



REF **Motorway Simulation**

CE Class I Medical Device

User manual

Distribution mode

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



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DESCRIPTION

MOTORWAY SIMULATION software is an immersive 3D simulation based on virtual reality technology, i.e. it allows a person to be immersed in an artificial digitally created world. **Motorway Simulation** is a software used for rehabilitation of the "motorway syndrome" - a disorder occurring when the left and right visual hemifields move at different speeds. Resuming ADLs - it is used to simulate a virtual driving situation.

INDICATIONS

Rehabilitation of scrolling disorders, particularly the "motorway syndrome" and when resuming driving (coordination, motor skills, visual controls).

CONTRAINDICATIONS

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

FOR USE BY

Healthcare professionals: Physiotherapists; Occupational therapists; Neuropsychologists; ENT doctors; Neurologists; PMR doctors (physical medicine and 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

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 certain 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 re-education must be undertaken progressively, especially in Virtual Reality where the stimulation is much more "powerful" than the 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 make sure of patients' 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)
- HTC VIVE Controller
- Thrustmaster T150 Wheel and pedals
- XBOX 360 Controllers
- USB HUB

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

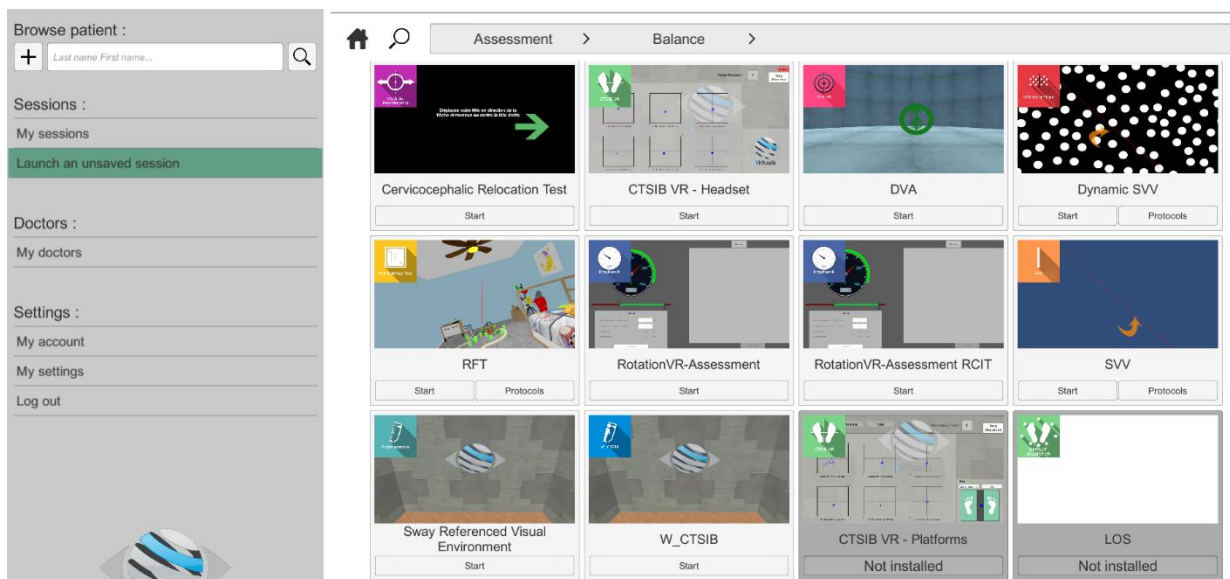
2. USE OF PATIENT MANAGEMENT

Once connected to the Patient Management software, you arrive on the home page. It is from this home page that you will be able to start your VR software, split into different modules, as well as the other Patient Management functions.

The software can be grouped according to criteria such as "Assessment" or "Re-education" and then by pathology type: Neurology, Balance, Functional or Kinetosis.

RVR software contains the following modules: Optokinetics, Optical Flow, Motorway Simulation, SVV, Dynamic SVV, Rod & Frame Test and Coupled vision.

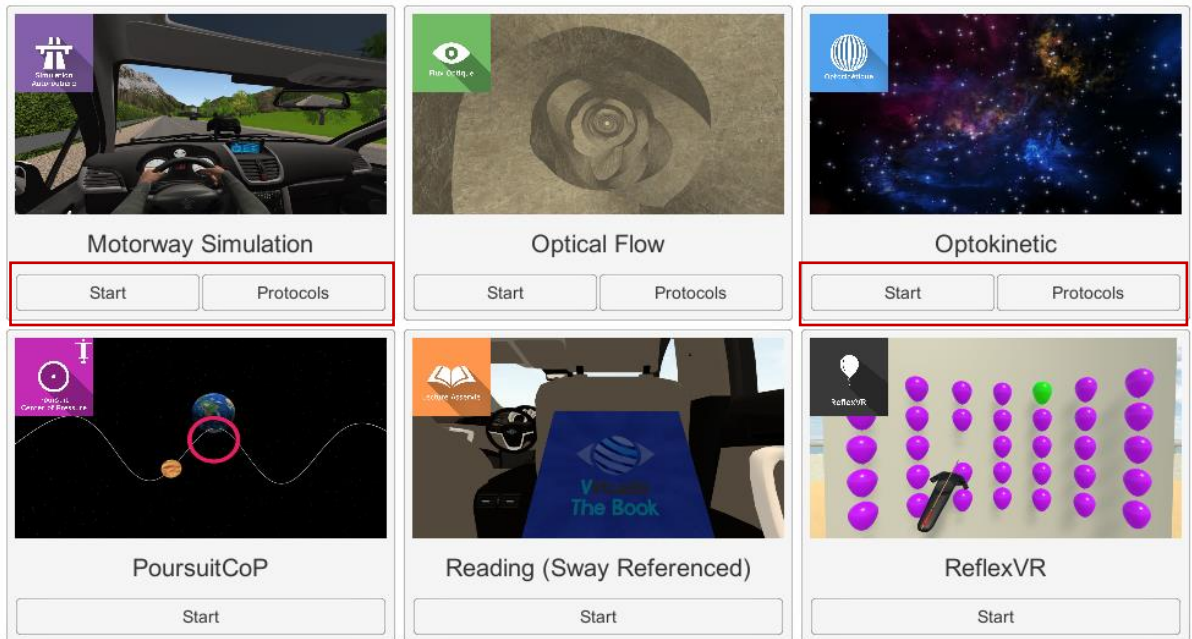
You can launch or switch from one software to another from the home page by clicking the corresponding "Start" or "Protocols" button.



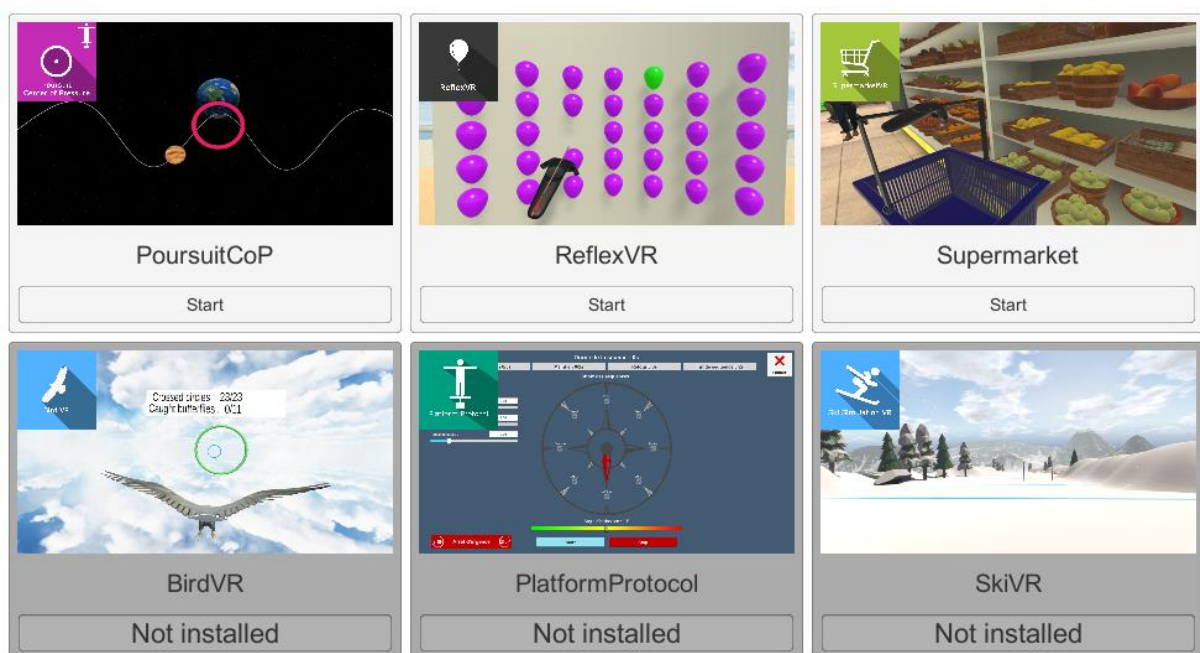


Some software can be started either in **manual mode**, by directly clicking the "Start" button, or in **protocol mode** by clicking the "Protocols" button.

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

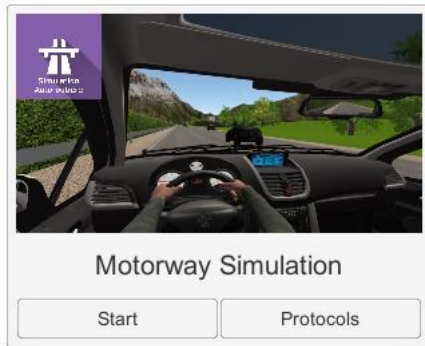


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3. MOTORWAY SIMULATION

3.1. Start interface



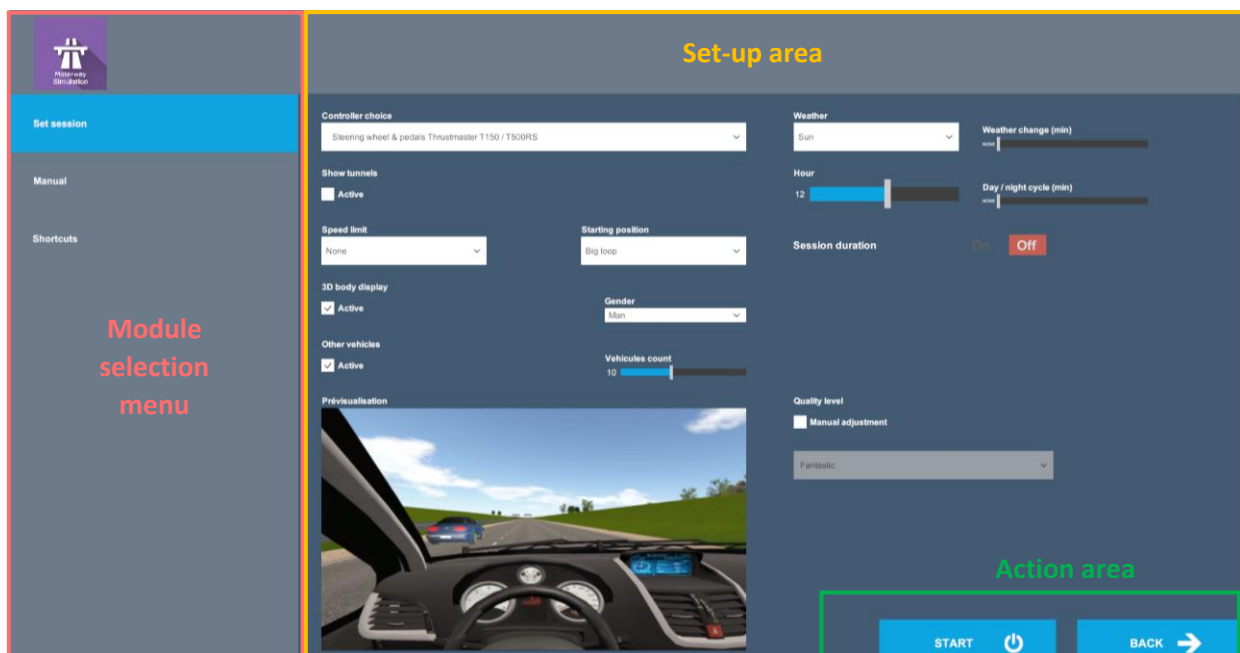
To start the Motorway Simulation software from Patient Management you have two possibilities: start in **manual mode** ("Start" button) or **protocols**.

When the software is started in **manual mode**, the opening is made in a start 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 "Back" button located in the action area, or by pressing the "escape" key on the keyboard.

The module is launched by simply clicking the "Start" button in the action area.



Once this button is pressed, the module starts by taking into account the specified settings. You also have the possibility to modify some settings when the module has been launched, using the mouse.

The Start/Quit buttons allow the environment to be played back or stopped entirely to adapt the experience to the patient's sensations.

When you start the Motorway Simulation software from Patient Management in **protocol mode**, you arrive on a home page from which you can find four protocols for men and women with difficulty levels ranging from level -1 to level 2.

It is recommended to start with a low difficulty level session in order to measure the patient's tolerance to the stimulation and the proposed VR environment.

For each proposed protocol, the different options are already set. Just validate the selected protocol to start the application.

Select a template		
	Controller choice	Steering wheel & pedals Thrustmaster T150 / T500RS
Level -1 Man	Countdown	Yes
Level -1 Woman	Day-night cycle	0
Level 0 Man	Display of the 3D body	Yes
Level 0 Woman	Duration planned	240
Level 1 Man	Gender	Woman
Level 1 Woman	Graphic quality	Fantastic
Level 2 Man	Manual settings	No
Level 2 Woman	Other vehicles	Yes
	Scrolling speed	0
	Speed limit	50
	Starting position	Big loop
	Time	12
	Tunnel display	No

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

3.2. Module field of application

This module has been designed for the treatment of the "Motorway Syndrome". This particular form of scrolling syndrome is characterized by several elements, including:

Only occurs with drivers (not the passenger, or only exceptionally)

Occurs most often above a certain speed (90 - 100 km/h on average)

Occurs on open roads, especially 4 lane roads / Motorways

Varied symptoms: often a sensation of deviating to the left or right. Disturbed ++ when overtaking heavy goods vehicles, false impressions of speed variations, etc.

This syndrome, at least in part, is thought to be due to the relative speed of scrolling of each hemi field of vision: a specificity of motorways, the scrolling is fast on the left (guardrail, oncoming vehicles...) and slow on the right (clear view, fields etc...)

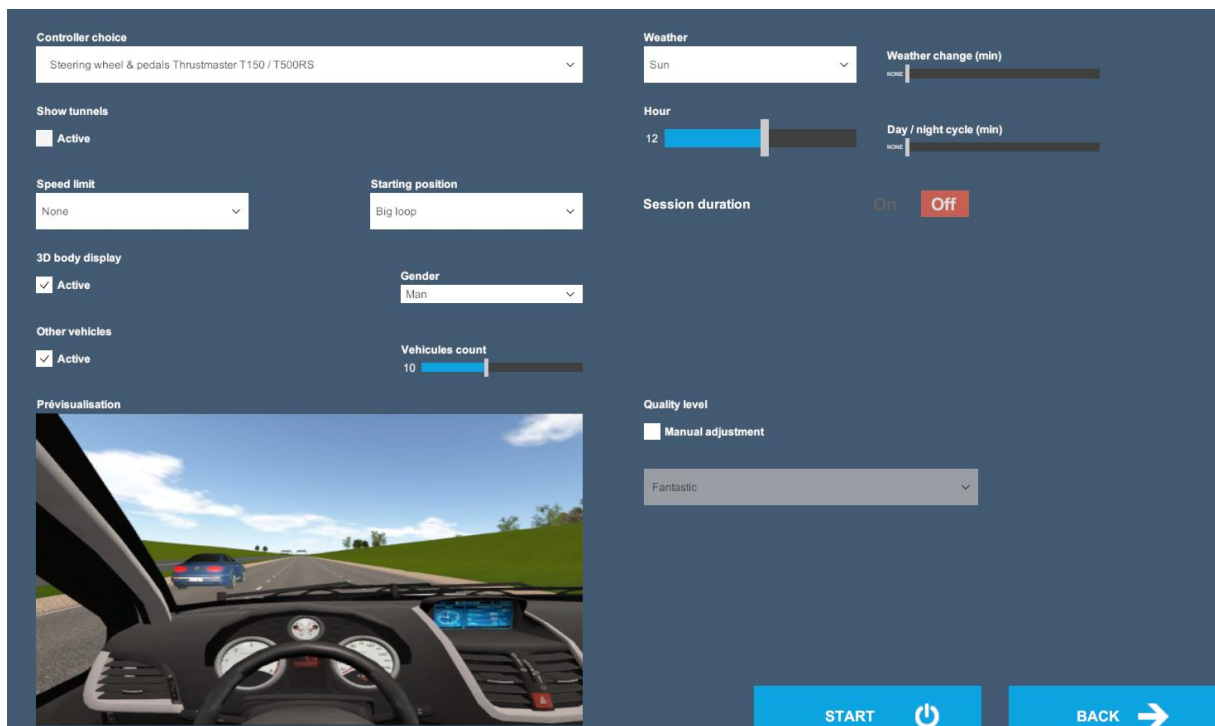
To be differentiated from Travel Sickness in cars, there is another specific module for it (CinetoVR software Automobile Simulation). The mechanisms and symptoms are completely different.

3.3. Installing the patient

It is strongly recommended to acquire the steering wheel / pedals kit (references on our website purchase guide) to place patients in triggering conditions. It is common to reproduce their discomfort when driving with a steering wheel, it is much more difficult with a joystick. The psychological / phobic aspect that develops in these patients needs to be taken into account and requires to "put them back in the conditions", gradually.

3.4. Session settings

These are the initial settings, when the stimulation starts for a launch of the software in manual mode. Most of these settings can be changed at all times using the joystick (remote control) or keyboard shortcuts (see tab: Shortcuts), or on-screen controls.



Choice of controller: Used to select the device being used.



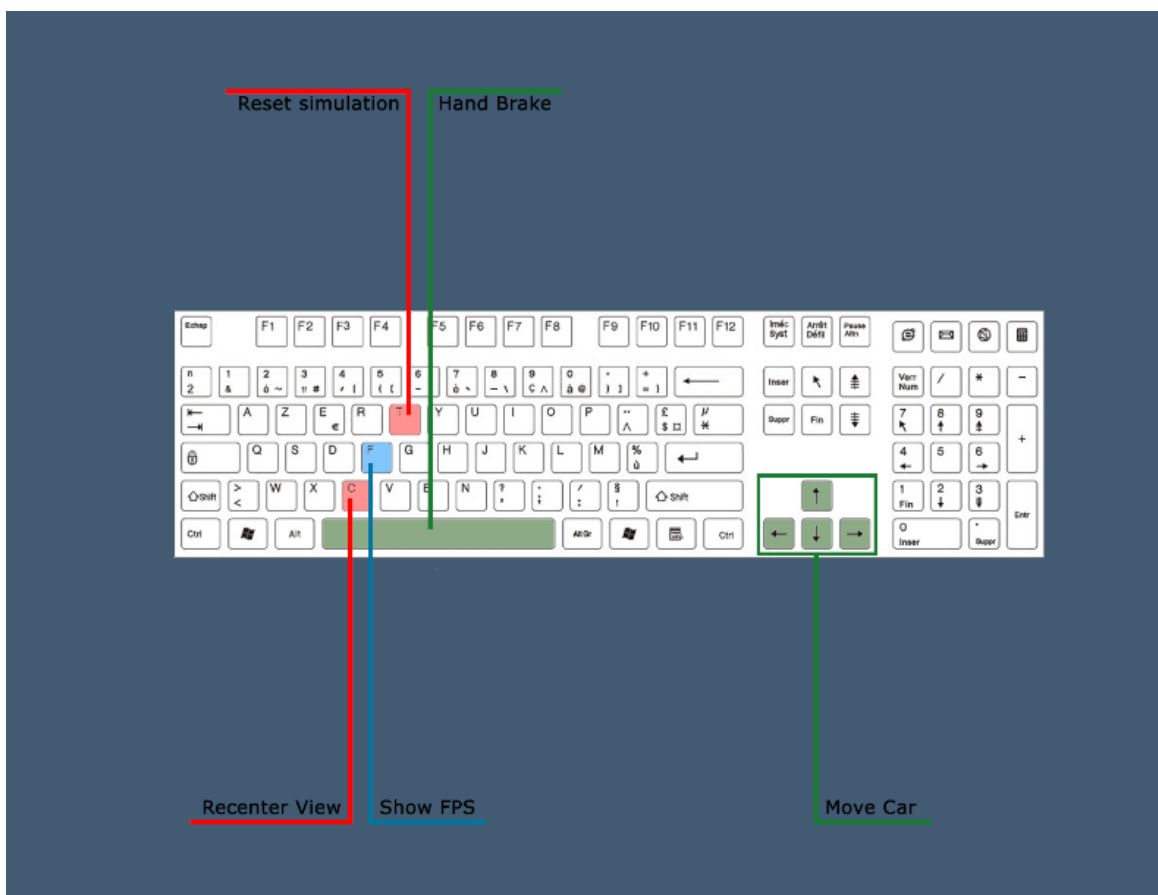
TIP: *If you have both, it is imperative to disconnect the joystick when using the steering wheel. Conflicts appear when both controllers are connected at the same time.*

Other settings such as: the environment weather, activation of tunnels along the route, patient speed limitation, 3D body display and body selection depending on the patient's gender can be customized.

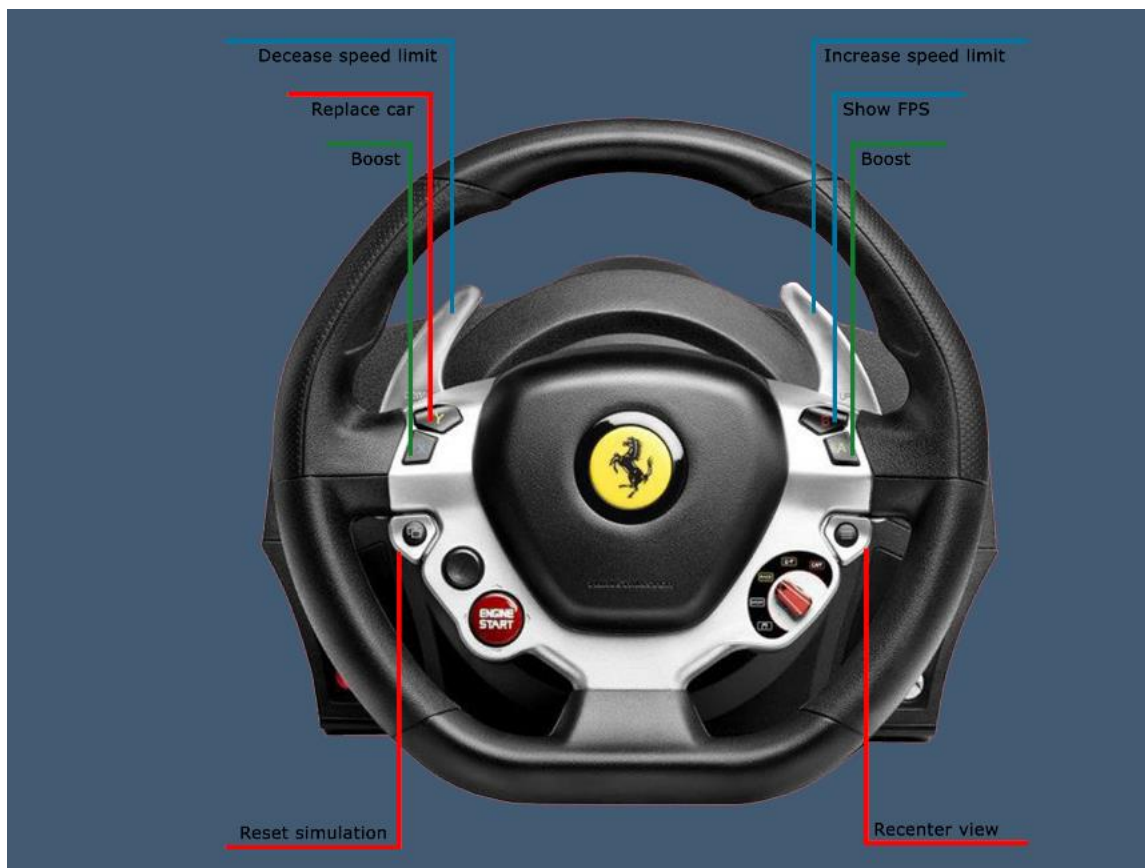
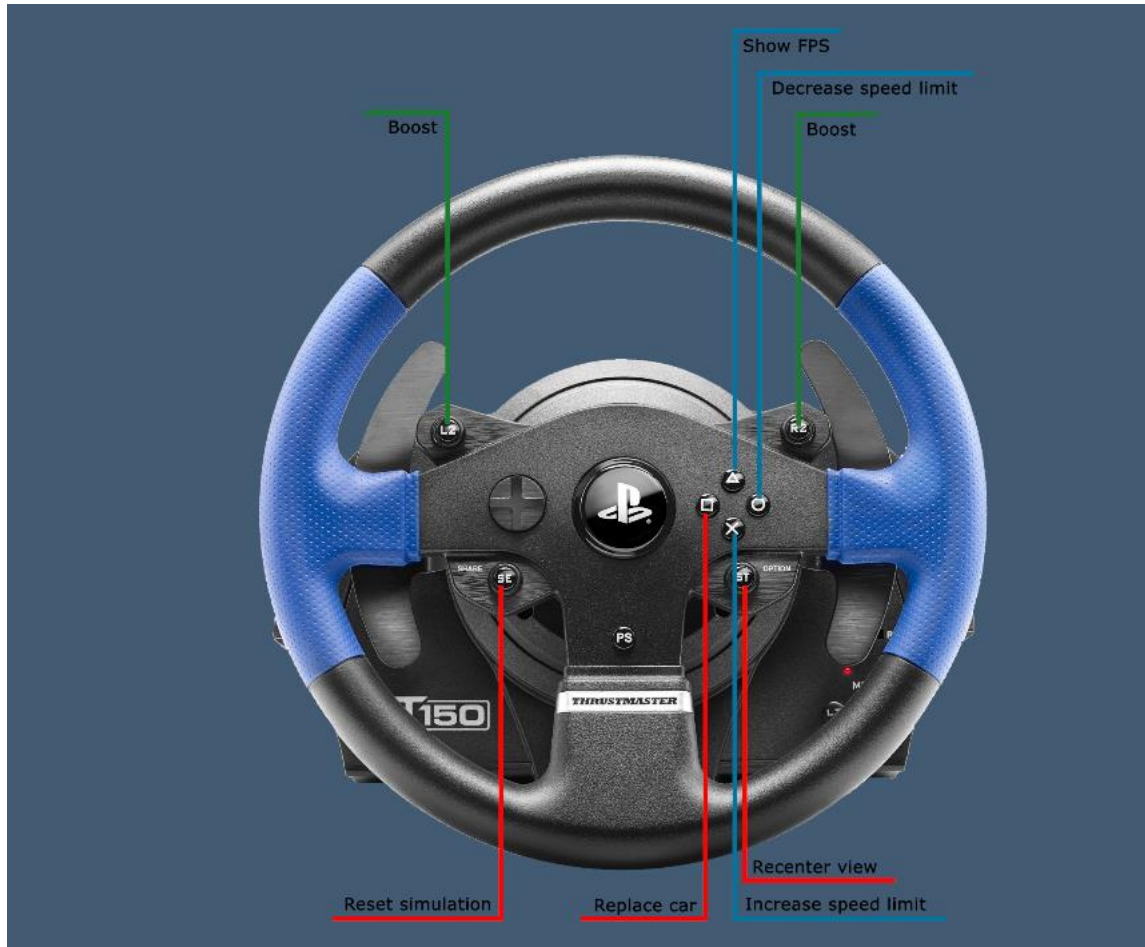
3.5. Shortcuts

The keyboard, joystick and steering wheel shortcuts can be accessed in two ways:

- on the "Shortcuts" tab available at the start interface level
- within the module, by clicking on the joystick icon in the upper right corner of the screen









3.6. Data processing

Data retrieval and analysis uses the Patient Management software.