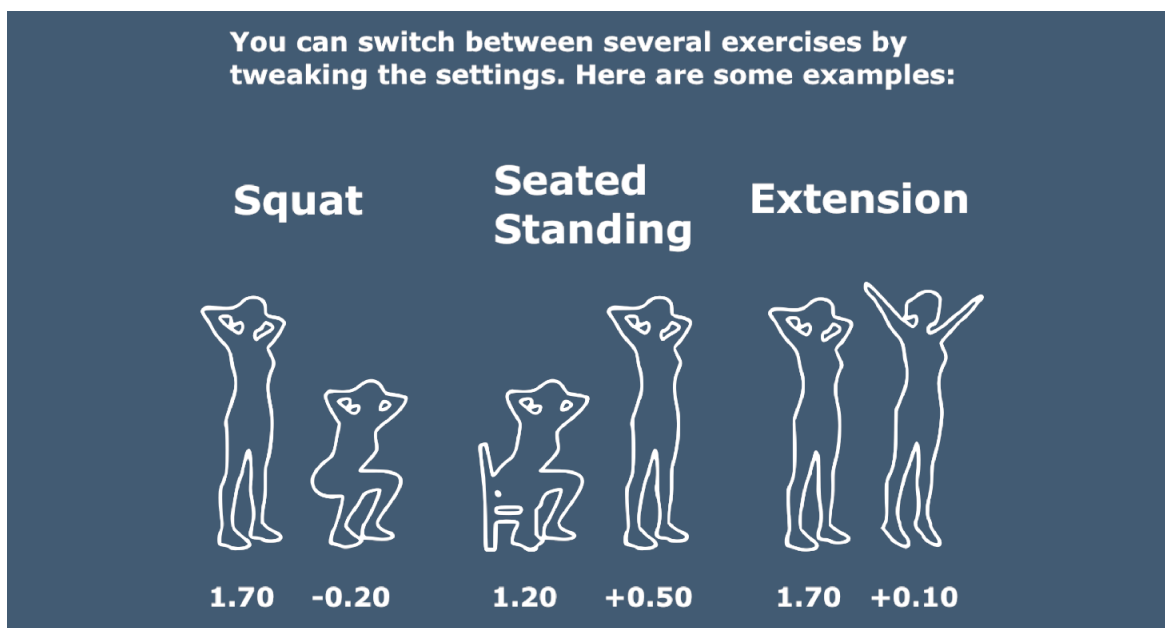
The software's variable settings are as follows:

Height and Amplitude

Height and amplitude are two settings that must be considered together.

Height serves as a reference position for the resting position. It can be calibrated automatically by positioning the patient in the resting position, with the headset on his head, and then clicking

"calibrate". It can also be set manually by entering the height in cm of the headset from the ground in the resting position.

Amplitude defines the range of motion to be achieved with respect to the resting height. A positive value triggers an upward movement with respect to the resting position, while a negative value triggers a downward movement with respect to the resting position.

This can be calibrated automatically by placing the patient in the end-of-movement position and pressing the "calibrate" button, or manually by dragging the cursor to the value chosen for the exercise.

Exercise difficulty
There are several choices: very easy, easy, medium, difficult, expert, extension, sit-to-stand
Settings are predefined for each difficulty level.

Advanced settings

Each sequence can be configured if the advanced settings option is activated.

Target size

The size of the viewfinder can be set with the cursor using the mouse. More accuracy is required if the viewfinder is small.

Sequence: Hold up and down time and transition time

Each sequence can be configured by using the cursor to select the high and low holding times and the transition time.

The longer the holding position, the more stars will appear at the top and bottom (standing position, squat, extension, sit-to-stand).

The patient must then use his head to follow the direction of the target, which depends on the configuration of the exercise (standing position, squat, extension, sit-to-stand), to keep the stars within the target.

Speed
The stars' moving speed (increase / decrease) can be adjusted by using the right and left arrow keys directly on the keyboard.

Session duration
This is used to set the duration of the exercise by entering the required value in the appropriate box

Score
At the end of the exercise, the user gets a score showing his achievements: the number of squats performed and the number of stars reached and missed.

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
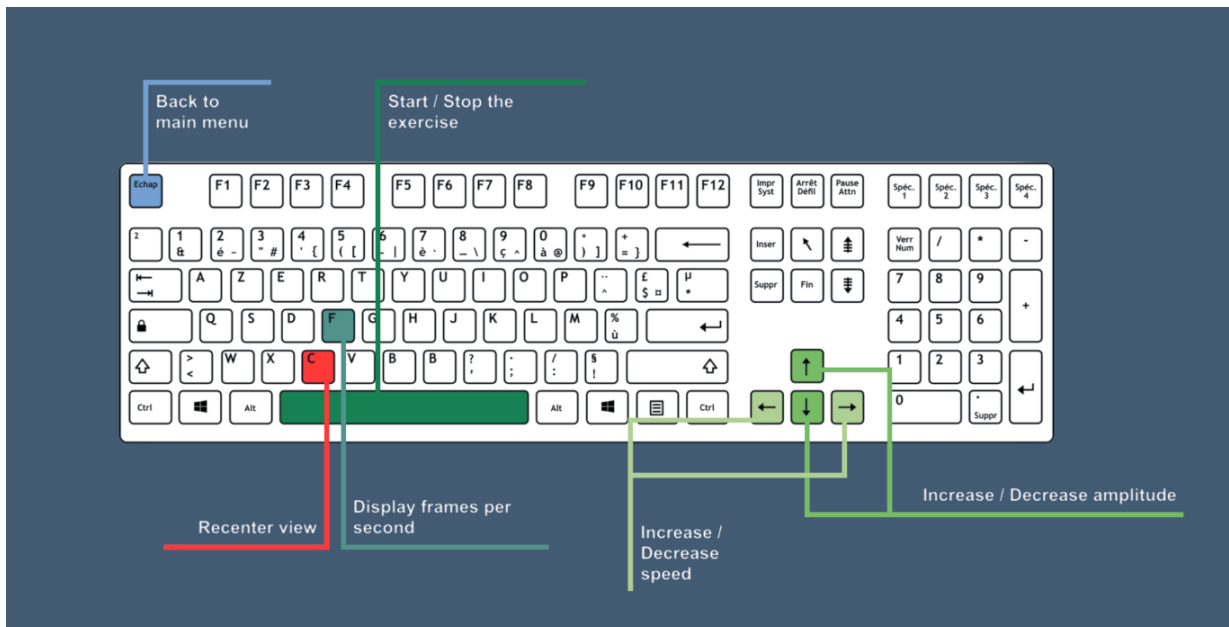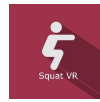
3.6. Data processing

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