REF  **MotionVR**

CE  Dispositif Médical de Classe I

# User manual

## Distribution mode
Available for direct download at
*http://virtualisvr.com/espace-client/*
Use under license

**VIRTUALIS**

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## DESCRIPTION

**MotionVR** system is a clinical balance assessment device that collects and analyzes force and moment data from a balance /force plate. The balance plate is seated in a dynamic chassis that can move in up and down directions, under control of the Virtualis softwares. The Patient Manager software contains both assessment and training modules that can be used during each session. The system is intended to be used by trained clinicians in a hospital or clinical (physical therapy or ENT) environment who operate the device via a computer and dedicateed software and ensure the safety of the patient. For use during dynamic training, MotionVR plateforme is fitted with a safety railing or the patient is placed in an optional harness.

## INDICATIONS

Evaluation and Rehabilitation of balance and postural disorders of multiple origins: vestibular, neurologic, othopaedic (lower limbs and spine)

## FOR USE BY

Motion VR is to be used only by qualifes and trained practitionners/ physicians.

Healthcare professionals: Physiotherapists; Ergotherapists; Neuropsychologists; ENT doctors; Neurologists; PMR doctors (physical medicine and rehabilitation), etc.

Research Centers: CNRS, CHU, INSERM, etc.

## Read Carefully Before Proceeding

**INTENDED USE :**

Balance Evaluation and Rehabilitation

The MotionVR system is intended as an objective platform used for gathering and characterizing movement of subjects with balance disorders or instability.

MotionVR systems should only be operated by qualified personnel.

⚠️ WARNING: To avoid risk of electrical shock, MotionVR system must only be connected to properly grounded power sources.

The successful use of the Virtualis technology requires an appropriate level of professional expertise to set-up proper treatment programs that are specific to the patient and their individual cases. The operators should be confident they understand the operation of the system, can properly administer test protocols, and interpret results.

The patient's center of gravity position **(**COG) can be monitored real time during all tests and measures.

NOTE: Virtualis equipment must only be serviced by qualified personnel. Please do not attempt to service equipment yourself.

Please contact Virtualis first for any service or support requests.

All protocols should be performed in stocking feet with hygenic foot covers.

WARNING: Do not modify Vitualis systems in any way. Modifications will void the warranty.

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

For additional product service or support, please contact: Virtualis Corporation Avenue de l'Europe – 34830 Clapiers, phone : 00 33 980 809 291 or contact@virtualisvr.com

## General Maintenance

Virtualis MotionVR plateform require basic maintenance, performed on an as-needed basis.

CLEANING INSTRUCTIONS :

- Wipe down the balance platform with damp cloth or standard cleaning solution.
- For good hygiene, patients should wear footies.

# Table of Contents

# PATIENT CONSIDERATIONS PRIOR TO TESTING

**OPERATOR RESPONSIBILITIES**

1. The clinician will be responsible at ALL TIMES for the safety of the patient while using the MotionVR plateform.

**BEFORE BEGINNING A SESSION MAKE SURE :**

• The patient is standing on the platform with feet properly positioned and is facing into the visual surround (if present).

To help ensure patient safety :

- The MotionVR plateform is fitted with the safety railing which can be adapted to each patient's needs regarding their height/ size.

Or

- The patient is properly fitted with the harness and the harness straps are attached to the overhead bar with the correct tension (for dynamic systems).

**MECANICAL PATIENT SAFETY SYSTEMS : SAFETY RAILING AND PATIENT HARNESS**

**If safety railing is used :**

The safety railing must be used at all times : during static and dynamic use of the MotionVR system for evaluation or training.

**Safety railing settings :**

The safety railing of the platefom must be securely closed and its height adapted to the patient's size.

The safety railing height can be modified in two ways (Figure 1): manualy by pressing the **Up** and **Down** button or automatically by means of button **2**, **3** and **4** for a predifined position (buttons are located on the front side of the MotionVR plateform). The height of the safety railing is displayed on the screen next to the buttons.

Button **2** : the height of the safety railing is 1.15 m

Button **3**: the height of the safety railing is 1.25 m

Button **4**: the height of the safety railing is 1.40 m

Button **1** : allows to go down the safety railing at 1 m

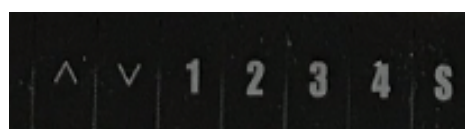Button **S** : allows to stop the movement of the safety railing at any moment.



Figure 1. The safety railing control panel

**Security harness settings :**

**If harness is used :**

Patient security can provided during testing and training with the use of a harness. The patient must wear a securely fitted safety harness connected to the overhead bar by two suspension straps.

**Warning:** A harness appropiate for the weight of the patient shall be selected to ensure patient safety during use.

Included are:

- A complete harness – already assembled and ready to be worn. The maximum weight capacity is 300 lb.
- Two shoulder straps to connect the harness to the support structure

**NOTICE!**

**Harness straps must be tight enough to stay in place if the patient should fall and therefore prevent injury. Tension should not trigger pain or physical or respiratory incomfort or restrict the required mobility for the correct progress of the evaluation or training.**

## GETTING STARTED

**YOUR MOTIONVR BALANCE SYSTEM(S)**

Identify all tests and measures that are available to you on your MotionVR system :

Sensory Organization Test (SOT), Adaptation Test (ADT), Limits of Stability (LOS), Unilateral Stance (US), Ski, Bird, MotionProgram, Sea Simulation

**TURNING THE MOTIONVR SYSTEM ON/OFF**

**Do not stand (operator or patient) on the device during system switching on of off.**

1.  Turning the MotionvVR System ON correctly allows for proper initialization and operation :

    **MotionVR must be turned on prior to turning on the computer**

    • Locate the Power Box on your system and turn it on (Figure 2)



Figure 2. Base turned On

    • Once done, turn ON the computer and start the **Patient Manager** software which allows you to acces to all softwares and operational commands.

2.     Turning the System OFF correctly allows for proper system back-up and protection of MOTIONVR operating systems.

    • From the launch interface of the software you use, select **QUIT** button
    • The MotionVR system will systematically shut down its' operation.
    • After shutting down the computer completely, turn OFF the Power Box located on the system (Figure 3)

Figure 3. Base turned Off

**EMERGENCY STOP BUTTON**

The emercency stop button is located on the front of the device under the security railing (Figure 4).
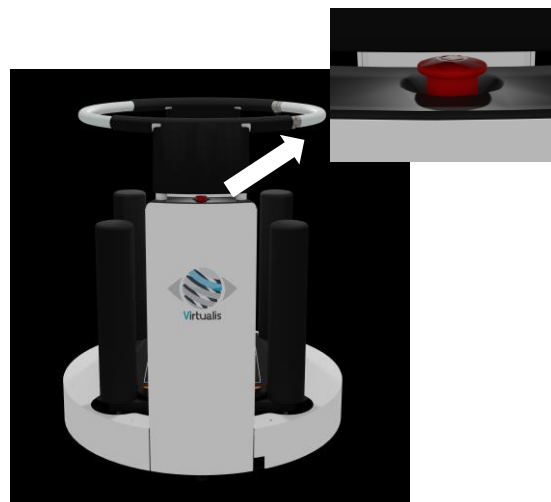


Figure 4. Emergency stop button

1.To stop the device press the button down.

2. To unblock the device after an emergency stop, release the button by turning it 1/4 turn to the right (clockwise rotation indicated by an arrow).

**POSITIONING THE PATIENT**

**The device must be correctly turned on and initiated and computer software operational prior to patient positionning on the device.**

When standard foot placement is required (applies to all force plates), position the patient as follows:

1.Help the patient step onto the platform base facing forward

2. Center the patients' feet on the force plate. The medial malleolus of each foot should be centered directly over the center horizontal (wide) line on the force plate and the lateral calcanei are aligned with the small (**S**), medium (**M**), or large lines (**L**). (Figure 5)

**S** = 30-55 inches/76-140 cm; **M** = 56-65 inches/141-165 cm; **L** = 66-80 inches/166-203 cm
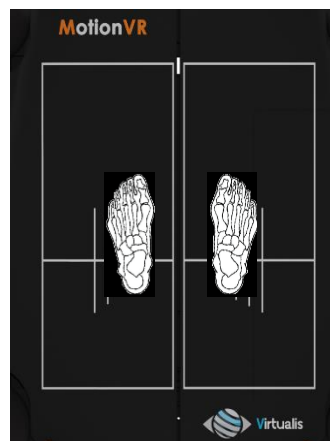


Figure 5. Proper foot placement

**NOTICE! It is recommended that all testing be completed in non-slip socks to achieve standardized input from the somatosensory system cues and to compare to the normative data set.**

The dynamic force platform performs linear tilting or impulse movements, depending on the chosen parameters.

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

Sessions may be interrupted at any time (if the patient starts to fall, etc.) by selecting the **Pause** or **Stop** button on the control screen.

**SYSTEM CONFIGURATION**

REAL TIME VISUALISATION AND PARAMETER SETTINGS

**Options Setup**

The operator must select the icon in the upper right corner of the screen (**arrow**) to set-up the parameters for MotionVR system (from the clinician home screen of each software).
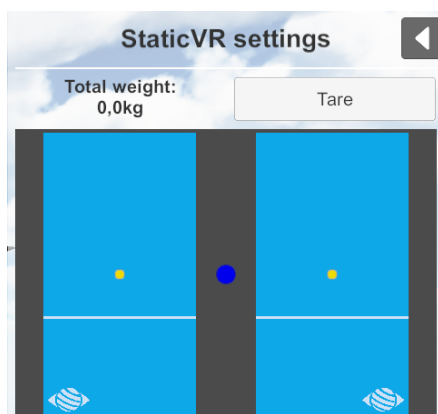
## StaticVR settings

**Real time feedback through control screen located top right of the control screen**

**Raw data sent by the platforms**

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

Blue dot: Global Center of Pressure (COP)

The weight distribution for each foot is displayed



**Tare**

Platform reset (must be carried out when empty)

**Advanced Settings**

The grey triangle located on the top right of the previous diagram opens the optional settings menu.

STATICVR optional settings menu

Selection of the menu on right hand side of the screen.
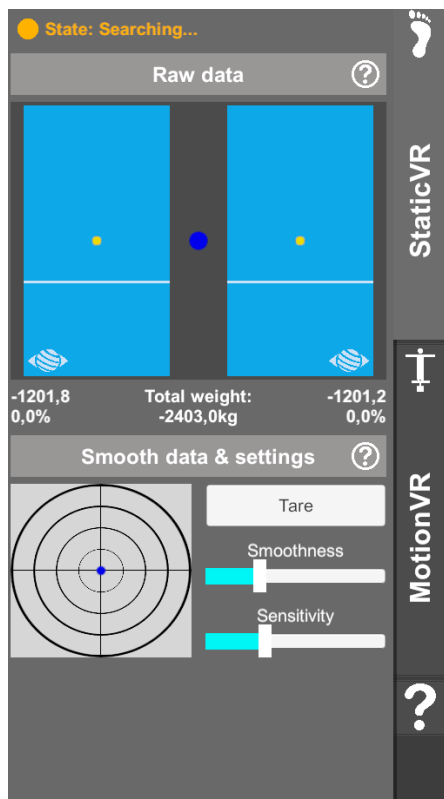


**Smoothed data & settings:**

**Smoothing**

Smoothing force applied to the data

**Sensitivity**

Multiplier applied to received data

Decrease to reduce motion sensitivity

## MotionVR settings

To activate the Motion VR settings menu, open the settings menu located on the right hand side of the screen.
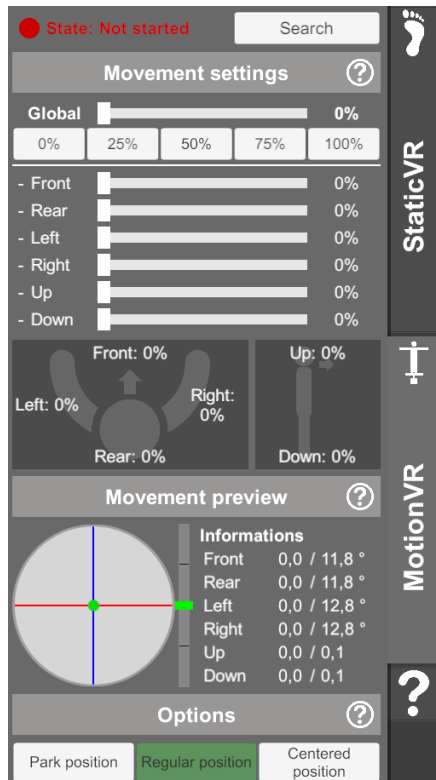


**Movement settings**

Platform movement amplitude values can be defined to an overall equivalent setting or independently per axis.

To set movement amplitude of all axes simultaneously the operator can use the "global" cursor or by choosing one of the proposed values by simply clicking on the button corresponding to the value. In this case all axes movement values will represent the same percentage of total amplitude possibilities

To set independently the movement amplitude values per axes the operator uses the specific cursors regarding the front, rear, left, right up and down settings.
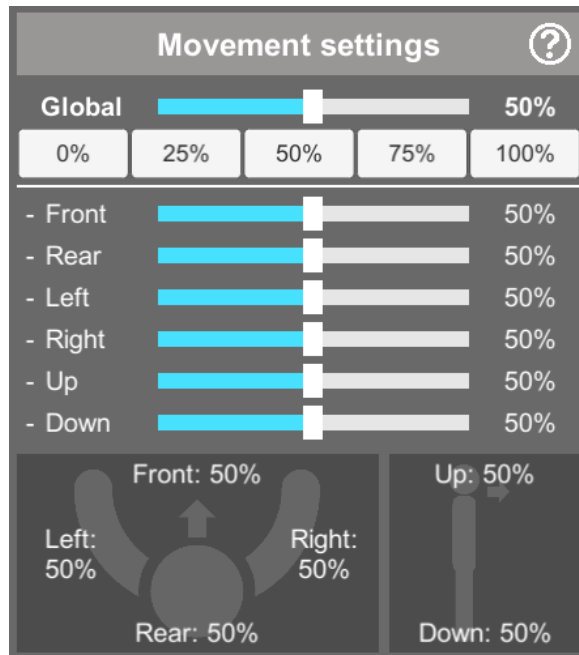
For example:

- To work in anteroposterior mode, reduce the left and right amplitude
- To work in the mid-lateral position, reduce the forward and backward amplitude
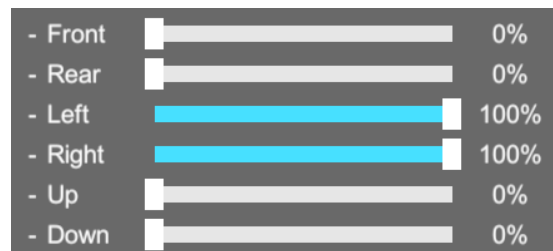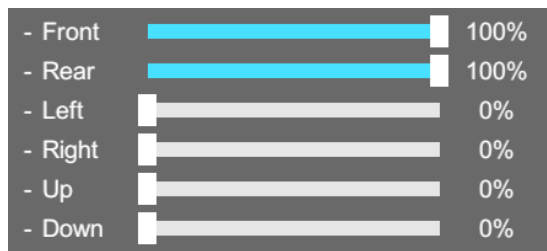
### Movement preview

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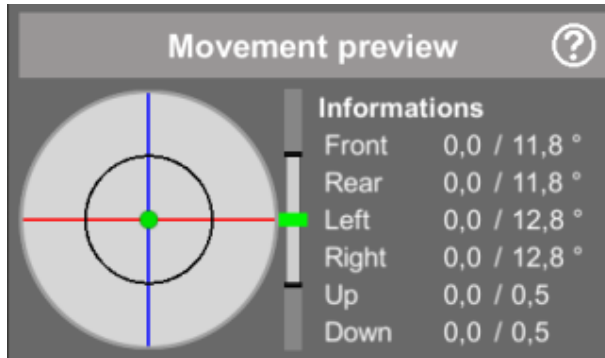


### Options
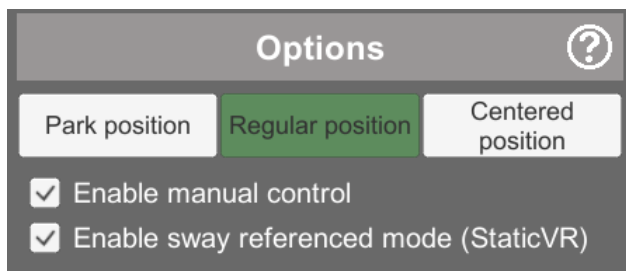


### Platform positions

**Park position:** forces the platform to lowest level

**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

### Activate manual control

Use the arrow keys on the keyboard and the "+" and "-" keys on the numeric keypad (up and down) to move around.

### Enable sway referenced mode (for StaticVR platforms)

The platform movement is controlled by the patient's center of gravity.

The [?] button on the launch interface at the bottom right provides access to other advanced

options:

Check the corresponding box to **"Enable development options"**

Two types of display are possible:

- ☐ [StaticVR] Display graphics
- ☐ [StaticVR] Display port status

These boxes are development options used to test and control the device and are reserved for maintenance purposes. It is not advisable to use them (slows down the software).

**Recording Options:**

You have the possibility of choosing the type of data to be recorded by ticking the corresponding box:

StaticVR:

- ☐ Raw data
- ☐ Smoothed data

MotionVR

- ☐ Gross position (pitch & height)

Select the location on the computer to save the data and press the "Start Recording" button

**EMERCENGY STOPPAGE OF DEVICE**

**Through software/ manual Emergency Stop Button**

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.

**ENTERING THE PATIENT MANAGER SYSTEM**

To Log into the Program:

1. Open **Patient Manager** software.

2. Opening the Patient Manager software will reveal the Login Screen shown in Figure 6

3.Click on the correct username within the User name box.

4. Type in the correct password.

5. Click the "Login" button, to arrive at the clinician home screen. Refer to the following page for information regarding the clinician home screen.
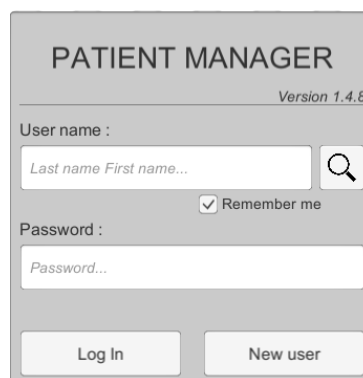


Figure 6. Software Login Screen

New user Login to Patient Manager System for the First Time:

1. Open **Patient Manager** software. Arrive at the login screen, shown in Figure 6.

2. Click on the New user button.

3. Fill in all required fields (Figure 7)

4. Enter a password

5. Click the "Create" button, to arrive at the clinician home screen.



Figure 7. Creation of new Operator account

## CLINICIAN HOME SCREEN

The clinician home screen is the first screen seen immediately after the operator (or administrator) logs in the Patient Manager software (Figure 8). All operational commands are listed here for easy navigation.
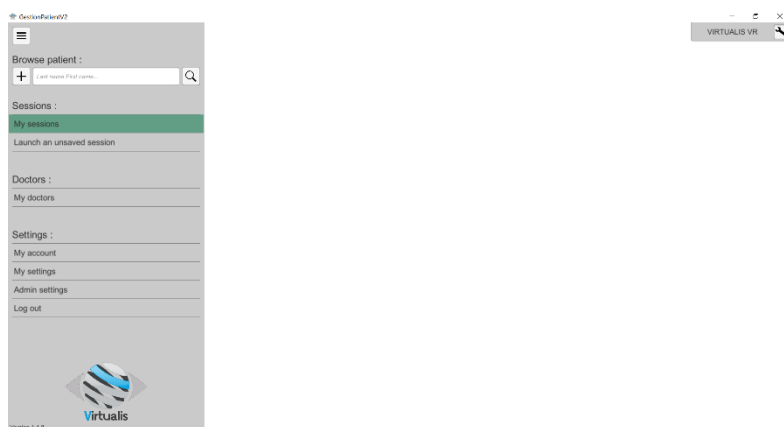


Figure 8. Virtualis Patient Manager System Main Page

The left side of the screen is split into three main regions, described below.

1. Patient Information : This is the primary interface for loading a patient, creating a patient, and viewing a patient's history.

2. Sessions : All of the software available with the system are located within the *Sessions* ares. Each software is represented by an easily identifiable icon. A wide range of options are available to help rehabilitate a patient.

3. Settings: This is the interface for creating an account for operator and set-up some parameters of Patient Manager system.

**ESTABLISHING NEW PATIENT FILES**

To Create a New Patient:

1. From the system main page, click on « **✚** » button (located in the upper left corner of the screen).

2. After clicking, the **Add a patient** page will appear with empty patient information fields. The popup window is illustrated in Figure 9.

3. Use the TAB key to change fields and enter the patient specific information. Fill in all required fields.

4. Click on the Create button to establish the new patient profile.



Figure 9. New Patient Data Entry page

**RECALLING EXISTING PATIENT FILES**

To Select a Patient who is already recorded in the System :

1. Click on the Browse *Patient* field and enter the patient's name or click on the [  🔍  ] boutton. A list of patients will appear on the left side of the screen.

2. Click to select the patient. The patient's information will appear in the center of the screen. Above the patient's information are the dates of previous tests (if any were performed).

**STARTING A NEW ASSESMENT OR REHABILITATION SESSION**

Once a patient is selected from the Patient Manager database, the operator may complete assessments or training by clicking on the « Start a new session » button at the center of the bottom of the screen.
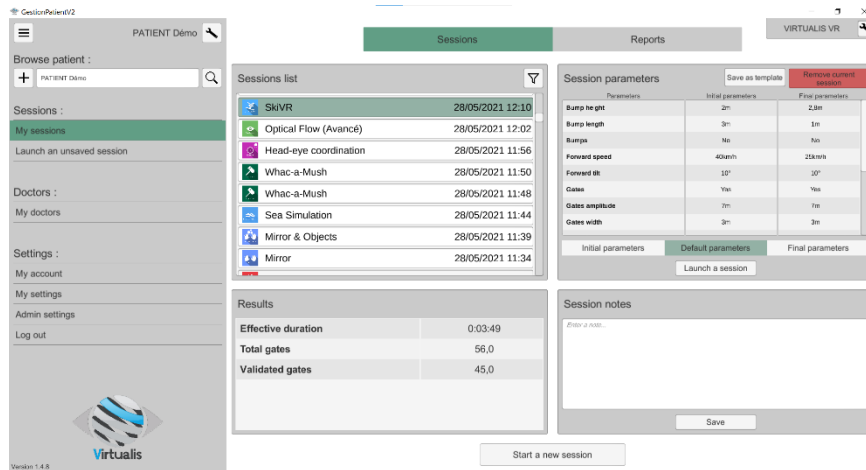


This will open a new screen from which the operator may choose the desired program after running through the *Module choice menu* : the software can be grouped according to criteria such as "Assessment" or "Rehabilitation" and then by pathology type: Neurology, Balance, Functional, Motion Sickness.
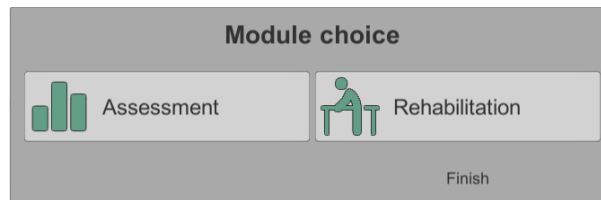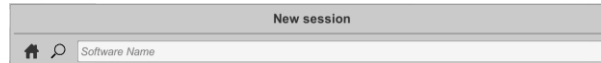


By choosing « finish » the operator will acces directly the full list of programs presented by alphabetical order.
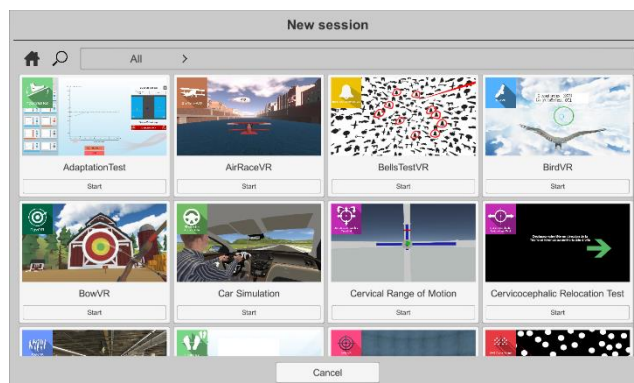
You can start any software by clicking on the corresponding "Start" button.

The operator may also click on the magnifying glass button in order to type the name of the required program.



Some software can be started either in *manual mode*, by directly clicking the "Start" button, or in *protocol mode* by clicking the "Protocols" button.

*Manual mode* allows users to choose the settings for each environment. *Protocol mode* offers several sessions with different difficulty levels to test and gradually accustom patients to the VR environment.

**PARTICULAR CASE : LAUNCHING AN UNSAVED SESSION**

Before conducting an assessment or treatment the operator may decide whether he will need to acces the dater later in time by recording the data in the patient folder or not

To perform an unsaved assessment or rehabilitation test click the *Launch an unsaved session **button,*** shown in figure 8.

By choosing an unsaved session there will be no recording of data and therfore it will not be possible to regain acces to the results after the test or treatment.

Advice is **do not to use this option** if you have any doubts on the need to regain access to session data. It is possible to remove a saved session through the session history screen after selecting the session to be disguarded and clicking on the following button :
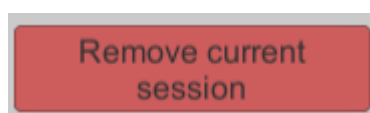


**PATIENT ASSESSMENT**

To Start a Patient Assessment :

1. Acces an existing patient's session file or create a New Patient file

2. Decide whether to launch a Data Saved or Unsaved session

3. Properly position the patient's feet on the balance plate.
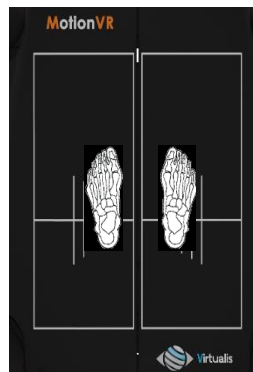
4. Choose the desired software you wish to perform (sensory tests, motor impairment tests and functional tests available on the system, example shown in Figure 10) and select **Start** to open the software.
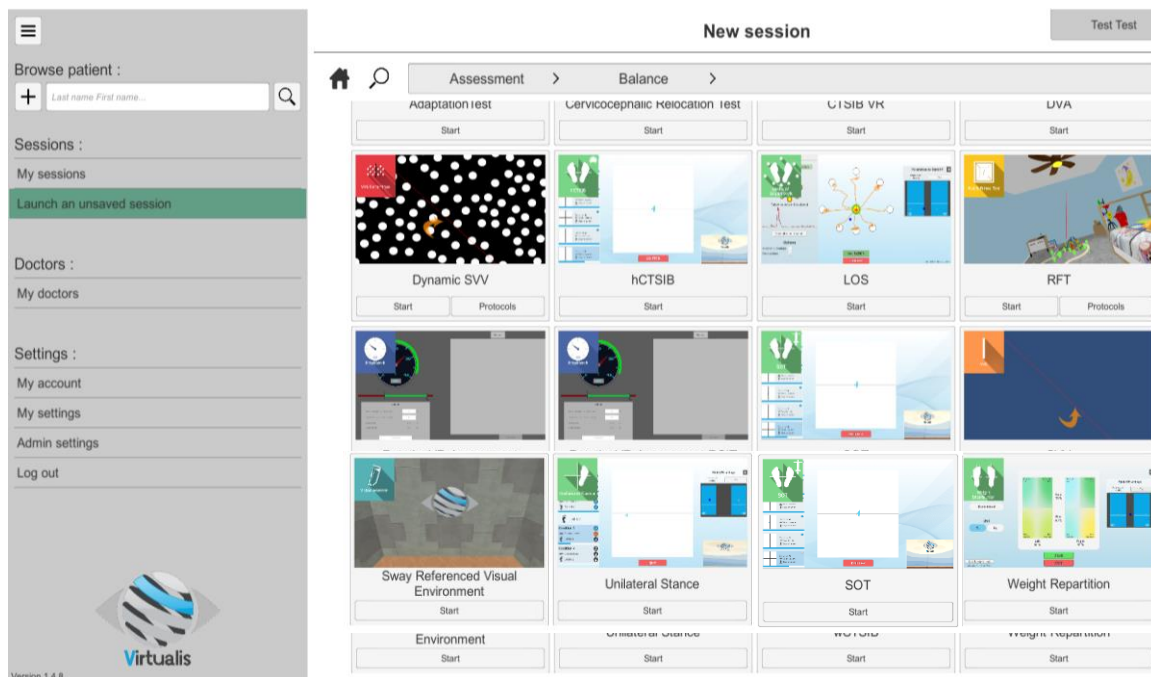


Figure 10. Clinician screen : assesment tab for balance

5. After setting up the parameters to perform the test, select **Start**, located in the bottom of the page.

For a description of an assessment or rehabilitation, refer to the appropriate user manual devoted to said assessment or rehabilitation.

6. Once tests are completed, return to the main menu of Patient Manager software, select **My sessions**.

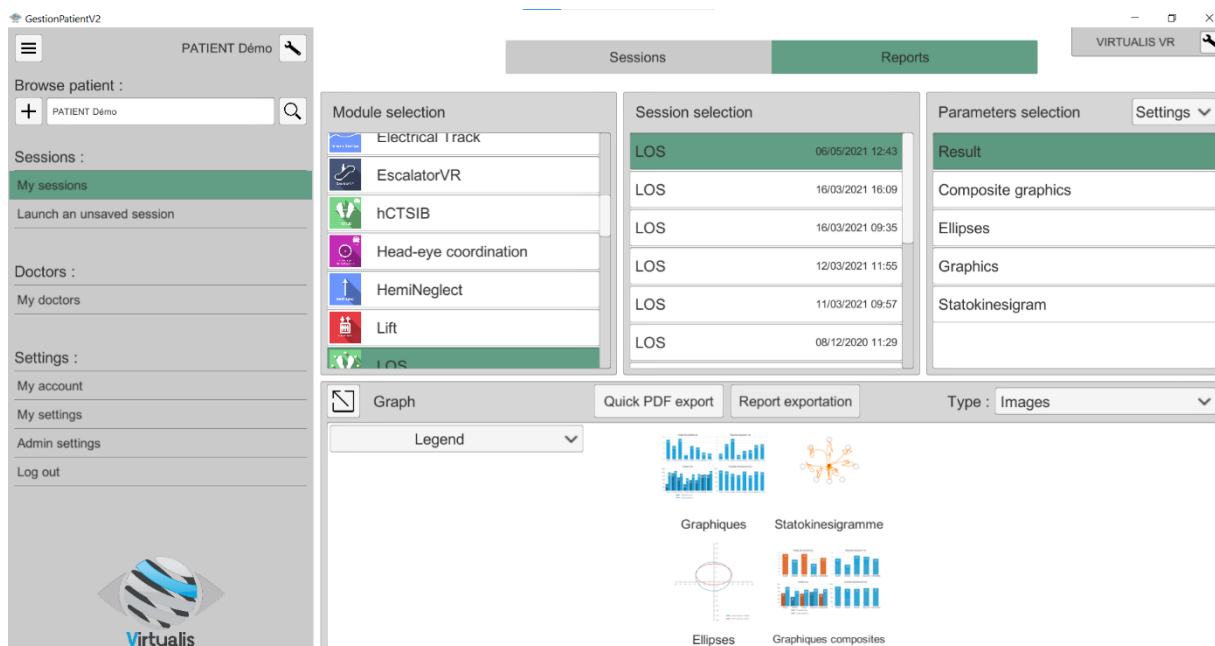Data retrieval and analysis uses the Patient Manager software.

Assessment results are viewed directly from Reports.

**TO VIEW AND PRINT REPORTS OF COMPLETED ASSESSMENTS :**

- From the **main menu** screen of Patient Manager software, select **My sessions**.
- Navigate to the patient tab and confirm the correct patient is selected.
- The My sessions screen will be listing the completed tests for the current patient file under Sessions Test tab.
- View the numeric (or other data) reports by selecting the desired report under **Reports** tab (example shown in Figure 9)
- Once the desired assessment report is pulled up, click on the **Quick PDF export** located in the middle of the screen to export and print the report.

**ASSESSMENT REPORTS**

Individual Test Reports present the results from a single assessment performed on a specific day. An individual test report may be generated for any single assessment or training. The results may be presentes through a variety of types graph (histogram, lines, radar) (Figure 11).
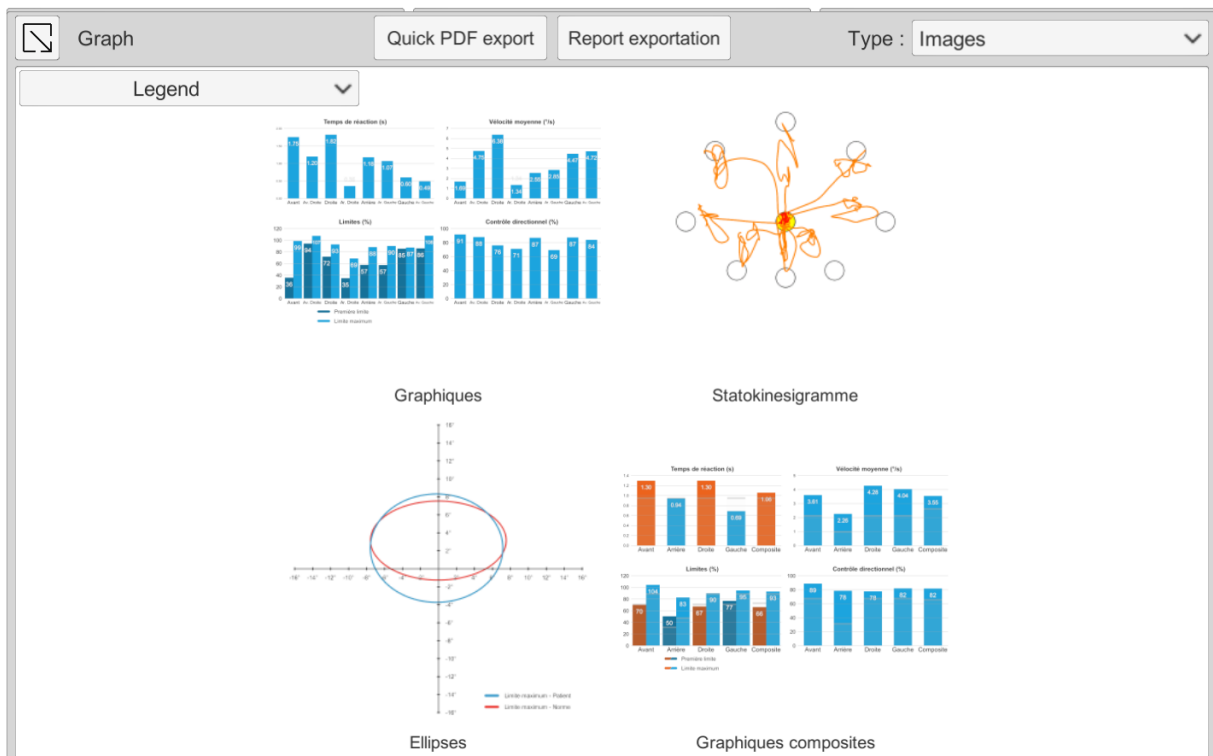
Figure 11. An example of a LOS Test Report