



SimCraft Control Panel “CraftCon” Usage Manual

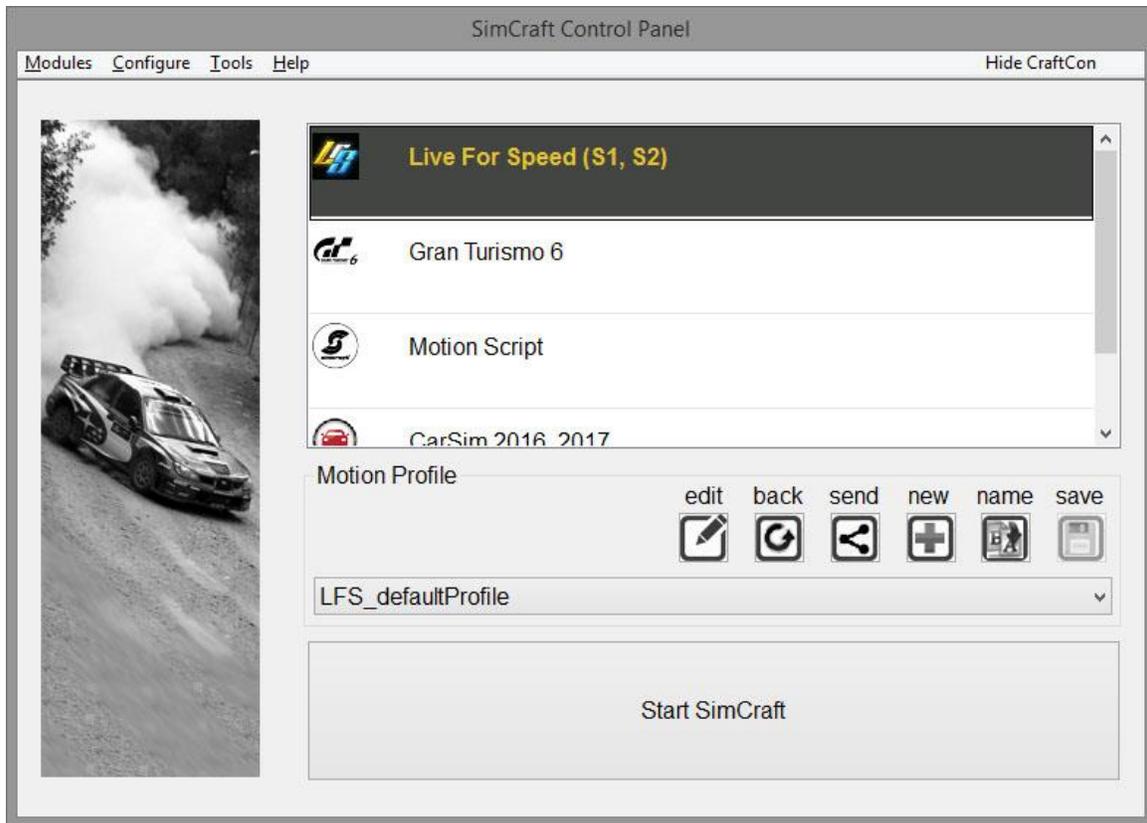
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v2.6



The SimCraft Control Panel, “CraftCon”, allows you to access the SimCraft integrations or “interface modules” that control the interaction between your SimCraft motion system and the game/computer simulation you are using. A module is represented as a list item in the CraftCon window containing the game/sim name and the game/sim’s icon. Within CraftCon, each game/simulation has a corresponding module, and the modules are all independently enabled and managed. CraftCon allows you to control module activity and the configuration of the motion system with module specific settings for each game/simulation.

Make sure you read through each of the chapters carefully as they outline specific parts of CraftCon and its effects on the motion system. Do not change any of the default settings of CraftCon before consulting this manual. In addition, make sure to follow proper safety precautions when using a SimCraft motion system by consulting the motion system safety document included with your installation of the SimCraft Control Panel. Failure to do so may result in serious injury or death.

For a list of the games/simulations that currently work with SimCraft Motion, please visit the SimCraft website at <http://www.simcraft.com>

Table of Contents

Activation.....	5
General CraftCon Rules & Operations	6
Main Screen	6
Module Listing (Main listbox).....	7
Start SimCraft - Starting and Stopping Modules	8
Game/Sim Versions	10
SimCraft Module Settings.....	12
Make Globalized Launch Settings for this Interface Module.....	13
Game /Simulation Title Executable Path.....	13
Auto Launch.....	13
Launch 3 rd Party Program	13
All AXIS Motion Amplitude	13
All AXIS Motion Intensity	13
Axis Advanced –.....	14
Enable Logging.....	14
Basic Motion Profile Settings	15
Roll.....	15
Pitch	16
Yaw	17
Surge	17
Sway.....	17
Heave	18
Advanced Motion Profile Settings.....	19
Reverse Roll G.....	19
Range of Motion	19
Acceleration Multiplier.....	19
Orientation Multiplier	20
Collision Detection	20
Detection Sensitivity.....	20
Reactive Amplitude	20
Uber.....	20
Uber Motion Settings.....	21
Use Worked Threads –.....	21
Velocity.....	21
Positions per Degree	21
Dynamic CD Sensitivity	21
Dynamic CD Factor –	21
Dynamic CD Sample Impact –	21
Modules Menu	22
Enable / Disable Modules	23
Configure Menu	24
Simulator Components –.....	25
Calibrate Motion	25
Go Home –	26
System Settings.....	26
Com Port for motion system -	27

Launch last active module at startup -	28
Launch CraftCon at StartUp –	28
Start-up Sound Effects –	28
Heads Up Display – [deprecated, does not work in Windows OS 10]	28
Launch JoyToKey at StartUp.....	29
Reverse Roll.....	29
Reverse Pitch	29
Reverse Yaw	29
Reverse Surge	29
Reverse Sway.....	29
Reverse Heave	29
Roll (Pitch, Yaw, Surge, Sway, Heave) Axis Installed –	29
Initialize Roll (Pitch, Yaw, Surge, Sway, Heave) –.....	29
Overall Amplitude Control (Apply to the selected axes) –.....	30
Overall Intensity Control (Apply to the selected axes) –.....	30
Module Settings –	30
Adjust Key Mappings	30
Manage Motion Profiles	31
DEBUG (Show Module Process) –	31
Share Motion Profiles	32
Help Menu	34
Sim Error Correction.....	34
1. Safety Guidelines	35
2. CraftCon Usage Manual	35
3. Legal Disclosures.....	35
4. Software License Info	35
http://www.simcraft.com	36
Set License Key	36
About.....	36
Hide CraftCon Menu.....	37
Appendix A – Glossary of Terms	38
Appendix B – Creating a motion profile primer	40

Activation

Upon installation, and after launching CraftCon, you will be prompted to enter in your License Keys. You only need to activate CraftCon once per PC but additional activations may be required after major hardware changes.

The screenshot shows a "License Activation" dialog box. It features two input fields for license keys, each with an "Open" button. Below these is a "User Code" field containing the alphanumeric string "1058-19FD-538C-ADE1-3EF9-3919-2372-390F". To the right of the User Code field is a scrollable area displaying registration details: "REGISTER USER: SMACDON", "REGISTERED COMPANY: SIMCRAFT", and "ALL MODULES". Below the User Code field is a paragraph of text: "If you have not obtained your license keys, please request one from SimCraft Support by providing the User Code displayed above. You may choose to select the E-mail button below, but please make sure to send the requesting e-mail through the e-mail account you used when registering your user id with SimCraft.com." Below this text is an "E-Mail" field containing "scsupport@simcraft.com" and a "Phone" field containing "1.877.SimCraft". At the bottom right of the dialog are "Cancel" and "OK" buttons.

To obtain your keys, you must e-mail SimCraft Support with the “User Code” provided in the User Code field. You can automatically generate an e-mail message with your user code by pressing the scsupport@simcraft.com button. Requests for keys via e-mail will be returned within 24 hours in most cases.

If you have already obtained your keys from SimCraft Support, you can also select the “Set License Key” menu item from the “Help” menu, and enter your keys in the field provided. You will be notified of a successful activation and will be need to re-start CraftCon after acceptance. Follow the same procedures as above.

If you need to reinstall CraftCon on the **same** computer, you can with the **same** license keys. Installing CraftCon on a **different** computer will require **different** license keys.

General CraftCon Rules & Operations

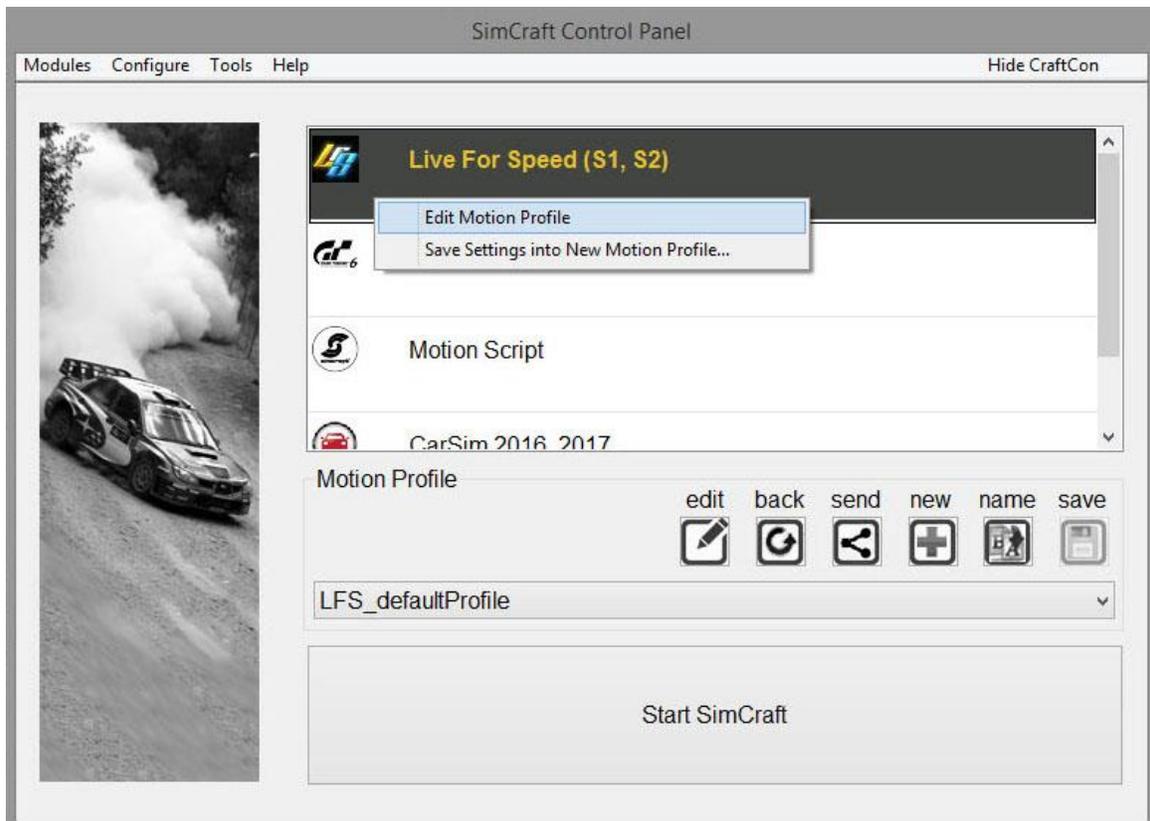
- You cannot have multiple modules running at the same time.
- You must stop the currently running module to begin another.
- You cannot launch a module outside of CraftCon

Minimizing CraftCon will create an icon in the Windows System Tray. This icon allows basic start/stop functions to be accessed. Right clicking on the system tray icon will bring up all the contents of the CraftCon system tray menu system. You can perform some basic tasks including starting and stopping game interface modules. Left clicking the icon in the system tray will restore the CraftCon window to its previous size and location.

Main Screen

The CraftCon main screen displays all enabled interface modules as well as the current state of the selected module (active or inactive). All of your installed modules are listed in the main window of CraftCon.

The basic operation from this main screen is to select an interface module, select a motion profile, and click “Start SimCraft”. The corresponding game or simulation can be configured to launch simultaneously. To change these launch settings, you must modify the “Module Settings” by right-clicking (or double-clicking) the integration module in the main window module listing.



If you choose not to launch the game/sim with the module, you must launch the SimCraft module software first in most cases. If you have already started the game/sim you wish to play, you may need to close the game, stop the module, and then restart the module and then the game/sim title after that. After taking these steps, you should be able to run the game/sim and have it interact with the motion sim correctly. If the problem persists, you may need to re-launch CraftCon, and then the module, and then the game. Contact SimCraft support with any issues.

Module Listing (Main listbox)

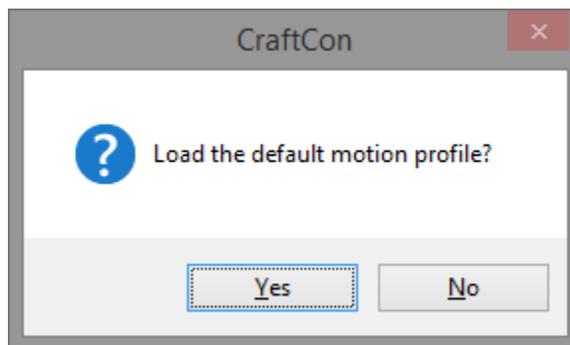
This field is a listing of all enabled interface modules on your system.

Motion Profile (dropdown listbox)

This list is populated with motion profiles contained in the “motionProfiles” directory. You may select a motion profile from this list prior to starting the sim. If you do not select one, the last loaded settings will be used.

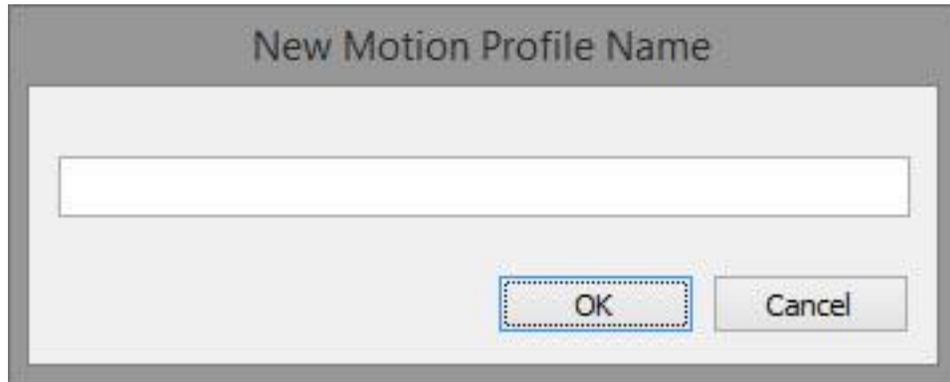
Edit edit the current motion profile

Back Restore the default motion profile for the selected module

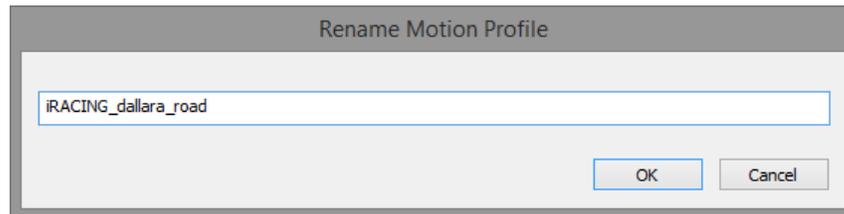


Send use this button to share a motion profile

New use this button to create a new motion profile. The starting point for the new profile will be from the last loaded profile. You will be prompted for a name for the new profile and it will load automatically once you accepted the new name.



Name rename the current loaded motion profile



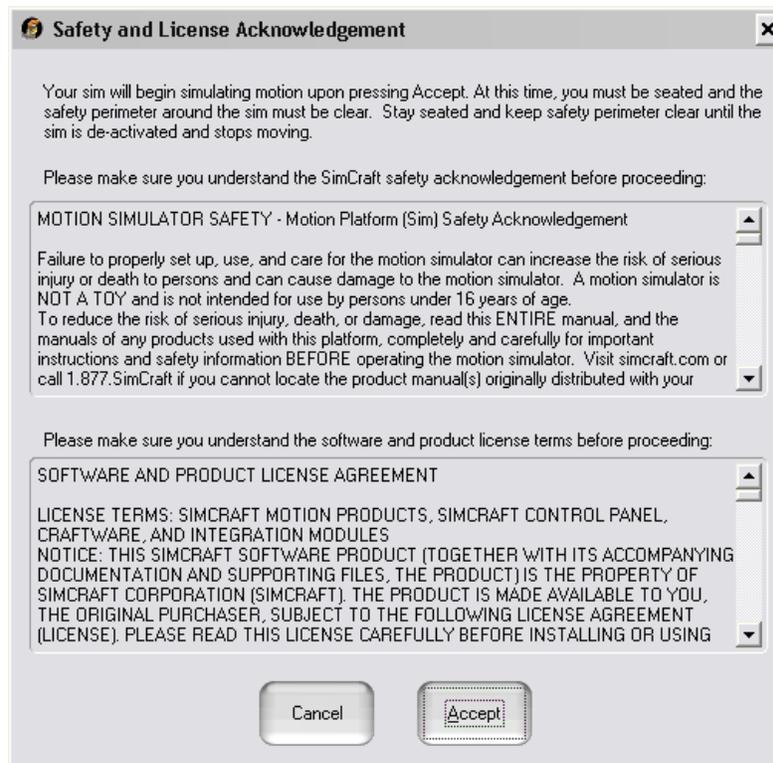
Save this button is disabled by default. You will only see it enabled after realtime adjustments have been made.

Changes to a motion profile are saved automatically to the XML file that stores all the various motion profile settings in the “motionProfiles” sub-directory WHEN THOSE CHANGES ARE MADE FROM THE GUI (Graphical User Interface). In other words, as long as you are working within CraftCon screens and windows. Adjusting settings with sliders, and entering numbers, etc will be auto saved when you exit the screen to return to the main CraftCon window.

Motion adjustments made with the realtime adjustment functionality will **not** be auto saved. You must click on the save button to save those changes and you will be prompted to confirm.

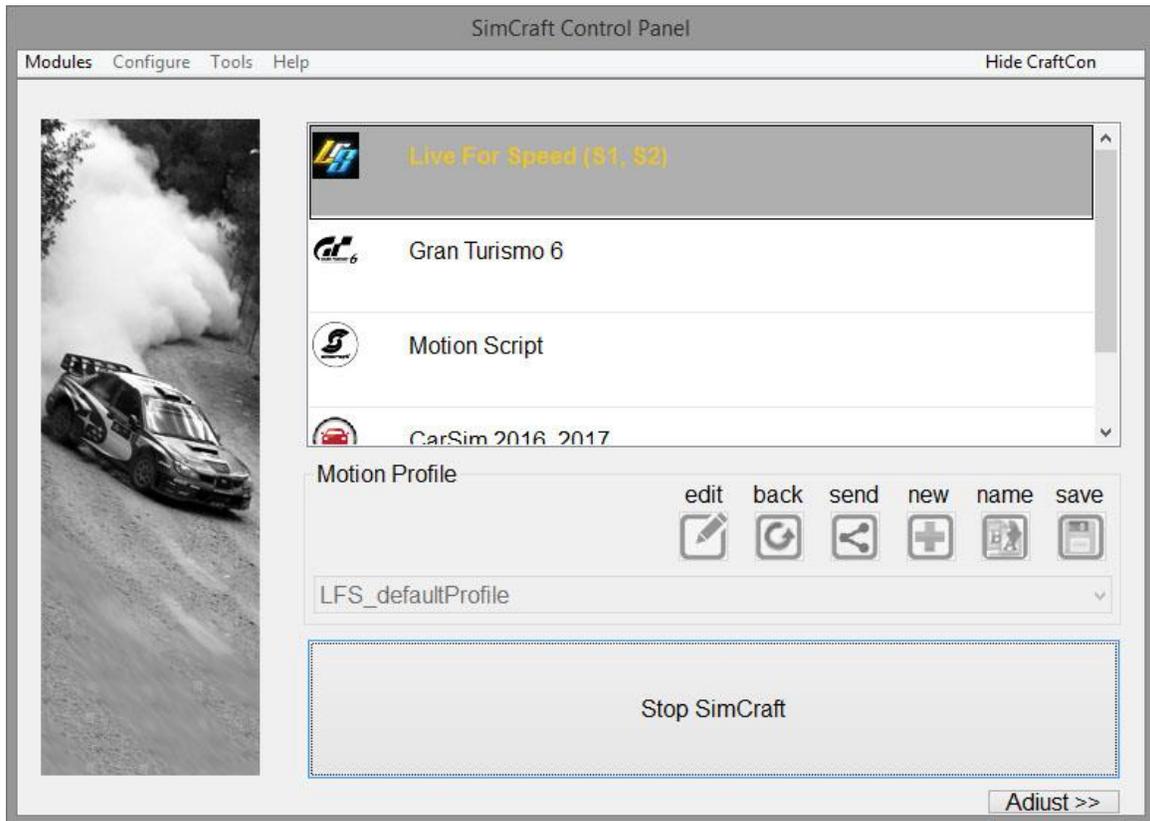
Start SimCraft - Starting and Stopping Modules

Modules are the link between the SimCraft motion system and the game/simulation software. Even though CraftCon allows you to control all the modules from a central location, each module is its own program capable of storing settings created by you for the most customizable motion experience. To launch a module, select the desired game/simulation from the main screen with a left-click, and then click the “Start” button. This action will launch the module software first, and then the game/simulation itself if this option is selected and the path to the game/sim executable is correct.



Upon launching the module by selecting the “Start SimCraft” button, you will be prompted with a safety acknowledgement dialog and must accept the acknowledgement before proceeding. Upon pressing accept on this screen, the launch process will continue.

To stop your sim, you click the “Stop SimCraft” button. This action will terminate the game/sim process only if it was launched from CraftCon when the sim was “Started”. This action will park the motion simulator into a home or parked position in addition to terminating the interface module software process.



Alternatively, you may click on the “Modules” menu to start and stop modules. The menu accessible from the main window and the right-click menu on the system tray icon when the main screen is minimized are the same menus and provide the same operations.

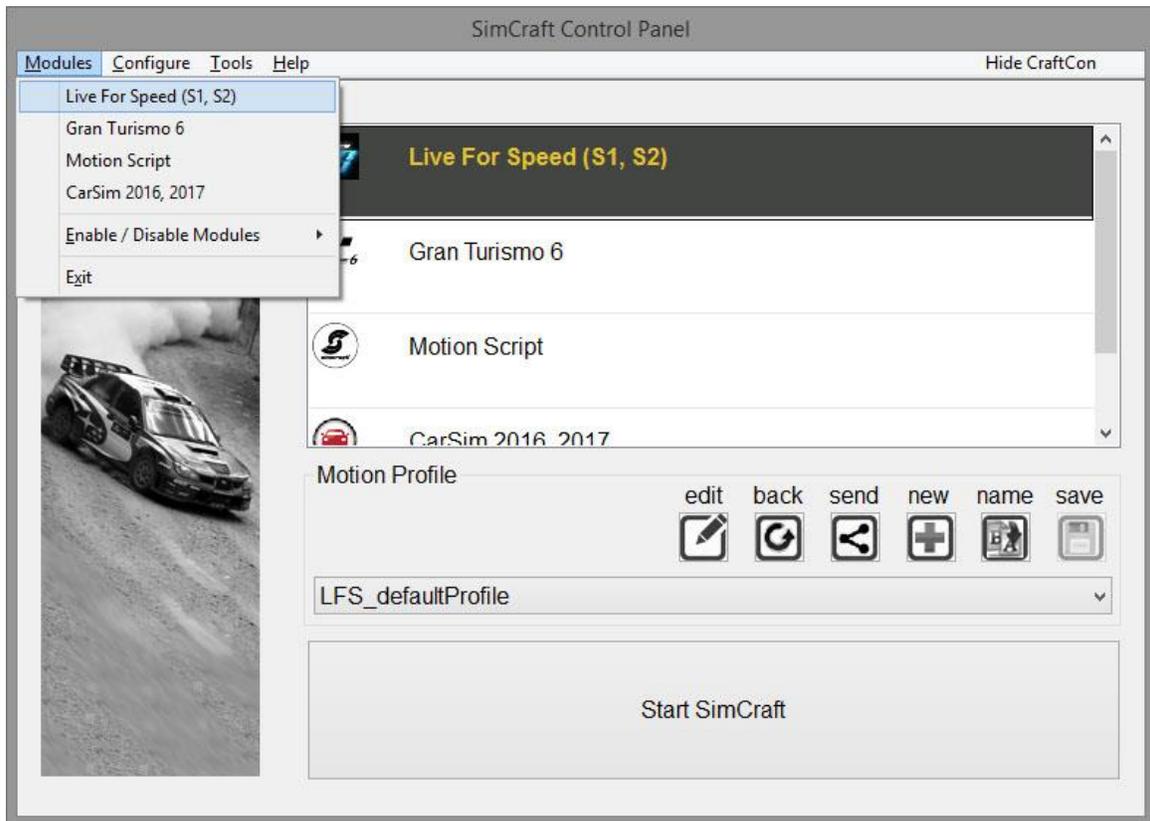
Game/Sim Versions

The versions of the game/sim supported by the applicable module are generally listed beside the title of the module in CraftCon. If you are using a version of the game/sim that is not listed, the module may fail to initiate and CraftCon should display an error. In some cases you may not see an error displayed, but you will not experience any motion in the SimCraft system.

In order to assure correct operation of the module, CraftCon, and motion simulator, you will need to get the correct module for the version of the game/sim or simulation you have. To check the list of games and download their appropriate and most current modules please visit SimCraft at www.simcraft.com.

You may also need to install a patch or upgrade to some games/sims. Some of these patches are available on the SimCraft website and others will be found on support websites for that particular game/sim. Some SimCraft module installers will

automatically install required patches. In either case, whether a patch is needed or applied automatically, you will be notified when running the module installer.



Clicking on any of the listed modules will automatically start that particular module. If a module is already started, re-selecting the same module within this menu will stop it. Selection of another module other than the active one will result in the termination of the active module and the starting of the one selected. You can alternatively click the stop button from the CraftCon main view, and then choose then new module you wish to start.

SimCraft Module Settings

Right clicking or double clicking on any of the modules will bring up a window containing the first screen of current settings for that particular module. Within this window, you can change the settings of various aspects of that module.

Motion Profile Edit

Make Globalized Launch Settings for this Interface Module (Motion Profile Independent)

Game/Simulation Title Executable Path: Auto Launch

Program to Launch Path: Launch 3rd Party Program

Editing Motion Profile: Enable Logging

LFS_defaultProfile

All AXIS Motion Amplitude

All AXIS Motion Intensity

Axis Amplitude / Intensity Axis Advanced

Use Suspension Data for Positioning

Suspension Settings

Accelerometer in Sim

Integral Gain

Proportional Gain

OK

Make Globalized Launch Settings for this Interface Module Selecting this option will apply all of the settings inside the top box “global” for all motion profiles. Use this setting if you wish to specify the launch setting once and not have to set this each time a new motion profile is created.

Game /Simulation Title Executable Path This field contains the path to the game/sim executable process that will be launched if the “Auto Launch” checkbox is ticked. The “...” button to the right of this field allows you to change the directory and executable name of where the actual game or sim software is. If you change the location of the actual game/sim on your computer, you may have to adjust this path to align it with the current location of the game/sim process to allow the system to locate the game/sim again. This path and executable name can be specified when the module is enabled.

Auto Launch - This option allows CraftCon to launch the actual game/sim process when the module is started. This ensures the proper sequence is followed during the start of a game, and allows the user to be situated and ready for sim use with a single action. This option is selected by default in most cases.

Program to Launch Path – This field contains the path to a third-party executable process that will be launched if the “Launch 3rd Party Program” checkbox is ticked. The “...” button to the right of this field allows you to change the directory and executable name of where the actual executable software is. If you change the location of the executable software on your computer, you will have to adjust this path to align it with the current location.

Launch 3rd Party Program- This option allows CraftCon to launch a third-party program process when the module is started. This option allows you to launch supporting software for you simulation, in addition to the game/sim software.

All AXIS Motion Amplitude

This slider setting adjusts the amplitude, or amount, of motion in the system and adjusts the motion amplitude of all present and enabled axes. This adjustment is a “global” setting and applies to all integration modules. This setting may be controlled in realtime during actual simulator usage by using the applicable key mappings. See the Key Mappings details later in this document for more information about how to control this value in realtime.

All AXIS Motion Intensity

This slider setting adjusts the intensity, or aggression, of motion in the system and adjusts the motion intensity of all axes specified to utilize this adjustment in selected in the CraftCon Settings dialog. Details of the CraftCon Settings dialog are contained later in this document. This adjustment is a “global” setting and applies to all integration modules. This setting may be controlled in realtime during actual simulator usage by using the applicable key mappings. See the Key

Mappings details later in this document for more information about how to control this value in realtime.

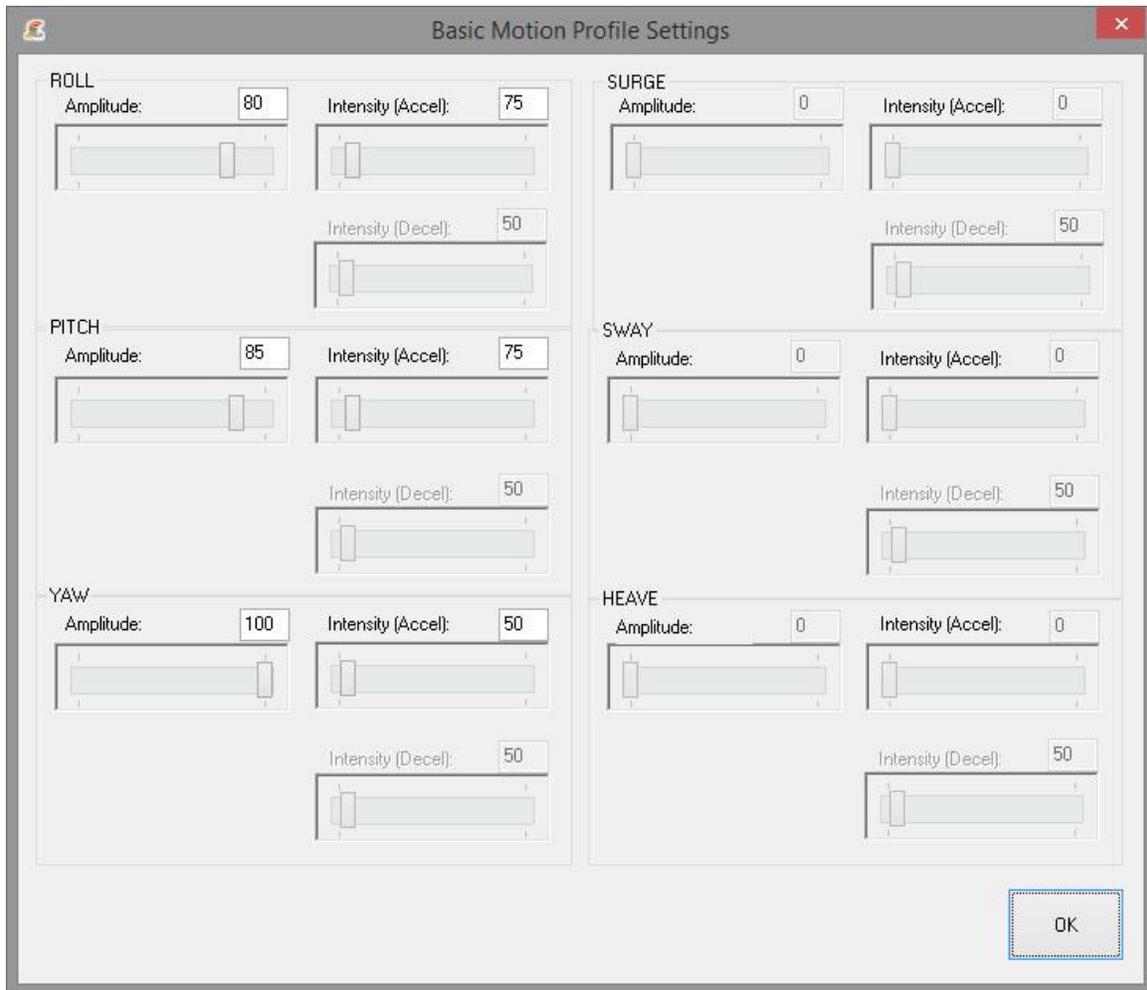
Axis Amplitude / Intensity – This button allows you to change the first tier of motion settings for the integration selected. The contents of the resulting dialog and the motion settings that can be adjusted are detailed later in this document.

Axis Advanced – This button, when selected, will display the “Advanced Motion Settings” dialog that contains the second tier of motion settings that can be adjusted. The contents of this dialog are detailed below:

Enable Logging - This option creates a log of the actions performed by the module each time it is launched. Logging is primarily useful in tracking down any errors or difficulties that may occur during gameplay. Logging will be used primarily for assisting the SimCraft Support team in resolving any problems with any part of the SimCraft system. Typically speaking you will not want to run with Logging enabled because it may cause inefficiencies in the system that will inhibit top performance.

Basic Motion Profile Settings

This button on the module settings dialog will display the below dialog. This dialog allows you to enable/disable each of the six axes as well as set the first tier of motion settings, amplitude and intensity for each individual axis.



Roll

Motion Amplitude - This setting allows you to vary the range of motion for the roll axis used by the motion system. Adjust this value to control the amount of movement of the sim within the roll axis. You can move the range of motion down or up to your desired level. CraftCon will adjust the motion received from the module accordingly, so you will experience varying degrees of roll motion, but at the percentage specified of the actual motion position determined for the motion system.

Motion Amplitude adjusts the amount of roll motion you feel that is translated from the physics of the game. The greater you set the motion amplitude value for roll, the greater the motion of the roll axis. In flight simulation applications, the amplitude should be set somewhere less than 50. The reason for this is that you will have a greater range of motion capability especially for very dynamic aircraft flying in combat style simulations.

Motion Intensity – This setting allows you to vary the aggression of motion on the roll axis. Flight Simulations will have a very low value for this setting to create a smooth “air under the wings” motion simulation. Racing simulations such as rally style racing games/sims where you want to feel every bump in the terrain will require a higher motion intensity value.

Pitch

Motion Amplitude - This setting allows you to vary the range of motion for the pitch axis used by the motion system. Adjust this value to control the movement of the sim within the pitch. You can move the range of motion down or up to your desired level. CraftCon will adjust the motion received from the module accordingly, so you will experience varying degrees of pitch motion, but at the percentage specified of the actual motion position determined for the motion system.

Motion Amplitude adjusts the amount of pitch motion you feel that is translated from the physics of the game. The greater you set the motion amplitude value for pitch, the greater the motion of the pitch axis. In flight simulation applications, the amplitude should be set somewhere less than 50. The reason for this is that you will have a greater range of motion capability especially for very dynamic aircraft flying in combat style simulations.

Motion Intensity – This setting allows you to vary the aggression of motion on the pitch axis. Flight Simulations will have a very low value for this setting to create a smooth “air under the wings” motion simulation. Racing simulations such as rally style racing games/sims where you want to feel every bump in the terrain will require a high motion intensity value.

Yaw

Motion Amplitude - This setting allows you to vary the range of motion for the yaw axis used by the motion system. Adjust this value to control the movement of the sim within the yaw axis. You can move the range of motion down or up to your desired level. CraftCon will adjust the motion received from the module accordingly, so you will experience varying degrees of yaw motion, but at the percentage specified of the actual motion position determined for the motion system.

Motion Amplitude adjusts the amount of yaw motion you feel that is translated from the physics of the game. The greater you set the motion amplitude value for yaw, the greater the motion of the yaw axis

Motion Intensity – This setting allows you to vary the aggression of motion on the yaw axis. You will want to keep this value low at all times as the yaw axis motions for racing, driving, or flight simulation are always smooth and never that intense. Intensity does not apply to the speed of the motion, just the smoothness.

Surge

Motion Amplitude - This setting allows you to vary the range of motion for surge, longitudinal, motion of the motion system. Adjust this value to control the movement of the sim within the surge axis. You can move the range of motion down or up to your desired level. CraftCon will adjust the motion received from the module accordingly, so you will experience varying amounts of surge motion, but at the percentage specified of the actual motion position determined for the motion system.

Motion Amplitude adjusts the amount of surge motion you feel that is translated from the physics of the game. The greater you set the motion amplitude value for surge, the greater the motion of the surge axis.

Motion Intensity – This setting allows you to vary the aggression of motion on the surge axis. Intensity does not apply to the speed of the motion, just the smoothness.

Sway

Motion Amplitude - This setting allows you to vary the range of motion for sway, lateral, motion of the motion system. Adjust this value to control the movement of the sim within the sway axis. You can move the

range of motion down or up to your desired level. CraftCon will adjust the motion received from the module accordingly, so you will experience varying amounts of sway motion, but at the percentage specified of the actual motion position determined for the motion system.

Motion Amplitude adjusts the amount of sway motion you feel that is translated from the physics of the game. The greater you set the motion amplitude value for sway, the greater the motion of the sway axis.

Motion Intensity – This setting allows you to vary the aggression of motion on the sway axis. Intensity does not apply to the speed of the motion, just the smoothness.

Heave

Motion Amplitude - This setting allows you to vary the range of motion for heave, up/down, motion of the motion system. Adjust this value to control the movement of the sim within the heave axis. You can move the range of motion down or up to your desired level. CraftCon will adjust the motion received from the module accordingly, so you will experience varying amounts of heave motion, but at the percentage specified of the actual motion position determined for the motion system.

Motion Amplitude adjusts the amount of heave motion you feel that is translated from the physics of the game. The greater you set the motion amplitude value for heave, the greater the motion of the heave axis.

Motion Intensity – This setting allows you to vary the aggression of motion on the heave axis. Intensity does not apply to the speed of the motion, just the smoothness.

Advanced Motion Profile Settings

Advanced Motion Profile Settings

ROLL
 Enable
Range of Motion: 100
Acceleration Multiplier: 34
Reverse Roll G:
Orientation Multiplier: 69

PITCH
 Enable
Range of Motion: 100
Acceleration Multiplier: 35
Orientation Multiplier: 71

YAW
 Enable
Range of Motion: 100
Acceleration Multiplier: 100

SURGE
 Enable
Acceleration Multiplier: 34
 Use Speed for Control

SWAY
 Enable
Acceleration Multiplier: 34

HEAVE
 Enable
Acceleration Multiplier: 34

Collision Detection: Dynamic Control:
Detection Sensitivity: 0 Reactive Amplitude: 0

Uber... OK

Reverse Roll G – This option, when selected, will reverse the direction of the acceleration forces on the roll axis.

Range of Motion – Specifies the range of use on the three rotational actuators. Typically you would run these values at 100. If you want to limit the range of motion on an axis, decrease this value. What this value does is “block out” positions on the 2 ends of stroke on the actuator.

Acceleration Multiplier – This value represents the multiplier or coefficient for the acceleration value on the applicable axis. A value of 100 is translated to a 1.00 coefficient, a value of 50 is translated to .50, and so on. The “acceleration” value is the representative value for the acceleration force on the specified axis.

This multiplier is used as a means to take a portion of that value for positioning the sim by means of applying this adjustable coefficient.

Orientation Multiplier – This value represents the multiplier or coefficient for the orientation value on the applicable axis. A value of 100 is translated to a 1.00 coefficient, a value of 50 is translated to .50, and so on. The “orientation” value is the representative value for the orientation of the vehicle on the specified axis. This multiplier is used as a means to take a portion of that value for positioning the sim by means of applying this adjustable coefficient.

Collision Detection – This option, when turned on, will allow you to specify the collision detection criteria: Sensitivity, and Amplitude. Collision Detection is designed to detect when the vehicle you are driving or piloting has come in contact with something, and provide a representative motion reaction in the sim.

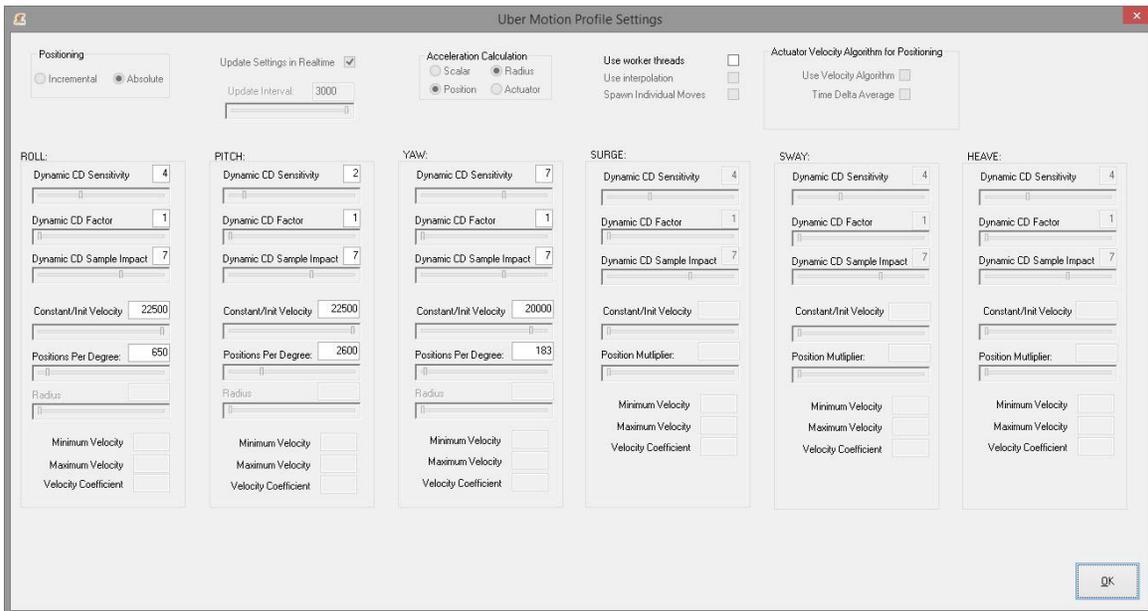
Detection Sensitivity – this value will specify the condition for detecting a collision. A lower value creates more opportunity for collision detection and a higher value will provide less. This value should be adjusted depending on the type of racing or flying that is being performed.

Reactive Amplitude – this value will specify the amount of reactive motion, and the aggression of that reaction, when a collision is detected.

Dynamic control – check this box to utilize the advanced and automatic detection and reactive algorithm which will provide more reactive amplitude for larger collision events, and less amplitude for smaller events. Selecting this value will disable the manual detection sensitivity and reactive amplitude values and controls.

Uber – Select this option to open the Uber Motion Settings dialog.

Uber Motion Settings



Use Worked Threads – when specified, a thread is spawned to control each axis. Use this option as the default for best performance.

Velocity – adjusts the velocity of the actuator. Max value here is 22500 and typically you will want to leave this value at 22500 for roll and pitch. Yaw is generally adjusted downward depending on desired feel.

Positions per Degree – This option specifies the number of positions on the actuator that comprise a degree of motion. This value is generally determined by the mounting distance between the axis of rotation and the actuator. This value can be increased for exaggerated motion or decreased for suppressed motion.

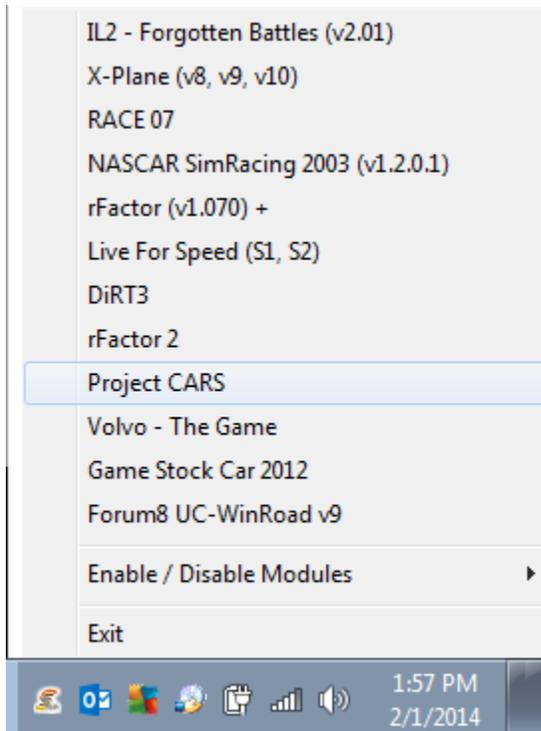
Dynamic CD Sensitivity – Adjusts the sensitivity of the dynamic collision detection algorithm on the specified axis.

Dynamic CD Factor – Adjusts the factor of the motion response within the dynamic collision detection algorithm on the specified axis.

Dynamic CD Sample Impact – Adjusts the number of subsequent samples of the physics / telemetry feed that are affected by a collision detection event for the dynamic collision detection algorithm on the specified axis.

Modules Menu

The “Modules” menu is accessible from the upper left hand corner of the main screen with a left-click, or in the system tray of your Windows operating system with a right click. The SimCraft logo will appear in the Windows system tray when the CraftCon main screen has been minimized or “hidden”.

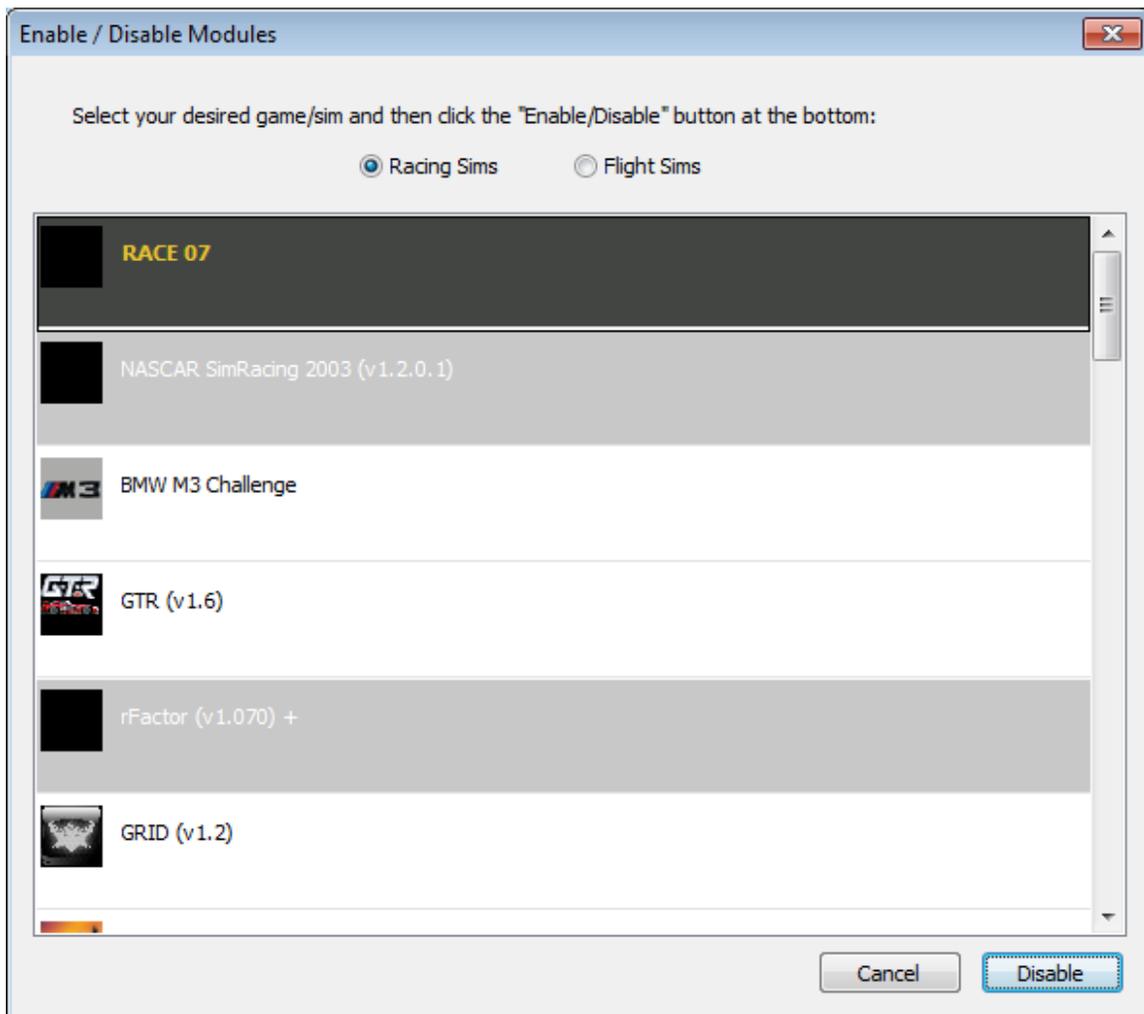


The menus in each case are identical. The first set of menu items that appear in the menu are the installed modules on your system. As these items are selected, the corresponding modules will be stopped and started as described in the section of this manual entitled “Starting and Stopping Modules”.

Select the Enable / Disable menu item to launch the module enable / disable dialog where you can activate or deactivate the module installed within your CraftCon environment.

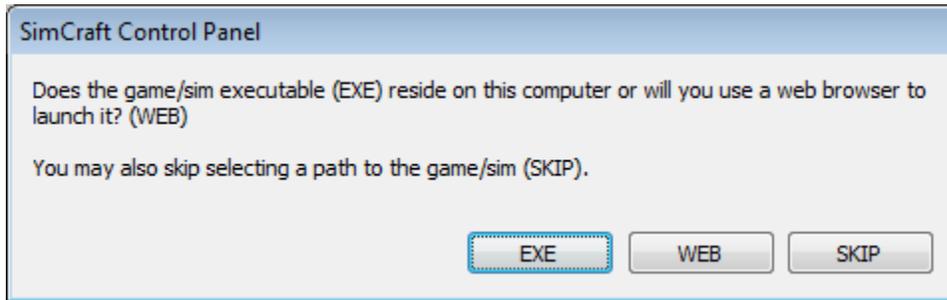
You may also EXIT CraftCon from this menu by selecting the “Exit” menu item.

Enable / Disable Modules



From this screen you may select modules to enable, or modules to disable. The currently enabled modules will appear “Greyed out” with a black logo. When you select an enabled module in the list, the enable / disable button will show as “Disable”. When you select a module that is currently not enabled, the button will read “Enable”.

When you Enable a module, you will be prompted to enter the path to the game/sim:



Select the EXE button and you will be promoted to navigate to the location of the executable for the applicable game/sim that you are enabling. You will need to navigate to the path and select the exe to launch automatically when you Start the module for an interactive simulation.

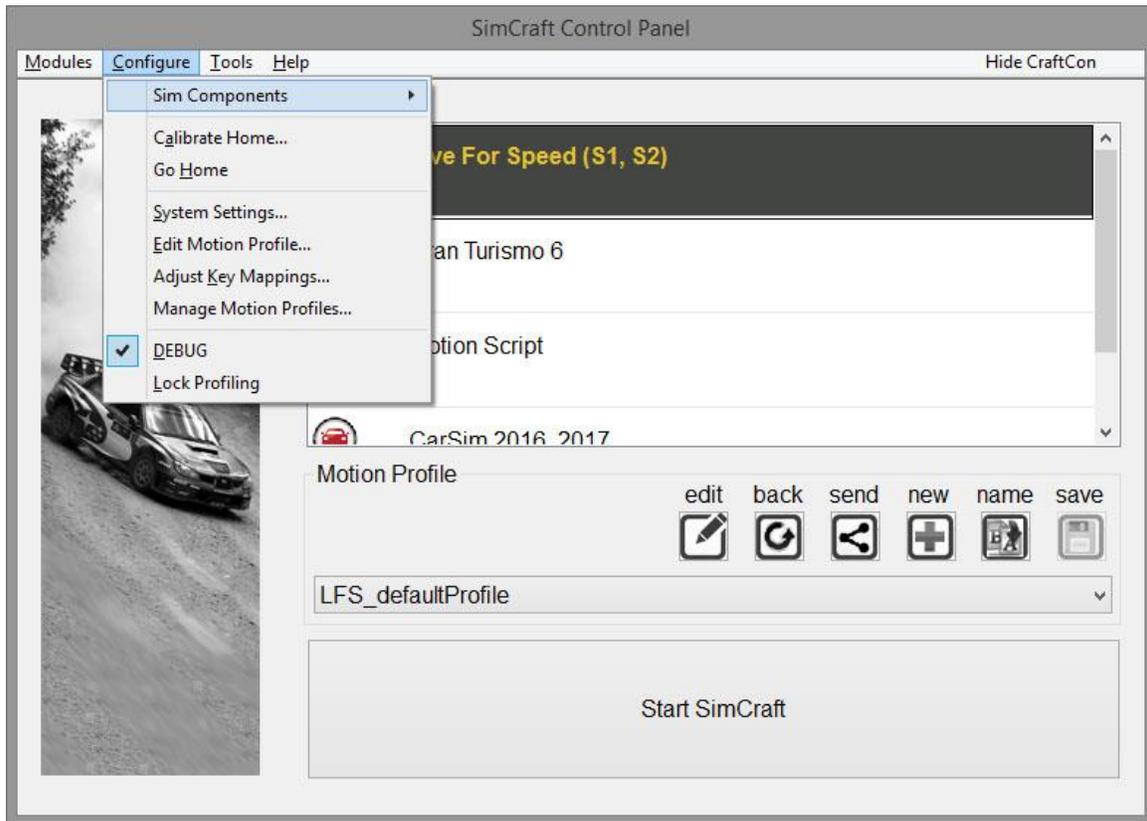
Select the WEB button and you will be promoted to enter a URL to launch for the applicable game/sim that you are enabling. A web browser with this URL will launch automatically when you Start the module for an interactive simulation.

Select SKIP to proceed to the next step without entering a auto-launch game option. ***Selecting SKIP, however, may prevent CraftCon from completely activating the game / sim for motion.

After this step, CraftCon will shutdown and auto relaunch. Immediately after the relaunch, CraftCon will begin downloading any updated or required files for the newly activated module. If the module was previously enabled, there may be no files to download.

Configure Menu

This menu contains items that allow you to change both the CraftCon and the module settings. It also contains calibration and error correction methods of the motion system, and allows you to view the process logging output window which contains messages from CraftCon, Craftware, and the motion system and is used in troubleshooting.



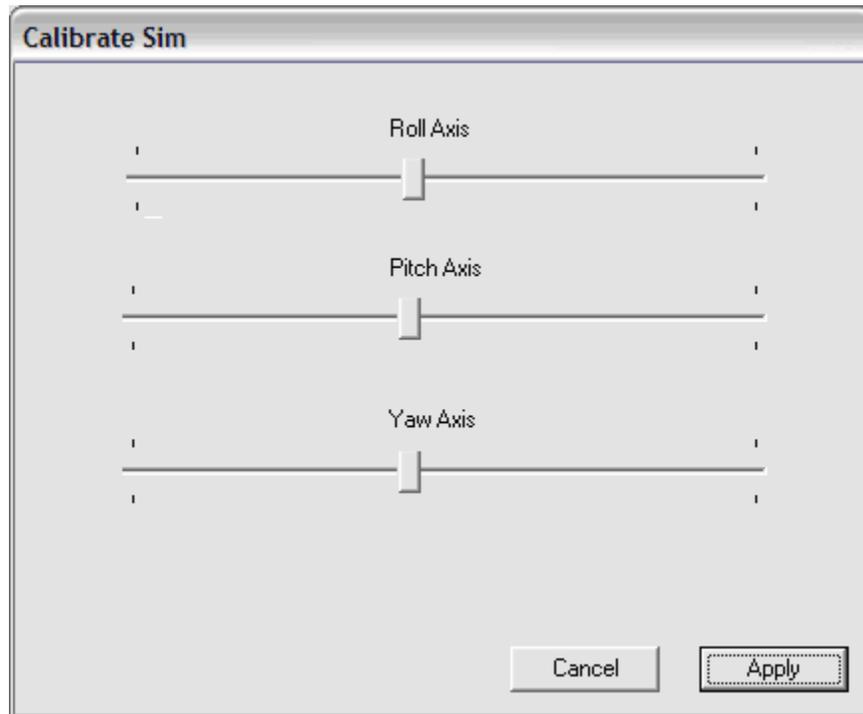
Simulator Components – This menu is a handy way of accessing your audio, video, and controls settings for your Windows environment.

Calibrate Motion - This option will allow you to set the motion system back to “home” or perfectly level. This option should be used to calibrate the sim to an evened “park” position.

In order to successfully calibrate the sim, you will need to stop any running the module. Upon successful stopping of the module, click on “Calibrate the Sim” menu item. The motion system will initially start in a position previously calibrated to what it believes is level.

If you do not return to a level state after calibration or receive an error when attempting to calibrate the system, re-launch CraftCon, and try to calibrate the system again. If you still do not return to a level state, you can try the “Sim Error Correction” menu item under the “Help” menu which is detailed later in this document.

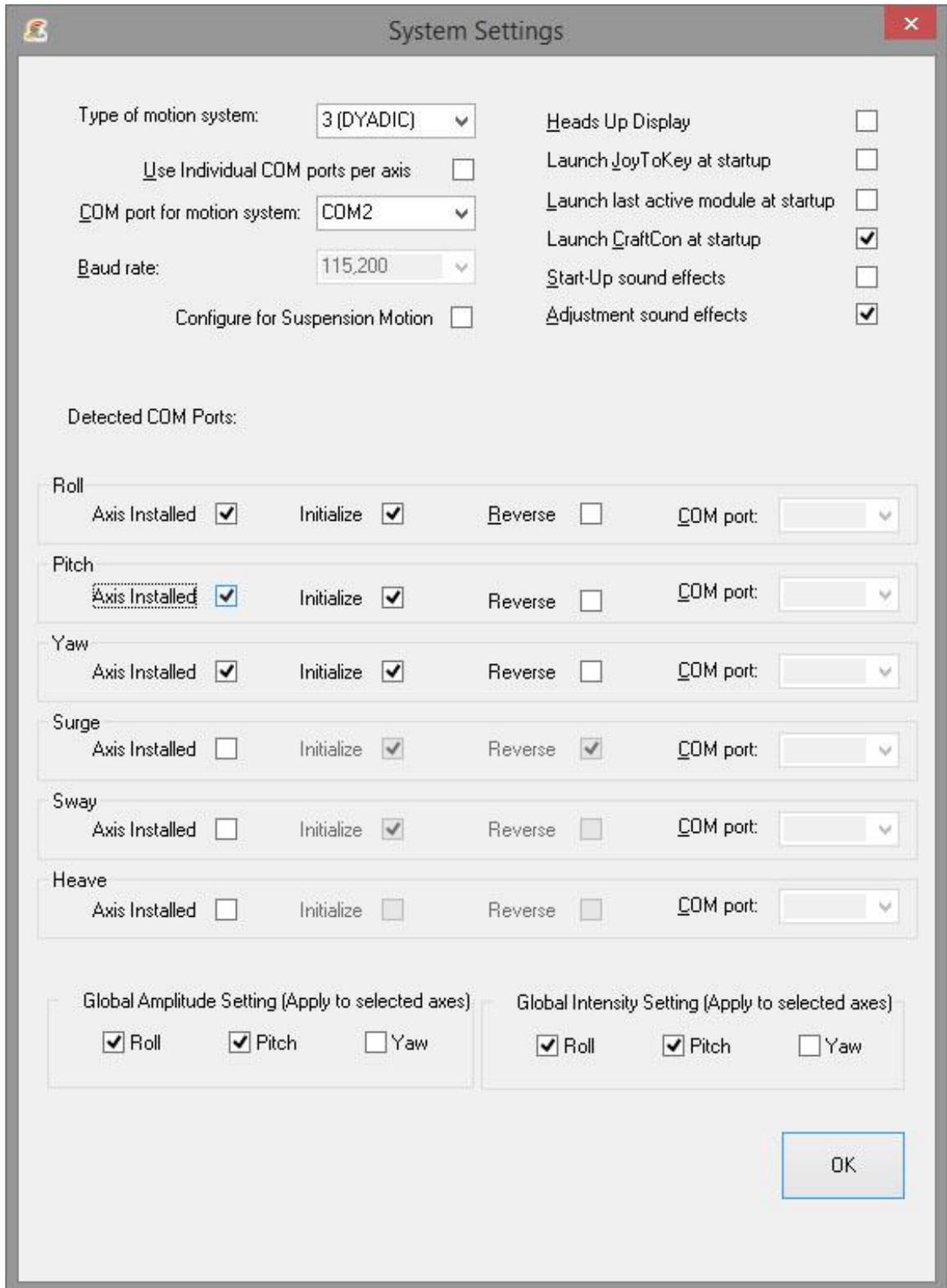
If Error Correction does not return the motion system to its home position, carefully exit the simulator, and contact SimCraft Support.



When the Calibrate Sim dialog launches, the axis controls will be obscured by a field containing a set of instructions. To reveal the controls, simply click on the instructions. Once the controls are revealed, you can adjust a level / home position for each of the installed and enabled axes in your system. Once you click "Apply", the position will be saved and retained as the home / parked position going forward.

Go Home – Selecting this option will return the actuators to the "home", "park" position (or mid-stroked position) that you specify when you "calibrate motion".

System Settings - These settings are settings for setting up the motion control system, and SimCraft Control Panel.



Com Port for motion system - This setting allows you to set the Serial Communication Port on which the motion system will communicate. Although your SimCraft motion system is “Plug ‘n Play” and is USB compatible, it may require proper specification of

the COM port used in the communication between the PC and the motion system. In almost all cases, you can leave this setting blank as this value will be determined dynamically and automatically by the SimCraft control software. In certain cases however, you may be instructed by a SimCraft Support representative to set this port to a specific port ID, particularly on systems where a setting above COM10 is required.

Type of Motion System – Specifies the type of motion technology that is being used within the CraftCon environment.

Launch last active module at startup - This option allows CraftCon to immediately load itself and activate the last running module, (and the game/sim title if selected to launch in tandem) as soon as your system boots. The option is NOT checked by default.

Launch CraftCon at StartUp – Select this option to have CraftCon start up when the PC boots.

Start-up Sound Effects – Check this option if you want to hear sound effects from CraftCon when starting modules. when adjusting settings in realtime.

Adjustment Sound Effects - Check this option if you want to hear sound effects from CraftCon when adjusting settings in realtime.

Heads Up Display – [deprecated, does not work in Windows OS 10] if this option is selected, then a Heads Up Display tool called Overlay Tools will launch when CraftCon is launched. A separate process called OverlayTools.exe will receive messages from CraftCon which will be displayed in a HUD (Heads Up Display) window when adjusting settings in realtime. This HUD window may only be displayed when the game/sim title that you are using is running in WINDOWED mode, but this varies from system to system. If this option is enabled you will see a separate HUD window toward the top of the screen when launching CraftCon and anytime a new realtime setting is adjusted. You may be prompted to stop a Windows Service called “Desktop Window Manager Session Manager”. If this service is running, the HUD feature will not work.

Launch JoyToKey at StartUp – Select this option to have the JoyToKey application automatically start.

Reverse Roll – select this option if your roll actuator is mounted on sim right (when sitting in the sim, to the right side). This will reverse the sim motion direction to allow for mounting of the actuator on either side.

Reverse Pitch – select this option if your pitch roll actuator is mounted on the nose of the cockpit (when sitting in the sim, to the front). This will reverse the sim motion direction to allow for mounting of the actuator either the fore or aft of the cockpit.

Reverse Yaw – select this option if your yaw actuator is mounted on sim in the opposite direction of default travel. This will reverse the sim motion direction for yaw to allow for mounting of the actuator on either side and facing either direction.

Reverse Surge – select this option if your yaw actuator is mounted on sim in the opposite direction of default travel. This will reverse the sim motion direction for yaw to allow for mounting of the actuator on either side and facing either direction.

Reverse Sway – select this option if your yaw actuator is mounted on sim in the opposite direction of default travel. This will reverse the sim motion direction for yaw to allow for mounting of the actuator on either side and facing either direction.

Reverse Heave – select this option if your yaw actuator is mounted on sim in the opposite direction of default travel. This will reverse the sim motion direction for yaw to allow for mounting of the actuator on either side and facing either direction.

Roll (Pitch, Yaw, Surge, Sway, Heave) Axis Installed – uncheck these boxes to disable an axis across the motion system. This setting is slightly different from the enable option in the SimCraft Module Motion Settings dialog in that this disables the axis for ALL modules.

Initialize Roll (Pitch, Yaw, Surge, Sway, Heave) – in almost all cases you should leave these boxes checked. Only for troubleshooting

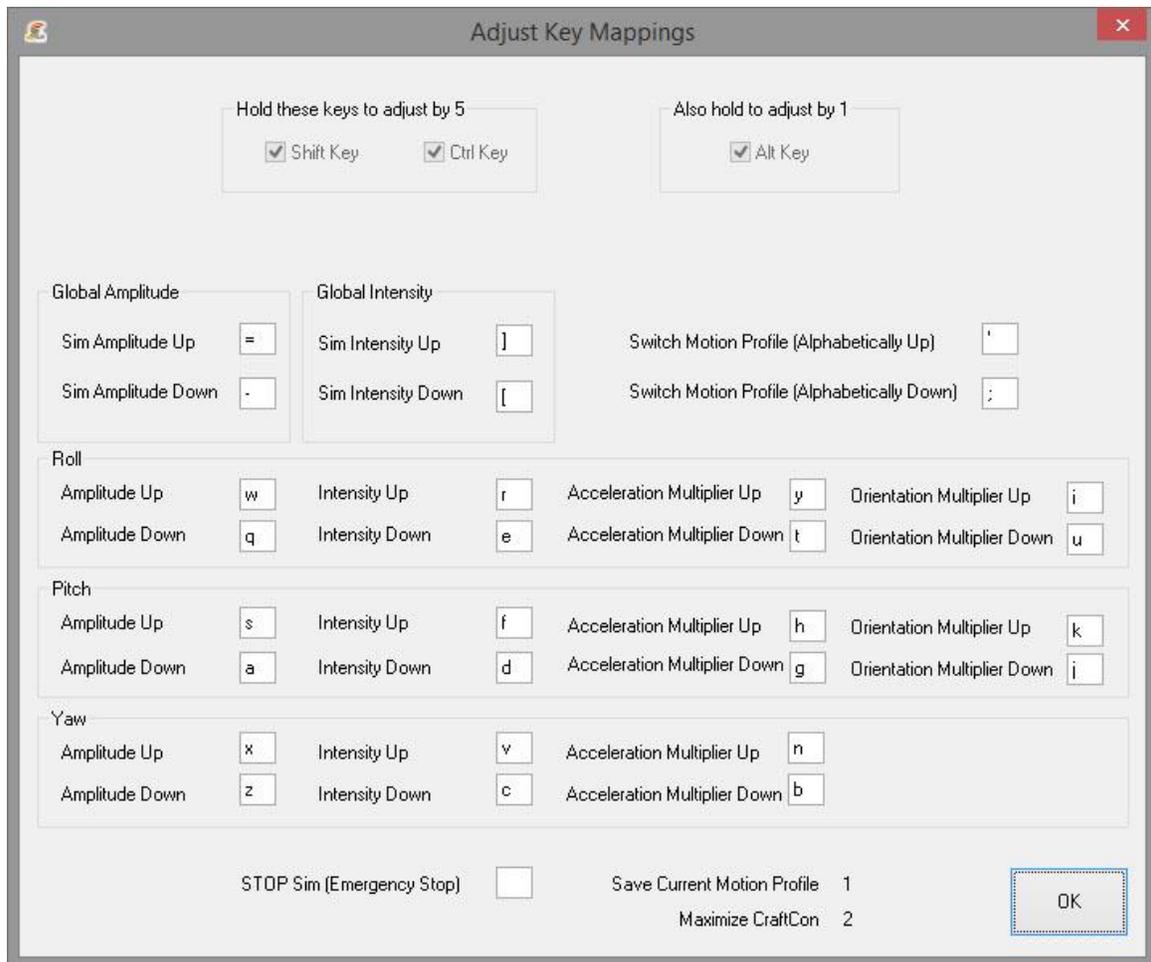
and it instructed by a SimCraft rep will you need to uncheck these boxes.

Overall Amplitude Control (Apply to the selected axes) – The overall amplitude control adjustment will be applied to the selected axes. If an axis is unchecked, the overall amplitude is not applied to the axis, resulting in a higher amplitude for this axis.

Overall Intensity Control (Apply to the selected axes) – The overall intensity control adjustment will be applied to the selected axes. Typically you do not want to include changes to this control to the yaw axis as yaw intensity is almost always turned down.

Module Settings – This menu item is another way to access the SimCraft Module Settings dialog. See above heading ‘SimCraft Module Settings’ for more details about the contents of the resulting dialog.

Adjust Key Mappings



The Adjust Key Mappings dialog allows you to map keys to realtime control adjustments. During simulator usage, you may adjust various settings without stopping and restarting the sim, allowing you to dial in settings in REALTIME. These key mappings all require you to select the Shift + Ctrl keys and then the mapped key for adjustments in increments of 5. For example, in the above default settings, if you are running a racing sim and want to turn up some more yaw amplitude because you are in an off road rally race – hold the Shift + Ctrl keys, then hit the ‘x’ key. This will move “Yaw Amplitude” up by 5%. Each time you hit ‘x’ will adjust the amplitude up another 5%. You can also adjust values in increments of 1% (“Micro Adjustments”) by holding the Shift + Ctrl + Alt keys simultaneously and then pressing the desired adjustment key.

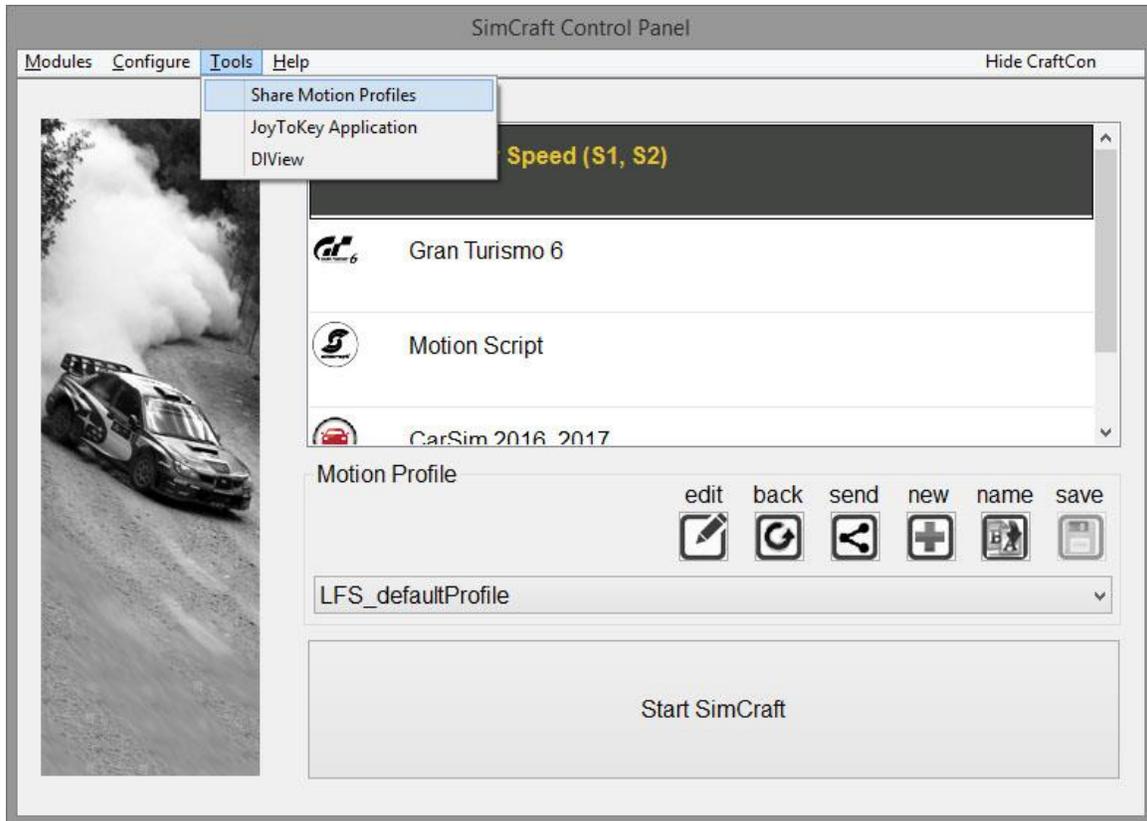
Make sure that if you change these key mappings that you do not select the same key for two or more adjustments as this may result in an unknown response.

Manage Motion Profiles – Selecting this menu item will launch your motionProfiles folder in a Windows Explorer window.

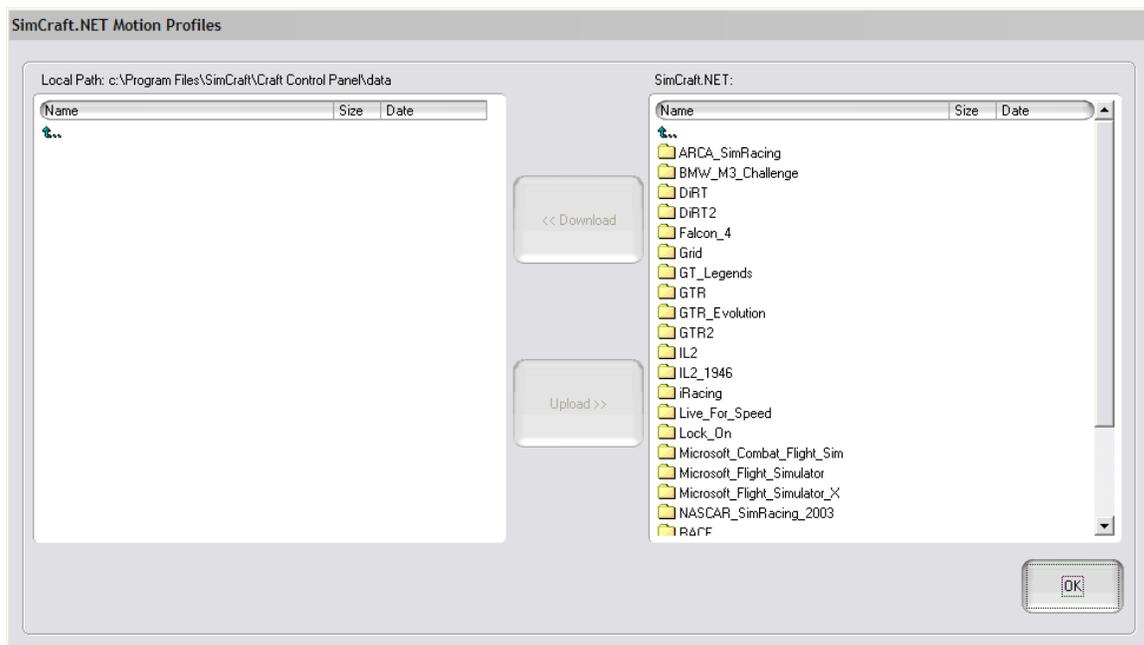
DEBUG (Show Module Process) – This option when selected will “show” the integration module process window when it is launched. Generally speaking this menu item is enabled only when troubleshooting an issue with this system as the resultant window that is displayed contains status messages that are not present when this option is disabled.

Lock Profiling – an option to lock profiling. This option will prevent modification of motion profiles and is used for commercial installations.

Tools Menu



Share Motion Profiles



The SimCraft.NET client allows for the sharing of motion profiles and the usage of profiles shared by others in the SimCraft community. On the left side of the dialog is a list that displays the contents of your date folder inside your SimCraft installation. You may navigate around your sim PC to upload XML files to SimCraft.NET. Once you select an XML file, the “Upload” button will become enabled.

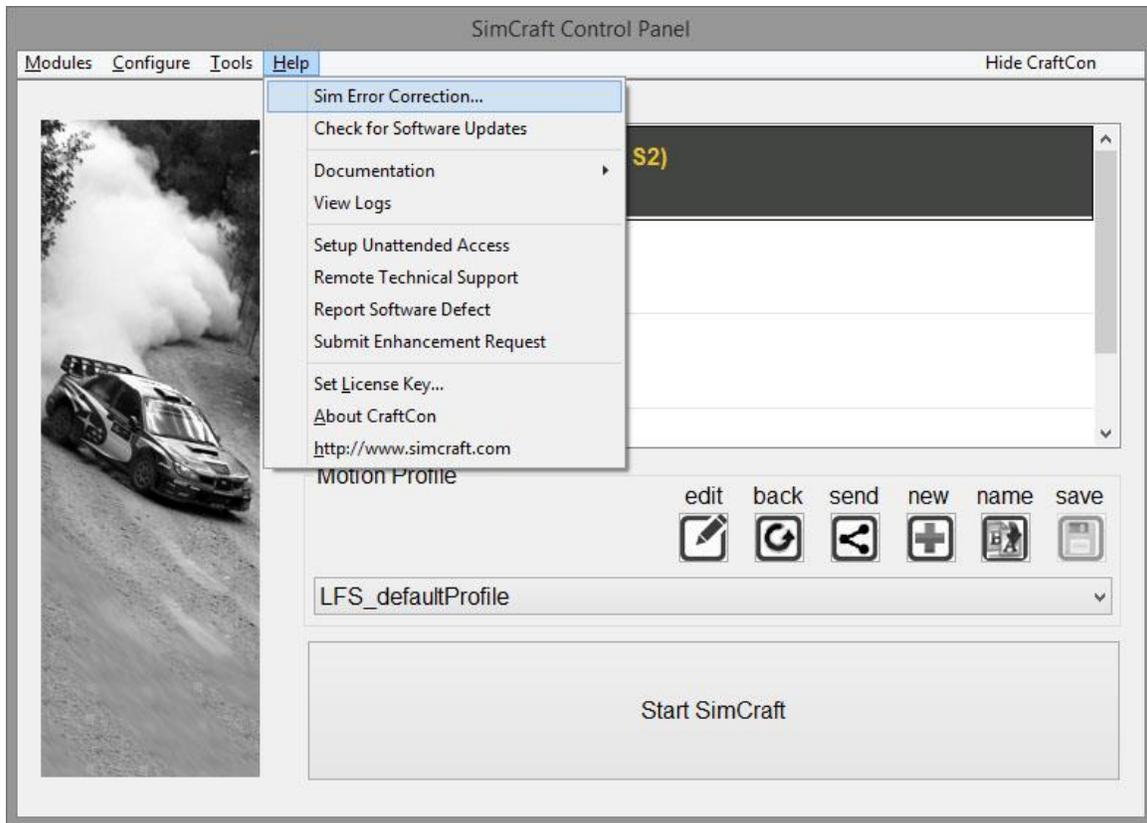
On the right side of the dialog is a listing of folder and motion profile xml files contained on SimCraft.NET. To download a profile to the directory shown on the left side of the dialog, simply click on the desired profile and hit “Download”. Downloaded profiles must be imported / loaded as the active profile before the settings from the new downloaded profile are “live”.

Please note: The current directory on the left, LOCAL, side is displayed at the top left of the dialog. The starting path is always your “data” directory inside your SimCraft CraftCon installation directory. Only directories and XML files are displayed in both the local and remote file listings

Joy to Key Application – This is a 3rd party application that is distributed with CraftCon. It is useful for mapping buttons and switches to keyboard commands and can be a useful application when used with the realtime adjustment capability of CraftCon.

DIView – The DIView application is a useful utility for setting up sim controls. Further documentation and usage can be found online.

Help Menu



Sim Error Correction - This option will reset the motion control system in the event of error or unexpected power outage. The difference between this method and the calibrate method is that error correction will attempt to fix any internal problems with the motion control system and the calibration function assumes that everything is functioning normally.

The Error Correction method will turn off and reset all actuators in the system. If no errors occur, the actuators will then be turned back on. If the system does not return to home after the system is corrected, try to run a calibrate method immediately following this method.

During the launch process of CraftCon, the motion system will be detected and an attempt will be made to detect the state of the system. If the system is in a good and ready state then you will not see this screen upon the launching of CraftCon. Should an error be detected during this process, the Sim Error Correction dialog will launch automatically.



The Sim Error Correction dialog will attempt to detect the status of each axis and provide a green or a red indicator showing the state of the axis. Green represents that the axis is on and error free, Red means that there is an error on the axis. To reset the axis that is in an error state, click on the applicable Reset button. The system will attempt to reset that axis. If the attempt is successful, a green indicator will replace the red one.

Check for Software Updates – This option, when selected, will connect to the SimCraft software server and check for any updates for CraftCon, all relevant files, and enabled modules.

Documentation - This section of contains various links and documentation provided with your CraftCon installation including:

1. **Safety Guidelines** – a must read document that details warnings and dangers of motion simulation.
2. **CraftCon Usage Manual - This manual.**
3. **Legal Disclosures** – copyright, patent and other legal information as it pertains to SimCraft and the intellectual property of other companies.
4. **Software License Info** – the software license that was acknowledged during the installation of CraftCon and the terms of usage for CraftCon.

View Logs – this option will launch the logs folder in a Windows Explorer window.

Setup Unattended Access – this function will install a SimCraft Support utilized utility called FixMe.IT (Techinline) to allow for seamless and easy remote desktop support.

Remote Technical Support – will launch an application that assists with remote access to your PC when needed for troubleshooting.

Report Software Defect – an easy link to send an e-mail to SimCraft to report a software defect.

Submit Enhancement Request – an easy link to send an e-mail to SimCraft to suggest a product enhancement.

<http://www.simcraft.com> - Link to the SimCraft knowledge base and support section. It also includes an electronic copy of the CraftCon User Manual and all other documentation provided with this manual.

Set License Key - This menu item launches the window where you can register the CraftCon software. For more information on Activating CraftCon and the Set License Key dialog, please see the Activation section above.

About - The about screen shows simulator information such as the class, the serial number and the date of manufacturer. It also shows the installed version of CraftCon, who the software license is issued to, and the COM port used in communications.



Hide CraftCon Menu

This menu item will minimize the CraftCon window to the system tray. The main CraftCon window can be restored by single left clicking on the CraftCon logo displayed in the system tray when the window is minimized.

Appendix A – Glossary of Terms

Simulate or Simulation – to imitate the character or appearance of. Simulation mimics or emulates a “real world” experience and is accomplished with hardware, software, or both in combination. Simulation is an attempted replication of something in a controllable environment.

Simulator or Sim – A simulator is a combination of software and hardware to replicate an experience. A sim is typically used to simulate flight or racing and is most effective when the sim includes full motion. Simulators and their key components can be linked to the human senses and measured against them for effectiveness and realism.

Motion Sim or Motion Simulator- A motion sim can also be called a motion chassis, a motion base, a motion platform, or a motion simulator among other things. The primary function of a motion sim is to provide realistic physical movement for one or more occupants. The movement is synchronous with visual display and is designed to add a tactile, or sense of touch, element to video gaming, simulation, and virtual reality. When motion is applied and synchronized to audio and video signals, the result is a combination of sight, sound, and touch.

Motion Simulation – The simulated motion created by the motion sim intended to replicate the dynamics of an actual craft or vehicle. The motion, derived from realtime physics and telemetry, represents the direction, speed, and forces felt on the craft during operation.

Degree of Freedom – A rotational or translational displacement in three dimensional space. Rotational motion, (roll, pitch, yaw), rotates around an axis in a circular motion, while linear motion, (heave, surge, sway), travels along an axis linearly along a plane. The six degrees of freedom are roll, pitch, yaw, heave, surge, and sway. Motion sims are often characterized by the number of Degrees of Freedom they provide and the range of motion on each axis.

Range of Motion – The amplitude, or amount, of possible movement on a motion axis

Actuator – A device that provides movement either rotationally, or linearly. Linear actuators are used on SimCraft Motion Sims.

Physics or Telemetry – data, either collected or calculated, which characterizes behavior. In motorsports simulation, the physics of a real racecar, (i.e. acceleration, velocity, orientation) are emulated virtually to create a realistic dynamic in the simulation.

SimRacing or Racing Simulation – The virtual recreation of motorsports. The software physics, control, handling, visuals, track mapping, and other factors are all key components of SimRacing. The hardware motion, feel, handling, performance, precision, control, response, detail, and other factors are also components of SimRacing.

FlightSim or Flight Simulation - The virtual recreation of aircraft. The software physics, visuals, flight control, handling, environment, training procedures, and other factors are all key components of FlightSim. The hardware motion, feel, handling, performance, precision, control, response, detail, and other factors are also components of FlightSim.

Craft or Vehicle – that which can be driven, steered, or piloted which also provides a mode of transport.

Cockpit - A compartment, either open or closed, that houses the driver/pilot and all of the accessories of a sim (screen, joystick, pedals).

Craftware - SimCraft proprietary software that translates physics from your sim/game title and drives the SimCraft simulator's motion.

Integration (Gaming/Sim) Module – SimCraft software which corresponds to a racing or flight title. A module exists for each title compatible with SimCraft sims.

SimCraft Control Panel (CraftCon) – A modular SimCraft application that allow the user to manage the various Integration Modules that interact with a SimCraft Motion Sim. From the CraftCon you can manage Module settings, Motion Settings, and other features.

SimCraft DIY - The first simulator project developed by the founder of SimCraft, William Dexter MacDonald. DIY was released as an open source project in 2006 and is hosted on SourceForge.net, which consists of a manual of instructions on how to build a 2 DOF motion sim from scratch.

Appendix B – Creating a motion profile primer

SimCraft Motion Tuning

Brief Summary of Terms

Amplitude: The amount (volume) of motion, generally speaking.

Intensity: The aggressiveness (gain) of motion.

Acceleration Multiplier: Vehicle motions in the simulation.

Orientation Multiplier: Environmental derived motions in the simulation.

Deeper Explanations

Amplitude: In a motion based vehicle simulation there are 2 factors that influence the motion of the SimCraft. The vehicles motions through the 3d simulated world, and motions from the world itself. The amount of motion experienced is referred to as the amplitude. Both the accelerations and the orientations will be incorporated into the motion amplitude. The amplitude does not distinguish between accelerations or orientations, it is simply the overall *amount* of motion.

Intensity: Sometimes intensity is referred to as "gain". It is the aggressiveness of the motion. The lower the intensity, the smoother and docile the motion. The higher the intensity, the quicker, jerkier the motion is. SimCraft motion technology does adjust the intensity in real time if collision detection is turned on. Intensity should be tuned for normal/nominal driving or flying.

Acceleration multiplier: inputs to the simulation such as gas/brake and steering wheel influence the vehicle's motion in the simulation. It is the acceleration multiplier that tunes how much of the vehicles motions within the 3D simulation influence the motion of the SimCraft. Increasing or decreasing this multiplier will only affect the motions that come from inputs to the vehicle. Too much pitch on braking? Reduce pitch acceleration. Not enough body roll on the steering wheel input? Increase roll acceleration.

Orientation multiplier: This second counterpart to the motion of the SimCraft comes from the environmental conditions in the simulation. Hills, curbs, banking, potholes, etc. affect cars and these elements come through the orientation of the vehicle. Increasing or decreasing this multiplier will only affect how much the environment affects the motion. Too much pitch on hills? Reduce pitch orientation. Not enough roll on banking? Increase roll orientation.

Approaching setting up a motion profile

There are overall amplitude and intensity adjustments on the first screen of editing a motion profile. Set both of these to 75% (unless using larger actuators, then set intensity to 100) and leave alone.

Go into the axis specified amplitude and intensity adjustment screen. These values should be set to 25 for all available axes.

Next go to the advanced screen and set orientation multipliers to 70 and acceleration multipliers to 35.

Drive.

Work on one axis at a time. Roll first.

When driving pay attention first to the roll of the car when using the steering wheel. The car should roll in the opposite direction you are turning the wheel. If it is rolling in the same direction, go to advanced settings and check/uncheck the reverse Roll G checkbox.

If the motion feels "jerky" on wheel input, reduce the roll intensity. If it feels sluggish, increase.

If the roll of the car is too much, reduce the acceleration multiplier, if too little, increase.

Once this feel right, drive on some banking, hills, and curbs. You should feel roll in the direction of the orientation of the banking/hill/curb you are on. If you do not feel enough, increase the orientation multiplier. If you feel too much decrease.

If you get to this point and you have maxed out to 100% on either the orientation or the acceleration multipliers, go to the roll amplitude setting and increase to 50. Then, go back to the acceleration and orientation multipliers and set them to HALF of their current value. This effectively is the same motion setup as when the amplitude was at 25. Increase the multipliers as needed, and repeat this step as necessary.

Next, pitch.

When driving pay attention first to the pitch of the car when using the gas and the brake. The car should pitch down the braking and pitch up slightly when accelerating. Remember, you can decelerate much faster than you can accelerate. You will feel much more pitch on braking than you will on accelerating.

If the motion is too sluggish on braking, increase the pitch intensity, if too "jerky", decrease.

If the sim pitches too much on braking, reduce the acceleration multiplier, if too little, increase.

Getting the intensity and acceleration multiplier just right on braking is half the effort in dialing in pitch.

Once this feel right, drive on some hills, and curbs. Go both uphill and downhill. You should feel pitch in the direction of the orientation of the banking/hill/curb you are on. If you do not feel enough, increase the orientation multiplier. If you feel too much decrease.

If you get to this point and you have maxed out to 100% on either the orientation or the acceleration multipliers, go to the pitch amplitude setting and increase to 50. Then, go back to the acceleration and orientation multipliers and set them to HALF of their current value. This effectively is the same motion setup as when the amplitude was at 25. Increase the multipliers as needed, and repeat this step as necessary.

YAW (If you have it)

There is no orientation adjustment for yaw. You are simply trying to dial in the sensation of over steer and you have 2 adjustments, intensity and acceleration multiplier.