



GTM SimTools Software Installation Manual Version 1.0

motion



Part 1: Installation

This software has been tested to be functional with Steam software. While plugins are freely provided, games are sold separately through Steam. Not all games have been fully tested, please visit the Simtools Forum for technical support.

For best performance, Simtools requires a dedicated USB port. SimTools may not recognize the GTM Simulator if the simulator is unplugged and plugged into a different USB port. Please take note of which USB port you have your GTM Simulator plugged into should you need to unplug the simulator.

System Requirements :

Windows XP, Windows 7, Windows 8 Microsoft .NET 4 running Steam Software

Checklist:

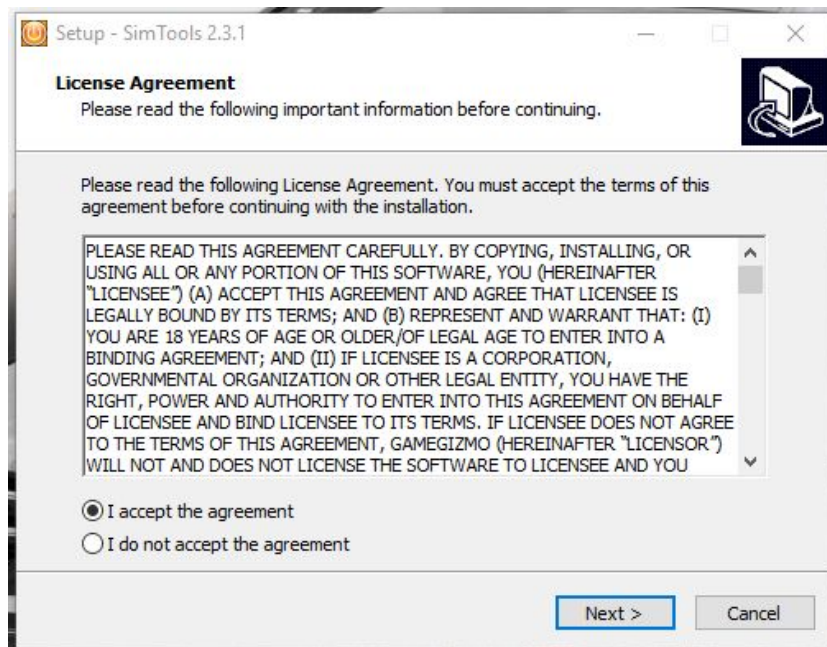
- Plug in** The GTM Motion Simulator to both a power source and your PC's USB port.
- Download** GTR SimTools from <https://gtrsimulator.com/gtm-support/>
- Extract and run** : GTR Simulator Simtools
- Patch** your games with the provided plugins

Steps :

1. Please visit <https://gtrsimulator.com/gtm-support/> To download the SimTools software.
2. Open the directory of the downloaded software, select the compressed setup file and unzip the GTR Simulator Simtools Installer package to the directory of your choice.
3. Navigate to where the install package was extracted to and right click on GTR_SimTools_Setup.exe to select "Run as Administrator".
4. Click "more info" to select "Run anyway".
5. When asked if you would like the software to make changes to your PC, select "Yes"
6. Once the welcome screen loads you may press any key to continue.



7. Please read the End User License Agreement (EULA) and “accept the agreement” in order to continue. Select your installation destination location (*The typical Installation directory is “C:\Program Files (x86)\GTR Simtools”*). This install will require at least 15 MB. Continue to follow the prompts until you reach the Install Button. Click Install to confirm your selections and install to the directory you’ve specified. Clicking “Finish” will close the setup once installation is complete

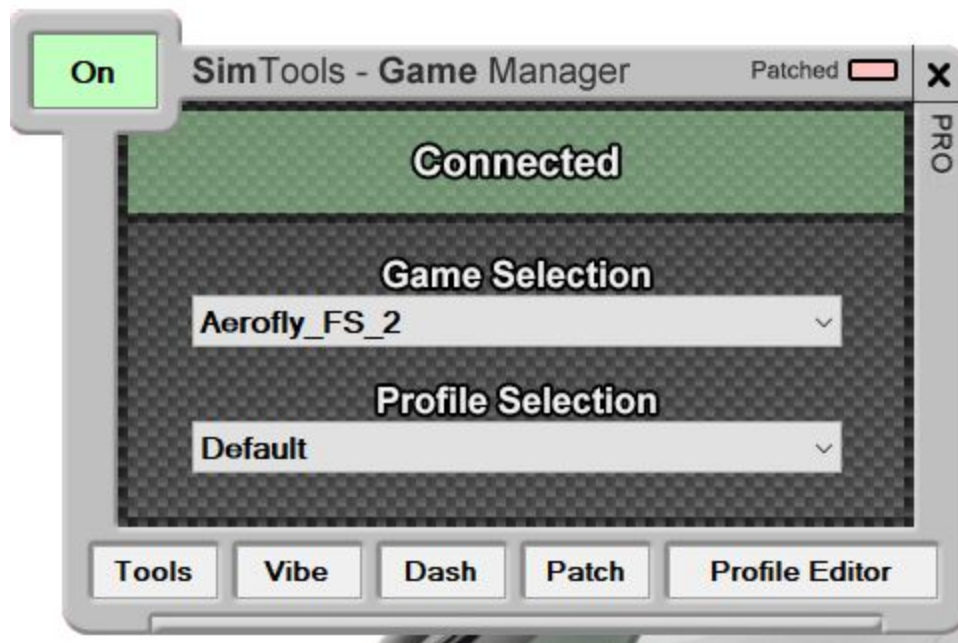


➤ After a successful installation you will be asked to provide an email address and an activation key to use the software. For the email address type in info@gtrsim.com and

for the activation key use your GTM Serial Number that can be found on either the product box or located on a motor of the GTM Motion Unit. Once activated you will want to launch GTR Simulator SimTools Game Manager to patch your game software. GTR Simulator SimTools Game Engine can be used to set up the GTM Motion Simulator hardware.

Testing Movements:

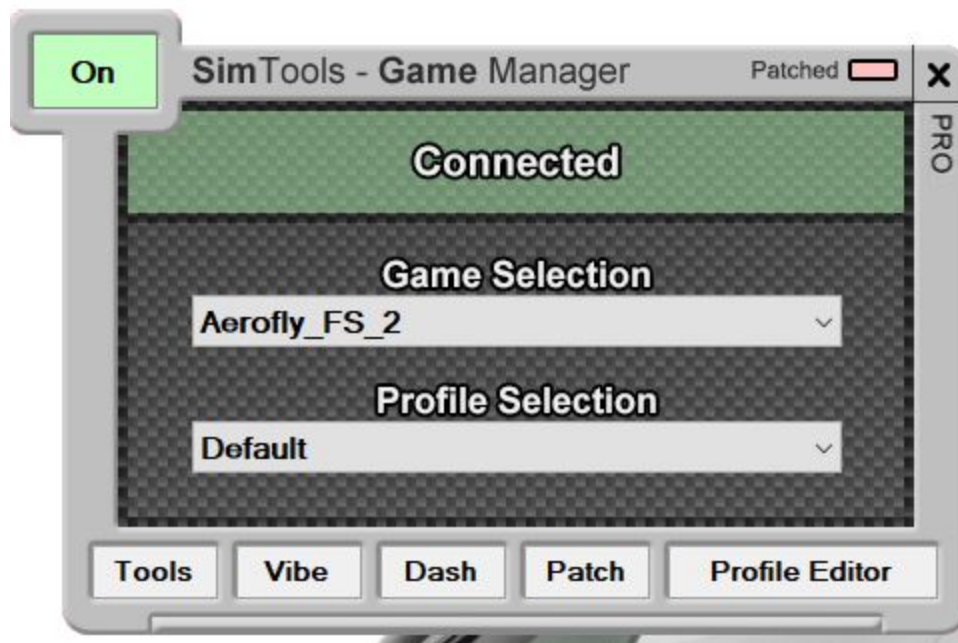
- Run GTR SimTools - Game Engine and select Output testing.
- Click the “Turn On” button located near “Output Type”
- Moving the Roll slider should cause the GTM Motion Unit to move the racing chair.
- If there is no movement when adjusting the roll, try selecting another “ComPort” under the Serial Output settings under the Interface Settings tab. Click “Save” after making changes. If you plug the USB cable of the GTM Motion Simulator into another port, these settings will have to be changed.
- With GTR Simulator Game Engine



Part 2: Patching the Game(s)

Games must be installed before patching. To patch a game run Game Manager and Game Engine by right clicking each icon and selecting "Run as Administrator."

- If the Game Manager window doesn't open automatically, double-click on the tray icon for the Game Manager to open the Game Manager window.
- Select the game you want to play from the Game selection drop-down list.
- Select "Patch".
- There should be a confirmation message when the game is patched correctly ("Patch installed!").



Part 3: Setting Up Simulation Axes

- a) Definitions your simulator is powered by several actuators. Consider that each actuator is seen by GTR Simulator Simtools as an Axis.

GTR Simulator Simtools can extract up to 6 telemetry data (“DOF1” to “DOF6”) from the From the games and can handle up to 6 actuators (“Axis1” to “Axis 6”).

This step in the tutorial will let you indicate to GTR Simulator Simtools the data mixing to Operate before sending instructions to your simulator’s interface along your simulator Configuration.

- b) Setting up the “Default” axis assignments
First step, you have to define the “Default” settings.

- Right-click on the GameEngine tray icon
- Click on the Axis Assignments button
- Under Game List drop-down (Axis Assignment 1) select Default



- Click on the Axis Assignments second tab
- Select a preset from the Presets drop-down list for your simulator.



The tab automatically switches back to Axis Assignments Tab 1

- Select Default from the Game List and click on the Save Settings

Click Save Settings This is a first very basic setup : you just apply the Roll and Pitch to your sim. With more experience you can also add (for example) some % of Surge (to simulate acceleration and braking) or Heave for road bumpiness.

c) Warning be sure to setup your “Default” Axis Assignments profile :

- 1 - When using Output Testing, the Axis Assignments Profile that is used is the “Default” profile. If you have not setup this profile, you will not get any output.
- 2 - The “Default” profile is also copied for each new game installed as a starting place for the Axis Assignments for the new game.

*Axis 1 - 6 are the motors of your simulator DOF 1 - 6 are the game data extracted by the plugin

Part 6

Setting up Simulator Axis

Simtools supports up to 6 different interfaces. They are selectable in the 6 tabs interface 1 - interface 6.

- a) How many interfaces do you need to setup in GTR Simulator Simtools?
 - Only 1 interface to be setup if you use an arduino board that drives the 2 actuators.

Arduino is on Windows COM3

SimTools "Interface 1" will be sent to COM3 the information of Axis1 and Axis2 concatenated.

Arduino will dispatch the data sending Axis1 orders to Actuator 1 and Axis2 orders to Actuator 2.

- Or 2 interfaces if you use 2 JRK12v12 boards. And each JRK drives its own actuator.

JRK1 is on Windows COM

SimTools "Interface 1" will be sent to COM4 the information of Axis1.

JRK1 will send Axis1 orders to Actuator 1.

JRK2 is on Windows COM6

GTR Simulator SimTools "Interface 2" will send to COM6 the information of Axis2.

JRK2 will send Axis2 orders to Actuator2.

b) Type of interfaces (SER / NET)

Basically, you will use "USB Serial Interface" to drive your Arduino or JRKs.

Net interface is used for LAN connected interface. It's not described in this Quick Starting Guide.

Select Interface1 to setup your first interface.

Select the Output Type - typically "SER"

c) JRK example

If you are using JRK's select JRK 12bit from the Presets drop-down list. Otherwise select the correct ComPort settings as provided by your controller manual.

Select the ComPort your controller is connected to.

Click on Save

Select Interface 2nd tab

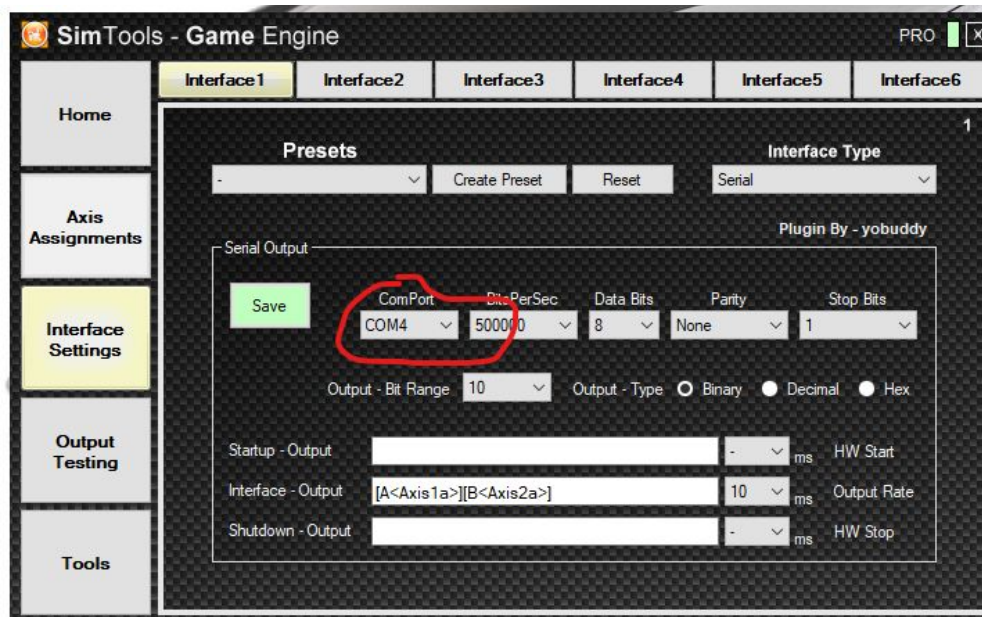
Again, select SER and the correct ComPort settings as before with interface1

Enter in the interface - Output!

Click Save

d) Arduino example

Interface 1 only :



If simulator does not move :

*By default the settings may show 3 port options. In this case, unplug the USB and exit Game Engine - then reopen. This should show up with more port options.

Go to the interface settings tab -

1) Try changing the different options in the dropdown for a different port. Hit Save*

2) Go to output testing and hit 'turn on' button. If it moves you are successful. If it does not, then go back to Interface Settings try a different port in the dropdown and hit save.

3) Repeat Step 2.

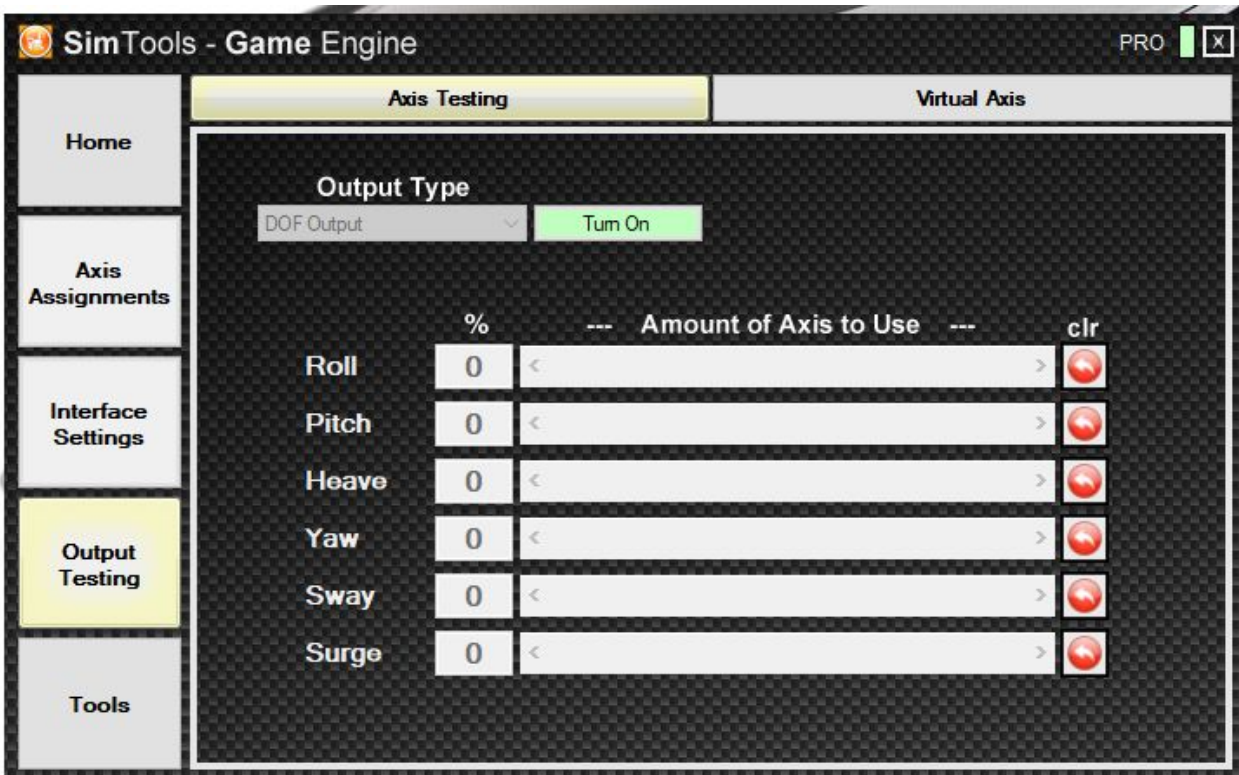
Part 7

Moving Your Simulator with your mouse

USB Comports :

Go to the output testing tab -

- 1) Hit 'Turn On' Button (1,2,3 secs)
- 2) Move one of the scrolls to test if the simulator will move



We recommend to first manually test your simulator before testing any game output.

- 1) Plug your serial connection between your computer and your simulator. For example, a USB cable between your computer and your arduino/JRK
- 2) Game Engine / Output Testing

Click 'Turn On' Select Axis Output

Choose one of the Axis and slide the slider bar with your mouse. As an Axis corresponds to an actuator, you will see the selected actuator moving.

Axis limitation is not active for this testing purpose. The smoothness depends on the refresh rate (try below 10 ms).

Part 8

Checking the Direction of Movements

Now we need to test that the simulator behaves correctly : if the game plugin sends 'tilt left', the simulator should tilt left and not right.

You can invert the motor wiring ... or invert the DOF in the 'Axis Assignments'.

With the slider, we will manually make sure that it is rolling and pitching in the right direction.

For this example we find Roll :

100% - Tilts Left

Roll : - 100% Tilts Right

Pitch : 100% Tilts Forwards

Pitch : - 100% Tilts Backwards

We have to follow the coordinate system that is in place in the GTR Simulator SimTools Plugin API reference - see APPENDIX1

We know from that in Virtual Axis when it Tilts Left - Roll is all the way Left

Tilts Right - Roll is all the way Right

Tilts Forward - Pitch is all the way Left

Tilts Backwards - Pitch is all the way Right

Virtual Axis can be found next to the 'Axis Testing' tab and needs to be turned on by pressing 'Turn On'

So to be correct to the coordinations we need to invert the Roll and invert the Pitch or our games will not produce the right direction of movement.

Once we have this all set up including Heave, Sway and Surge we can then go on and patch a game and begin to test the motion and fine tune it to your Sim.

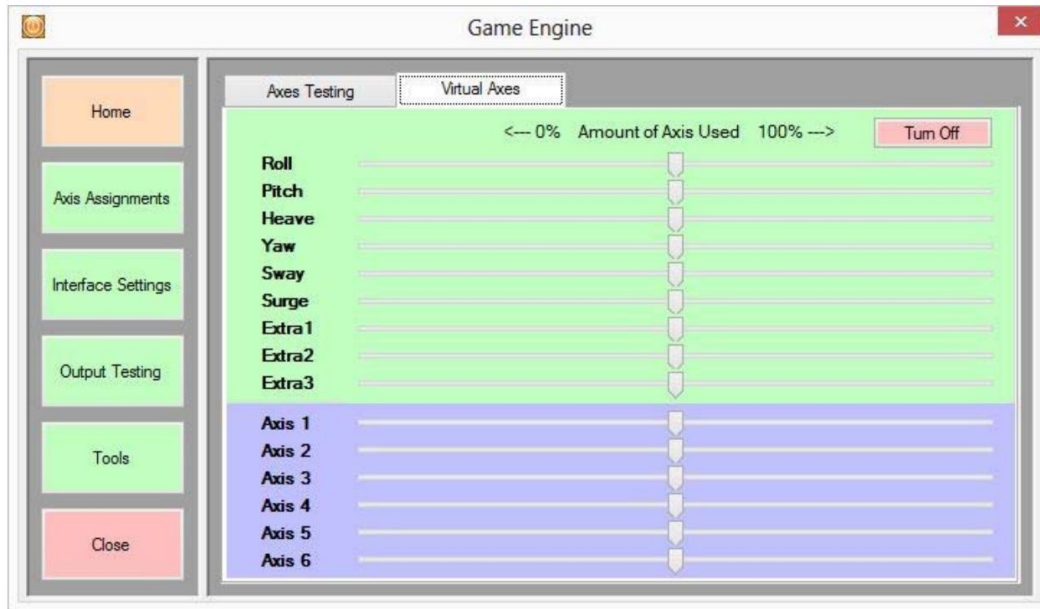
Part 9

Visualizing Game's Data Extraction

Click on Output Testing.
Don't connect the motors yet.

Click on Virtual Axes and on Turn on. * Run the game. If everything is set-up correctly the sliders should be moving.

You can now see that GTR Simulator SimTools can read the Game data!



Note : If you only want to test the slider movements and don't have 7 ComPorts, just write into the interface - Output line.

Part 10 Starting Your Simulator

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- a) Security approach First step, the Security approach : in order to preserve your hardware, begin the test by lowering the range and the intensity.
- Via the GameEngine / Axis Assignments / Axis Limiting : reduced to 50%
 - Via the GameManager, open the "Profile Editor" window in the Game tab / Main settings: Put the Main Level to 20% to preserve your actuators
- b) Second step, starting the sequence :
- Launch GameEngine

Launch GameManager, select the Game Profile in the drop down menu
Launch the game, start a race and the seat will start moving ...

- c) Increase the levels :
Last step, increase the levels until simulator's movements are satisfactory.

Part 11
Conclusion

Congratulations, you have now completed the Quick Start Manual!

APPENDIX1 - FINE TUNING

- a) Generality the GREAT point, is the opportunity to change the setting parameters live. If you have 2 computers, you can adjust in live the next parameters located in the Game Manager :
 - Main Level
 - DOF Levels

b) First in the Game Engine, Axis Assignments select the DOF for pitch and increase the % of Axis used.

Second if you find the Max Min Settings in the Tuning Centre in a particular game is not to your liking it can be also changed there, but pressing capture to enter a Min Max setting manually - lower the value quicker until the forces reaches 100% of its axis. The bigger it is the lesser the axis it will use.

Ok now for Rfactor I have not done a profile of such yet, just a quick test to look at the direction of forces.

Be aware pitch now is the actual car angle in world terms represented by an angle. So lower the Min Max the sooner the sim reaches the % of axis you have set in the axis assignment. So a balance can be found.

How to Deal with Setting the Pitch

1. In Axis Assignments - Set all DOF to 0% if selected.
2. In Axis Assignments - Set Pitch to 60%.
3. Test in output settings to see how far the min and max pitch will reach. Adjust in Axis Assignments until happy, beware don't use 100% of your axis travel, about 50-60% you need the rest of the travel to factor in other force movements.

Once happy with settings then test in game.

Once game is running, test by driving around a track to feel the reaction of the pitch movement knowing how far your max angle is you can gauge whether the values in the tuning centre of Game Engine suit what you want.

Pitch can be fairly placid until you hit a big bump, climb a steep hill, or roll over. Try and test most situations before adjusting. If it is not reactive enough, such as not giving enough feel for the changes of pitch in the changes of pitch in the ground elevation, adjust your Max Min for pitch in the tuning centre down by 3 - 5 and continue to test. If too great of movements adjust the value up by 3 - 5.

This takes time - after you have done a couple it becomes a lot faster.

This process should be followed when building a base profile for a game.

Now there are 2 more forces that affect the pitch of your simulator and need to be included in your Axis Assignment all to adjust the pitch of the motion simulator correctly.

Surge and Heave :

Surge (longevity) Heave (Vertically). You need to do the above for these two then mix all three together to find a nice in total pitch movement for your sim.

c) Adjusting : Value1 The pitch and roll sliders should not be 0 or 1 (so to speak) but move through the full range. You might have to increase the values for pitch and roll in the Tuning Centre.

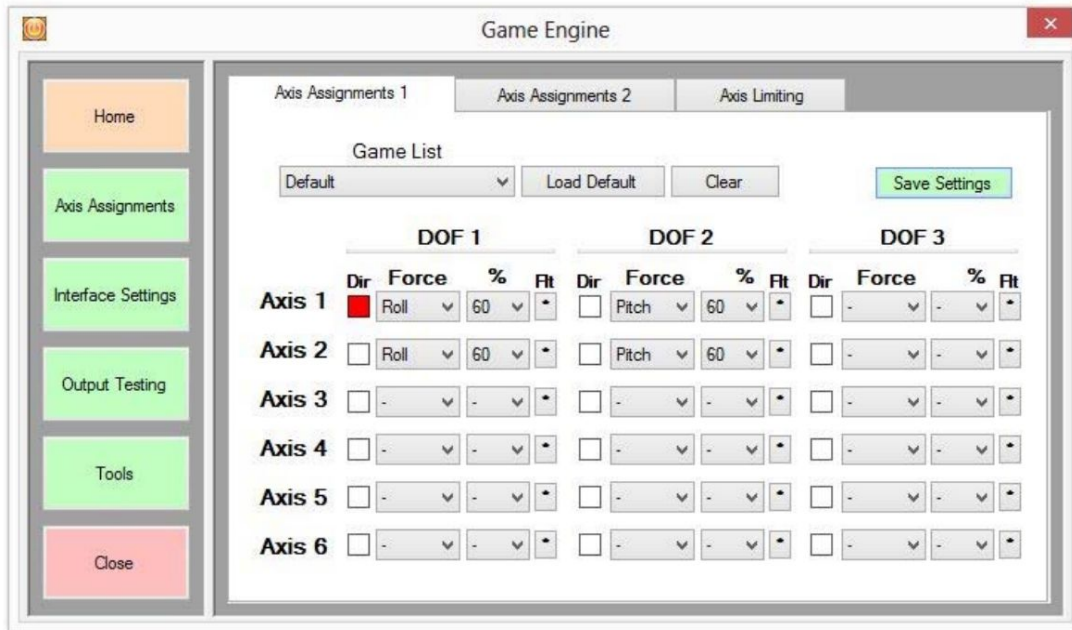


. $\pm 25^\circ$ should be sufficient.

Now regarding the behaviour of roll and pitch:

Pitch and roll represent the orientation of the car in the world: up or down when uphill/downhill, tilted left or right on a bank. But also when the car leans into a curve, you should see this on the slider. Or when accelerating the car moves the hood up.

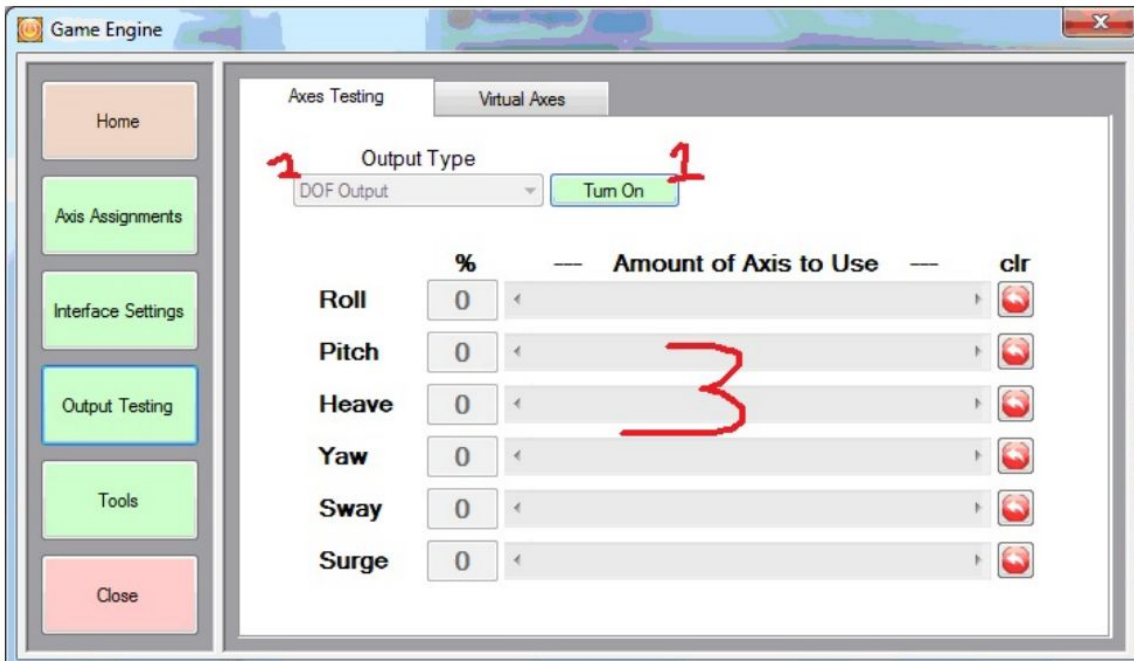
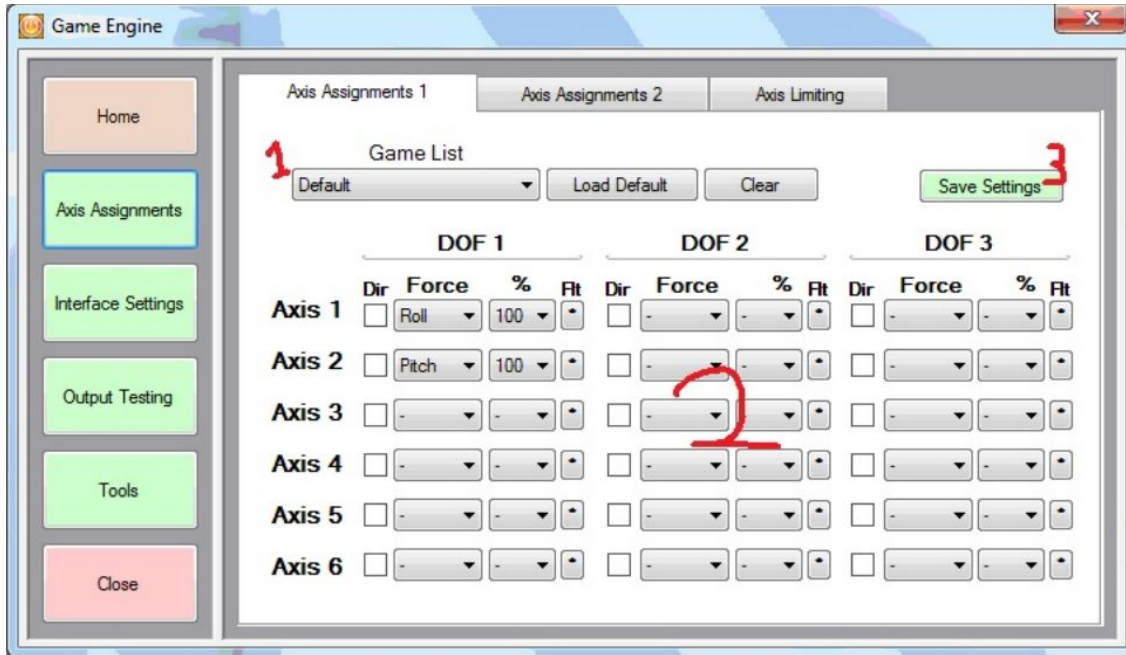
However as most of us only have 2 axes – representing 2DOF – we have to tweak a little here and add some surge and sway to the signal. This is why there is the possibility to mix DOF's in the Axis Assignment tab



So instead of only assigning pitch and toll to your axis you also add a few % of surge to the pitch axis and sway to the roll axis. And maybe some heave for the bumpiness of the track, up to your gusto

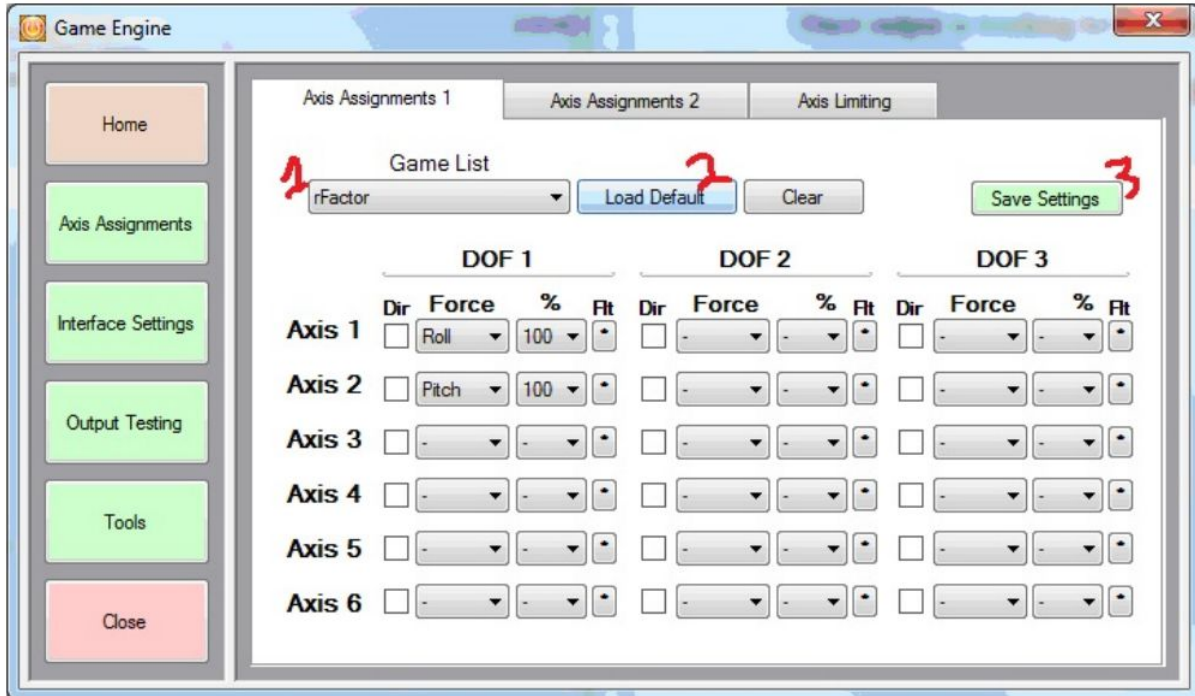
d) How to setup Axis Assignments for all your other games ? To use Axis Assignments in simple mode for SimTools 3.1, do as follows.

Setup the "Default" profile in the 'Game List' and click 'Save'.



Once output is working to your liking, copy the 'Default' profile to all games installed.

To do this, select the game from the drop down list, then press 'load Default' and then click 'Save'.

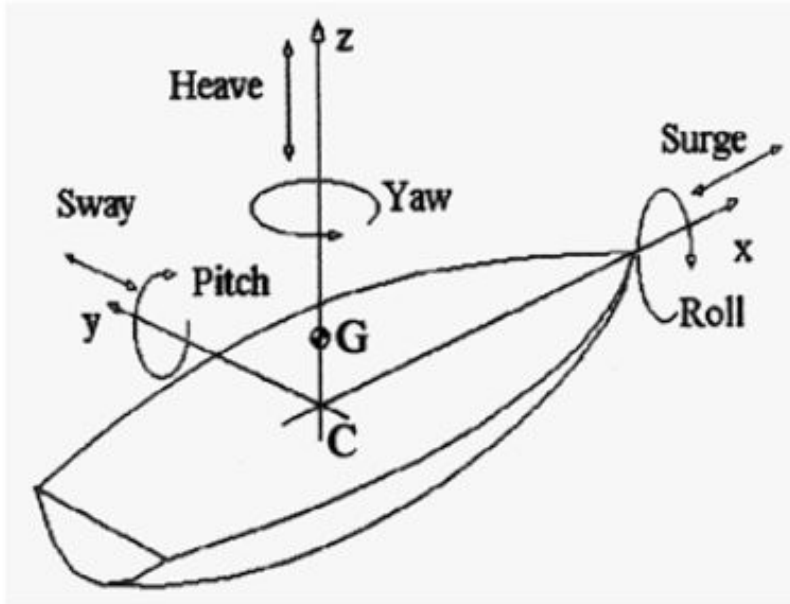


All new games added will automatically be installed with a copy of the default axis assignments profile.

APPENDIX 2 - COORDINATE SYSTEM

This is the reference used by the Plugin developers.

- a. Nomenclature of movements in Simtools



Pitch is the tilt of the car forwards or backwards in degrees [°]

Roll is how much the car is dipped to the left or right in [°]

Yaw is the heading of the car (north, east, south, west) in [°]

Surge means the acceleration of the car in longitudinal direction [g]

Sway means the acceleration of the car in lateral direction [g]

Heave means the acceleration up and down [g]

b) Direction of movements in SimTools

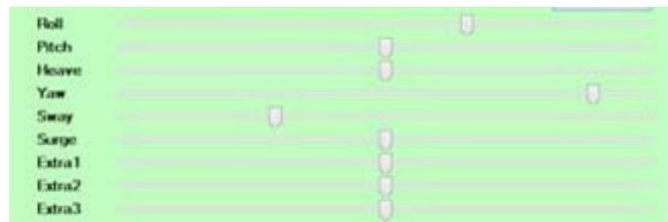
Acceleration → pitch slider moves to left, surge slider moves to right

Deceleration (braking) → pitch slider moves to right, surge slider moves to left

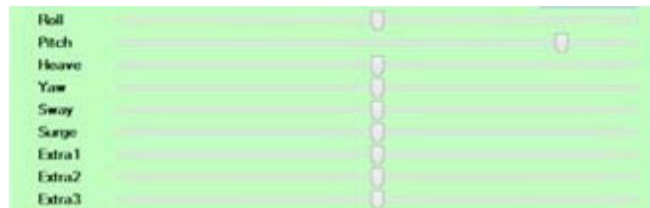
Right turn → roll slider moves to left, sway slider moves to right, yaw slider moves to left



Left turn → roll slider moves to right, sway slider moves to left, yaw slider moves to right



Driving downhill → pitch slider moves to right



<p>Driving uphill → pitch slider moves to left</p> 	
<p>Tilted to the left → roll slider moves to left</p> 	
<p>Tilted to the right → roll slider moves to right</p> 	

Where available a plugin shall also issue Speed, RPM and Gear as a minimum for dashboard applications.

Extra1 data is Traction Loss per default. However this is not mandatory

If you have a suggestion, an issue or a bug to report, please first read the following topic :

<http://www.x-simulator.de/forum/simtools-v3-0-issues-bugs-suggestions-t4615.html#p44014>