

FLIGHT SIMULATOR PLATFORM SOLUTIONS FSPS ©

SIM PHYSICS X
for FSX or Prepar3D

USER MANUAL
VER. 1.3



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1. Introduction

Flight Simulator Platform Solutions – FSPS © is a software development company producing applications mainly for Microsoft's © “Flight Simulator” family of products.

Up to today our main focus was either on applications that boosted your Flight Simulator performance – like Xtreme FSX , FSX Booster etc. – or on applications that directly added functionality to Flight Simulator - like FS Manager, Ultimate Airline Crew, Ultimate Checklist etc.

This experience helped us in fully understanding FS's mechanics in all aspects, so after having considered what was missing , we decided to utilise that knowledge in a software program that would add functionality to the final-user's Flight Simulator. Functionality not only new, but combined with previously released FSPS technology , so you would run one instead of 3 or 4 separate applications.

We managed to add the effect of Icing accumulation on the Aircraft during flight and its effects on controls with the additional drag it causes on the aircraft . We manipulated the aircraft performance during take-off and landing depending on the weather, we modified the braking action depending on the condition of the runway, we added visual and sound effects when the dynamics change in flight, we added runway bumping effect when the aircraft passes over the centre line runway lights, even added a working anti-skid braking system for your stock aircraft. And more...

We tried and, we believe , succeeded in delivering a Flight Simulator add on that will change the way you fly and it may be your new “must-have FS application” like your standard weather engine is now.

SIM PHYSICS X is here...

2. Minimum Requirements

In order to be able to enjoy the benefits of Sim Physics X/P3D in your system you need a computer that conforms to the following minimum requirements:

Minimum Requirements:

Windows: XP SP3 / Vista / Win 7 – 32 or 64 bit

2 Core Processor with 2GHz per core speed.

1GB RAM

Flight Simulator X – Service pack 2 or Acceleration pack OR Prepar3D v 1.4

Microsoft's NET Framework 3.5 and above

Latest Version of FSUIPC by Peter Dowson. (Registered or unregistered)

A joystick or yoke etc. suitable for control inputs

Up and running internet connection for activation and license checking of the product.

PDF viewer application for reading the manual.

This software uses the FSUIPCClient.dll by Paul Henty to communicate with FSUIPC & FS .

Limitations:

One installation on only one PC at any given time. (Checked via online validation after every installation.)

Sim Physics X is WideFS compatible. (Ver 1.1)

Sim Physics X is compatible with 3rd party 3D cockpit head movement family software with some limitations. (Version 1.0.0.2 and later)

3. Installation

From now on when referring to “FSX” you can assume that it the word “Prepar3D” can be used when you are using Lockheed's simulator.

After your purchase from the web store of your choice you will be given a link to download the software and a serial number. Keep this combination of letters and numbers (your serial number) somewhere safe as it is your software's unique identification. Never lend it to anybody, keep it safe, and provide it in every communication with FSPS's support concerning Sim Physics X.

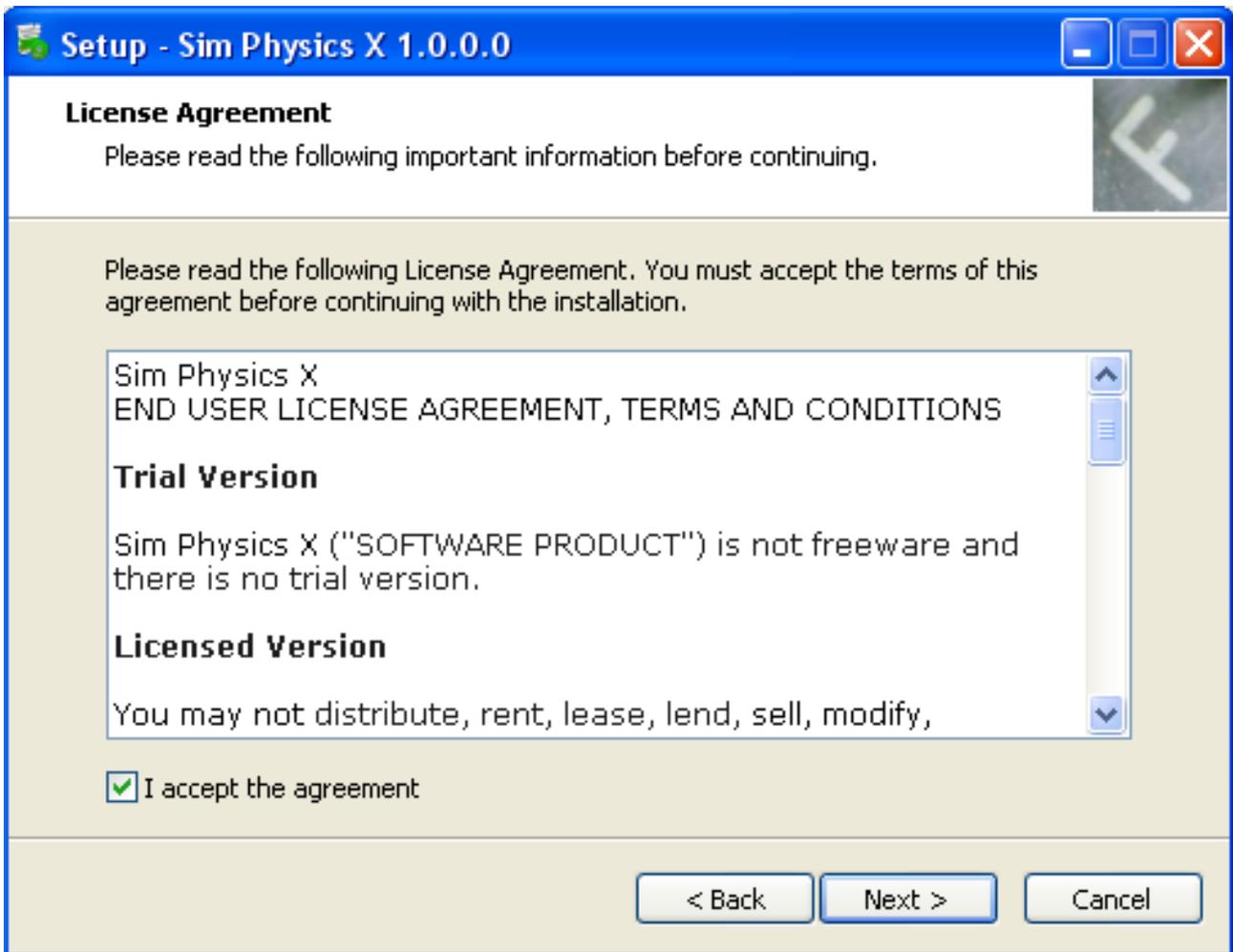
The executable file is named `SPX_Setup.exe` and to start installation you will have to double click on it after downloading is complete.

Do so and you will see the following screen:



Please close other applications and click next to continue the setup.

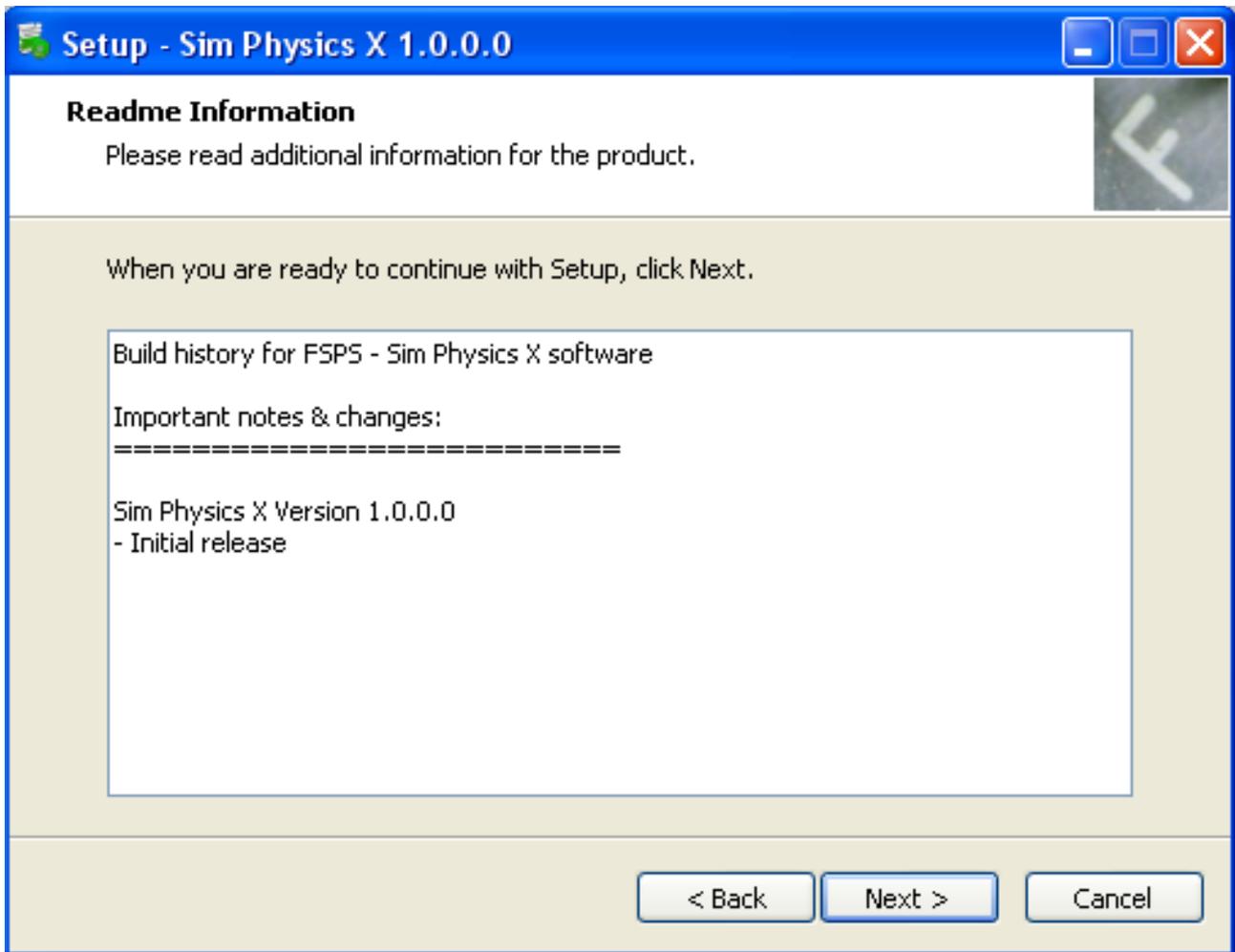
On the next screen you will be presented with the Licence agreement.



Please read it, click on “I accept the agreement” and then press Next > to continue.

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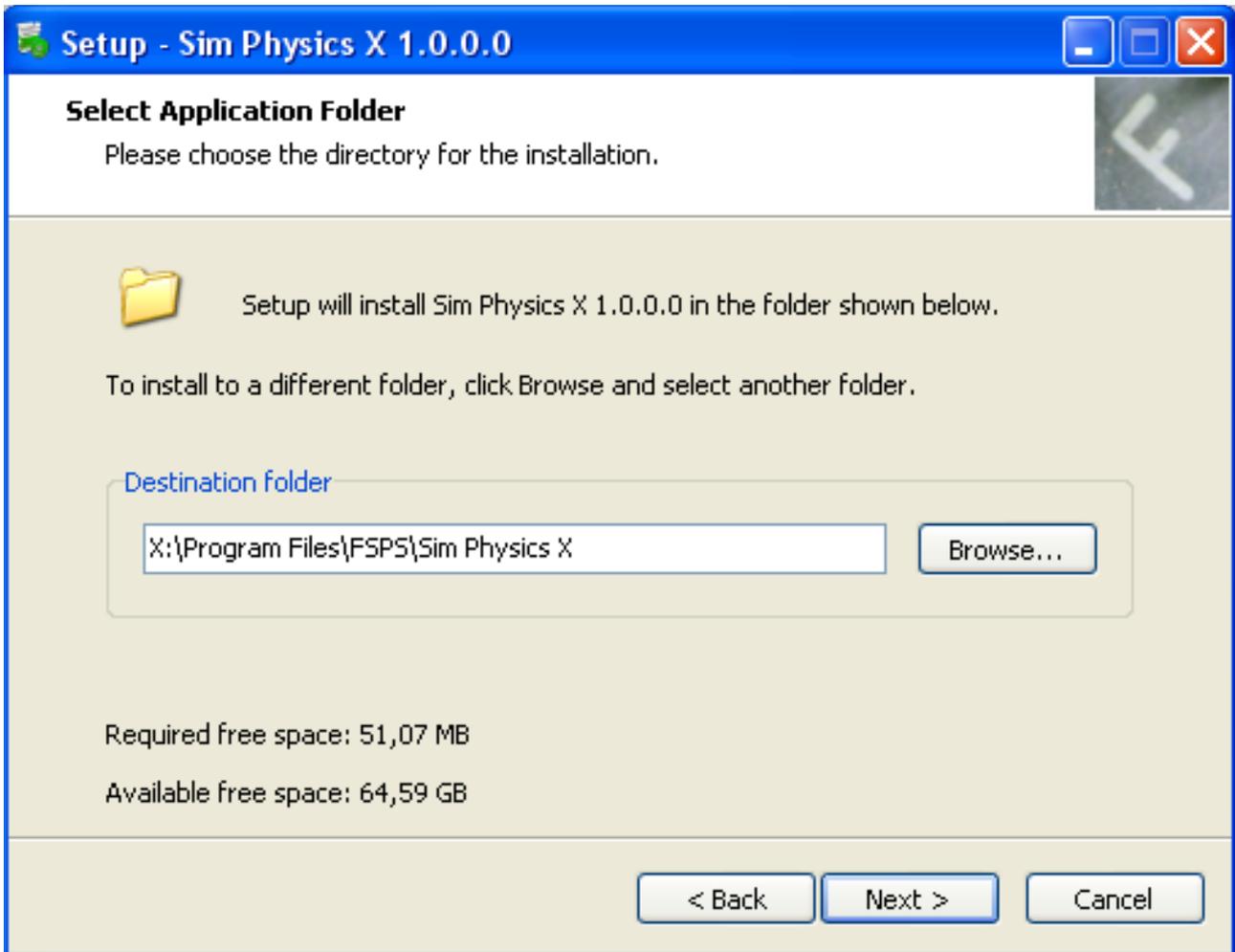
Next step is reading the version changes history...



Press next to continue.

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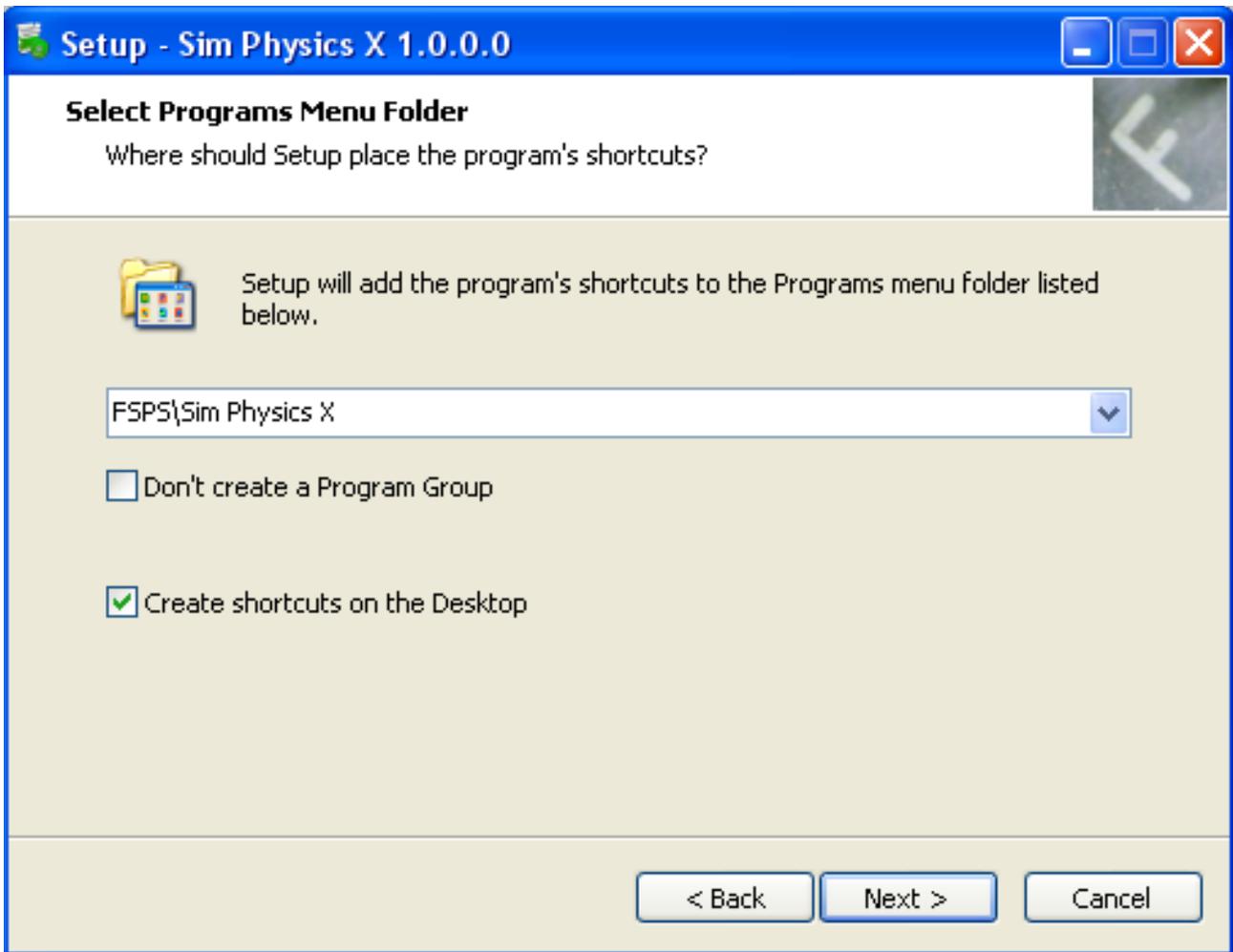
In the next step you will be asked where Sim Physics X is to be installed.



Choose the directory you want , as I did above, and press next to continue.
CAUTION: If you are running a x64 system make sure you install the product on a Program Files (x86) folder !!!

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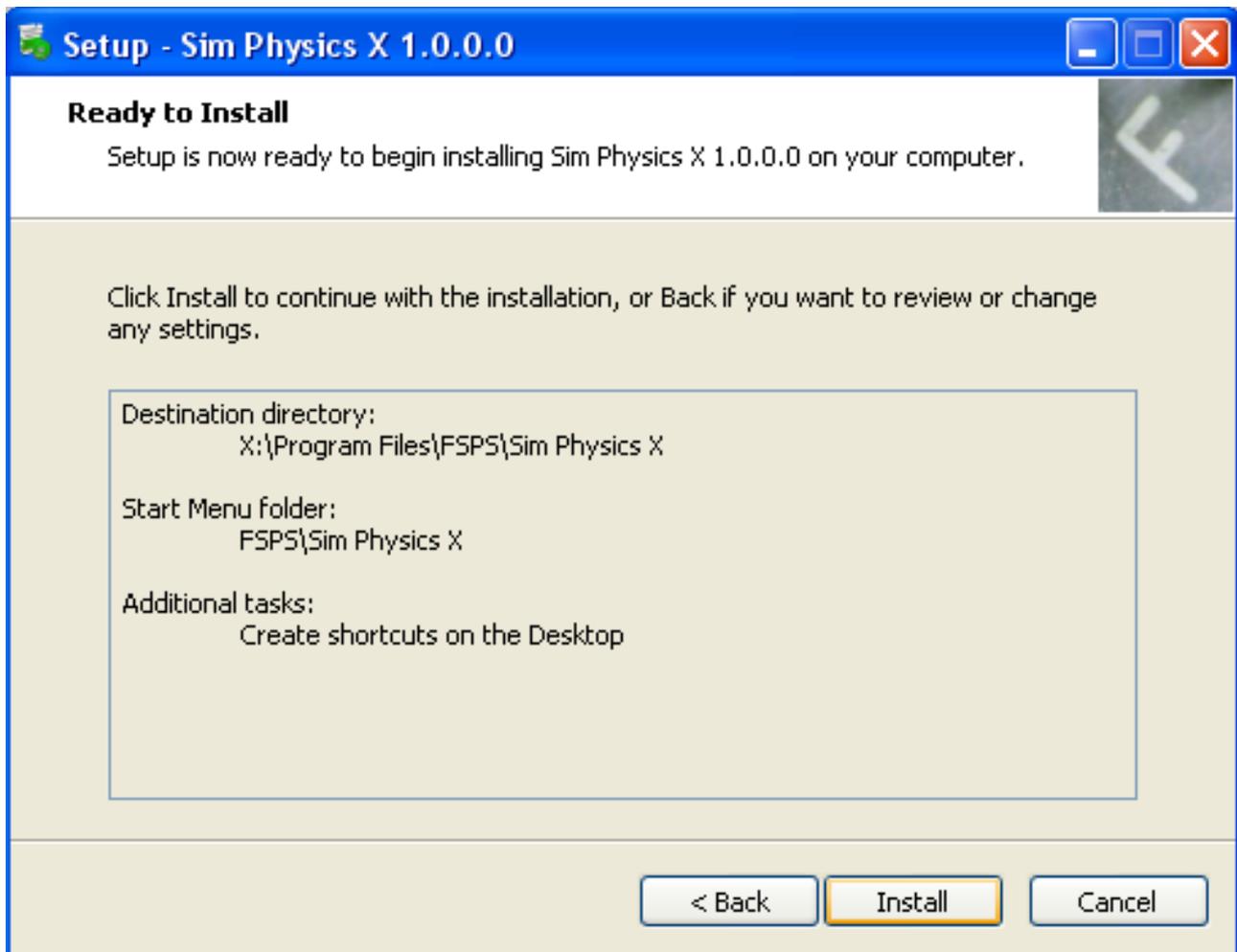
Next step is for shortcuts in the Programs menu and on the desktop



Make your choice and press next to continue.

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Finally :



Read the summary of what it is about to be installed and where and of course press Install to continue.

The progress will be shown and soon the final setup screen will be shown.

The completion setup screen:



Restarting the computer is mandatory for the installer to complete its tasks.

Please do not execute the application before restarting as you may experience strange display issues.

4. Activation

After the restart , you will easily recognize two icons in the desktop (if you have made that choice) :



the Sim Physics X shortcut to the application and the Physics X Configurator shortcut. Pressing either one will guide you on this first installation to the new FSPS Activation Centre screen (You need a working internet connection at this point)

FSPS Activation Center
×

Site code	MID
<input type="text" value="D091741F"/>	<input type="text" value="3CC9-16DE-CBE2-AC2B"/>
Serial number	<input type="text"/> ?
Email Address	<input type="text"/> ?
<input type="button" value="Unlock Application"/>	

Please make sure to disable your firewall during activation procedure

On this screen you can see two codes created, the “Site code” and “MID”, codes that identify your PC hardware. The slightest change – even a different HD for example – will change these codes, thus making impossible for the Anti Piracy system to

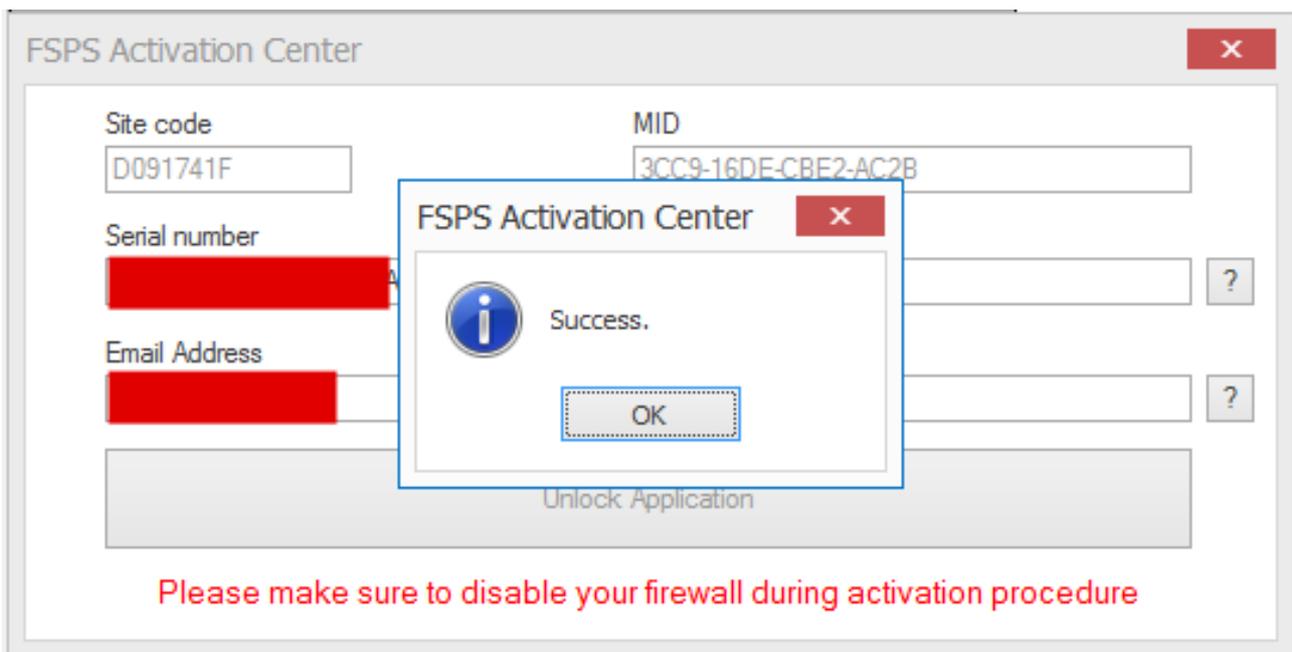
mistakenly ID two different computers.

All you have to do now to activate the software, is to insert your serial number in the first field marked “Serial number” and a valid email address in the second field marked “Email Address” and press the - now available - “Unlock Application” button.

Please wait as the software is communicating with FSPS servers, uploading your serial number and registering your software.

If all goes smoothly the following screen will appear:

Pressing OK (below the Application unlocked) will shut-down the FSPS Activation Centre and will launch the Sim Physics X Configurator. (see chapter 4)

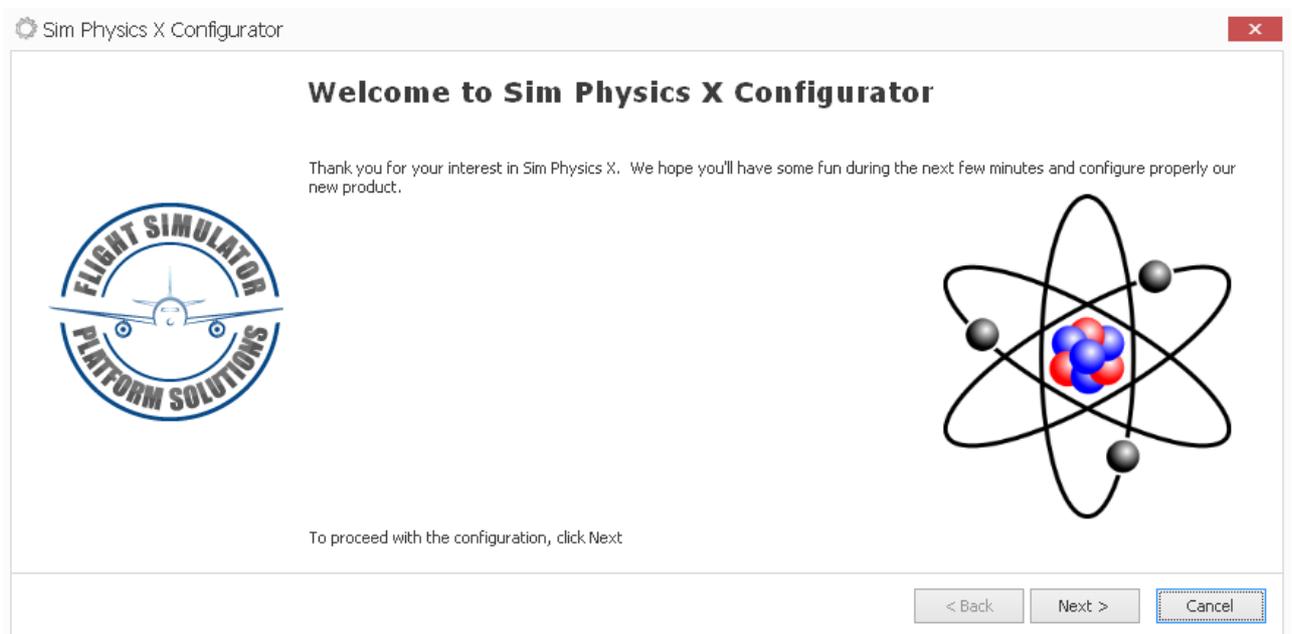


If you encounter an error like “Error all licences in use” please contact support at: <http://support.thefsp.com> using our ticket system, with your serial number, your Site code and your MID included, as either something has gone terribly wrong in the activation or you are already installing on a second computer...

5. Physics X Configurator

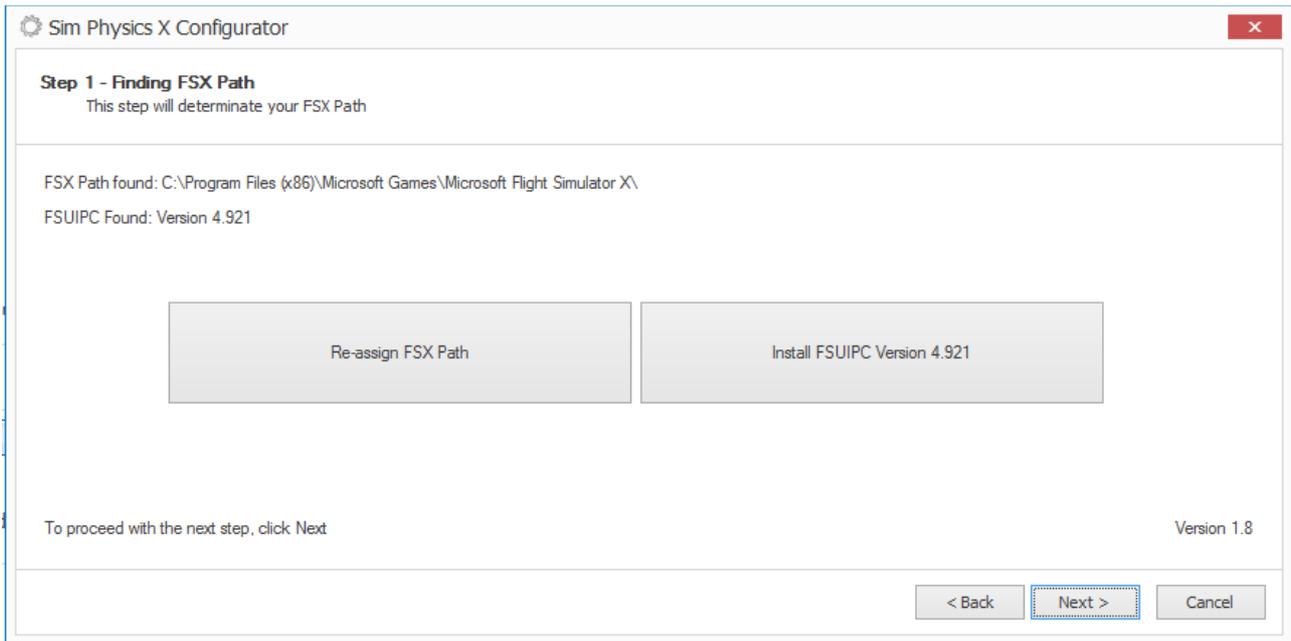
Sim Physics X is a very advanced software program and to make advanced software work, sometimes you have to prepare it in the correct way or it will lose functionality or even have it crash. So, following and executing the Configurator is mandatory and normally will not take more than 1-2 minutes.

Let's take it step by step with pictures and you will see how the wizard does its work...



Opening the Configurator will show you the screen above . Nothing special here just press Next to continue...

Step 1 will return the FSX path and the FSUIPC version as shown below:

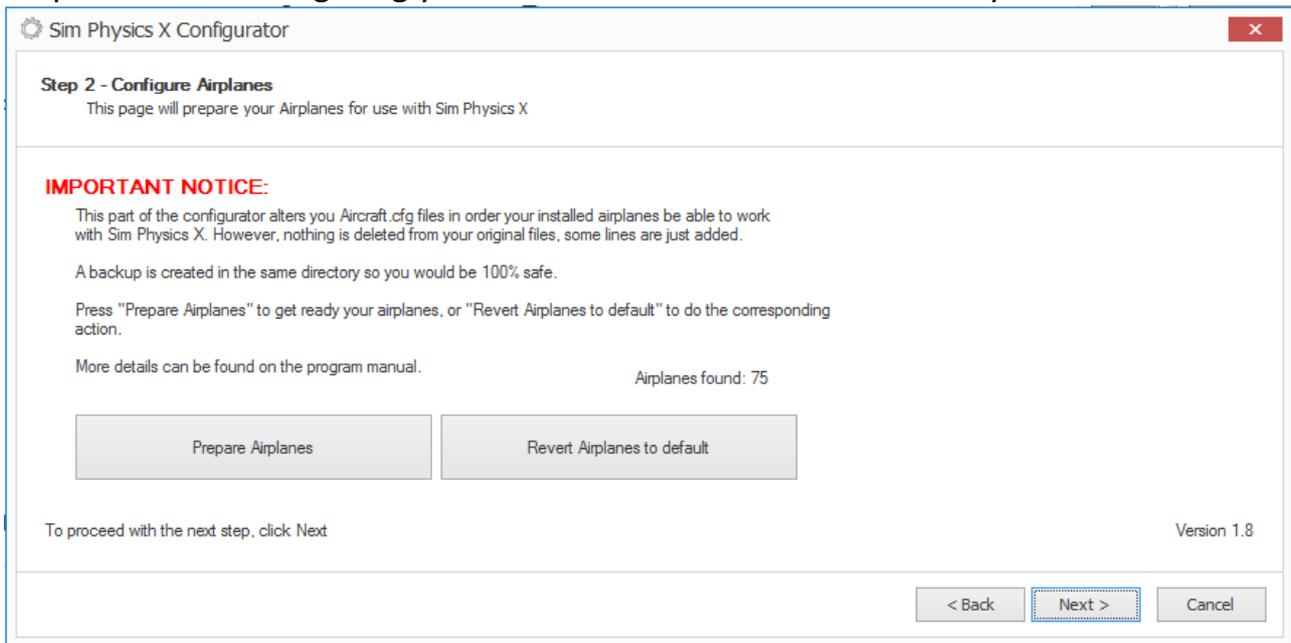


There is a chance your FSX path cannot be found (due to a messed FSX installation or a broken registry entry). In that case there will be a warning (FSX Path not found) and you will have to browse by pressing the button “Setup FSX Path” (normally disabled) to find the fsx.exe file and press OK. That will store your FSX path for future usage. However we strongly advise you find and run an FSX registry repair application in order not to face similar problems in the future.

In case the FSUIPC version is not found, pressing the “Install FSUIPC Version” will automatically download and install FSUIPC by Peter Dowson to your FSX/Modules directory. You have to do this as FSUIPC is a mandatory item for Sim Physics X to work.

Pressing next will take you to Step 2...

Step 2 is about configuring your Aircraft fleet for use with Sim Physics X.



Sim Physics X needs to apply some small changes to the aircraft.cfg files so that you will be able to use your aircraft together with the application. In order to do so, some lines have to be added to these files.

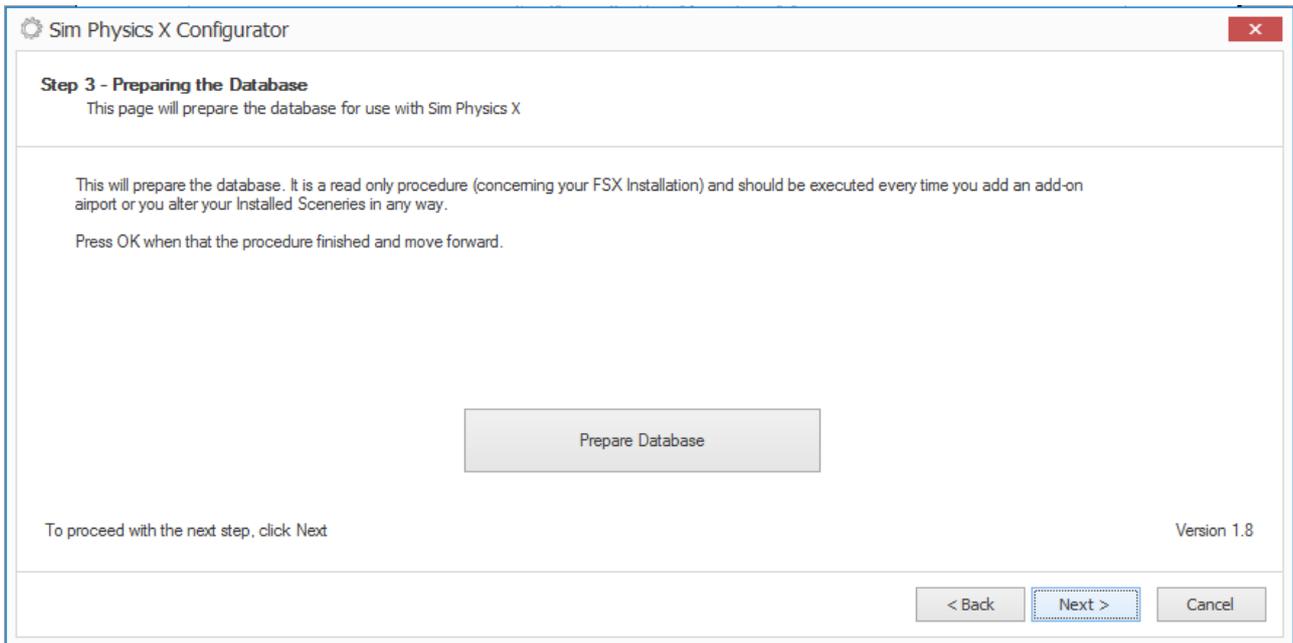
FSPS, understanding the need for security in editing the aircraft.cfg files and the trouble that this might cause to the final-user if it were to go wrong , have created a 100% safe procedure to do these changes. The program creates - first of all - a backup file in the same directory, and then just adds some lines to the aircraft.cfg without interfering with your precious previous configuration.

All you have to do is to press “Prepare Airplanes” and the procedure will start and finish in no time.

A message with the number of aircraft that were prepared will pop-up, for your information, and you can also see a list of the aircraft that were done.

Note: Whenever you want to revert your changes you can press “Revert Airplanes to default” and that will undo the changes made by Sim Physics X. The original backup file will stay there for even more safety.

Step 3. Preparing the database...



For various Sim Physics X sub-systems the existence of a database is necessary for them to work. In this step the Makerwys.exe application by Peter Dowson is used and creates an up to date “image” of your airports. This image will be used in step 4 to create a database in FSPS format.

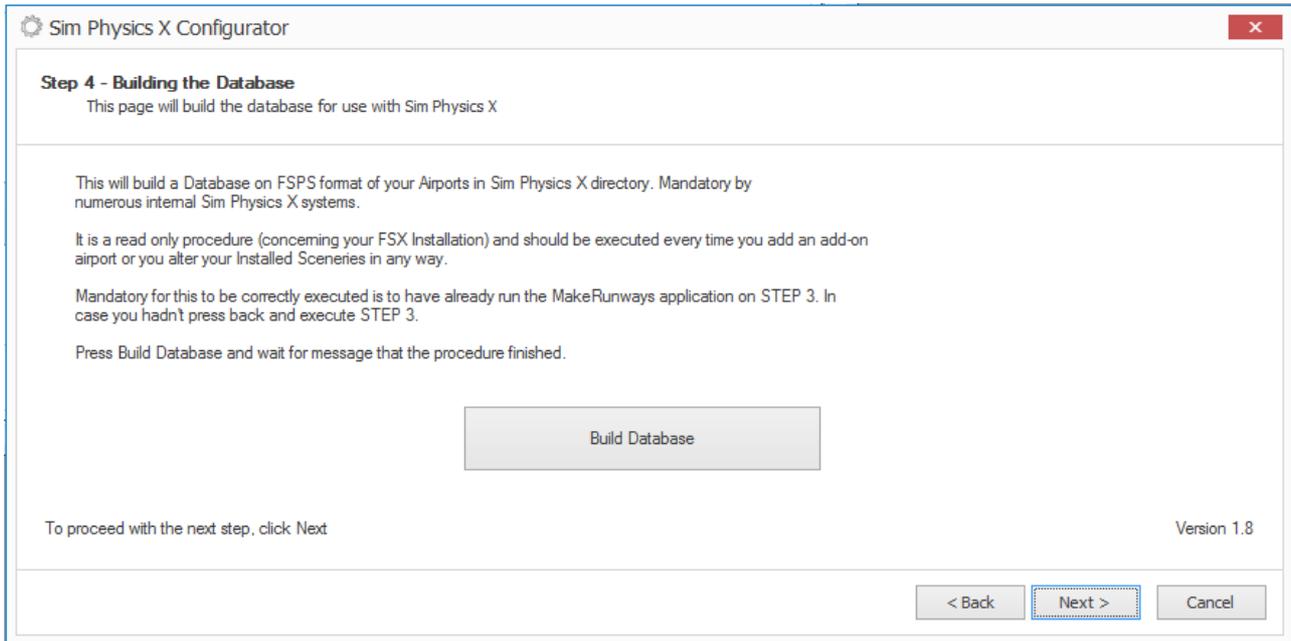
As explained in the Configurator text pressing the “Prepare Database” button will launch the procedure which is a READ ONLY one, thus 100% safe for your computer and your FSX. *You have to do this every time you add scenery or an airport to FSX.*

When all is done , Makerwys.exe will notify you that it has finished,



all you have to do is to press OK and then on the Configurator window “Next” to proceed to Step 4.

Step 4. Building the Database.



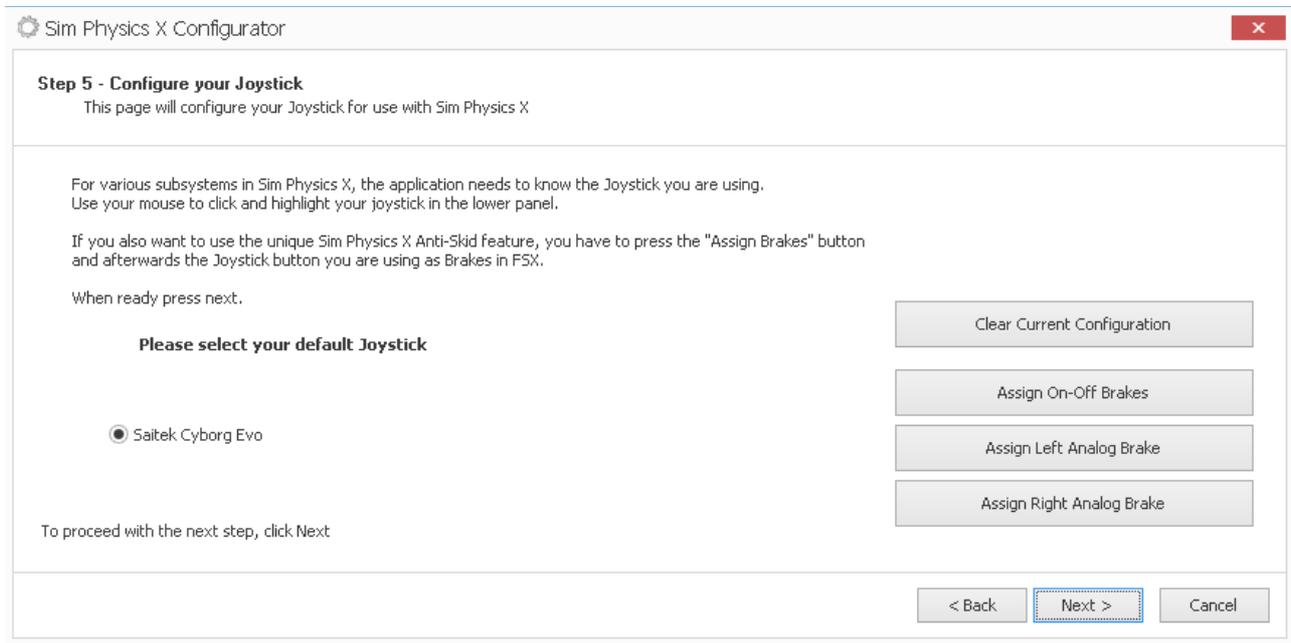
This step will build a Database of your airports in Sim Physics X directory, in our special FSPS format using the “image” of your Airports created in the previous step.

As stated it is a read only procedure (regarding your FSX installation) so it is 100% safe , and you should run it (together with Step3) every time you add or remove an add on airport in your FSX installation.

Press “Build Database” button and after the procedure is finished a “Database has been built successfully” will show up. Press OK and then “Next” to proceed to Step 5

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Step 5. Joystick configuration. * See notice below *****



The Joystick configuration is necessary for Sim Physics X, as its subsystems needs to know what joystick you are using and what button etc. you use for braking.

Just select the joystick on the button next to each description.

For the Anti-Skid feature, Sim Physics X needs to know if you are using a single joystick key-press for applying braking power or if you are using analogue braking / pedals.

If a Joystick button press “Assign On-Off Brakes” and follow the on screen instruction to calibrate the button

If a pair of pedals/ analogue brakes, you separately configure each brake by pressing “Assign Left Analogue Brake” and “Assign Right Analogue Brake” and follow the on screen instructions to finish with both.

Then press “Next” to continue , and to the final screen “Finish” to exit the Physics X Configurator.

***** As of version 1.0.0.4 and above this final joystick calibration step is automated in the configurator! All kind of joysticks are supported. (Inputs by FSUIPC – custom drivers – DirectX etc)**

You are now ready!

6. Application usage / Menus.

If you have successfully completed the above you should be ready to start up the Sim Physics X application. You can start up Sim Physics X before or after FSX. After the splash screen (please be patient as various subsystems are initiated “behind” the splash screen) the following Main Menu screen is shown:



As you can see it consists of 3 main parts.

The upper menu-bar : It provides various links to forums , support etc., the check for updates function and the Licence Transfer button.

The Main Menu centre screen with navigation buttons : It is the “heart” of the application, here everything starts...

The bottom information bar: It shows your FSX version, the FSUIPC version and if it is connected or not and the version number of Sim Physics X you are currently using. If the “Check for new Sim Physics X version” is applied (see below) and a new version is present on our servers you will also see a notification in this area.

The Upper menu-bar:



Pressing the “Web Home” icon will launch a browser window and you will navigate to FSPS homepage : <http://www.thefsp.com>

Pressing the “Tech Forum” icon will launch a browser window and you will navigate to the FSPS official forum :

<http://forum.simflight.com/forum/128-fsps-support-forum/>

Note that the forum although monitored regularly is not the official support place, but more of a kind of gathering place for users to talk about the products, ask for new features etc.

Pressing the “Support Ticket” icon will launch a browser window and you will navigate to FSPS Support web page : <http://support.thefsp.com/>

The Ticket system ensures support in a case by case order, just press the “Open New Ticket” to submit a new problem, or “Check Ticket Status” to check for answers to a previously created ticket.

Pressing the “ PDF Manual” icon will launch this manual in your default PDF file type reader.

Next three buttons under the Check for updates at Startup:

Pressing “ Sim Physics X” will make that button stay pressed. When pressed the application will check on each startup for new versions of Sim Physics X . Highly recommended to keep it as “pressed”.

Pressing “Database Tools” will make that button stay pressed. When pressed the application will check on each start up for new versions of the tools used in creating the database. Recommended but not critical.

Pressing “FSUIPC” will make that button stay pressed. When pressed , the application will check on each start up for new version of FSUIPC by Peter Dowson. Highly recommended to keep it as “pressed”.

The next and final button “Licence Transfer” has a very important function , please note carefully.

As previously described the application can be installed on one computer only. The system that checks for validity of the information however is so secure that even uninstalling the application will not delete the licence information from the FSPS servers. So ...

If you want to change/alter your hardware on the same PC that you have Sim Physics X installed on, if you want to install on another computer or if you want to uninstall Sim Physics X, in order TO AVOID APP LOCK UP on the next installation, press “Licence Transfer” button before you do anything.
(You need a working internet connection at this point)

This will , after your confirmation, shut down Sim Physics X, and remove the Licence information from our servers, thus enabling the application to be installed on a different computer, or in the same computer after the big hardware changes!

So before any change of hardware or Operating system, before any uninstallation or if you just want to have the software installed and used on a different PC, start up the Sim Physics X and press “Licence Transfer”. Then do your changes in hardware or Operating System, install Sim Physics X on a different computer etc.
Just activate the software using your serial number and no problem... you can use the application normally.

* Auto Shutdown on FSX Exit if selected will close Sim Physics X also when you shut down FSX.

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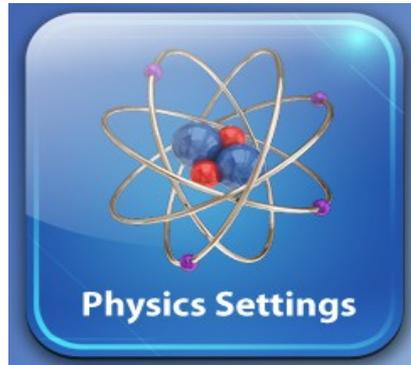
The Main Menu.



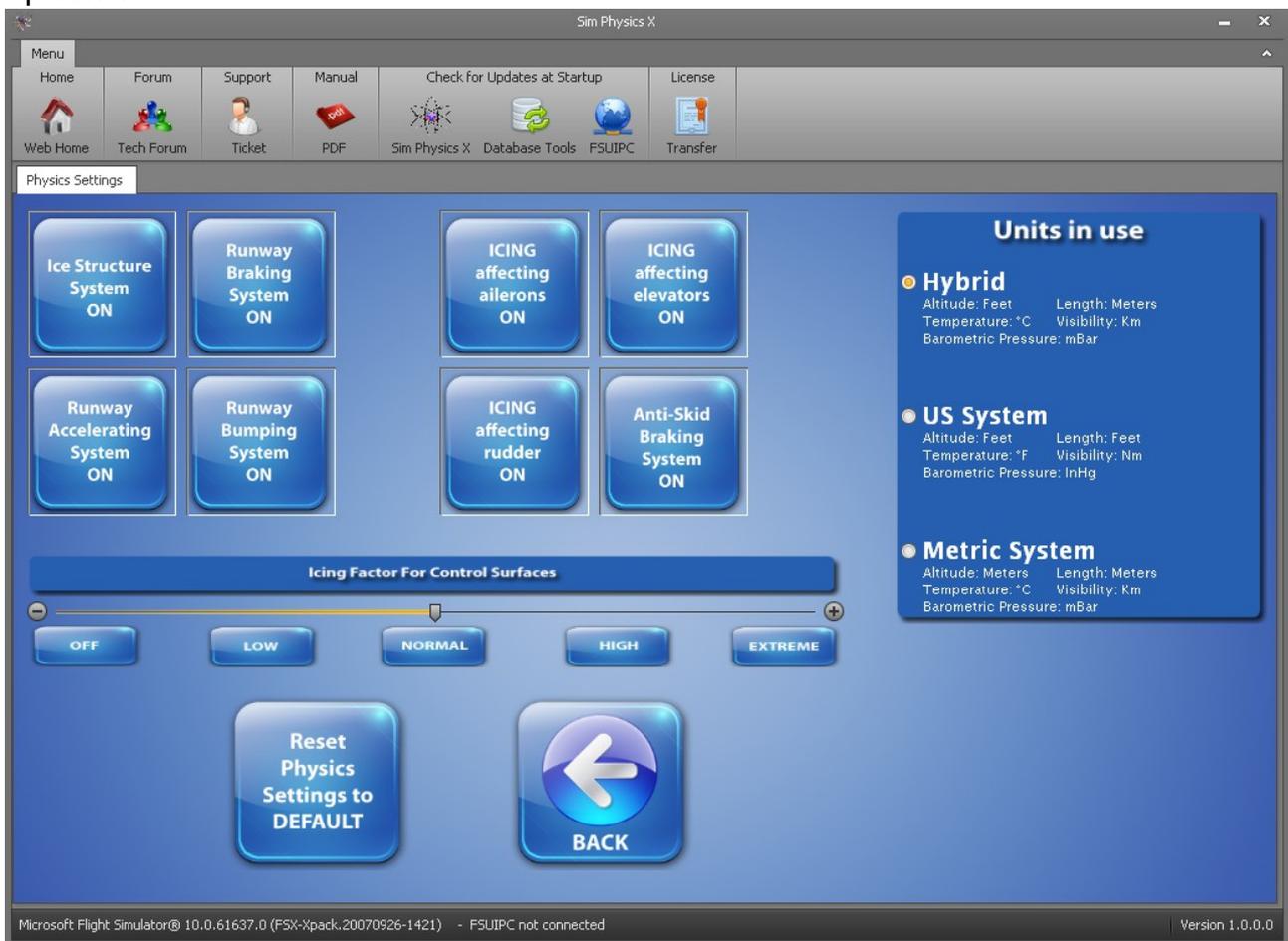
The Main Menu as you can see consists of 6 big buttons. Pressing each button will guide you into a sub-menu in which you could edit settings, view Real-Time Charts of aircraft functions, or view important Airport and Aircraft information.

Let's look at them one by one.

6.1 Pressing the **Physics Settings** button:



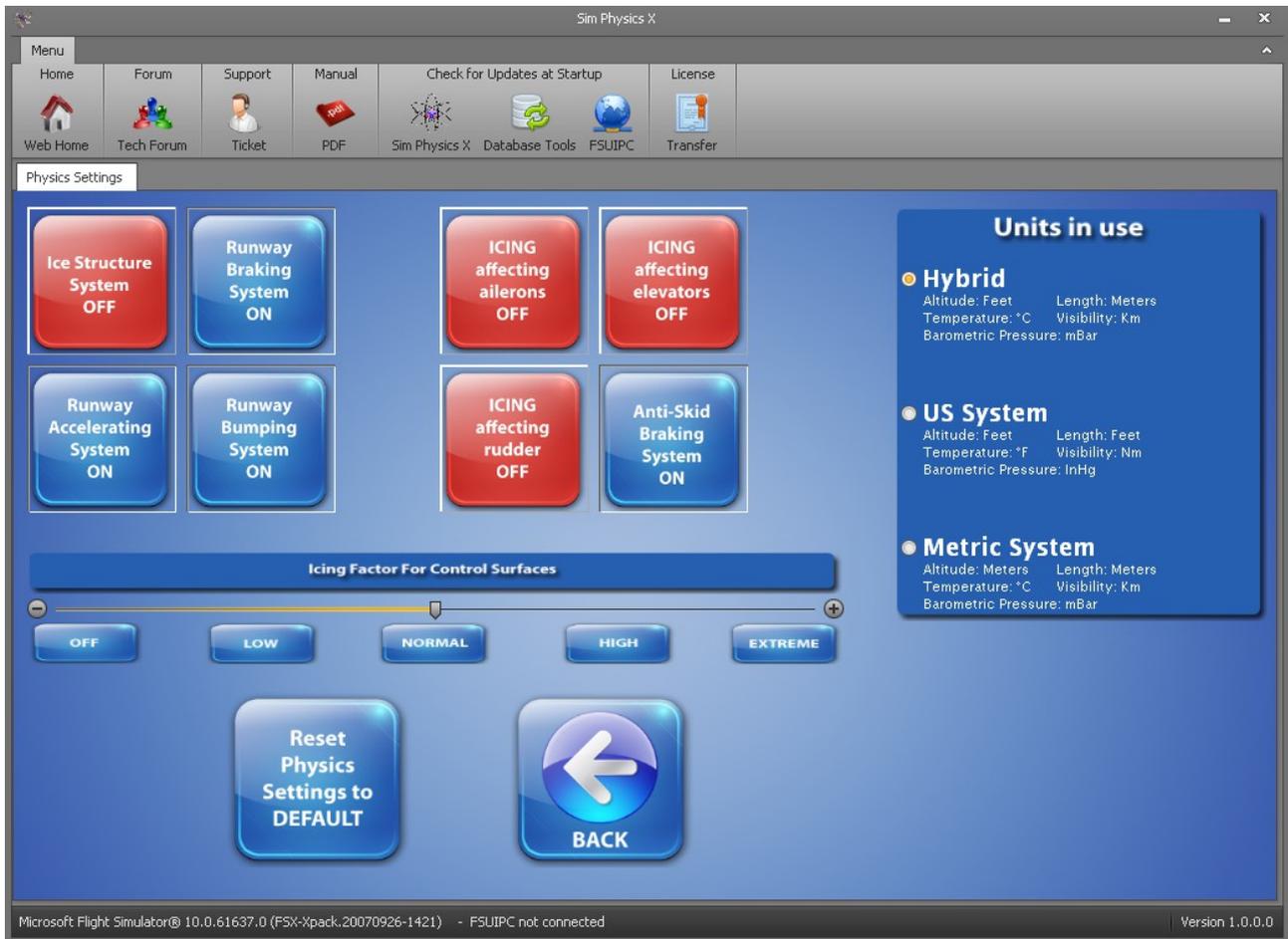
Will allow you to enter the Submenu where you could change various Sim Physics X options:



Here are more buttons that you can press and toggle their value to ON or OFF, the “Reset Physics Setting to DEFAULT” button, that resets all changes, and the BACK button that will navigate you back to the Main Menu. On the right you can choose

the default Units system you would like to use.

So... After some changes the menu could look like this:



Notice there is no “Save” button as the changes are saved while you make them.

“ But what do those buttons do (or not do) ? “ You would naturally ask.

Let's describe each function.

ICE Structure System:

When flying into certain type of clouds (Cumulus or Thunderstorm - FS Types) and in certain temperature conditions, ice exists and can be accumulated on the airframe and the control surfaces. That makes the aircraft change its behaviour gradually (as ice is being built up) by adding drag , making the control surfaces behave strangely and even adding weight to the aircraft itself.

Here at FSPS we carefully studied the latest scientific documentation on Aircraft Icing at altitude and with the help of Professional airline pilots who have faced the hidden danger up there during their careers, we implemented the ICE Structure System that when ON will allow ice to be accumulated on your aircraft (virtually – sorry can't make your aircraft look like a big ice crystal) and start affecting controls, drag, weight and eventually aircraft performance.

PRESS Ice Structure System to ON position to activate the system or to OFF position to deactivate it.

ICE Accumulation – up to this version – is considered to be happening IN THE AIR – while flying only!

No simulation of ground pre-flight Icing YET , but is scheduled for the near future.

Runway Braking System:

An aircraft in the default FSX , will land , take off and land again and there will be no difference to the functionality of the brakes. Who cares (for FSX) if it is raining or how much the precipitation rate is, or if it is snowing or what temperature the aircraft brakes are. FSX doesn't care about that at all.

With the Runway Braking System ON, Sim Physics X will analyse your wheels, your brakes, your aircraft mass and it's energy during braking. It will analyse the runway condition, will take into account your speed, will calculate and adjust your brakes' temperature, will reduce - for example - your brakes' temperature faster if you keep your wheels out a bit after take off: will in other words... make each braking action a unique experience. No landing will be the same as previously (or Take off abort) . You will have to check for the outside temperature, the brakes temperature, the runway condition, and even try hard not to lock your wheels while braking: You can't imagine what locking the wheels during braking can do to your aeroplane in reality... Sounds for braking and locking the wheels (connected to your speed) are also added when the system is ON, you can adjust their volume later to fit your preference.

PRESS Runway Braking System to ON position to activate the system or to OFF position to deactivate it.

Runway Accelerating System:

Similarly to the situation above, whether the runway is soaking wet or completely dry will make no difference to the default FSX take off. Or if it is covered with thick snow. We have changed that... As in reality the runway surface condition will affect your take off performance. Unfortunately FSX does not provide any way of building, for example, snow on the runway as time passes, so the level of precipitation will play that role. If for example there is light rain, the effect on the runway will be small, if there is heavy rainfall the effect on the runway will be really severe.

PRESS the Runway Accelerating System to ON to activate the system or to OFF position to deactivate it.

Runway Bumping System:

The Runway Bumping Effect is the just previously released application from Flight Simulator Platform Solutions. We decided during development to implement its functionality into Sim Physics X to provide you with effects when you pass over a centreline runway light. Compared to other applications that just play an accelerating sound when you are taking off, the Runway Bumping System is calculating the exact position of each runway's lights' then calculates your wheels' position (Front , Right and Left wheels) and while you roll on the runway (during take-off or landing) it creates a sound and visual effect upon passing over any runway light, for each wheel separately. You can adjust this subsystem's unique options elsewhere.

PRESS Runway Bumping System to ON position to activate the system or to OFF position to deactivate it.

ICING affecting ailerons, elevators, rudder (3 buttons) :

As previously described the new FSPS Icing Structure System can play a role in how the aircraft controls behave while the aircraft is accumulating ice.

Having these three buttons pressed will make your inputs, while ice exists, different from normal (as it should be) and its level can be adjusted by the bar below



You can press the buttons to move the position or drag the slider to your desired position.

Caution! Some payware aircraft use some “virtual control inputs” to control the autopilot and others don't follow Microsoft's FSX SDK at all . In those cases you will notice strange autopilot behaviour when ice exists and the bar is not on OFF. When you encounter highly abnormal control input – outputs, you are advised to turn this feature OFF.

PRESS ICING (affects ailerons, elevators, rudder (3 buttons)) to ON position to activate the corresponding system or to OFF position to deactivate it.

Anti-Skid Braking System:

If you have a joystick and you press the “Brakes Apply” button you will notice that the left and right wheel on your aircraft may lock. In reality, pilots in aircraft not equipped with an Anti-Skid system, apply just enough pressure on the brakes so the wheels do not lock, understanding the disastrous results that lock-up may cause. In real-life again, if there is an Anti-Skid system present and activated, and if pilots apply maximum manual braking the wheels will not lock. The effect of the Anti-Skid system prevents locking the wheels and allows deceleration under the pilot's control.

We decided to implement this feature for all aircraft and your wheels will not lock! Try it if you like using an outside camera to look the wheels and apply max. braking with your joystick button. Amazing. No lock-up!

! Caution ! Some payware aircraft have Anti-Skid brakes installed. In most cases no problem was observed during beta-testing , but if you see anything irregular set the function to OFF to avoid conflicts.

- Units in use:

On various information screens Sim Physics X provides next to the numbers the units that are in use. Here you can check the units you like to use by picking one of the three presets:

- Hybrid System, (Weights in Kgs, Altitude in Feet, Temperature in C)

The most common system used mainly in Europe and South America.

- US System (Weights in Lbs, Altitude in Feet, Temperature in F)

The system used mainly in United States

- Metric System, (Weights in Kgs, Altitude in Meters, Temperature in C)

The system still used mainly in Russia and some other areas in Asia.

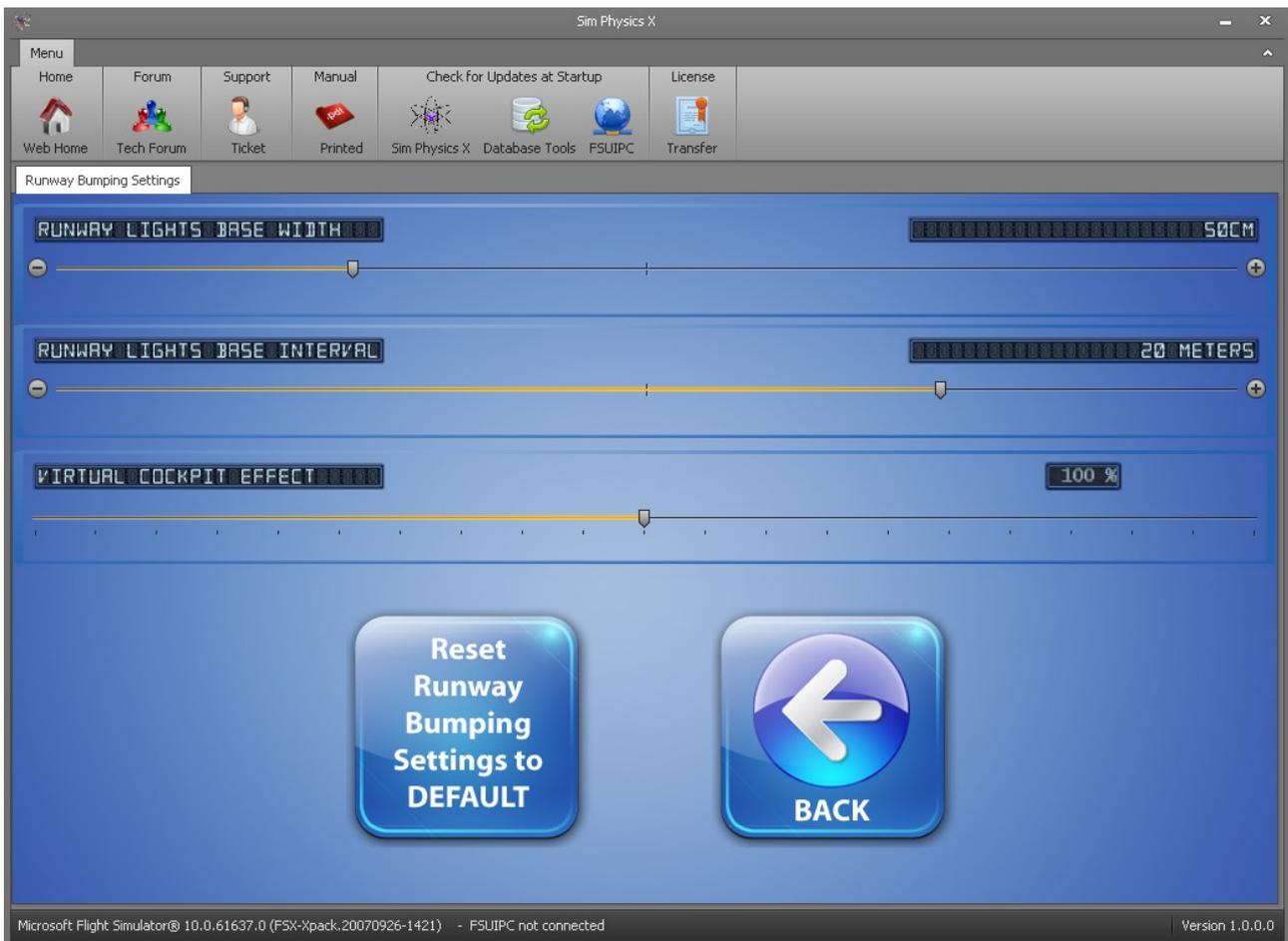
Picking any one will result in a change of the units shown in other areas of the application.

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6.2 Pressing the Simulated Systems Settings button: * See APPENDIX for more ****



Will allow you to enter the Submenu where you could change various system options:



For the time being only the Runway Bumping Settings are here, but more could well be added as more systems may be implemented in future updates.

As previously described the Runway Bumping System will produce a unique sound and visual effect when you pass over a runway centreline light.

In this screen you can set individual details according to your preference.

First, the Runway Lights Base Width . Normally a centreline light has a width of 20-25 cm. Adjusting this bar can -virtually- make the light bigger so you could not miss it while rolling. Some of you may move the slider all the way to the right. In that case it will be almost impossible for you to miss it (Remember that all your wheels can hit it). Default setting is the reality setting of 25cm. (Our preferred one is 50cm.)

Second is the Runway Lights Base Interval. Normally there is a 15 metre interval between the lights. However if you think the effect is too frequent (in reality it is) you can make the interval bigger so you could hear the sound (always depending on your speed and the distance you cover) less frequently. Default setting is the reality setting of 15 metres (Our preferred one is 20 metres.)

Finally the Virtual Cockpit Effect. As described before, when you pass over a runway light a visual effect is created. Available only in Virtual Cockpit view mode, you will notice a head movement while you hear the sound passing over the light. This head movement can be adjusted with the slider. (Our preferred setting is 100%.)

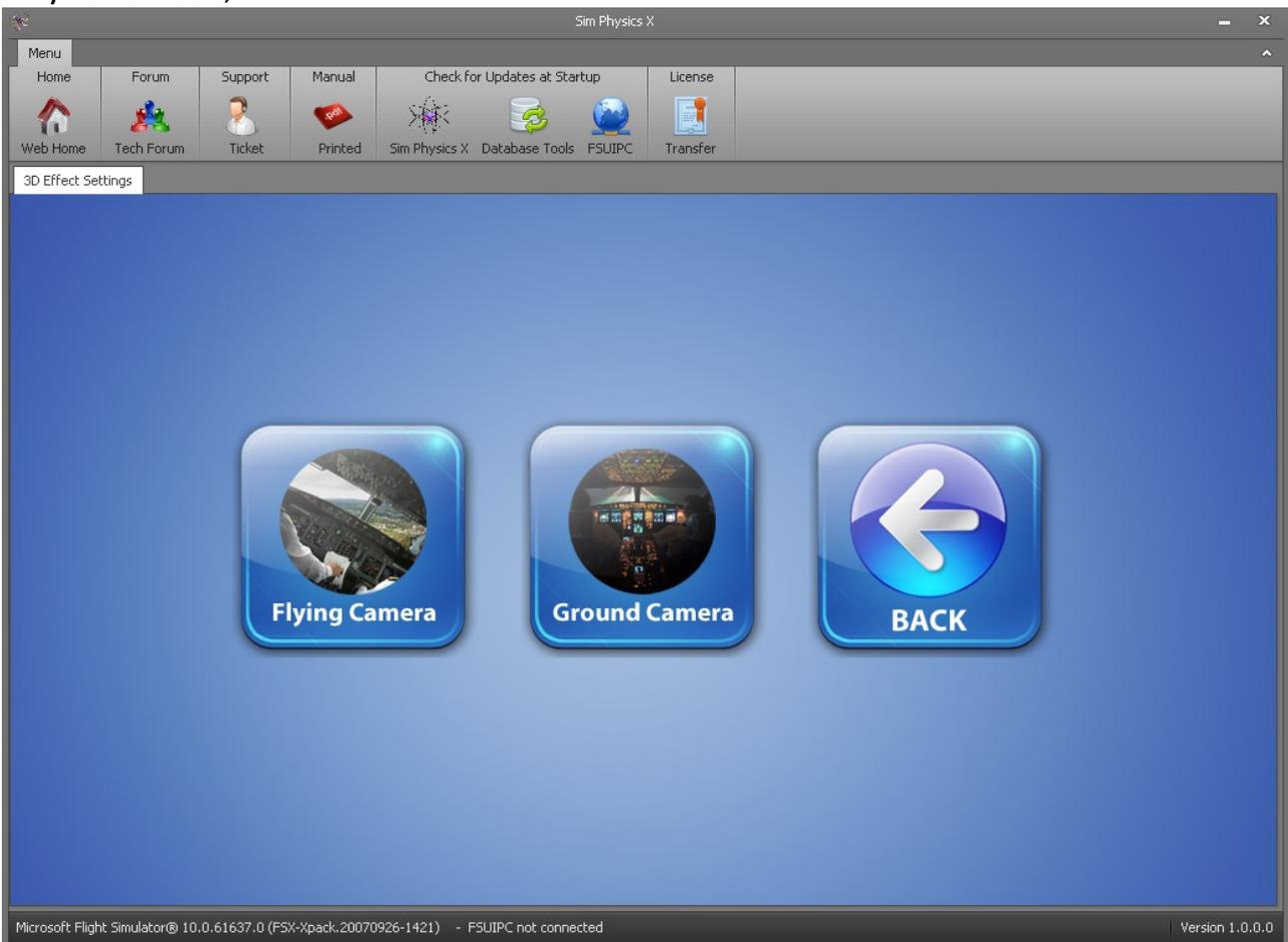
Of course pressing “Reset Runway Bumping Settings to DEFAULT” will reset the setting and pressing the back button will navigate you back to the Main Menu.

6.3 Pressing the **3D Effect Settings** button:



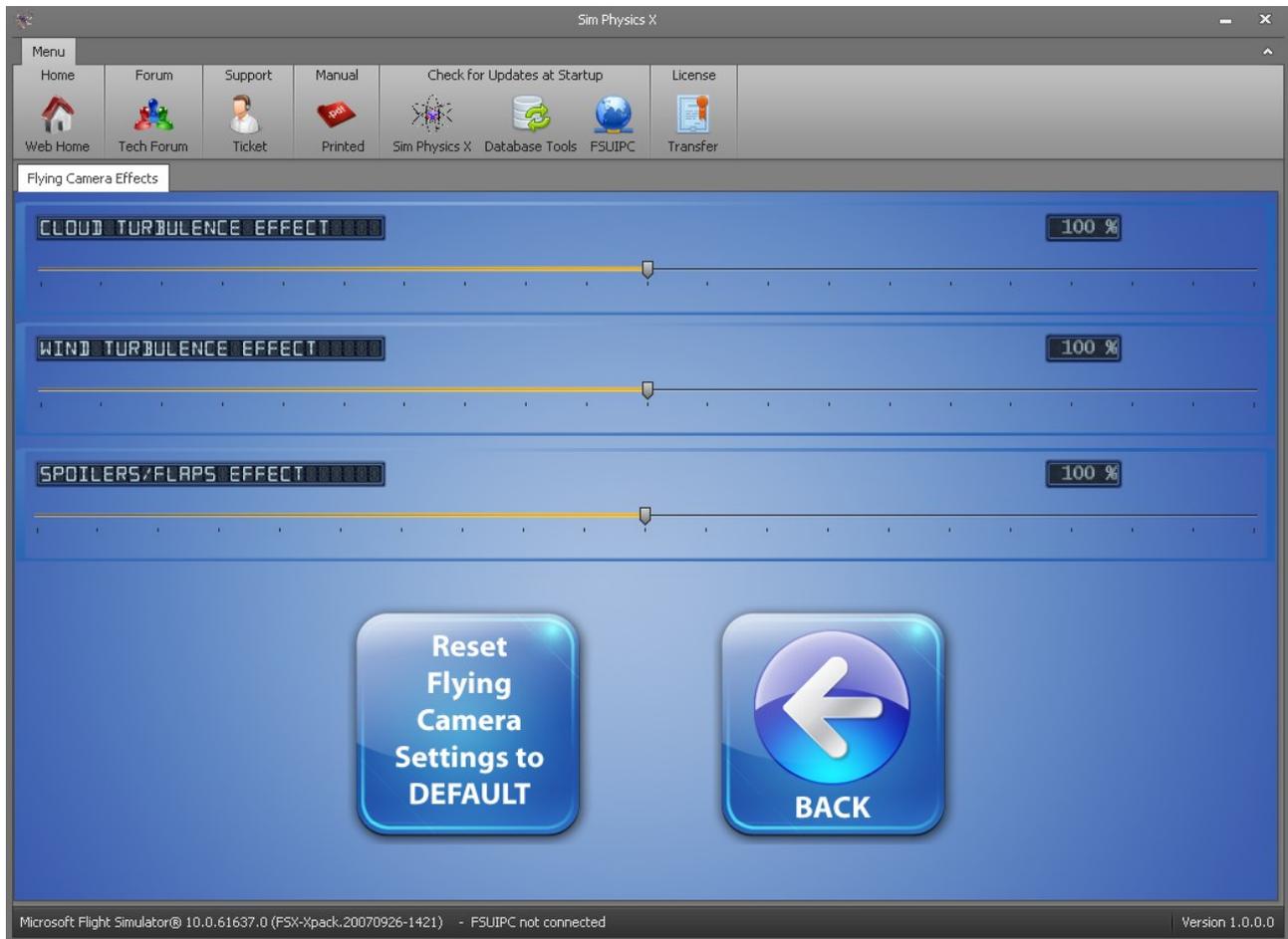
will navigate you into the submenu that handles the head moving technology in 3D Cockpit view.

As you can see,



There are two more navigation buttons you can press.

Pressing the “Flying Camera” button will navigate you into the next submenu



that handles the “Flying Camera”. When we say Flying Camera we mean the effects that are created while flying.

There are 3 sliders as you can see.

The first one is the Cloud Turbulence Effect. Flight Simulator X in its weather settings has the ability to add from light up to severe cloud turbulence, a shaking of the aircraft, that is, when you enter the cloud. We discovered that many addon weather programs use this parameter almost always whenever the aircraft enters a “big” cloud, so the aircraft shaking is a very common sight on FSX flights.

Leaving the slider at 100% will provide a head moving shaking effect just like the aircraft's one, we believe that is fairly realistic. This effect is dependant on the intensity of the “Cloud Turbulence” magnitude that can be from “Light” to “Severe” and can only be observed in 3D Cockpit view . It is created irrespective of where you are looking.

Adjusting the slider in the 1-99 % range will give you a less intense effect than the default one, and when on 0% the effect is disabled.

In the same manner, adjusting the slider in the 101-200% area will give you more intensity .

So use the slider to adjust the effect according to your preference.

For example a Cessna 172 may require the bar be at 200% while an Airbus A380 the bar at 50%...

Next slider is the Wind Turbulence Effect.

In the FSX weather engine the Wind can be set up to create turbulence. Again , shaking the Aircraft , minimal when the turbulence is set to “Light” or a maximum shaking effect when it is set to “Severe”. Just like the Cloud Turbulence Effect, Sim Physics X , when you are in the 3D Camera view mode, will move or let's rather say, shake, your head in relation to the severity of the weather engine setting.

Again the slider can disable the effect by setting it to 0% or double its intensity if you set it to 200%. Please adjust it according to your preference.

Last slider in this submenu is the Spoilers/Flaps effect.

You will have noticed in real life flights that aircraft shaking is created when the Pilot extends the spoilers while descending , to reduce his speed when “he is coming in high” . The more speed the aircraft has the more intense the effect is.

In the same way – but more rarely – the pilot can lower his flaps to a setting of more degrees than the normal Flaps Extension schedule to further reduce his speed or to increase his rate of descent. Reasons for that could be to get the Glide Slope in an ILS approach coming from above, or to configure for landing fast due to other traffic. In that case because the flaps, like the spoilers, are not aerodynamically “clean”, they produce extra vibration on the aircraft.

Sim Physics X takes the above into account and constantly monitors the spoilers and flaps . If they are moved while in flight (in 3D cockpit view) the effect comes into play and will create a vibration. If however the speed is not that high the effect will be

barely noticeable and the opposite, if the speed is high, the effect will be something you can't miss.

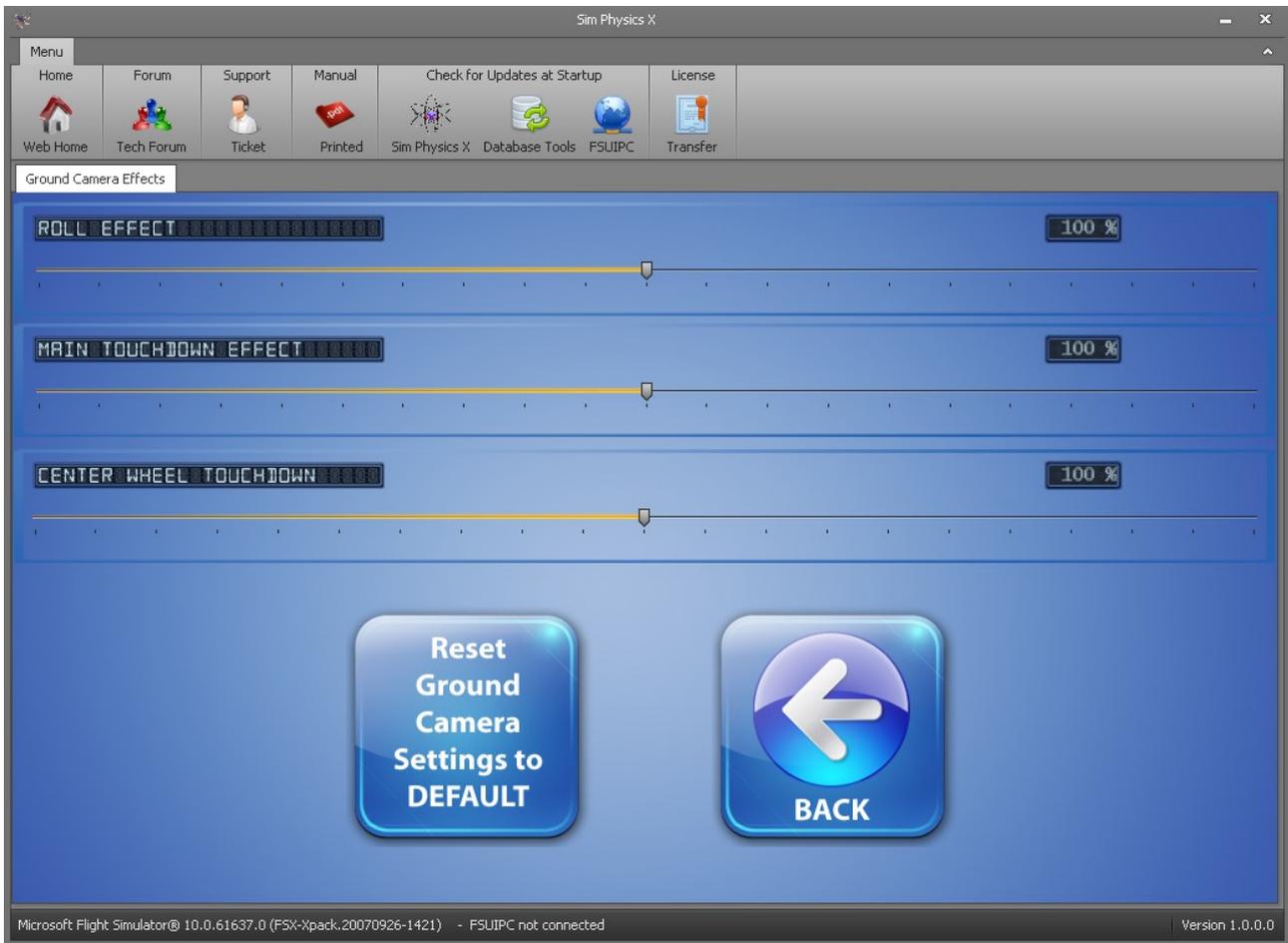
This is happening because Sim Physics X also takes into account the Airspeed while creating the effect. If you lower for example Flaps 30 with 150Kt IAS this is fairly normal and no effect will be created. But if you lower to Flaps 40 with 200 (!) Kt IAS you will see what happens.

Again – according to your preference – you can adjust the slider from 0% where the effect is disabled, up to 200% where the effect has the double intensity of the default one.

Finally you can press the “Reset Flying Camera setting to DEFAULT” that does what it says with the default values set to 100% in all cases, and the back button will guide you to the previous screen.

Intentionally left blank

Pressing the “Ground Camera” you will navigate to the Ground Camera settings screen as shown below:



Here again there are 3 sliders you can play with. Let's see them one by one:

The Roll Effect slider.

As you can probably remember from your real life flights, when the plane is on the runway and is rolling for take off or rolls out in landing , things are not calm. The non stop runway usage of thousands of planes in busy airports and – always – not enough runway maintenance , makes the aircraft shake up and down , left and right. The higher the speed, the higher the shaking...

Sim Physics X creates this effect in 3D Cockpit view mode, for you the virtual pilot. As you've done before the slider can be adjusted from 0% (where the effect is disabled) up to 200% (where the effect is doubled compared to the default 100% setting). Please adjust it according to your preference.

The Main Touchdown effect.

Again during landing in real life flights, the aircraft flares (lifts its nose up) and the main landing gear, the back left and right wheels that is, are the first to touch the ground. If the pilot makes a “kiss” landing the effect will be barely noticeable , but if he makes a “hard” one the aircraft will shake.

Sim Physics X also calculates this and will return an effect when the main wheels touch the ground, again available only in 3D Cockpit view.

Like before the slider can be adjusted from 0% (where the effect is disabled) up to 200% (where the effect is doubled compared to the default 100% setting). Please adjust it according to your preference.

Centre Wheel Touchdown slider.

In the same manner as with the Main Touchdown effect, a head move will be created by Sim Physics X – in 3D Cockpit view mode – when the front Centre Wheel is lowered and touches the ground.

Again the slider can be adjusted from 0% (where the effect is disabled) up to 200% (where the effect is doubled compared to the default 100% setting). Please adjust it according to your preference.

Pressing “Reset Ground Camera Settings to DEFAULT” button will reset the setting to their default position, which in all cases is 100%.

Pressing Back twice will navigate you again in the Main Menu

6.4 Pressing the **Sound Settings** navigation button:

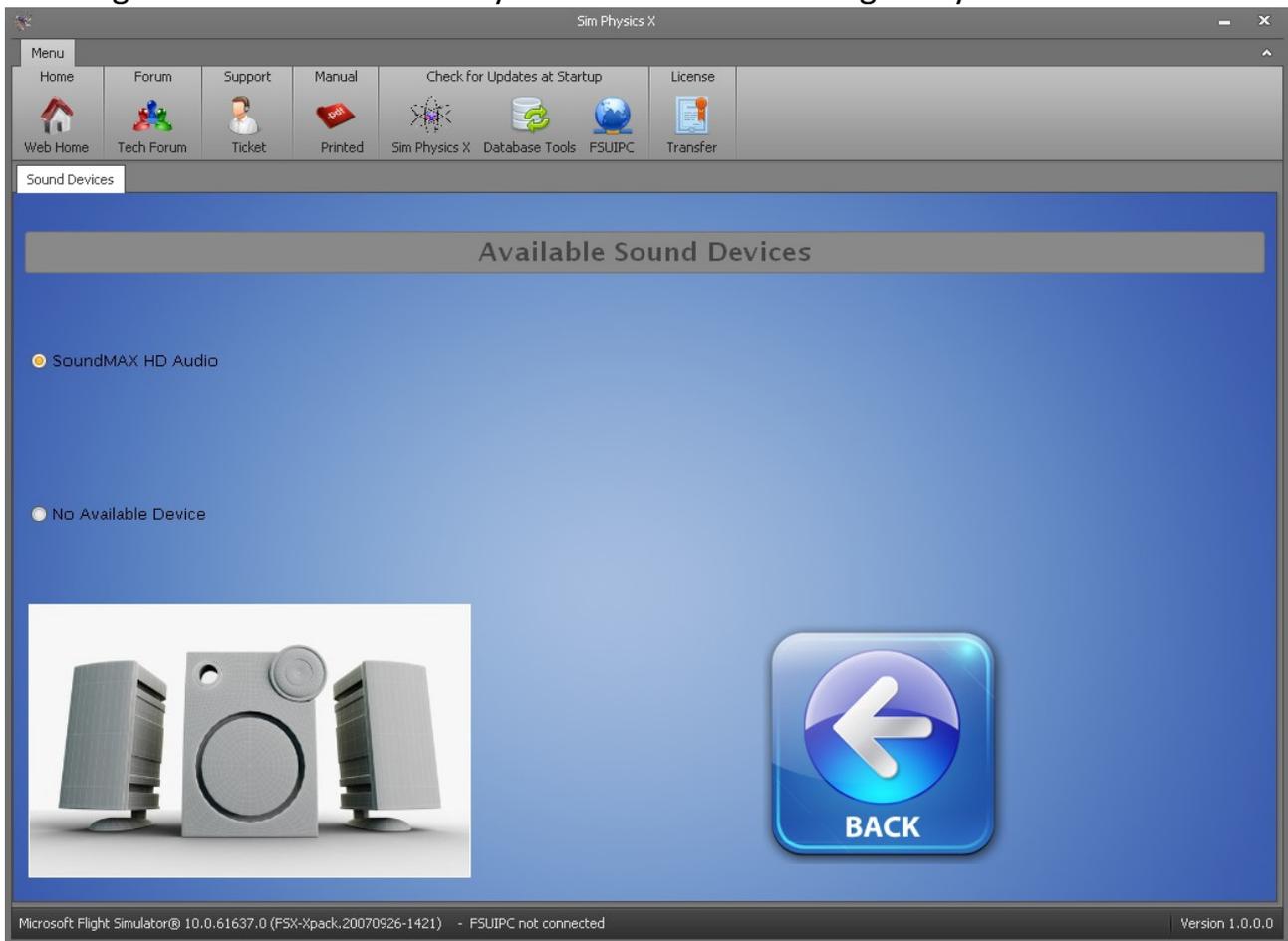


will navigate you into the Sound Settings submenu as shown below:



, with many choices for you. Let's clear them one by one for you...

Pressing the first button “Select your Sound Device” will guide you into:



the Sound Devices selection submenu. Here the names of your sound devices will be displayed and you would be able to choose the one that will create the sound effects Sim Physics X is capable of.

In my case the SoundMax HD Audio is the only choice , but you may have more devices to choose from. Make your selection according to your preference. The back button , naturally, navigates you back to the Sound Settings menu.

Pressing the Runway Bumping Effect Sound Settings button will navigate you here:



As previously described when you pass over a centreline runway light, an effect is created. Not only a visual one (head shaking in 3D Cockpit view mode) but also a “Bump” sound. In this sub menu you can select the speakers the effect will be played through for each wheel. (Left , Nose and Right Gear on a full 7.1 Dolby configuration). As you see the default setting for the right and left wheel is set to Front Speaker channel. If you own just two speakers (L-R) and the Nose wheel is set to All speakers, this will make the Left and Right wheel's bumps heard in a lower volume than the nose one.

If you own a full 7.1 Surround system you can set the Nose wheel to front speakers and the left and right one to Real Left and Rear Right Speakers. This will create an excellent surround effect when one of the wheels touches the Centre line Runway lights.

The overall volume of the effect can be set by the slider, there is a button to revert

to default settings and the back button will navigate you back to the Sound Settings menu.

Pressing the Braking System Sound settings button now will get you to the menu below:



When you press the “Apply Brakes ” button on your joystick or keyboard, or when your Autobrakes are activated (so whenever braking power is being applied), Sim Physics X will play a sound that has been carefully calibrated to simulate the real life sound of brakes being operated. It will not be just a single scratching sound . Sim Physics X calculates the braking power, your ground speed, brakes temperature and will play a different sound each time, changing its frequency and its volume.

You can select the speaker the sound will be played on for every brake , and you can adjust the overall volume with the slider.

Again the Reset Braking Sounds to DEFAULT button will reset the settings and the

back button will navigate you back to the Sound Settings submenu.

Pressing Tyres Squealing Sound Settings will navigate you into this menu:



Sim Physics X calculates if your braking wheels lock up during braking action.

This is done by looking at all the wheel's revolutions per second, measuring their diameter and the distance they cover. If for example the front wheel (that has no brakes) rotates at 2000 rpm and the two back wheels rotate at 0 rpm, it is obvious that the back wheels have locked. Some payware aircraft have integrated an Anti-Skid system and now also Sim Physics X gives you the opportunity to use such a system in all aircraft (as we saw above). However if you disable the Anti-Skid and you lock your back wheels in real life the landing will not be without a terrible tyre squealing sound. So if you apply braking, with Anti-Skid off and you lock up your brake wheels a sound will be played, a sound carefully computed according to the wheel area and the kinetic energy of your aircraft.

You can select the speakers this sound will be played on, the master volume with the slider, and you can revert the setting to default pressing the usual button.

Pressing back will navigate you back into Sound Settings submenu.
Pressing Spoilers Sound Settings will get you to this screen:



As we saw in the Flying Camera Settings, a vibration is created when you extend your spoilers. Sim Physics X however doesn't leave it there, as it creates a special sound relevant to your Airspeed and the spoiler setting, the sound of the spoilers “cutting” through the air while the aircraft travels.

Some addon aircraft create this sound also, some not, but Sim Physics X takes the Airspeed into account – we emphasise this. A different sound will be played for Spoilers deployed at 300 kts than if they are deployed at 180 kts.

Again you can select the speakers and the master volume of the effect and you can press the usual button to revert to the default settings.

Pressing Back will navigate you back to the Sound Settings submenu.

Pressing now Flap Sound Settings will navigate you into this menu:



Like the Spoilers a sound will be created when the flaps are extended, a sound that depends on the Airspeed in combination with the angle they are set at.

As before you can select the speakers and the master volume of the effect and you can press the usual button to revert to the default settings.

Pressing Back will navigate you back to the Sound Settings submenu.

Pressing Gears Sound Settings will guide you into this menu:



Lowering the gear as we saw in Flying Camera Settings will create a visual effect in 3D Cockpit view mode.

Like the Spoilers and Flaps sound effect, when the Gear is lowered while in the air a sound effect will play, created directly in relation with the Airspeed of the aircraft .

As before you can select the speakers and the master volume of the effect and you can press the usual button to revert to the default settings.

Pressing Back will navigate you back to the Sound Settings submenu.

*** In general some of Sim Physics X Sound effects may be similarly available in some addon aircraft, or some sound package addons. Study the sounds carefully and choose which one will play, to avoid hearing two sounds for the same event , played by two different applications. We give you the option to disable them. Other apps may not. ***

6.5 In the Main menu again press now **Real Time Charts** button



will bring you the Real Time Charts submenu as shown below:



Not a lot of things need to be explained here as each individual button guides you into the a corresponding chart of what the labels say. Their purpose is for you to be

able to check some of the things Sim Physics X is creating in real time.

For example in Ice Build-up chart, a chart of how much Ice is present on the aircraft can be seen. In Brake Temps you can check the Temperature of your brakes in relation to time.

The Elevator, Ailerons and Rudder Charts will give you a real time graph of what is happening on the controls when Ice has started affecting them.

If there is enough ice you will notice that if you input, lets say, 100% up motion a maybe 90% up motion will be applied in the “Output”.

Charts are not “running in the background” for resource management reasons, and when you close them will stop motoring.

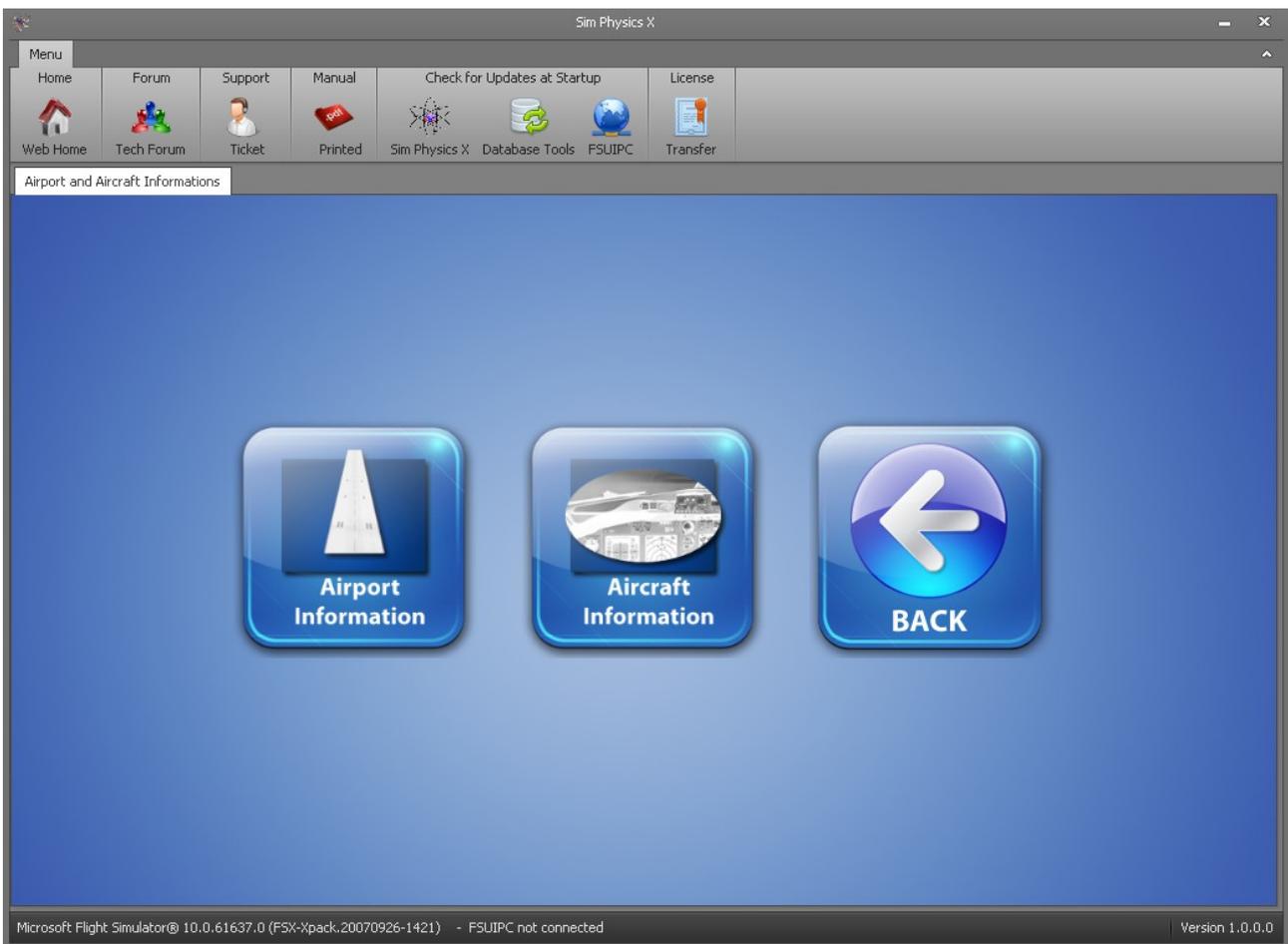
Pressing back will bring you to the Main Menu again.

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6.6 Pressing Airport & Aircraft INFORMATION button :



will navigate you to the Airport and Aircraft information submenu.



6.6.1 Pressing the **Airport Information** will navigate you to a screen similar to the following :

Current Airport Information

ICAO: KJFK - Name: Kennedy Intl
 Country: United States - New York - New York
 Runway: 4L Altitude: 13 feet Available Runways : 8
 Length: 3,460 meters Width: 46 meters
 Mag Heading: 44.7 degrees Mag Variation: -14.000 degrees
 Surface: Asphalt Friction: VERY GOOD

Nearest Airports

CGAS	5.0 Nm
NK30	6.0 Nm
FLU	9.7 Nm
KLGA	10.1 Nm
4NY2	10.4 Nm

Weather Information

OAT: 14 °C
 TAT: 15 °C
 Dew Point: 4 °C Relative Humidity : 51 %
 QNH: 1013 mbar Water Vapor(Air) : 5.93 Grams/Kgr(Air)
 Visibility: > 100 Km
 Wind: 0 Knots 0 degrees
 Season: Fall

Flight Simulator Clock

System UTC Time: 04 October 2013 12:25:40 PM
 FS UTC Time: 04 October 2013 10:23:13 PM
 FS Local Time: 04 October 2013 06:23:13 PM

Nearest Airports Information

Runway	Length	Altitude	Surface	ILS	Freq	Course	Glide Sl...	DME	Category
13R	14,564 ...	13 feet	Asphalt						
4L	11,353 ...	13 feet	Asphalt	IHIQ	110.90	45	Yes	Yes	ILS/DME
13L	9,992 feet	13 feet	Asphalt	ITLK	111.50	135	Yes	Yes	II
4R	8,401 feet	13 feet	Asphalt	IJFK	109.50	45	Yes	Yes	III
31L	14,564 ...	13 feet	Asphalt						
22R	11,353 ...	13 feet	Asphalt	IJOC	109.50	222	Yes	Yes	ILS/DME
31R	9,992 feet	13 feet	Asphalt	IRTH	111.50	315	Yes	Yes	ILS/DME
22L	8,401 feet	13 feet	Asphalt	IIWY	110.90	225	Yes	Yes	III

Hide Kennedy Intl Information

BACK

Microsoft Flight Simulator © 10.0.61637.0 (FSX-Xpack.20070926-1421) - FSUIPC Version: 4.921 (Connected) - SimConnect Status: Connected | Version 1.3

As you can see there a lot of information in relation to the airports, the weather and the time appears. You can check all this information at any time to help you with choosing airports, confirming runways, checking weather and so on.

Let's check all tabs one by one:

Current Airport Information tab:

Here information about the airport you are on is displayed.



A screen similar to the above will be displayed if you are on a runway.

ICAO: xxxx is the International Commercial Aviation Organization 's 4-letter designator of the Airport you are at. In this example: EGLL .

Name: The name of Airport that is written in the Database. In this example: Heathrow.

Country: The Country and the City where the Aircraft is. In this example : United Kingdom – London.

Runway: The runway the aircraft is on (If the aircraft is not on a runway nothing will be displayed here). In this example : 9L

Altitude: The altitude (elevation) of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). In this example: 83 feet.

Units are according according to the units selection you have chosen in the settings. (If for example metric was selected the Altitude would be displayed in metres)

Length: The length of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). In this example: 3897 metres .

Units are according to the units selected in settings.

Width: The width of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). In this example: 50 metres .

Units are according to the units selected in settings.

Mag Heading: The magnetic heading of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). In this example: 92.69 degrees. Units are always degrees.

Mag Variation: The magnetic variation of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). In this example: -3.000 degrees. Units are always degrees.

Surface: The type of Surface of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). In this example: Asphalt.

Friction: The friction coefficient of the runway the aircraft is on. (If the aircraft is not on a runway nothing will be displayed here). As explained before, the application take into account the weather conditions, the type of the runway, and the precipitation rate, to simulate the friction of the runway and then produce various effects. The friction can be VERY GOOD, GOOD, MEDIUM, POOR, NIL . Consider it as the reported braking action by the previous pilot. In this example: VERY GOOD.

Intentionally left blank

Weather Information Tab:



The Weather Information Tab consists of some text information and a big button with the + sign on the right.

First let's see the text information.

OAT: Outside Air Temperature is the temperature of the undisturbed air surrounding the aircraft. In other words the ambient temperature outside. It will be displayed in the units selected in Settings. In this example: 4.0° C

TAT: Total Air Temperature is the temperature that considers the compression and the adiabatic increase in temperature of the air that hits the aircraft while it travels in high speed. It will be displayed in the units selected in Settings.

In this example : 4.0° C .

You will notice, however, that the faster you go the bigger the difference between OAT and TAT will be with TAT always higher.

Dew Point: The dew point is the temperature below which the water vapour in a volume of humid air at a constant barometric pressure will condense into liquid water at the same rate at which it evaporates.

It will be displayed in the units selected in Settings. In this example: 1.0° C

QNH (or Altimeter depending on the Unit Settings selected) is the barometric pressure of the station. It will be displayed in the units selected in Settings.

In this example : 30.07 mbar .

Visibility: The visibility created by the weather engine. It will be displayed in the units selected in Settings.

In this example : 40.3 Km

Wind: The winds created by the weather engine. Units: Knots and degrees. In this example: 6.0 Knots from 198 degrees.

Season: The season FSX engine uses for creation of graphics and sometimes runway conditions. In this example: Winter. (Some airports in winter will force Snow or Ice to be selected for the runway surface while forcing e.g. asphalt when in Summer. Take note of that as you may experience strange behaviour of the runway conditions if seasonal effects are in conflict with actual weather conditions.)

Pressing the button with the + sign will bring you to the detailed weather information screen as shown below:

The screenshot shows the 'Weather' information screen in Sim Physics X. It features a menu bar at the top with options like Home, Forum, Support, Manual, Check for Updates at Startup, Auto ShutDown, License, and New Version. Below the menu, there are three main data tables:

- Winds Data:** A table with columns for Altitude, Direction and variables, Speed and variables, Turbulence, and Windshear. It shows wind data for various altitudes from 6,001 feet to 51,998 feet.
- Temp Data:** A table with columns for Altitude, Temp. and variations, and Dew Point. It shows temperature and dew point data for altitudes from 89 feet to 48,999 feet.
- Clouds Data:** A table with columns for Lower Alt, Upper Alt, Type, Coverage, Rate and Type, Turbulence, and Icing. It shows cloud data for altitudes from 200 feet to 2,500 feet.

A 'BACK' button with a left-pointing arrow is located in the bottom right corner of the weather information area. The bottom of the screen displays the Microsoft Flight Simulator version (10.0.61637.0) and the FSUIPC version (4.86).

You can see three main tabs with a lot of available lines.

The first tab is the Winds Data.

As you can see it gives information per altitude of the direction of the wind and its possible variable direction, the speed of the wind and its possible variable strength,

of wind turbulence if it exists and of Windshear if again that exists.

A table of many altitudes is created, so you can see real-time weather information at all the weather engine layers created. Very important as you can check the climb schedule, make your plans on Anti-Ice activation etc. The table updates in real time, so if you want to have correct information, check it often.

Second tab is the Temp Data, which stands naturally for Temperature Data. Here again information is gathered from FSX weather engine and the output is presented layer by layer on each line. The altitude, the temperature and its possible variations plus the dew point are displayed.

Last tab is the Clouds Data.

Once again information is gathered from FSX weather engine and the output is presented layer by layer on each line. The lower and the higher altitude of the existing cloud is displayed along with its type, coverage in percentage, precipitation type and rate if it is present, and of course turbulence and icing strength in the cloud if again these exist.

Combining all the information of the detailed weather page is a very useful tool for flight planning and flight motoring.

Pressing back will navigate you back in the Airport Information screen.

The next tab is the Nearest Airport tab that is linked to the Nearest Airports information tab below.

Nearest Airports

KJFK	2.6 Nm
FLU	7.5 Nm
CGAS	8.4 Nm
KLGA	8.5 Nm
4NY2	8.6 Nm
NK30	9.6 Nm

Nearest Airports Information

Runway	Length	Altitude	Surface	ILS	Freq	Course	Glide Sl...	DME	Category
▶ 13R	14,564 ...	13 feet	Asphalt						
4L	11,353 ...	13 feet	Asphalt	IHIQ	110.90	45	Yes	Yes	ILS/DME
13L	9,992 feet	13 feet	Asphalt	ITLK	111.50	135	Yes	Yes	II
4R	8,401 feet	13 feet	Asphalt	IJFK	109.50	45	Yes	Yes	III
31L	14,564 ...	13 feet	Asphalt						
22R	11,353 ...	13 feet	Asphalt	IJOC	109.50	222	Yes	Yes	ILS/DME
31R	9,992 feet	13 feet	Asphalt	IRTH	111.50	315	Yes	Yes	ILS/DME
22L	8,401 feet	13 feet	Asphalt	IIWY	110.90	225	Yes	Yes	III

Hide Kennedy Intl Information

On the upper left part is the Nearest Airports tab.

There the 6 closest airports compared to the aircraft's position are presented with their ICAO 4-letter designator code and the distance (of Airport's centre) to the aircraft.

Pressing the + sign button next to each airport will bring up detailed Runway information on the bottom “Nearest Airports Information” tab.

So in case of an emergency situation for example or if you just want to land because you have to leave, assuming that your aircraft is not equipped with a sophisticated FMC , you can find here the most suitable airport to land. Runway lengths and their elevation are presented, along with their Surface type (To avoid landing your Boeing on a grass surfaced 2 mile long runway for example).

Pressing Hide Information removes the Information displayed. Like this:

The screenshot displays the Sim Physics X interface for airport information. At the top, there is a 'Menu' bar with icons for Home, Forum, Support, Manual, Check for Updates at Startup, and License. Below this is a navigation bar with 'Airport Informations' selected. The main content area is divided into several sections:

- Current Airport Information:** Displays details for Heathrow (EGLL), including Country (United Kingdom - London), Runway (9L), Length (3,897 meters), Width (50 meters), Mag Heading (92.69 degrees), Mag Variation (-3.000 degrees), Surface (Asphalt), and Friction (VERY GOOD).
- Weather Information:** Shows OAT (4.0 °C), TAT (4.0 °C), Dew Point (1.0 °C), QNH (30.07 mbar), Visibility (40.3 Km), Wind (6.0 Knots 163 degrees), and Season (Winter).
- Flight Simulator Clock:** Displays System UTC Time (2/9/2013 4:45:53 PM), FS UTC Time (2/9/2013 12:33:38 PM), and FS Local Time (2/9/2013 12:33:38 PM).
- Nearest Airports:** Lists nearby airports with their distances: EGLL (1.01 Hm - Current Airport), EGWU (5.23 Hm), EGLD (6.71 Hm), EGTF (8.20 Hm), EGLM (10.78 Hm), and EGTR (12.30 Hm).

A 'BACK' button is located in the bottom right corner of the main content area. The status bar at the bottom shows 'Microsoft Flight Simulator® 10.0.61637.0 (FSX-Xpack.20070926-1421) - FSUIPC Version Connected: 4.859s (Registered)' and 'Version 1.0.0.0'.

In case of really big, or better say huge airports with many many runways more pages will be available for you to check. (Up to to 3 pages on the airport with most runways in FSX).

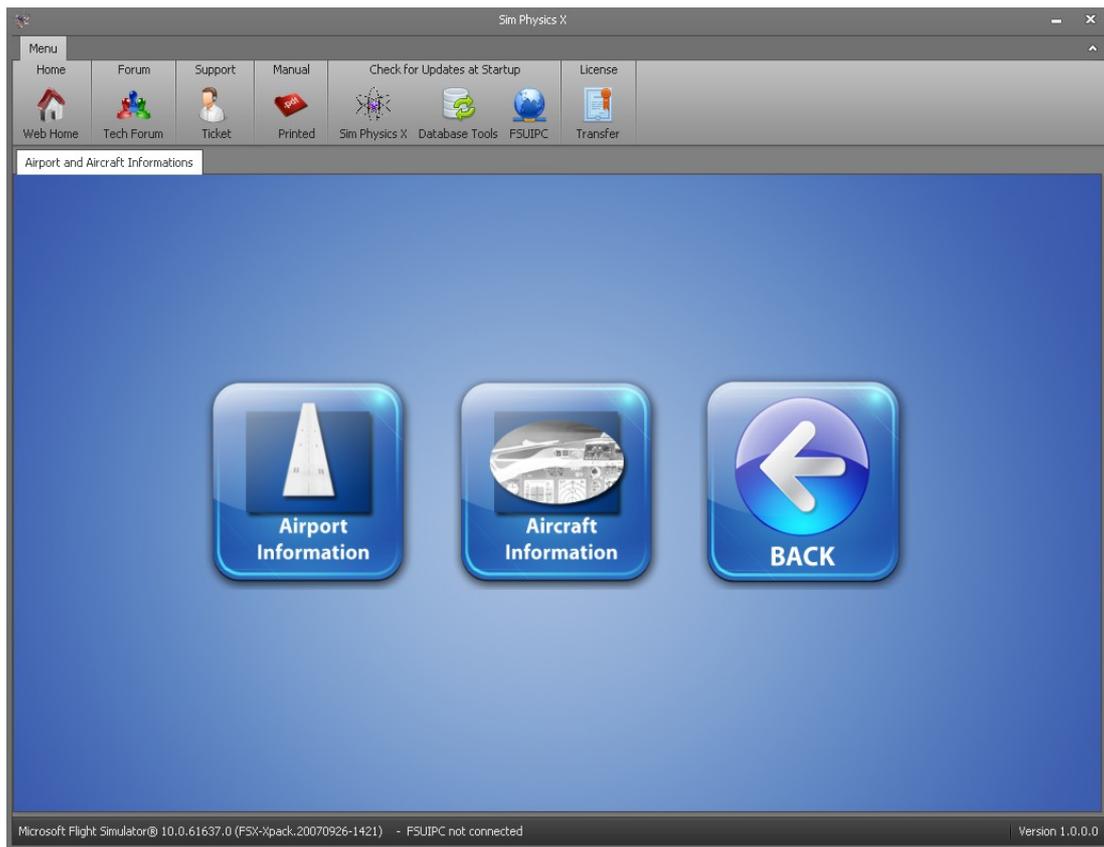
Finally the Flight Simulator Clock tab:



displays your PC's (System) UTC date and time (UTC is the so-called Z Time , Zulu time) , your Flight Simulator UTC date and time, and Flight Simulator Local Time.

We guess you can understand the differences , so we won't expand...

Pressing the back button brings you back to the Aircraft or Airport Information selection submenu:



6.6.2 Pressing this time **Aircraft Information** button will bring you into this screen:



As you can see many tabs are displaying crucial information of the aircraft's systems most those having relation with Sim Physics X to be exact...

There are 6 main tabs, let's try to explain them in depth one by one.

First tab on the upper left part of the screen is the Aircraft Information.



Basic information of the Aircraft is displayed here, directly taken from the aircraft.cfg file of the plane you picked.

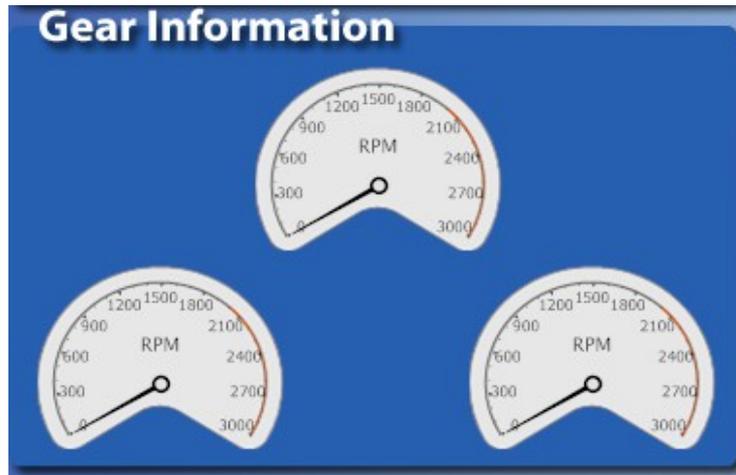
Aircraft Model , Aircraft Name, Airline and Tail Number .

*** Caution ***

In case your aircraft is new and you haven't run the Physics X Configurator (and the "Prepare Airplanes" part) you will see a large warning sign. This means that your aircraft is not properly configured for use with Sim Physics X and so you have to run the Configurator in order to make it work.

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Second tab directly underneath the first is the Gear Information.

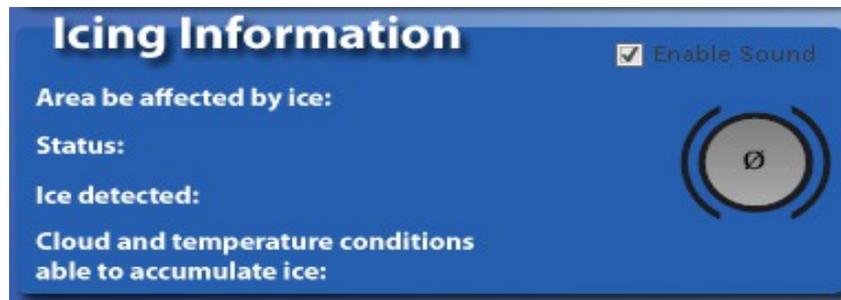


You can see the 3 gauges that – in real time – measure exactly the revolutions per minute (RPM) of each wheel.

These are not a direct speed gauge as each wheel is different. For example if you taxi down the runway with an aircraft whose front wheel has a much small diameter compared to the two main wheels, the front wheel RPM will be much higher.

In any case this tab will give you some idea of what is happening during wheel locking, during take off, during flare for landing when the Anti-Skid is off etc.

Third tab on the left is the Icing Information. If FSX isn't running you will see this:



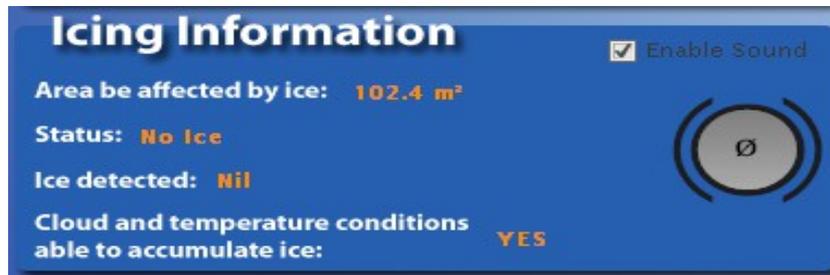
This is a very important tab that gives valuable feedback in relation to the Icing effects that hit your aircraft.

First of all the “ Area be affected by ice: “ will give you an figure of how much of the total aircraft's area can be affected by ice. This is not the total area of the aircraft of course but a part of it. Sim Physics X calculates this number by carefully reading the aircraft model and comes out with a certain figure. Changing aircraft will change this number, also please check how the number changes even in similar types of aircraft...

The larger the number – naturally – the bigger the ice quantity that accumulates on the aircraft per second. However a big number is not always more “difficult” for a pilot to handle , as here the engine power and the total lift the aircraft produces come into play. For example an Airbus A380 can easily handle even a ton of ice accumulated on its whole structure, if this is applied on a C172, the result will be a huge disaster .

The “Status: “ and the “big round gauge” are linked together and can get 4 different readings :

First possibility is to have the “Status:” reading “No Ice” and the round gauge Grey in colour with nothing showing inside, just like below:



If this is the case, Status declares that there is No Ice on the aircraft... We emphasize the “on the aircraft” because there could be ice around but not yet accumulated on the airframe.

Second possibility is to have the “Status:” reading “De-Icing” and the round gauge at Green with a minus sign inside, just like below:



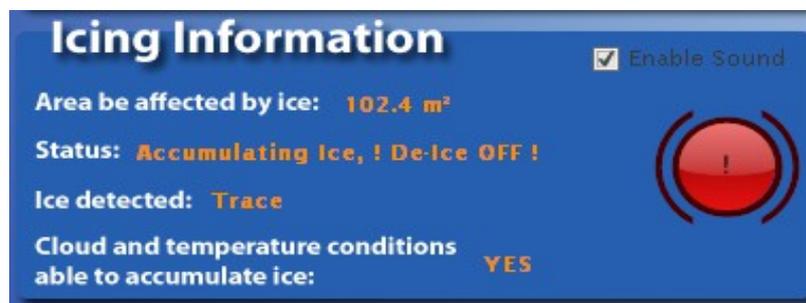
If this is the case, Status declares that there is ice still on the airframe, but it's quantity is getting less as the time passes. This is not only related to the Structural or Wing Anti-Ice being turned on , but in relation to the temperature conditions, if you were out of clouds and so on.

Third possibility is to have the “Status:” reading “Accumulating Ice, De-Ice ON” and the round gauge to Orange with a plus sign inside, just like below:



In this case, you have successfully turned on the Anti-Ice system of the aircraft but despite this, the Icing is so strong that Ice still accumulates on the airframe. Leave the cloud as soon as you can, check for higher temperatures, find a solution FAST, as the quantity you are getting could be from tiny to huge (You can never know)

Last possibility is to have the “Status:” reads “Accumulating Ice!,De-Ice OFF!” and the round gauge to Red with a ! sign inside, just like below:



This means that Ice is accumulating in the aircraft and you have Anti-Ice system to OFF ! Turn it on immediately as the rate ice accumulates is much higher with the Anti-Ice at the OFF position. After doing so the gauge should turn to orange and the Status will change back to “Accumulating Ice, De-Ice ON”.

Next in the Icing Info tab is the “Ice Detected” reading.

This checks the FSX weather engine and your Aircraft's position, to determine if you are flying inside a cloud, and if yes , if this cloud “carries” ice inside.

It can give you 5 readings:

Nil (There is no ice detected or you are not flying inside a cloud)

Trace (Very Small percentage of ice in cloud)

Light (Enough percentage of ice to start to worry)

Moderate (Danger starts to knock on the cockpit's door)

Severe (The only good thing is that things can't get worse than this)

Some payware aircraft have this option integrated, this is now available through Sim Physics X for every aircraft – even the stock ones.

Finally there is the “Cloud & Temperature Conditions able to accumulate Ice” reading.

This will inform you in a simple YES or NO read-back if the ambient conditions are such that Ice can be accumulated on the aircraft. Give this reading a special weight!

It is not as simple as the YES – NO implies..

FSX weather engine can add Ice into every type of cloud. Can add Ice even if OAT temperature is 40°C or if TAT is 100°C . It doesn't care at all, it just gives this possibility to the user to set weather like this.

Every Payware aircraft out there that has an “Ice status reader” will read the Ice in the cloud and return a value in the PFD or the ECAM display.

Try setting up a weather scenario with 50°C at 0 altitude, a cirrus 8/8 (overcast) coverage between 1000 and 5000 ft , and in Ice a value other than None. Get into your expensive payware aircraft fly into that cloud and... “ICE DETECTED” will be shown.. Tragic...

Sim Physics X makes calculations based on scientific data and years of studying aircraft icing what type of cloud can contain hazardous Ice particles for an aircraft , in which range of temperatures (OAT and TAT) , and what the effect will be on the aircraft.

You will see that despite No ice being detected, sometimes Ice will be slowly built up as this label is YES. You will see that despite ICE Severe being detected ice will not build up as this label is NO.

Why? Because Sim Physics X calculates perfectly when, where and how ice accumulates and ONLY then adds it on the aircraft.

The first – and complete – Icing emulation system is at your hands with Sim Physics X.

Enjoy it!

Enable Sound tick-box:

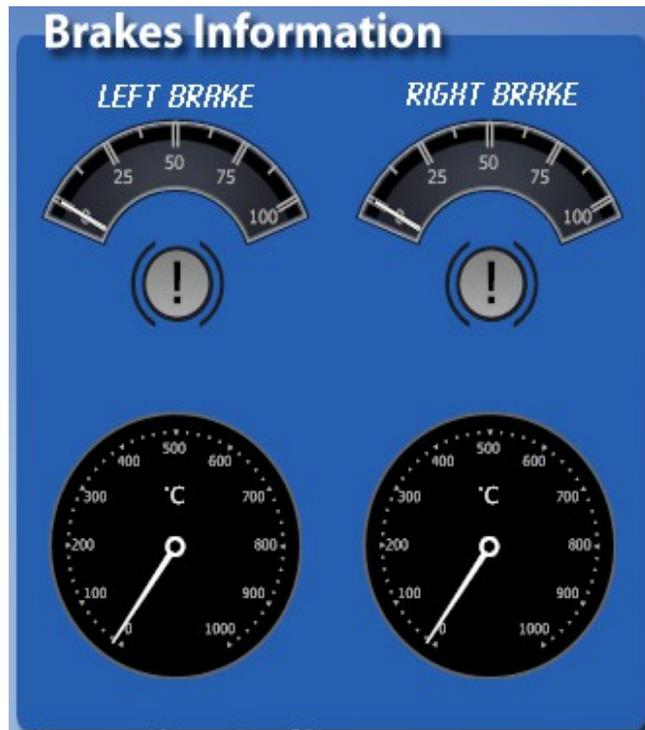
On the upper right part of the Icing Information tab you should notice a tick-box with the label Enable Sound next to it.

Every time the Status changes, a sound is played to inform you about the change. You can uncheck this box if you don't want to hear the sound, as sometimes it can be distracting or annoying. (e.g. if you enter and exit clouds all the time, or when you prepare for an approach.)

However the sound playing could be handy if you are using a single monitor configuration and Sim Physics X runs in the background.

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Next tab on the Aircraft Information page is the Brakes Information:



As you can see there are 2 sets of gauges , one for the left and one for the right brake.

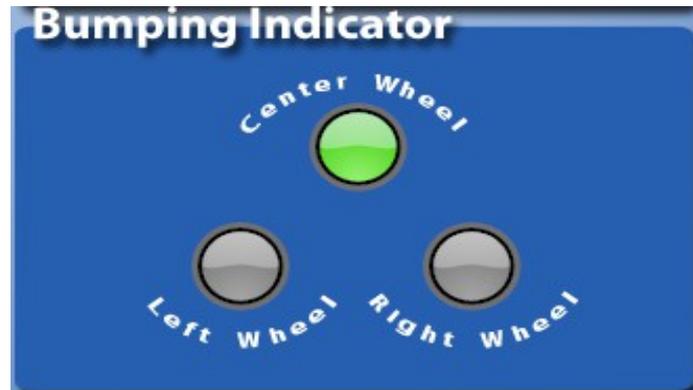
The upper one represents the braking power applied (as output) to the brakes. Check how much this reading changes when you apply manual braking with the Sim Physics X Anti-Skid feature ON , compared to OFF.

The middle row represents the brakes locking status and it is not a “Parking brake position”light.

If the wheels lock-up, one or both of these lights will turn to red.

The lower gauges shows the brakes' temperature reading. This reading will go up while you are applying braking power , as we described earlier. After many calculations Sim Physics X Braking system determines: The speed of the aircraft, it's mass and the ambient temperature. All play a role in your brakes' temperature. Watch this, because the higher the temperature the less performance your brakes will have. The temperature will decrease over time when you don't use your brakes. Check how much faster the temperature drops if you leave your wheels down while airborne!

Next tab on the lower centre section is the Bumping Indicator:



This indicator returns information on the Runway Bumping System.

It consists of 3 lights that represents your 3 wheels , the centre , the left and the right. The 3 lights have 3 possible colours.

When the colour is Grey this means that the moving wheel is not on the centreline so it cannot hit a centreline runway light.

If the colour is Green, this means that the wheel is on the centreline so if the aircraft moves ahead, eventually this wheel will hit a light.

Finally when the Green colour turns to Red, it is the exact time you will also hear the Bump sound and the visual effect on the 3D Cockpit view mode will be seen.

Try to place your rear right or left wheel on the centreline while the front wheel is also on the centreline. Imagine the centreline as "I" and the aircraft orientation as "/" . You will notice both centre and left or right wheel will turn green. This shows how precise the calculation of the centreline and the wheel position is.

In the settings as seen previously you can adjust the "virtual" width of the centreline light. If you set this wider you will see that it will be much easier to get the green light.

Next the final tab on the upper right hand is the “Active Settings” tab.



As you remember in various parts of Sim Physics X you can make changes to the Settings.

In this tab all the important settings show their values . The first ones have a light next to them, meaning that the particular setting is active when the light is GREEN, and de-activated when the light is RED.

Below, some features are represented by text and return values that you have set in different parts of the program.

Not much else to say as all the features have been previously explained. It is just a tab to confirm if a setting is active or not without the need to return to the individual setting screen.

7. Short Application Guide for everyday usage

- 1.** Finish the Physics X Configurator (if already done and/or no change in aircraft or scenery has been made, skip this step)
- 2.** Start up FSX
- 3.** Load the aircraft, weather etc, press Fly Now!
- 4.** “Spawn” in an airport.
- 5.** Finish the Aircraft load (very important in case of external payload managers)
- 6.** Start up Sim Physics X
- 7.** Check if on the upper right of the SPX screen the traffic light is Green.

If yellow you should deactivate the “Pause on task switch” in FSX Settings General.
If red your FSUIPC connection has troubles: re-install FSUIPC!

- 8.** Manipulate any settings you wish
- 9.** Minimize Sim Physics X (or move it out of your screen into a second screen, extended desktop etc)

FLY and ENJOY SIM PHYSICS X

When you are done and you close FSX Sim Physics X will also close automatically.

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8. Frequently Asked Questions

Q: Sim Physics X doesn't start. I pressed the icon but nothing happens.

A: Confirm the application is running by checking the Task Manager. If it is running, terminate the process (End Task) and navigate to the Sim Physics X installation directory. (i.e. Program Files/FSPS/Sim Physics X/) There delete the location.xml file.

Q: The Application terminates itself telling me to run the Physics X Configurator.

A: Do as it asks. Probably your configuration is broken or never completed.

Q: On some airports I have problems with the Runway Bumping System. Never on a default one, only in some payware.

A: The exact position of the centreline is determined from information written in the BGL scenery files, which follow a certain SDK: a standard for development let's say. If the developer didn't follow that SDK and his scenery contains wrong information (that is however not noticeable in the visual product) this may cause 3rd party applications like Sim Physics X to misbehave.

Q: I started the application and I see an “ERROR: All licences are in use” message.

A: Either you are trying to install the application on a different computer, or something is seriously wrong with your installation. If you do install on a different computer read the Activation chapter again. If not contact support by dropping a ticket to <http://support.thefsp.com>

Q: The application crashes unexpectedly upon start up.

A: Your Microsoft's NET 3.5 installation is not complete. Go to Microsoft's site to complete it. You may encounter the same if you don't have FSX installed but we guess this is not the case...

Also some systems may have a broken Simconnect installation. You have to re-install Simconnect. (Check for the Simconnect.msi installation file inside your FSX SDK folder) . If you can't find it ask for help via a ticket in <http://support.thefsp.com>

Q: My X “Perfect Payware” aircraft is not compatible with Sim Physics X

A: Despite our efforts to cover most of the aircraft out in the Market, this is impossible because many aircraft designers don't follow Microsoft's or Simconnect's SDK or disregard compatibility with FSUIPC. We identified some and covered them in our design using our own internal communication with the aircraft's systems but some irregularities could certainly occur. For example a well known and state of the

art aircraft with multiple awards don't return any value when you start up the Wing Anti-Ice from the overhead panel. So you will get ice until you run away from the ice conditions...

Please contact us with some details if this happens, in the support system:

<http://support.thefsp.com>

Q: In 3D virtual cockpit view I encounter strange behaviour with my views.

A: You must have a 3rd party head moving software. Due to the fact that the same technology we use for head movement, is used by other 3rd party applications (i.e. TrackIR, Ezdok camera) , Sim Physics X's camera effects cannot run at the same time with them. You should disable those programs to enjoy our camera effects.

Another solution to have both running is to disable all 3D Camera effects in Sim Physics X (both flying and ground camera) by setting the slider to zero. Also the Runway bumping system Virtual cockpit effect must be moved to zero. On this configuration all 3D effects are disabled and you can run any 3rd party camera application along Sim Physics X.

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9. Changes History

Version 1.3 (Begin of October 2013)

- Massive changes in code for passing more communication tasks to Simconnect.
- Further improved memory use and application's smoothness for low end systems.
- New airport information functionality
- Latest FSUIPC and MakeRunways versions
- Runway contamination system now directly controlled by FSX (Unregistered users of FSUIPC now enjoy the full benefits of the system)

Version 1.2 (End of July 2013)

- New Configurator
- Better CPU utilization
- New FSUIPC Version
- New MakeRunways Version

Version 1.1 (End of April 2013)

- Implementation of Ground Icing Accumulation (Check APPENDIX A)
- Implementation of Ground De-Icing procedures and all fluid types (Check APPENDIX A)
- Real Time Charts re-calibration to avoid out of index errors caused by corrupted SimConnect incoming data, finally fixed.
- Tyres squealing optimization to avoid zero wheel rotations (thus endless squealing sound) due to aircraft not made acc. to FSX SDK or due to SimConnect corrupted data or a combination of both.
- New configurator that produces extended FSPS Database for use with future expansions.
- New weather page with color coded lines for important weather phenomena.
- New Airport information – Nearest Airports representation.
- Fine tuning internal code for use with very weak machines. (Min requirements don't change however).
- New dll files
- Implementation of Anti-Ice button for aircraft with incorrect SimConnect or FSUIPC communication that caused Sim Physics X not knowing that user had

pressed the Wing Anti Ice button on his panel.

- Small brakes heating and cooling changes.
- New manual to reflect last changes.
- Auto Shut down button (to shut down SPX if FSX closes) on menu bar.
- FSX's accelerated rate of time (R & + or R & -) effects “time processes” in SPX (Icing accumulating - Deicing and brakes cool down times for example)

Version 1.0.0.5 (4 April 2013)

New dll files

Internal code for joystick devices changed , now fully automated calibration.

New activation exe file

New configurator

New 3D camera keystokes eyepoint changes implementation

More airport informations added

Brakes heating and expansion code changed

GA aircraft with wrong manufacturer values causing irregularities in Icing and braking fixed.

Russian FSX version now supported (special characters in aircraft.cfg)

Camera effects on 3D cockpit fixed for some aircraft and accuracy of position is now perfect.

Icing code expanded to take into account more factors for ice formation.

Charts code improved to eliminate out of range errors occuring due to strange SimConnect's values.

SimConnect code optimization

Aircraft.cfg file reading for gear points improved

More airports sort acc. to Nm fixed

NEW MANUAL reflecting changes. English fine-tuned and corrected by Ian Harrison

Version 1.0.0.4 (beta) : Internal release

Version 1.0.0.3

Remaining fault internally fonts replaced

Sounds can be configured up to 200%

Fonts resizing with windows magnified fonts fixed

New Physics Configurator Version 1.2.0.0

Internal code update for big database builds
Fonts resizing with windows magnified fonts fixed
Database message problem displaying correctly now

Version 1.0.0.2 (01 MAR 2013)

All fonts embedded into code.
Icing chart capacity increased
Controls chart capacity increased
Application's start up duration reduced
Rare disconnection from FSUIPC resolved
Gauge connection status added at top right corner
 Red = No FS Connection
 Yellow = FS Connected but in pause or slew mode or in menu activity
 Green = FS Connected
Braking temps for unregistered Fsuipc users: logic updated
Icing chart rare crash fixed
Updated code for charts
Analogue brakes support added (needs the Configurator 1.1.0.0)
Better memory management implemented (lower cpu usage)
Internal code update for big databases
Diagrams to Charts tab renamed
Degrees to degrees typo fixed
New Physics Configurator Version 1.1.0.0
 - Messages to show aeroplanes done list added
 - Aeroplanes done list option added
 - Supports up to six Joysticks
 - Supports analogue brakes for anti-skid
 - New alert message added
New activation executable

Version 1.0.0.1 (13 FEB 2013)

Missing dll file added (hot fix for old windows versions)
On Air Camera effect conflict with EZCA fixed
QNH for Hybrid and Metric fixed
File digital signatures added

Version 1.0.0.0 (11 FEB 2013) : Initial Release

10. APPENDIX A . (Version 1.1)

Prologue

Since the initial release of Sim Physics X many customers – obviously excited by the Icing accumulation features of Sim Physics X – requested the expansion of the Icing feature to cover all phases of the Simulation, thus including Ground Icing also.

On the first release this was not including as the physics behind the Ground Icing accumulation is – on a large extent – different than those while airborne . Also Ground Icing accumulation would mean that proper Ground De-Icing simulation should also had to be developed. In the end this would mean that release would had been delayed for months...

Well ... Ground Icing, via the free update to version 1.1 (or with a new purchase) is here .

GROUND ICING ACCUMULATION

Ground Icing Accumulation in Historic terms, had been the cause of terrible aircraft accidents. It was – and still is – a great danger to flights around the globe, and requires a great ground and pilot crew effort to properly be dealt with.

The main problem is that during certain weather conditions the Airframe and the Flight Control surfaces can be covered with a thick layer of Ice and this can have disastrous effects during the takeoff roll and the first moments of the flight.

In general Icing layers can be formed on the Aircraft surfaces if the Outside Air Temperature (OAT) is below Zero degrees Celsius and there is enough humidity on the air or rate of precipitation (rain or snow) that would turn into Ice.

The technology behind removing these layers of Ice before the flight is – in general – called Ground De Icing (and Anti Ice protection Applying.)

The most usual process starts with removing the Ice on the airframe by applying a hot fluid (some times even water or steam) and then by applying another fluid for the giving the aircraft some anti-ice protection for a limited time, in order the pilots be able to take the aircraft in the air safely.

VERSION 1.1 IMPLEMENTATION OF GROUND ICING AND DE ICING.

Version 1.1 of Sim Physics X brings you now further simulation on your FSX. While on ground and if the OAT is below Zero (0) degrees Celsius, if the humidity is high enough or if there is Rain or if there is Snow ... ICE will form on your aircraft. Slowly but steadily.

You can use the Ice Build up chart to check the quantity (the actual weight) of extra ice on the aircraft. As always the precipitation rate , the temperature, even the wind strength play their role on how much ice is actually accumulated.

So if you land (or start your session) in an airport with “bad” weather conditions (Microsoft's default “Heavy Snows” weather is a good test bed) you will feel the effect of the problem. Your solution is to use before your departure the proper De-Ice and Anti-Ice fluid , so that the ice could be removed and a protection be applied on your aircraft while taxi and taking off.

Have in mind that the De-Ice fluid itself is being dropped from the aircraft due to the high Airspeed and vibrations (usually during the take-off procedure) so the protection ends when airborne. From then on you can depend only on your aircraft's protection mechanisms (Wing and Structural De-Ice, and Engine Anti-Ice) and your ability to avoid probable Icing conditions (especially when there is more than “light” Icing) by flying on an alternate course or by changing your altitude.

Let's see how the whole thing works...

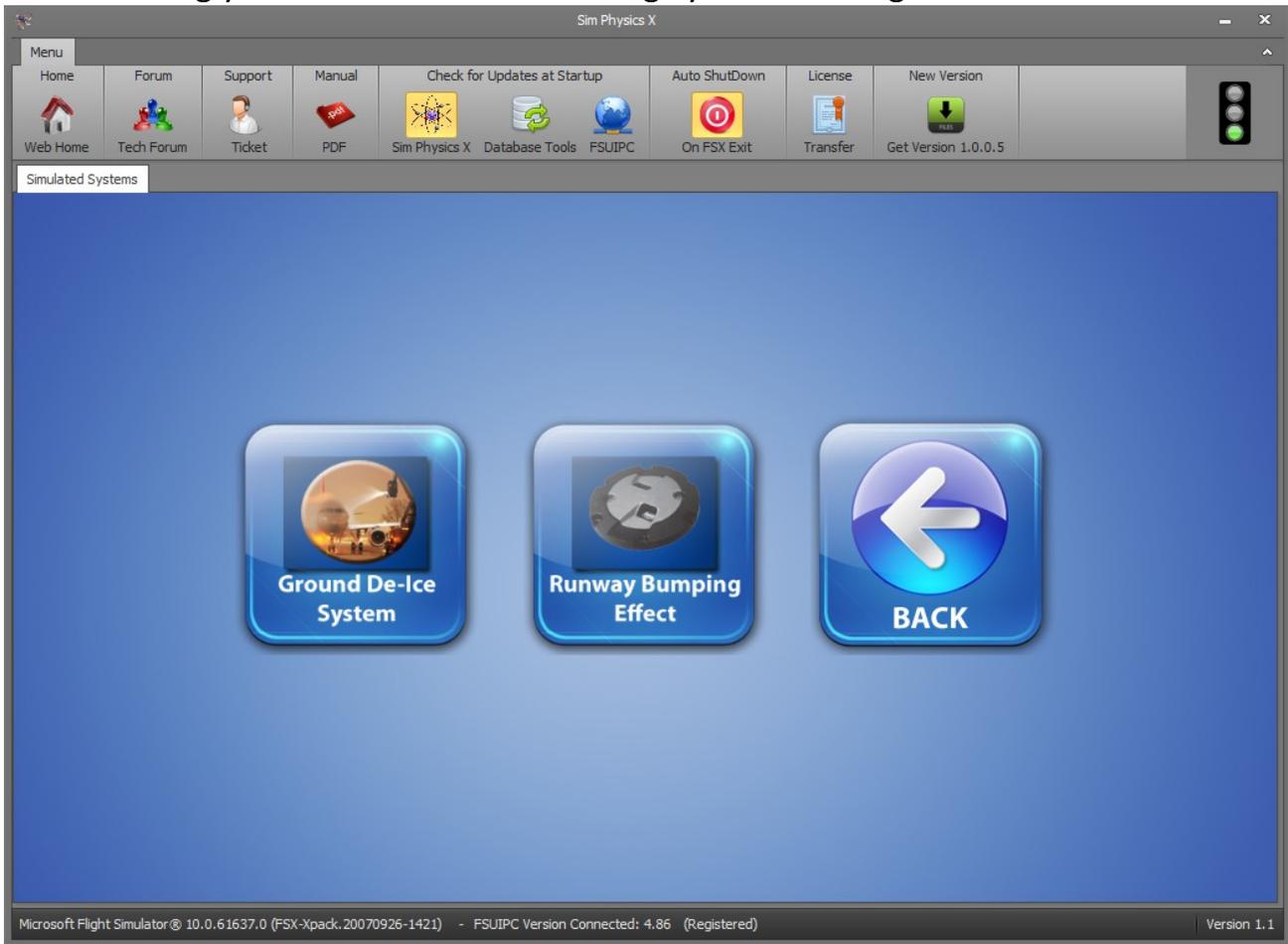
The Ground De – Ice System

On the main Sim Physics X menu:



Press the Simulated System Settings button.

This will bring you into the new “Simulating Systems Settings” sub menu:



As you can see the up-to-version 1.1 menu is gone (was concerning only the Runway Bumping Effect) and is now inside the appropriate menu “Runway Bumping Effect”)

Press the Ground De-Ice System button.

(Assuming that you had your aircraft ready at the airport , using Microsoft's default “Heavy Snows” weather you will see in Sim Physics X the following screen, have the Parking Brake ON during this...)

The Ground De – Ice System Menu:



As you can see this is a screen that is split on 3 main sections:

On the left :

You can see some aircraft and weather information , and on the bottom left the Ground Icing Information. As you see due to the weather conditions our aircraft starts to be covered by ice. (Status: Accumulating Ice! De-Ice OFF!), since the “Humidity, temperature, and precipitation rate able to accumulate ICE on ground” is “YES”.

You can slow down the accumulation by turning your Wing Anti Ice on , but this is not enough. Anyway let's push that ON at the Overhead ...



As you can see the change is visible in Sim Physics X (“Status: Accumulating Ice, De-Ice ON”) and the new Anti-Ice button is also turned on.

Important note for the new Anti – Ice button:

- Some aircraft are not properly made by their software manufacturers , and are not using the according “Wing Anti Ice” offsets either with FSUIPC or SimConnect the two ways we are gathering and sending data from/to FSX. This has the effect that despite the user is pushing the Anti-Ice button on FSX aircraft's panel, no effect on the status of Sim Physics X was made. So if you see no change on “Status” label , if you see that you are “Accumulating Ice, De-Ice OFF” despite you had the proper button pressed in FSX , you must press the Anti-Ice button in Sim Physics. This will send the proper command to FSX and turn indeed the Anti-Ice to ON. Press it again to turn it off.

If the aircraft is correctly made according to FSX's SDK the button will produce the proper effect in your aircraft's panel also – turning the button correctly ON and OFF.

On the center part you can see the available Fluids under “Fluid Type

Selection” (Fluid Tupe I, II, III and IV) for De-Icing and some basic information next to them.

Here you can select one or a combination of two De-Ice fluids for the De-Icing process. Every combination will give you a different result on the protection duration. (More on this later).

If the buttons are not properly colored, two things may happen:

- Either you don't have the Parking Brake engaged (You have to, if you want fluids be applied).
- Or, the weather is such that De-Icing is not needed!

Selecting one or two fluids will change also the status on the

Right part where the “Selected types” lights turns to orange.

Also present are:

The “Fluid Application Duration” that gives to user feedback on how much time is left for the De-Icing process to complete. (It starts with 2 minutes for one type selection and goes to 3 minutes for a two type combination selection).

The “ Protection Ends:” that gives feedback to use on when the applied protection ends (no ice will be accumulated on aircraft during this time).

And the two buttons : “Start De-Ice” and “Stop-reset procedure”.

Let's present an example...

DE-ICING PROCEDURE EXAMPLE

As said before, the scenario is: be on the ground, with the Parking Brake ON, your Wing Anti-Ice also ON, and the weather such to create Ice accumulating effects. If done so you will see the following screen:



As you see the weather condition is building Ice in our aircraft. Let's get the rid of it. We really don't like to end up on a highway on the extension of the the runway, or into the sea or a nearby frozen river...

Press and select the Type I and the Type IV fluids on the centre frame:



You can clearly see that those two types (TYPE I and TYPE IV) are selected. By the way this is a wide used technique as TYPE I has excellent De-Ice properties (removing the Ice from the airframe) and then applying the TYPE IV gives excellent protection against further icing accumulation.

- You can select up to two fluids. In any case the protection duration depends on the “best of the two fluids” in relation of the weather conditions (check the “Holdover table” below)
- Type IV is not selectable “stand alone” as it used in normal temperature (not pre-warmed) so it can have no De-Ice effects alone.

All you have to do is to press the “START DE – ICE” button.

You can see the message “De Icing started” in FSX also:



And soon after the duration of the De-Icing procedure also.
In Sim Physics X, you can check the remaining time also on the right :

After the procedure finishes you will see in FSX and Sim Physics X the remaining time your aircraft will be protected from Icing Accumulation.



As you see almost an hour in this case is on your hand to prepare the aircraft for take off...

Spend it wisely and get airborne...

Note that:

Each fluid provides different protection duration , depending on the Weather. (Mostly temperature and precipitation type and rate).

Also Weather Changes will change the remaining duration! In example a sudden temperature drop AFTER the procedure was applied will change your “Protection Ends” time and you maybe have to alter and speed-up your planning. Don't forget your checklist however doing so... Aircrafts tend to crash because of that. So Pay attention to the “Protection Ends”. You don't want to take off without protection.

FLUID TYPES AND PROTECTION DURATION. A PILOT'S CALCULATING NIGHTMARE.

Despite De-Icing procedures are a great tool at the hands of the Airline Industry , making flights possible where the weather conditions are such that in the past it was highly dangerous to even consider a take-off , it had put a further “calculations problems” on pilot's mind...

Each Fluid , its exact composition, percentage of water in the mixture, its temperature , the weather conditions all play a role on how the applying of the procedure is effecting the protection duration. So each Airline uses a complex way to provide information to the flight crew on how much time they have to spend, on the so called “Holdover tables”, available for the Turn-around...

International Organizations like ICAO, FAA, CAA, AEA etc provide also guidelines and standard Holdover tables. (more than 100)

Unfortunately Flight Simulation X limitations in the weather engine cannot provide accurate data for these tables to be implemented as is, nor the fluid exact composition selection which is a “ground crew” job, would be implemented also.

Sim Physics X , due to the above, is using the “ideal” mixture on each fluid type and uses an internal “Holdover Table” to calculate each time the remaining protection time.

It is not in the scope of this manual to provide deep details on how this works but you can follow the following table (page 87) to calculate in general the time you will be protected.

We emphasize the word “general” because even small weather changes can effect the duration after the application of the fluid. So it is not something “fixed”.

Also note that the Accelerated Rate of FSX can be used to speed things up in the clearing process as also in the ice build up. (To avoid staying on an airport for ... 2 hours in Icing conditions to check what will happen if you take off) . It is fully supported by Sim Physics X in other aspects that requires “time” in general (Time to cool down brakes etc).

SIM PHYSICS X – HOLDOVER TABLES FOR GROUND DE-ICING

FLUID TYPE	OAT (°C)	HOLDOVER TIME (MINUTES)		
		ICING DUE TO HUMIDITY	ICING DUE TO SNOW	ICING DUE TO ICED RAIN
TYPE I	-3°C < OAT < 0°C	9	7	5
TYPE I	-6°C < OAT < -3°C	7	6	5
TYPE I	-10°C < OAT < -6°C	6	5	4
TYPE I	OAT < -10°C	5	4	3
TYPE II	-3°C < OAT < 0°C	60	45	30
TYPE II	-14°C < OAT < -3°C	40	30	15
TYPE II	-25°C < OAT < -14°C	20	15	N/A
TYPE III	-3°C < OAT < 0°C	40	20	15
TYPE III	-14°C < OAT < -3°C	30	15	5
TYPE III	-25°C < OAT < -14°C	25	10	N/A
TYPE IV	-3°C < OAT < 0°C	180	120	55
TYPE IV	-14°C < OAT < -3°C	120	55	25
TYPE IV	-25°C < OAT < -14°C	40	30	5

FLUID TYPE	OAT (°F)	HOLDOVER TIME (MINUTES)		
		ICING DUE TO HUMIDITY	ICING DUE TO SNOW	ICING DUE TO ICED RAIN
TYPE I	26.6°F < OAT < 32°F	9	7	5
TYPE I	21.2°F < OAT < 26.6°F	7	6	5
TYPE I	14°F < OAT < 21.2°F	6	5	4
TYPE I	OAT < 14°F	5	4	3
TYPE II	26.6°F < OAT < 32°F	60	45	30
TYPE II	6.8°F < OAT < 26.6°F	40	30	15
TYPE II	-13°F < OAT < 6.8°F	20	15	N/A
TYPE III	26.6°F < OAT < 32°F	40	20	15
TYPE III	-13°F < OAT < 6.8°F	30	15	5
TYPE III	-13°F < OAT < 6.8°F	25	10	N/A
TYPE IV	26.6°F < OAT < 32°F	180	120	55
TYPE IV	-13°F < OAT < 6.8°F	120	55	25
TYPE IV	-13°F < OAT < 6.8°F	40	30	5

FINAL WORDS

As you probably can observe every fluid type provides different protection. That's logical as the latin number next to the word Type goes with the era each fluid type was invented and brought in the business.

Type I was the first one made , with very low times as you can see, but still used today due to it's excellent De-icing properties. Types II and III followed years later, to provide longer Holdover times and avoid conjunctions for de-icing at the runway entering points, as most times due its short term protection the appliance of the Type I fluid had to be done the last possible moment before takeoff.

Type IV is the most recent fluid and most widely used by the industry nowadays , providing the longer holdover times of all fluids. But it has the disadvantage that it cannot be used alone as it has very poor de-icing properties (Other warmed type must do the De-Icing before Type IV is applied), so making the whole process a bit expensive.

Note that none of the newer fluids provide any protection in extremely low OATs and the “ancient” TYPE I is the only choice below -25°C .

GRAPHICAL REPRESENTATION

As you can understand ,having purchased and used Sim Physics X, here at FSPS we mostly care of bringing you the best possible simulation of various systems. Nobody however in the programming team is a 3D artist and the graphical representation of the De-Icing trucks etc. on the ground couldn't have be done by us.

We are however in contact with Aerosoft's “AES” © developer , that had produced an excellent product which also includes the graphical representation of the procedure. In the future the two applications may – after some programming issues been resolved – work together with great compatibility and interaction to provide to you, the final user the best possible simulation of Ground de-icing for FSX. Till then...

Have some effective Ground De-icing Simulations Captains!