Fire Fighter X

Documentation

http://firefighterx.weebly.com

Version 1.87
23.06.2019

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1. Overview

Tired of repetitive fire bombing missions? Trigger switches to put out fires that may work or may not work? Want the real thing? Meet FireFighterX.

This addon application for “Microsoft Flight Simulator X ®” and “Lockheed Martin Prepar3d® V2.5, V3 and V4 puts you in a completely dynamic environment, where fires live and grow, are aware of weather and precipitation, generate updrafts and general mayhem.

- Spawn fires randomly or in any specific place you like.
- Watch them grow and multiply themselves.
- Jump into your water bomber and do something about it!
- Invite other FFX pilots to join you in MultiUser sessions
- Send out AI fire fighter airplanes to assist you
- Use any plane in your FS hangar.
- Fight the nasty updrafts over the fires.
- Keep your distance – fly too low and suffer the consequences.
- Refill your tanks at the airport.
- Scoop water from water bodies near you.
- Handle the effects of weight shift when dropping fire retardant from your aircraft in large quantities.
- Use large drops of retardant as barriers to prevent fires from spreading.
- Tweak any aspect of the fire and retardant drop simulation to your liking.
- Save or load settings profiles.
- Save or load fire situations.

2. Installation

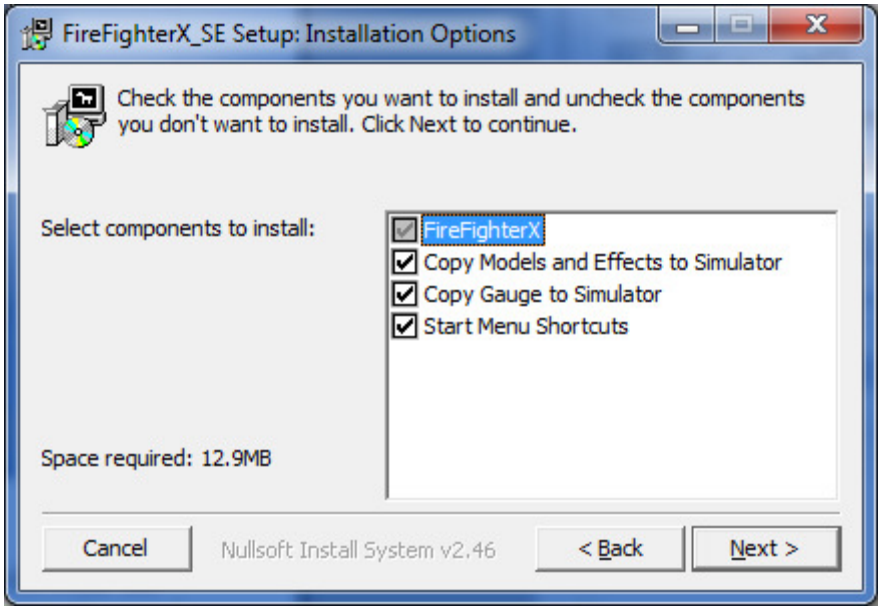
2.1 Distribution

FireFighter X is distributed as self-extracting installer packages.

2.2 Installation

- Please use the installer intended for your sim:
  - FSX boxed or dual install with SE: *FireFighterX_Install.exe*
  - FSX SE stand alone: *FireFighterX_Install_SE.exe*
  - Prepar3D V2.5: *FireFighterX_Install_P3D.exe*
  - Prepar3D V3: *FireFighterX_Install_P3D_V3.exe*
  - Prepar3D V4: *FireFighterX_Install_P3D_V4.exe*

Running the installer:



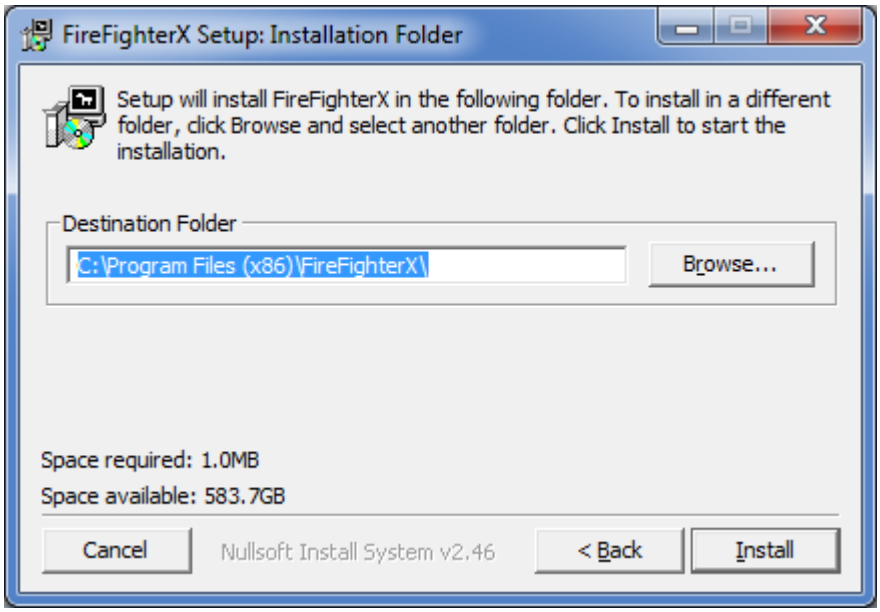
On the first page you may select optional installation targets:

- "Copy Models and Effects to Simulator" (does not apply to P3D V4) : The installer will read the default path to your simulator from the Windows Registry and copy the FireFighterX effects and SimObjects directly into it.
  Note: the installer will always copy the new Effects and SimObjects into the main directory of FireFighter X, in case you want to copy

them yourself or your sim is not present in the Windows Registry.

- "Copy Gauge to Simulator" (does not apply to P3D V4) : The installer will read the default path to your simulator from the Windows Registry and copy the FireFighterX gauge directly into it.
  Note: the installer will always copy the gauge files into the main directory of FireFighter X, in case you want to copy them yourself, or your sim path is not present in the Windows Registry.
  Note: this does not install the gauge into any aircraft, it just makes the necessary files available for manual installation.
- "Start Menu Shortcuts": FireFighterX will be added to your Start Menu (advised)

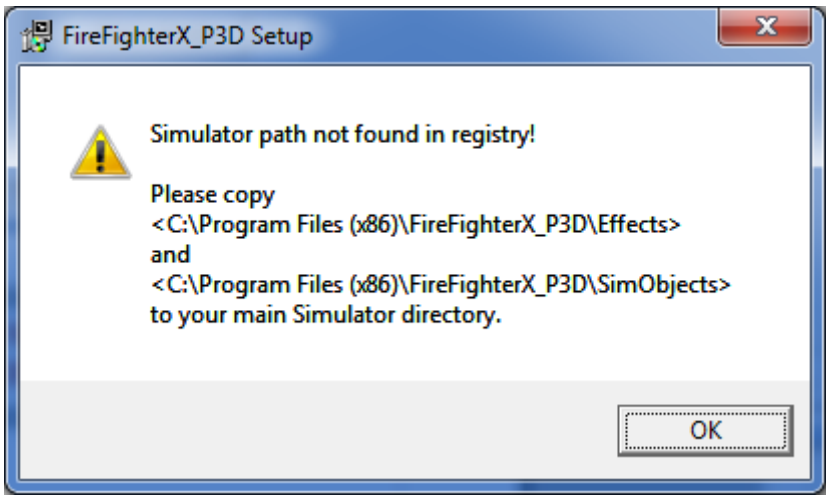
- On the next page you choose the installation path for FireFighterX. **THIS IS NOT THE PATH TO YOUR SIMULATOR DIRECTORY, IT IS USED EXCLUSIVELY FOR FIREFIGHTER X!**



- Selecting "Install" will begin the installation

Troubleshooting:

- If your simulator can not be detected in the registry, the installer will show an error message.



In this case, you have to copy the two folders mentioned in the message to your main sim directory yourself.

2.3 Microsoft .Net 4.0

The FireFighter X requires that the .Net ("dot Net") library version 4.0 is installed and current on your PC. This will most likely be the case if you are running a modern PC with Windows 7 or if you are using FSX SE or P3D V2/3ff.

On older PCs it may be required to download and install Microsoft .Net 4.0. The download can be obtained here: https://www.microsoft.com/en-us/download/details.aspx?id=17851

2.4 SimConnect

FireFighterX relies on SimConnect being installed correctly on your computer. SimConnect is a part of FSX/P3D and it is set up automatically when you first install the simulator. To save you the trouble of installing the SDK, the necessary SimConnect DLL for each sim is shipped inside FireFighterX and gets deployed in your Temp folder when FireFighterX is run.

FSX only: In case SimConnect is not installed, and FireFighterX does not start up, giving you an error message instead, you will have to install SimConnect manually:

- FSX boxed users can find the "SimConnect.msi" installation file

either online or in the FSX SDK folder "..\Microsoft Flight Simulator X SDK\SDK\Core Utilities Kit\SimConnect SDK\lib"

- FSX SE users find it here: "..\Steam\steamapps\common\FSX\SDK\Core Utilities Kit\SimConnect SDK\LegacyInterfaces\FSX-SP1\SimConnect.msi "

SimConnect networked: it is possible to run FireFighterX on another computer, using the standard SimConnect network setup. But as the LAN connection is very slow compared to accessing the sim on the same computer, especially the water drop effects will not render properly.

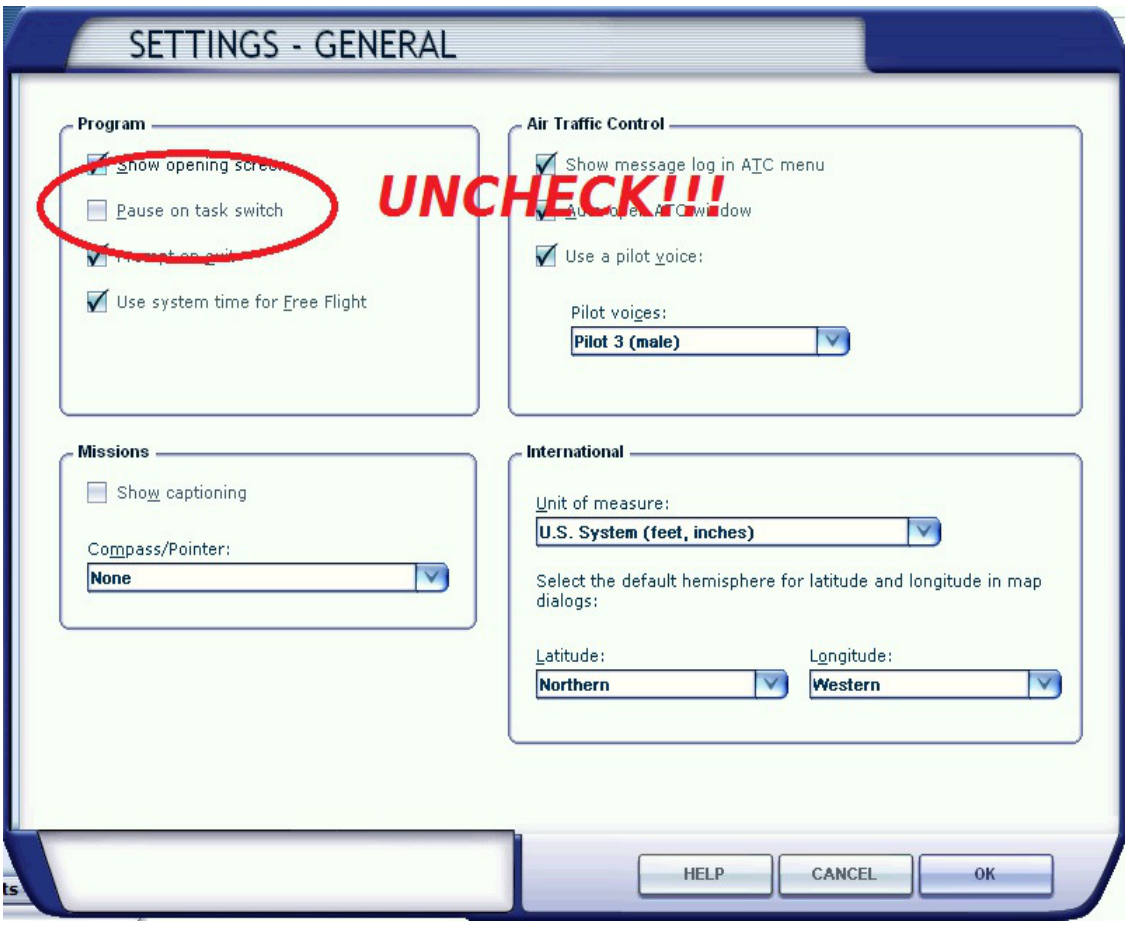
2.5 Vsync

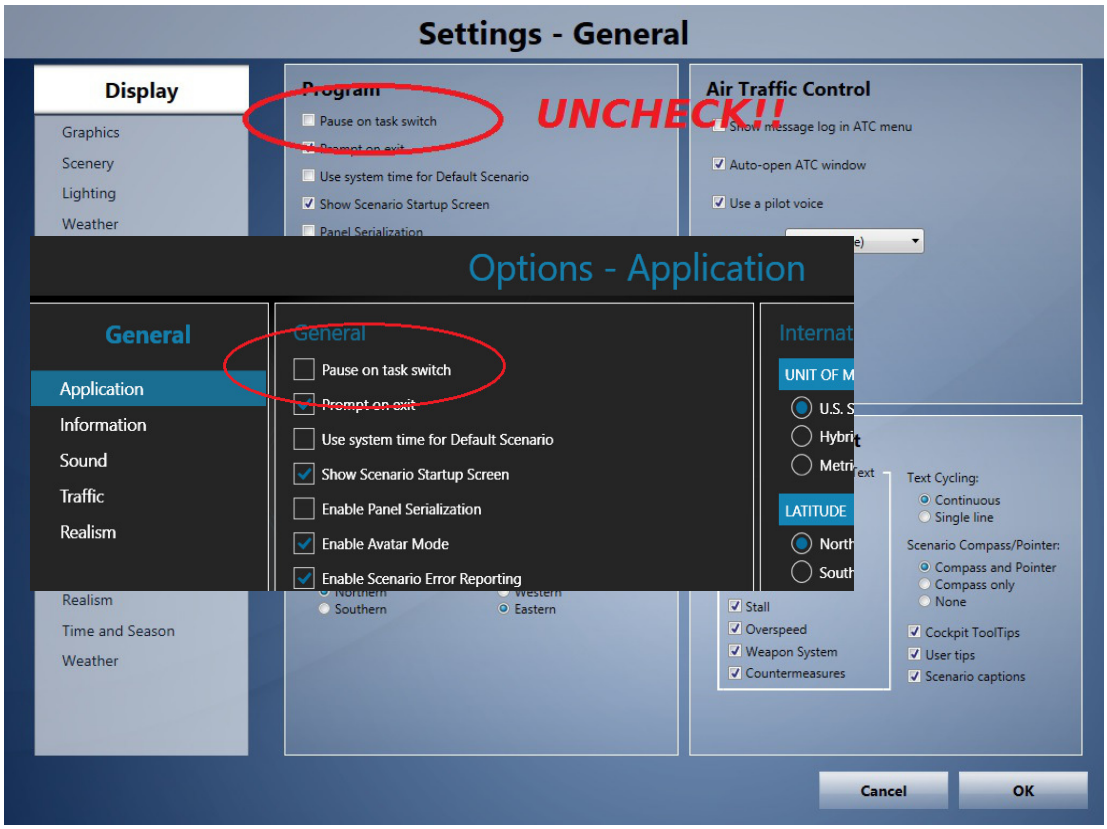
If Vsync is activated, either in the sim or externally (for example through Nvidia Inspector), the green status bar display may lead to periodic (one second) stutters in the sim. To counter this effect, an alternate status display has been implemented, using a window (similar to the ATC window). Using this will rid your sim of the stutters, but the window will gain focus every second, making it necessary to switch it off if other windows need to be operated. It does not affect gauges or panels though, neither in VC nor in 2D.
Please refer to the chapter "In the sim" for further information.

2.6 Pause on Task Switch

FireFighter X is a separate application, a task independent from your simulator.

It is therefore extremely important, that you switch the "Pause On Task Switch" option OFF in your simulator. If you leave it on, the FireFighter X can and will not work correctly!


SETTINGS - GENERAL
Program
Show opening screen
Pause on task switch
Use system time for Free Flight
UNCHECK!!!
Air Traffic Control
Show message log in ATC menu
Use a pilot voice:
Pilot voices:
Pilot 3 (male)
Missions
Show captioning
Compass/Pointer:
None
International
Unit of measure:
U.S. System (feet, inches)
Select the default hemisphere for latitude and longitude in map dialogs:
Latitude:
Northern
Longitude:
Western
HELP
CANCEL
OK


Settings - General
Display
Graphics
Scenery
Lighting
Weather
Pause on task switch
Use system time for Default Scenario
Show Scenario Startup Screen
UNCHECK!!
Air Traffic Control
Auto-open ATC window
Use a pilot voice
Options - Application
General
Application
Information
Sound
Traffic
Realism
Pause on task switch
Prompt on exit
Use system time for Default Scenario
Show Scenario Startup Screen
Enable Panel Serialization
Enable Avatar Mode
Enable Scenario Error Reporting
Realism
Time and Season
Weather
Southern
Eastern
Stall
Overspeed
Weapon System
Countermeasures
Text Cycling:
Continuous
Single line
Scenario Compass/Pointer:
Compass and Pointer
Compass only
None
Cockpit ToolTips
User tips
Scenario captions
Cancel
OK

2.7 Airplanes

FireFighterX works with any airplane in your hangar. It will fill up the payload stations available with retardant of the weight you specify and it will drop it accordingly.

In some instances the airplane model you chose will not be able to carry the amount of retardant that you specified. In this case, please use the built-in payload manager to add payload stations.

2.8 MultiUser and AI aircraft

In order for FFX to show the correct airplane models in a multi-user environment or as AI fire fighters, these models need to be installed into your simulator first. Please refer to the documentation coming with these models for the correct procedure.

The default plane for multi user and AI initially is the Dash 8-100 of the stock AI aircraft, as that one is present in every version of the ESP based sims.

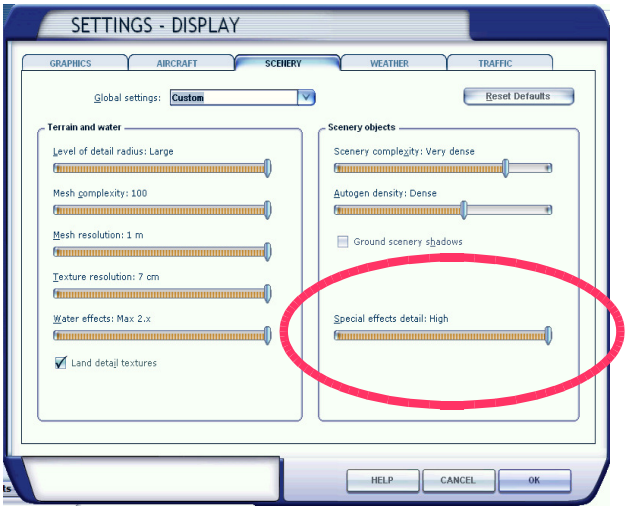
Networked: FFX will automatically try to find the other player's airplane in your sim. If it cannot find it, it will use the default airplane model.

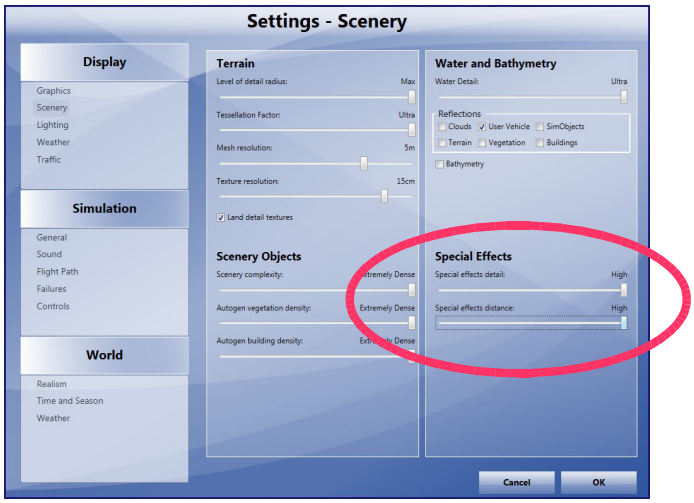
AI will always use the default model until you add others.

More on adding AI models or player aircraft in the Settings chapter below.

2.9 Effects settings

To get the most out of the fire and retardant drop effects, make sure you set “Special effects detail: High”





2.10 Object collisions

The visual drop effect is made of a multitude of simple objects. Unfortunately these objects are solid, as all objects are in the sim. Due to this restriction you may run into “Object collisions” with your plane crashing while pulling extreme maneuvers during the drop.
If this happens frequently, please move the visual effect away from your plane, by using the height and length adjustments in the Settings window “Retardant drop config”. Another method is to turn off crash detection completely in the sim (Aircraft->Realism Settings->Ignore crashes and damage).

2.11 Network

To use the multi-user features of FFX, two or more computers have to be connected over a network. The version or make of simulators used are of no consequence, as FFX uses its own protocol for multi user operation. You can connect any number of FSX boxed, SE or Prepar3D in the same multi user session through FFX.

FFX does not have a dedicated “server” program, instead every FFX installation can be used both as a server (hosting the fire situation) or as a

client connecting to that server.

The depiction of the other player's airplanes by FFX can be turned off too, so as an alternative you can additionally use the multiplayer features built right into the simulator or any external multiplayer application (for example like FSHost).

Network parameters:
Port (6076):
FFX wants to communicate over a single UDP port (initially 6076), so you need to allow passage through this port in your firewall and/or router.

IP-Address:
For the clients to connect to the game “master”, the connections to the relevant IP addresses have to be allowed too in firewall and router.

If your computer is located behind a router, you will have to add a port forwarding rule to your router for this to work. This mostly is not needed if all the computers running the simulators are connected to the same local network (LAN). But port forwarding is always needed, if you are connected to the internet by a local router and want to use multiplayer features over the internet.

Please refer to the documentation or online resources about

- How to allow a specific UDP port in your Windows firewall
- How to allow access for specific IP-addresses in your Windows firewall
- How to add a port forwarding rule to your router

2.12 Simulation Rate

FireFighter X will synchronize to the simulation rate used in the simulator, up to 4x acceleration. Values above 4x simulation rate would throw off the internal calculations in FireFighter X and are ignored.

At an accelerated rate the fires will burn faster and spread out with the appropriate speed.

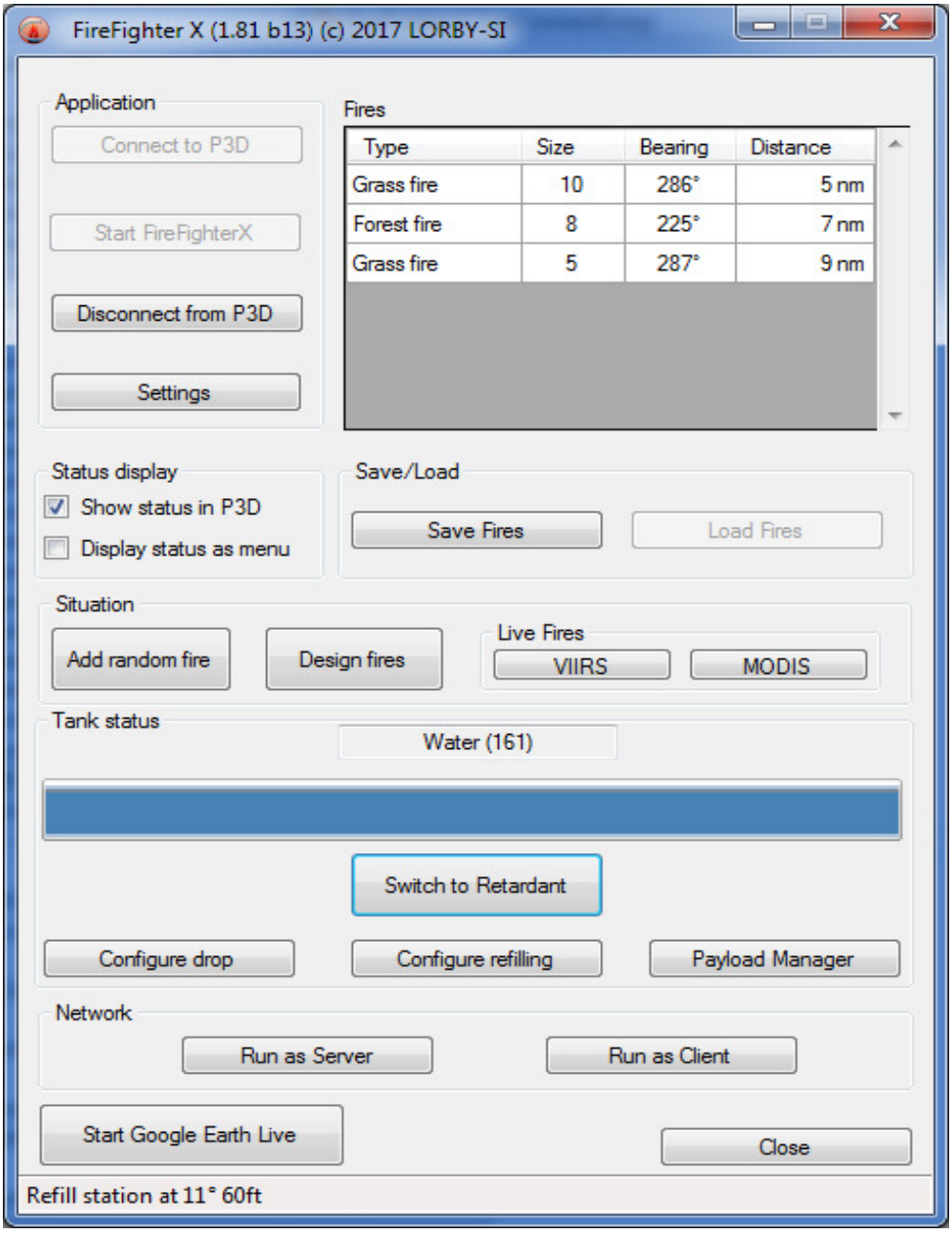
3. Quickstart

Jumping right into the action is easy:

1. Start up FSX
2. Go to “Free Flight”
3. Select any airport you like
4. Select a plane roughly the size of a Canadair CL-215
5. Click on “FLY NOW!”
6. Wait until you are sitting in your aircraft
7. Start FireFighterX by double-clicking the “FireFighterX.exe”
8. Click on “Connect to FSX”
9. Click on “Start FireFighter X”
10. In the sim go to the menu “Aircraft → Fuel and Payload” and reduce the fuel load until the weight of the aircraft is correct (leaving about 30% in the main tanks should do it)
11. In the “Fires(size)” window three fire locations will pop up
12. Fly the indicated heading until you are on top of the fire
13. Arm the drop system on the “Configure Drop” dialog, by clicking on the top left green LED so it lights up
14. Press “Shift+D” (release droppable objects) to drop fire retardant
15. ...good luck
16. To refill the retardant tank return to your starting position or fly really low over a water body (less than 10 feet!). Refilling starts automatically.

Hitting and extinguishing fires is not easy and it takes a lot of practice. The “Settings” menu has options that allow for larger hit zones, better and more effective retardants etc.

4. Main Window



Elements explained:

- Button “Connect to FSX” initializes SimConnect
- Button “Start FireFighterX” starts the fire simulation
- Button “Disconnect from FSX” terminates SimConnect
- Checkbox “Show status in FSX” shows or hides the status line in FSX
- Checkbox “Display status as menu” changes the dipiction of the status bar in the sim.

- Button “Save Fires” saves the current fire situation to disk
- Button “Load Fires” loads a fire situation from the disk
- Button “Add random Fire” creates a fire at a random place near you
- Button “Design fires” open the fire designer to generate fires of your own or alter the existing ones
- Buttons VIIRS or MODIS in “Live Fires” open a dialog to download and choose fires from the 24h Active Fire data downloaded from FIRMS/VIIRS or MODIS
- “Tank Status” shows how much retardant (water or retardant) you have left in your tanks
- The status bar at the bottom shows bearing and distance to your refill station plus the number of AI fire fighters currently in the air.
- Button “Switch to Water” / “Retardant” lets you change the retardant type.
  This button is tied to the “TOGGLE_LAUNCH_BAR_SWITCH” event of the simulator, so it can be triggered by “Shift+U”.
- Button “Configure drop” opens the drop configuration panel
- Button “Payload Manager” opens the payload manager dialog
- Buttons “Run as Server”, “Run as Client” switch the program to the respective MultiPlayer mode
- Button “Start/Stop Google Earth Live” starts or stops the Google Earth Live View feature
- Button “Close” ends the program

5. Operations

5.1 Simulation startup

FireFighterX relies on a certain sequence of actions to work properly

!!Always start your flight (and let it finish loading) before connecting to FSX with FireFighterX!!

After connecting to FSX you can start the fire simulation by either

- Using the button “Start FireFighterX” to spawn fires at random positions
- or loading a (previously saved or manually created) list of fires from the disk

The application will then create the fires and fill your tanks according to the settings you specified in the “Settings” window.

5.2 Performance considerations

Using particle effects like fires and smoke in FSX comes at a price. The more fires you have in the sim, the slower it will become. As the fires grow and spawn, this can happen fairly quickly. FireFighter X includes two different sets of fire effects that can be chosen on the first page of the Settings dialog: a complex one, heavier on FPS and a more lightweight variant that doesn't require as much resources.

The visual water/retardant drop effect is very taxing for the sim too. In case this leads to an unacceptable drop in FPS, you can switch it off completely in the Settings, by setting “0” for “Reduce visual drop density by” on the page “Retardant drop config”.

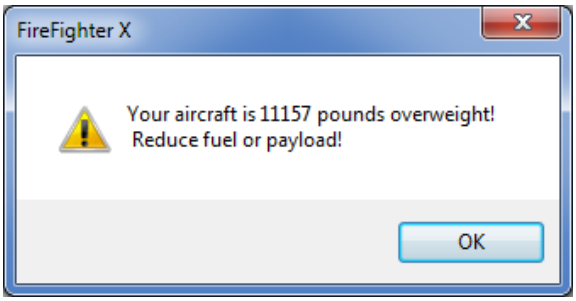
To find the sweet spot for your system, use the Settings – you can define the maximum number of fires and their components to suit your particular sim installation.

5.3 Payload manager

FireFighter X loads the fire retardant on your plane automatically, and subtracts it accordingly when you drop retardant.

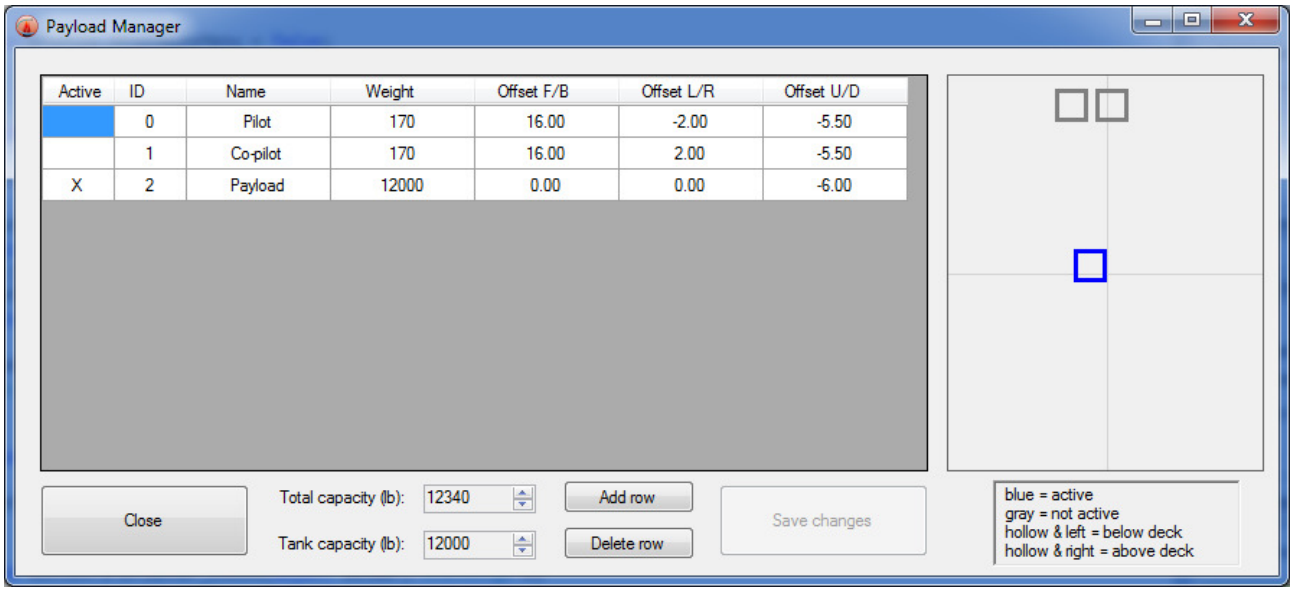
When starting up the application after connecting to the sim, or when changing your aircraft while the simulation is running, the FireFighter X will analyse your aircraft's carrying capabilities, and fill each payload station of the aircraft with retardant until your desired tank size has been achieved.

If the total weight of your aircraft exceeds the maximum gross weight allowed for it, you will get a warning:



To adjust the fuel load, please use the “Fuel and Payload” menu in the sim.

To adjust the payload, FireFighter X has a built-in payload manager. This dialog shows the actual payload configuration of the current aircraft:



- Activate or deactivate payload stations to carry retardant by clicking in column “Active”
- Adjust Weight by either
  - clicking into the cell once, then rolling the mouse wheel up or down
  - doubleclicking into the cell and entering a value
- Adjust Positions by clicking into the cell once, then rolling the mouse wheel up or down
- Adjust the station name by double clicking and editing it directly in the cell.
- Add new payload stations with the “Add row” button
- Remove payload stations by selecting the row first, then clicking on “Delete row”.

The graphic display on the right shows you roughly where the payload stations are in relation to your aircraft.

- Blue icon means the station is activated to carry retardant
- Gray icon means that this station is ignored by FFX
- A hollowed icon means that the station is above (depicted right of the center line) or below (depicted left of the center line) of the central point of the aircraft.

The changes that you make will be persisted, as soon as you click “Save changes”.

Persistence:
FireFighter X will remember

- the active payload stations and the tank size for every individual aircraft livery, using an internal database
- the total amount and the size of the payload stations for each aircraft model, saved in the aircraft.cfg file

5.4 Fire Lifecycles

In the simulation fires are built from “Elementals”, basically a single point of burning material of a certain size.The Elementals come in four sizes: “small”, “medium”, “large”, “huge”. If left alone, they will grow over time, until they reach the “huge” size. After that the cycle will reverse, and they will slowly die until only burnt terrain remains. (Unfortunately it is not possible to manipulate the autogen objects in the fire zone, so trees, houses and bushes will remain green).

An Elemental can spawn itself, and it will do so over time. Spawning depends on the weather, if the ambient wind speed is above 5 knots, the spawning will take place preferably in the winds direction, and it will speed up.

If it starts raining, the Elementals will reverse their growing cycle too, and die down slowly.

Manual Lifecycle:
The timings for the four sizes (how long a fire of this size will burn), the spawn probabilites and calculation paramters can be adjusted in the Settings. In this mode the fires will “jump” ahead, by spawning new small fires in the direction of the wind.

Realistic Lifecycle:
In this lifecycle mode the fires will react only to the current weather conditions and will grow and progress approximately like fires in the real world would. There is a fixed set of rules about the fire behaviour implemented in the FireFighter X, derived from actual fire fighter training materials. Fires will basically “crawl” ahead, at a certain pace derived from the environmental conditions. Fire progression is a lot slower in this mode than in manual. Use a higher simulation rate if you want your fires to grow more quickly.

Note: this mode uses a lot more effect objects in the simulator that “Manual” and will have a massive effect on FPS. It is advisable to run only one or two fires at the same time in this mode, unless your PC is very powerful.

5.5 Creating or editing fires

Fires can be created anywhere in your virtual world, either in random places with randomized parameters (default) or specifically where and when you want them.

After you are connected to the sim and FFX is started, these buttons will become active.

- "Add random fire" will increase the number of fires in the list by adding a new fire at a random position.

- "Design fire" allows you to add and edit fires anywhere you like in the virtual world

- "Add live fires" makes it possible to download and inject live fire data from the VIIRS or MODIS online data services

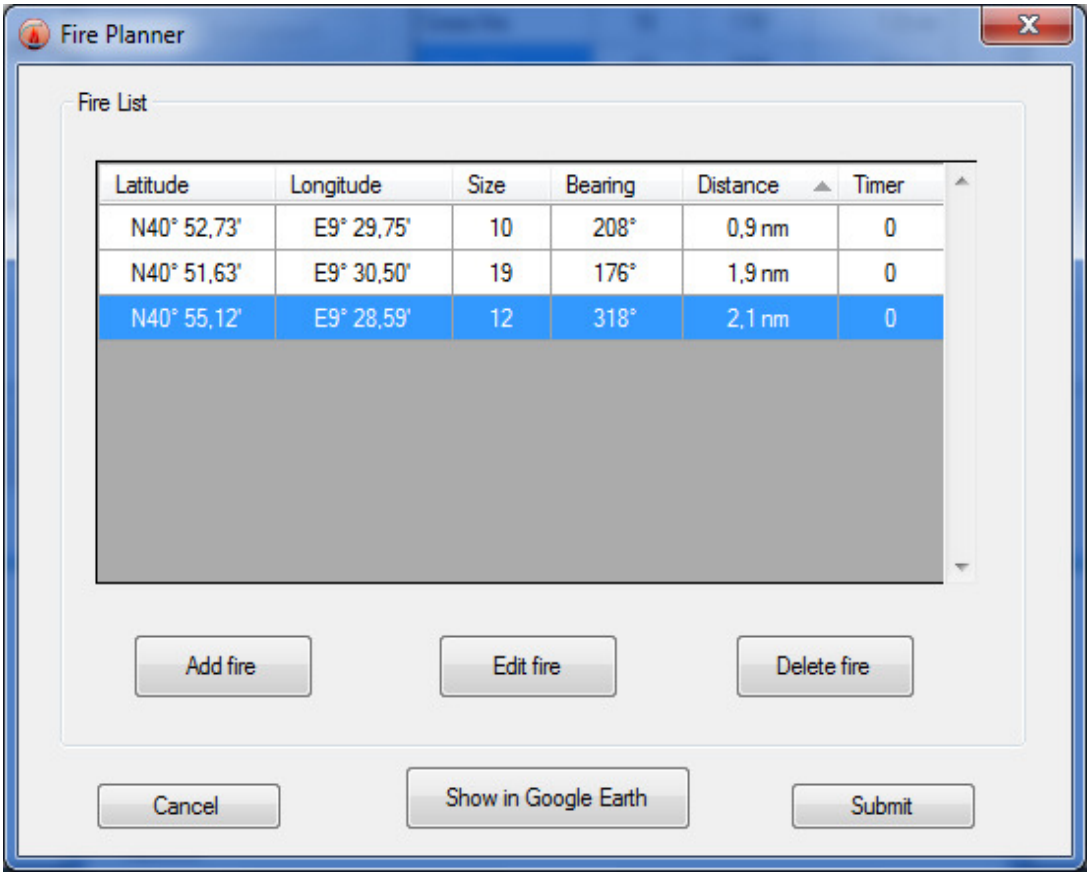
5.5.1 Add random fire

Generates a new fire in a random location. It will be added to the list as an additional fire location, the maximum number of fires that is set in the settings menu will be incremented too.

If you set a timer value in the Settings menu "Fire Spawn" to a value greater than 0, then the fire will start at a random point in time between now and the number of minutes specified.

5.5.2 Add custom fire

This button opens the “Fire Planner” window:

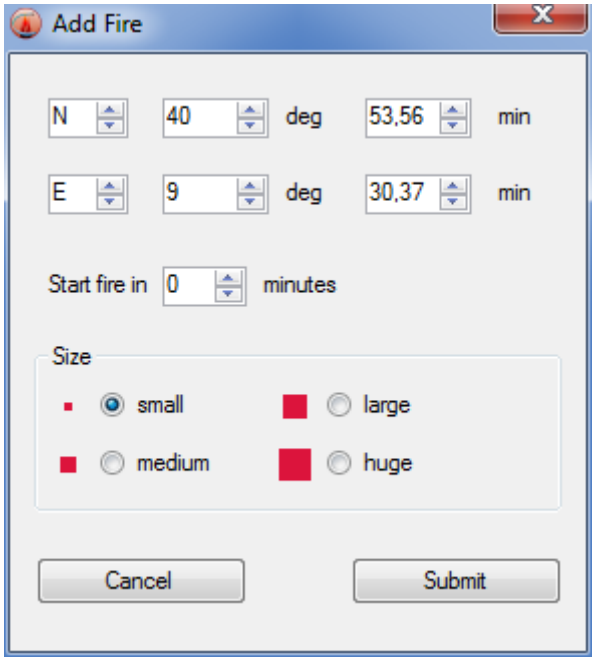


The list shows the currently active fires.

You can

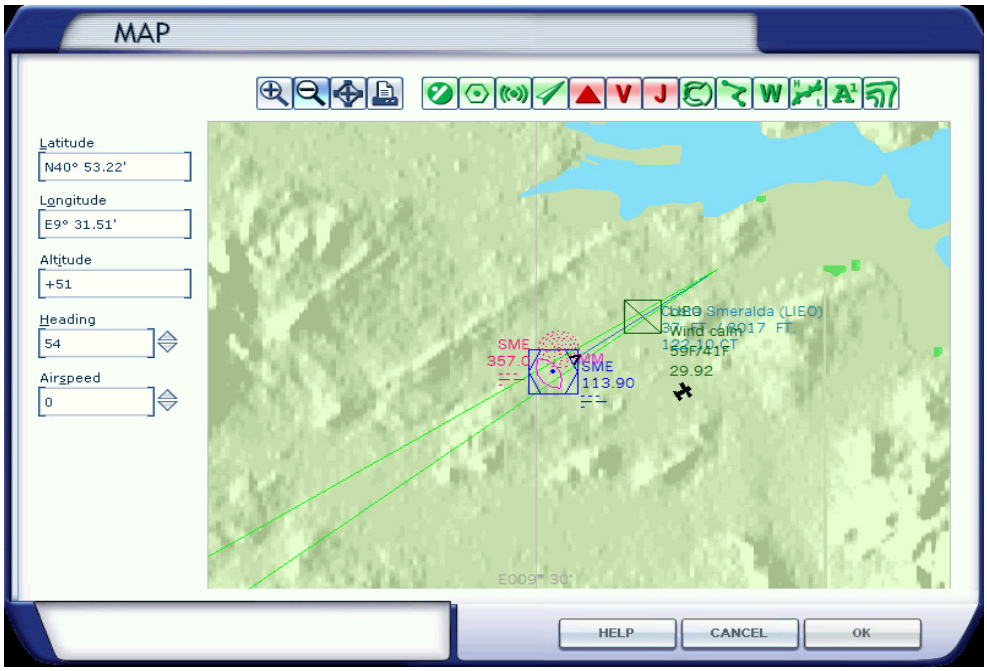
- **Add** a new fire at a specific location
- **Edit** an existing fire
- **Delete** a fire
- “**Cancel**” will undo all your changes
- “**Submit**” will replace the fires in FireFighter X with the list from the planner window and restart the fire simulation lifecycle.
- “**Show in Google Earth**” will create a KMZ file and open Google Earth to show you the locations of the fires.

5.5.2.1 Add Fire



The input fields are pre-filled with your actual aircraft position. Change these values to any point on the simulated map where you wish to create a fire.

The easiest way to find a specific location is to use the map in the simulator. You can drag the little black airplane to the place where you want to start the fire, and then read off the coordinates in the top left corner. **Click "Cancel" in the sim when exiting the map or your plane**



will be moved to this spot too!

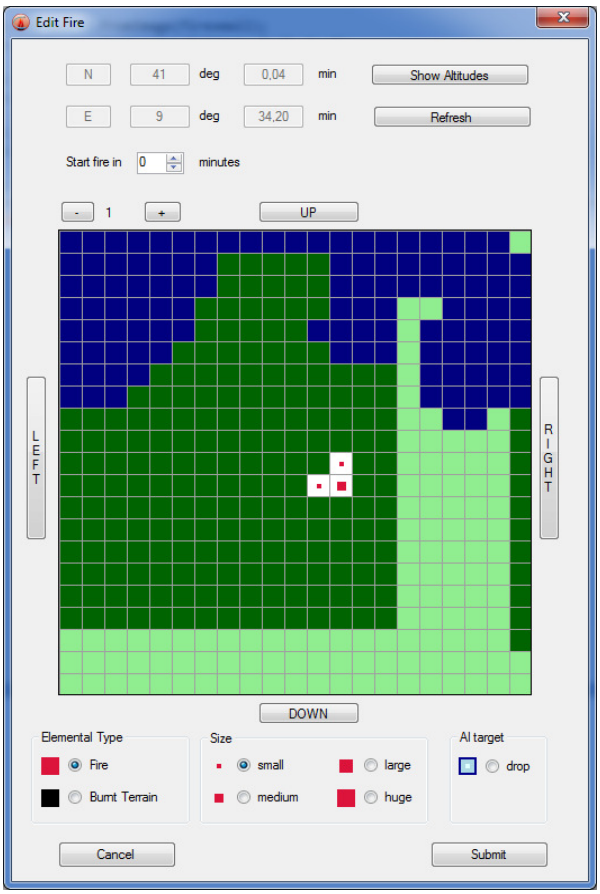
Fires cannot be placed everywhere, as FireFighter X is aware of the surface type of the underlying terrain. In case you placed the fire incorrectly (on tarmac or on water), FFX will display an error message and revert to the random fire generation mode.

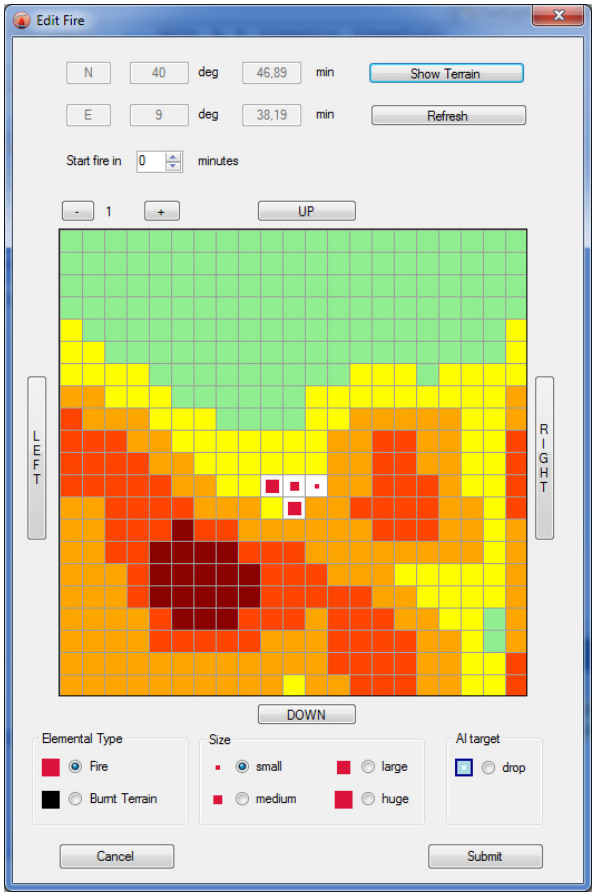
By choosing a timer value, the fire will start at that point in time once you generate it. The timer is coupled with the simulator time, so speeding up or slowing down the simulation rate will affect it too.

Now select the desired size for the fire and click “Submit”. The new fire will be added to the fire list in the Planner window and you can either edit it, or send the list to the FireFighter X by pressing “Submit”.

5.5.2.2 Edit fire

This button will open the fire designer window:





- *Timer*: you can select a new value for the point in time when the fire should start
- *Show Altitudes*: Switches to a schematic altitude profile of the terrain. The colors are derived from the highest and the lowest point in the geographical location that you are looking at, they do not represent absolute altitudes.
- *Show Terrain*: Switches to a schematic depiction of the "surface type" that the simulator has assigned to this spot. The "surface type" does not equal the terrain landclass that is depicted visually, it is a rather coarse overlay that the simulator uses to decide where objects of certain types can be displayed (boats on water, houses on land, etc.). This feature is used by FireFighter X too, to determine if the terrain that the fire is burning on is flammable or not.
- *Refresh*: Sometimes the map may remain completely white – this happens, when the simulator cannot service the data request at this time. Press "Refresh" to send the request again.
- *Buttons +/-*: change the zoom factor of the map. At a zoom factor of "1" the width of one square on the map equals 300 ft. Zooming out doubles this value, zooming in halves it.
- *Buttons UP, DOWN, LEFT, RIGHT* move the whole fire by one square in the direction specified.
- You can place a fire elemental by choosing the type and size, then left-clicking in the spot on the map where you want it to be.
- You can remove a fire elemental by right-clicking on it.
- You can dispatch an AI fire fighter to any position on the map by selecting the AI target "drop" and then left-clicking on the map where you want the AI to go.
- "Submit" will add your changes to the fire list in the planner window

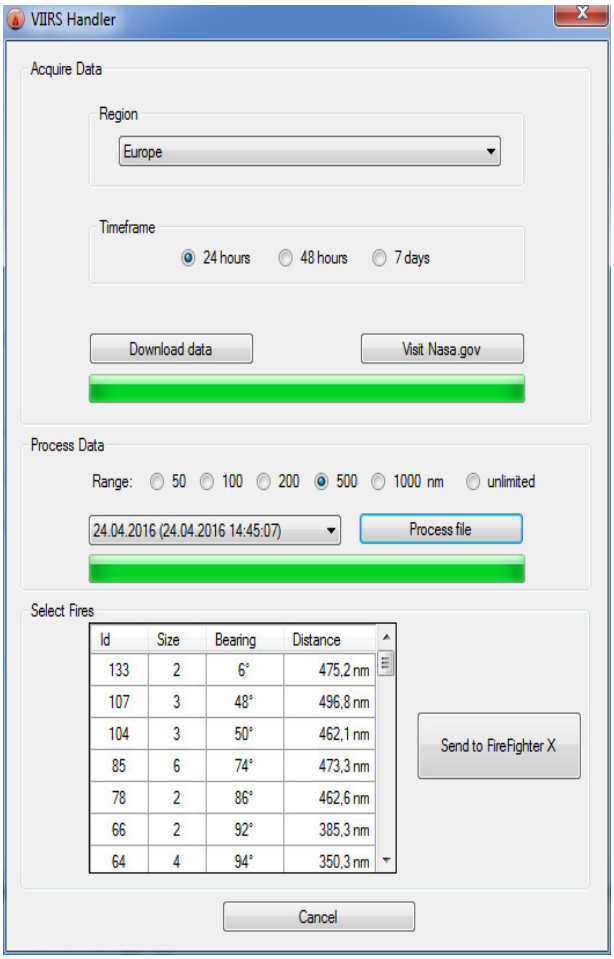
Terrain colors:

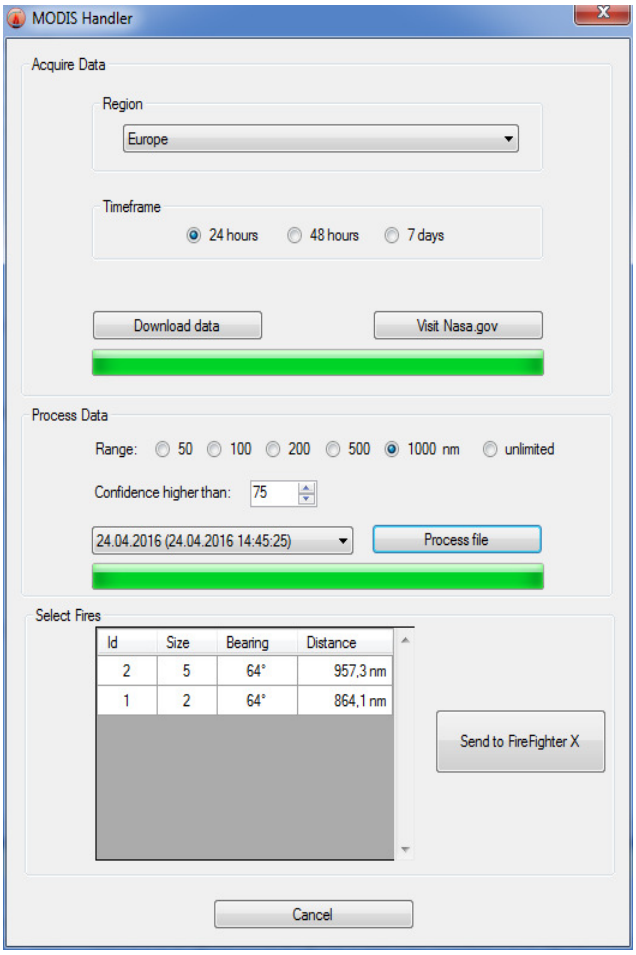
- light green: grass of all types
- dark green: forest
- yellow: sand
- light grey: urban
- black: not flammable (tarmac, concrete etc.)
- blue: water

5.5.3 Live fires

Opens the VIIRS or MODIS download and processing window.

All data will be referenced to your own position in the simulator. Make sure that you are at the airfield of your choice before opening this dialog.





Steps:

1. **Data acquisition**
2. **Processing the downloaded file**
3. **Selecting fires to be displayed in FireFighter X**

1. **Data acquisition**

First select a region and then a timeframe with the radio buttons. If data has already been downloaded for this region and period, the dropdown list in “Process Data” will show the saved files with their dates.

If you want to download new data, press “Download data”. The application then connects to the “Fire Information for Resource Management System” on “nasa.gov”. It will then download the CSV/Text data file for the region you selected.

Note: Selecting “Global” will result in a large download and a very long processing time.

2. **Processing the downloaded file**

Once the file is downloaded, you can select a radius around your current position in the simulator to limit the number of fires that have to be extracted from the downloaded file.

MODIS: this data has a confidence level for each fire pixel, ranging from 0 to 100. This indicates the probability that there really was a fire in this spot. The higher you set this value, the better this data represents reality.

3. **Selecting fires to be displayed in FireFighter X**

When the processing is complete, you will be presented with a list of fires in the table at the bottom. You can then select rows from this table to be imported into FireFighter X. Pressing the button “Send to FireFighter X” will replace the data in the main fire list in FireFighter X and close the download dialog.

Notes:

- Once the data is downloaded, it can be processed multiple times with different range settings.
- If you move your plane in the simulator, you will have to process the data again to get new fires.
- Colums in the fire table can be sorted by clicking on the columns header

FIRMS: VIIRS / MODIS data is provided by the Land Atmosphere Near-real time Capability for EOS (LANCE) system operated by NASA/GSFC/ESDIS.

Please visit

- the VIIRS I-Band 375m Active Fire Data website at https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms/viirs-i-band-active-fire-data

- the MODIS Active Fire Data website at http://modis-fire.umd.edu/pages/ActiveFire.php?target=Description

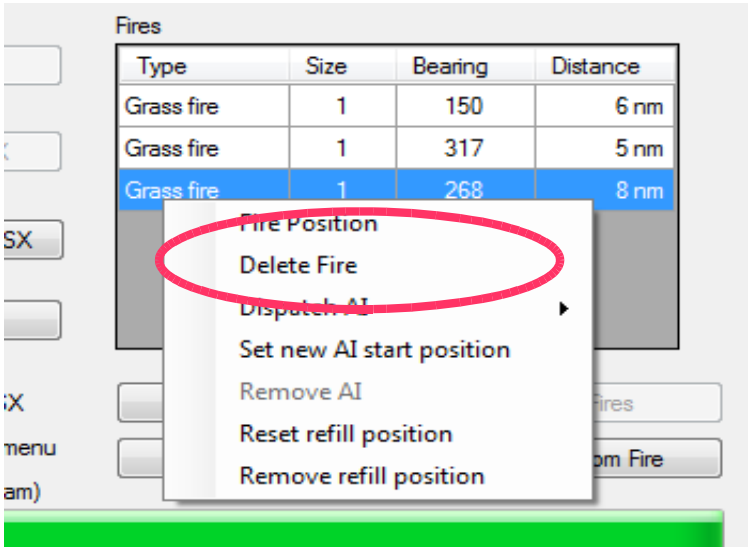
If the download fails: this is mostly happening when a secure TLS 1.2 connection cannot be implemented. In that case you will see an error message advising you about the error, then your browser will open the FIRMS:VIIRS/MODIS website where you can download the desired file yourself. Choose one of the Text/CSV files and save it to your Documents folder. After completing the download, proceed with the "Process button", which will then open an Explorer window where you must select the file you downloaded. After selecting the file it will be processed normally.

The filenames and URLs used for the download are subject to change through NASA. To account for this, the values used by FireFighter X can be adjusted in the Settings menu.

5.5.4 Removing a fire

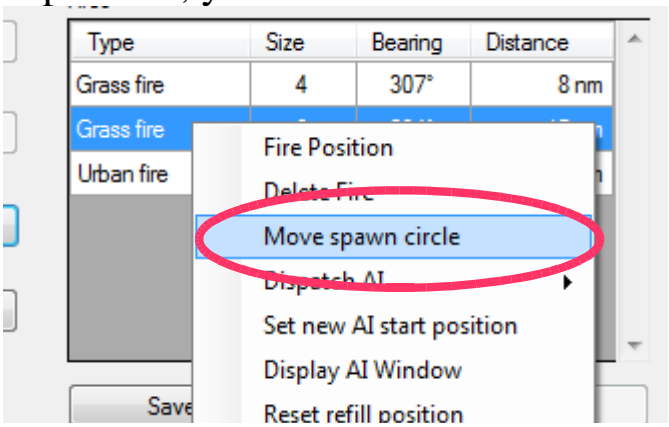
To remove a fire from the list, you can move your mouse over the entry in the list and click on it with the right mouse button. A context menu will pop up, and if you click on "Delete Fire" , that fire will be removed from the list and from the sim.

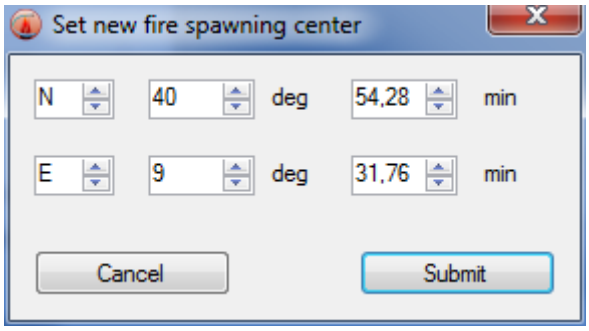
Note: The maximum number of fires in the Settings will be reduced as well.



5.5.5 Moving the random fire generation

If you want the random fires to be generated in some other location than around your current position, you can move the reference point:

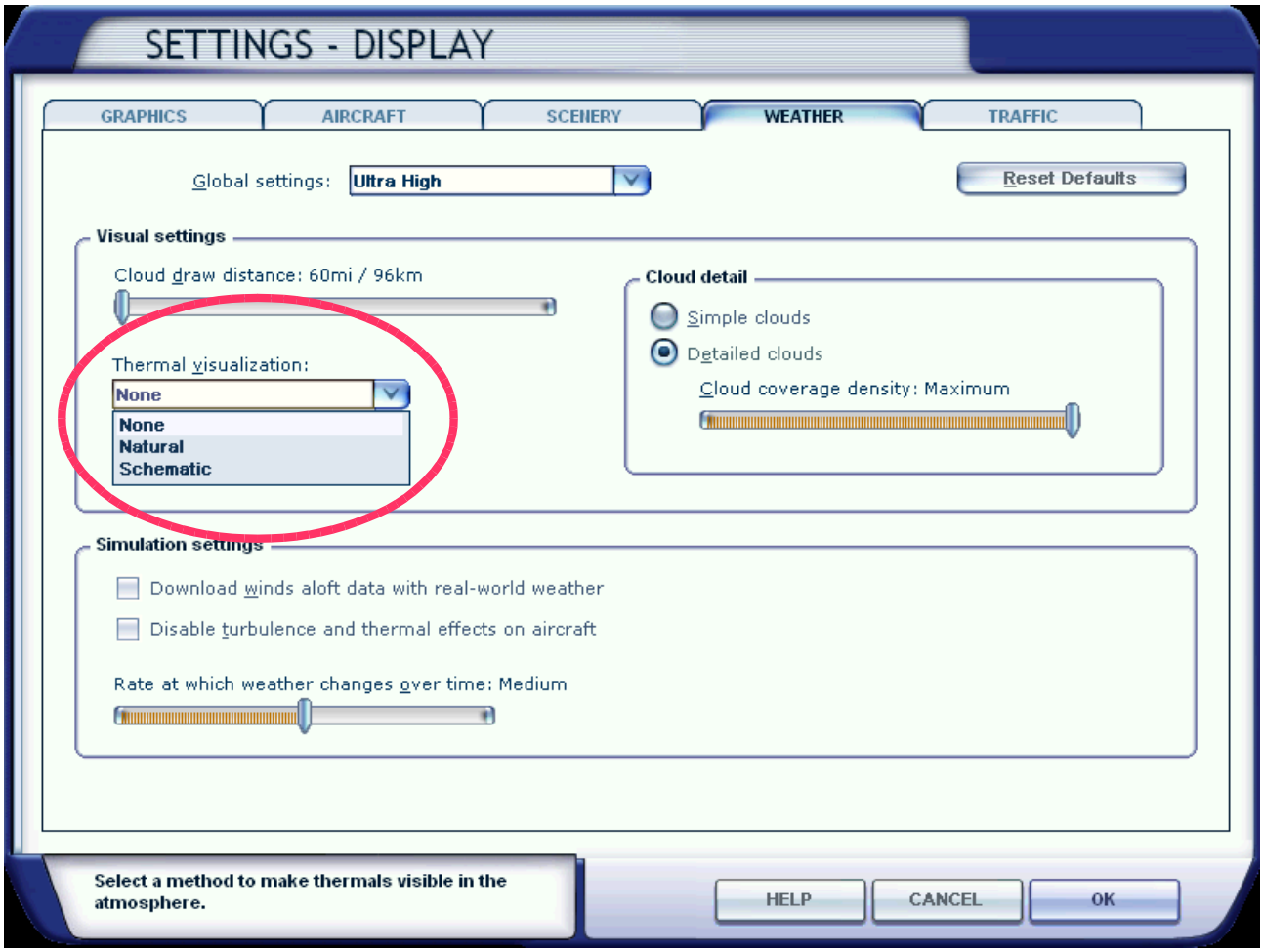




You can set a new geographical location as the center of the area where random fires are generated.

5.6 Updrafts

As large fires generate hot updrafts, FireFighterX creates very strong thermals over each Elemental. You can make these thermals visible by using the “Thermal visualization” setting in the sim.



5.7 Extinguishing fires

In the Drop Configuration for each aircraft you specify the key element of the fire bombing simulation: the amount of retardant a single drop releases from your tanks and how big and effective the smallest amount of retardant is - the “Unit”.

A single retardant drop will release the defined amount of Units from your tanks. Think of these Units as the smallest amount of retardant necessary to put out a small fire. The more of those you drop at one time, the larger the hit zone will be and more fire may be extinguished.

The amount of units necessary to put out fires of a certain size can be adjusted in the Settings.

The application will calculate the accurate point where the dropped retardant will hit and handles all Elementals according to the amount of retardant that hit them. They will either be put out and replaced with steam or they will be knocked back to a smaller stage.

As the hit point is pretty accurate, actually hitting an Elemental is really difficult. Practising drops from different altitudes and at different speeds is imperative. There are options in the Settings to increase the drop zone by a large amount (up to 900%) to facilitate this.

If you set the time the retardant is active to a value greater than 0, it will not just vanish when dropped. The application remembers the drop points and will prevent fire elementals from spawning there. That way you can use the retarding agent as a barrier to protect inhabited regions or just prevent fires from spreading further, even if you did not manage to put it out with your drop.

5.8 Yelp and Warble

In real life, the fire fighters on the ground are alerted that a drop is about to happen by sounding the “Yelp”. After the drops have been completed, the pilots sound the “Warble” as an “all clear” signal.

You can do this in FireFighter X with the keyboard combinations

- Shift & F11 for the “Yelp”
- Shift & F12 for the “Warble”

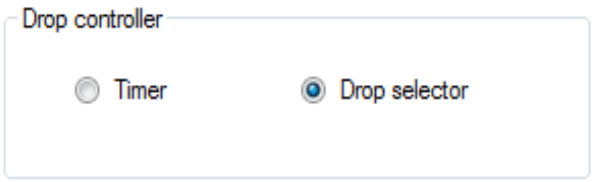
These actions are also linked to the simulator Event-IDs “EGT3_SET” and “EGT4_Set”.

5.9 Retardant drop configuration

There are two different modes in FireFighter X to control how retardant is dropped from your aircraft:

- a timer based method
- a simulated drop coverage selector box

You cannot use both methods at the same time, you will have to switch between them on the first page of the FireFighter X settings:



To open the drop configuration panel, click on the green tank status bar on the main dialog or use the button “Configure drop”. Depending on your choice, this will open the appropriate controller panel.

5.9.1. Timer based drop configuration

Arming the systems

Before you can drop retardant, the drop system must be armed. Click on the green LED on the top left to arm the drop. In real life, retardant aircraft take off with the tank armed so they can jettison the load in the event of an emergency. Once they are at cruise, the tank is disarmed to prevent accidental dropping of the load. The skimmer aircraft take off dry land with the tank disarmed and land on the water with the tank disarmed to prevent the doors from opening.

Likewise, to scoop water with a skimmer aircraft, you have to arm the scooping doors with the LED on the top right hand side.

If arming the systems doesn't work

This is caused by some aircraft models overriding the simulator events that are controlling the arming. If this happens, try activating the “Bypass simulator events” checkbox at the bottom. You will be able to arm the systems on the drop dialogs, but you can no longer do it from the FFX gauge in the simulator.

Emergency dump

To drop your whole tank at the fastest rate possible, click on the red button in the middle.

Drop timer

This sets the time for how long retardant will exit the valves after you press the trigger. The rate is determined by the amount that you select:

Selecting 50% of a 12000lb tank and 3.0 seconds will release 6000 lb of retardant with each trigger press, and each drop will take 3 seconds to complete before you can trigger the next one.

Select % of total capacity to drop

Click on the green squared to limit the drop to 25 – 50 – 75% of your total tank capacity. This will work in conjunction with the timer setting and drop the according amount of retardant at the calculated rate. This drop rate is limited by the “Maximum drop rate” below.

General settings

- ***Maximum drop rate in lb/s****:* This is the maximum drop capability of the aircraft, basically the rate at which the retardant will exit the tanks when you open all drop doors at once.
- ***Smallest unit size (lb)***: defines the amount of retardant to put out a small fire. This settings manages the visual simulation too, as the amount of retardant effect objects dropped from your plane is determined by this.

- ***Drop procedure**:* You can select between two modes
  Tank percentage priority means, that the aircraft will drop the selected tank percentage in the time that you specify
  Drop rate priority means, that the aircraft drops retardant at the "Maximum drop rate" until either the selected percentage is reached or the timer runs out

Visuals

- *Adjust for aircraft height (feet):* curiously, some airplane models in FSX show the current altitude relative to a point on the top of the visual model. **If not corrected, the visual drop effect will begin somewhere inside the airplane model and scooping will not work!** For example, the freeware CL-215 needs to be corrected for -15 feet, as the altitude above ground is not measured from its "keel" but from the top of the wings.

- *Adjust for aircraft length (feet):* This is a visual setting too, and it determines the point on your fuselage the retardant effect objects will appear when dropped.

- *Retardant active for (minute):* Time in minutes the dropped retardant remains active and prevents fires from spawning.

- *Visual drop density:* this controls the density of the visual drop effect (5 = very dense, 1 = sparse, 0 = off). This will help performance if the visual effect is too demanding for your system.
  Setting this to "0" turns off the visual effect completely (the fires will still get put out though, even if you can't see the water falling)

- *Small/Large*: determines the size of the visual drop effect elements.

- *Size of ground splash*: Determines the size of the splash effect on the ground. If "Auto" is selected, then FireFighter X will calculate the appropriate setting from the amount of water/retardant dropped per second.

- *Smoke System Triggers Drop*: If this checkbox is activated, FireFighter X will trigger the retardant drop if the “Smoke System On/Off” toggle is sent. Use this, if you prefer aircraft that have their own drop effect built in and you don't want to use the visual effect of the FireFighter X. If you set “Reduce Visual drop Density” down to “0”, the visual effect from FireFighter X will disappear. Note that the Smoke system is a toggle switch, you have to press it once to start it, then a second time to stop it.

- ***Remove all retardant splashes*:** use this button to remove all the retardant splashes on the ground. This is useful in multiplayer sessions, when there are a lot of those splashes – which will cost performance.

Attach a bucket or tank

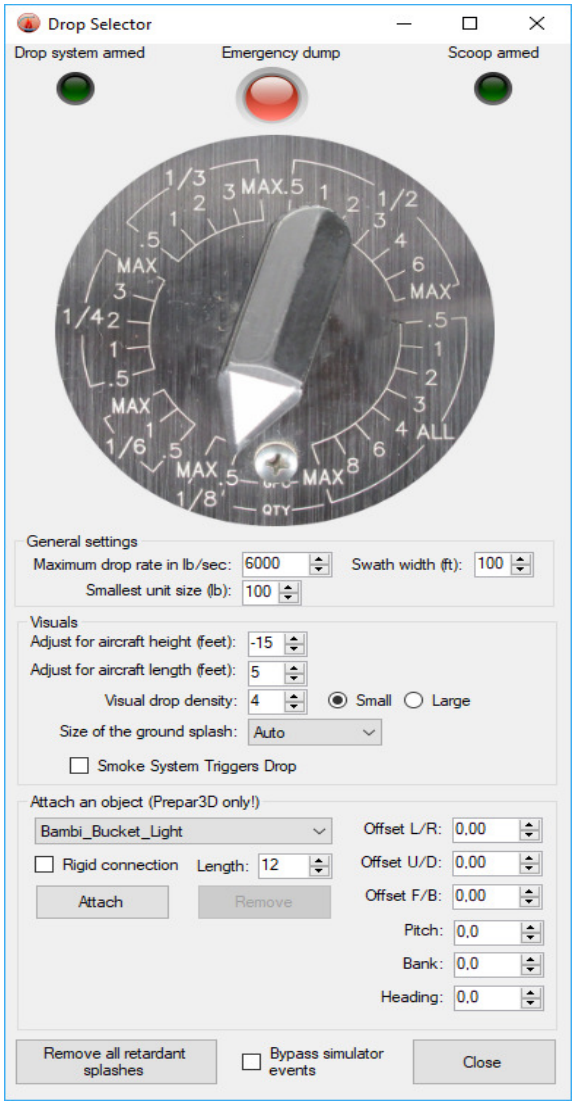
With this feature you can attach a 3D sim object model to your aircraft.

- The offsets “L/R, U/D, F/B” define the point on the fuselage where the object will be attached.
- “Rigid connection” will freeze the bucket in its relative position; then the orientation can be changed with “Pitch, Bank, Heading”
- “Length” defines the point where FireFighter X will create the drop effect. For a Bambi Bucket this is the length of the cable.

Important note for users of FSX and FSX:SE:
This logic is only fully functional in Prepar3D. Unfortunately the older simulators don't have the necessary functionality, and the attachment feature has been limited significantly:

- **You can only attach buckets, ridig objects don't work.**
- **There is no animated water/retardant level.**
- **You will experience stutters on the attached objects and the alignment will shift with aircraft movement.**

5.9.2. Drop coverage selector



- The outer ring of number on the controller shows the selected percentage of your tanks
- The inner ring is the desired “GPC” setting – the coverage of the ground in gallons of retardant per 100 square feet.
- The “Maximum drop rate in lb/sec” should be set to fitting values for your aircraft. For example, a Canadair CL215 can drop 12000lb of retardant in 6 seconds, so your drop rate would be 2000 lb/s.
- The “Swath width (ft)” should be set to the appropriate value too – depending on the size of the aircraft that value is between 50ft for a small aircraft up to 300ft for the DC-10 tanker.
- The rest of the settings are identical to the timer control (see 5.8.1)

5.9.3. Simulator events bound to the drop logic

The timer, selector handle and the percentage can be adjusted remotely by sending these simulator event Ids:

- EGT3_INC, EGT3_DEC: to increase/decrease the timer value or selector handle position EGT4_INC, EGT4_DEC: to add/subtract 25% of the percentage

The values of the controls are transmitted back to the simulator as the values of:

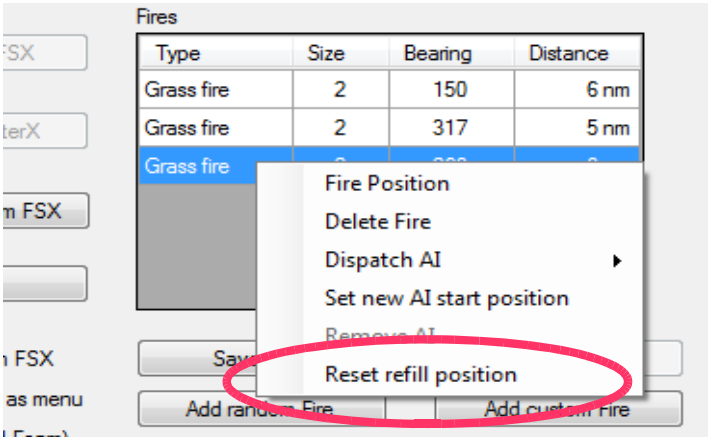
- the “WATER RUDDER HANDLE POSITION” for the timer (multiplied by 10) and the selector handle (values 1-30)
- the “TAILHOOK POSITION” for the current fill level of your tanks in percent

Note: the TAILHOOK POSITION variable may not work correctly, if your aircraft actually has a tailhook. In that case you can disable the tailhook entries in the aircraft.cfg with the button “Disable Tailhook” (otherwise it is disabled)

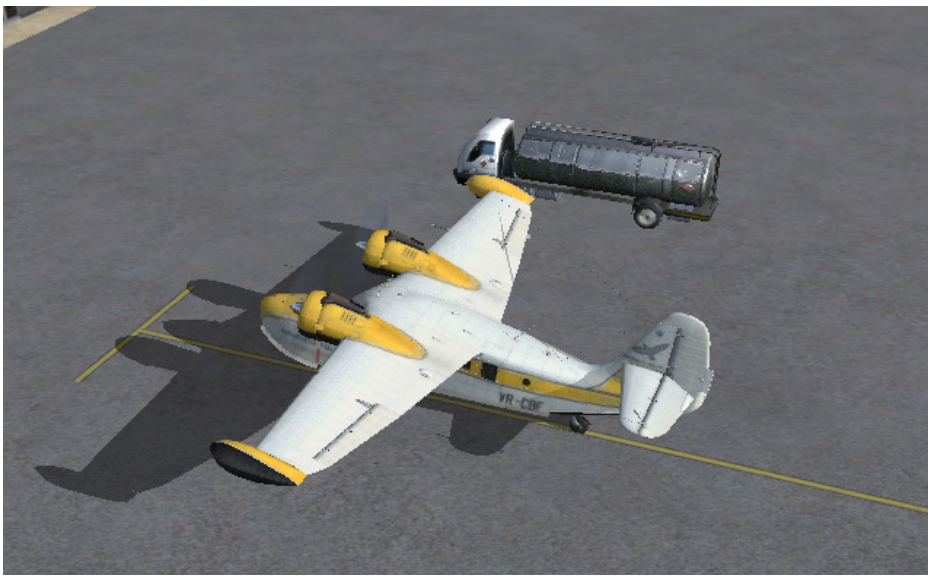
5.10 Refilling your tank

FireFighterX will initially use the coordinates where your plane is located as the position of your refilling station. This happens when you press the button “Start FireFighterX” or load a set of fires.

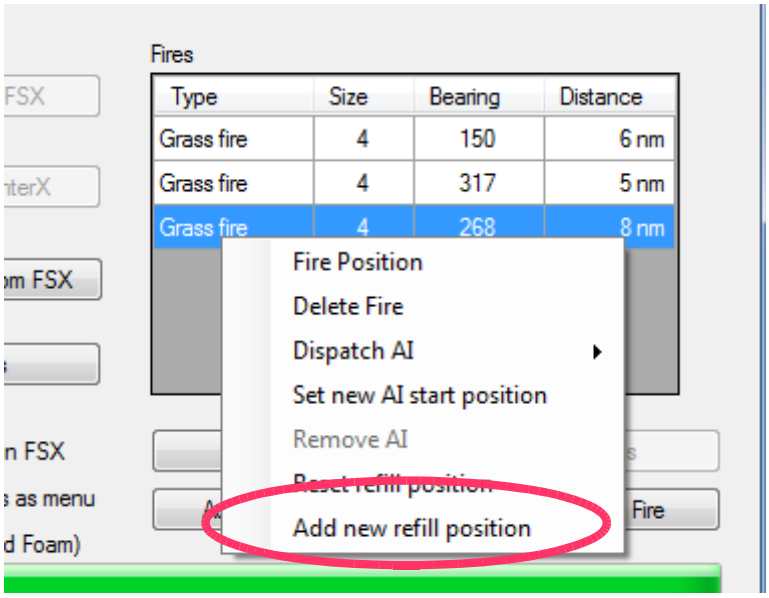
The position of the refill station can be changed to your current position at any time by selecting “Reset refill position” from the fire context menu



To mark the refill position visually, FireFighter X initially creates a standard fuel truck model at your right wingtip. This model can be changed in the “Refill/Scoop” settings.

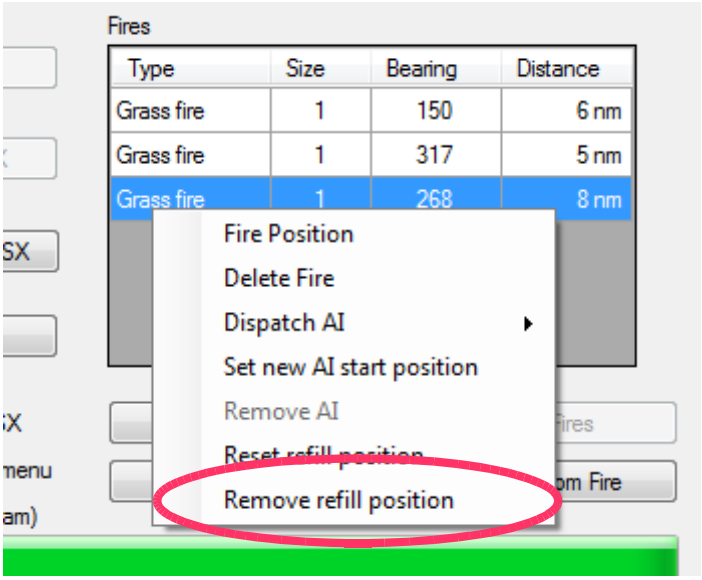


FireFighter X can handle multiple refill positions at the same time. To add additional stations, use the “Add new refill position” from the fire context menu:



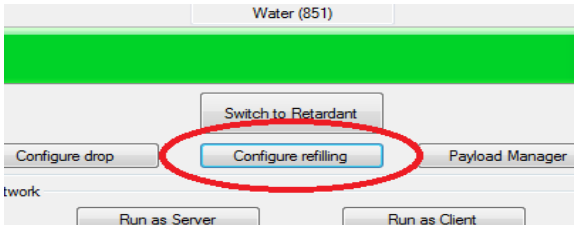
This will add an additional refilling station at your current position.

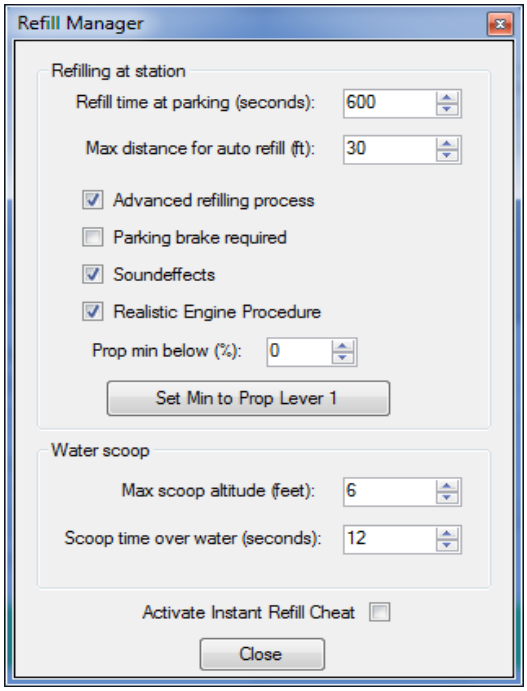
Refill stations can be deleted too, use “Remove refill position” from the fire context menu.



This will delete the refilling station that is currently closest to you.

Refill configuration





The refill configuration is saved for each individual aircraft livery.

- *Refill time at parking (seconds)*: amount of time it takes to top off your tanks once you are at the refilling station
- *Max distance for auto refill (ft)*: If you get closer to the refill station than this distance, refilling will commence automatically
- *Max scoop altitude (feet):* how low you have to fly over water to activate scoopig
- *Scoop time over water (seconds):* time it takes to top off your tanks when scooping
- *Activate instant Refill Cheat:* if this is selected, then you can refill your tank by repeatedly pressing “Release Droppable Objects”. Turn this off for maximum realism – you will have to return to the airport or scoop water if your tank is empty.
- *Advanced refilling process:* turns the advanced refill procedure on or off. When this checkbox is not activated, then it is sufficient to simply pull up to the refill station and activate the parking brake.
- *Soundeffects*: turns the refill soundeffects on or off.
- *Realistic Engine Procedure*: activate a more realistic refilling procedure where you have to set your props to min on the side where the hose gets attached

- *Parking brake required*: If this is enabled, the refilling process will start only if the parking brake is set.
- *Prop min below (%)*: sets the prop lever position below which the props are considered to be at minimum. This is helpful for turboprops where a low setting would shut off the engine completely
- *Set Min to Prop Lever 1*: If FFX is connected to the sim, this button sets the Minimum described above to the current position of the prop RPM lever for engine 1

The refilling process can be configured to be easy or realistic. You can adjust the time that the refilling takes in the "Refill/Scoop" Settings, and choose "Realistic engine handling" for added immersion:

1. Proceed to your nearest refill station by using the information in the status display and come to a halt.
2. **Set your parking brake**
3. **Easy engine procedure:** refilling will begin automatically.
4. **Realistic engine procedure** for props/turboprops:
    1. Set the propeller(s) that are on the side of the aircraft next to the refill station model to minimum RPM (feather as much as possible). (Keyboard: select engine with "E" + number, then press CRTL + F1) If you don't want to use separate controls, you can simply feather all props.
    2. The hose will now be attached
    3. Spool up those propellers again to avoid engine damage (CRTL + F4)
    4. Refilling will now start
    5. After the refill is complete, you will be asked to set the props to minimum RPM again
    6. The hose gets detached.
    7. Spool up the propellers and you are ready to go
5. **Realistic engine procedure for jets:**
    1. For a jet aircraft, all engines have to be shut down while refilling the retardant tanks!
6. **The status bar will advise you when each action is required!**

If activated, you will hear the sounds of the hoses being attached, the water flowing into the tank and the hose being detached.

In case you just want to keep dropping water, the “Instant Refill Cheat” can be activated in the “Refill/Scoop” Settings. If your tank is empty, keep triggering the drop until you get the “Instant refill” button – clicking the button or just pressing the trigger again repeatedly will refill your tank immediately.

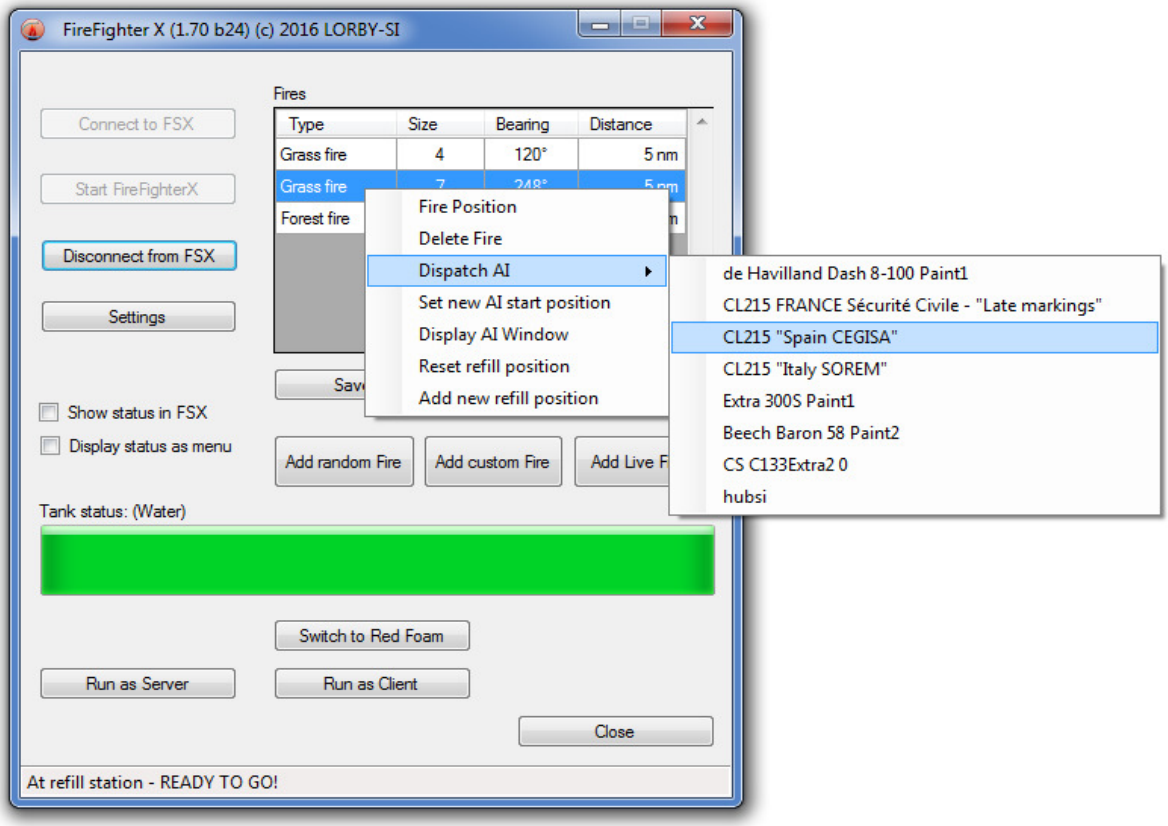
Here is an example of the refilling procedure in the real world:
https://www.youtube.com/watch?v=xPQ_OiAUS8I

5.11 Scooping

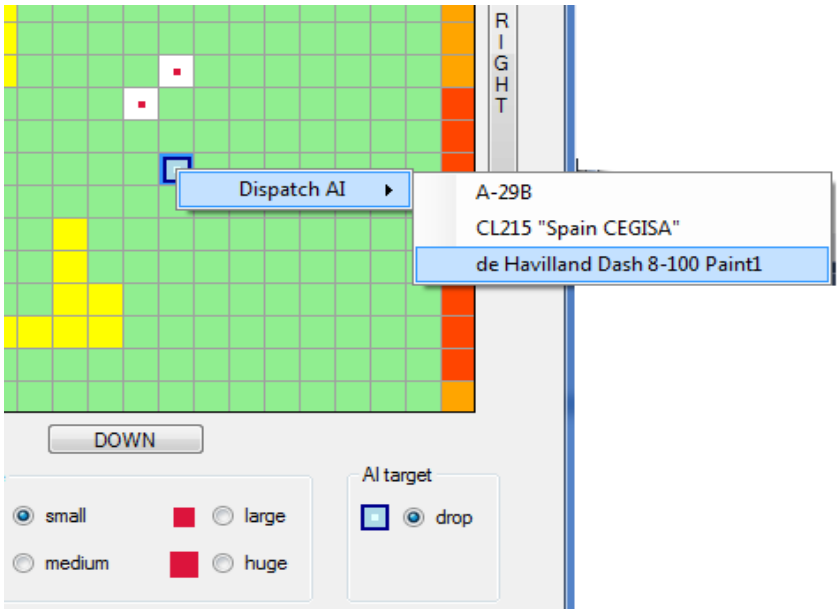
Scooping water is a quite difficult, especially with crash detection turned on. The application will determine if your plane is flying over water and if it is below a predefined altitude. If these conditions are met, then scooping will start automatically. The altitude necessary for scooping and the time it takes to fully refill your tanks can be adjusted in the Settings. Set the scoop time to “0” if you do not want your plane to have this ability – with time “0” it will not scoop.
Real world example: the Canadair CL-215 takes all of 12 seconds to refill her 6-ton water tank. Just be aware that you take on quite a lot of weight in a very short period of time – let her settle on the water and it may take forever to get her back into the air!

5.12 AI Traffic

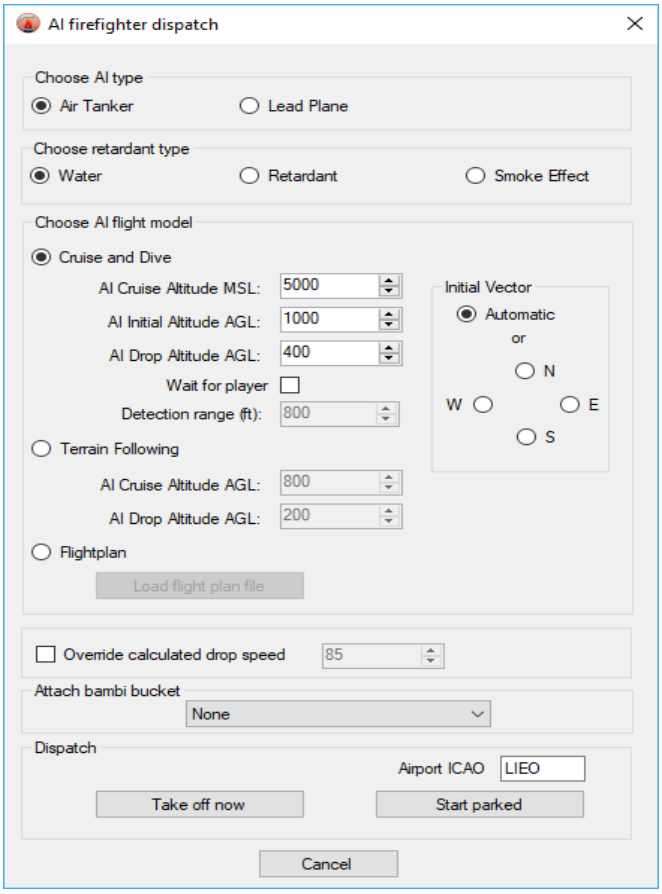
1. You can either send out AI fire fighters to every fire on the list, by right-clicking on the fire, then first selecting “Dispatch AI” followed by left clicking on the desired model.



2. Or you can send out AI fire fighters by setting drop points with the fire designer.



5.12.1 fighter dispatch



First choose what the AI aircraft should do:

- Air tanker: will fly out to the target and drop retardant
- Lead Plane: will fly out, and at 3000 feet from the target it will activate the smoke system of the airplane model to show other planes the way to where to drop the retardant. Lead planes sent out in Cruise&Dive mode will enter a holding pattern directly after takeoff, climbing to their cruise altitude, to give you the opportunity to catch up with them. The will enter a hold over the fire too, and will make several additional low level passes over it.

Next choose the retardant type that the AI shall drop:

- Water and Retardant simulated by FireFighter X
- Smoke Effect, if there is one present in the aircraft model. A lot of freeware Air Tanker models for FSX and P3D already have a retardant drop effect built in, and you can use this option here, if you prefer the look of it to the simulated FireFighter X drops.

Then choose the flight model:

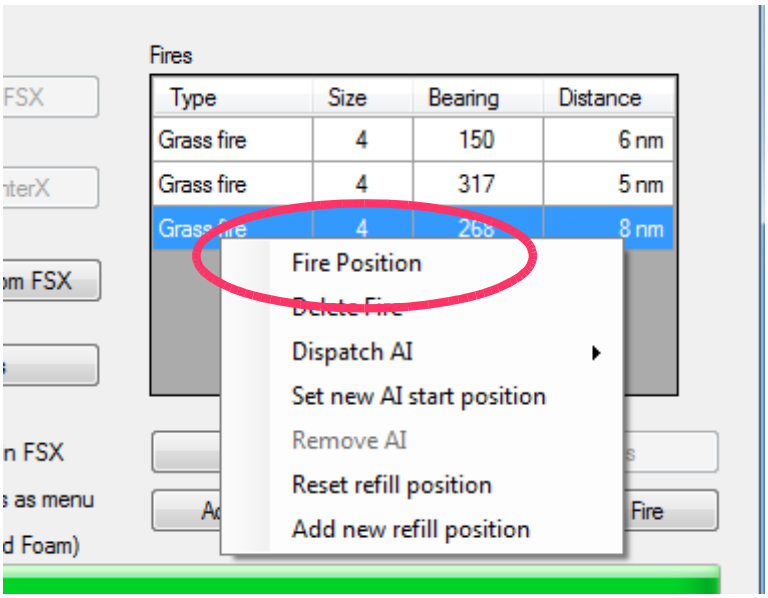
There are three flight models available:

Cruise and Dive:
These airplanes will take off, climb out to the cruise altitude, fly towards the fires, dive & turn at the Initial, drop the retardant, climb back out, fly a short pattern and sometimes have another go at the fire. Then they fly back to the airfield. This mode is designed for the fast and the heavy, as they need time to make their turns and get aligned. It works best for fires that are farther out, depending on airplane type. Planes will make the final turn toward the fire from the direction selected with “Initial Vector”.
By selecting “Wait for player” it is possible to make an AI firefighter or lead plane wait for your aircraft in a holding pattern over the fire. Once you get closer than the specified range from behind the AI, holding the same altitude, the AI will commence the descent and it will make its' run over the fire. It will then return to the hold and wait for you again, until the fire has been extinguished completely.

Terrain Following:
These airplanes will take off, fly out to the fire at the specified cruise altitude above ground, make their run dropping retardant and then return home and land. This only works for fires closer than 20 miles, or else the internal flight plans get too long for the simulator too handle and the AI planes gets stuck on the runway.
Additionally, the aircraft cannot be too large or too fast, terrain “hugging” is not for the likes of DC-10 or F-18 (at least not under simulator AI control). Planes will again make the final turn toward the fire from the direction selected with “Initial Vector”,

Flightplan:
This will open an Explorer window for you to choose a flight plan file. This file you have to prepare in advance, by using the internal flight planner in the sim or any flight planning software at your disposal (FSX/P3D flight plan format required). The AI aircraft will then start at a parking position at the designated airport in the file and fly to the destination. If it flies right over a fire, it will drop retardant too, so make sure to include at least one waypoint at the fire's position. Use the “Fire

Position" option in the context menu to get the exact coordinates.



5.12.2 Releasing AI

5.12.2.1 "Override calculated drop speed"

The FireFighter X will calculate the speeds for the AI aircraft for cruise, dive, approach and finally the speed when dropping retardant over the fire. Unfortunately not all aircraft model include the necessary information, so the speeds may be set to default values. Default drop speed is 85 knots, and enabling this checkbox allows you to override that predefined value, in case that the AI planes fly to slow or too fast over the fire.

This is especially useful when you use the Lead Plane functionality, you can adjust the final speed of the lead plane over the fire to your own aircraft's capabilities.

5.12.2.2 "Attach Bambi Bucket"

This feature is only available starting with Prepar3D version 4.2!

P3D 4.2 introduced helicopter AI traffic. With this option you can attach a Bambi Bucket to a helicopter AI.

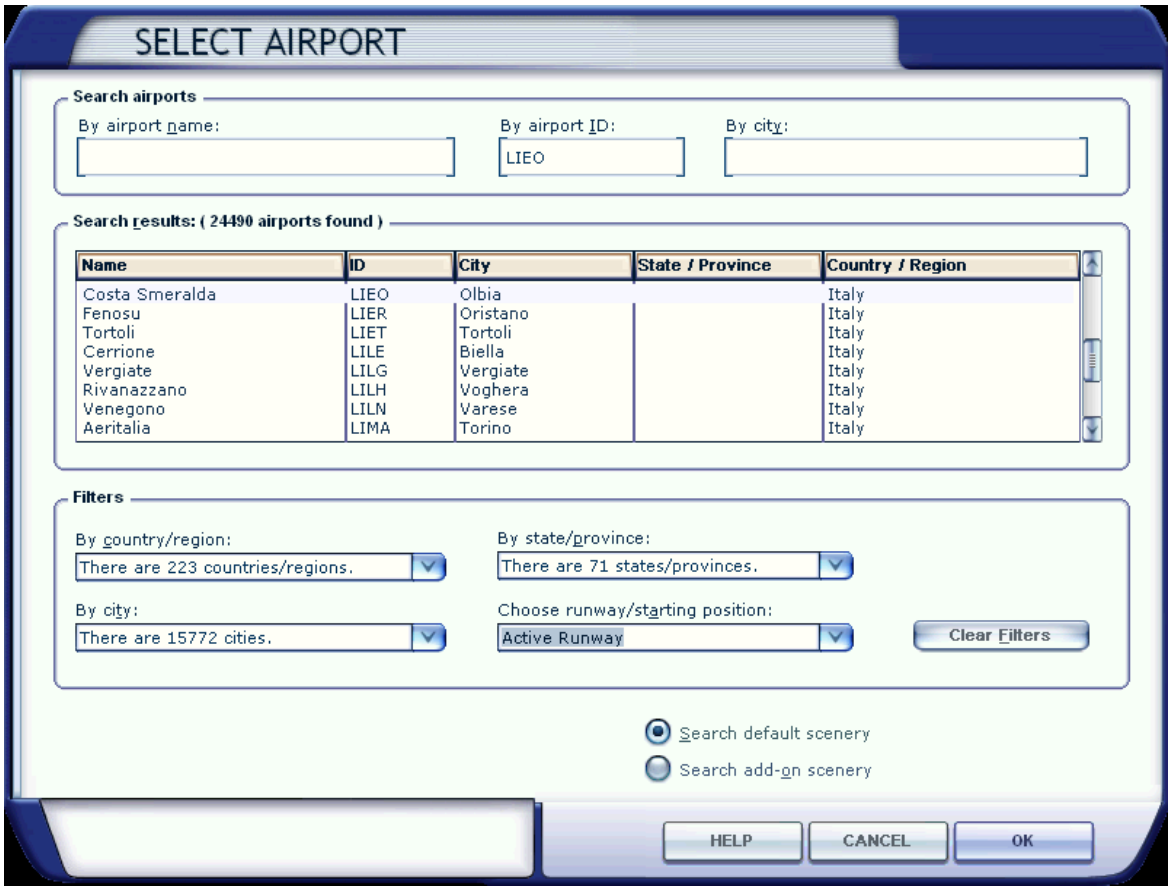
5.12.2.3 “Take off now”

This will create an AI aircraft at the designated starting position. Initially this is right in front of your own aircraft. The AI will then speed away, taking off into the direction you yourself are facing.
You can set this starting position anywhere where you can position your aircraft, the best place would be right on the active runway. Once set, this starting position will be remembered, so every subsequent dispatching of AI fire fighters will start in this spot.

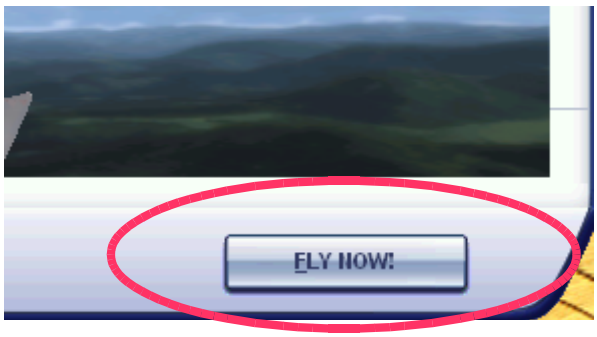
Unfortunately, due to shortcomings of the simulator's AI logic, AI planes of this type cannot taxi from a parking position to the runway.
It is imperative to set a correct starting position for them, or they will end up taking off in any odd direction.

The easiest way to set the AI starting position for “Take off now” is to start the simulation on the active runway. Unfortunately then your refilling station will be in this spot too, which might not be desirable.

If you want to start your flight on a parking position instead of the runway

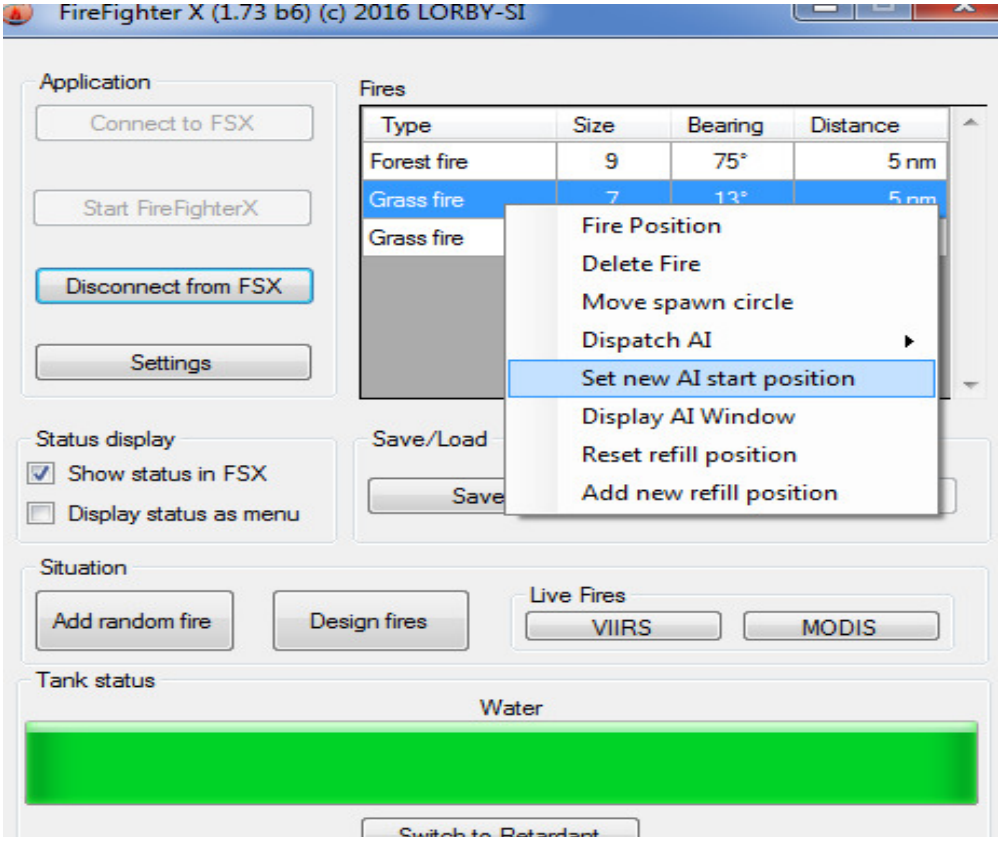


- **Start your flight selecting “Active Runway” in the dropdown selection box “Choose runway/starting position” for your current airport**

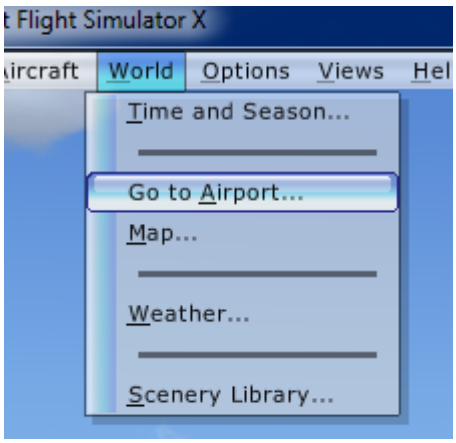


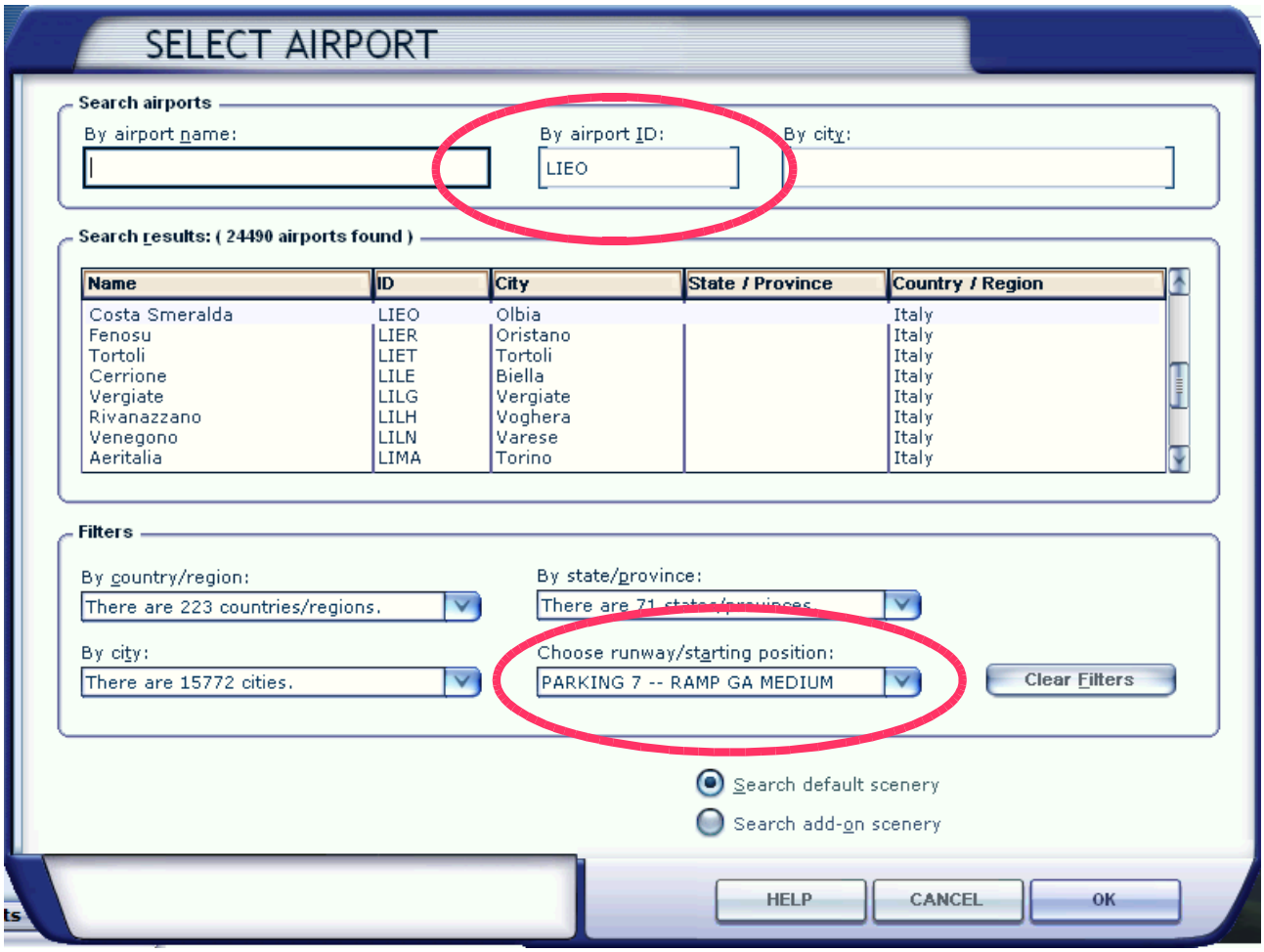
- **Once the loading of your flight is complete, open FireFighter X, Connect to the sim, Start the Fires**

- **Right-click on one of the fires and select “Set new AI start position”**



- **Return to your simulator again, select “World-> Go to Airport” and return your aircraft to the desired parking position**



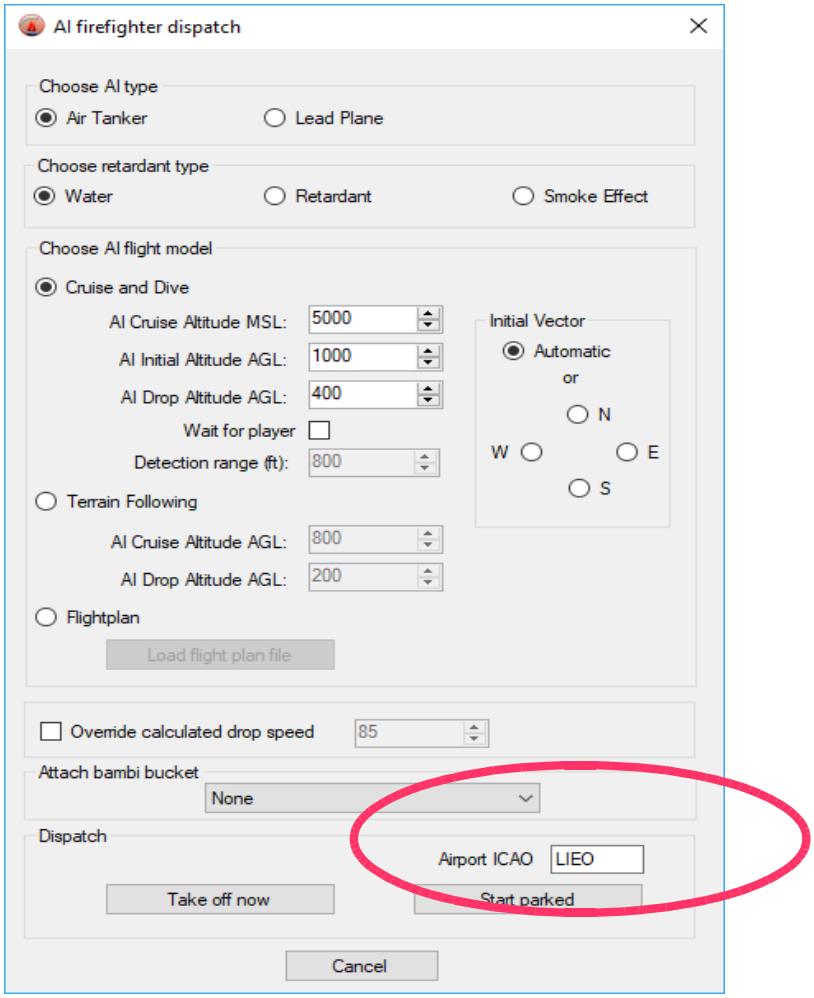


- **In FireFighter X, open the fire context menu by right-clicking on any fire. Select “Set new refill position”.**

- **Now the starting position for AI and your refill position are set correctly.**

5.12.2.4 “Start parked”

If you provide the ICAO code for your current airport in the text field, the button “Start parked” will be activated.



When pushing this button, the FireFighter X will create the desired AI aircraft on a parking position of this airport, provided there is a free spot large enough for that aircraft. The AI will then request VFR clearance and taxi to the active runway, take off and fly out to the fire.

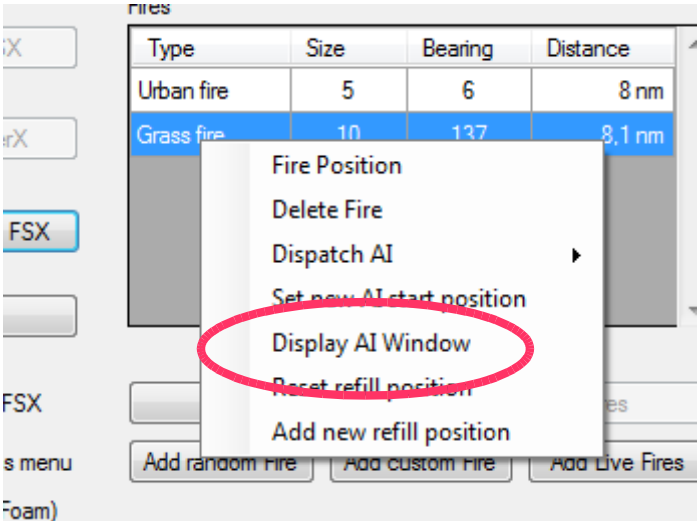
Note: Unfortunately there is no method to directly determine the current airport via SimConnect (most addons use their own database or the “makerunways” tool for this). So the departure airport has to be entered manually - either the airport you are currently positioned on yourself, or one very close by. If you choose an airport outside the current reality bubble, FireFighter X will display an error message and the AI will not be created.

5.12.3 Landing

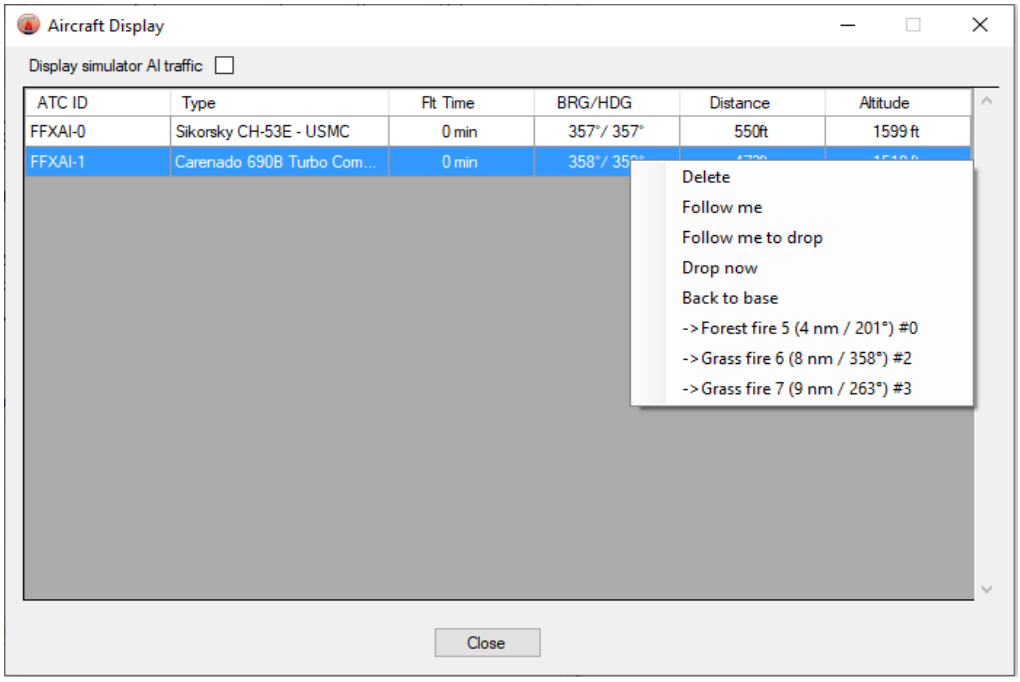
Due to limitations of the sim the AI fire fighters are unable to taxi in to a parking position once they have landed. Because of this, the FireFighter X will remove landed AI airplanes instantly.

5.12.4 Displaying and Removing AI

To display the exact position of the AI aircraft relative to your own and if you want to remove them, use the “Display AI Window” option from the fire menu:

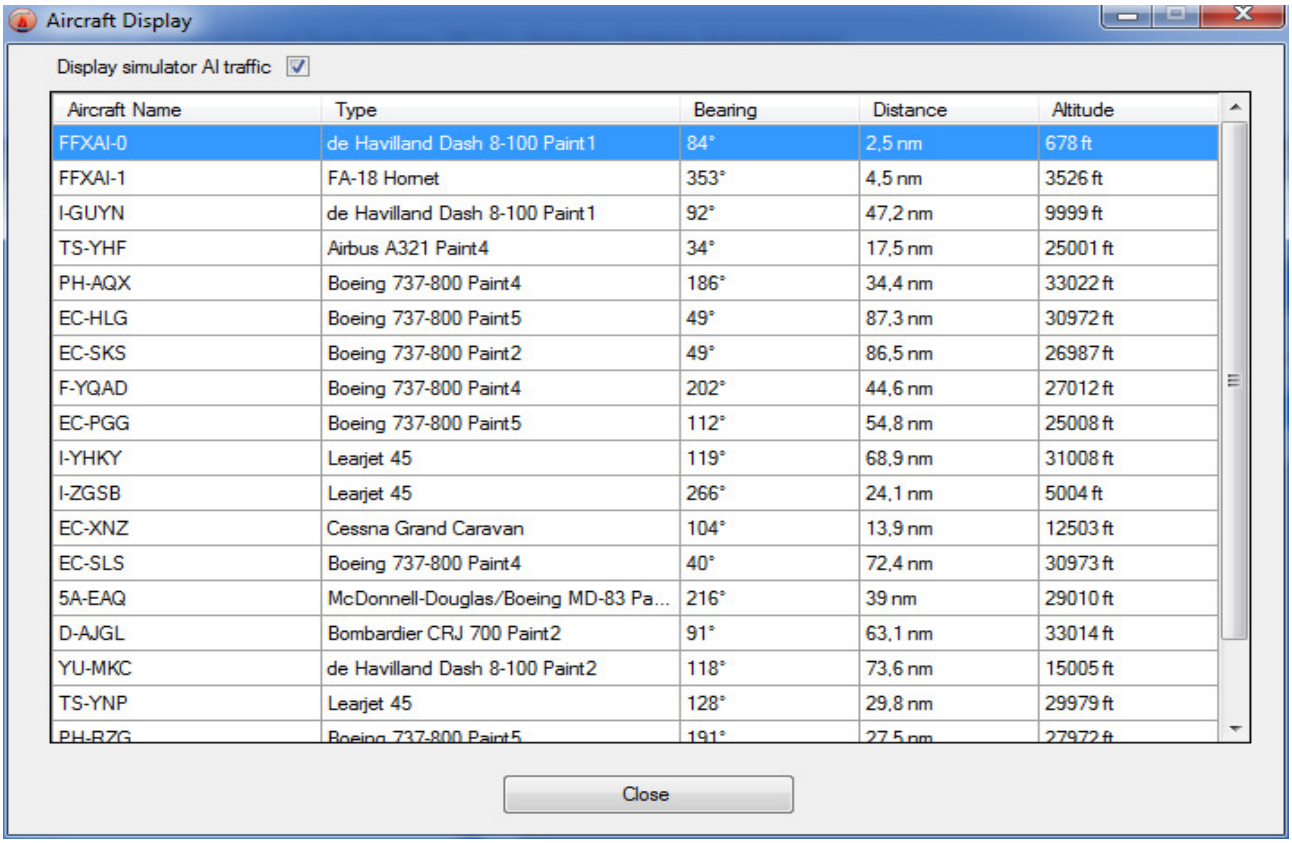


This opens the aircraft display window:



- By selecting “Delete” from the popup menu you can remove individual AI planes.
- “Follow me” will make the AI follow your own aircraft to the best of it's abilities
- “Back to base” lets the AI return to the takeoff position to land there.
- “Drop now” sends an AI in the holding pattern back to the fire, while “Land now” sends it back to the airfield.
- “->” will send the AI to work that fire instead of the current one.

If you activate the checkbox “Display simulator AI traffic” the FireFighter X will add all airborne aircraft inside your “reality bubble” (approx. 80nm) to the list:



5.12.5 Lead planes

In the real world, the large air tankers are often guided to the fire by smaller and lighter “lead planes”. These operate in close contact with the fire boss on the ground, to find the best possible drop point for the air tankers. The lead planes use smoke trails like in aerobatics to guide the larger air tankers in.

- In FireFighter X this procedure is simulated too, albeit not totally accurate.
- You can fly lead yourself, by selecting “Follow me” from the context menu. It is up to you to make sure that the AI following you can catch up with you and aligns with your flight path. The best strategy is to fly tight circles on the desired approach path until the AI catches up, then turning towards the fire. AI will drop retardant on the fire automatically. When you release the AI from following you it will continue to work the fire that it last dropped retardant on. The release can be triggered with the context menu.
- You can also use “Follow me to drop” to direct an AI to follow you until you drop retardant yourself. When you trigger your own drop, the AI will be released, and it continues to work that location.
- If you send out a lead plane to a fire, it will behave like the standard AI air tanker, with the exception, that it triggers the smoke effect at 3000 ft out from the fire as a guidance line for others.
- Every normal air tanker that you send out after this lead plane in the same mode (Cruise&Dive or TerrainFollowing), will follow the same route to the fire as the lead plane did – except if “Wait for Player” was activated.
- A lead plane sent out in “Cruise and Dive” mode will enter a holding pattern right after takeoff, to give you a chance to catch up with it.
- A lead plane sent out in “Cruise and Dive” mode will enter a holding pattern over the fire, making several low level passes with the smoke effect.
- If “Wait for player” was activated when you sent out a “Cruise and Dive” lead plane, it will hold until you get close enough. If you didn't select the “Wait for player” function, the AI will follow its flightplan and eventually dive and fly over the fire. It will not fly the holding pattern right after takeoff in this mode.

- A lead plane sent out in “Terrain Following” mode will not wait, as the flightplan does not permit this – you will have to catch up best as you can. A good strategy would be, if you took off first and hold over the end of the runway or the initial approach point to the fire, then dispatch the lead plane.
- After flying over the fire, the lead plane will climb back to cruising altitude and enter a holding pattern over the fire for a while, to monitor the success of the drop.

To furnish a particular aircraft that doesn't have one with an appropriate smoke effect, all you have to do is add the following to the aircraft.cfg:

[SMOKESYSTEM]
smoke.0=-10.00, -0.70, 0.0, fx_smoke_w

This would add a smoke trail with the effect “fx_smoke_w.fx” from your “Effects” directory 10 feet behind, 0.7 feet to the left and 0 feet above or below your aircraft. It can be triggered with the “I” key by default if you fly the aircraft yourself.

5.12.6 General notes on AI fire fighters

The built-in logic in the simulator handling AI aircraft is powerful, but not very intelligent. As the AI fire fighters in Terrain Following or Cruise&Dive cannot follow regular flight plans, they are created as “Non-ATC” or VFR aircraft. For some reason the simulator does not take care of those in the same way that it does with ATC- and flight plan controlled aircraft.

These planes with VFR waypoint lists have no “survival instinct” whatsoever, they will fly straight into a mountain if it is in their way. And this will happen a lot in FFX, you will frequently lose fellow AI pilots to their inability to read the terrain.

Care has been taken in FFX to map the waypoint lists as detailed and harm-free as possible. But aerial fire fighting is a dangerous business, and many an AI pilot will pay the price for the simulators' shortcomings.

The best strategy is to fly out there yourself and have a look at the terrain

to determine the best approach vector (N,S,E,W) before you send out AI pilots. There may be situations where sending them out might not even be an option – not if you want to bring some of them home. Deep valleys or fires on mountain tops, dangerous departures or approaches pose severe challenges to the AI logic.

You can adjust the AI parameters to help them out, set higher cruise or drop altitudes and make the cruise AGL or MSL.

For example fighting a fire near Chelan, you would be well advised to set the cruise at 4000ft and the drop altitude at 2500ft. But if you are fighting grass fires in northern Sardinia, you can set cruise at 800 AGL and drop at 200 easily. If AI planes are sent out to cruise higher, either keep them at VFR altitudes, like 5000ft, and/or set them to use MSL (or else they will continue following the terrain contours, even when at altitude).

5.12.7 Sending AI back to the fire

After their drops, the AI return to a holding pattern above the fire for a while before flying the next approach. You can direct them to leave the holding pattern immediately with the context menu on the Aircraft Display window (see 5.11.4) or by calling up a menu in the sim by pressing "**Shift & F10**"

5.12.8 Sending AI back to base

You can direct AI to return to the aircfield immediately with the context menu on the Aircraft Display window (see 5.11.4) or by calling up a menu in the sim by pressing "**Shift & F10**"

5.12.9 Redirecting AI to a different fire

You can redirect AI to target a different fire with the context menu on the Aircraft Display window (see 5.11.4) or by calling up a menu in the sim by pressing "**Shift & F10**"

5.12.10 Making AI follow you

You can direct AI to follow you and release it with the context menu on the Aircraft Display window (see 5.11.4) or by calling up a menu in the sim by pressing "**Shift & F10**"

5.12.11 Dispatching AI in the sim

You can dispatch AI air tankers to target a fire through calling up a menu in the sim by pressing "**Shift & F9**". These air tankers will fly in Cruise&Dive mode, using the current parameters from the dispatch dialog.

5.12.12 Stuck AI planes

AI planes may get stuck, circling seemingly forever or not departing from the runway at all. Best option then is to delete them, as they may not recover.

If an AI plane does not depart, this means an error has occurred with its waypoint list – you will have to change Settings before you try again. The most common problem is sending out AI planes over large distances (20 miles or more) and letting them fly AGL. This results in a list of thousands of calculated waypoints, that the simulator just cannot cope with. In that case, uncheck AGL and let them fly at MSL altitude, this reduces the waypoint list to manageable proportions.

5.12.13 AI Aircraft models

You can use any aircraft that is installed in your simulator, either flyable or non-flyable AI. All you have to do is to find out the name of the aircraft model in its aircraft.cfg and add it to the list in the Settings window. See chapter 6 for details.

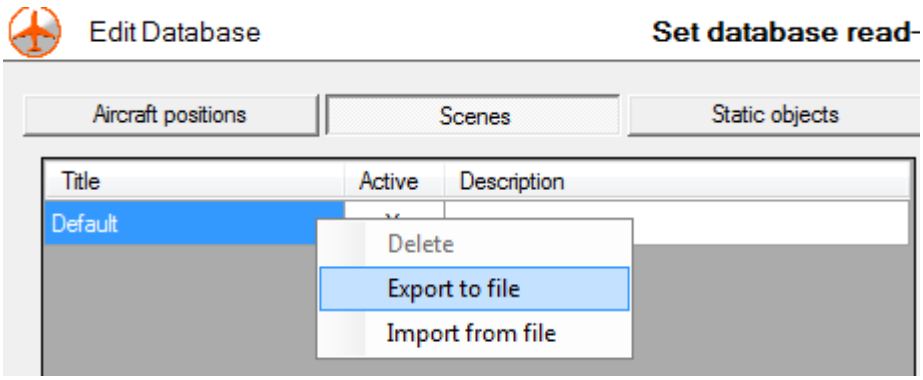
Note for users of FSX and P3D 1.x to 3.x: Unfortunately it is not possible to use helicopters unless you massively alter their .air file and turn them into airplanes. Only P3D V4 can use helicopters as AI.

5.13 Importing Scene files created with WAMA

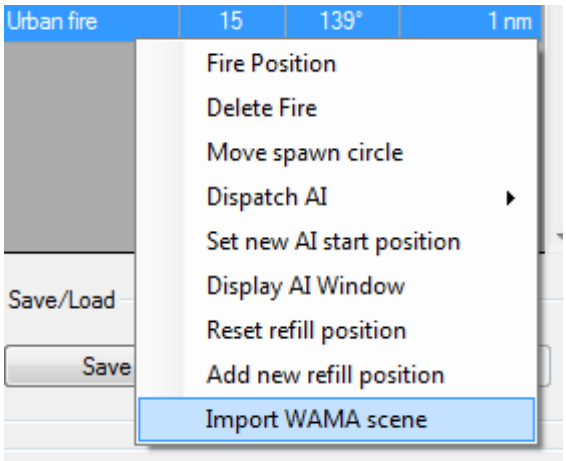
If you have the Lorby-SI “Where are my aircraft” (WAMA) app, you can import scene XML files that have been created with that program in to FireFighter X.
You can use this for example to populate your refill station with additional objects or to place ground vehicles, refill tanks etc. around the fire.

When you save a fire, then these objects will be saved with it. So importing them is only required once.

- To place objects accurately, you can run WAMA and FireFighter X at the same time, then export the Scene from WAMA:



- From the FFX fire context menu select “Import WAMA scene”
- A standard Windows Explorer window will open, which you use to navigate to the Scene file that you have exported from WAMA



5.14 In the sim

Status display
When activated, either a status line at the top of the screen or a menu type window are displayed. These will show you the necessary information to guide you to your refuel station or to the active fires. They also show you the amount of retardant left in your tanks.

The display can be toggled on or off with the “Tow rope (release)” - event, either by using the defined keys (default is “Shift + Y”) or any external control bound to this event (like a joystick button).

There are no actions associated to the menu items, except “1 – Close”. The menu items are selectable, but doing so will also only close the window. This unfortunately is due to a limitation in the simulator itself, there is no other way to format and use these menu windows over Simconnect.

Caution:
The menu-type status display will refresh every second, pulling away the focus of any other active windows (like ATC). It should best be deactivated with the toggle key described above, when other windows need to be operated.

Retardant drop release
To release a drop you need to trigger the “Release Droppable Objects” event in the sim, either by using the defined keys (default is “Shift + D”) or any external control bound to this event (like a joystick button).

Pausing
The application reacts to pausing the sim. As long as your flight is paused, the fire lifecycle and other “live” functions are disabled too.

Weight and balance
It is crucial to check your weight before takeoff. After you start FFX, take a look at the “Fuel and Payload” menu in the sim and adjust fuel so that the plane is not overweight (less than 30% should do it).

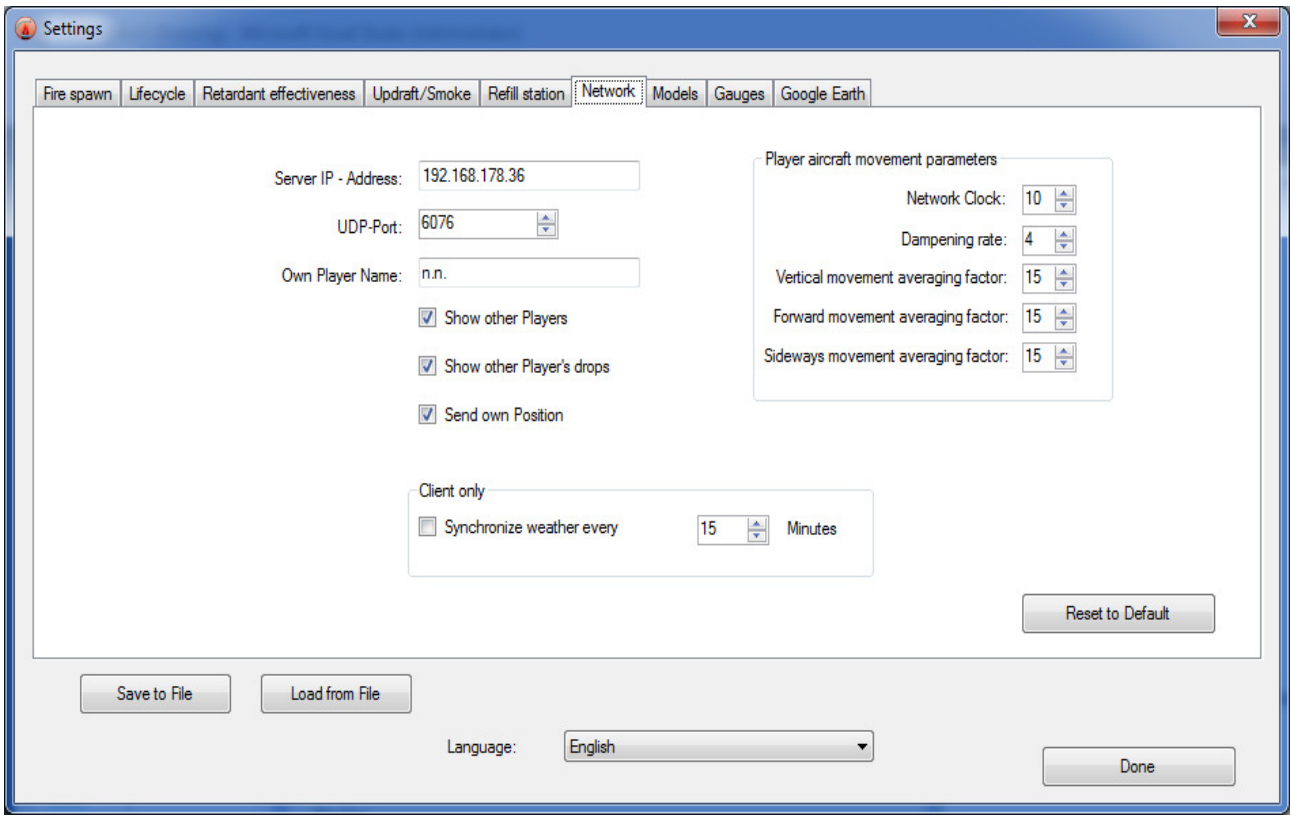
5.15 Multiplayer Operations

FFX was designed to work either as a server or as a client in a multi user setup, no additional software is needed.

In case you already have a multiplayer product (like FSHost) or are using the multiplayer functions built into the sim, FireFighter X allows you to disable its own depiction modes for the other players aircraft. In that case, only the fires and retardant drops will be shared between the different FFX installations.

Settings
Before you start, you need to set up the network prerequisites as described in the installation chapter above.

You then enter the settings as shown in the example below:



- *Server IP-Address*: IP address of the FFX running as server to connect to
- *UDP-Port*: port for connecting

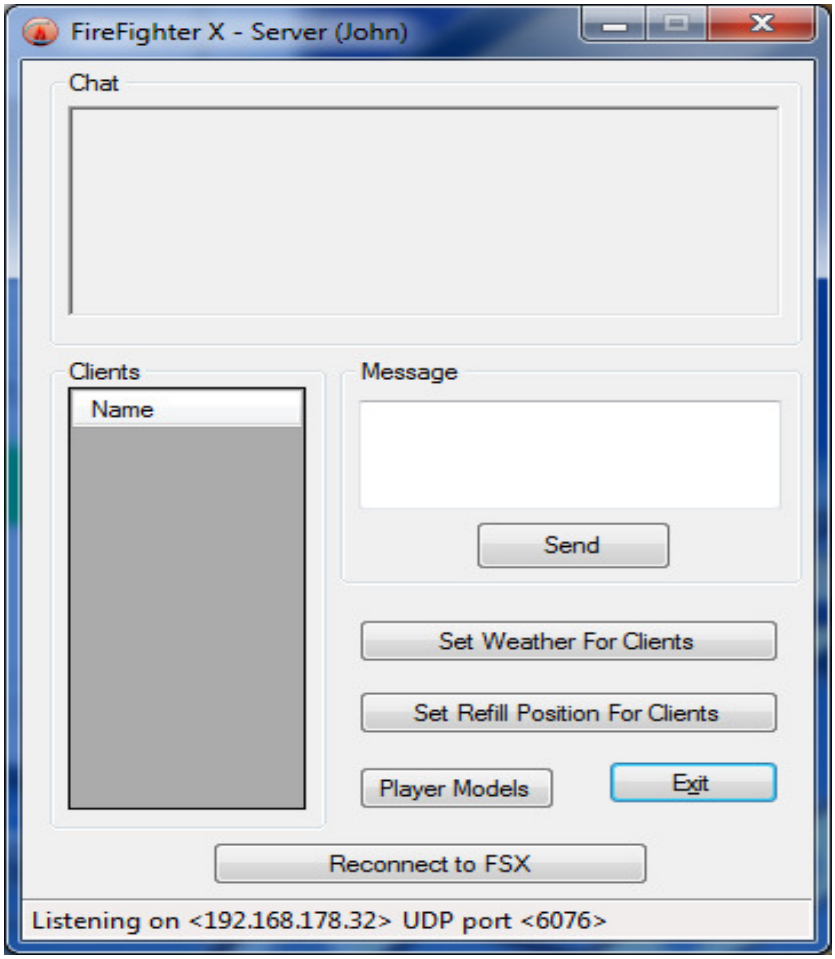
- *Own Player name*: Your name as displayed in the sim
- *Show other players*: use this to switch the depiction of the other player's airplanes on or off. Useful if your computer is not fast enough to allow fluent gameplay when multiple complex objects are visible at the same time
- *Show other player's drops*: use this to switch the depiction of the other player's retardant drops on or off.
- *Send own Position*: uncheck this to make your plane disappear from the other player's sims. Again useful for slower computers or networks.
- *Network Clock (FPS)*: Frequency with which the network communication will occur. The higher this value, the more fluent the depiction in the sim will be – but be mindful of slower computers in your setup and network bandwidth considerations. If your IP connection is very slow, setting this to higher values will make no difference. But if your connection is very fast, like in a LAN, you can limit the communication frequency with a lower value, to free up bandwidth for TeamSpeak etc.

The “Show other Players” and “Send own Position” options only influence the depiction mode in the sim. The central fire simulation in the server-FFX will still continue, and all players will share the effects of your retardant drops, even if they cannot see your airplane in their sim.

It is important to dial down the visual density of the retardant drops in the “Retardant drop config”. If this is set on too high a value, FPS on clients and server will suffer greatly. It is recommended to set this as low as possible (1-2) or to turn it off.

Server

If you decide to run your FFX as a server, the following window will appear:

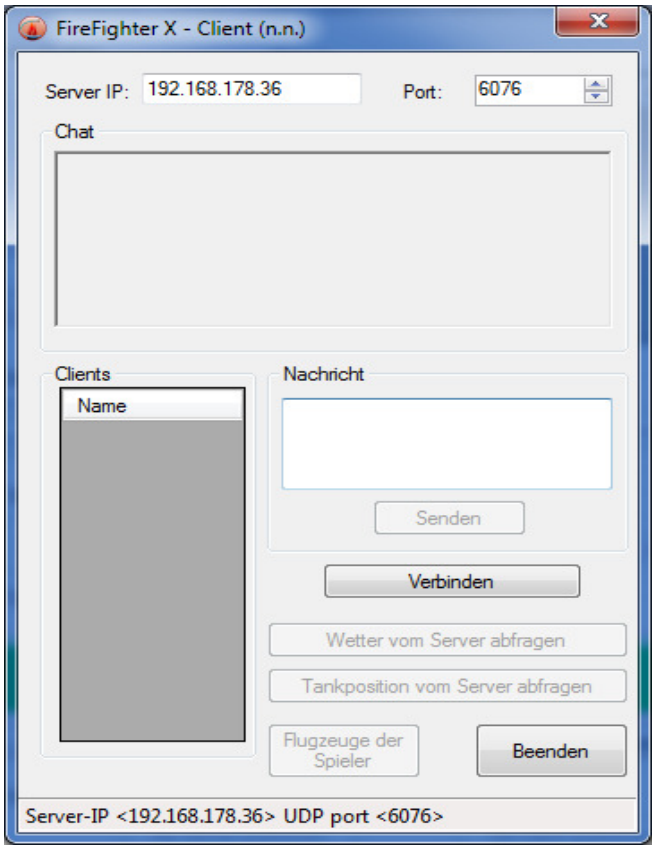


- *Chat*: view all messages from other players and technical notes from FFX
- *Player list*: displays all players present in the network session
- *Message & Send*: type in a message and send it to all players
- *Set Weather For Clients*: Forces the current time of day and weather on all connected clients.
- *Set Refill Position For Clients*: Forces the position and sim model of the refill stations on all connected clients. Note: If clients do not have the SimObjects in your simulator to depict the refill stations, that model will not be displayed – but the position of the refill stations will change anyway. You will have to exchange the models to be used, for example via email.
- *Player Models*: opens the aircraft assignment window, where you can change the model displayed for a player (described in more detail below)

- *Exit*: shut down the server.
- *Reconnect to <sim>*: on occasion it may happen that SimConnect stops working and does not tie into FireFighter X any more. The FireFighter X application will continue to run and the network protocol remains active, but all models, airplanes and fires disappear from the simulator on the server. If this happens, you can reconnect the FireFighterX to the sim by using this button. All clients will be forced to disconnect and have to join again, but the fire situation and results will be preserved.

Client

If you want to connect to a server, use the "Run as Client" button



- ServerIP/Port: are initially filled with the values from the settings page. You can overwrite them here if you are connecting to a different server.
- Button "*Connect*": tries to connect you to the server address and port you specified in the Settings/Network window.
- *Chat*: view all messages from other players and technical notes from FFX
- *Message & Post*: Type and send out a message to all players

- *Request Server Weather:* sets the global weather and time of day to the same settings as the Server
- *Request Refill Position:* sets the position and model of the refill stations to the same settings as the Server. Note: If you do not have the SimObjects in your simulator to depict the refill stations, that model will not be displayed – but the positions of the refill stations will change anyway. You will have to exchange the models to be used with the user running the server, for example via email.
- *Player Models*: opens the aircraft assignment window, where you can change the model displayed for a player (described in more detail below)
- *Exit*: shut down the client.

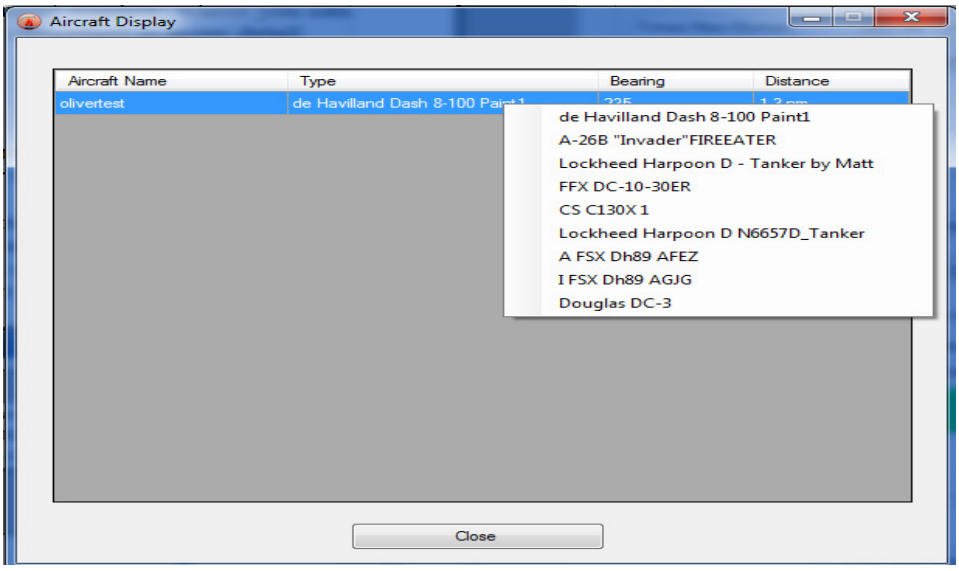
Weather on the server

Please note that the FireFighterX reads the current weather report only once every minute. If you change your weather in your "server" simulator, please wait for one minute before sending it to the clients.

Player Aircraft assignment window

When you connect two FFX installations via network, they will try to display the aircraft model that the other player is using.

The best course of action is to exchange the aircraft models you plan to use beforehand, so both simulators have the same aircraft installed. If this is not possible or not really working (like old FS aircraft in P3D) you can assign the same aircraft to the other player that you use for AI operations.



Right click on the plane that you want to change and choose a model from the drop down list, and it will change instantly in the sim. Bear in mind, that not all functions will be available for all aircraft. If for example the other player is using a single engine plane, assigning a twin prop in your own sim to him will result in one engine not turning.

Network protocol

Apart from aircraft movement and orientation, the following events are transmitted over the network:

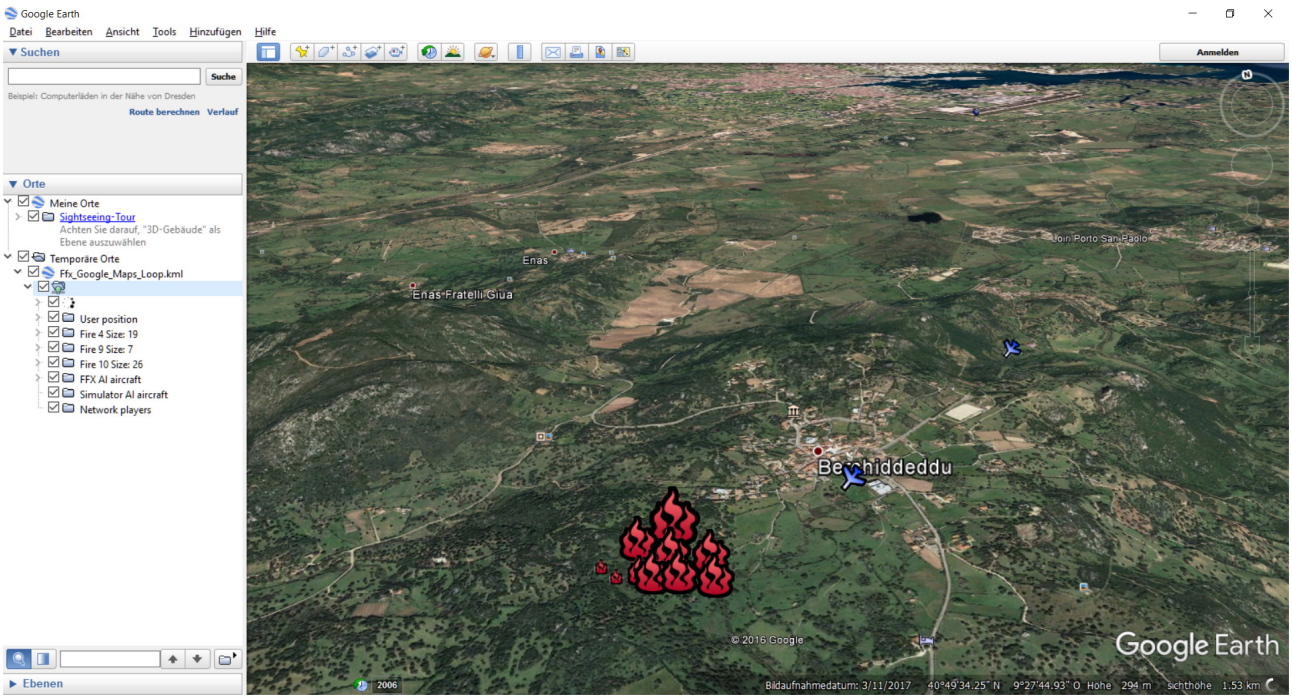
- Aircraft lights
- Throttle position
- Control surface positions
- Gear
- Flaps
- Smoke effect toggle

Note: Due to creative use of the simulator events by some developers, these events may not fully work.

5.16 Google Earth Live View

FireFighter X can use Google Earth to display a dynamic view of your fire situation. Depending on the choices you made in the Settings Dialog, tab “Google Earth”, the following will happen when you press the “Start Google Earth Live” button on the main FFX window:

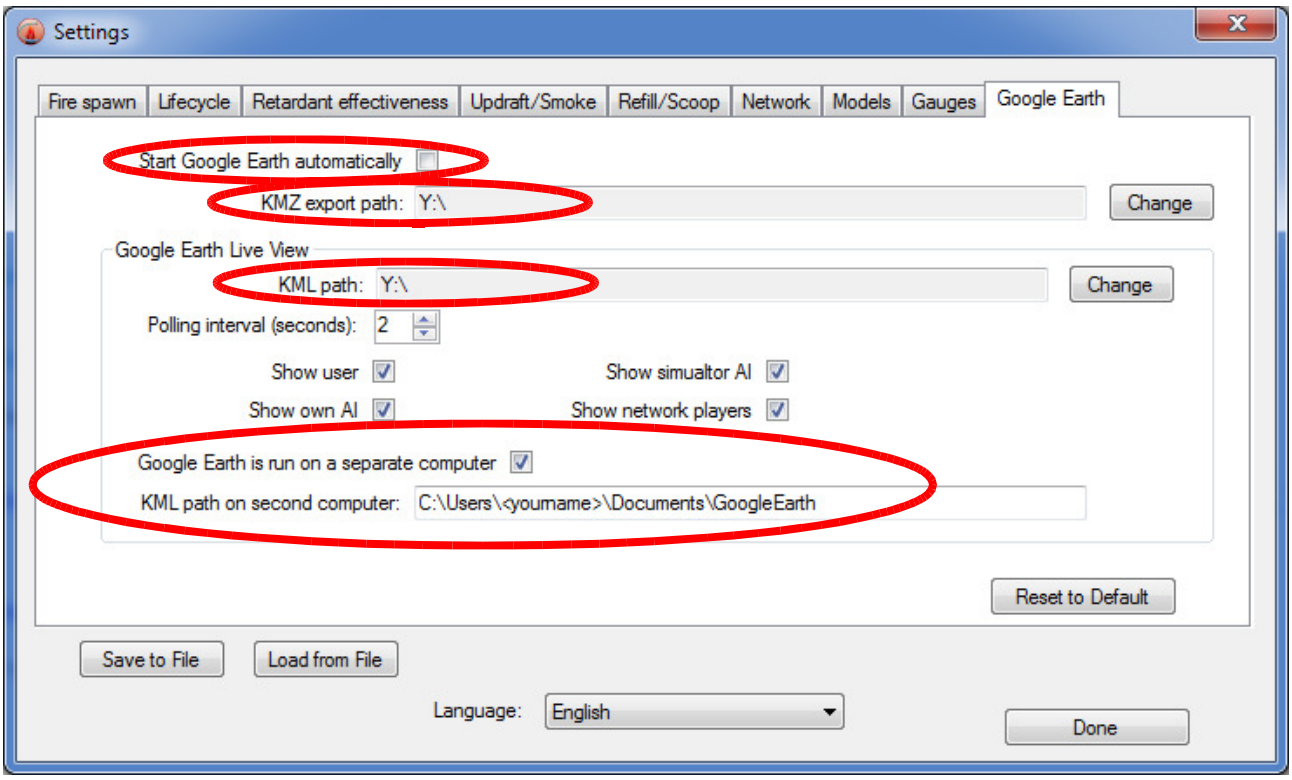
- Google Earth will open automatically (if desired)
- FFX will establish a self loading file that will continuously poll for the following data:
  - position and size of fires
  - your own position
  - positions of AI fire fighters
  - positions of simulator AI aircraft
  - positions of the other players on the network



Running GoogleEarth on a separate computer

It is possible to stream the Live View data to a second computer running Google Earth.

- Create a folder on your secondary computer that shall contain the FireFighter X KML files
  Example: **“C:\Users\<yourname>\Documents\GoogleEarth”**
- Share this folder on your secondary computer. Make sure that your primary computer has full access privileges
- Map the folder as a network drive on your primary computer, for example as **“Y:”**
- Now go to the “Google Earth” tab in the FireFighter X Settings and make it look like this:



(<yourname> has to be replaced with the name of your user account!)

Now FireFighter X will save all KMZ and KML files on your second computer, and you have to open them manually there - Google Earth cannot be started automatically.

For the live view, doubleclick on the file “Ffx_Google_Earth_Loop.kml”

5.17 Saving and loading fire situations

By using the “Save Fires” and “Load Fires” buttons, you can preserve a current situation. These buttons open the standard Windows Explorer to navigate and choose files. The situation files have a simple XML layout:.

```
<?xml version="1.0" encoding="utf-8"?>
<FireList xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <refills>
    <RefillPosition>
      <latitude>40.892769</latitude>
      <longitude>9.506387</longitude>
      <altitude>51.875181</altitude>
      <heading>57.562733</heading>
      <truckModel>Reservretardant</truckModel>
      <truckLat>40.892614</truckLat>
      <truckLon>9.506517</truckLon>
    </RefillPosition>
    <RefillPosition>
      <latitude>40.902054</latitude>
      <longitude>9.515523</longitude>
      <altitude>51.806994</altitude>
      <heading>328.668335</heading>
      <truckModel>Reservretardant</truckModel>
      <truckLat>40.902149</truckLat>
      <truckLon>9.515731</truckLon>
    </RefillPosition>
  </refills>
  <fires>
    <Fire>
      <elementals>
        <Elemental>
          <latitude>40.882288</latitude>
          <longitude>9.393401</longitude>
          <state>grow</state>
          <stage>small</stage>
          <type>FIRE</type>
        </Elemental>
      </elementals>
      <latitude>40.882288</latitude>
      <longitude>9.393401</longitude>
    </Fire>
    <Fire>
      <elementals>
        <Elemental>
          <latitude>40.811438</latitude>
          <longitude>9.621412</longitude>
          <state>grow</state>
          <stage>small</stage>
          <type>FIRE</type>
        </Elemental>
      </elementals>
      <latitude>40.811438</latitude>
      <longitude>9.621412</longitude>
    </Fire>
  </fires>
  <barriers>
```

```
    <Barrier>
      <latitude>40.902181</latitude>
      <longitude>9.524675</longitude>
      <radiusFeet>143</radiusFeet>
      <minutes>29</minutes>
    </Barrier>
  </barriers>
</FireList>
```

XML values:
Refills:

- Latitude/Longitude/heading in dregrees
- Altitude in feet
- Model type and position

Elemental:

- Latitude/Longitude in dregrees
- state: grow / shrink
- stage: small, medium, large, huge
- type: FIRE / BURNT

Barrier:

- Latitude/Longitude in dregrees
- radiusFeet: size of the Barrier element
- minutes: time the barrier stays active

Notes:
If you want your file to contain only RefillStations, you can leave out the <fires> and <barriers> lists completely. After loading the file, the FireFighter X will start the default random fire generation.

Default situation: If you save a fire situation in the standard folder "Documents\FireFighterX Files" giving it the name "DefaultFireList.xml", the FireFighter X will load that file automatically every time when you press "Start FireFighter X".

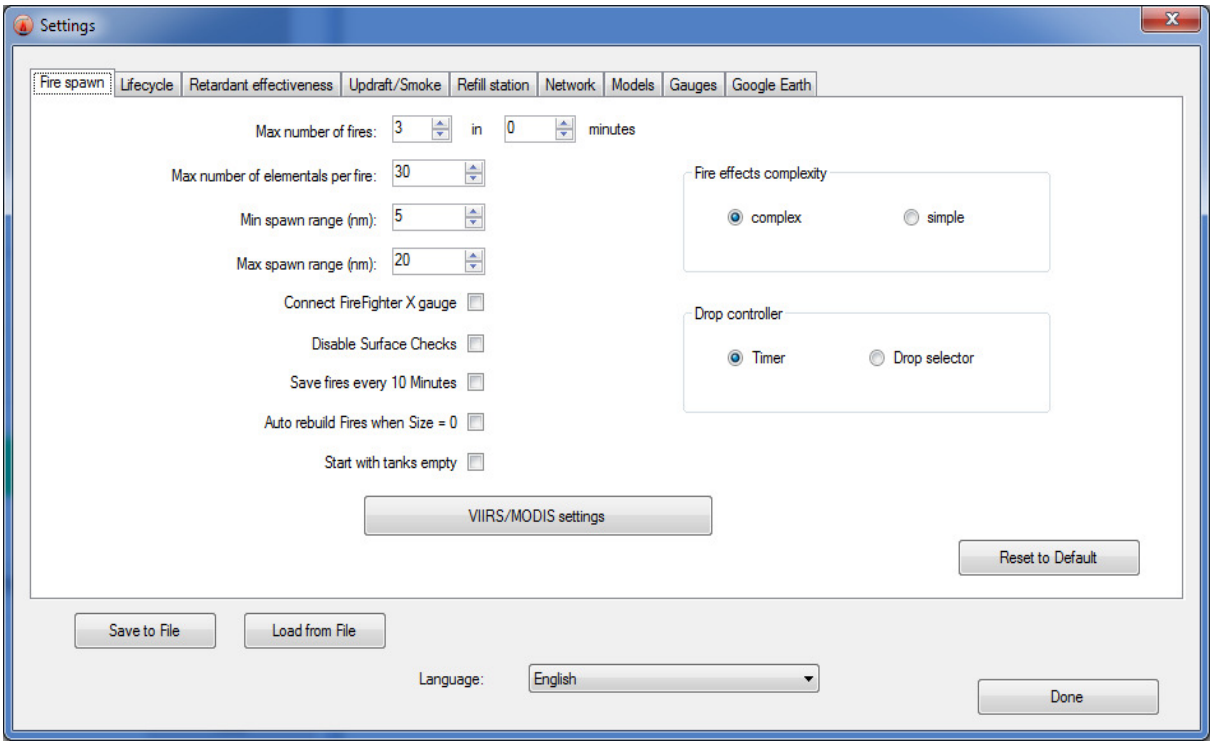
6. Settings dialog

The settings window allows you to tweak all aspects of the simulation to your liking. Settings can be changed any time, even when the simulation is already running.

Language: The application language can be changed with the drop down list. Every change triggers a restart of FireFighter X.

Note: all the settings that you make are automatically saved to the default config file and will be reloaded the next time that you start the program. You can reset the values visible on the selected tab to the pre-programmed default by clicking the button “Reset to Default”

6.1 Fire spawn



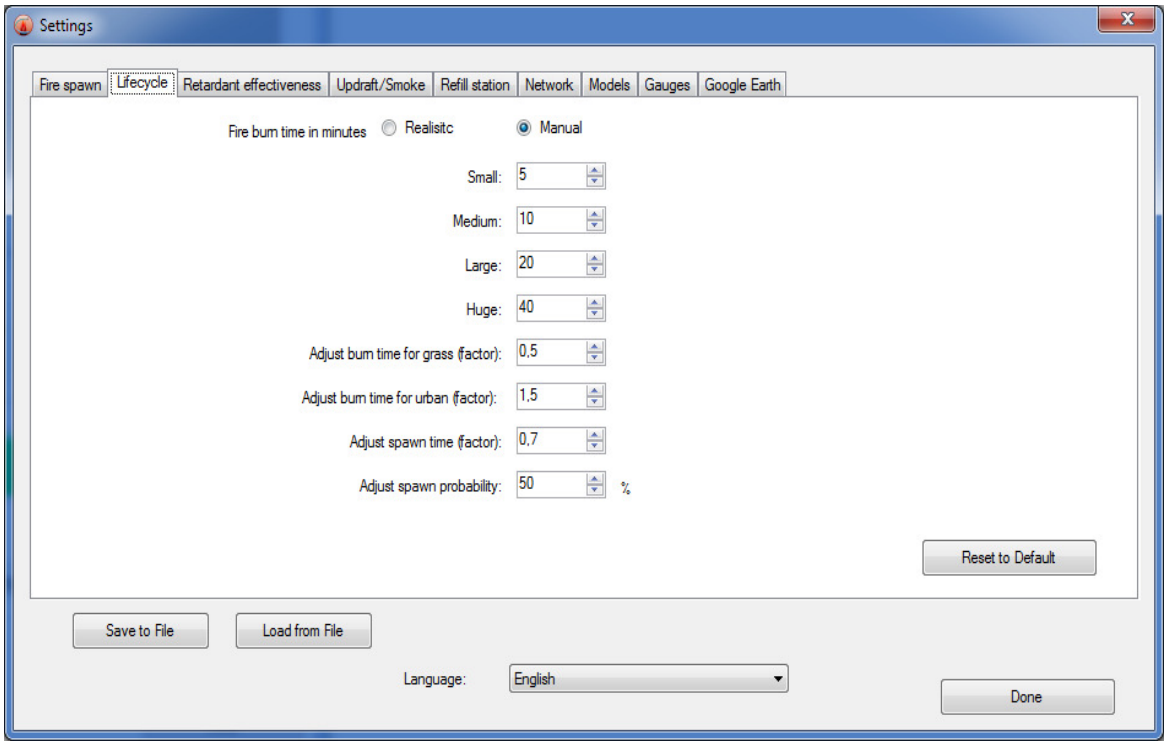
- *Max number of fires*: defines the maximum number of fires the simulation is allowed to spawn – turn this down to gain FPS
- *in "x" minutes*: If you set this to a value greater than "0", the point in time when a fire will start will be randomized.
  Example: "Max number of fires -3- in -30- minutes" means that a total of three fires of unknown size will be created in random places in the next 30 minutes.
- *Max number of elementals per fire*: defines the maximum number of single effects objects (Elementals) that a fire may consist of – turn this down to gain FPS
- *Fire effects complexity:* You can choose between complex, more elaborate fire effects and lightweight ones to gain FPS.
- *Drop controller:* Switch between timer based drop control and the drop coverage selector.
- *Min spawn range (nm)*: the distance in nm from your current position where the simulation will start spawning the fires at random
- *Max spawn range (nm)*: fires will be spawned no further than this distance from your current position.
- *Connect FireFighter X Gauge*: Needs to be checked for the

FireFighter X fire radar gauge to work. If you are not using the gauge, keep this unchecked to avoid unnecessary load on the SimConnect interface.

- *Disable surface checks:* when checked, the FireFighterX will not check if the location of a fire can actually sustain a fire (=is flammable). When you activate this option, fires can be spawned everywhere, even on water.
- *Save fires every 10 minutes:* this automatically saves the current fire situation every 10 minutes to a file called "FireFighterX_Autosave.xml" in your "Documents" folder. This can be useful if your sim is unstable and crashes frequently. Especially in multiplayer mode it may be advisable to activate this option on the user's application that is acting as Server, so the current situation is saved if the Server should crash. Please note though, that saving large fires takes a brief moment, and the sim may stutter while this is done.
- *Auto rebuild Fires when Size = 0*: if this option is enabled, then fires that have been completely dowsed (Size will drop to 0) will be removed from the main list, and a new fire will be spawned instead.
- *Start with tanks empty*: if this option is enabled, then FireFighter X will not fill up your retardant tanks when you start the application.
- *VIIRS/MODIS settings*: opens a dialog to adjust the download parameters for the VIIRS and MODIS services → see 6.9

The option to disable surface checks was added because scenery developers use different conventions for setting the surface type in the simulator. By enabling this option, fires can be spawned and will grow on every surface, even water (in case you want to simulate a burning oil tanker or something like that). All fires that are spawned in this mode will start as "grass" fires.

6.2 Lifecycle

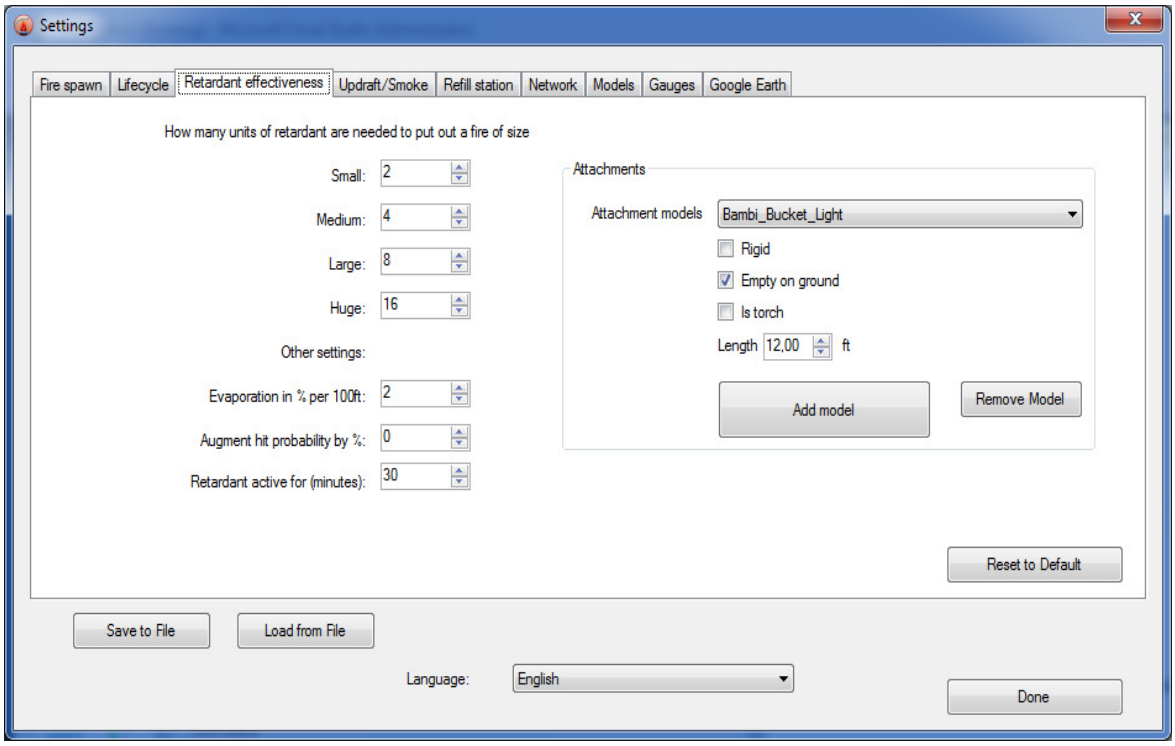


- *Realisitc / Manual:* these Radiobuttons switch between the two available lifecycles

"Manual" lifecycle only:

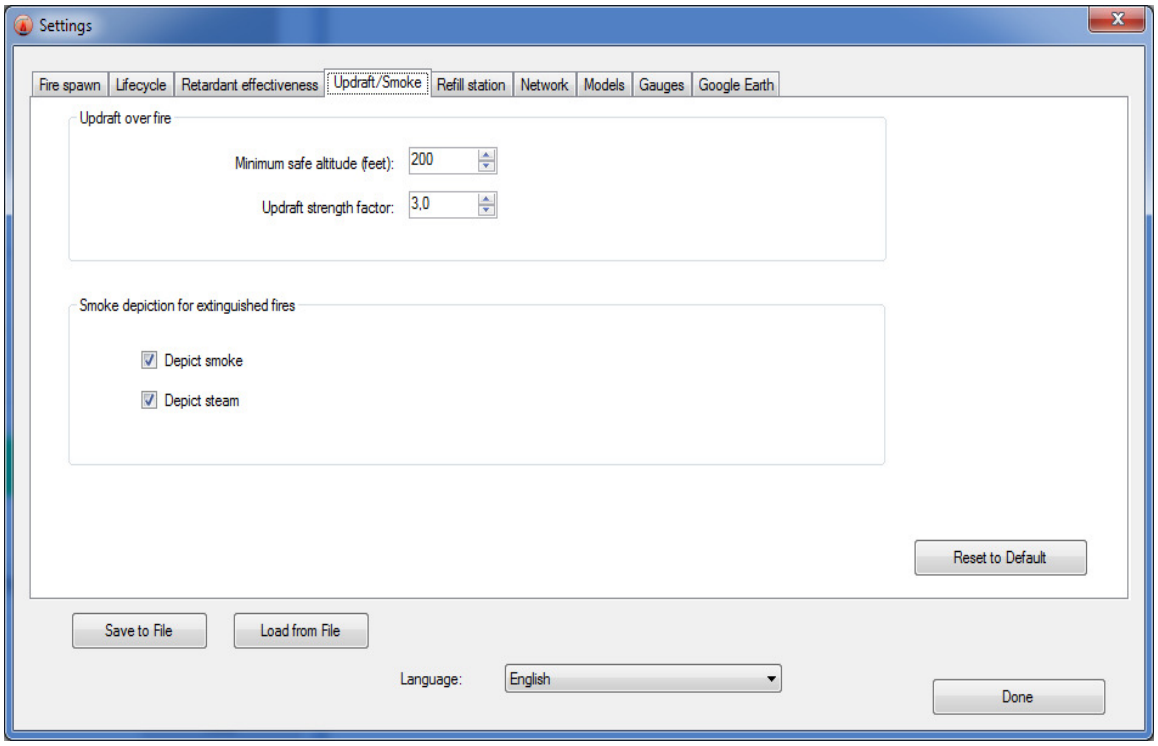
- *Fire burn time in minutes*: define the time how long an Elemental of a certain size will burn until it changes into a larger or smaller shape
- *Adjust burn time for grass (factor)*: Grass burns a lot faster than forests, this can be adjusted here. Setting 0.5 means that an Elemental where you defined a burn time of 10 minutes will only burn 5.
- *Adjust burn time for urban (factor)*: When an Elemental is spawned on urban landclass, it should burn slower. Setting 1.5 means that an Elemental where you defined a burn time of 10 minutes will burn 15.
- *Adjust spawn time (factor)*: Adjust the time needed until an Elemental will spawn itself. Setting this to 1.0 means the Elemental will complete it's life cycle until it spawns. Settings this to 0.5 for an Elemental that burns 5 minutes means, that it it will start multiplying itself after 2.5 minutes.
- *Adjust spawn probability*: Adjust probability that an Elemental will spawn at all. Set this to "0" and fires will not spawn new fires, set it to "100" and they will multiply quickly (depending on wind)

6.3 Retardant effectiveness



- *How many units of retardant are needed to put out a fire of size:* If an Elemental is hit by this much retardant (in Units – see previous Settings page!) it will die.
- *Evaporation in % per 100ft:* This decreases the retardant effectiveness by this percentage for every 100 feet of altitude you are above the fire
- *Augment hit probability by %:* increases the effective zone where the retardant hits.
- *Retardant active for (minutes):* Time in minutes the dropped retardant remains active and prevents fires from spawning.
- *Attachments*: Here you can manage the objects that can be attached to your aircraft on the Timer and Drop Selector dialogs. Some features are only available in Prepar3D!
  - Checkbox “Rigid”: activate this if the model is an unmovable attachment, like a tank
  - Checkbox “Empty on ground”: Activate this if the attachment should be emptied when put down on the ground (like a bucket)
  - “Length”: this parameter influences the movement of a non-rigid attachment and at what altitude it is supposed to touch the ground.
  - “Is torch”: activate this if you want the attachment to drop fire.

6.4 Updraft/Smoke



This settings page combines to different sets of parameters:

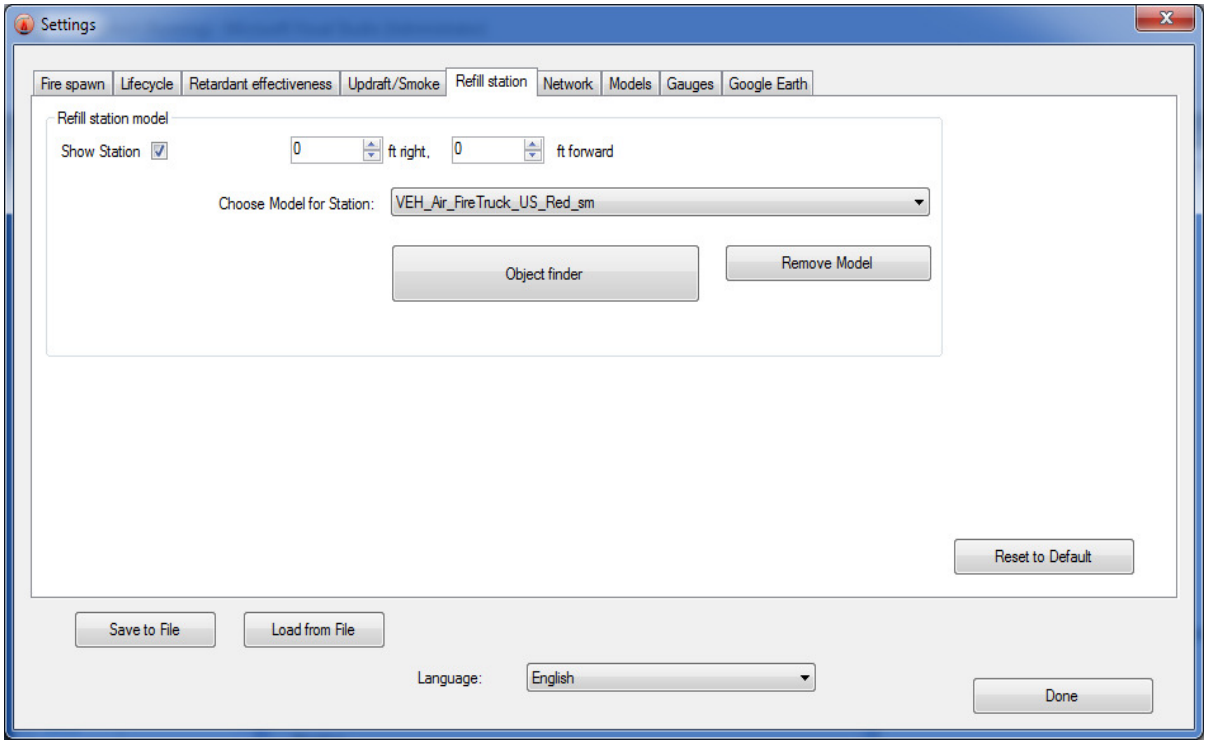
Updrafts over the fires:

- *Minimum safe altitude (feets)*: fly lower than this altitude and bad things will happen.
- *Updraft factor:* determines the strength of the thermals above the fire. The higher the number, the stronger the updraft will be.

Smoke depiction:

- Choose here what you want to be displayed if you extinguish a fire: nothing, smoke, steam or both.

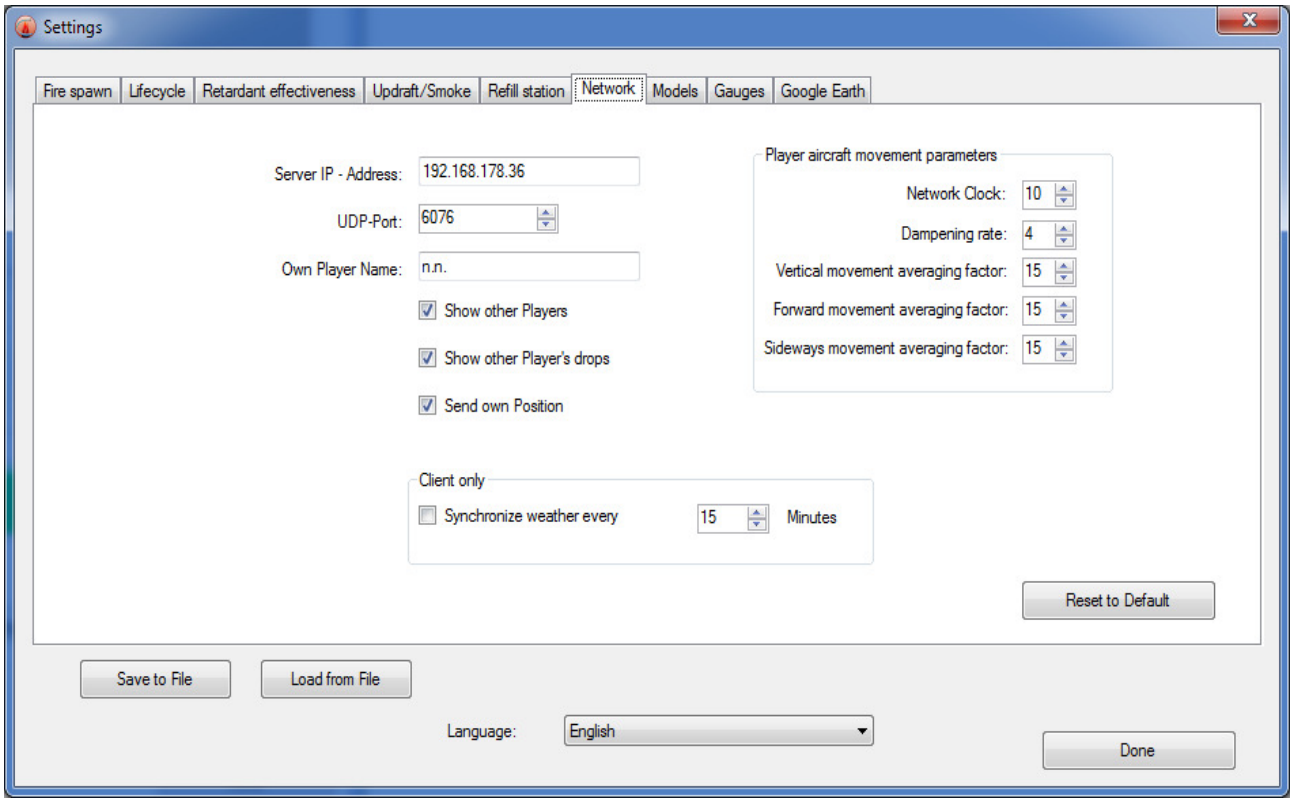
6.5 Refill station



- *Show Station*: display the selected model at the refill station position. If this setting is changed, you have to use the fire context menu and "Set new refill position" to add or remove the truck
- *Offset right/forward*: distance the fire station model is generated from your current position (left/right and forward/aft). If this setting is changed, you have to use the fire context menu and "Set new refill position" to change the offset
- *Choose Model for Station*: "Title" of the sim object to be used for the refilling station. If this setting is changed, you have to use the fire context menu and "Set new refill position" to change the model
- *Remove Model*: removes the selected model from the list.

To add a new model to the list, use the "Object finder" button. This will open the standard Finder dialog, which is described in chapter 6.7

6.6 Network



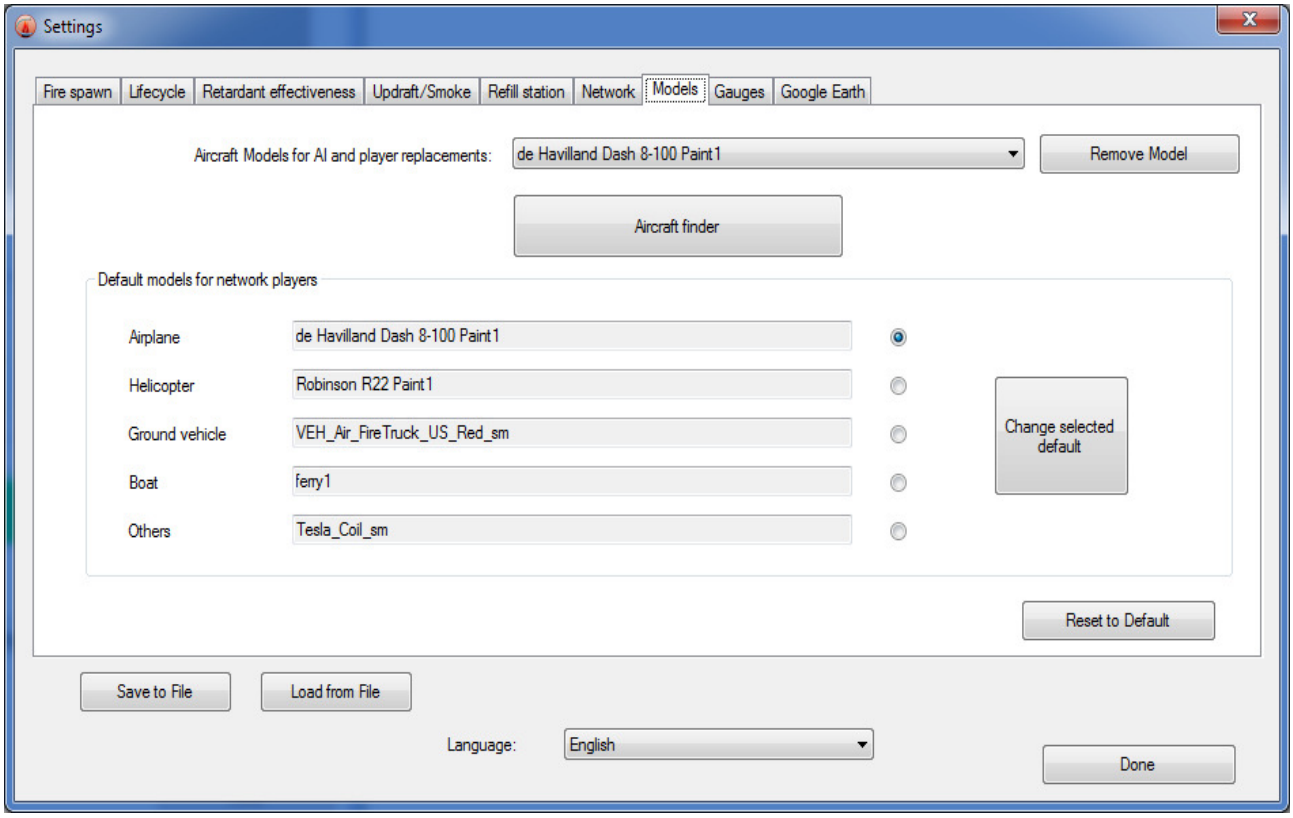
- *Server IP-Address*: Address of the FFX installation that is used as the server.
- *UDP-Port:* The port that you configured in the firewall.
- *Own player name:* Your name that you want to appear in the sim
- *Show other players:* display the other players' aircraft.
  Turn this off if you are using an external multiplayer software
- *Show other players' drops:* display the other players dropping retardant. If your computer struggles with low FPS when displaying the drops, turn this off.
- *Send own Position:* display your aircraft in the other players' sim.
  Turn this off if you are using an external multiplayer software
- *Sychronize weather:* When selected on an FFX client, it will synchronize the global weather with the server every (15) minutes. Weather sync may fail the first time it is called, in that case request the first sync with the “Request Server Weather” button on the client window.

Player aircraft movement parameters:

Every computer and network connection is different. These parameters can help to adjust the movement of the other players to the smoothest possible depiction.

- *Network clock:* The position updates of the other players are controlled with this parameter. Higher values make the updates less frequent, which results in smoother movement at the expense of accuracy.
- *Dampening rate:* Set higher values to compensate for “jumping” aircraft.
- *Vertical|forward|sideways movement averaging factor:* Adjust these values to compensate possible jittering in that directon.

6.7 Models



On this dialog you can add additional aircraft models and change the defaults that are chosen if you don't have a particular model of a network player yourself.

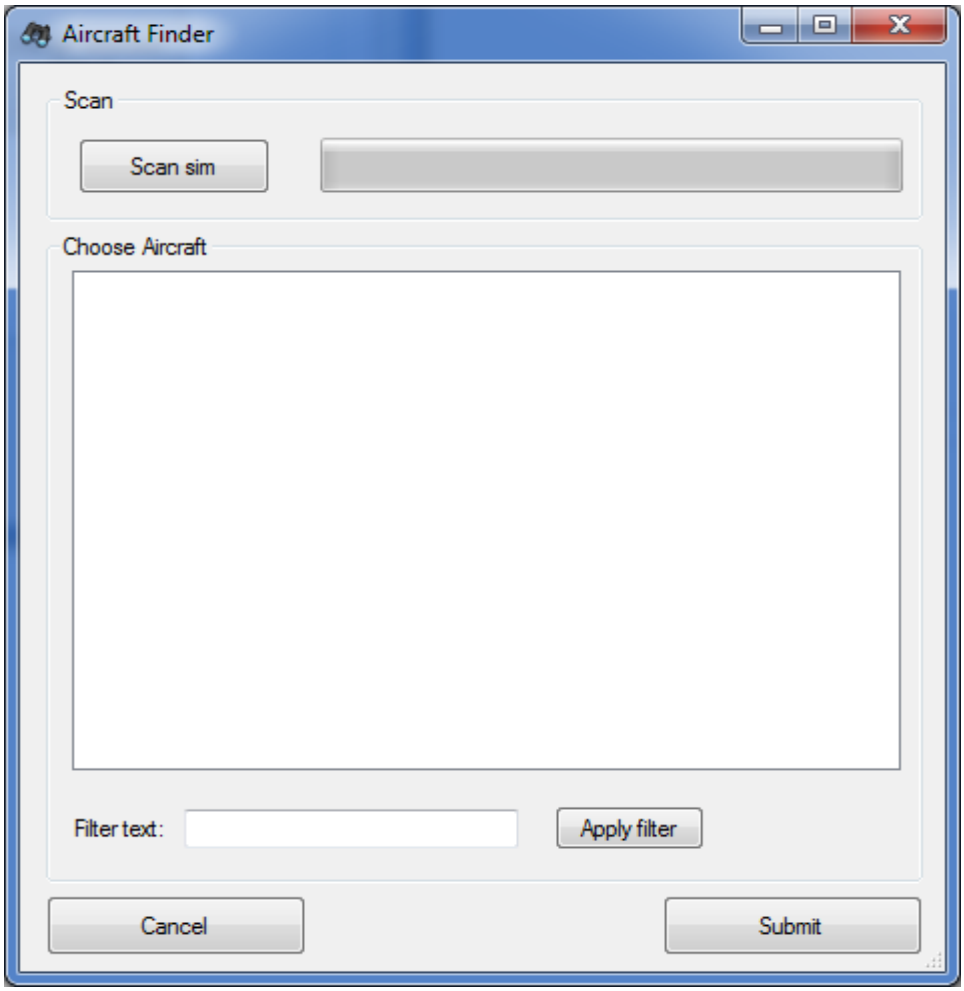
These models will be used

- To provide the selection for choosing AI fire fighters
- To assign different models to other players in the sim when in multiplayer mode

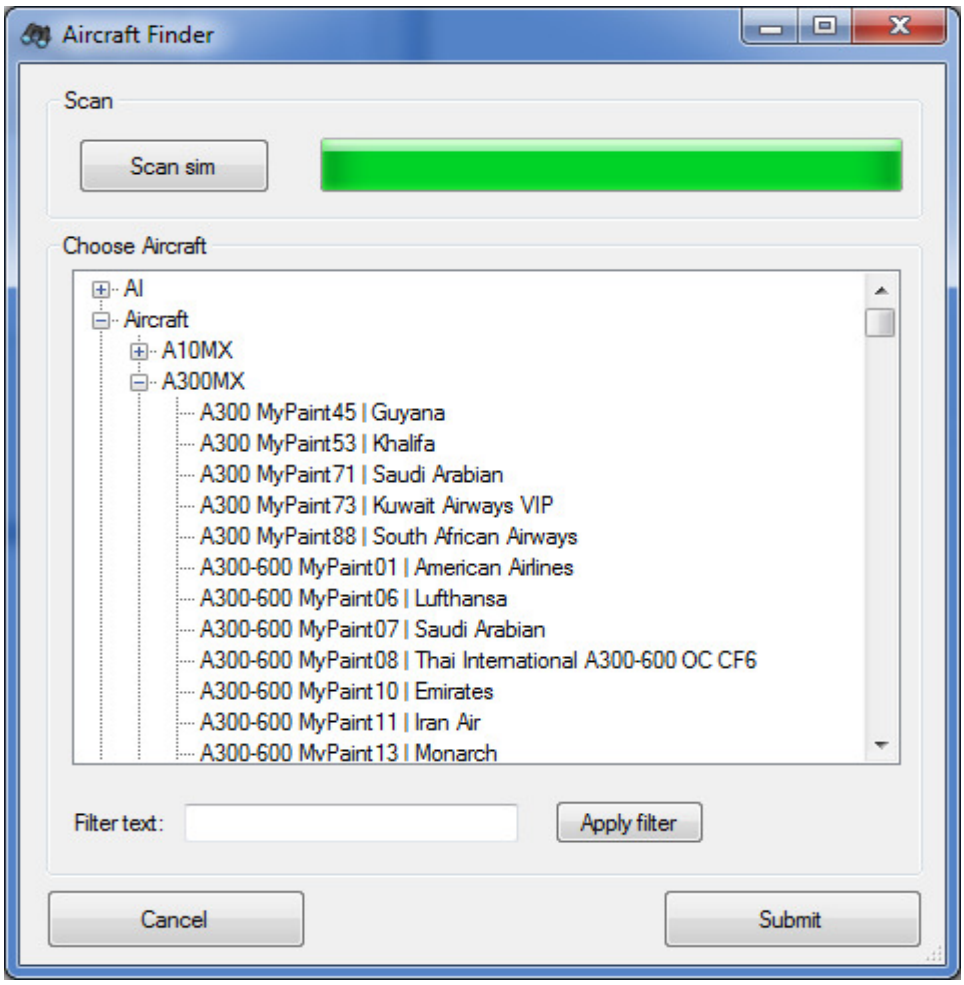
The entries in the drop down and the text boxes are derived from the "title=" tag in the aircraft.cfg file you will find in your SimObjects folder.

To change a default, activate the radio button next to it, and click on "Change selected default".
To add models to the list, use the "Aircraft Finder" button:

The standard finder dialog will open, and models can be selected as described below:



- The application will search through all SimObjects folders of the current simulator when you press the button “Scan sim”
- After scanning is complete, the tree-view will be populated:

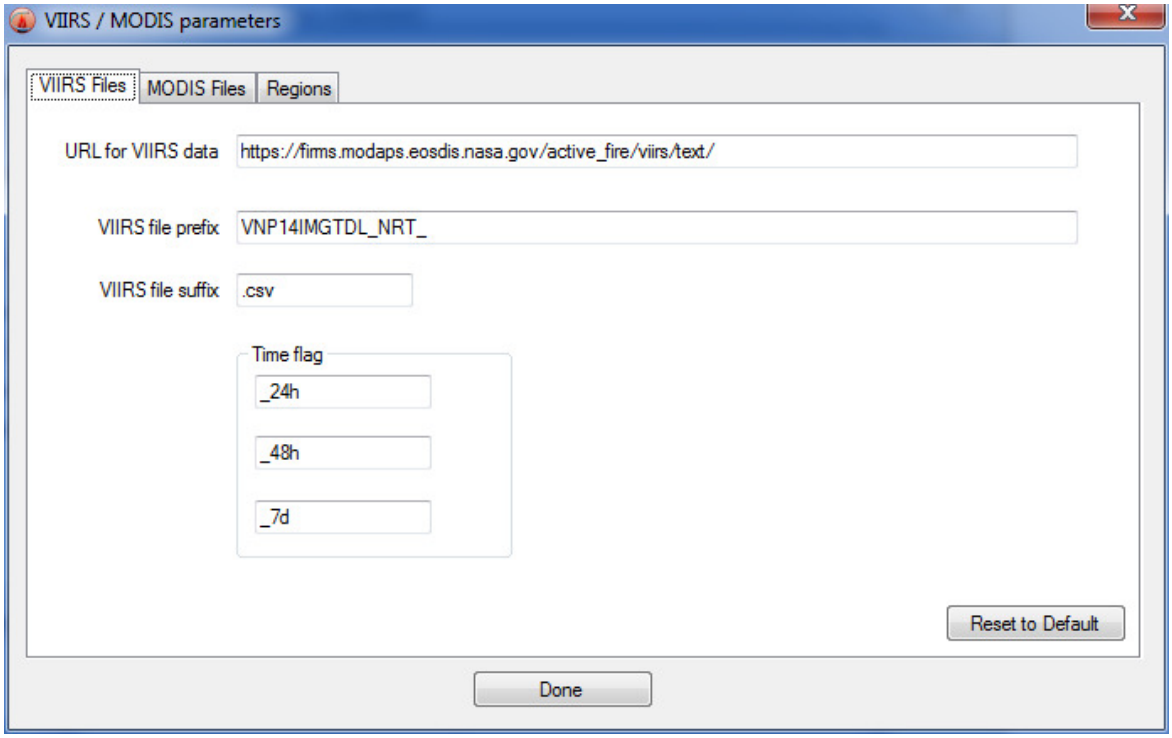


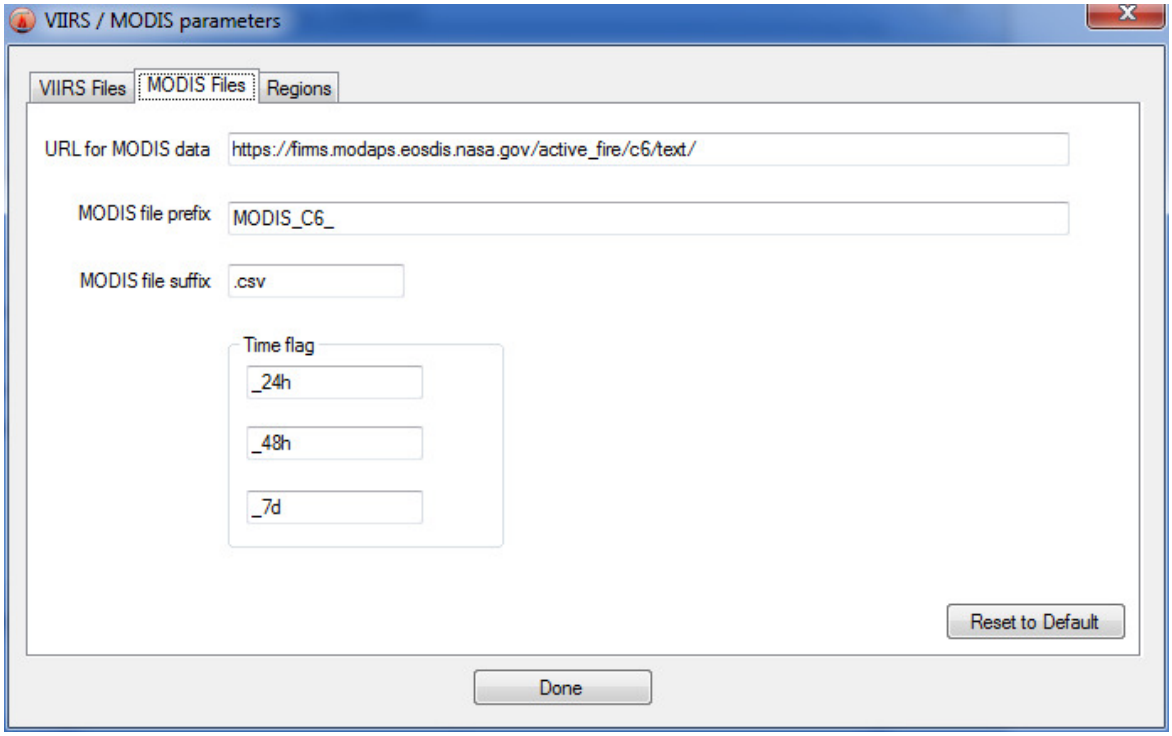
Filtering the list: by entering a filter text (for example “737”) and clicking on “Apply filter”, the list will be reduced to all object descriptions containing that text.

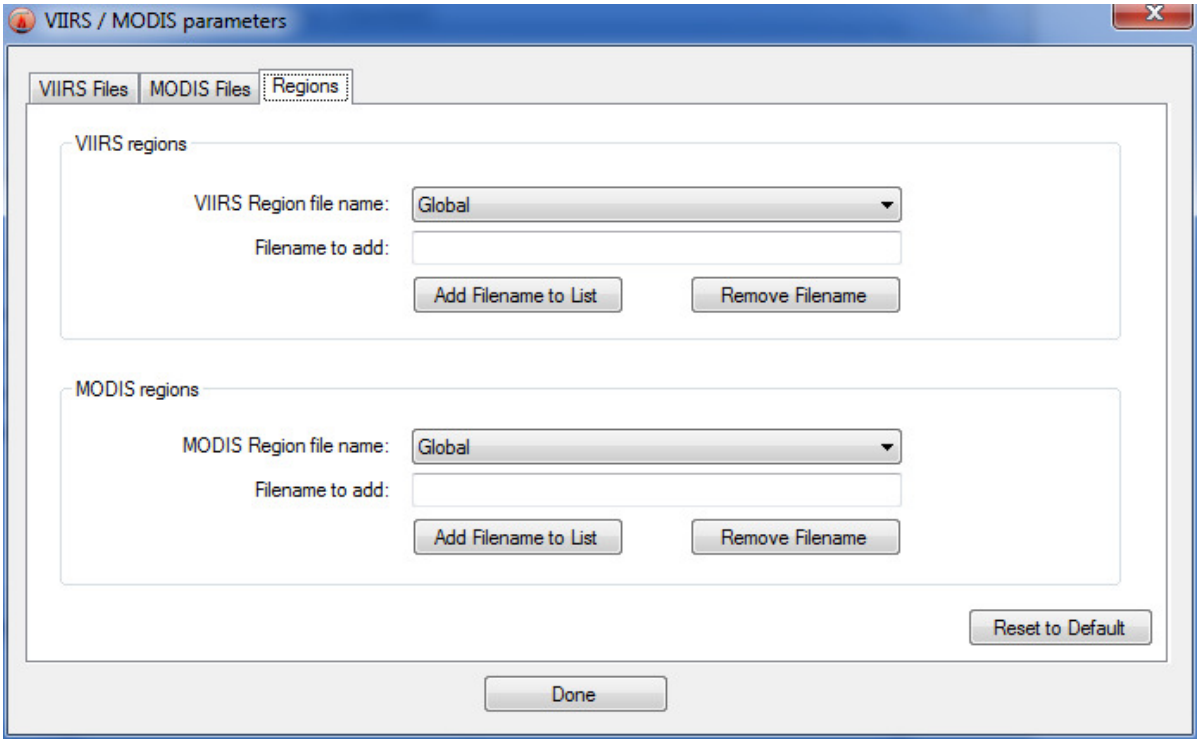
Select an aircraft/object model from the list, and either double-click on it or press “Submit” to transfer it to the Settings dialog. The finder window will close.

6.8 VIIRS / MODIS settings

If NASA should change either the URL or the filenames, you can edit these pages to reflect these changes.







Filenames:
Both the VIIRS and the MODIS download URLs use this pattern:

<BaseURL+FilePrefix+Region+Timeflag+FileSuffix>

Example:

https://firms.modaps.eosdis.nasa.gov/active_fire/viirs/text/VNP14IMGTDL_NRT_Europe_24h.csv

By adjusting the individual building blocks of the filename, you can adapt FireFighterX to whatever changes NASA may implement on their site.

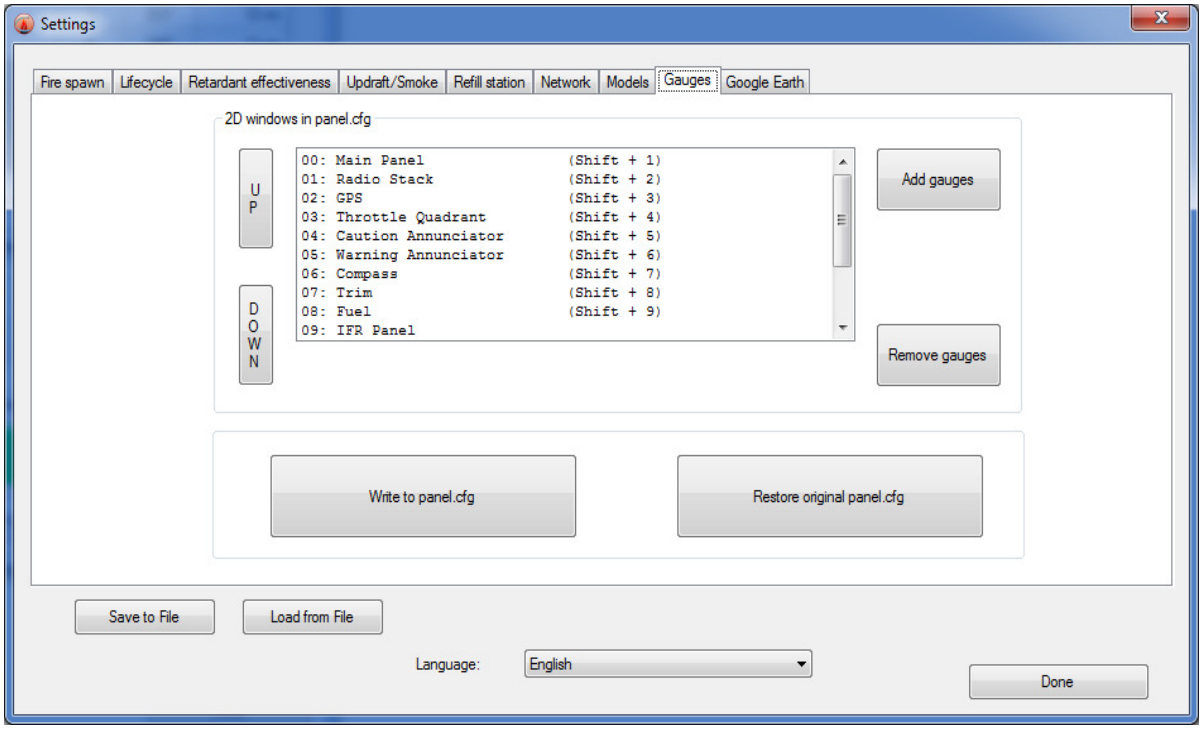
Regions:
The names of the regions can be found in the actual filenames on the NASA site (use button “visit nasa.gov” on the VIIRS/MODIS handler dialogs to open the FTP directory in your browser):

Notes:
Take care that the filenames are case-sensitive.
Names do not contain “blanks” but “underscores” instead.

6.9 Gauge installer

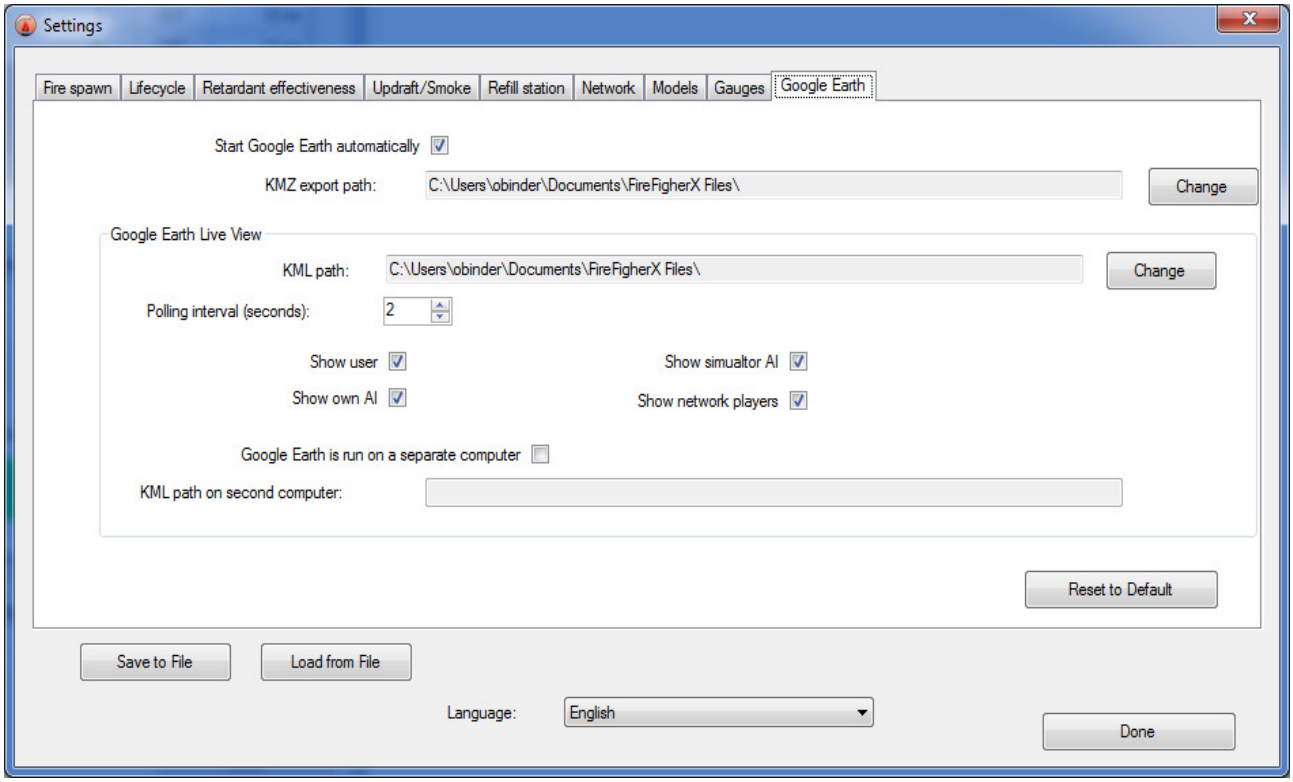
As soon as the FireFighter X is connected to the sim, you can install the Fire Radar and Drop controller gauges with this dialog.

For the gauges to work, installing additional Microsoft runtime components may be required – see chapter 7.2.



- *2D windows in panel.cfg*: This is a list of all 2D window definitions in the panel.cfg of the aircraft that you are flying in your sim.
- *Add gauge*: This will add the FFX gauge
- *Remove gauge*: This will remove the FFX gauges.
- *UP/DOWN*: Move the selected item in the list up or down. This way you can change the keyboard assignment and sequence of the gauges.
- *Write to panel.cfg*: This will write a new panel.cfg file for your aircraft and reload the aircraft in the sim afterwards – that way you can use the gauges immediately.
  Please note that FireFighter X is writing a new file with different formatting. None of your original definitions will be lost.
- ***Restore original panel.cfg*: This will restore your original panel.cfg file, before the gauges were installed.**

6.10 Google Earth



- *Start Google Earth automatically*: As soon as FireFighter X creates a Google Earth file it will try to start the application itself
- *KMZ export path*: This is the path where FFX stores the Google Earth file from the Fire Designer window.

Google Earth Live View

- *KML path*: This is the path where FFX stores the Google Earth file for the Live View feature. If you want to use Google Earth on a different computer, set this to point a connected network drive that can be accessed from the other computer and point Google Earth to the file that will be created by FFX
- *Polling interval (seconds)*: sets the frequency that FireFighter X will use to update the Google Earth file
- *Show user, Show own AI, Show simulator AI,Show network players*: Activate the corresponding item
- *Google Earth is run on a separate computer*: Activate this, if your Google Earth is running on a secondary computer

- *KML path on second computer*: complete path where the KML files will be saved **on the secondary computer!**

6.11 Saving and loading settings

By using “Save to File” and “Load from File” you may preserve a profile for later use. These buttons open the standard Windows Explorer windows to navigate and choose files.

7. The FireFighter X Gauges

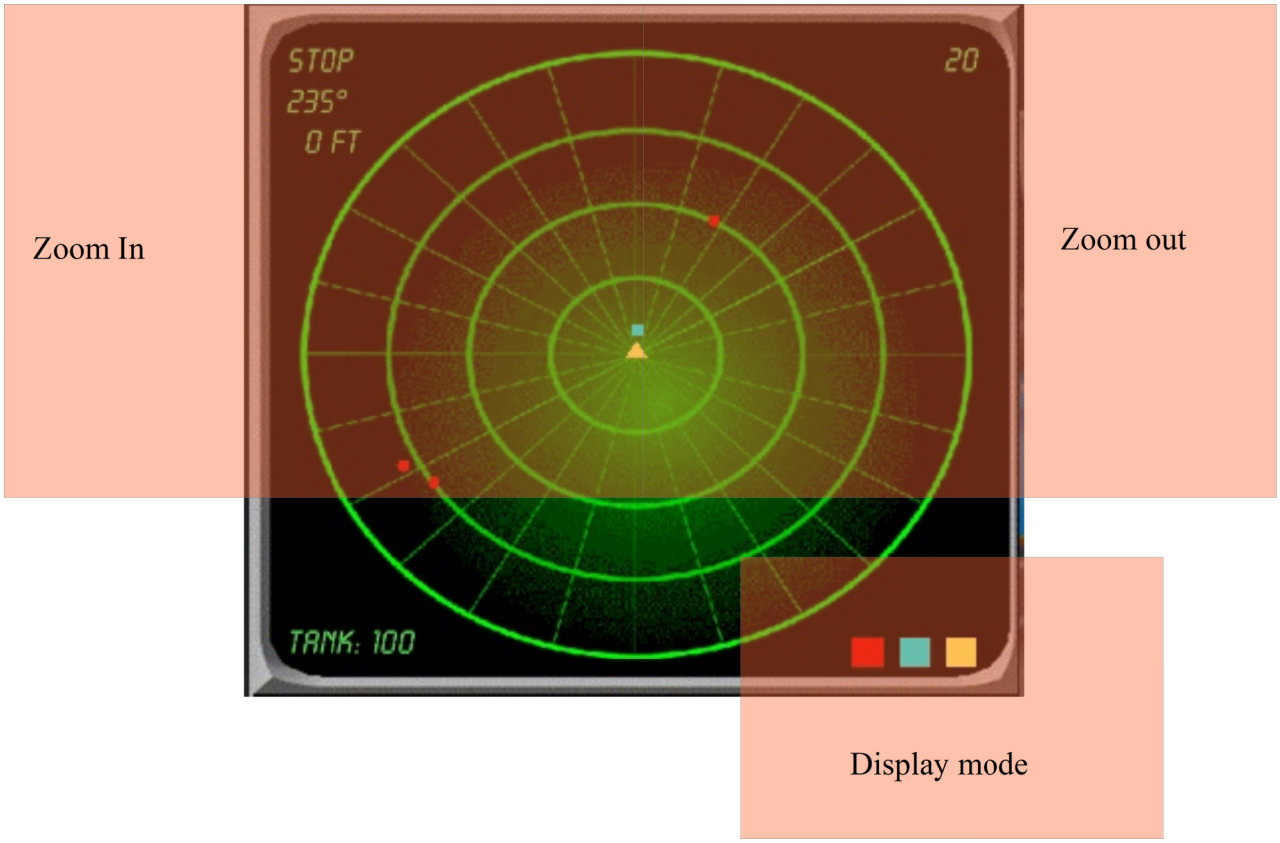
7.1 Radar Gauge

The FireFighter X Fire Radar is a gauge that can be installed into your aircraft to replace the green status bar or status menu. It can either be added to your 2D or VC panels or called as an stand-alone instrument panel.

Elements

- Blips:
  - Red dots are fires
  - Blue squares are AI or multiplayer aircraft (light blue are the FFX AI and players, dark blue the standard simulator AI aircraft)
  - Yellow triangles are the refill stations
- Top left: Distance and bearing to the nearest refill station
- Bottom left: Tank status in percent
- Top right: Zoom range in nm (distance from center to outer ring)
- Bottom right: Toggles the display modes

Clickspots

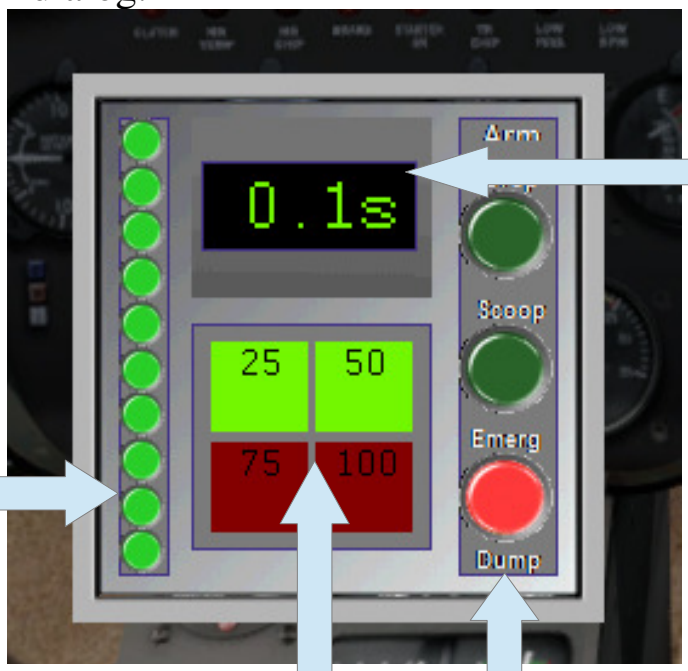


Displaying AI traffic:

The radar gauge will always display the light blue network player aircraft and FireFighter X's own AI. To enable the full AI traffic display, you have to activate the checkbox “Display simulator AI traffic” on top of the AI traffic window in FireFighter X (see chapter 5.10 about AI traffic).

7.2 Drop control panels

The FireFighter X Timer drop control panels is a group of three gauges, that show how to access the bound simulator events and control the drop parameters from inside the simulator. It covers the basic functions of the drop configuration dialog.



Scroll mouse wheel to adjust the timer

Remaining retardant

Click to select drop percentage

Click buttons to arm systems / trigger dump

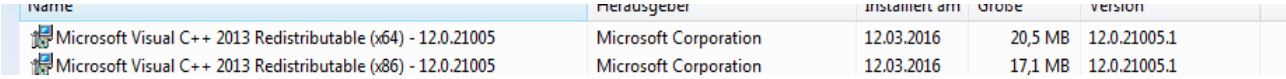
The drop coverage selector has a turning handle as control.

Click buttons to arm systems / trigger dump

Turn with mousewheel or clicks

7.3 Installation

In preparation for using the gauge, you may need the VC2013 redistributable files from Microsoft, in case they are not already installed on your computer. Please check the Software tab in your Control Panel for these entries:



If no version of the “Visual C++ 2013 Redistributable” is present, please download and install the runtime from the Microsoft website:

https://www.microsoft.com/en-us/download/details.aspx?id=40784

The following section is only relevant if you want to install the gauges yourself, instead of using the automated installer described in chapter 6.10, or if you want to install it into the virtual cockpit.

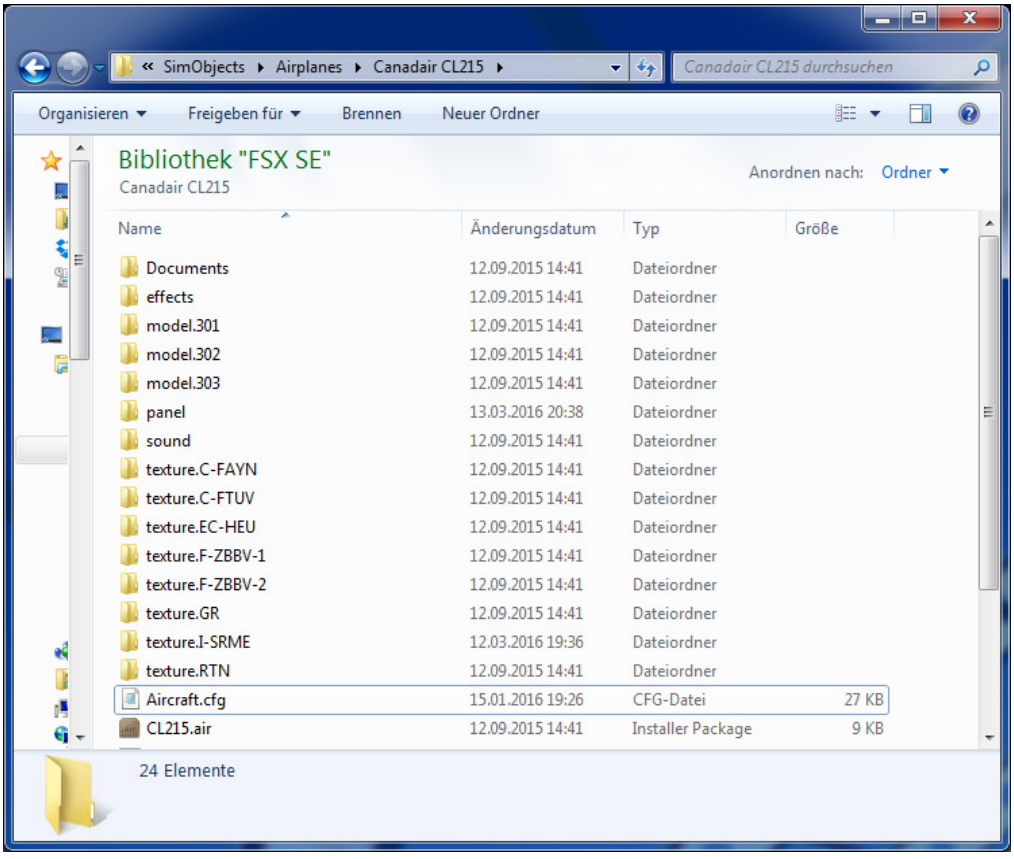
Manual installation

Each FireFighter X installation (FSX boxed or SE, Prepar3D V2 and V3) have their own version of the gauge, and you have to use the correct version and gauge name for your simulator to make it work.

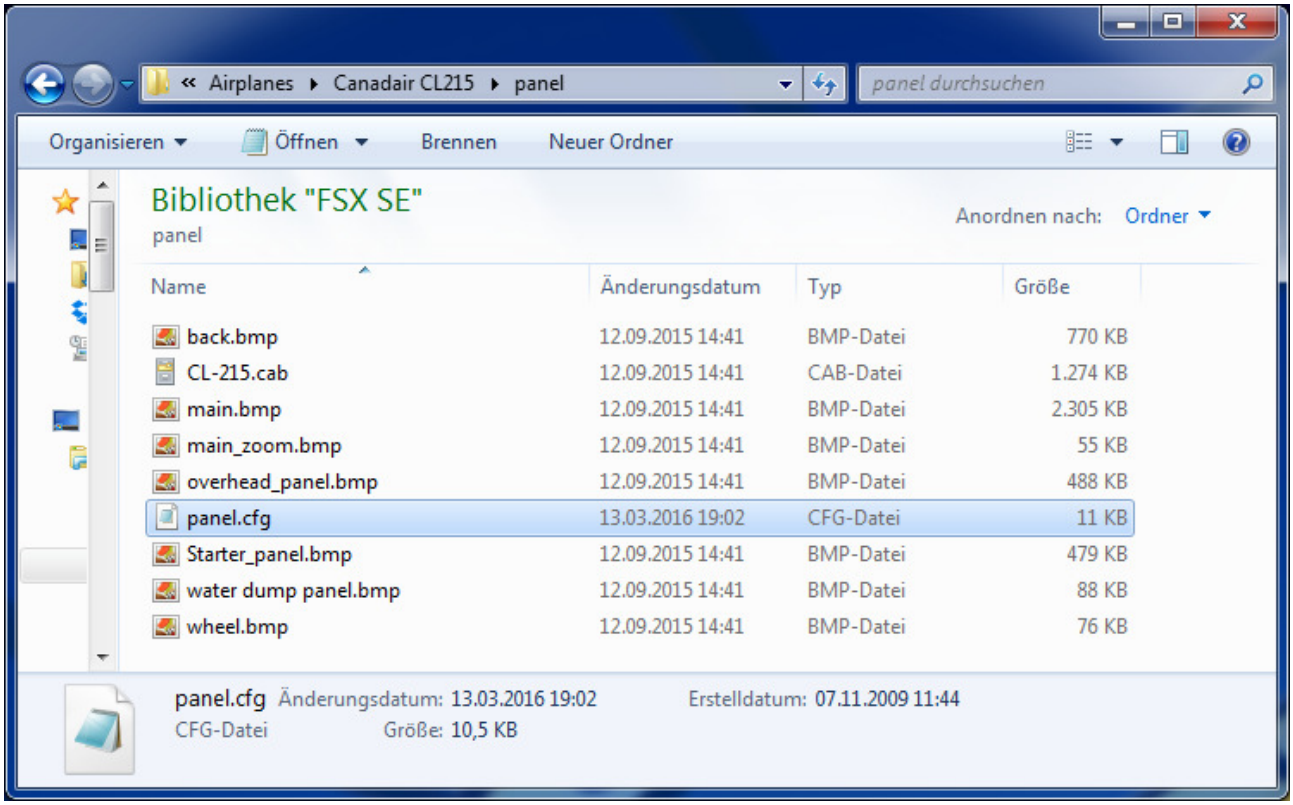
In your FireFighter X program folder, you will find a subfolder named “Gauge”, which contains an example panel.cfg file where the changes described below are already applied. You can copy the necessary parts directly from that file. YOU CANNOT USE THIS FILE DIRECTLY WITH ANY AIRCRAFT! ONLY COPY THE NECESSARY LINES!

1. **Copy the necessary files to your simulator**
   - If you chose the default copy option when installing the FireFighter X, the gauge files will already been added to the appropriate folders in your simulator.
   - If you chose to copy them manually, then you will find the file in your FireFighter X installation directory in the subfolder “Gauge”

2. **Locate the folder where your aircraft files are stored**
   - This folder is by default in your simulator main directory, subfolder “\Simobjects\Airplanes”
   - The contents of this folder will look something like this:



3. **Edit the panel configuration file**
   - The file is located in the “panel” subfolder



   - Open the file using “notepad” or any text editor you like

There are basically three ways to add the gauge:

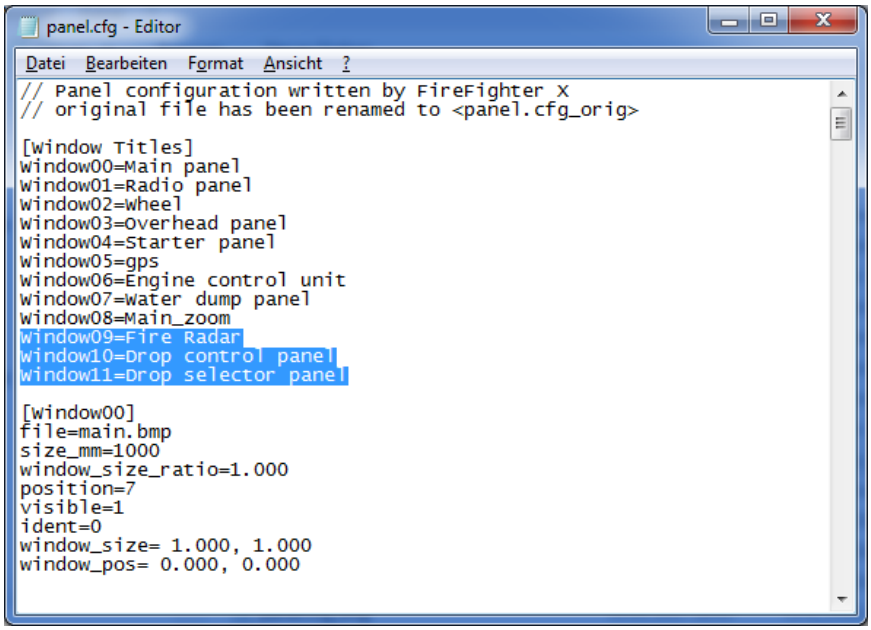
1. **Stand alone instrument window**
2. **Replace a gauge in your 2D panel**
3. **Replace a gauge in your virtual flightdeck / VC**

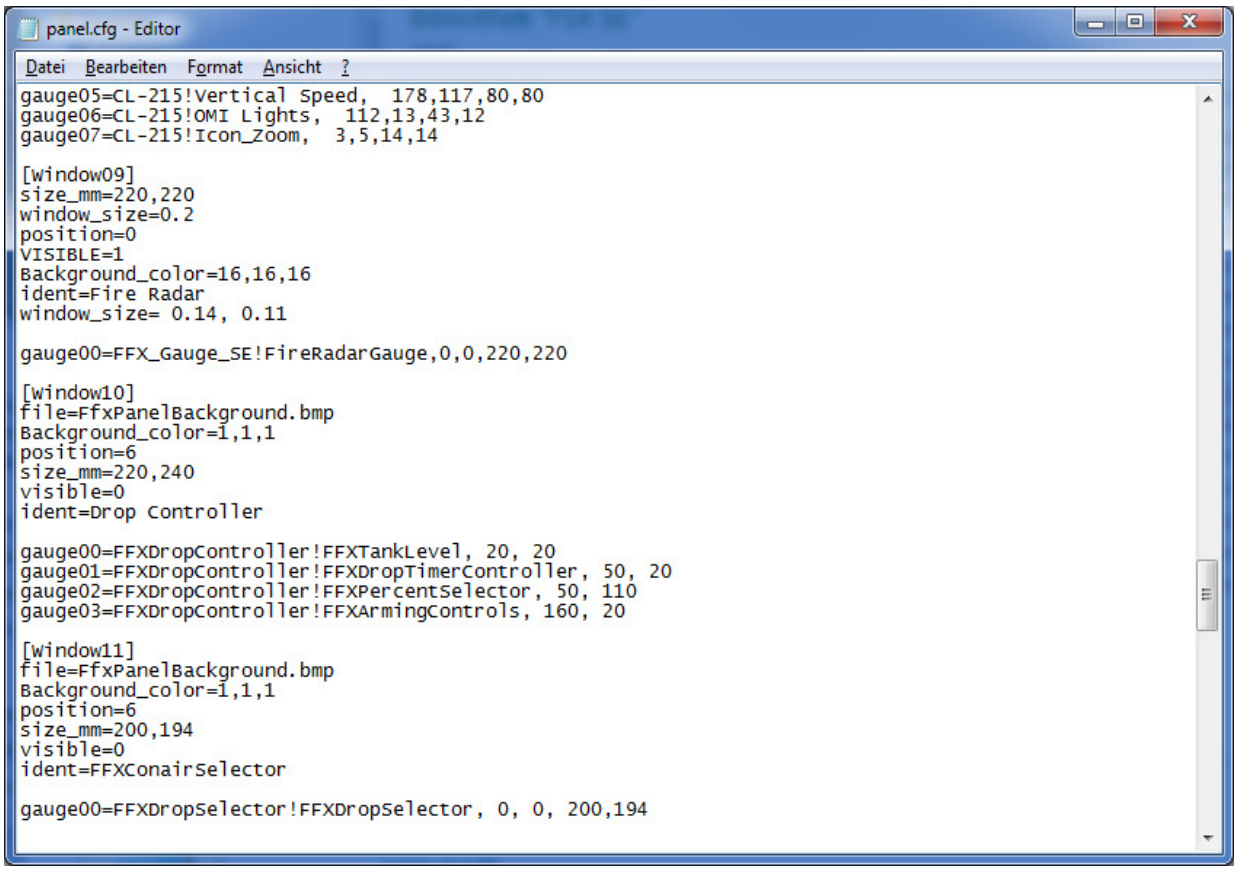
Options 2/3 will only work if you have the necessary space and a spare gauge that you can replace.

1. Stand alone instrument window

Edit the panel file like this:

Replace or add a window definition:





Note: The gauge DLL has a different name for each simulator:
FSX boxed:
gauge00=FFX_Gauge!FireRadarGauge,0,0,220,220

FSX SE:
gauge00=FFX_Gauge_SE!FireRadarGauge,0,0,220,220

P3D V 2.5
gauge00=FFX_Gauge_P3D!FireRadarGauge,0,0,220,220

P3D V3.x
gauge00=FFX_Gauge_P3D_V3!FireRadarGauge,0,0,220,220

P3D V4.x
gauge00=FFX_Gauge_P3D_V4!FireRadarGauge,0,0,220,220

Now save and close the panel.cfg. You can access the gauges with the usual key controls or by using the menu:

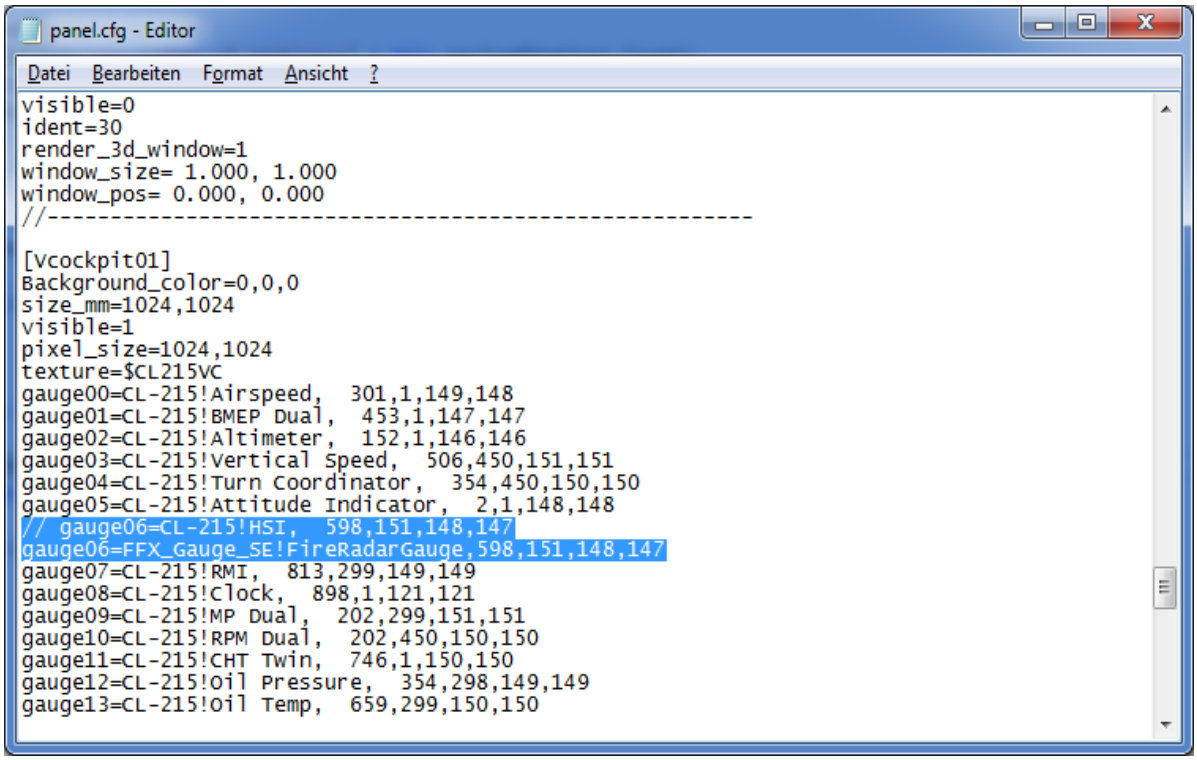
2. Replace a gauge in your 2D panel

or

3. Replace a gauge in your virtual flightdeck / VC

Edit the panel file like this:

Replace an existing gauge definition, keeping the gauge size



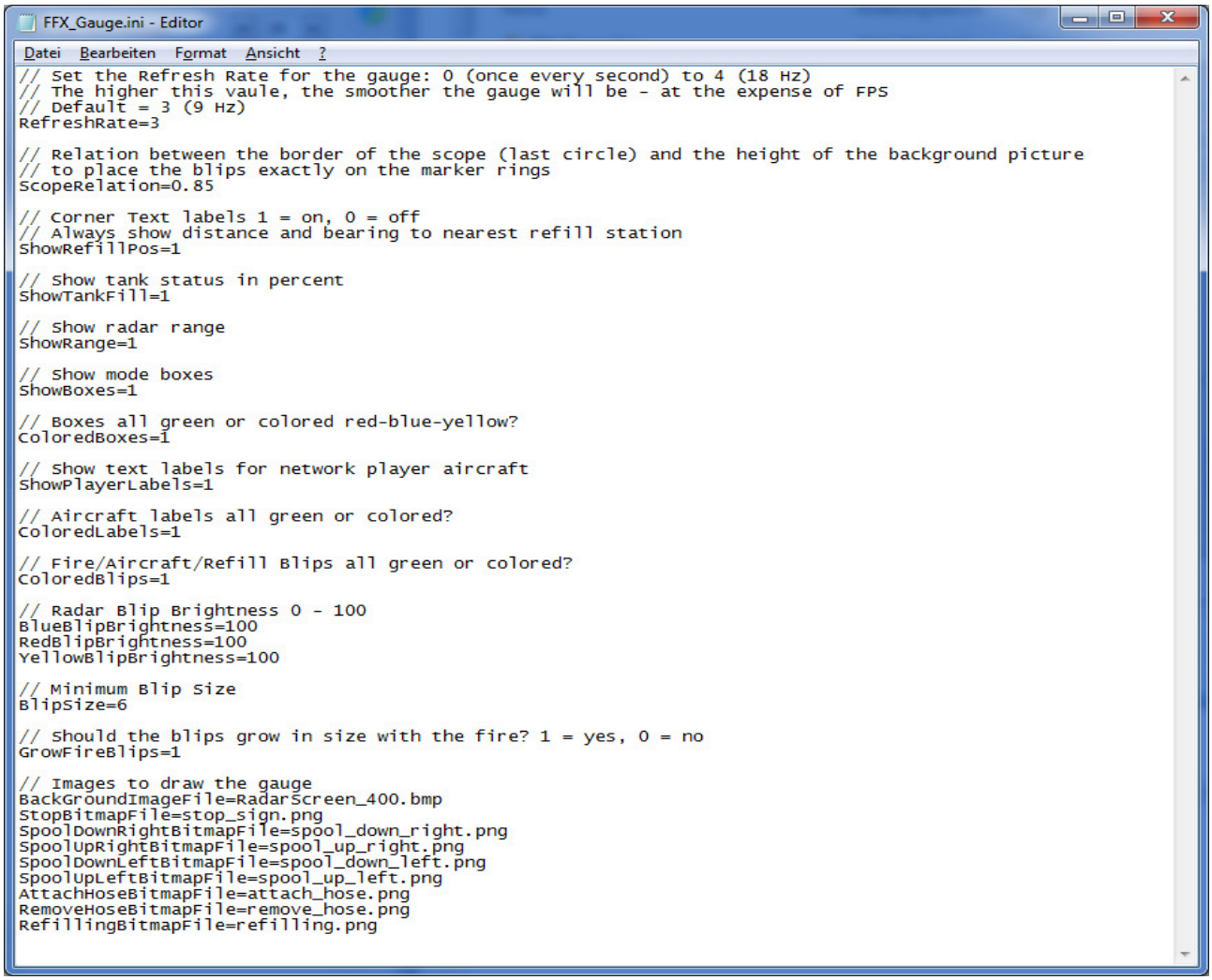
In the example we disabled the existing HSI display on the pilots' instrument panel and replaced it with the FireFighter X Fire Radar.

7.3 The INI-File

The appearance of the Fire Radar gauge is configurable by editing the "FFX_Gauge.ini" file.

The file is located in the "\Gauges\FFX_Gauge" folder of your main simulator directory and can be edited with the standard Windows Notepad.

For P3D V4 users the file is in "\Documents\Prepar3D v4 Add-ons\Lorby-SI FireFighterX_P3D_V4\Content\Gauges\FFX_Gauge"



Options:

- *RefreshRate*: using this gauge will have an impact on your FPS. With this parameter you can adjust the refresh rate of the gauge display to best suit your computers' capabilities.
- *ScopeRelation*: If you replace the background "radar scope" image with one of your own, you may have to adjust the "gridlines" to

reflect the actual distances.
Example: with the default green scope, the relation between the total image height to the radius of the outermost green ring is 1:0.85. By setting the value 0.85, a blip that is 20 miles out will be placed exactly on the outermost green ring at range 20.

- *ShowRefillPos*: Switch the text on the top left corner on or off
- *ShowTankFill*: Switch the text on the bottom left corner on or off
- *ShowRange*: Switch the text on the top right corner on or off
- *ShowBoxes*: Switch the mode selector boxes in the bottom right on or off
- *ColoredBoxes*: Toggle if these boxes should be color coded or all green.
- *ShowPlayerLabels*: Toggle if the blips of the network player aircraft should get a small text label with the first three characters of the player name
- *ColoredLabels*: Toggle if the aircraft labels should all be green or colored like the blips
- *ColoredBlips*: Toggle if the blips should all be green or colored red/blue/yellow
- *BlueBlipBrightness, RedBlipBrightness, YellowBlipBrightness*: Set the brightness of the blips. Accepts values between 0 (dark) and 100 (bright)
- *BlipSize*: the minimum size that a blip may have.
- *GrowFireBlips*: Toggle if the red fire blips should grow in size in relation to the size of the fire.
- *BackGroundImageFile*: Background image
- *StopBitmapFile, SpoolDownRightBitmapFile, SpoolUpRightBitmapFile, SpoolDownLeftBitmapFile, SpoolUpLeftBitmapFile, AttachHoseBitmapFile, RemoveHoseBitmapFile, RefillingBitmapFile*:
  Bipmaps shown in the refill process

All picture files have to be located in the same “gauges\FFX_Gauge” folder where the INI itself is.

8. Simulator variables and events

FireFighter X uses a number of simulator variables and events. You can assign these to joystick buttons or your own gauges

Variables:

TAILHOOK POSITION	Tank fill level
WATER RUDDER HANDLE POSITION	Timer value / Coverage selector position

Events

RELEASE_DROPPABLE_OBJECTS SMOKE_TOGGLE	Triggers / toggles the retardant drop
CABIN_NO_SMOKING_ALERT_SWITCH_TOGGLE	Arm/Disarm the drop system
CABIN_SEATBELTS_ALERT_SWITCH_TOGGLE	Arm/Disarm the scooping system
TAKEOFF_ASSIST_FIRE	Trigger the emergency dump
TOW_PLANE_RELEASE	Toggle the green status bar in the sim
TOGGLE_LAUNCH_BAR_SWITCH	Switch from retardant to water and vice versa
EGT3_INC EGT3_DEC	Increase/Decrease the drop timer value / coverage selector position
EGT4_INC EGT4_DEC	Increase/Decrease the tank percentage selection
EGT3_SET	Siren “Yelp”
EGT4_SET	Siren “Warble”

9. Disclaimer

FireFighter X is licensed for private, non-commercial use only. It is not sold, any property rights remain with the author.

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Disassembling, refactoring or changes of any kind to code and models are prohibited.

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- the software will meet your requirements or expectations
- the software or the software content will be free of bugs, errors, viruses or other defects;
- any results, output, or data provided through or generated by the software will be accurate, up-to-date, complete or reliable;
- the software will be compatible with third party software;
- any errors in the software will be corrected.
- the software will not cause errors or damage to the computer system where it is installed.

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