

OpusFSI

Flight Simulator Interface for Prepar3D User Guide



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OpusFSI - Flight Simulator Interface for Prepar3D

Thank you for downloading our OpusFSI Flight Simulator Interface.

The **OpusFSI** Flight Simulator Interface for Lockheed Martin Prepar3D (P3D) incorporates the **Live Weather Engine**, the **Live View** synchronized multi-screen networked display, and **Live Camera** view control and docking software supporting multiple windowed views. In addition OpusFSI includes **Opus World Weather Themes**, **Weather Locator** and **Weather Relocation**. Device drivers are included for ButtKicker control and GPS output with full interface for the PMDG 737NGX aircraft simulator.



*The **OpusFSI** interface is ideally suited for both **standalone** (single PC) and **networked** (multi-PC/Laptop) systems.*

On standalone systems, **OpusFSI** incorporates two superb functions through its **Live Weather Engine** and **Live Camera** interfaces.

The **Live Weather Engine** makes use of our unique **Dynamic Weather** update to provide the most advanced weather updating software in the marketplace. The **Live Weather Engine** has set new standards for weather updating for the Prepar3D flight simulators. **OpusFSI** provides the most detailed, realistic and efficient weather updating service. The **Live Weather Engine** is responsible for supervising both the turbulence and ultra-realistic **Dynamic Head Movement** (virtual cockpit camera shake) utilising actual real-life captured **3D accelerometer data**. **Automatic Head Movements** assist the pilot whilst taxiing and banking in a turn. The **Live Weather Engine** allows you to create and name your own **Opus World Weather Themes** based on the current dynamic weather created from the live METAR reports. In addition you can import your own custom METARs, load historic weather from within the previous 9 days (24 hours for WWT and the Weather Locator/Overview). **Live Weather Overview and Locator** provides overview maps of weather conditions and a search facility so that you can locate weather matching your criteria. You may also **Relocate Weather** from any place in the world to your current location. **Flight Planning Assistant** provides dynamic in-flight weather reports and more.

Live Camera provides excellent camera creation, control and docking facilities through its user friendly interface, totally eliminating the need to alter any of the simulator's controls. You can create many useful views that are not included as standard in your sim and also control the transition speed between these different views. This can be coupled with **Live Camera Control** and a dedicated 6-axis GamePad controller to move around the cockpit or exterior to your heart's content. Import, create or export **Camera Panning Sequences** which can be assigned to a shortcut button/key or camera views. The **Live Camera** interface also includes support for **Windowed Views** which are ideally suited to computer systems equipped with either multiple screens or single large screens.

On networked systems, irrespective of the size and complexity of your system, whether your system consists of a main 'flying' PC with a single networked laptop client, or a more elaborate multi-computer networked system; the **Live View** interface, with its **ultra high-performance IPC**

communications, unique **Client Side Smoothing** software, and perfect synchronization of aircraft status, weather and cloud formations, will provide you with the highest possible networking performance. Whether you simply want an additional controllable display to provide further scenic or external view options, or wish to create a multi-screened panorama for your Prepar3D experience, **Live View** offers you the ideal hassle free user-friendly solution.

Your main 'flying' **OpusFSI** server is the machine through which you control the aircraft. The networked client **OpusFSI** systems are synchronised to the server through multiple ultra high-performance IPC links, the client systems are used primarily as view controllers. The networked systems allow you to create a multi-screened simulator system without placing the full workload and burden on your main system.

From this set up it therefore follows that all in-cockpit or instrument panel views used to control the aircraft must be displayed on the main server. All other views (scenic or external) can be offloaded onto the client systems. You can create wide panoramic vistas this way, or additional external aircraft views, without draining the resources on your main system or degrading its performance.

On networked systems you must install the sim and the **OpusFSI** software on each of your client computer systems (laptops or PCs), along with all the scenery and airport addon packages. If you wish to display external aircraft views on the client computers you will also need to install all relevant aircraft addons. The **OpusFSI** software does not need to be licensed on the client systems, the purchased license is only required for your main 'flying' server system. You may either copy or install the **OpusFSI** software on each of your client systems, the **CLIENT** program that you will run on the client computers does not check for any licensing information. It simply connects to and receives all necessary data from your main server system.

Live View allows you to easily create multi-screen networked displays for your system. **Live Camera** provides a user-friendly interface for creating and controlling any number of virtual cockpit, 2D cockpit and external aircraft views on both standalone and networked systems. All camera views are created and controlled centrally from the server. Both features are described in more detail below.

The software includes device drivers for the **CPFlight MCP737/EFIS737 PRO/EL** panels and the driver interfaces for the **PMDG 737NGX** aircraft simulation.

OpusFSI is fully compatible with Windows (7/8/10) operating systems, 64-bit versions. **OpusFSI** does not require the Windows Server operating system to create or maintain the local area network links, and different operating systems may be utilized throughout the local area network.



Figure 1 - Live View Multi-Screen Networked Displays

Photo courtesy of the Human-Centered Design Institute, Florida Institute of Technology

System Requirements

- Lockheed Martin Prepar3D simulator.
- Windows 11/10/8/7 (64-bit version) operating system.
- Microsoft .NET Framework v4.7.2.
- FSUIPC (see below).
- 90 MB hard disk space.

You need .NET v4.7.2, SimConnect and FSUIPC to be installed on your server system (and optional client systems) for OpusFSI to work.

Microsoft.NET

You can check what versions of .NET you have installed in Control Panel by selecting Settings, System, Apps and features, then search for .NET and a list of installed versions will be displayed. For older operating systems you can check what versions of .NET you have installed by checking your c:\Windows\Microsoft.NET\Framework or Framework64 folders. You should see a v4.0.xxxxx folder.

SimConnect

In the case of SimConnect, first make sure you have installed P3D, SimConnect is usually installed automatically with it. If you have mislaid or corrupted your SimConnect then you can try re-installing it using the SimConnect.msi file within your c:\OpusFSI_v6 folder.

FSUIPC

FSUIPC is required on the SERVER system. FSUIPC is required on Live View clients that are used to display camera views.

You can download a free copy from <http://www.fsuipc.com>

Software Installation

Please refer to our **OpusFSI_v6_Getting_Started_Single_PC** document located in the **OpusFSI_v6** install folder, also available from our download page.

Setting up the Network

Please refer to our **OpusFSI_v6_Getting_Started_Networked PCs** documents located in the **OpusFSI_v6** install folder, also available from our download page.

General Operation The Server Dialog



The **Operating Mode** should be “UNLIMITED MODE” for licensed systems or “DEMO MODE” for the limited demo evaluation mode.

If **Live View** is enabled (**Configure** dialog) then the **Client App Links** value indicates how many client links are open and **No. Connected** indicates how many clients are currently connected. In addition you may **View Client App Links** (ref [OpusFSI v6 Getting Started Networked PCs v6 Getting Started Networked PCs](#)).

The [Device Drivers](#) value indicates how many driver (ButtKicker and CPFlight panels) links are open and **No. Connected** indicates how many devices are currently connected. In addition you may **View Device Driver Links**.

The **Configure** button opens the configuration dialog in order to configure options for Live Weather, Live View, the In-Flight map, device drivers (ButtKicker and CPFlight panels), GPS output options and Landing Analysis.

The **Cameras** button opens the [Camera Management](#) dialog.

The **Panning** button opens the [Panning Sequence Management](#) dialog.

The **Control** button opens the [Live Camera Control](#) dialog.

The **Shortcut** button opens the [Shortcut Controls](#) dialog.

The **Weather** button opens the [Live Weather](#) dialog. The **Reports** button displays the [Opus Weather Reports](#). The **LWA Map** button displays the large [Live Weather Assistant](#) weather map. The **Wx Maps** button displays the smaller [Live Weather Assistant](#) weather maps. The **Wx Locator** button displays the [Weather Locator](#) map.

The **Spy** button displays the [Spy](#) window.

The **Save Win**, **Restore Win**, **Open Win**, and **Close Win** button options assist you in controlling your **Live Camera** windowed views, both docked and undocked.

Standalone systems

If you have a standalone system then simply run the **SERVER** program on your Prepar3D computer system, the program should be run after Prepar3D, you may configure your system to run the server program automatically each time you start Prepar3D (see Recommended Start Up Procedures in the [OpusFSI_v6_Getting_Started_Networked_PCs.pdf](#) document).

Networked systems

The **OpusFSI** network is created by running the **SERVER** program on the main (host) Flight Simulator PC, and running the **CLIENT** program on each client PC. Each of your computers must be able to 'see' each other over the local area network (refer to our [OpusFSI_v6_Getting_Started_Networked_PCs.pdf](#) document). The **OpusFSI** software will make efficient use of any speed of network, but the faster the better.

You must install Prepar3D and the **OpusFSI** software on each of your client computer systems (laptops or PCs), along with all the scenery and airport addon packages. If you wish to display external aircraft views on the client computers you will also need to install all relevant aircraft addons. The **OpusFSI** software does not need to be licensed on the client systems, the purchased

license is only required for your main 'flying' server system. You may either copy or install the **OpusFSI** software on each of your client systems, the **CLIENT** program that you will run on the client computers does not check for any licensing information. It simply connects to and receives all necessary data from your main server system.

The recommended start up procedure for the SERVER and CLIENT programs are detailed in our **OpusFSI_v6_Getting_Started_Networked_PCs.pdf** document. You can monitor the connection status on the server program's ClientApp Link display and each of the CLIENT programs. In each case, the Application Links will turn green when a connection is made. Note, the server will allocate two or three links for each 'Live View' client, one link for each of the possible 'Live View' Position & Attitude, Weather and Traffic connections.

Setting Up OpusFSI

Please refer to our **OpusFSI_v6_Getting_Started_Single_PC.pdf** document located in the **OpusFSI_v6** installation folder, also available from our download page.

Live Weather

For a detailed description of **Live Weather** please refer to the **OpusFSI_v6_Live_Weather.pdf** guide which can be found in the OpusFSI_v6 installation folder and on our website.

General Dynamic Head Movements and Bump Aircraft Turbulence

To experience turbulence effects you must either,

- enable **General DHM Options** in the Server's Configure dialog or
- enable **Live Camera** and create and display a camera view.

The **General DHM Options** are not associated with Live Camera views but are configured in an identical fashion so please refer to the **OpusFSI_v6_Live_Camera.pfd** guide for a description of the configuration options.

Live Camera

For a detailed description of **Live Camera** please refer to the **OpusFSI_v6_Live_Camera.pfd** guide which can be found in the OpusFSI_v6 installation folder and on our website.

Live Camera Control



Live Camera Control (LCC) is selected via the main server form's **Control** button and can be used to adjust the eye point for any VC, 2D, or Custom view types. The LCC is for making temporary (Set) or permanent (Adjust) adjustments to the eye point, creating a new camera (Create) or simply having a wonder around the cockpit or aircraft.

LCC does not require Live Camera to be enabled.

The **Set** option temporarily saves the current eye point offsets and assigns them to the currently selected camera view so that you don't have to keep moving the eye point back after changing camera views. This is handy for changing seat position or general adjustments to overcome any changes to the usual reference axis for the aircraft within the sim. However it is a temporary set of offsets, only valid whilst the program is running or until you clear them using the **Reset All** function. If you want a permanent alteration to the camera view then use the **Adjust** option.

If you suffer from the sim anomaly (bug) that shifts the aircraft axis for certain aircraft (e.g. the new PMDG 777) at certain locations then try using the LCC to correct this before flight. First correct the anomaly by shifting the VC view using the LCC, then use the LCC **Set** Camera function which saves the view offset and associates it with the camera view. If the anomaly subsequently corrects itself in flight then you can use the LCC **Reset All** Camera function to set the view back to its original position.

The **Reset All** option is used to reset all temporary offsets for the currently selected camera view.

The **Adjust** option can be used to adjust the current camera's eye point position and automatically save the modified camera view's configuration.

The **Create** option can be used with the current LCC adjusted eye point and the current camera view to automatically create a new cloned camera view with an adjusted eye point position. The new cloned camera is selected for view on the display and appended to the camera list which is then automatically saved to disk.

The text for the Adjust and Create button options on the LCC dialog has been coloured dark red to indicate their permanent nature.

The eye point can be adjusted either using a game controller (refer to the **Shortcuts** section for setup), the arrow keys in the small LCC dialog, or any assigned joystick button (including the POV or Hat Switches) or key sequences specified via the Shortcuts dialog (see Shortcuts section below).

When using Shortcut Controls in flight the movement will be either Continuous or Stepped according to what setting was last selected in the Live Camera Control dialog.

If Continuous movement is selected then to stop movement,

- use one of the red Stop buttons (or other direction arrows) in the LCC dialog or
- use the assigned Stop shortcut control key/button or
- you don't necessarily need a Stop button/key assignment - just move back in the opposite direction.

Multiple arrow/key/button presses speed up or slow down the movement. Arrow keys in the LCC dialog will be greyed out and inoperative when you have a joystick or controller assigned for LCC use since you can't use both.

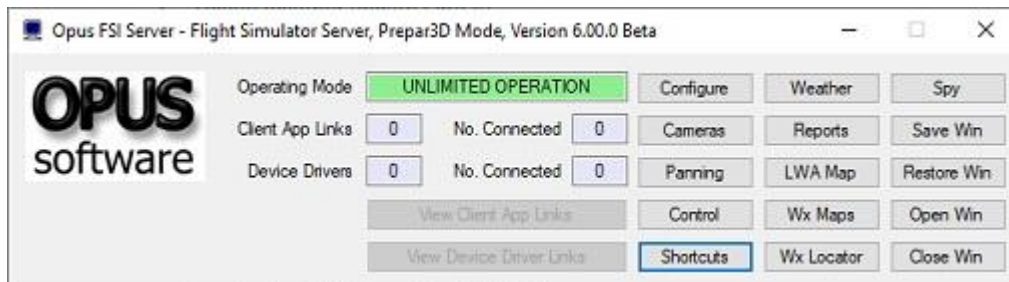
Do not use sim controls (key commands or panning) to adjust the eye point whilst using LCC since OpusFSI will not be aware of these changes and the view will reset back to its original position.

There is a sim limitation for pitch control. Unlike bank and yaw motions, the pitch angle can only be adjusted between +90 and -90 degrees up and down. The bank and yaw movements wrap around.

The **Set** option temporarily saves the current eye point offsets and assigns them to the currently selected camera view so that you don't have to keep moving the eye point back after changing camera views. This is handy for changing seat position or general adjustments to overcome any changes to the usual reference axis for the aircraft within sim. However it is a temporary set of offsets, only valid whilst the program is running or until you clear them using the Reset functions. If you want a permanent alteration to the camera view then use the Cameras dialog, edit and Save the camera view that way.

Shortcut Controls

Shortcut Controls enable you to assign joystick button and keyboard keys to common actions or controls within the SERVER program. All shortcut controls are defined using the Shortcut Controls dialog accessed via the SERVER program's main form.



At present, you can assign buttons and keys to,

- Update the weather
- Toggle weather update On/Off
- Toggle the Simulator weather report window On/Off display
- Cycle to the next Simulator weather report window
- Cycle backwards to the previous Simulator weather report window
- Toggle the Opus weather report window On/Off display
- Cycle to the next Opus weather report
- Cycle backwards to the previous Opus weather report
- Toggle the large Weather Assistant Map on and off the screen
- Toggle the first Weather Map on and off the screen
- Toggle the DHM and AHM effects On/Off
- Toggle the ButtKicker effects On/Off
- Toggle windowed views On/Off
- Restore window sizes and positions
- Cycle the camera views forward (next) matching the currently selected view mode (virtual cockpit, 2D cockpit, or External Aircraft camera views for the currently selected aircraft)
- Cycle the camera views backward (last) matching the currently selected view mode (virtual cockpit, 2D cockpit, or External Aircraft camera views for the currently selected aircraft)
- Play the panning sequence assigned to the current camera. If there is more than one panning sequence assigned then the on-screen Menu box will be displayed allowing you to select the required sequence.
- Toggle the View Selection Menu On/Off

Opus FSI Server - Button / Key Shortcut Controls

	Assigned Button	Assigned Key
Update Weather	No Button	U
Toggle Weather Update On/Off	No Button	shift+U
Toggle Sim Wx Report On/Off	No Button	No Key
Cycle Next Sim Wx Report	No Button	No Key
Cycle Last Sim Wx Report	No Button	No Key
Toggle Opus Wx Report On/Off	Joystick 2 Btn 21	W
Cycle Next Opus Wx Report	No Button	N
Cycle Last Opus Wx Report	No Button	shift+N
Toggle LW Assistant On/Off	No Button	shift+W
Toggle Weather Map On/Off	No Button	ctrl+W
Toggle DHM/AHM On/Off	No Button	shift+D
Toggle ButtKicker On/Off	No Button	No Key
Toggle Windowed Views On/Off	No Button	T
Restore Window Positions	No Button	shift+T
Cycle Next Camera View	No Button	V
Cycle Last Camera View	No Button	shift+V
Play Panning Sequence	No Button	ctrl+P
Toggle View Select Menu On/Off	No Button	V

Only relevant weather reports can be displayed using these controls. The Local Area weather report is always considered active and relevant. The Lower and Upper Atmosphere weather reports are only active if the GRIB data is enabled. The Destination and Alternate weather reports are only considered active if the relevant Destination or Alternate site has been specified in the Weather dialog. The weather report Display, Next, and Last Shortcut commands are assumed to refer to the 'first' OpusFSI Wx Report.

All windowed views must be docked/undocked manually.

Assigning Joystick Buttons and Keyboard Keystrokes

Click within the button or key command text boxes to specify the required assignment. When you click within the text box, the box will empty and turn red indicating it is waiting for your entry. You can now either click a second time to clear the entry, or press your desired joystick button or keyboard assignment.

OpusFSI will accept buttons 1 through to 32 of Joysticks 1 through to 16. All button and registered key events are displayed within the Spy window when the button or key is pressed. If they are not displayed then the joystick or button is invalid, either not registered within the sim, already assigned elsewhere (i.e. 3rd party add-on etc), or just an illegal entry.

Each keyboard assignment may consist of a combination of up to **two** modifier keys (Alt, Ctrl, or Shift) with a normal keyboard key. The entry is not case sensitive. The numeric pad keys 0 to 9 can be used but they must be assigned with the Num Lock ON (for recognition), and used with the Num Lock OFF within P3D. This is a quirk of the simulator and not the Opus FSI software.

N.B. The Insert, Delete, Home, End, Page Up, Page Down, Left, Right, Up, and Down keys cannot be assigned to shortcuts.

I have U (Update weather), shift-U (toggle weather update on/off), W (Weather report), N (cycle Next), and shift-N (cycle last), D (toggle DHM on/off), Q (toggle windowed views on/off), V (cycle next camera view) and shift-V (cycle last camera view) configured and operating on my system.

There is a difference between the actions of the Shortcut View Cycling commands and the way 'common' camera key or buttons are processed when configured into the actual Live Camera views. The Shortcut keys will only cycle the views with the same view mode that was last selected onto the display through the Live Camera interface. So the Shortcuts will cycle through all your VC views or all your External views depending on what was last selected through Live Camera actions. The common key (or button) is assigned to groups of views, assigned within the camera views themselves. I use a common X key configured in all my camera views. This common key (or button) will cycle through all assigned camera views irrespective of the camera view mode.

Shortcut Commands - Cycle through relevant views with the same view mode as the current view.

Camera Commands - Cycle through all cameras assigned with the same common key/button.

Live Camera Control

You can assign buttons and keys to move the eye point during flight within any VC, 2D, or Custom view. The **Ctrl+Shift** keys work fine (e.g. **Ctrl+Shift +U** for Up, **Ctrl+Shift +D** for Down etc.).

POV and Hat Switches

Joysticks or controllers with POV (Point Of View or 8-Position Hat switches) can be assigned to the LCC functions. Up to four POV or Hat switches are supported. Any POV or Hat switch assigned for use by the LCC should be removed from the sim SETTINGS.

Game Controllers

Shutdown OpusFSI and the sim.

Plug in your controller, install the windows driver if necessary. Start up the sim and the OpusFSI SERVER program.

Edit the sim SETTINGS and Delete all button and axes assignments (automatically made by the sim) to your new PS3 controller, save the changes. The controller should be enabled but control nothing. Similarly for FSUIPC the controller should control nothing.

Open the Opus Spy window, you should see the controller listed there. Check your list of devices when you open Spy, it should match the list in the sim Settings.

Open the Shortcuts dialog and click on Live Camera Control (LCC).

Select the controller type from the Controller list box. Click on Left and then operate the left-hand X axis on the controller. Click on Up and operate the left-hand Y axis on the controller. Repeat for

Forward and Yaw Left using the right-hand axes. The LCC left/right, up/down, forward/backward, pitch up/down, bank left/right, and yaw left/right movement controls are highlighted in yellow. The axes are read directly by the LCC software however, you can adjust the sensitivity (speed) for cockpit and external views, and dead zone (default 10%) for the axes in the LCC dialog.

Now assign your buttons. I use the left-hand buttons for motion, the right-hand for stop and resets, then central buttons for changing mode and the PS centre button for the Set Camera LCC function.

Click Save a couple of times and you are done.

A **Reverse Axis** option is available for the LCC Shortcuts Left/Right, Up/Down, Forward/Backward, Pitch Up/Down, Bank Left/Right, and Yaw Left/Right controller axes. When ticked, the GamePad Controller axes will be reversed for the associated control movement.

In flight when you press one of these assigned keys/buttons the movement will be either Continuous or Stepped according to what setting is selected in the Live Camera Control dialog. If Continuous movement is selected then to stop movement use either one of the red Stop buttons in the Live Camera Control dialog or the assigned Stop shortcut control key/button.

Remember the sim only allows eye point (6DOF) control in VC, 2D, and the Opus 'custom' external aircraft view.

If the view drifts or stutters then calibrate your controller, alter the dead zone, usually between 0 to 15%.



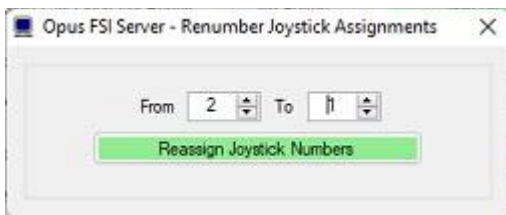
All Shortcut Command data is stored in the P3DSERVER.CMD file.

The shortcut controls are backed up into a date stamped file (e.g. P3DSERVER_30082018.CMD) each time the shortcut controls are saved via the Shortcuts dialog's OK button. To revert to a backup delete or rename P3DSERVER.CMD and rename the backup file to P3DSERVER.CMD.

The Shortcut's Joysticks Option – Reassign Joystick Numbers for Shortcuts

The **Joysticks** button option is used to reassign joystick numbers for Shortcut Commands. In the 'Renumber Joystick Assignments' dialog numeric boxes are primed and displayed allowing you to specify the 'From' and 'To' joystick numbers. The 'From' number is always primed with the first selected item's joystick number.

All listed items are changed when reassigning the joystick numbers for Shortcut Commands. It is not possible to select a subset of the shortcut commands to change.



This option will change the assigned joystick numbering without changing the current device/joystick mapping.

N.B. Camera view and panning sequence joysticks are reassigned using the 'Joysticks' button within the relevant Camera Management and Panning Sequences Management dialogs.

Live View

Live View is a standard feature within the **OpusFSI** Flight Simulator Interface; this feature provides a multi-screen networked display option for P3D by synchronizing multiple networked PCs running copies of Lockheed Martin Prepar3D simulator.

With **Live View**, Opus Software have used their 30 year experience of developing high-performance real-time networked telemetry and data acquisition systems, to provide the networking software you need to create a multi-screened experience for the sim. No matter what complexity of system you intend to create, Live View will provide the ideal solution.

Live View is ideally suited to home cockpit builders and general enthusiasts alike. The **Live Camera** control feature included within **OpusFSI** also simplifies the Live View set up, allowing you to customize and automate the Live View displays on each of your client PCs (see below for details).

The **Live View** multi-screen networked display feature allows the sim to be synchronized across multiple networked computer systems, including laptops. Live View can be used to create a variety of panoramic views or to simply provide additional fixed spot plane, fly-by, tower, or map views on separate 'client' computers.

A networked **Live View** system is created by activating the **SERVER** program on your main 'flying' computer, and running the **CLIENT** program on each of your connecting client systems (PCs or laptops). The programs can be activated in any order, with or without the sim, which greatly simplifies the set up of your system.

The configuration of the **Live View** system is simple to the extreme, just tell the main 'flying' server how many Live View clients you wish to support, and configure the server's computer name or IP address into each of the client systems, and away you go. You can sit back and watch your client systems connect and start communicating with the server. **Spy** buttons help you monitor the activity over all the networked links, or monitor the overall activity and operation of the **SERVER** and **CLIENT** programs.

The **OpusFSI_v6 Getting Started Networked PCs** guide explains how to set up the OpusFSI network and also includes some Live View FAQs.

The set up and configuration of your system is further simplified using the in-built **Live Camera** interface.

The main features of **Live View** are,

- Live View synchronizes the aircraft's current position, attitude, landing gear, wheel movement, lighting, ailerons, elevator, rudder, flaps, spoilers (speed brakes), engine throttles, reversers and parking brake.
- Live View synchronizes the simulator's date and time, with either weather themes or full METAR weather updates for the aircraft's surrounding area.
- Live View employs and optimizes multiple dedicated high-performance network links to provide the highest level of performance and the smoothest possible operation.
- Live View requires minimal set up and configuration to get up and running.

*N.B. In order to see the full synchronized effects of Live View users must save a default flight with all engines running on each client system to ensure the aircraft is powered up correctly and ready to fly. For P5D ensure the **Enhanced Atmospheric (Beta)** option is **disabled** otherwise the clouds will not synchronise between server and client systems.*

To ensure consistent views you should also have the same scenery, textures, and airport Add-ons installed on each P3D system and the same P3D sim settings.

Live View Weather Synchronization

The current version of the software supports synchronization of either Weather Themes or the surrounding area's METAR data.

FSUIPC is required on Live View clients that are used to display camera views. You can download a free copy from <http://www.fsuiipc.com>

GPS Output (including SkyDemon and ForeFlight)

The OpusFSI GPS Simulator interface can be used to feed data into an Aviation Planning and Navigation package running on an external device (e.g. SkyDemon or ForeFlight). The external device can be either a PC connected via Wi-Fi or LAN, or a mobile device connected via Wi-Fi (e.g. iPad, iPhone, or Android device).

Connecting to SkyDemon / ForeFlight on a Mobile Device via Wi-Fi

Step 1 - Find the Mobile Device's IP Address

Open the device's Settings -> Wi-Fi page.

IOS - Select the 'i' info button next to the connected Wi-Fi network.

Android - Select the Configure option in the bottom menu.

Make a note of the device's current IP Address.

Step 2 - Configure OpusFSI

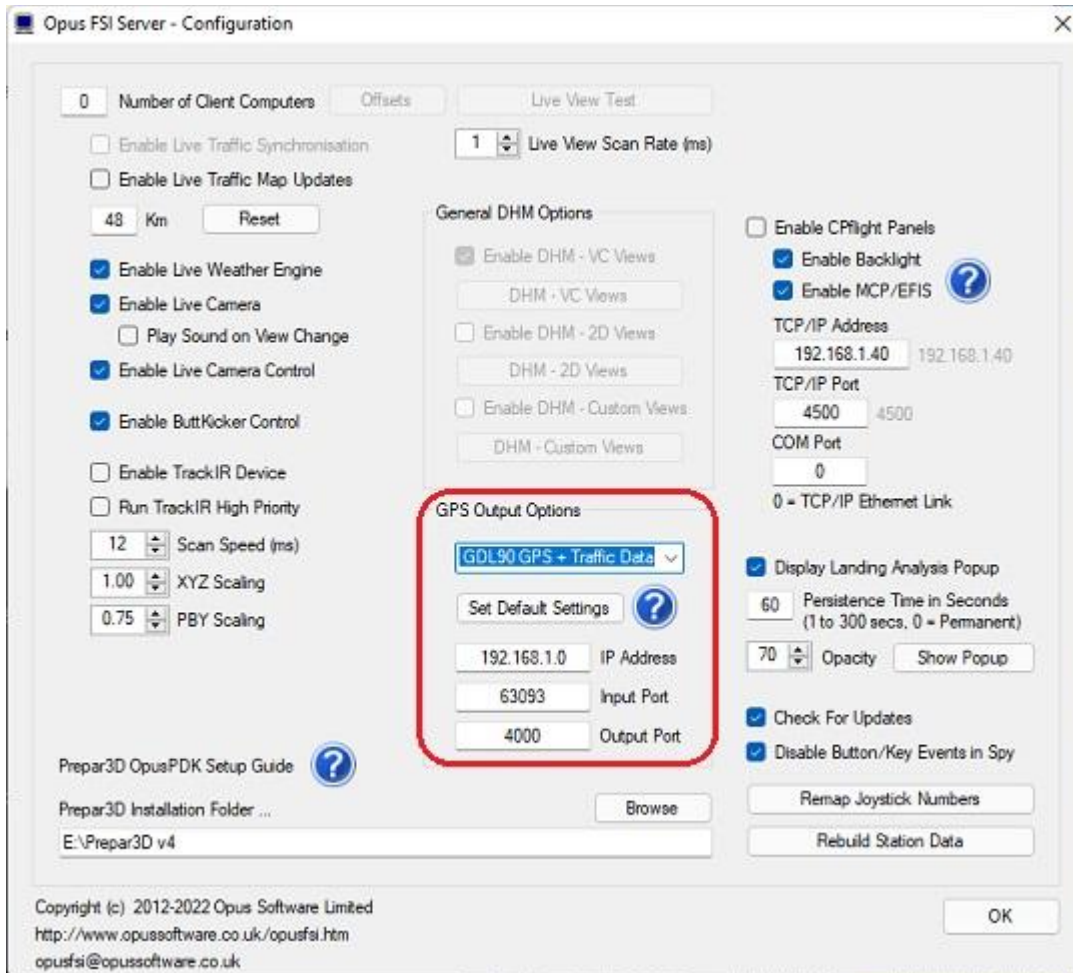
Open the OpusFSI Configuration dialog and prime the **GPS Output options**. Within the Configuration dialog the GPS Simulator interface can be disabled, set to feed basic Simulator GPS data via a WiFi or Ethernet LAN link, set to feed both Simulator GPS and Traffic data via a WiFi link, or set to imitate an external GPS using the NMEA protocol via a VSP (Virtual Serial Port).

The following GPS Output Options are available from the dropdown menu and described below,

1. GPS Output Disabled
2. Basic SIM GPS Data

3. GDL90 GPS + Traffic Data
4. NMEA GPS Data via VSP

Either click on the **Set Default Settings** button or enter the **Input Port** and **Output Port** values manually.



1. GPS Output Disabled

This option should be selected when no external device is used. The option disables all GPS output preventing OpusFSI from attempting to connect and communicate with any external device.

2. Basic SIM GPS Data

This option transmits basic GPS (lat/lon position, altitude, heading and airspeed) data without any traffic information. To use this option you should set the following OpusFSI Configuration IP Address and I/O Port options. On the external device you should then select the Third-Party XPlane (or equivalent) option within the SkyDemon/ForeFlight packages.

IP Address : < Your mobile device's IP Address>

Input Port : 49001
Output Port : 49002

3. GDL90 GPS + Traffic Data

This option transmits both GPS (lat/lon position, altitude, heading and airspeed) data along with all the simulator's traffic information. The data is broadcast over a WiFi link to the external device using the aviation industry standard GDL90 protocol. Using the standard GDL90 protocol OpusFSI is able to imitate 'in cockpit' GPS + ADSB Input/Output devices (e.g. SkyEcho 2).

Note, to display traffic data on the SkyDemon/ForeFlight you must also tick the **Enable Live Traffic Updates** option within the OpusFSI Configuration dialog. The sim should also be configured within it's settings to generate some AI airline and GA traffic.

To use the 'GDL90 GPS + Traffic Data' option you should set the following OpusFSI IP Address and Port Configuration options. On the external device you should also select any of the Third-Party SkyEcho, or GDL90 Compatible Device options within the SkyDemon/ForeFlight packages.

IP Address : < Your mobile device's IP Address >
Input Port : 63093 (Not Used)
Output Port : 4000

N.B. You must have a WiFi interface on the server PC for this link to function. It will not be able to make a connection via an Ethernet LAN connected router, even if the router itself is equipped with a WiFi output.

The **Local WiFi Broadcast IP Address** will share the same first three IP Address codes as your external device (e.g. iPad) with the final address code set to the Broadcast address of zero (0). Over local networks a router will typically assign local IP addresses ranging from 192.168.1.1 through to 192.168.1.253 (the router is normally assigned to local IP address 192.168.1.254). Hence on most systems the Local WiFi Broadcast IP Address will be 192.168.1.0.

4. NMEA GPS Data via VSP

This option transmits basic GPS (lat/lon position, altitude, heading and airspeed) data without any traffic information. The GPS data is transmitted to an Ethernet LAN connected PC via a VSP (Virtual Serial Port) using the industry standard NMEA GPS serial protocol. This protocol and VSP allows OpusFSI to imitate an externally connected GPS receiver. See the section below.

IP Address : 127.1.1.0
Input Port : 0 (Not Used)
Output Port : 23 (The VSP's TCP/IP Port Number)

Step 3 - Configure SkyDemon / ForeFlight

Enable the X-Plane option and select 'Go Flying' mode.

In SkyDemon enable the X-Plane option in the 'Third-Party Devices' settings. Tap 'Go Flying' on the top menu and select the 'Use X-Plane' option.

Using The OpusFSI GPS Option with an NMEA Output (Virtual Serial Port)

Step 1:

Download and install the **HW Group Virtual Serial Port - HW VSP3** software from the HW Group website www.HW-group.com.

Create a desktop icon for the HW Virtual Serial Port.

Run the VSP3 program, open the **Settings** tab and turn OFF all options except for,

- TCP Server Mode

- Connect to Device even if Virtual COM is closed

Save your settings to the INI file using the button.

Open the [v]Virtual Serial Port tab and specify your general parameters for the VSP. I have mine set up as follows,

- Port Name: COM7

- IP Address: 127.1.1.0

- Port: 23

Click on the **Create COM** button.

The VSP Status will change to **Creating..** then finally **Created**. The LAN Status will then go to **Listen**.

Step 2:

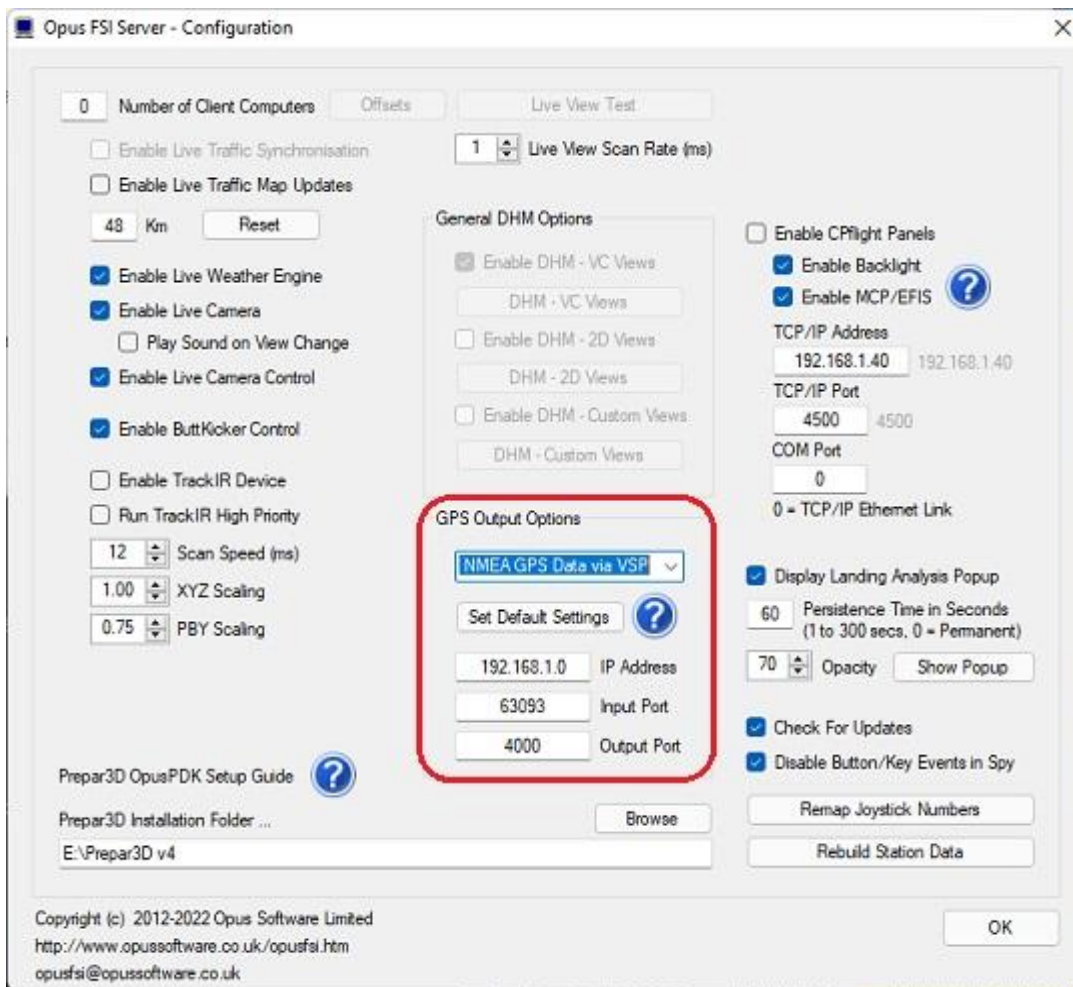
In the Opus SERVER program's form click on the **View Device Driver Links** button to display the Device Driver Links on the form.

Now Open the SERVER program's **Configure** dialog, select the **NMEA GPS Data via VSP** option from the dropdown menu. Either click on the **Set Default Settings** button or enter the **IP Address** (e.g. 127.1.1.0) and **Output Port** number (e.g. 23) in the fields provided.

Click **OK** to close the Configure dialog.

A Device Driver Link should become coloured showing the GPS Simulation Networked TCP/IP Socket link, this link will turn green when it connects to the VSP.

The VSP LAN Status should now change to **Connected**.



Step 3:

After running and loading the flight in Prepar3D you are now ready to run the SkyDemon (or other 3rd party) package.

You will now have to set up your SkyDemon package.

Setup -> Device Connectivity Options ...

I have a Garmin handheld device

Port: COM7

OK

Setup -> GPS Navigation Options ...

General tab,

GPS Hardware,

Port: COM7

Baud: 9600 (I have my COM7 mode set to 9600,N,8,1)

OK

You are now ready to click on the **Start GPS** option in the top RH corner of the SkyDemon screen.

Landing Analysis



The touchdown and landing evaluation data is displayed in the main Spy window which will also display the previously captured landing data. The current evaluation is graded purely on the touchdown vertical speed in feet per minute (including any bounces). Landing completion is assumed once the aircraft has slowed to less than 30 knots. On landing the vertical speed is logged in both FPM and FPS units. The following evaluation gradings are now employed,

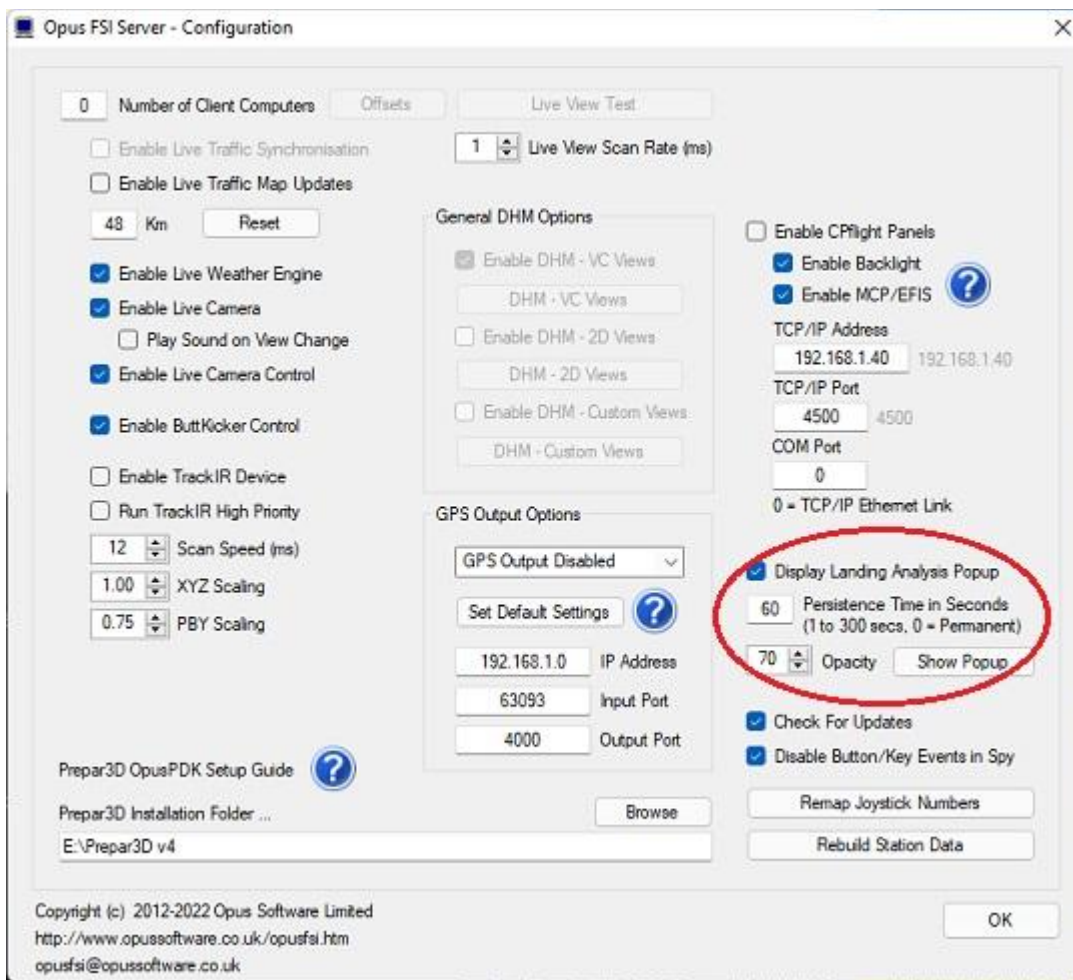
BUTTER LANDING	< 0.2 FPS (less than 12 FPM)
EXCELLENT LANDING	< 0.4 FPS (less than 24 FPM)
VERY GOOD LANDING	< 0.7 FPS (less than 42 FPM)
GOOD LANDING	< 1.0 FPS (less than 60 FPM)
MODERATE LANDING	< 2.0 FPS (less than 120 FPM)
POOR LANDING	< 3.0 FPS (less than 180 FPM)
HEAVY LANDING	< 4.5 FPS (less than 270 FPM)
VERY HEAVY LANDING	>= 4.5 FPS (270 FPM or greater)

An example Spy landing report is shown below. The evaluation is also given as a percentage value (100% for perfect landings). The touchdown airspeed, ground speed, vertical speed and lateral speed are shown. The lateral speed is always displayed in feet per second (FPS) for greater relevance.

```
LND Previous Touchdown at 09:49:20 Hrs
LND BUTTER LANDING, Evaluation 74 percent
LND Airspeed 52 knots, Ground Speed 46 knots
LND Vertical Speed 79 FPM, Lateral Speed 1.2 FPS
```

A **Landing Analysis Popup** window along with Config options are also included.

The **Config** options allow you to disable the popup, specify the display persistence time in seconds, and specify the popup window opacity. Defaults are set to display enabled, 60 second duration, and 70 percent opacity.



All landings are also logged in a User Landings Log file (**LANDINGS.log**) within the OpusFSI_v6 install folder.

OpusFSI - User Landings Log File
Generated 22 October 2020, 10:24 Hrs

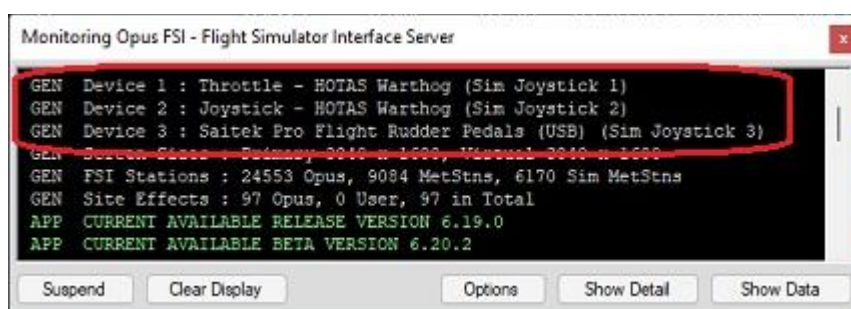
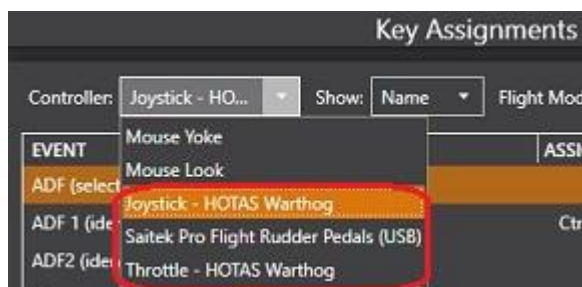
Aircraft : RealAir Legacy V2
Touchdown at 22/10/2020, 10:44:26 Hrs
POOR LANDING, Evaluation 28 percent
Airspeed 78 knots, Ground Speed 78 knots
Vertical Speed 216.7 FPM, Lateral Speed 5.6 FPS

Aircraft : RealAir Legacy V2
Touchdown at 25/10/2020, 09:01:25 Hrs
GOOD LANDING, Evaluation 51 percent
Airspeed 76 knots, Ground Speed 82 knots
Vertical Speed 209.7 FPM (3.5 FSP), Lateral Speed 0.4 FPS

Remap Joystick Numbers

The **Remap Joystick Numbers** option in the Config dialog is used to review and change the Input Device to Sim Joystick mapping. Check the order of the joystick devices in the sim and the order of

the devices in the OpusFSI Spy window. They should be in the same order. If they are not you can change the order in the 'Input Device To Sim Joystick Mapping' dialog by using the dropdown boxes on the right.



After changing the joystick numbers to match the controller order within the simulator's Controls Settings the **Remap Joystick Numbers** button will save the new Device/Joystick mapping data in the relevant JOYSTCKS.DAT file.

Camera view, panning sequence, and shortcut command joysticks are reassigned using the 'Joysticks' button within the relevant Camera Management, Panning Sequences Management and Shortcut Commands dialogs.

Rebuild Station Data

The OpusFSI Stations data contains details of all simulator stations along with all runway and communication frequencies. However, if you have installed addon airports then these will have replaced existing airport definitions in the sim. The runway designations may be different as they can change over time, also the com frequencies may be different. You may also have installed scenery addon packages that contain other small airfields that may not even be defined in the sim. For both these instances the standard Stations (aerodrome) data will not reflect any of these Addons, in the case of the smaller airfields the original data does not even include them.

So if you have addon airports or addon scenery defining new airfields you should build your own Stations data file to include all these changes within Opus, that way the correct COM frequencies will be displayed and the correct runway information and advice given.

The **Rebuild Station Data** option in the Configuration dialog is used to build system specific data, station data matching your current installed system.

Follow the steps below to build your user station data file(s).

1. Download and save the latest **MakeRwys.zip** file from Pete Dowson's downloads webpage, <http://www.schiratti.com/dowson.html>
2. Extract the **MakeRwys** files using the Windows 'Extract All' file option.
3. Copy the extracted **MakeRwys.exe** utility program into your simulator's installation folder.
4. Navigate to your simulator's installation folder and run the **MakeRwys.exe** program.

N.B. If you have any small runway addon airfields, airfields with runways less than 1500 feet (457 metres) long then you will have to run the program with the **/>n** argument, where 'n' identifies the minimum runway length in feet. For example, **MakeRwys.exe />820** specifies a minimum runway length of 820 feet or 250 metres.

The MakeRwys.exe program will create the required **Runways.txt** file ready for decoding.

5. Run the OpusFSI SERVER program, you do not need to run the simulator.
Open the Configure dialog, select your simulator type and make sure you have identified the simulator's install folder correctly.

6. Click on the **Rebuild Station Data** button in the SERVER Configure dialog.

If Opus cannot find the **Runways.txt** file an error message box will be displayed advising you to perform steps 1 to 4 above.

7. The **Rebuild Station Data** dialog will now appear confirming your current selected simulator type along with the current total number of Stations (aerodromes) that are loaded.

When ready click on the **Start** button.

The **Start** and **OK** buttons will be disabled during the decoding. The decoding process will take some time due to the text decoding, station validation, and duplication checks. The current progress is indicated using a standard progress bar. The current number of Decoded Stations is also indicated within the dialog.

8. When decoding is complete press the **OK** button to save the new station data into your **OpusFSI_User_Stations_...** data file. Separate files are used for each simulator type.

Device Drivers

The device drivers provide an interface to the popular Addon hardware for the sim. Each device driver will interface to the relevant aircraft simulation thereby eliminating the need to install separate drivers dedicated to each aircraft.

All device drivers are aware of any new aircraft selections even if the aircraft is changed in mid-flight. The appropriate interface (SimConnect, FSUIPC or the manufacturer's SDK) will be initialised and employed automatically whenever necessary.

ButtKicker

Please refer to our **OpusFSI_v6_ButtKicker.pdf** document located in the **OpusFSI_v6** installation folder, also available from our downloads page.

TrackIR

Please refer to our **OpusFSI_v6_Getting_Started_Single_PC.pdf** document located in the **OpusFSI_v6** installation folder, also available from our download page.

To set up TrackIR cockpit limits refer to the **OpusFSI_v6_Live_Camera.pdf** document.

CPFlight MCP737/EFIS737 PRO/EL Panel Driver

Simply enable the CPFlight driver in the Server Configuration dialog and set the COM port as appropriate.

The following MCP panel features have been partially implemented,

- Course Knobs and Displays (adjust and display the Nav 1 and 2 course settings)
- Speed Knob and Display
- Heading Knob and Display
- Altitude Knob and Display
- Vertical Speed Dial and Display
- A/T ARM Switch. The MCP panel's A/T ARM will automatically disengage when not applicable, available, or settable on the selected aircraft.
- Left F/D Switch
- HDG SEL Button and Light
- LNAV Button and Light
- VOR LOC Button and Light
- APP Button and Light
- ALT HLD Button and Light
- CMD A and B Buttons and Lights. The MCP CMD A and B buttons can both be used to engage or disengage the sim's autopilot. The MCP A/P DISENGAGE switch is also factored into the control interface and effectively disables both CMD buttons.

Flight Director Master (MA) lights will only be controlled after establishing a connection to the sim. As there is no feedback or relevant data in the sim, these Master (MA) lights simply mimic the current ON/OFF state of the left and right F/D switches.

Improved control of the MCP **V/S light and vertical speed setting** while the autopilot is not engaged allows you to prime both the A/P's target Altitude and V/S before takeoff. You should take note, the F/D ON/OFF switch on the CPFlight MCP panel is not controllable so the **F/D needs to be turned ON** to allow V/S mode and speeds to be set. If you don't enable the panel's F/D first, the panel will override the sim, turning the sim's F/D OFF, resulting in the sim disabling V/S mode!

N.B. The following MCP Panel controls are not functional,

- N1, SPD INTV, VNAV, LVL CHG, V/S, ALT INTV, CWS A, and CWS B buttons, RH F/D switch.

The following SIM A/P controls cannot be processed,

- VNAV, BC, V/S, and FLC.

This is all due to omissions and limitations within the current SDK SimConnect.

FSC Motorised TQ Driver for the Prepar3D Simulator and PMDG's 737 NGX Aircraft

The OPUSFSCTQ.EXE program is supplied free of charge as part of the OpusFSI v6 software installation. Please refer to the **OpusFSI_FSCTQ_User_Guide.pdf** in your OpusFSI_v6/Docs folder.

Future Development Plans

Further upgrades and enhancements are also planned, see our website for details. All upgrades will be freely available from our web site. The OpusFSI_v6_Release_Notes.txt file in the OpusFSI_v6 folder details all upgrades and releases.

If you have any comments or requests for added features we will be pleased to hear from you. All the above planned features will be included as standard within the licensed version of **OpusFSI**.

Contact Details

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FAQ and Troubleshooting

Please refer to our **website FAQ page**, **OpusFSI_v6_Getting_Started_Single_PC**, **OpusFSI_v6_Getting_Started_Networked_PCs**, **OpusFSI_v6_Live_Weather** and **OpusFSI_v6_Live_Camera** guides.