

OpusFSI

Flight Simulator Interface for Prepar3D

The OpusFSI Live Weather Engine



January 20, 2025

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Overview

The **Live Weather Engine** is a standard feature within the **OpusFSI** Flight Simulator Interface.

The **Live Weather Engine** provides live weather updates on your **OpusFSI** system. The live weather data is acquired by either downloading the current METAR reports for all Met stations within your weather horizon or importing the METAR reports contained within a user specified import file. The weather engine's horizon covers an area of 1280km by 1280km centered on your aircraft's current position, this is the size of the detailed **Dynamic Weather** region created by the engine.

As you are probably aware the use of METAR data to update the weather in the simulator leaves a lot to be desired. To adjust the weather correctly using METAR updates you are forced to clear the current weather completely and either load a totally unrealistic globalised weather pattern, resulting in the same weather horizon to horizon and false ATC and ATIS reports, or reload the new METAR data very slowly one station at a time. This METAR update process is not only totally unrealistic, but can result in a great deal of screen flicker while the simulator slowly loads the new METARs. There are also problems with METAR voids, METAR morphing, and inconsistent weather synchronization across networked systems using METAR updates. These problems are inherent within the Prepar3D simulator. On the other hand, our **Dynamic Weather** loads instantly into the simulator with no screen flicker, no disturbance to the flight, no weather morphing, and no inconsistencies with ATC or ATIS.

The **Live Weather Engine** has set a new standard for weather updates within the simulator community. OpusFSI provides the most efficient and accurate weather updates for Lockheed Martin's Prepar3D simulator.

Live Weather Features

- **Live Weather** constructs Dynamic Live Weather from current live (or historic) METAR data.
- Accurate detailed weather as far as the eye can see throughout your flight. No more unrealistic globalized weather from horizon to horizon, with OpusFSI you can see distant weather patterns all around you. See the changing weather patterns en route as you fly.
- **Live Weather** provides instant weather updates. No more unrealistic clearing of the weather prior to updating. No more annoying screen flicker as METARs are slowly loaded into the sim.
- No more METAR voids or unrealistic METAR data morphing.
- No more inconsistencies with distant ATC and ATIS reports. Accurate Destination Weather when over 200km away, with perfect weather reports at any distance to any point en-route.
- **OpusFSI** weather reports can be used instead of ATIS, and at non-ATIS airstrips.
- **Live Weather** allows you to see low lying mist and fog patches.
- **Live Weather** creates very realistic cloud, visibility layering and an overcast effect.
- **Live Weather** lets you turn on, off, or automatically generate the cirrus cloud effect.
- The **Live Weather Engine** supervises both the turbulence and ultra-realistic **Dynamic Head Movement** utilising actual real-life captured 3D accelerometer data.

- **Weather Overview/Locator** can be used to either locate specific weather conditions on the map area that match your specified criteria, or obtain a Weather Overview of the general weather conditions.
- **Relocate Weather** from any place in the world to your current location.
- Load your own custom weather using a simple METAR import file.
- Load historic weather from within the last 9 days (24 hours for WWTs and the Weather Locator).
- Create your own named **World Weather Themes** from the current weather.
- Dynamic Weather reports displayed during flight for your local area, destination, alternates, en route, lower and upper atmosphere weather.
- **Flight Plan Assistant** imports activated flight plans and provides dynamic flight plan weather reports together with detailed reports on METARs, GRIB lower and upper atmosphere weather, flight plan waypoint weather and SIDs/STARs ordered according to direction and distance.
- **Live Weather Assistant** provides maps of Surface QNH, Surface Winds, Surface Visibility, Surface Temperature, Precipitation Levels, Low Cloud Cover and Met Station Cover for the current 800 x 800 mile weather map.
- **Client Side Weather Control** enables you to edit flight parameters and display weather data on a networked client PC.
- **Live Weather** allows perfect synchronisation of dynamic weather and cloud formations on networked systems.

Sky and Cloud Textures

The Live Weather Engine does not include any sky and cloud textures. For optimum effect we strongly recommend you install sky and cloud textures from packages such as Flight Environment X (payware) or HDEv2 (freeware) for clouds with the sky upgraded by Danny Glover, and use the OpusFSI Live Weather Engine for the actual weather updates.

We would strongly recommend using lower resolution 1024 cloud textures and also not using HD cloud textures, this will be beneficial in terms of frame rates as well as looking more realistic and less harsh.

Slow and Low Flyer Configuration

If you cruise below FL200 then just set your **Destination** and **Max Cruise Altitude**.

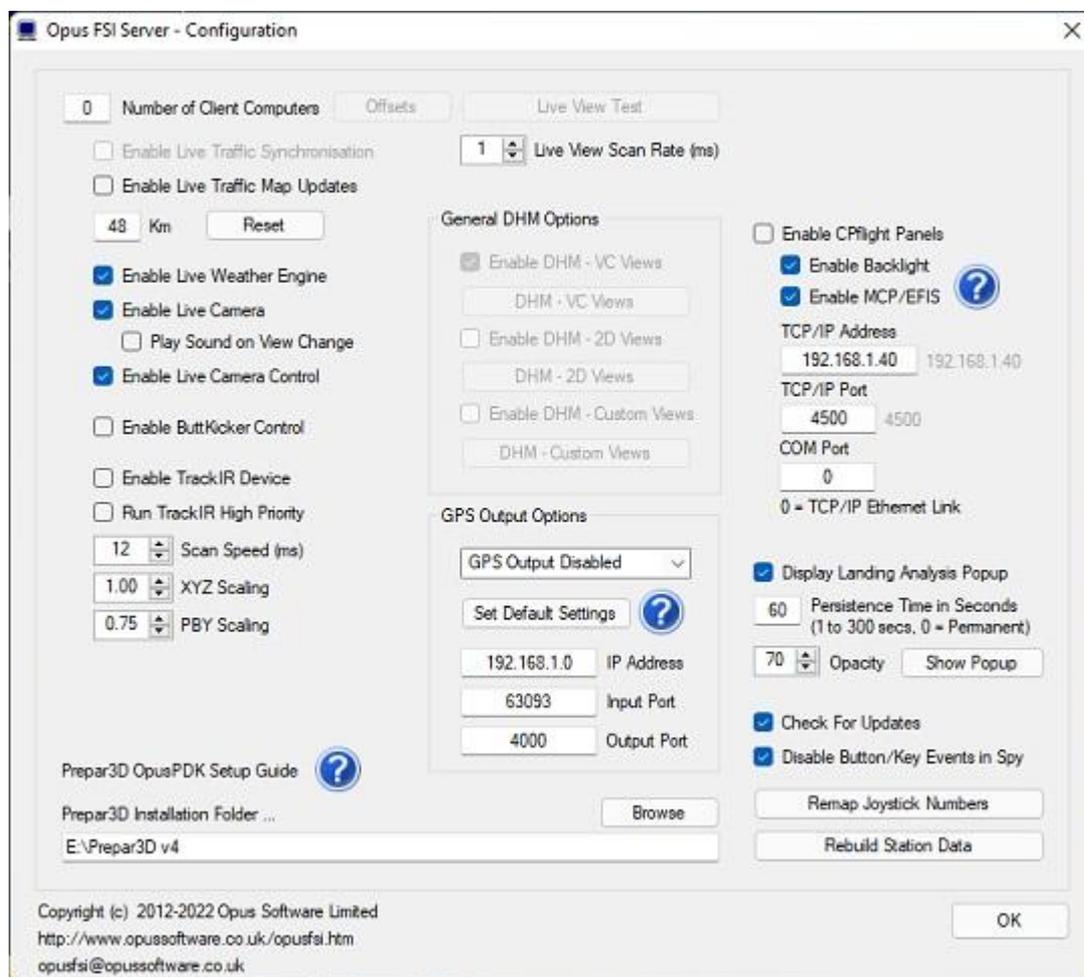
High Flyer Configuration

If you cruise above FL200 then set your **Destination** and **Max Cruise Altitude**. If your system has wind shifts enable the **Sim Friendly GRIB Wind Targets** option in the Weather Download dialog, this option gives you winds very close if not the same as the true forecast, especially if you have specified your **Cruise Altitude**.

Configuration

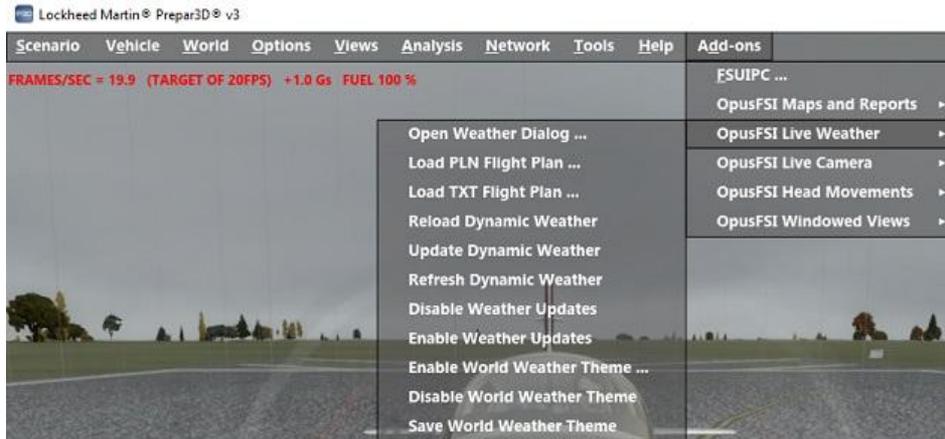
You will need to set your sim to run in windowed mode (i.e. press ALT+ENTER, or turn off full screen mode in the P3D View menu) in order to display the OpusFSI SERVER form. The server and all client displays will be paused whilst the dialog is active.

The Live Weather Engine is enabled via the OpusFSI server program's Configuration dialog, accessed via the Configure button on the OpusFSI SERVER's main form or the Add-ons menu.



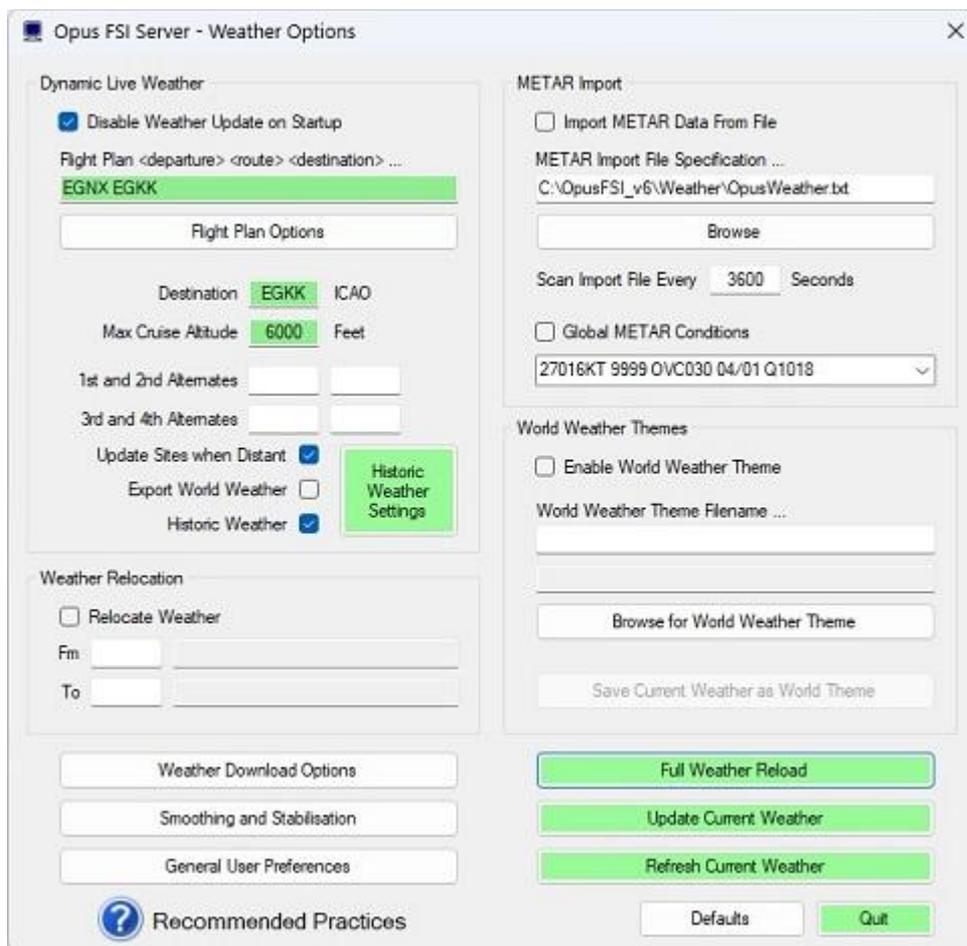
To enable, tick the **Enable Live Weather Engine** checkbox within the Configuration dialog. Ensure you have disabled all other weather injection from P3D, third party engines, VATSIM etc.

You can open the Weather dialog, load a flight plan, force a reload/update/refresh of the Live Weather, temporarily disable/enable Live Weather updates, or enable/disable/save World Weather themes using the **OpusFSI Live Weather** options within the simulator's Add-on menu.



The Live Weather update parameters and import options are specified within the Weather dialog, accessed via the Weather button on the OpusFSI SERVER's main form.

Dynamic Live Weather



If the **Disable Weather Update on Startup** option is enabled the LWE will remain dormant until you force a weather update either via,

- Automatically activating a flight plan (Flight Plan Options, **Auto Load Newest Flight Plan For Departure**), or manually loading or activating a flight plan,
- the **Add-ons menu** (OpusFSI Weather options),
- the **Full Weather Reload** button in the Weather dialog
- a Shortcut Control (OpusFSI_v6_ User Guide).

This option allows you to enter the flight details and adjust the weather settings prior to generating and updating the weather at the start of your flight.

You may enter (or paste) your flight plan, or a list of ICAO, nav aids and general waypoint codes into the **Flight Plan** edit box. Your flight plan destination ICAO will be automatically copied to the **Destination ICAO** field. Refer to the section below for a description of the [Flight Plan Options](#).

If you haven't entered a Flight Plan or Station List then configure a **Destination ICAO** Code and up to four alternate airfield designations. Always specify your destination ICAO, this is very important in preventing wind shifts. The specified destination and alternate airfield weather is updated automatically without the need to constantly download new METAR reports. These automatic updates ensure compliance with the current downloaded METAR reports at these locations. You can change the ICAO codes in flight. It is recommended you update the weather manually (via the dialog or add-on menu) when you change the ICAO codes, either before a flight or whilst airborne. Weather Report windows provide accurate weather reports for the specified destination and alternate airfields. These reports can be used in place of ATIS and are accurate out to about 640km (400 miles or 345nm).

The **Max Cruise Altitude** setting in the weather dialog allows you to specify a reference cruise altitude (max 65000 ft). You can enter a three digit flight level, or FLnnn format (e.g. FL230), or an altitude. All altitudes less than 1000 feet are interpreted as an implied flight level. For the Sim Friendly GRIB wind adjustment, any cruise altitude less than 20000 feet will reference the forecasted tropopause height.

Update Sites When Distant will update the weather at the specified Destination and all specified Alternate sites using the Selective Update methods. These updates will occur whenever a theme is updated and the sites are on the current weather map but currently lie outside the area covered by the Dynamic Weather Theme. This option allows accurate (Actual) Destination and Alternates weather when up to 400 miles (about 640km) away!

Export World Weather when enabled will save the world-wide GRIB data in a single 8.45Mb OpusGribExport.dat data file in the \OpusFSI_v6\Weather folder and the METAR data in the OpusMetarExport.txt file. These files are intended for use by third-party flight planning packages. The supplied OpusFSI_v6_Weather_Export.pdf document in the \OpusFSI_v6\Weather folder provides details of the both the exported GRIB data and METAR text file formats. This document can also be downloaded from our Downloads page via the hyperlink at the bottom-right of the page.

If you want [historic data](#) then tick the **Enable Historic Weather** checkbox and use the **Historic Weather Settings** button to select the historic date of interest. You can load historic weather from within the previous 9 days (24 hours for WWTs and the Weather Locator).

Refer to the section below for [Weather Relocation](#).

Refer to the section below for [Weather Download Options](#).

Refer to the section below for [Smoothing and Stabilisation](#).

Refer to the section below for [General User Preferences](#).

Refer to the section below for [METAR Import](#).

Ticking the **Global METAR Conditions** option enables you to specify Global METAR conditions for use in the sim. The global conditions are specified in standard METAR form excluding the ICAO and Day/Time code at the start, in other words excluding the "ICAO DDHHMMZ" phrase at the start. For example, the string "27004KT 2000 SCT042 04/01 Q1018" would specify a surface wind of 270 at 4 knots, visibility of 2000 metres, scattered cloud at 4200 feet, temperature 4, dew point 1, and a QNH of 1018mb. The dropdown list stores a history of your METAR conditions.

Refer to the section below for [World Weather Themes](#).

If you have set your **Destination** and **Max Cruise Altitude** then you can go ahead and fly without setting any further options in the Weather Download, Smoothing and Stabilisation, and General User Preferences dialogs, they are provided for you to tweak the settings manually if required.

Defaults

The **Defaults** button sets all recommended default options.

Reload, Update and Refresh

The **Full Weather Reload** option performs a full update of the weather without any cloud/visibility smoothing (equivalent to the initial weather update or updates when on the ground).

The **Update Current Weather** option performs a full update with cloud/visibility smoothing (when it is enabled) and you are airborne.

The **Refresh Current Weather** option requests a weather regeneration or refresh using the current METAR and GRIB data with cloud/visibility smoothing (when it is enabled) and you are airborne. In other words it does not download new METAR or GRIB data.

Reload - download new METAR or GRIB data, no smoothing

Update - download new METAR or GRIB data, with smoothing

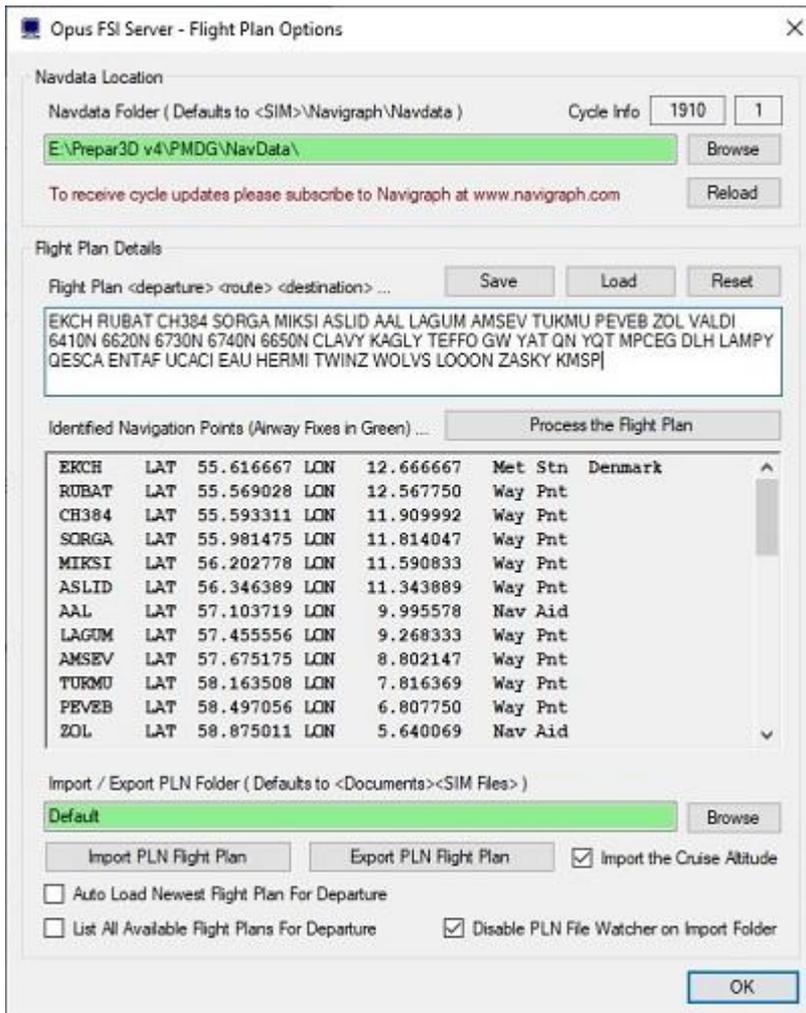
Refresh - no download of data, with smoothing

All requested Weather Refreshes are performed at the next appropriate time as determined by the Live Weather Engine. The text in the Weather button on the OpusFSI SERVER form is grayed

out and changed to 'Updating' whilst the LWE is busy refreshing or downloading and updating the weather.

Flight Plan Options

The LWE will automatically import flight plans activated via the sim. In addition two options are included with this dialog, **Auto Load Newest Flight Plan For Departure** and **List All Available Flight Plans For Departure**. Alternatively flight plans may also be loaded via the sim's Add-ons OpusFSI Live Weather menu option.



If the **PLN File Watcher on Import Folder** option is enabled then the Live Weather engine will detect and process any changes to, or the creation of a new, PLN flight plan within the current Import PLN Flight Plan Folder. Any change to a PLN flight plan file (or the creation of a new PLN flight plan file) will be processed and trigger a Full Weather Reload. Disable the **PLN File Watcher** if you prefer to manually select and load a departure flight plan before flight.

The full file specification for all P3D activated (loaded) flight plans is displayed within the main Spy window of the OpusFSI SERVER program.

However if you wish to manually import, edit, or enter and process a flight plan then you can do it via this dialog.

Identifying your Navdata Source

The flight planning assistance software decodes the standard Navigraph Navdata Nav aids and Waypoints text files for use in identifying all Nav aids and general waypoints within the your flight plan.

First locate your Navdata folder. The standard <SIM>\Navigraph\Navdata\ path is the default location for these files but you may **Browse** to different folders should they be located elsewhere (e.g. NavDataPro folder). The Navigraph Navdata supplied for the PMDG aircraft is in your <SIM>\PMDG\NAVDATA folder in the wpnavaid.txt and wpnavfix.txt Navigraph files. iFLY files are in the <SIM>\iFly\Navdata folder.

If you do not have any Navigraph files then a default version of the files (apart from SIDs and STARs) are installed into your OpusFSI_v6\Navdata folder. To update Navigraph files subscribe to Navigraph's FMS data service at www.navigraph.com.

You will know if OpusFSI has extracted the Nav data because the NAVAIDS.DAT and WAYPOINTS.DAT files will be created in the OpusFSI_v6 folder. The NavData is reloaded each time you change the folder location, or press the **Reload** or **Process the Flight Plan** buttons, or exit the dialog.

N.B. you only need to identify your Navdata folder once and it will be used for all aircraft types, you do not need to change the Navdata folder when selecting aircraft from different manufacturers. The same Navdata folder can be used for all sim types.

Entering a Flight Plan Manually

If you enter the flight plan manually then your flight plan should start and end with a station's ICAO code, i.e. in the form,

<origin> <nav aids, waypoint fixes, airways and lat/lon fixes> **<destination>**

e.g. EGCC 53.317167N2.318000W WAL33 TULIP LFST

Your departure and destination points are required in order for the software to identify the specific Nav aid or waypoint since many of them have shared names. So make sure you specify your origin and destination ICAO codes. The origin, destination and fixes can also be defined as Lat Lon fixes. The format for Lat Lon fixes are as follows,

<sign><lat>/<sign><lon>:<code> e.g. 12-34-56/-123-45-67 or 12°34'56"/-123°45'67" or 1234/-12345
or 1.23/-1.23:ABC1

or <lat><N or S><lon> <E or W>:<code> e.g. 12-34-56N123-45-67W or 1234N12345W or 1.23N1.23W:ABC1

or <N or S><lat><E or W><lon>:<code> e.g. N12-34-56W123-45-67 or N1234W12345 or N1.23W1.23:ABC1

or <N or S><lat> <E or W><lon>:<code> e.g. N12-34-56 W123-45-67 or N1234 W12345 or N1.23 W1.23:ABC1

where

<sign> = + (optional) to indicate North or East

- to indicate South or West

<lat> = dd-mm-ss

dd°mm'ss"
 ddmm
 deg.deg
 <lon> = ddd-mm-ss
 dd°mm'ss"
 dddmm
 deg.deg
 <code> = optional ICAO code or station name

where dd = degrees in 2 digits
 ddd = degrees in 3 digits
 deg = degrees represented in decimal form e.g. 30 minutes would be 0.5 degrees
 mm = minutes in 2 digits
 ss = seconds represented in decimal form

All LatLon fixes used to define either the point of departure or destination within flight plans are temporarily added to the OpusFSI station list with a pseudo name Xnnn, where 'nnn' ranges from 000 to 999. If the LatLon fix is within 2km of an existing station then that station is assumed to be identified.

Saving and Loading a TXT Flight Plan

You can use the **Save** button to save your manually entered flight plan in a text file. These saved flight plans can be loaded in future flights using the **Load** button. All text flight plan files contain the cruise altitude and flight plan string on two separate lines. Text flight plan files are stored in the \OpusFSI_v6\Plans folder. The **Import the Cruise Altitude** checkbox option is used when loading text flight plans.

Importing a PLN Flight Plan

You can import any PLN formatted flight plan (with .PLN filename extension). The **Import Flight Plan** option will initialise its path to your **My Documents\<SIM> Files** folder ready for you to select to your flight plan files. Your PLN folder's location is remembered by the FPA software after you have selected the required .PLN filename.

An **Import the Cruise Altitude** checkbox option is provided to enable or disable the importing of the cruise altitude from the flight plan.

All flight plans activated within the simulator are decoded and processed automatically. For this to happen the OpusFSI SERVER program must be running before the flight plan is loaded into the simulator.

The decoding of Lat/Lon coordinates in imported PLN flight plan files has been extended to accept delimited degrees (°), minutes (') and seconds (") coordinated values.

Processing a Flight Plan

If you have manually entered or edited a flight plan, or loaded a TXT flight plan then you need to process the flight plan. Click on the **Process the Flight Plan** button to decode the Flight Plan and display the result in the **Identified Navigation Points** box. The navigation aids and waypoints, where they exist, are displayed with their Lat/Lon coordinates, general type and two letter country

codes. Where possible the specified label of any lat/lon waypoint fixes are shown. Airway fixes are displayed in green. Alternate Met stations are displayed in red.

The software ignores all identifiers that are not listed as Nav aids and waypoints. Airways are recognised provided the entry point is specified, also if you have specified both entry and exit points in the flight plan (usually done) then the FP Assistant will replace the Airway with the list of points en route and provide weather information and upper winds/temps for each of those navigation points.

The nearest four Met stations within 128km (80 miles) of a navigation point are added to the download list.

The **Flight Plan Details** editbox lists all identified navigation points extracted from your flight plan.

If you subsequently change your alternates then you will need to process the flight plan again.

Just remember to force a weather update to download the METARs. Until then there will be no METAR data since it hasn't been downloaded. After downloading, all the non-reporting Met stations are removed from the list.

Exporting a PLN Flight Plan

The **Export PLN Flight Plan** option will save the current processed flight plan into a standard user specified P3D PLN file.

Auto Load Newest Flight Plan For Departure

When ticked the **Auto Load Newest Flight Plan For Departure** will instruct the OpusFSI Live Weather engine to search for all likely flight plans for your point of departure in the current specified Import/Export folder. It will then determine the newest (last updated) file and automatically import (load) the newest flight plan. This feature is only active when on the ground. After the flight plan has been loaded a Full Weather Reload is performed by the weather engine.

For a flight plan file to be recognised the departure point's ICAO code must appear within the filename and start within the first four characters. In other words you are allowed to have up to three characters preceding the ICAO code. The checks are not case sensitive.

For example, assuming the aircraft is on the ground at EGNX (East Midlands, U.K.) then the following filenames will all be recognised.

```
EGNXEGKK.pln
EGNX TO EGKK.pln
001EGNXEGKK.pln
01_EGNXEGKK.pln
01 EGNX TO EGKK.pln
```

When any flight plan is loaded with automatic weather generation the weather engine will display the following banner on the simulator screen for a period of 20 seconds.

```
OpusFSI Live Weather - Loading Flight Plan : <flight_plan_name>
```

List All Available Flight Plans For Departure

When ticked this option will display a text list of the first nine available flight plan filenames, ordered from newest to oldest. Select the required flight plan menu number, or click on the plan with the mouse, to load the plan and perform a Full Weather Reload.

Flight Plan Reports

The **Flight Plan En Route Weather Report** displays the navigation points associated with each listed Met station, refer to the [Weather Reports](#) section for further details.

The **OpusFlightReport** text file in the **OpusFSI_v6\Weather** folder provides details of all cruise winds, cruise temperatures and local weather reports at each of the navigation points.

Deleting a Flight Plan

To delete a flight plan simply press the **Reset** button.

Add-ons Menu Options

Three flight plan options are provided via the sim's Add-ons menu (OpusFSI Live Weather option),

- Departure Flight Plans
- Load PLN Flight Plan – browse for PLN flight plans
- Load TXT Flight Plan– browse for TXT flight plans



Departure Flight Plans

Lists all flight plans with the departure ICAO included in the first 7 characters of the PLN filename. Enter the list entry number or click on the list entry to load the flight plan and update the weather, or select Quit to exit.

If you edit your flight plan during flight it will automatically be reloaded and trigger a Full Weather Reload.



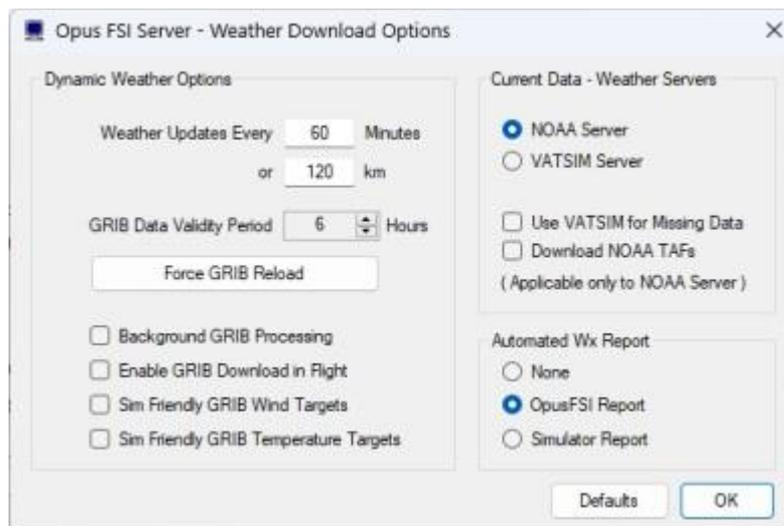
Load PLN Flight Plan

Browse for and load PLN flight plans. Defaults to the \Documents\

Load TXT Flight Plan

Browse for and load TXT flight plans. Defaults to the \OpusFSI_v6\Plans folder. Double click on a listed flight plan text file to load the flight plan and update the weather.

Weather Download Options



Dynamic Weather Options

The default **Weather Update** settings are 60 minutes and/or 120km (75 miles) travelled. The minimum Live Weather Update frequency and distance is 10 minutes and 32km respectively. The Weather Update period and distance can be set to up to a maximum of 120 minutes and/or 240km (150 miles). Take into consideration your sim cloud draw distance and your ground speed when setting your update time, if the update time is not frequent enough then you may reach the cloud draw distance before a weather update takes place. We recommend setting a Cloud Draw Distance of between 70 and 110 miles in the simulator. The lower setting of 70 or 80 miles will be adequate for low level VFR, and anything from 80 to 110 miles for high level flying. The clouds at the range of the Cloud Draw Distance will either condense into view or dissipate out of view as you fly toward or away from them.

If you do not like change (cloud shifts) and you don't fly beyond 320Km then you can disable weather updates via the simulator's OpusFSI Add-on menu but be aware that if you eventually perform another weather update, the injected targets may be completely different from the current wind and may cause one or more wind shifts. Alternatively you can save the current weather as a **World Theme** and reload that theme for worldwide coverage of the weather which will not be updated.

The **GRIB Data Validity Period** allows you to specify the validity period for the downloaded GRIB cycle data. Each GRIB cycle contains 15 days of forecast data. The validity period can be adjusted between 3 hours and 240 hours in increments of 3 hours. The default setting is 6 hours.

You can force an immediate GRIB reload via the **Force GRIB Reload** button.

If enabled the **Background GRIB Processing** option (default OFF) will process GRIB data (i.e. GRIB data extraction and the data decoding) slowly in the background and does not affect the sim during this period.

When **Enable GRIB Download in Flight** is enabled the world wide GRIB data will be downloaded during a weather update, either on the ground or in flight, whenever it is found to be either incomplete or invalid (e.g. is older than the specified **GRIB Data Validity Period**). When disabled, GRIB download and decoding will only take place when the aircraft is on the ground (e.g. either before flight or after landing).

Sim Friendly GRIB Wind Targets should be enabled along with **Enable Wind Stabilisation** (Smoothing and Stabilisation) on any system experiencing troublesome wind shifts. The **Sim Friendly GRIB Wind Targets** option causes the LWE to adjust any 'sim unfriendly' wind changes in direction and speed.

The **Sim Friendly GRIB Temperature Targets** option causes the LWE to adjust any 'sim unfriendly' temperatures, enable this if the sim is having difficulty maintaining its targets.

Current Data - Weather Servers

Select the required server NOAA or VATSIM (remember to disable VATSIM's own weather injection).

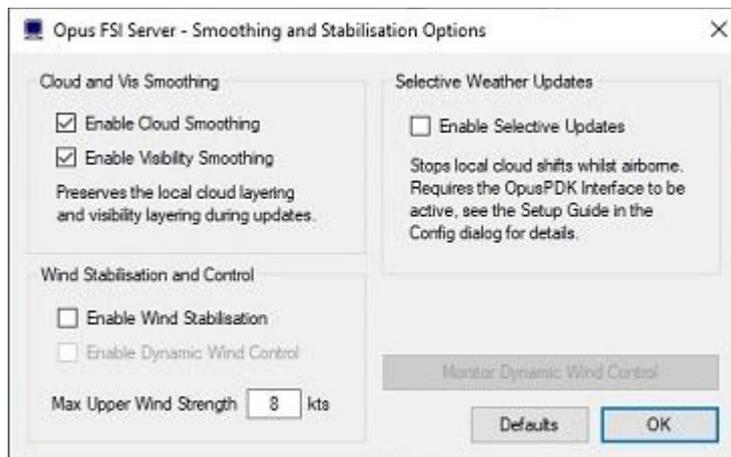
Tick the **Use VATSIM for Missing Data** checkbox if you wish to use VATSIM to fill in missing dynamic weather data (not historic) from the other servers, useful for areas such as NZ.

When the **Download NOAA TAFs** checkbox is ticked the LWE will download all available TAFs for all METAR stations. This option is only applicable when the primary NOAA Server is selected. The downloaded TAFs are shown within the OpusFlightReport.txt (FLIGHT PLAN) text report.

Automated Wx Report

Select 'None' to disable the automated Wx (GRIB Download) report completely, select 'OpusFSI Report' for the usual OpusFSI Wx report window, or select 'Simulator Report' for the 'in sim' Wx report window.

Smoothing and Stabilisation



Cloud and Vis Smoothing

Enable Cloud Smoothing will attempt to preserve all cloud layers and coverage surrounding the aircraft. The extent of the preservation zone increases with increased elevation. All Cloud Smoothing is disabled when the aircraft is within 64km (40 miles) of the specified Destination. It is not possible to stop the sim re-positioning the individual clouds but the OpusFSI LWE can preserve the cloud layers, cloud types, cloud bases, cloud depths, cloud precipitation, and overall cloud coverage.

Similarly **Enable Visibility Smoothing** will attempt to preserve visibility surrounding the aircraft during all weather refreshes and updates whilst you are airborne.

Wind Stabilisation and Control

Enabling the **Wind Stabilisation** option will fix all upper winds from 4000ft altitude and above to the maximum wind speed specified within **Max Upper Wind Strength** (set this to zero to specify

no limit). This option is intended to completely neutralise all wind shifts within the P3D v4 and v5 simulators. Surface winds and upper wind directions are unaffected. Only the upper wind speed is affected. A suggested value of 3% of your aircraft's cruise speed should be ok (e.g. 8 for 240kt cruise, 9 for 300kt cruise) although some trial and error may be needed. Setting the Max to 2kt would neutralise the effect of all P3D generated wind shifts.

Enable Dynamic Wind Control is turned off by default due to the current problem in P4D and P5D.

Selective Weather Updates

*P5D works OK with selective updates when the **Enhanced Atmospheric (Beta)** option is disabled.*

Enable Selective Updates uses selective METAR updates and will prevent all cloud shifts. This mode requires the OpusPDK Interface to be active (activated using the PDKSETUP.EXE set up program once after installation of OpusFSI v6). The OpusPDK Interface injects detailed OpusFSI Dynamic Weather Theme data into the Prepar3D simulator. Before flight, or when either sat on the ground or after issuing a **Full Weather Update**, the weather engine will prepare the 'in sim' weather in a number of stages. This preparation will be accompanied by several messages appearing in a fixed banner at the top of the sim display. The following weather update messages may be displayed,

OpusFSI Weather - Selective Update Mode, <action in progress>

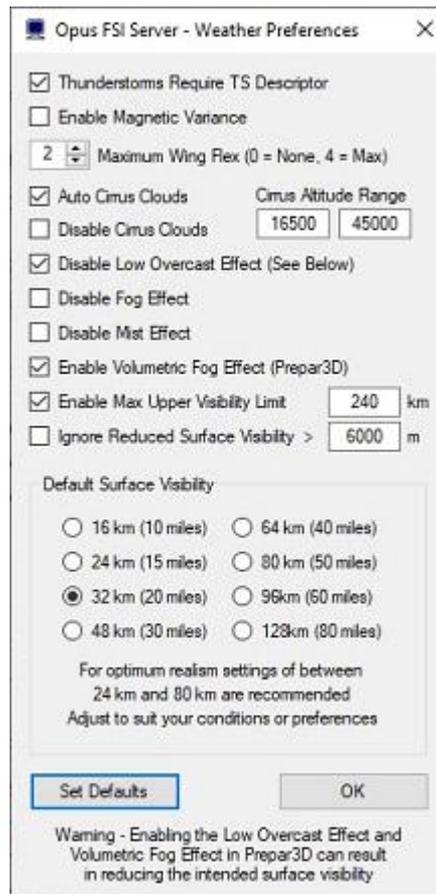
Where <action in progress> is one of the following,

Preparing Weather Data and Met Stations
Initialising the Local Weather
Initialising the Regional Weather

As soon as the weather has been prepared and the regional weather injected the banner will be removed and all further weather updating will be performed steadily in the background.

Note, **Cloud Smoothing** and **Visibility Smoothing** are automatically disabled in **Selective Update** mode as they are both unnecessary. We also recommend you disable the **Dynamic Wind Control** as this may not be functional in the latest P3D v4.5. We would also recommend you set the **Enable Max Upper Visibility Limit** option in the **Weather Preferences** dialog and set the **Max Visibility** to 240km or even as low as 128km. If the option is disabled then the weather engine will unrealistically inject unlimited visibility at medium to high altitudes. If the option is enabled then the upper visibility will be restricted as it mostly is in the real world.

General User Preferences



The **Thunderstorms Require TS Descriptor** option (enabled by default) only produces active thunderstorm (CB) clouds when the TS descriptor is specified within the METAR statement. When this option is disabled either TS or CB in the METAR will produce an active thunderstorm.

Enable Magnetic Variance is disabled by default. When enabled, there will be a difference between the reported wind directions METAR and GRIB forecast data which always report directions with respect to True North and the current wind directions within the simulator and reported by ATIS which are always Magnetic directions. To assist the pilot, the LWE will show the current **Magnetic Variation** in the weather report windows, displayed in the form '**MagVar XX.X'** at the end of the surface wind information. You must **ADD** this value to all wind directions to convert them to Magnetic directions at the current location. Please note, OpusFSI cannot show the Magnetic Variation at the Destination or Alternate sites, only at your current location in the simulated world.

The **Maximum Wing Flex** level (0 = None, 4 = Maximum) moves the ASI and VSI when the simulator's turbulence and thermal setting is enabled (recommended); in the sim menu - Options, Settings, Display, select the Weather tab, there is an option for turbulence and thermal effects on the aircraft, make sure it is not disabled. Also enable the 'Advanced Animations' option in the sim menu - Options, Settings, Display - Graphics tab. Note, the wing flex option can cause some

aircraft simulations to loose A/T or A/P lock, if so try lowering the value and if it still causes problems disable it in the sim and here.

High level cirrus cloud is not included within the standard METAR reports. The **Auto Cirrus Clouds** option (set as default) automatically displays cirrus cloud whenever it determines the weather is quite changeable, possibly due to a weather front. The cirrus cloud coverage is generated randomly between the configured lower and upper **Cirrus Altitude Range** based on the aircraft's current latitude. The lower range will be adjusted to between 10,000 feet at the poles to 20,000 feet at the equator; the upper range will be adjusted to between 25,000 feet at the poles to 60,000 feet at the equator. The calculated limits are graduated throughout the polar, temperate, and tropical zones. For example, at EGNX East Midlands (latitude 52.8 degrees) the limits are set to range from 15,900 to 43,100 feet. In fairly stable conditions the cirrus cloud will be disabled. In flight, the cirrus is reassessed every 80 miles flown.

Disable Cirrus Clouds if you don't want any cirrus clouds at all, either auto or random. If you haven't selected auto cirrus or disabled cirrus clouds then the Live Weather Engine generates a single cirrus cloud layer at a random height between the configured lower and upper **Cirrus Altitude Range**. The valid range of altitude settings are from 10,000ft up to 60,000ft (default range is 16,500ft to 45,000ft).

Low Overcast Effect (disabled by default) comes into force whenever the overcast cloud cover is less than about 6000 feet AGL. You must be IN the Low Overcast Effect to see it. Overcast by definition means 90% or more cloud coverage. Don't expect to see solid blanket type overcast when looking vertically downward ... you WILL see transparent holes just like you do in real life until you get IN an OpusFSI Low Overcast Effect (an overcast below 6000 feet). **Low Overcast Effect** can be combined with P3D Volumetric Fog but only when on the ground or at your specified Destination or Alternate sites and can result in reducing the intended surface visibility. Disable **Fog** and **Mist effects** if required. The mist and fog effects place a thin layer of cloud on the mist/fog layer so that it is visible from above.

In P3D simulator mode the **Enable Volumetric Fog** option is set automatically using the VolumetricFog setting within the Prepar3D.CFG file. If you change this setting during a P3D session then either change the **Enable Volumetric Fog Effect** in OpusFSI to match P3D or restart OpusFSI. Enabling both the **Low Overcast Effect** and **Volumetric Fog Effect** in Prepar3D can result in reducing the intended surface visibility.

The **Enable Max Upper Visibility Limit** option is for those users who prefer their upper visibility limits to be reduced, this will also harmonise with the sim's max cloud draw distance, thus reducing any observed hard edge at the cloud draw boundary. The limit can be specified as a value between 80km (50 miles) and 240km (150 miles). A checkbox is provided to enable/disable the reducing effect, when disabled the Upper Limit will be set to 0, all values less than 80km will disable the effect. This effect can be adjusted to match the Max Cloud Draw Distance within the sim's Weather settings. Note, changing the setting mid-flight may not have much of an effect if you have the OpusFSI Visibility Smoothing enabled. In Prepar3D you can have a reduced visibility layer above the low lying Volumetric Fog effect.

Realistic reduced visibility is an effect seen in the real world which we have simulated for P3D. You may **Ignore** (disable) realistic **Reduced Surface Visibility** by configuring the distance as required, a value of zero disables reduced visibility entirely.

The **Default Surface Visibility** setting defaults to either 32km (20 miles) or 48km depending on latitude and time of year. The maximum visibility at altitude is usually 128km (80 miles) and attained at or below a target altitude of 28,000 feet. This maximum visibility can be reduced to 96km (60 miles) whenever average surface visibility is reduced below some predetermined distance depending on your Max Surface Visibility setting. Of course when using Dynamic Weather the visibility values in the METARs will override this setting so it only comes into force when the METARs state CAVOK, 9999 or 10SM conditions. The forecast land/sea visibility data will be downloaded and factored into the Live Weather Engine's modelling of the Default Surface Visibilities used in areas not covered by actual METAR reports.

Recommended Settings and Practice

Upgrade to the latest Release or Beta Version.

Set all Defaults in all weather dialogs. *

Specify your Destination.

Specify your Max Cruise Altitude.

Update the Weather. **

Check the Weather ***

* This will enable the cloud and visibility smoothing, wind stabilisation and dynamic wind control options in the Weather Smoothing dialog.

** If you have specified **Background GRIB Processing** in the Weather Download Options dialog then the GRIB data extraction and lengthy decoding will proceed at a slower pace and can take several minutes. Otherwise the processing will be done as fast as possible at the expense of sim performance or frame rates. The **GRIB Data Validity Period** allows you to specify the validity period for the downloaded GRIB cycle data between 3 and 240 hours in increments of 3 hours (default 12 hours).

*** Before flight you should get into the habit of checking the weather. At the very least display and check the Opus **Local, Lower, Upper, and Destination Weather reports**. You may also like to examine the various Opus text reports accessed via the sim Add-ons menu. There are separate reports showing the downloaded METARs, all the GRIB wind and temperature targets from 4000 feet up to FL540, all the en route weather for any specified flight plan including TAFs if you have enabled them, and finally an easy reference to all relevant SIDs and STARs. This report gives a handy direction and bearing for each listed SID and STAR.

The Opus weather reports (e.g. The Destination Weather) should be checked during climb and descent to monitor all wind and temperature targets, compared with the actual P3D ambient conditions. This way you will know that your sim is operating as expected.

Never disable weather updates, the sim will NOT cope on its own it simply cannot contain all the necessary data.

Text Weather Reports, located in the OpusFSI_v6\Weather folder and accessed via the sim Add-ons menu or the **Wx Report** button on the OpusFSI SERVER form...

- OpusWeather.txt ... The downloaded METARs
- OpusWeatherReport.txt ... The GRIB data report
- OpusFlightReport.txt ... The flight plan en route weather report
- OpusSIDSTARReport.txt ... The relevant SIDs and STARs

Live Weather Assistant (LWA) and Weather Map data ...

- Surface Visibility
- Precipitation Levels
- Surface QNH
- Surface Temperatures
- Cruise Level Temperatures
- Upper Level Temperatures
- Surface Winds
- Cruise Level Winds
- Upper Level Winds
- Cruise Level Turbulence
- Upper Level Turbulence
- Lower Level Cloud Cover
- Medium Level Cloud Cover
- Met Station Cover

The LWA and up to six weather maps can be displayed on the server or a networked client.

Remember ... You should use all the various Opus weather reports and text report files to check your weather before and during flight. Especially BEFORE you fly. At the very least examine the Opus on-screen weather reports.

BEFORE flight ...

1. Check the Local weather report and confirm the weather has been injected OK.
2. Check the Lower Atmosphere weather report to confirm you have GRIB data downloaded and decoded. It will also show you what winds and temps to expect as the LWA takes you up to FL200 and the GRIB forecasted winds and temps.
3. Check the Upper Atmosphere weather report, again to confirm the GRIB data is downloaded and in use. This will also confirm the expected upper winds and temperatures.
4. Check your Destination weather report, if not within the current weather map then check the Destination report in the En Route weather reports. Then you will be warned of any adverse weather at your Destination.
5. If you have processed a flight plan then check the OpusFlightReport.txt file. You can access this via the Add-ons menu or directly, you will find it in your OpusFSI_v6\Weather folder. The file content is self explanatory.

Other Comments and Useful Hints ...

Both the Lower and Upper Atmospheric reports, and the OpusWeatherReport.txt (GRIB Data) report file contain details of the actual downloaded GRIB data cycle. In addition, each weather report contains the METAR day and time code.

There should never be any need to question the validity of the forecasted data. All the weather related information is available for you to examine, as you should do before every flight.

The OpusWeatherReport.txt (GRIB Data) text report shows ALL the forecasted and Opus 'Sim Friendly' adjusted upper wind and temperature target data from FL040 upwards. All data from FL200 and above being derived directly from the actual forecasted GRIB data.

Specify the altitude you are going to spend the most time cruising at in the Max Cruise Altitude. If you set the Sim Friendly Options (Recommended to minimise weather updates amongst other things) then the software will ensure the raw GRIB forecasted data is adjusted (sim friendly adjustments) about this reference altitude. Of course the GRIB forecast is only adjusted when needed at each 500 foot level. You can see the results of this in the OpusWeatherReport.txt (GRIB Data) report file and the Upper Atmosphere Report.

Helpful hints ...

If the upper winds, above FL200, all veer upwards above your lowest stepped altitude then they will not be adjusted by the Sim Friendly option. This option allows veering wind directions and increasing wind strengths and only adjusts those that are backing (rotating anti clockwise as you climb) upwards.

You can compare the adjusted and raw GRIB in both the text report file and in the Upper weather report.

The actual GRIB data cycle is also identified. There is 360 hours (15 days) of global forecast data in each cycle. The cycles are never posted on time as that identifies the time of the forecast cycle and not the time of release. Cycles can in fact be posted anything up to 9 hours after the cycle time.

There should be no need to force a weather update, the LWE will update automatically to keep all the wind and temp targets appropriate to the current altitude zone. It is usually best to leave the LWE to monitor and adjust the winds dynamically (you will need FSUIPC installed for this).

Use the various on screen weather reports and the shift-Z info bar to monitor your ambient conditions (wind) checking against the targeted wind in the weather report for your altitude. Start off using all default settings. Get used to monitoring the targets against the current ambient wind.

I usually position the weather report window immediately below the shift-Z info line. I monitor the Lower report during the climb below FL200 then switch to the Upper report as I continue to climb up to my cruise altitude. Then I usually monitor the Destination weather report.

Never use accelerated time during the climb or descent, give your sim and the Opus Dynamic Wind Control (DWC) the best possible chance to maintain its targets. In the cruise if you must use accelerated time only use x2, x4 with supervision. Not all aircraft sims are designed to work in accelerated time.

The above weather checking and target monitoring will confirm that your sim is performing as expected. The DWC on the vast majority of systems will hold the winds within 2 degrees and 2 knots of the desired target values. Remember DWC does require FSUIPC.

Historic Weather Data

If you want historic data then tick the **Enable Historic Weather** checkbox and use the **Historic Weather Settings** button to select the historic date of interest. You can load historic weather from within the previous 9 days (24 hours for WWTs and the Weather Locator).

This data is fully time-synchronised with the OpusFSI's GFS GRIB 'atmospheric' data to provide world-wide historic weather coverage.



The required historic date and time can either be entered manually, set to the system time, or to the sim time. If **Static Historic Weather** is ticked then the historic weather will be loaded but not updated. **Reset Historic Weather** will reload the weather from the start date and time.

Weather Data Import (current and historic)

There are three methods you can use to import your own weather data,

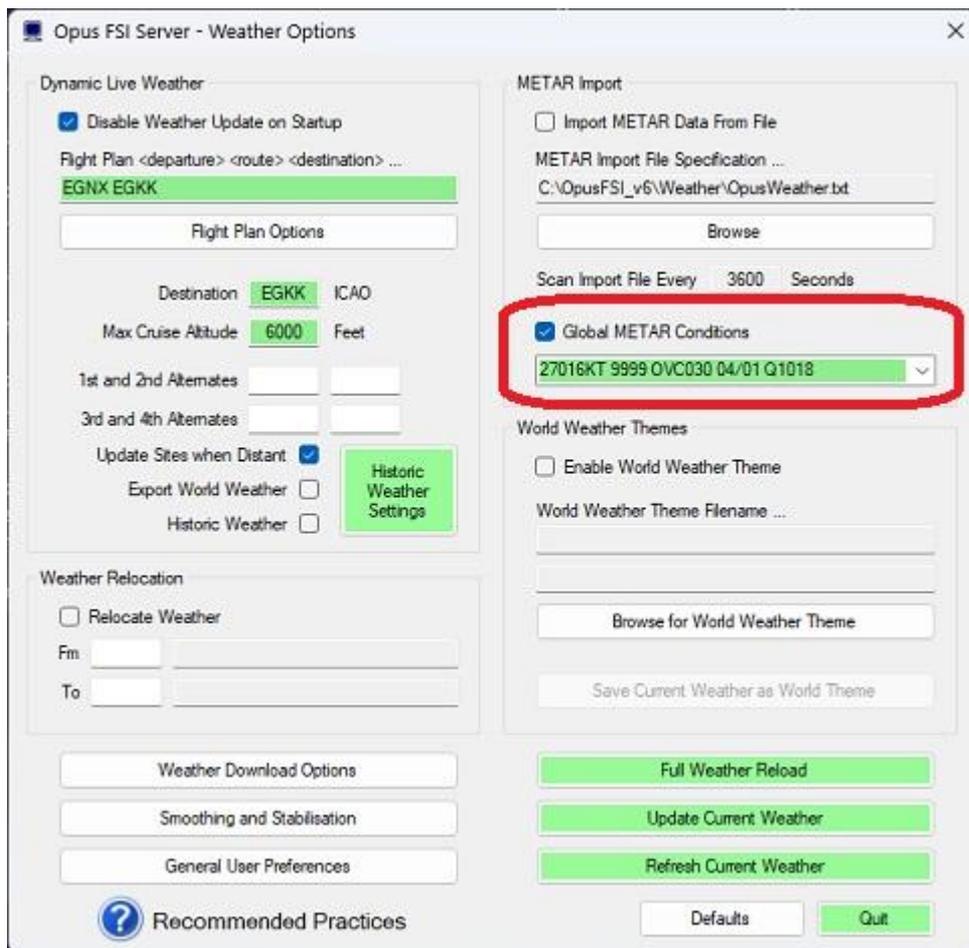
- a global METAR specified in the weather dialog
- a text file containing a list of METARs
- a named world weather theme

METAR Import

Global METAR

The **Global METAR Conditions** checkbox and combo box option in the Weather dialog is used to select and specify global METAR conditions for use in the sim.

The global conditions are specified in standard METAR form excluding the ICAO and Day/Time code at the start. In other words excluding the "ICAO DDHHMMZ" phrase at the start. For example, the string "27004KT 2000 SCT042 04/01 Q1018" would specify a surface wind of 270 at 4 knots, visibility of 2000 metres, scattered cloud at 4200 feet, temperature 4, dew point 1, and a QNH of 1018mb. The dropdown list stores a history of your METAR conditions.



Text File Import

As an alternative to the weather data collection over the Internet the software can be instructed to import its METAR data from a user specified import file. The **METAR Import File Specification** and file scan frequency (default 3600 secs) is specified within the Weather dialog on the server.

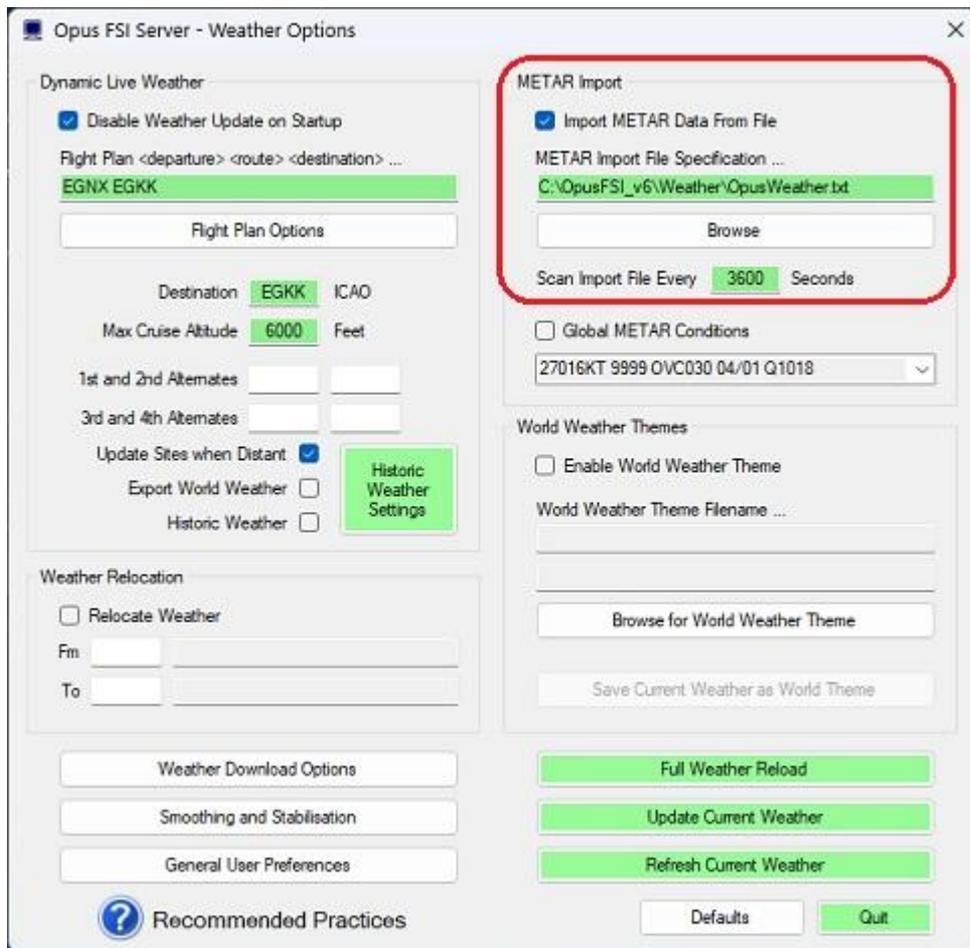
This interface provides the means for you to perform instant weather updates across the **OpusFSI** system with all the benefits of using our **Dynamic Weather** update. In such circumstances, the

OpusFSI weather engine will load all METARs created by you that are contained within the specified text file. These reports will be used to perform a weather update of the system. This interface can also provide you with a simple means to create your own localized or global weather themes by specifying the required METAR string(s) within the import file. The global ICAO station code GLOB can be used to specify global weather and overrides any other METARs in the file.

The METAR date/time is ignored and so can be set to any date/time. Also the word METAR, MET or SPECI is ignored if present in the file. The METAR must be on a single line.

Example: KORD 010203Z 19020 6SM -SHRA BKN070 12/08

decodes as station id KORD, wind direction 190 degrees, 20 knots, visibility 6 Statute Miles, light rain shower, broken cloud at 7000 feet, temperature 12 degrees Celcius, dewpoint 8 degrees Celcius.



If you want to use the above weather conditions at any location then substitute KORD for GLOB.

Example: GLOB 000000Z 27008KT 7000 OVC004 03/02 Q1003

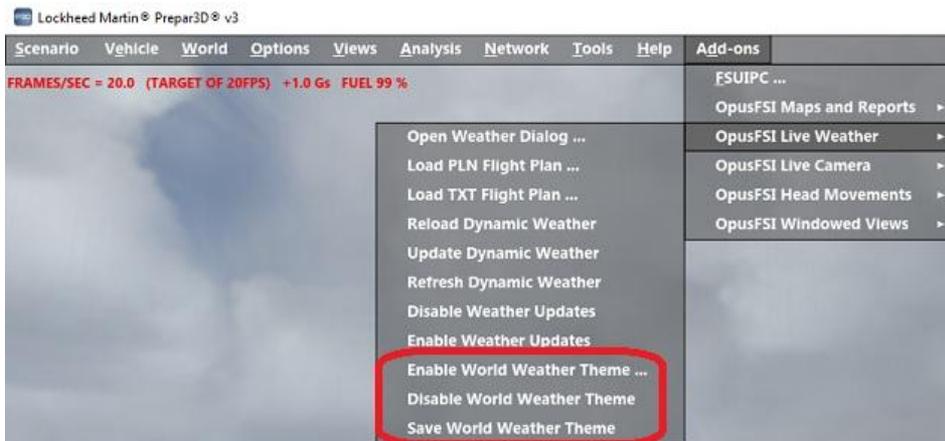
sets the visibility to 7000 meters with an overcast ceiling at 400 feet.

The OpusFSI Live Weather Engine (LWE) saves all downloaded METAR statements into an OpusWeather.txt file. We use this method to reload a user's weather if they report an anomaly they want us to look into.

There are many websites describing the METAR format, here is an example, <http://www.wunderground.com/metarFAQ.asp>

World Weather Themes

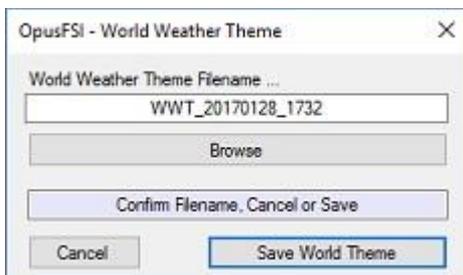
The OpusFSI LWE can save a snapshot the current worldwide weather (METARs and GRIB forecast data) as a named weather theme for you to reload at any time and place in the future. You can use this feature to save interesting weather scenarios anywhere in the world. You can simply build up a library of interesting weather scenarios of your own, or even swap weather themes with others.



To save a theme ...

Let the LWE construct the detailed weather map. After it has loaded, save the weather theme using the **OpusFSI Live Weather, Save World Weather Theme** add-on menu option, or the **Save Current Weather as World Theme** button in the Weather dialog.

If you save the theme via the Weather dialog then you have the option of naming the theme.



If you save the theme via the add-on menu all theme files are automatically stored in the \OpusFSI_v6\Weather\Themes folder in a file named 'WWT_yyyymmdd_hhmm'. If you wish to rename a theme saved via the add-on menu you must remember to rename both the theme's dat and txt files, and you will need to restart OpusFSI for the filename changes to take effect.

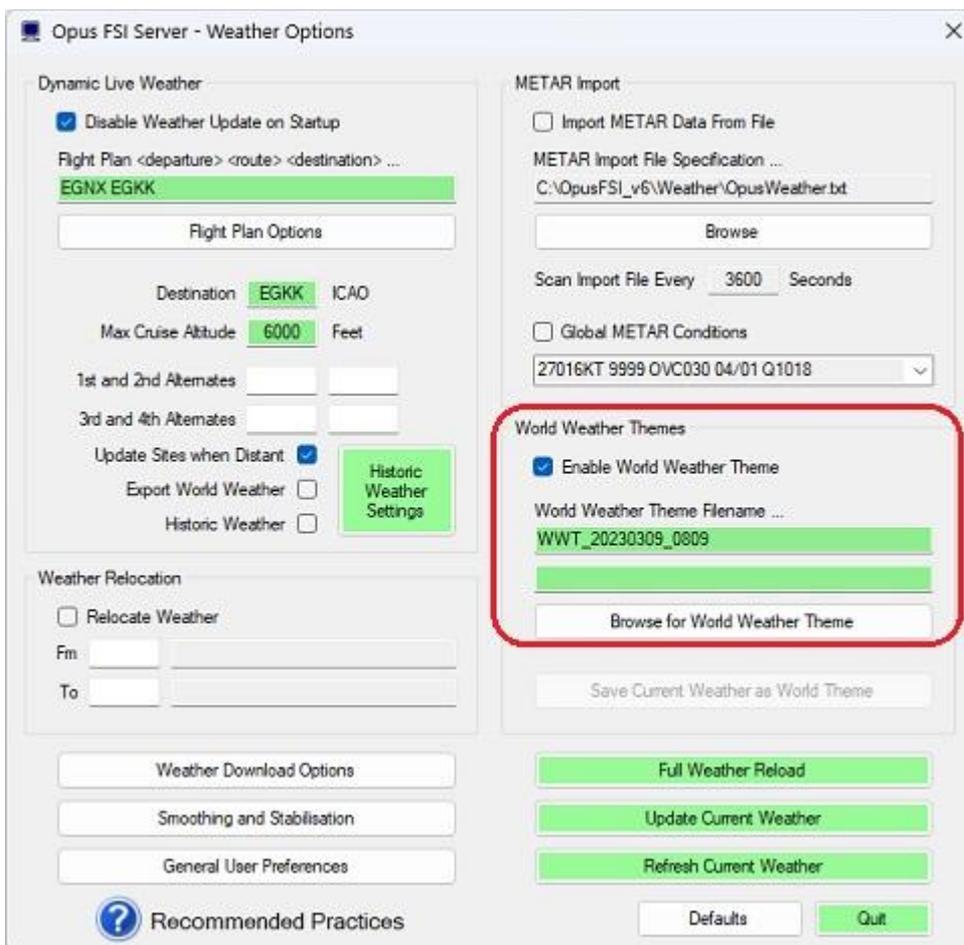
If historic weather is loaded then the simulator's current Zulu time will be assumed, otherwise the LWE will download the current real-world Zulu time over the Internet, defaulting to the computer's current Zulu time on failure.

World Weather Themes cannot be saved before the weather has been generated, nor can they be saved when either of the **Import METAR Data From File** or **Enable World Weather Themes** options are ticked.

To load your saved theme ...

World themes can be loaded via the simulator's add-on menu. First select the **Load World Weather Theme** option within the Live Weather menu. The displayed window will provide a directory of all World Weather Theme filenames along with their saved Zulu date and time. Use the **Display Previous** and **Display Next** options to navigate the pages. Click on the required filename to load the weather theme, the weather will automatically be injected into the sim. Loading a World Weather Theme via the Add-ons menu will automatically display the Weather Report menu ready for you to check the loaded theme weather and GRIB forecast data prior to flight.

Alternatively tick the **Enable World Weather Theme** checkbox in the Weather dialog. Select the **Browse for World Weather Theme** button and Browse for the required theme file.



Select **Update** to load the weather theme and inject the weather into the sim.

If a World Weather Theme does not include any GRIB forecast data (i.e. the theme's data file is missing) then the **Enable GRIB Forecast** option in the Weather Downloads dialog will determine whether the current GRIB data cycle should be downloaded and used.

The **Disable World Weather Theme** option in the add-on menu can be used to disable the World Weather Theme mode and revert back to using the current live weather.

Many OpusFSI users like storm chasing, the saved themes can be used to repeat the experience at some other time of your choosing. You can use the OpusFSI **Weather Locator** to find interesting current weather to capture and reload.

Editing A Theme

You can tweak or change the surface weather at a location by editing the relevant saved theme text (.txt) file in the OpusFSI_v6\Weather\Themes folder. Search for the ICAO code for the METAR you wish to change and then edit it's content. That way you can change the surface conditions at that site. The saved World Weather Theme text file can be edited using Notepad.

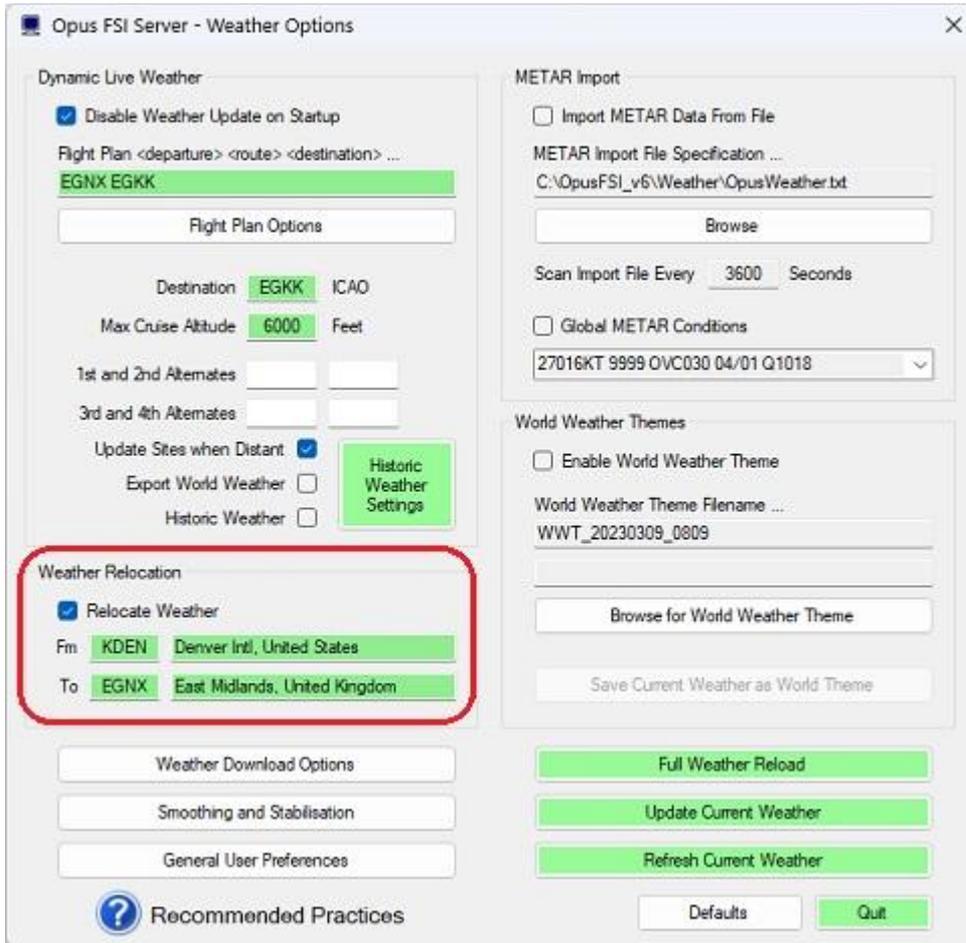
Networked Systems

The use of weather themes is efficient and guarantees consistent weather and cloud formations across all networked systems. Weather themes do not require the transfer of METAR reports from the server to client systems.

To ensure correct synchronization, the desired weather theme for the flight must be selected in the OpusFSI SERVER's Weather dialog, and not via the usual sim Weather menu. If at any time the weather or cloud formations differ on your client machines, possibly due to you manually pausing one or more of the simulators, this can happen as a result of displaying a sim dialog, then you can quickly resynchronize the weather by displaying the Weather dialog on the OpusFSI SERVER and clicking on the Reload button to reselect and reload (i.e. synchronize) the chosen weather theme. You may of course choose to browse for a new weather theme and select that.

This procedure may also be required after the client systems have first connected. For example, when you have not prepared everything, including the weather theme, on the server system before the client connections are made. In either case, the resynchronization is almost instant.

Weather Relocation



Weather relocation enables you to experience the weather conditions from anywhere in the world whilst still flying at your favourite location or with your favourite scenery. For example, you will be able to experience tropical weather in the middle of the winter at Gatwick U.K.

Weather relocation will work with any source of OpusFSI weather data, whether it be the current Live Weather, Historic Weather, or a specified World Weather Theme.

The Weather Relocation option consists of an enable checkbox and separate FROM and TO textboxes for your specified aerodrome ICAO codes. When enabled, all weather will be relocated or offset in latitude and longitude to move or relocate the weather using the specified FROM and TO locations, i.e. the whole world's weather is rotated about the globe. The ICAO code for either the point of departure or the destination would typically be specified in the TO box. To aid entry, an empty TO box will automatically be filled in with the nearest aerodrome details whenever the FROM box is edited.

To get appropriate cloud textures etc for the weather you may need to change the **Time and Season** in the sim to match the weather you require.

The [Weather Overview/Locator](#) (Server dialog) can be used to either locate specific weather conditions on the map area that match your specified criteria, or obtain a Weather Overview of the general weather conditions. This is very useful for locating any weather you are interested in globally, or viewing a simple overview of the weather in a specific region of the world.

The on-screen Flight Plan En-Route weather reports and generated flight plan text and report files are disabled in Weather Relocation mode.

Live Weather Overview and Locator

Introduction

The **Weather Overview/Locator** feature is independent of both the simulator and the Live Weather Engine, hence, it can be used without the simulator running and before any weather is generated. The Live Weather Overview/Locator map can also be used with Opus World Weather Themes.

The **Weather Overview/Locator** can be used to either locate specific weather conditions on the map area that match user specified criteria, or obtain a **Weather Overview** of the general weather conditions. This is very useful for locating any weather you are interested in globally, or viewing a simple overview of the weather in a specific region of the world.

The weather criteria may be good or bad, based on some very simple user specified weather options. General weather conditions are depicted on the map using coloured dots to indicate good (green), moderately good (green yellow), moderate (yellow), moderately poor (orange), and poor (red) surface conditions.

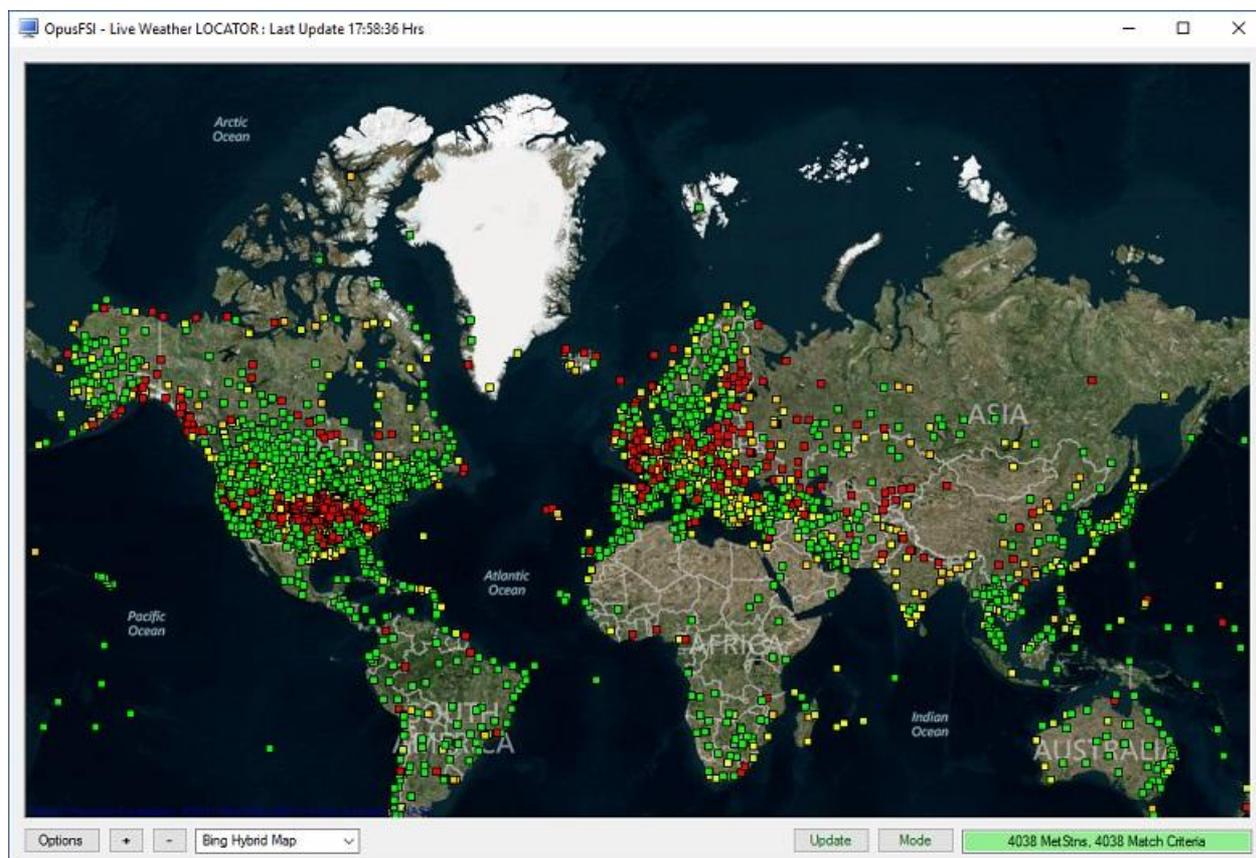
Using the Weather Locator



Click on the **Wx Locator** option within the Server dialog, a **Live Weather Overview** will be displayed. Click on the **Update** button to display the current weather conditions.

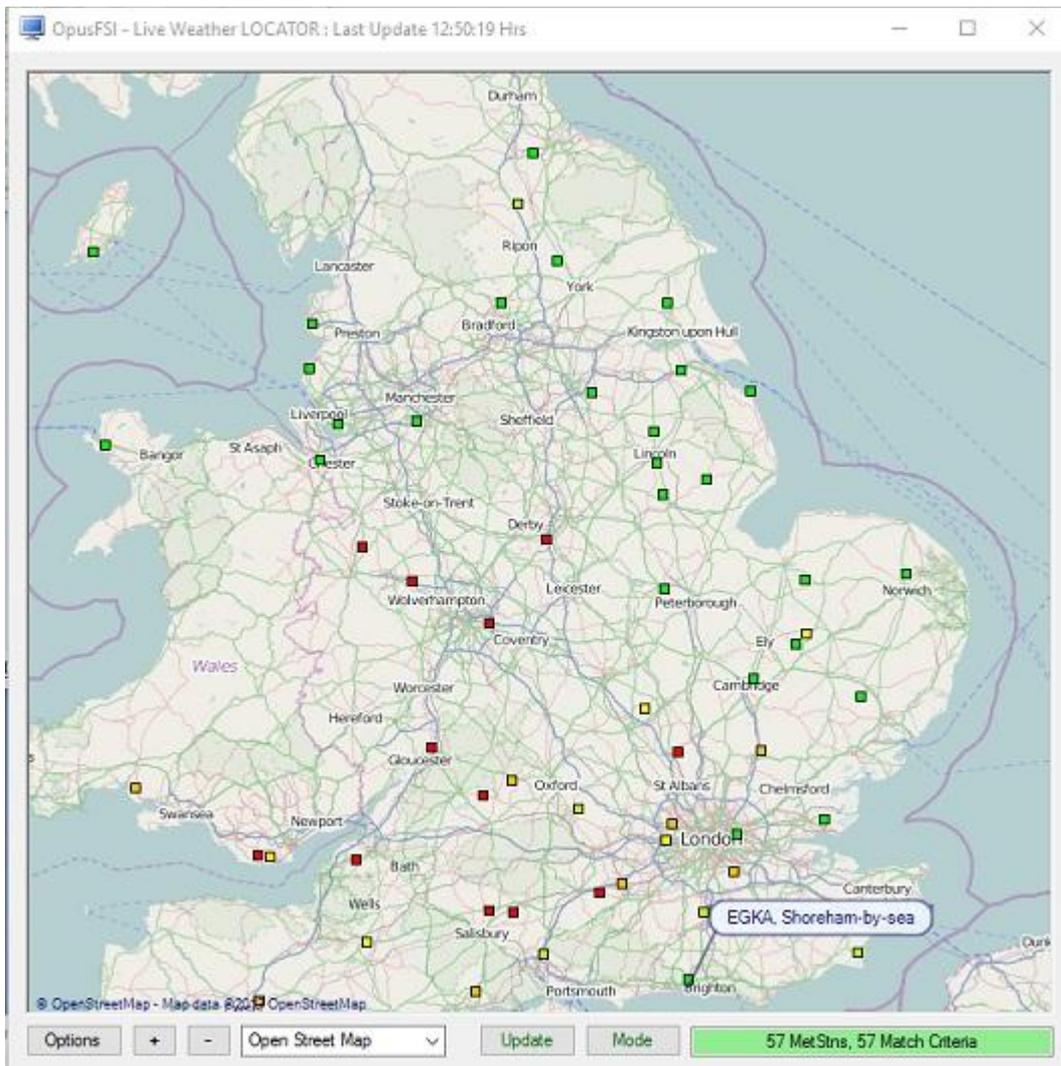
The Live Weather Overview/Locator map can be displayed on a client system using the **Wx Locator** button on the OpusFSI CLIENT's main form. The client system must be connected to the OpusFSI SERVER for this feature to function. All METAR downloads are performed on the server system.

The Live Weather Overview/Locator map's caption displays the local time when the Met Station data was 'Last Updated'. The OpusFSI SERVER program's main Spy window indicates the origin of all METAR updates.

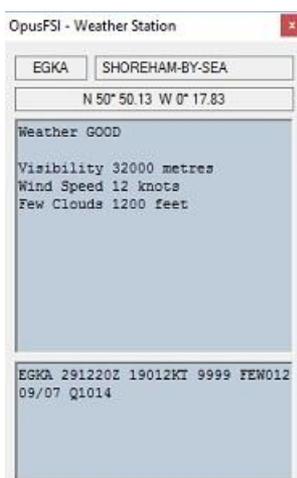


Weather conditions are depicted on the map using coloured dots. GREEN dots represent good conditions, YELLOW-GREEN dots for moderately good conditions, YELLOW dots for moderate conditions, ORANGE dots for moderately poor conditions, and finally RED dots for poor surface conditions.

Hovering the mouse over a met station will display the station ICAO and station name.



Click the mouse cursor over a met station (using either left or right button) to display the weather station data.



The most significant weather which determines the current condition (good, moderately good, moderate, moderately poor and poor conditions) is displayed in red text. Only the most significant i.e. lowest cloud layer for each cloud type (few, scattered etc) is reported.

Zooming and Moving the Map Area

Use the + and - buttons to zoom in and out on the map. To move or drag the map area hold down the right mouse button whilst dragging the mouse, this won't work when you are hovering over a met station.

Map Type

Click on the down arrow in the map type box to select between Bing Street Map, Bing Satellite Map, Bing Hybrid Map, Google Street Map and Google Terrain Map and ArcGIS Street Map . The **Weather Overview/Locator Options** dialog (**Options** button) includes an option to enable/disable the **Map Grey Scale**.

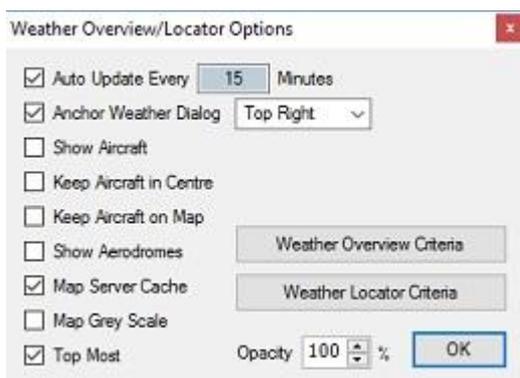
Update

The **Update** button can be used any time you change the map location and need to refresh the weather data. The information box in the bottom right corner of the dialog indicates the current progress of the METAR download. N.B. the **Weather Overview/Locator Options** dialog (**Options** button) has an option to **Auto Update** at a user configurable time period.

Mode

Changes the mode between **Live Weather OVERVIEW** and **Live Weather LOCATOR**. The current mode is always displayed on the caption bar.

Options



Auto Update Every xx Minutes

Used to enable/disable the Auto Update option and set the update interval in minutes after which the current METAR data will be downloaded and updated on the map.

Anchor Weather Dialog

When enabled the **Weather Station** dialog will be anchored to the main **Live Weather Locator** dialog and aligned with the map. Select an option from the dropdown box to anchor either Top Left, Top Right, Bottom Left, or Bottom Right. When anchored the Weather Station dialog will be automatically closed each time you move the **Live Weather Overview / Locator** map.

Show Aircraft, Keep Aircraft in Centre, and Keep Aircraft on Map

Enable the required options to **Show Aircraft**, **Keep Aircraft in Centre** or **Keep Aircraft on the visible Map**. The aircraft marker will only be displayed when the sim is active and the aircraft position data has been updated. The map will show your current aircraft's location using the custom Aircraft symbol in the OpusFSI_v6/Aircraft.bmp bitmap file which you create yourself. If Aircraft.bmp does not exist then the default Aircraft_Light.bmp is used. An AircraftHeavy.bmp and AircraftRotor.bmp are also provided. If you create your own custom aircraft symbol then use roughly the same sized square bitmap image (43x43 pixels) and use the same magenta colour for the background.



Show Aerodromes

When enabled all aerodromes that are not also met stations will be displayed on the map as grey dots.

Map Server Cache

Selecting **Map Server Cache** will speed up the display of the geographic map by saving it to cache instead of downloading it via the internet. Note that for Google and Bing maps you are limited to the number of downloads you can perform during a session.

Map Grey Scale

The **Map Grey Scale** option makes it easier to view certain data against the geographical map.

Topmost

This option keeps the map topmost on the display.

Opacity specifies the opacity for a map down to a minimum of 30%.

Weather Overview Criteria

	Good	Mod.Good	Moderate	Mod.Poor	Poor
Visibility	8000	6500	5000	3000	metres
SCT Cloud Base	1200	1100	1000	800	feet
BKN Cloud Base	1400	1300	1200	1100	feet
Wind Speed	12	15	18	24	knots
Wind Gusts	14	17	20	26	knots
FEW CBs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
SCT CBs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Precipitation	None	Very Light	Light	Moderate	level

This option is selected via the **Options** dialog. The criteria for the five different weather conditions (good to poor) are all user configurable with suitable defaults provided (as per the above screenshot).

These criteria allow limits to be specified for surface visibilities, max allowed scattered cloud bases, max allowed broken/overcast cloud bases, wind speeds, wind gusts, and max allowed precipitation levels. We also include options to allow few or scattered+ CBs (thunderstorms) and TCUs (towering cumulus). In other words, decide whether to allow isolated or widespread CBs and TCUs.

The **Colour** for each condition can be modified by clicking on the colour boxes and assigning your preferred colour using the standard **Colour Picker** dialog.

Colour Picker dialog showing a grid of basic colours and a section for custom colours. The 'OK' button is highlighted.

Use the '**Assign Default Colours**' button to reset. All colour changes take immediate effect after clicking the **OK** button.

Visibility

Enter the visibility in meters for each of the weather categories (good through to moderately poor). The default values are 8000 meters or more for good visibility, 6500 to 8000 meters for moderately good visibility, 5000 to 6500 meters for moderate visibility, 3000 to 5000 meters for moderately poor visibility and less than 3000 meters for poor visibility.

SCT Cloud Base

Enter the scattered cloud bases in feet for each of the weather categories (good through to moderately poor). The default values are 1200ft or higher for good conditions, between 1100ft and 1200ft for moderately good conditions, between 1000ft and 1200ft for moderate conditions, between 800ft and 1000ft for moderately poor conditions, and less than 800ft for poor conditions.

BKN Cloud Base

Enter the broken cloud bases in feet for each of the weather categories (good through to moderately poor). The default values are 1400ft or higher for good conditions, between 1300ft and 1400ft for moderately good conditions, between 1200ft and 1300ft for moderate conditions, between 1100ft and 1200ft for moderately poor conditions, and less than 1100ft for poor conditions.

Wind Speed

Enter the max allowed wind speed figures in knots for each of the weather categories (good through to moderately poor). The default values are 12kts or lower for good conditions, between 12kts and 15kts for moderately good conditions, between 15kts and 18kts for moderate conditions, between 18kts and 24kts for moderately poor conditions, and greater than 24kts for poor conditions.

Wind Gusts

Enter the wind gust figures in knots for each of the weather categories (good through to moderately poor). The default values are 14kts or lower for good conditions, between 14kts and 17kts for moderately good conditions, between 17kts and 20kts for moderate conditions, between 20kts and 26kts for moderately poor conditions, and greater than 26kts for poor conditions.

FEW CBs

Tick the checkboxes to determine if few cumulonimbus (CB) clouds are acceptable for each of the weather categories (good through to moderately poor). CBs and TCUs are interpreted with respect to the 'Thunderstorms need TS Descriptor' Weather Preferences option.

SCT CBs

Tick the checkboxes to determine if widespread (scattered or more) cumulonimbus (CB) clouds are acceptable for each of the weather categories (good through to moderately poor).

Precipitation

Select the maximum precipitation (rain or snow) levels from the dropdown boxes for each of the weather categories (good through to moderately poor). Available entries are None, Very Light, Light, Moderate, and Heavy.

Weather Locator Criteria

Weather Locator Criteria

<input type="checkbox"/> Weather	Moderate	or Worse
<input checked="" type="checkbox"/> Visibility	9999 m	User
<input type="checkbox"/> Cloud Base	5000 ft	None Below
<input type="checkbox"/> Cumulonimbus (CB)		Few +
<input type="checkbox"/> Towering Cumulus (TCU)		Few +
<input type="checkbox"/> Precipitation	All	Very Light +
<input type="checkbox"/> Wind Speed	18 kts	or Higher
<input type="checkbox"/> Wind Gusts	20 kts	or Higher

OK

This option is selected via the **Options** dialog. The displayed screenshot illustrates a CAVOK (ceiling and visibility OK) criteria.

You may choose to specify criteria for general weather, visibility, cloud base, reported cumulonimbus or towering cumulus clouds, precipitation type and levels, wind speeds and wind gusts.

Weather

Tick this checkbox to enable general weather checking. Specify the required weather condition (good, moderately good, moderate, moderately poor, or poor) from the first dropdown box. Specify the required matching criteria (Only, or Better, or Worse) from the second dropdown box. The 'Only' criteria will match the specified weather condition exactly.

Visibility

Tick this checkbox to enable visibility checking. The **maximum** visibility can be specified in metres using the textbox provided. Enter a distance code of **9999** when interested in sites that have no visibility restriction reported (i.e. visibility is greater than or equal 10000 metres). Any time you enter a visibility figure the dropdown box will be changed to 'User' indicating a user specified visibility. The dropdown box can also be used to select the visibility assigned to any required weather condition (good, moderately good, moderate, moderately poor, or poor).

N.B. Apart from a distance code of 9999, the visibility is assumed to be a maximum distance in metres, that is, the criteria will match all sites that have visibilities equal to or less than the specified distance.

Cloud Base

Tick this checkbox to enable cloud base and coverage checking. The required minimum cloud base is specified in feet AGL. The cloud cover option (None below, Few+, Scattered+, Broken+, or Overcast) is specified using the dropdown box. A selection of 'None Below' will match sites that report no cloud at or below the specified cloud base. A selection such as 'Scattered+' will match sites that report **at least** 3 octas (= SCT, scattered cloud), that is, sites that have reported either scattered, broken, or overcast cloud at or below the cloud base.

Cumulonimbus

Tick this checkbox to enable the cumulonimbus (CB) cloud checks. Use the dropdown box to select the required extent (None, Few+, Scattered+) of the reported thunderstorms. A selection such as 'Few+' will match sites that report **at least** 1 octas (= FEW, few CB clouds), that is, sites that have reported either few, scattered, broken, or overcast cumulonimbus (CB) clouds.

Towering Cumulus

Tick this checkbox to enable the towering cumulus (TCU) cloud checks. Use the dropdown box to select the required extent (None, Few+, Scattered+) of the reported towering cumulus. A selection such as 'Few+' will match sites that report **at least** 1 octas (= FEW, few TCU clouds), that is, sites that have reported either few, scattered, broken, or overcast towering cumulus (TCU) clouds.

Precipitation

Tick this checkbox to enable the precipitation checks. Use the first dropdown box to select the precipitation type (All, Rain or Snow). Use the second dropdown box to select the intensity of the precipitation (None, Very Light+, Light+, Moderate+, Heavy). A selection of 'Light+' will match sites that report light, moderate, or heavy precipitation.

Wind Speed

Tick this checkbox to enable the wind speed checks. The required wind speed is entered in knots in the textbox provided. Use the dropdown box to select the required wind speed range (Exact, or Lower, or Higher).

Wind Gusts

Tick this checkbox to enable the wind gust checks. The required wind gust is entered in knots in the textbox provided. Use the dropdown box to select the required wind gust range (Exact, or Lower, or Higher).

Building Live Weather

The Weather option on the main server form will be disabled (grayed out) whenever the Live Weather Engine is building new weather. Dynamic Weather is constructed slowly in the background to ensure there is no adverse effect on the simulator's performance (frame rates). It generally takes between 30 and 35 seconds to construct new dynamic weather.

You can force a weather update via,

- the **Add-ons menu** (OpusFSI Weather options),
- the **Full Weather Reload** button in the Weather dialog
- a Shortcut Control (OpusFSI_v6_ User Guide).

Alternatively if you want to revert to a weather theme, select **Enable World Weather Theme** from the Add-on menu.

Live Weather updating can be temporarily enabled and disabled via the OpusFSI Live Weather option in the simulator's Add-ons menu.

Dynamic Weather Region

Dynamic Weather covers an area of 1280km by 1280km (800 x 800 miles, or 691 x 691 nm) centered on your aircraft's current location

Weather Data Collection

The METAR data can be loaded via the Internet from either the NOAA (default) or VATSIM servers. You can even specify to fill in missing data from the VATSIM server. The latest METAR reports for all Met stations within your flying area (weather horizon) are downloaded at the start of the flight, and thereafter either at the user specified update period (default 60 mins) or after you have flown the user specified distance from your previous location.

METARs of course do change periodically, most airports will issue updated METARs half hourly at 20 past and 50 minutes past the hour. However, METARs are also issued at airports any time there is a significant change, that includes changing visibility and cloud layers, especially any changes to cloud coverage and visibility. Other METARs are mostly reported hourly. Hence, these reports will often contain different cloud coverage data (very usual since the cloud coverage does change frequently). During a weather update, any change in METAR will be reflected in the generated weather. Broken clouds may turn into few clouds, few to broken, clouds may disappear or appear where there were none before etc.

The LWE treats all METARs as gospel and generates the weather and clouds accordingly, so unless you have smoothing enabled don't be too alarmed if after an update your cloud coverage thickens, diminishes, vanishes, or new cloud suddenly appears. So far all the METARs I have seen accurately reflect what is seen out of the window.

Also bear in mind the LWE interpolates the weather, radiating outward from every met station within the weather grid. If a met station reports broken cloud coverage, that coverage will radiate

outward. If during a later update the met station is reporting just few clouds then the thick broken cloud will be replaced with few clouds.

If there are no Met stations found within the current weather horizon then the weather horizon is repeatedly expanded by 50% until one or more Met stations are located. In such cases, these stations are projected onto the outer rim of the weather grid and the localized weather within the grid is interpolated from this data.

If you do not like change then either disable weather updates via the simulator's Add-ons menu, or set the weather update frequency and distance to something like 60 minutes and 400km then YOU decide when you want the weather updated. For example, update the weather prior to takeoff and just before descending. It's up to you. Alternatively you can save the current weather as a World Weather Theme, when you subsequently load that theme the weather will not change, this is useful for long flights completed over several days.

Weather Data Smoothing

Weather data smoothing prevents abrupt and sudden unrealistic changes in weather as you pass from one weather cell to another.

Mist and Fog Layers

To improve the visual effect within the simulator, the **Live Weather Engine** automatically tops the mist and fog layers with a thin layer of stratus cloud with a coverage of 8 octas for mist and fog.

In P3D simulator mode the **Enable Volumetric Fog** option is set automatically using the VolumetricFog setting within the Prepar3D.CFG file. If you change this setting during a P3D session then either change the **Enable Volumetric Fog Effect** in OpusFSI to match P3D or restart OpusFSI.

Low Overcast Effect

Low Overcast Effects come into force whenever the overcast cloud cover is less than about 6000 feet AGL. You must be IN the Low Overcast Effect to see it. Overcast by definition means 90% or more cloud coverage. Don't expect to see solid blanket type overcast when looking vertically downward ... you WILL see transparent holes just like you do in real life until you get IN an OpusFSI Low Overcast Effect (an overcast below 6000 feet).

Cloud Positions and Textures

It is not possible for any software to position the clouds. The simulator does this itself and will reposition the clouds each time the weather is updated irrespective of whether there has been any changes to the cloud layering. No software can stop the cloud repositioning or control it. It is not possible for any software to select the individual cloud textures or bitmap images for rendering on the screen. This is all done by the simulator. You install the textures you prefer and the simulator selects and displays them to match the cloud layering. The cloud types used will be a mixture depending on a number of factors including weather and season.

Cloud Icing

The LWE will automatically set cloud icing within the cloud to none, low, medium, high, or severe depending on the ambient temperature within the cloud, the cloud type, and the cloud moisture level. Some icing is likely to occur when the ambient temperature is between -20C and 0C, with

more noticeable effects when the ambient cloud temperature is between -12C and -8C. All calculated icing effects require valid GRIB forecast data.

Your aircraft has to be configured to handle icing. Many fuel injected aircraft in P3D have the 'carb heat bug', their real counterpart doesn't possess carb heat however P3D will still simulate carb icing and you'll see your engine power drop quite drastically within the first few minutes of flight in icing conditions. Simply pressing the H key will solve this problem.

Cirrus Cloud Layers

Since high level cirrus cloud is not included within the standard METAR reports, the **Live Weather Engine** generates a single cirrus cloud layer if the Cirrus Clouds option in the Weather dialog has not been disabled. The cirrus cloud coverage is generated randomly between the configured lower and upper **Cirrus Altitude Range**. The valid range of altitude settings are from 18,000ft up to 50,000ft (default range is 34,000ft to 44,000ft).

The **Auto Cirrus Clouds** option will automatically display cirrus cloud whenever it determines the weather is quite changeable possibly due to a weather front. In fairly stable conditions the cirrus cloud will be disabled. In flight, the cirrus is reassessed every 80 miles flown.

Winds and Temperatures Aloft

Winds and temperatures aloft are downloaded from the GRIB forecast. The GRIB forecast data is produced by NOAA and provides a global forecast of atmospheric conditions such as wind speeds, directions, and atmospheric temperatures at various altitudes along with the tropopause. It also provides a forecast of the tropopause height. The GRIB data covers the entire globe at 1 degree latitude and 1 degree longitude precision. This data is used by the weather engine to determine all the lower and upper atmospheric conditions. The LWE uses the forecasted data to create ambient wind and temperature targets for all different altitudes from FL040 up to FL450, and even a temperature forecast for FL540.

The LWE will use GRIB data to provide realistic real world atmospheric conditions for you within the simulator.

The surface and FL200 through to FL420 targets are displayed within the Upper Atmosphere weather report along with the Tropopause forecast data (height, temp, and wind). The GRIB forecast cycle date and Zulu time code is displayed in the Upper Atmosphere Weather Report window.

Each cycle forecast contains 360 hours (15 days) of forecast data and is typically made available about 9+ hours after the cycle time, on occasions the 0000Z is posted after about 6+ hours. The LWE always tries to load the most recent cycle, and requests the previous cycle if that is not available yet. The GRIB download will automatically revert to downloading the FULL GRIB data file if the selective download from the 'Query' server fails to download any cycle data for the previous 24 hour period. Please note, the world wide GRIB data forecasting cycles are updated less frequently than the North American specific (USA) forecasts. A future update may see us access a variety of GRIB forecast data depending on your current Lat/Lon coordinates, but for now the world wide data will be used as the sole source of GRIB forecasts.

You can follow the process of the GRIB data download in the Spy window and in the Opus Lower and Upper Atmosphere Report windows. If any OpusFSI Weather Report is on display the Live Weather Engine will no longer force or update the sim Lower or Upper Atmosphere reports, instead all GRIB download and progress messages are displayed in red on the second line of all displayed OpusFSI Weather Reports. The procedure will progress through the following stages,

- Connecting To The GRIB Server
- Downloading The GRIB Data
- Extracting The GRIB Data
- Decoding The GRIB Data
- Reading The GRIB Data
- Preparing The Weather Data

The last stage covers both preparing the GRIB data for use in the weather map and also downloading the weather map's METAR data. Whilst the download is in progress the Lower/Upper report windows will indicate how many bytes have been downloaded. The following errors can be reported in the Lower/Upper report windows,

- GRIB Forecast Data Disabled At Present
- Unable To Connect To The GRIB Server
- No Data Available At Present

The first message indicates that the GRIB download is not required at present. The 'No Data' message is a general error message implying there is no valid data available to prepare the Lower/Upper reports with. If the LWE is 'Unable To Connect To The GRIB Server' then no further cycle downloads will be attempted, but the LWE will attempt to download the expected current cycle during each weather update.

If the GRIB data hasn't been decoded check your `\OpusFSI_v6\FSIDECODER.log` file for errors.

The LWE will only download the GRIB data when it determines the current data is out of date (older than 12.5 hours) and a new more accurate forecast cycle is available. In addition the **GRIB Data Validity Period** allows you to specify the validity period for the downloaded GRIB cycle data between 3 and 240 hours in increments of 3 hours (default 12 hours). You can also specify whether you wish GRIB data to be downloaded and updated in flight or just whilst on the ground before a flight.

After downloading the relatively large GRIB data file the LWE will proceed to extract all the data and then decode the extracted data before downloading the current METAR weather reports for your current 992km x 992km area. Extracting and decoding the GRIB data is a lengthy process, taking about 10 seconds to extract the GRIB data and between 25 and 35 seconds to decode the extracted data.

Wind Shear

There are three levels of wind shear at low elevations (< 4000 feet AGL). Wind shear is only associated with reported thunderstorm (TS) or squall (SQ) conditions and requires reported surface winds of at least 20 knots.

Where appropriate a Slight, Moderate, or Severe Wind Shear warning is appended at the end of the QNH pressure line in the Opus Local, Destination, and Alternate Weather Reports, just before the reported surface wind conditions.

Moderate wind shear levels require surface wind speeds of 30 knots or more, severe wind shear levels require surface wind speeds of at least 40 knots and warm conditions (surface temperatures of at least 20C).

METAR (and non METAR) Station List Corrections and Additions

Four template text files are provided which can be renamed and edited. These new files can be used to specify any corrections or additions to the LWE station list.

The template text files are,

- OpusFSI_MetStation_Additions_Template.txt
- OpusFSI_Station_Additions_Template.txt
- OpusFSI_MetStation_Corrections_Template.txt
- OpusFSI_Station_Corrections_Template.txt

Just edit the files and remove the '_Template' suffix from the filename and the LWE will read the content and update its station data each time the OpusFSI SERVER program is started.

If the new station is a met station then add it to the OpusFSI_MetStation_Additions.txt file. Met stations must be known to either NOAA or VATSIM in order for us to extract the METAR. The NOAA station list can be found at <http://aviationweather.gov/static/adds/metars/stations.txt>.

If the new station is not a met station then enter it in the OpusFSI_Station_Additions.txt file.

For corrections to existing stations edit the OpusFSI_MetStation_Corrections.txt or OpusFSI_Station_Corrections.txt as appropriate.

Master copies of these files will eventually be kept in-house to amend and update the MetStation data file with common changes and additions to the listed NOAA station data.

OpusFSI MetStation Additions

Prior to use please rename your file to OpusFSI_MetStation_Additions.txt.

Enter a list of met station additions in the form,

ICAO "station_name" latitude longitude elevation

Where

- the ICAO code always appears at the start of a new line
- the elevation is specified in feet amsl
- the lat/lon are entered in the following exact form <compass_direction>degrees minutes (mm.mm)
- latitude = Ndd mm.mm or Sdd mm.mm (9 characters)

- longitude = Eddd mm.mm or Wddd mm.mm (10 characters)

For example,

```
EGKK "London Gatwick" N51 08.88 W000 11.42 196
EGLL "London Heathrow" N51 28.65 W000 27.68 80
```

These additions may also be used as corrections.

OpusFSI Station Additions

Prior to use please rename your file to OpusFSI_Station_Additions.txt

Enter a list of station additions in the form,

```
ICAO "station_name" latitude_longitude elevation "country" "runways"
```

Where

- the ICAO code always appears at the start of a new line,
- the elevation is specified in feet amsl, the latitude_longitude is either specified in the free form used in flight plan entries, or in the following exact form,

```
<compass_direction>degrees minutes (mm.mm).
latitude : Nddd mm.mm or Sddd mm.mm (9 characters)
longitude : Eddd mm.mm or Wddd mm.mm (10 characters)
```

Examples,

```
EGNX "East Midlands" 52.831111N1.328056W 309 "United Kingdom" "9 27"
EGLL "London Heathrow" N51 28.65 W000 27.68 80 "United Kingdom" "9L 27R 9R 27L"
```

Additions may also be used as corrections to the current data.

OpusFSI Met Station Corrections

Prior to use please rename your file to OpusFSI_MetStation_Corrections.txt.

Enter a list of met station corrections in the form,

```
ICAO "station_name"
```

Where the ICAO code appears at the start of the line.

For example,

```
NZWB "Blenheim Woodbourne"
```

OpusFSI Station Corrections

Prior to use please rename your file to OpusFSI_Station_Corrections.txt

Enter a list of station corrections in the form,

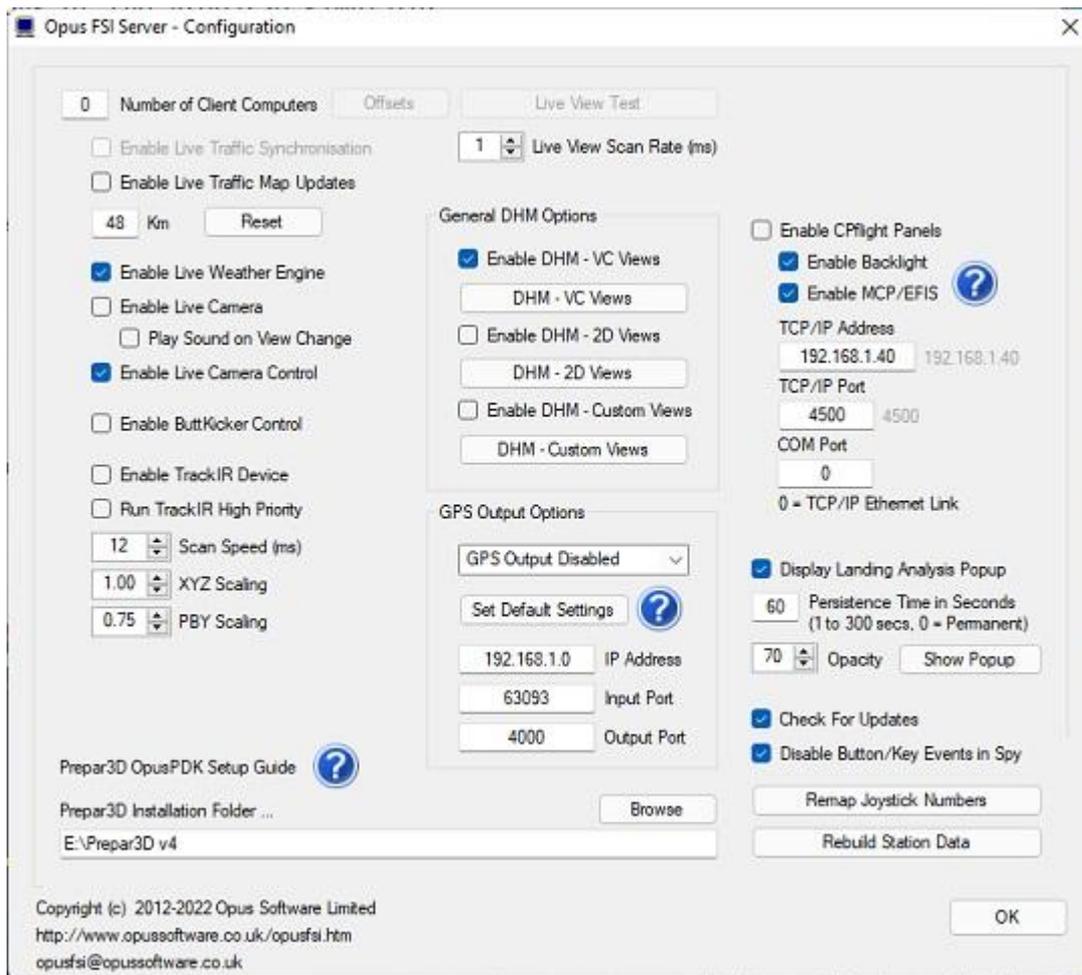
```
ICAO "station_name"
```

Where the ICAO code appears at the start of the line

For example,

```
NZWB "Blenheim Woodbourne"
```

Turbulence and Dynamic Head Movement (DHM)



General DHM Options can be found in the OpusFSI SERVER's Configuration dialog. These options allow general DHM and associated 'Bump Aircraft' turbulence to be enabled for VC view modes, 2D view modes, and custom view modes without needing the Live Camera interface to set up camera views. General DHM settings are not used when Live Camera is enabled.

Separate options are provided to enable the general DHM and aircraft turbulence for VC view modes, 2D view modes, and custom view modes. Each view mode has its own configurable DHM and Bump Aircraft settings that can be adjusted by you to suit your system or personal taste. These General DHM Options employ real life captured 3D accelerometer data with options to reference either the light or heavy aircraft data sets. All turbulence effects are supervised by the Live Weather Engine (LWE) which considers numerous meteorological and ambient conditions. Refer to the [Live Camera guide](#) for a description of the DHM and aircraft turbulence settings.

OpusFSI Site Effects

The localised Site Effects are additional effects, additional to the normal real time non-localised turbulence, clear air turbulence and wind shear which are determined solely on the basis of local meteorological conditions. All sites covered by the standard Opus Site Effects can be found listed in the OpusFSI_Site_Effects_List.txt text file.

Site Effects relate to your point of departure and destination ICAO.

You can specify your own Site Effects, whether real or not. You can even override the standard OpusFSI site effects if you wish. A template file is provided in **\OpusFSI_v6\OpusFSI_User_Effects_Template.txt**, just copy this to **OpusFSI_User_Effects.txt** and add the new effects.

Comments can be added to the file by starting the line with a ; character.

N.B. If you make adjustments to this file you must restart OpusFSI for the changes to come into effect.

User Site Effects

Enter a site ICAO (e.g. site = EGKK) followed by a list of one or more optional conditions. You can enter multiple sets of conditions for a site, for example where you have obstacles on the approach to an airfield and also close to the runway.

e.g.

```
; EGKK Gatwick London  
; Turbulence due to high ground to the S and SE, between 3 and 8 nm from the airport  
; between 0 to 2000 feet AGL.
```

```
Site = EGKK  
Direction = S SE  
Distance = 3 8 nm  
Elevation = 0 2000  
Turbulence = 1
```

```
; EGKK Gatwick London  
; Turbulence due to trees to the W of RW08 between 1 and 4 nm from the airport  
Site = EGKK  
Runway = 08 ;30 degrees either side of RW08  
Distance = 1 4 nm  
Turbulence = 1
```

Turbulence and Wind Shear

The Turbulence and Wind Shear factors are interpreted as follows,

0 = No Increased Effect

1 = Slight Increased Effect

2 = Moderate Increased Effect

3 = Severely Increased Effect

e.g.

```
; EGKK Gatwick London  
; Turbulence due to trees to the W of RW08 between 1 and 4 nm from the airport  
Site = EGKK  
Runway = 08 ;30 degrees either side of RW08  
Distance = 1 4 nm  
Turbulence = 1
```

In the case of Wind Shear, the normal effects require thunderstorm or squalls to be reported at the location. All increased levels permit some wind shear when any TCU or rain bearing storm clouds are present. The higher the level the greater the effect. Wind shears are always relevant to the whole surrounding area. In other words, they are not restricted by the specified conditions with the possible exception of Distance.

All increased turbulence effects are graduated as you enter or leave a defined zone based on the Distance, Bearing, Elevation, Wind Speed and Temperature conditions. The graduation is based on 15% of the specified range.

For example, if you specify a temperature condition of 20 degrees C with a Severe increase in turbulence (level 3) then when the surface temperature reaches 20C there will be a slight increase, at 23C there will be a moderate increase, and at or above 26C there will be the full severe increase.

If you specify a Bearing from 0 to 90 with a Severe increase in turbulence then when your bearing gets within 0 or 90 degrees from the airport location there will be a slight increase, when you get within a bearing of 13.5 or 76.5 degrees there will be a moderate increase, and within the central bearing of between 27 and 63 degrees there will be the full severe increase.

Runway

If the effect is limited to a certain runway then enter this condition using the two digit runway designation. If you specify a Runway the software will calculate an appropriate bearing from and to the station based on the specified runway heading +/- 30 degrees.

Runway codes can be specified with an optional L (left) or R (right) suffix. In which case the resulting From and To Bearings will be biased toward the specified runway approach radial.

For example, 'Runway = 16L' would be equivalent to setting 'Bearing = 150,190', and 'Runway = 16R' would be equivalent to setting 'Bearing = 130,170'.

If you specify a Runway then do not specify a Direction or Bearing.

e.g. Runway = 16 ; Bearing 130 to 190

e.g. Runway = 16L ; Bearing 150 to 190

e.g. Runway = 16R ; Bearing 130 to 170

Location of an obstacle or high ground, Distance, Direction/Bearing and Elevation

You can specify where an obstacle such as trees or high ground is by specifying a distance and either compass directions or bearings. You can also specify conditional elevations, the default range is 0 to 18,000 feet AGL.

If you specify a Direction from and to (from the station) the software will convert it to a bearing from and to. You can use compass points N,NNE,NE,ENE,E etc, for the Direction, the decoder will automatically extend the specified directions/bearings by 30 degrees either side to allow for graduation.

The distance (0 to 80) defaults to km and can also be specified in **nm** or **sm** by including the units after the distance.

e.g.

; EGKK Gatwick London

; Turbulence due to trees to the W of RW08 between 1 and 4 nm from the airport

Site = EGKK

Runway = 08 ;30 degrees either side of RW08
Distance = 1 4 nm
Turbulence = 1

Or,
; EGKK Gatwick London
; Turbulence due to trees to the W of RW08 between 1 and 4 nm from the airport
Site = EGKK
Bearing = 40,120 ;40 degrees either side of RW08
Distance = 1 4 nm
Turbulence = 1

e.g.
; EGKK Gatwick London
; Turbulence due to high ground to the S and SE, between 3 and 8 nm from the airport
; between 0 to 2000 feet AGL.

Site = EGKK
Direction = S SE
Distance = 3 8 nm
Elevation = 0 2000
Turbulence = 1

Conditional Wind Direction and/or Wind Speed

If the effect is conditional on the prevailing wind direction and/or wind speed then specify that using the Wind Direction and Wind Speed conditions.

You can specify two compass points as general wind directions instead of specific directions.

e.g. Wind Direction = SSW SW

The two directions, approx 202 to 235 degrees, would be converted to 172 to 265 degrees, allowing a 15% and 30% graduated effect within this specified range.

You could also enter a wind direction of SW, the decoder will convert this to a from/to a range of 205 and 265 (i.e. adding +/- 30 degrees to the general direction).

The wind speed is in knots. The speed relates to light aircraft and is automatically increased by 10 knots if heavy aircraft is specified in the DHM parameters. The effect is graduated so you will get a slight increase at that speed limit, a moderate increase at the speed + 20%, and the full severe (if specified) increase at speed + 40%.

For example assuming a setting of 15 knots and a severe turbulence level 3 specified ...

For light aircraft we would get ...

- Slight turbulence at 15 knots,
- Moderate turbulence at 18 knots,
- Severe turbulence at 21 knots and above.

For heavy aircraft we would get ...

- Slight turbulence at 25 knots,
- Moderate turbulence at 30 knots,
- Severe turbulence at 35 knots and above.

e.g.
; EGNX East Midlands
; Moderate turbulence and slight wind shear on RW09 in southerly winds above 15 kts
Site = EGNX
Runway = 09
Elevation = 0 3000

```
Wind Direction = S ;30 degrees either side of S
Wind Speed = 15
Turbulence = 2
Wind Shear = 1
```

```
OR,
; EGNX East Midlands
; Moderate turbulence and slight wind shear on RW09 in southerly winds above 15 kts
Site = EGNX
Runway = 09
Elevation = 0 3000
Wind Direction = 140 220 ;40 degrees either side of S
Wind Speed = 15
Turbulence = 2
Wind Shear = 1
```

Conditional Temperature

If the effect is conditional on the temperature then specify that using the Temperature condition specified in degrees C.

e.g.

```
; Turbulence in temperatures above 25 degrees C
Temperature = 25
Turbulence = 1
```

Example User Effects file <OpusFSI_v6>\OpusFSI_User_Effects.txt

```
-----
;
; OpusFSI Additional Site Effects
;
; All Opus effects are stored in the OpusFSI_Site_Effects.dat data file,
; a list of all stations can be found in the OpusFSI_Site_Effects_List.txt
; file.
;
; User specified effects must be stored in the OpusFSI_User_Effects.txt
; text file, a template file is provided which must be renamed before use.
; User specified site effects will replace the standard Opus effects.
;
; Enter a list of enhanced site effects each effect must contain the Site
; description (with ICAO code) followed by any relevant conditions and
; increased effects levels,
;
; Site = ICAO code
;
; Conditions and effects ...
;
; Runway = 00 to 36
; Direction = from to
; Bearing = from to
; Distance = from to km/nm/sm
; Elevation = from to
; Wind Direction = from to
; Wind Speed = from
; Temperature = from
; Turbulence = 0 to 3
; Wind Shear = 0 to 3
;
; Defaults ...
;
; Runway = XX
; Direction = 0 360
; Bearing = 0 360
```

```

; Distance = 0 8 (Default km)
; Elevation = 0 18000
; Wind Direction = 0 360
; Wind Speed = 0
; Temperature = -99
; Turbulence = 0
; Wind Shear = 0
;
; Where,
;
; Runways are specified using their two digit designation.
; Directions from the Site are in degrees true (0,360 = all directions)
; Bearings to the Site are in degrees true (0,360 = all directions)
; Distances (in units of km, nm, or sm) can range from 0 to 80km.
; Elevations are in feet AGL (0,18000 = covers all lower levels)
; Wind Directions are in degrees true (0,360 = all wind directions)
; Wind Speeds are in knots
; Temperatures are in degrees C
;
; Directions, Bearings, and Wind Directions can also be specified using
; cardinal directions (i.e. compass points N,NNE,NE,ENE,E,etc.). In such
; cases the 'To' compass point is optional.
;
; The Turbulence and Wind Shear factors are interpreted as follows,
;
; 0 = No Increased Effect
; 1 = Slight Increased Effect
; 2 = Moderate Increased Effect
; 3 = Severely Increased Effect
;
; In the case of Wind Shear, the normal effects require thunderstorm or
; squalls to be reported at the location. All increased levels permit some
; wind shear when any TCU or rain bearing storm clouds are present. The
; higher the level the greater the effect. Wind shears are always relevant
; to the whole surrounding area. In other words, they are not restricted
; by the specified conditions with the possible exception of Distance.
;
; All increased turbulence effects are graduated as you enter or leave a
; defined zone based on the Distance, Bearing, Elevation, Wind Speed and
; Temperature conditions.
;-----
;
; Guidelines,
;
; General Turbulence ... 4 nm, 2000 ft
; General Wind Shear ... 4 nm, 3000 ft
; Buildings & Trees .... 2 nm, 1500 ft
; Final Approach ..... 3 km, 1500 ft

; EGKK Gatwick London
; Turbulence and wind shear on RW26 in strong S and SW winds

Site = EGKK
Runway = 26
Distance = 0 4 nm
Elevation = 0 1000
Wind Direction = S SW
Wind Speed = 15
Turbulence = 2
Wind Shear = 1

; EGKK Gatwick London
; Turbulence due to trees to the W of RW08
Site = EGKK
Runway = 08
Distance = 1 4 nm
Elevation = 0 1000

```

```

Wind Speed = 15
Turbulence = 1

; EGKK Gatwick London
; Turbulence due to high ground to the S and SE

Site = EGKK
Distance = 3 8 nm
Direction = S SE
Elevation = 0 2000
Wind Speed = 12
Turbulence = 1

; EGNX East Midlands
; Turbulence and wind shear on RW09 in strong southerly winds

Site = EGNX
Runway = 09
Elevation = 0 3000
Wind Direction = S
Wind Speed = 15
Turbulence = 2
Wind Shear = 1

```

Testing Site Effects

You can test any of your specified effects using a GLOB imported METAR to specify the weather, using Slew mode to raise the aircraft off the ground and position it on the approach, or simulate an approach. It is helpful to temporarily disable DHM when using slew mode. You must of course specify the Destination in the Weather dialog and Update the weather. It is best with P3D in windowed mode so you can have the Spy window open at the time. The number of Opus and User Site Effects is displayed in the Spy window immediately after the current device list. The Total number of effects takes into account any Opus effects that have been replaced by your definitions. The LWE displays the results of all site related turbulence changes in the window, identifying which site effect factored in the most.

For example, Site Effect 4: Turbulence Increase 2

You can keep refreshing the Destination Weather Report to see what the calculated bearing and distance is to the site, that will also give you some idea how far the end of the runway is from the site's defined latitude and longitude position.

Flight Planning Assistant Reports



Reports may be selected from the sim Add-ons menu. The reports include,

- Sim Weather Reports using the simulator's own text menu window,
- Opus Weather Reports using OpusFSI Weather Report windows,
- OpusWeather (METARs),
- OpusWeatherReport (GRIB Data),
- OpusFlightReport (Flight Plan),
- OpusSidStarReport (SIDs and STARs)

The weather, maps and reports can be generated before the flight has been loaded provided a flight plan has been specified, identifying the point of departure. The weather generation will be a slow process whenever the simulator is not running (due to SimConnect delays), fastest when the simulator is running and the flight has not been loaded (i.e. with the start up screen displayed or minimised).

Sim Weather Reports

The **Sim Weather Report** is a transparent menu displayed within the sim's own text menu window,



The Shortcut Controls in the Server dialog enable you to configure key/button assignments to display and cycle through Weather Reports. Refer to the User Guide for further details.

The report selection window provides links to the **Local Area Weather Report**, **Lower Atmosphere Weather Report**, **Upper Atmosphere Weather Report**, the **Flight Plan En Route Report**, the **Destination** report and four **Alternate** met station reports.



The weather report windows indicate 'No Weather Available At Present' if the LWE hasn't generated or updated the weather at the time.

The distance to the destination and alternates is displayed in both km and nautical miles, along with the compass heading and bearing. You must be within 640km (400 miles) of the station to view the report.

If you reconfigure any of the ICAO codes in the Weather dialog during flight then you must re-display the weather report window.

The report selection window can be manually undocked and re-positioned on multi-screened PCs.

Either click on an option or enter the relevant number to display the required report or exit the menu.

The **Local Area Weather Report**, **Destination** report and four **Alternate** met station reports provide an overview of the target meteorological conditions for your chosen location and, if there is room, show the targets for the upper (above FL200) ambient temperature (SAT), ambient wind direction and speed, also the current ambient air temperature and TAT inside the simulator. The idea being, you can use these report windows to monitor the temperatures and above FL200 compare the target temperatures and winds with the actual.

These reports can be used in place of ATIS and are accurate out to the edge of the weather map (640km about 400 miles or 345nm). You can use this feature to check the weather and wind direction at non-ATIS airstrips.



All weather reports have a **Live** (dynamic weather update), **Imported** (METAR File Import), **Historic** or **Disabled** (LWE currently disabled) indication in the title line. The ICAO codes and where appropriate the station names are listed within each of the weather report windows together with the distance and bearing to the station. The distances, displayed in both km and nautical miles, will update when you cross into a new weather cell. The **(m)** displayed before the ICAO code signifies a METAR is available for the location, **(r)** signifies Relocated Weather mode has been enabled. If zero METARs are reported then it means there are no met stations in your current weather cell, that is within 5 to 10 miles of you.

Where appropriate the METAR time code (DDHHMMZ) is displayed in the first line, containing the reported QNH pressure. The METAR time code is only displayed within a weather report if there is a single METAR for the location. Stabilised pressures are depicted using the phrase '**Static**' whenever they are applicable indicating that pressure stabilization has been configured in the Weather Smoothing dialog. In those circumstances the pressures are stabilised (static) between weather updates to prevent P3D wind shift problems.

Where appropriate a Slight, Moderate, or Severe Wind Shear warning is appended at the end of the QNH pressure line in the Opus Local, Destination, and Alternate Weather Reports, just before the reported surface wind conditions.

The **Destination Weather Report** will have an **Actual** label appended after the QNH whenever the Destination weather has been checked and verified 'inside' the simulator. Hence, the label confirms that the Destination weather inside the simulator matches the Opus on-screen Destination Weather Report. This will generally occur once you are airborne and within 200km of your Destination.

Surface winds are depicted as '**Wind XXX at XX knots**' within the weather reports. You will see Variable and Gusting XX messages after the Wind statement indicating variable wind directions and gusty surface conditions, the XX giving the max gust wind speed in knots.

If **(pseudo effect)** is displayed after a cloud layer it's just to remind you that that cloud layer is a fake layer that has been added by the LWE to produce the fog or mist effect which tops the fog/mist layer with a thin stratus cloud so that you can see it from above, otherwise the sim is unable to depict the poor vis surface layer. So don't expect to see it in the corresponding METAR statement. Visibility is displayed in both metres and statute miles.

If **Magnetic Variation** is enabled (Weather's User Preferences dialog) then there will be a difference between the reported wind directions METAR and GRIB forecast data which always

report directions with respect to True North and the current wind directions within the simulator and reported by ATIS which are always Magnetic directions. To assist the pilot, the LWE will show the current **Magnetic Variation** in the local weather report windows, displayed in the form '**MagVar XX.X**' at the end of the surface wind information. You must **ADD** this value to all wind directions to convert them to Magnetic directions at the current location. Please note, OpusFSI cannot show the Magnetic Variation at the Destination or Alternate sites, only at your current location in the simulated world.

If you have specified a Cruise Altitude then the report will include the target cruise altitude wind direction, speed and ambient temperature displayed in the form '**Cruise ddd/ss tempC**'. Unknown temperature and dew points are shown as **??**.

Reports will append an **(S)** label to all cloud descriptions to inform you that Cloud Smoothing is in force at that location and the listed cloud layers may therefore differ from what is displayed in the simulator.

The **Local Area Weather Report** conditions are the target meteorological conditions for your current 16km square weather cell. Even though the targets are assigned to weather cells, they are in fact assigned to single points within the simulator. In flight, the defined point for the weather cell can be over 10 miles away from your aircraft's current position. Furthermore the target weather will naturally spill over into adjacent cells, hence the weather you see out of the cockpit may match more closely with the weather assigned to an adjacent cell and not the reported cell. Please keep this point in mind when using the Local Area Weather Report whilst airborne.

The **Upper and Lower Atmosphere Weather Reports** are valid if you have not disabled **Enable GRIB Forecast** in the Weather dialog's **Download Weather Options**. If it is disabled you will see the message "GRIB Forecast Data Disabled At Present".

The **Lower Atmosphere Weather Report** displays the surface and FL040 through to FL180 targets along with the current temperature and wind target. Click anywhere to return to the main report selection window.



The **Upper Atmosphere Weather Report** displays the GRIB forecast cycle date and Zulu time code as the first item on the list together with the Tropopause forecast data (height, temp, and wind),

surface and FL200 through to FL420 targets along with the current temperature and wind target. Click anywhere to return to the main report selection window.



Please note, the world wide GRIB data forecasting cycles are updated at approximately the same time as the North American specific (USA) forecasts and it can take between 6 and 9 hours for them to update a cycle.

The raw GRIB data is shown in the Upper Weather Report window whenever either of the Sim Friendly GRIB options are ticked (Wind or Temperature).

The **Flight Plan En Route Weather Reports** lists all identified met stations extracted from the flight plan, alternatively if you don't have a flight plan then any specified Destination and Alternate met stations are listed. Select the required station from the list to display the current reported weather at that site.

The report displays the navigation points associated with each listed Met station, these are appended to each line as [navpnt]. At present only the first associated navigation point is shown even though the same Met station may be common to a multiple, normally consecutive, group of navigation points.

If you change the flight plan the weather report may list Met stations as (Not Updated) indicating that a weather update is needed in order to request and download the new METARs.

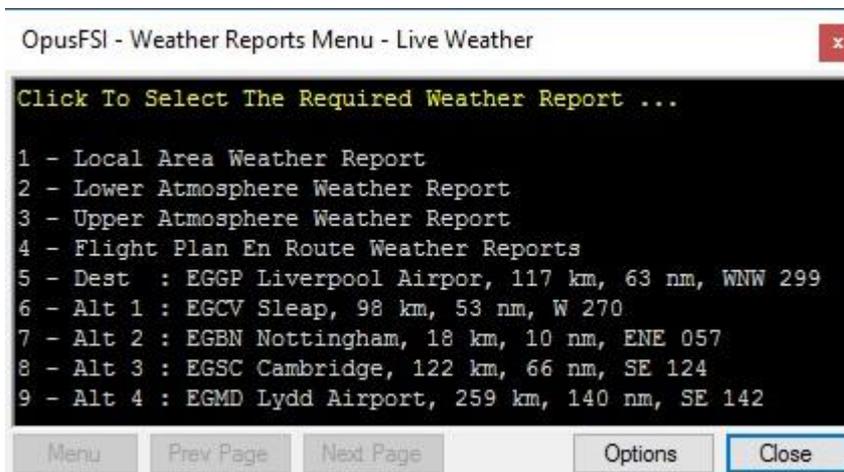


The **Local**, **Destination** and **Alternate Weather Reports** include the available runways and elevation in both feet and metres. The information is displayed immediately following the surface wind data. The runways are listed in the preferred order of use based on the current surface wind. The runway data is obtained from the Navigraph SIDSTARS NAVDATA. If you don't have a subscription to Navigraph then you can use the PMDG NAVDATA (the SIDSTARS Navigraph text files). The location of your NAVDATA folder must be identified in the Flight Plan Options dialog using the appropriate P3D Browse button (e.g. F:\P3D\PMDG\NAVDATA\).



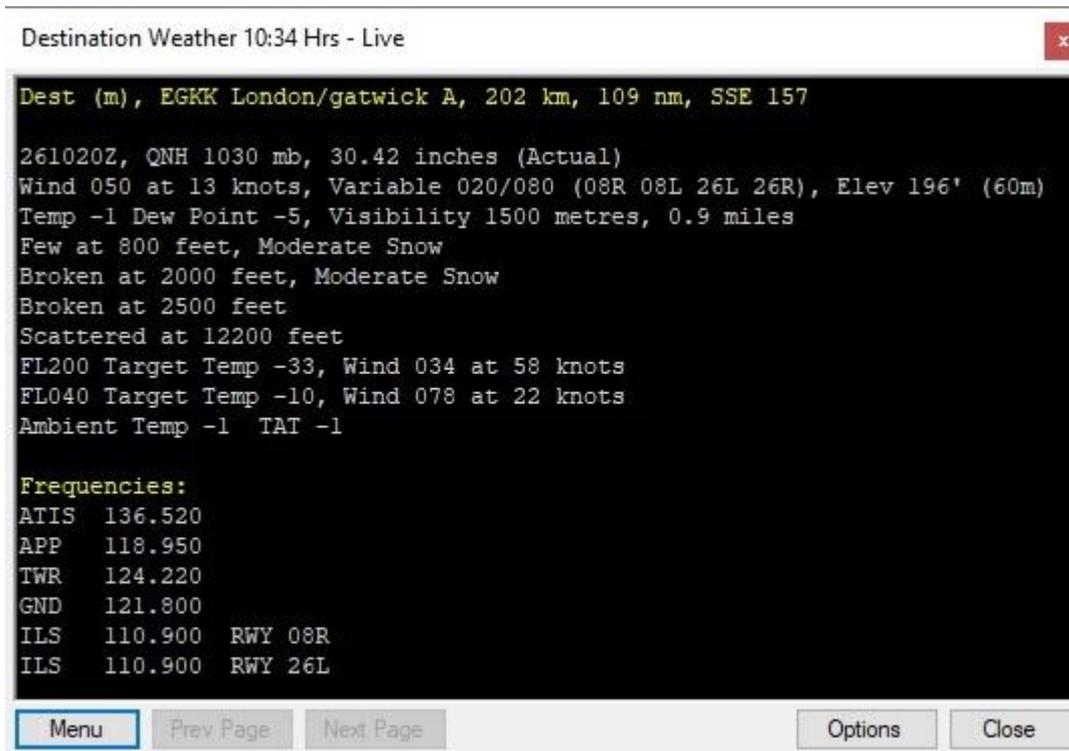
Opus Weather Reports

As an alternative to the Sim Weather Reports if you wish to display this information outside the sim you can use the **Opus Weather Reports**. Each time you select the **Opus Weather Reports** option it will open an additional Weather Report window,



The OpusFSI SERVER allows up to nine Weather Report windows to be opened and sized/positioned anywhere on a single or multi-screen system. You can change the font, font style and font size to suit your own screen resolution. The OpusFSI Weather Reports can be displayed either using the **Wx Report** button on the OpusFSI SERVER form or using the '**Opus Weather Reports**' option via the simulator's Add-ons Menu. If any OpusFSI Weather Report is on display the Live Weather Engine will no longer force or update the sim Lower or Upper Atmosphere reports, instead all GRIB download and progress messages are displayed in red on the second line of all displayed OpusFSI Weather Reports. Provision has been made to display other useful information

and messages on the second line of the OpusFSI Wx Reports. The destination weather report includes available runways and the radio and navigation frequencies.



On program startup the first four OpusFSI Weather Reports are primed to display the Local Weather, Lower Atmosphere, Upper Atmosphere, and Destination Weather respectively. The remaining reports are primed to open with the Weather Report Main Menu on display.

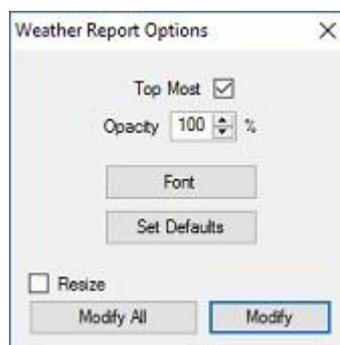
The Options button can be used to specify the following OpusFSI Weather Report options,

Top Most - Displays an OpusFSI Weather Report form top most on the screen.

Opacity - Specifies the opacity for an OpusFSI Weather Report form down to a minimum of 30%.

Font - Specifies the display font for an OpusFSI Weather Report form.

Set Defaults - Restores all OpusFSI size, font, topmost, and opacity defaults for the current report form. By default the font is set to "Courier New, 9 point", topmost is set to true, and opacity set to 100%. The form size is adjusted to give the minimal footprint for all report formats.



After specifying the above you may choose to '**Modify**' the current report form, or click on 'Modify **All**' to change all OpusFSI Weather Report forms. The '**Resize**' checkbox can be used to resize all forms the current form's size.

Specifying both **Top Most** and an Opacity less than 100% will allow the OpusFSI Weather Report form to be sized, positioned, and displayed over the simulator's main display. This will be found helpful when operating the simulator in Maximised or Full Screen mode.

Text Reports

The other sim Add-ons menu options are text reports displayed within the default text editor program. To change the default text editor program just right click on any **.txt** file and select the **Open with** option then select the **Choose default program..** option and select Notepad or the default program you want to be used to view the **.txt** files.

OpusWeather (METARs)

A detailed METAR report (including TAFs if you have enabled them in the Weather Download dialog) for the weather map (800 x 800 miles) is generated each time the weather is updated. Your local Met station is displayed together with your current distance from the station. Any specified Destination and Alternate sites are appended to the OpusWeather.txt report file. The report is saved in the text file **<OpusFSI_v6>\Weather\OpusWeather.txt** where **<OpusFSI_v6>** identifies your OpusFSI installation folder.

Example **OpusWeather.txt**,

```
OpusFSI Downloaded METARs, Software Version 6.00.0 Beta
Downloaded 25 November 2019, 09:52 Hrs - Live
Simulator 30 May 2017, 14:24 Zulu

Destination : EGKK, LONDON/GATWICK A, Distance 204.3 km

Local MetStn : EGNX, EAST MIDLANDS, Distance 1.7 km

EGNX 250920Z 11011KT 9000 BKN008 BKN017 09/08 Q1001
EBAW 250920Z 15006KT 9999 SCT020 08/06 Q1009 NOSIG
EBBE 250945Z 16004KT 9999 FEW250 09/06 Q1009 BLU BLU
...
LFYR 250930Z AUTO 14006KT 9999 -RADZ OVC016 09/07 Q1008 TEMPO 4000 -RADZ BKN005 OVC008
LSGC 250950Z VRB03KT 9000 BKN009 04/04 Q1009
LSZG 250950Z 10003KT 0250 FG VV001 04/04 Q1010 NOSIG

211 Metars Downloaded

358 MetStns, 211 Metars Available
```

OpusWeatherReport (GRIB Data)

A detailed weather report for the lower and upper atmosphere wind and temperature data relating to the current location is generated from the current GRIB data each time the weather is

updated. The report is saved in the text file <OpusFSI_v6>\Weather\OpusWeatherReport.txt where <OpusFSI_v6> identifies your OpusFSI installation folder.

If an Opus Weather Theme has been loaded then the World Weather Theme's filename and saved weather Zulu date and time is included in the report.

Example **OpusWeatherReport.txt**,

OpusFSI Weather Report at [39,39], Software Version 6.00.0 Beta

Generated 25 November 2019, 10:06 Hrs - Imported

Simulator 30 May 2017, 14:25 Zulu

Destination : EGKK, LONDON/GATWICK A, Distance 204.3 km

Location : EGNX (m) East Midlands

Cruise Altitude : 8000 Feet

World Wide GRIB Data, 25 November 2019, 06:00 Zulu, Offset 3 Hrs

Tropopause Height 34503 Feet, Temp -56, Wind 161/43

Upper Atmosphere

81 50 km : Temp 0 , Wind 267/78 : Top of Stratosphere (164,000 ft)

80 20 km : Temp -59, Wind 267/00 : Top of Tropopause (65,600 ft)

79 FL435 : Temp -59, Wind 267/20

...

32 FL200 : Temp -24, Wind 176/33

Lower Atmosphere

31 FL195 : Temp -23, Wind 178/33

30 FL190 : Temp -22, Wind 179/32

...

01 FL045 : Temp 2 , Wind 179/19

00 FL040 : Temp 3 , Wind 175/20

Surface : Temp +9, Wind 110/11, Static 110/11

OpusFlightReport (Flight Plan)

If you specify a flight plan in the weather dialog then a detailed flight plan weather report is generated each time the weather is updated. TAFs are included if you have enabled them in the Weather Download dialog. Any configured alternate Met stations are shown within the Route section of the OpusFlightReport text file and appended at the end of the Weather report section in an Alternates section. Bracketed wind and temperature averages for all altitudes ranging from 4000ft up to 44,000ft in 1000ft increments are included in the report. Unknown temperature and dew points within the flight plan report are shown as **??**. The report is saved in the text file <OpusFSI_v6>\Weather\OpusFlightReport.txt where <OpusFSI_v6> identifies your OpusFSI installation folder.

If an Opus Weather Theme has been loaded then the World Weather Theme's filename and saved weather Zulu date and time is included in the report.

Example **OpusFlightReport.txt**,

OpusFSI Flight Plan Weather Report, Software Version 6.00.25 Beta
 NAVDATA AIRAC Cycle No.1108, Revision 1
 Generated 03 February 2020, 14:52 Hrs - Live
 Simulator 30 May 2017, 13:20 Zulu

Plan:

EGNX TNT DTY EGKK

Route:

EGNX	EAST MIDLANDS	Lat	52.816667	Lon	-1.316667	Met Stn	United Kingdom
TNT	TRENT	Lat	53.053889	Lon	-1.670000	Nav Aid	Freq 115.700
DTY	DAVENTRY	Lat	52.180278	Lon	-1.113889	Nav Aid	Freq 116.400
EGKK	LONDON/GATWICK A	Lat	51.133333	Lon	-0.166667	Met Stn	United Kingdom

Averages:

FL040	Wind 219/26	Temp	3C
FL050	Wind 218/28	Temp	1C
...			
FL430	Wind 257/70	Temp	-59C
FL440	Wind 257/69	Temp	-59C

Weather:

 EGNX EAST MIDLANDS

FL040	229/27	2C	FL050	227/28	1C	FL060	223/30	-1C
FL070	226/32	-2C	FL080	233/33	-3C	FL090	234/36	-5C
FL100	235/40	-6C	FL110	238/45	-7C	FL120	240/51	-9C
FL130	242/57	-10C	FL140	244/63	-11C	FL150	244/71	-12C
FL160	244/77	-13C	FL170	245/78	-16C	FL180	246/79	-18C
FL190	247/80	-20C	FL200	252/95	-19C	FL210	254/96	-20C
FL220	254/98	-22C	FL230	254/99	-24C	FL240	254/100	-26C
FL250	254/101	-29C	FL260	253/102	-31C	FL270	253/103	-34C
FL280	254/102	-36C	FL290	254/102	-39C	FL300	255/101	-41C
FL310	258/102	-44C	FL320	261/104	-47C	FL330	263/106	-50C
FL340	266/108	-53C	FL350	267/106	-55C	FL360	269/104	-57C
FL370	270/103	-58C	FL380	270/98	-60C	FL390	269/88	-60C
FL400	265/85	-59C	FL410	262/83	-59C	FL420	259/80	-58C
FL430	256/77	-58C	FL440	254/75	-58C			

EGNX, EAST MIDLANDS, At Location, 251020Z
 Wind 180/9 Temp 10/9 Vis 7000m (4.3 miles) QNH 1011mb (29.86in)
 Few at 900 feet, Light Rain
 Scattered at 3000 feet

EGBB, BIRMINGHAM AIRPO, 49km (26nm), SW 217, 251020Z
 Wind 160/6 Temp 10/10 Vis 8000m (5.0 miles) QNH 1011mb (29.86in)
 Few at 3200 feet, Light Rain

 TNT TRENT 35km (19nm), NW 318, Total 35km (19nm)

FL040	229/27	2C	FL050	227/28	1C	FL060	223/30	-1C
FL070	226/32	-2C	FL080	233/33	-3C	FL090	234/36	-5C
FL100	235/40	-6C	FL110	238/45	-7C	FL120	240/51	-9C
FL130	242/57	-10C	FL140	244/63	-11C	FL150	244/71	-12C
FL160	244/77	-13C	FL170	245/78	-16C	FL180	246/79	-18C
FL190	247/80	-20C	FL200	252/95	-19C	FL210	254/96	-20C
FL220	254/98	-22C	FL230	254/99	-24C	FL240	254/100	-26C
FL250	254/101	-29C	FL260	253/102	-31C	FL270	253/103	-34C
FL280	254/102	-36C	FL290	254/102	-39C	FL300	255/101	-41C
FL310	258/102	-44C	FL320	261/104	-47C	FL330	263/106	-50C
FL340	266/108	-53C	FL350	267/106	-55C	FL360	269/104	-57C
FL370	270/103	-58C	FL380	270/98	-60C	FL390	269/88	-60C
FL400	265/85	-59C	FL410	262/83	-59C	FL420	259/80	-58C
FL430	256/77	-58C	FL440	254/75	-58C			

EGNX, EAST MIDLANDS, 35km (19nm), SE 137, 251020Z
 Wind 180/9 Temp 10/9 Vis 7000m (4.3 miles) QNH 1011mb (29.86in)
 Few at 900 feet, Light Rain

Scattered at 3000 feet

EGCC, MANCHESTER INTL, 52km (28nm), NW 309, 251020Z
Wind 000/3 Temp 10/8 Vis 7000m (4.3 miles) QNH 1010mb (29.83in)
Few at 2100 feet, Light Rain
Scattered at 3500 feet
Broken at 4200 feet

```
-----  
DTY      DAVENTRY      104km (56nm), SSE 158, Total 140km (75nm)  
-----  
FL040 215/27 3C      FL050 213/28 0C      FL060 213/31 -1C  
FL070 217/35 -2C     FL080 223/39 -2C     FL090 230/45 -3C  
FL100 236/51 -3C     FL110 239/55 -4C     FL120 241/59 -5C  
FL130 244/64 -7C     FL140 246/68 -8C     FL150 249/74 -10C  
FL160 253/80 -11C    FL170 253/80 -13C    FL180 254/80 -15C  
FL190 255/80 -18C    FL200 254/88 -17C    FL210 253/88 -19C  
FL220 253/88 -21C    FL230 252/88 -23C    FL240 251/88 -26C  
FL250 251/88 -28C    FL260 251/87 -31C    FL270 251/87 -33C  
FL280 251/88 -36C    FL290 251/88 -38C    FL300 251/89 -41C  
FL310 253/89 -44C    FL320 254/90 -46C    FL330 256/91 -49C  
FL340 258/92 -52C    FL350 260/90 -54C    FL360 263/86 -56C  
FL370 265/82 -57C    FL380 267/79 -59C    FL390 267/74 -60C  
FL400 265/73 -60C    FL410 263/71 -60C    FL420 261/70 -59C  
FL430 259/68 -59C    FL440 258/68 -59C
```

EGTC, CRANFIELD, 36km (20nm), ESE 110, 251020Z
Wind 170/10 Temp 12/11 Vis 32000m (19.9 miles) QNH 1012mb (29.89in)
Few at 1800 feet, Light Rain

EGTK, OXFORD, 41km (22nm), SSW 199, 251020Z
Wind 170/9 Temp 12/11 Vis 32000m (19.9 miles) QNH 1011mb (29.86in)
Few at 2500 feet, Light Rain
Scattered at 4500 feet

```
-----  
EGKK     LONDON/GATWICK A     133km (72nm), SSE 150, Total 273km (147nm)  
-----  
FL040 216/24 5C      FL050 218/27 3C      FL060 224/32 2C  
FL070 229/36 1C      FL080 234/40 1C      FL090 237/47 0C  
FL100 240/53 -1C     FL110 242/57 -2C     FL120 245/60 -3C  
FL130 246/62 -4C     FL140 248/63 -5C     FL150 249/64 -7C  
FL160 250/66 -9C     FL170 251/66 -11C    FL180 251/66 -13C  
FL190 251/66 -15C    FL200 254/66 -17C    FL210 254/66 -19C  
FL220 253/66 -21C    FL230 253/66 -23C    FL240 253/66 -25C  
FL250 253/67 -27C    FL260 253/67 -30C    FL270 253/68 -32C  
FL280 254/71 -34C    FL290 254/74 -37C    FL300 254/78 -39C  
FL310 254/80 -42C    FL320 257/78 -45C    FL330 259/77 -48C  
FL340 261/76 -50C    FL350 262/74 -53C    FL360 262/70 -55C  
FL370 262/67 -57C    FL380 262/63 -59C    FL390 262/60 -61C  
FL400 258/62 -62C    FL410 254/65 -63C    FL420 254/66 -63C  
FL430 256/65 -63C    FL440 258/65 -62C
```

EGKK, LONDON/GATWICK A, At Location, 251020Z
Wind 190/9 Temp 14/12 Vis 32000m (19.9 miles) QNH 1014mb (29.95in)
Scattered at 1200 feet

EGKB, BIGGIN HILL, 24km (13nm), NNE 031, 251020Z
Wind 170/11 Temp 12/11 Vis 4500m (2.8 miles) QNH 1014mb (29.95in)
Scattered at 1500 feet

EGKA, SHOREHAM-BY-SEA, 35km (19nm), SSW 195, 251020Z
Wind 190/15 Temp 15/12 Vis 32000m (19.9 miles) QNH 1014mb (29.95in)
Few at 1800 feet

N.B. The `OpusFlightReport.rep` text file is a simplified text report intended to supply weather and upper wind and temperature data for external flight planning packages.

OpusSidStarReport (SIDs and STARs)

The Opus SID (Standard Instrument Departure) and STAR (Standard Terminal Arrival Route) Reports are generated for your departure and specified destination stations. The SIDs are only included if you are on the ground at an airport. Both SIDs and STARs are listed in normal order to match the GPS and FMC listings. The SIDs show the headings you would be departing to, the STARs show the directions you would be arriving from. The report is saved in the text file **<OpusFSI_v6>\Weather\OpusSidStarReport.txt** where <OpusFSI_v6> identifies your OpusFSI installation folder.

Example **OpusSidStarReport.txt**,

```
OpusFSI SID and STAR Report, Software Version 6.00.25
NAVDATA AIRAC Cycle No.1108, Revision 1
Generated 03 February 2020, 14:52 Hrs - Live
Simulator 30 May 2017, 14:25 Zulu
```

EGNX East Midlands, SIDs (Standard Instrument Departures)

Name	Rwy	Fix	Latitude	Longitude	Distance	Heading
ASNI2N	27	ASNIP	53.478611	-2.907222	128 km (69nm)	NW 304
ASNI3P	09	ASNIP	53.478611	-2.907222	128 km (69nm)	NW 304
BPK2P	09	BPK	51.749736	-0.106736	146 km (79nm)	SE 144
...						
TNT3P	09	TNT	53.053953	-1.669970	34 km (18nm)	NW 317
WAL2N	27	WAL	53.391936	-3.134461	136 km (73nm)	WNW 298
WAL3P	09	WAL	53.391936	-3.134461	136 km (73nm)	WNW 298

EGKK LONDON/GATWICK A, STARs (Standard Terminal Arrival Routes)

Name	Rwy	Fix	Latitude	Longitude	Distance	Direction
ASTR1F		ASTRA	50.865556	-0.146389	30 km (16nm)	S 177
ASTR2B		ASTRA	50.865556	-0.146389	30 km (16nm)	S 177
ASTR2H		ASTRA	50.865556	-0.146389	30 km (16nm)	S 177
...						
WILO3D		WILLO	50.985000	-0.191667	17 km (9nm)	S 186
WILO3J		WILLO	50.985000	-0.191667	17 km (9nm)	S 186
WILO4C		WILLO	50.985000	-0.191667	17 km (9nm)	S 186

P3D Limitations

There are some limitations in P3D, Selective Update mode no longer works in Prepar3D due to problems in the P3D METAR interpolation and handling.

Also you must close a text report window before exiting P3D otherwise the sim crashes or causes OpusFSI to crash.

Spy Messages

Spy messages can be seen by clicking on the top right-hand Spy button on the server's main form. The **Live Weather Engine** will report its nearest weather station along with all METAR downloaded reports.

The Spy window automatically clears after 30 minutes.



Live Weather Assistant

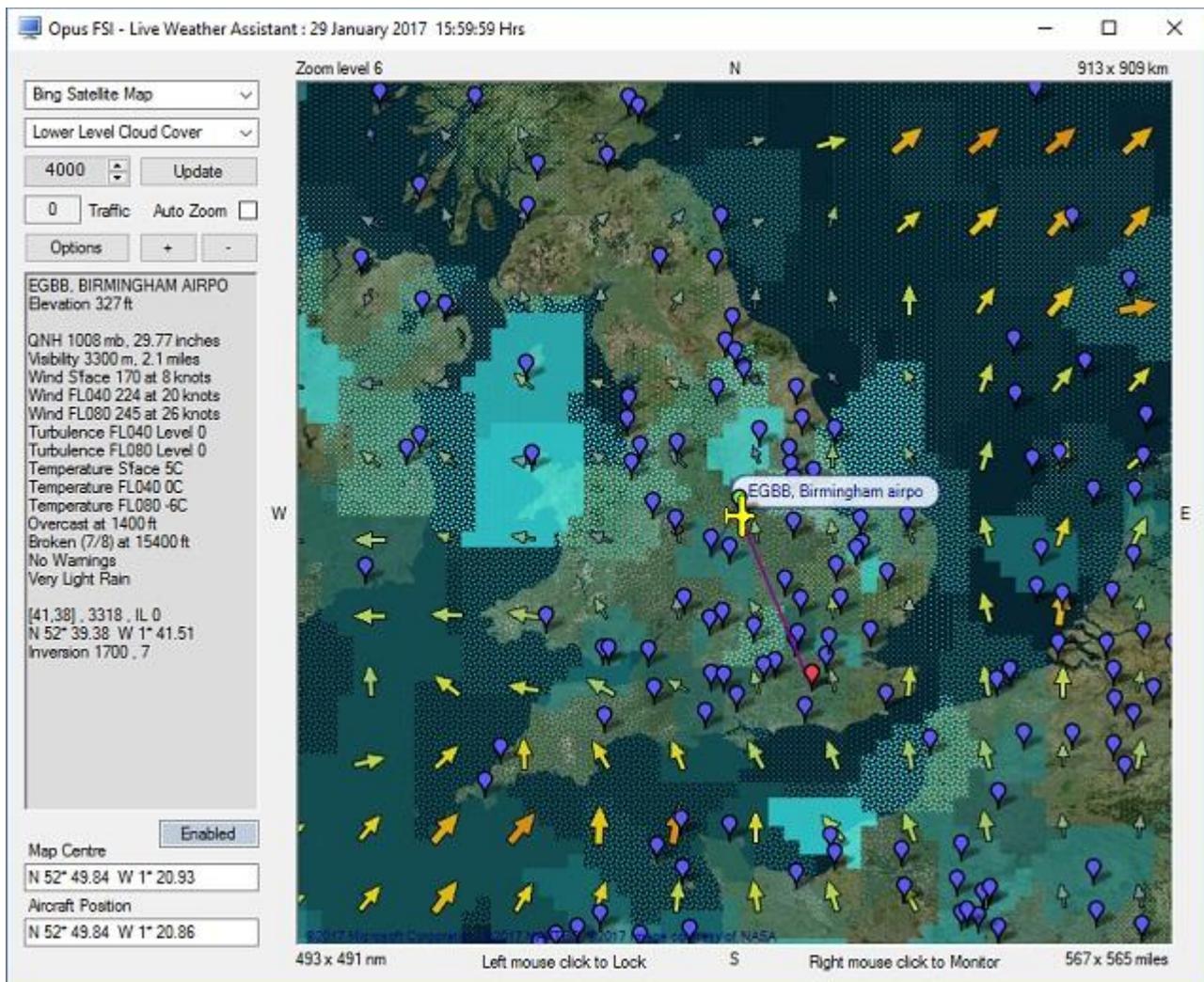
The **Live Weather Assistant** (LWA) provides useful weather information for the current Opus 800 x 800 mile weather map displayed graphically as a mosaic of 6400 weather cells in either a large or small footprint map.

To display the larger LWA map select the **LWA Map** button from the server form (or the **Live Weather Assistant Map** button from the client main form). You can display the smaller map using the **Wx Maps** button on the server (or the **Weather Maps** button on the client). Up to six Weather Maps can be opened and positioned on the screen, just click on the **Wx Maps** (or **Weather Maps**) button to open each new map.

The weather maps can be generated before the flight has been loaded provided a flight plan has been specified, identifying the point of departure. The weather generation will be a slow process whenever the simulator is not running (due to SimConnect delays), fastest when the simulator is running and the flight has not been loaded (i.e. with the start up screen displayed or minimised).



The **Live Weather Assistant** option displays a large dialog containing a graphic weather map in which various types of weather data can be displayed, you can select **Surface Visibility**, **Surface Precipitation Levels**, **Surface QNH**, **Surface Temperature**, **Cruise Level Temperature**, **Upper Level Temperature**, **Surface Wind**, **Cruise Level Wind**, **Upper Level Wind**, **Cruise Level Turbulence**, **Upper Level Turbulence**, **Low Level Cloud Cover** and **Medium Level Cloud Cover**.



The caption shows the date and time of the last weather update.

The LWA Map shows your current aircraft's location using the custom Aircraft symbol in the OpusFSI_v6/Aircraft.bmp bitmap file which you create yourself. If Aircraft.bmp does not exist then

the default Aircraft_Light.bmp is used. An AircraftHeavy.bmp and AircraftRotor.bmp are also provided. If you create your own custom aircraft symbol then use roughly the same sized square bitmap image (43x43 pixels) and use the same magenta colour for the background.



The location of your departure point (if known) is marked using a small green balloon and the destination using a small red balloon, your alternate sites using small yellow balloons and en-route flight plan navigation and waypoints points as small magenta balloons. SID fixes are green balloons and STAR fixes red balloons. The route is indicated using a dark magenta line. If the relevant options are enabled Met Station locations are shown as blue balloons and Aerodromes are shown as white balloons.

If SIDSTARS data for the aerodrome exists then the available runways are displayed, listed in preferred order based on the current surface wind at the station. All associated NAV and COM frequencies are also displayed below the runway information, i.e. all relevant ILS, APP (Approach), TWR (Tower), GND (Ground), COM (Unicom or Multicom), and ATIS frequencies.

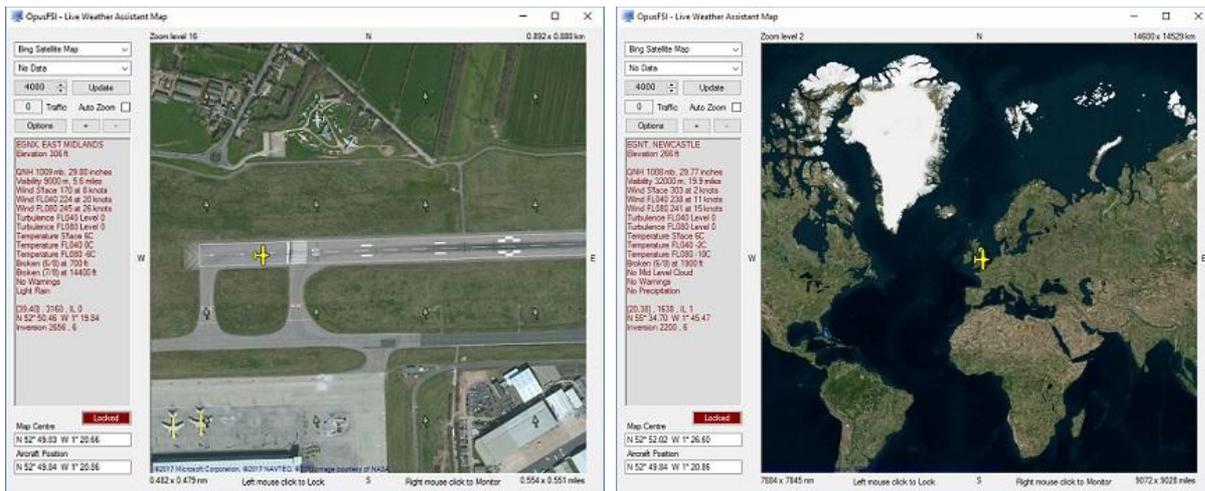
Moving the mouse cursor about the screen displays the weather at that point in the dialog's information box, if the location identifies a Met station then the ICAO, station name, and elevation in feet AMSL are also displayed in the information box.

Hovering the mouse over a balloon will display the station's ICAO and name. Hovering the mouse over a wind arrow will display the wind speed and direction.

The dialog can be resized with your mouse by dragging the edges or corners of the dialog. The LWA weather map's size and screen position are preserved and restored next time the LWA weather map is displayed.

You can drag the map with your right mouse button held down.

You can zoom in and out on the map using the plus and minus symbols on the dialog or using the scroll button on your mouse. The zoom level ranges from 16 (fully zoomed in) to 2 (fully zoomed out). N.B. you cannot zoom whilst hovering the mouse over a marker on the map. Navigation aids are visible at zoom level 8 and above on the LWA and Wx Maps. The more numerous Waypoints are visible at zoom levels 9 and above.



Auto Zoom

When Auto Zoom is enabled (LWA Map or Options button) the level will automatically zoom in or out to fit both your aircraft and the departure/destination marker within the map. In Auto Zoom mode, once the aircraft descends below 100 feet AGL the aircraft is automatically centered on the map and the zoom level changed to either 14, 15, or 16 depending on distance to the airfield marker, this is intended to aid taxiing.

Lock LWA Info Box

Left click the mouse within the map to LOCK the displayed information to the identified station. Once locked, all information within the LWA Info box will be displayed in RED. Left click the mouse anywhere within the map display to UNLOCK the mouse and revert back to normal mouse roaming. The current state is indicated in a status text box just below the data box. The status box will also indicate when the LWE is Updating (Yellow), Disabled (Red), or operating in normal Enabled mode.

OpusFSI - Live Weather Assistant Map

Zoom Level 6 N 1280 x 1280 km

Bing Satellite Map

Surface Wind

4000 Update

0 Traffic Auto Zoom

Options + -

EGKB, BIGGIN HILL
Elevation 598 ft

QNH 1011 mb, 29.86 inches
Visibility 16000 m, 9.9 miles
Wind Sface 170 at 8 knots
Wind FL040 204 at 29 knots
Wind FL080 235 at 30 knots
Turbulence FL040 Level 0
Turbulence FL080 Level 0
Temperature Sface 8C
Temperature FL040 0C
Temperature FL080 -3C
Broken (6/8) at 1200 ft
Scattered (4/8) at 13400 ft
No Warnings
Light Rain

[50.44], 4044, IL 0
N 51° 20.66 W 0° 15.82
Inversion 1653 . 6

Map Centre **Locked**

Aircraft Position

690 x 690 nm Left mouse click to Lock S Right mouse click to Monitor 800 x 800 miles

Aerodrome or Met Station Weather Monitor

Right click with the mouse over any aerodrome or met station on the LWA Map to display a small LWA Weather Monitor dialog. The dialog displays all known information about the identified station including its lat/lon coordinates, current distance and bearing to the station, all runways (in preferred order of use), all Nav and Com frequencies, and its current weather.

The **SIDs** and **STARs** button options use the selected station's ICAO code. The button options are greyed out if no departure or arrival data is available for the selected station. Refer to the SIDs and STARs section below for further details.

The **Airways** button opens the LWA Map Airways dialog which can be used to search for all Airways that have Navigation Points within the specified distance from the station (default 50nm). Refer to the Airways section below for further details.

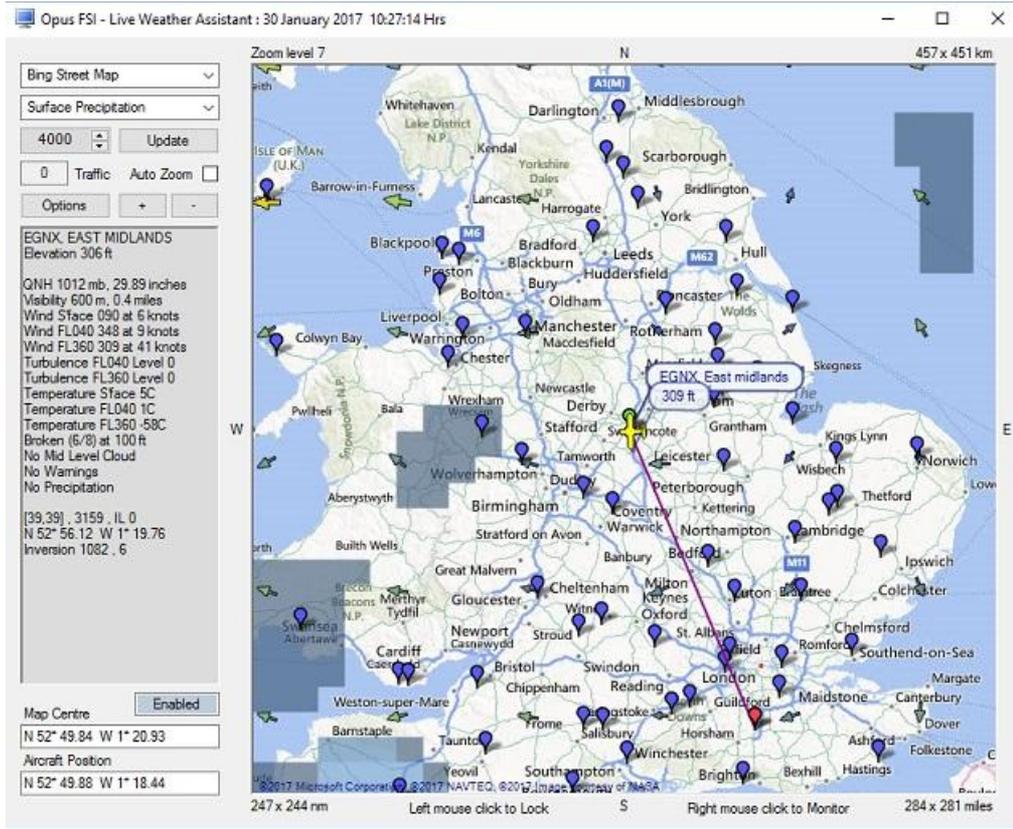
The screen positions of the first 8 LWA Monitor dialogs are remembered by the software.

N.B. When a LWA Weather Monitor dialog is first opened some of the LWA Map weather data is used to prime the weather data, this is always displayed with a TIME code of 000000. After the weather has been updated by the OpusFSI SERVER the TIME code will revert to the usual DDHHMM format showing the day and time code for any associated METAR.

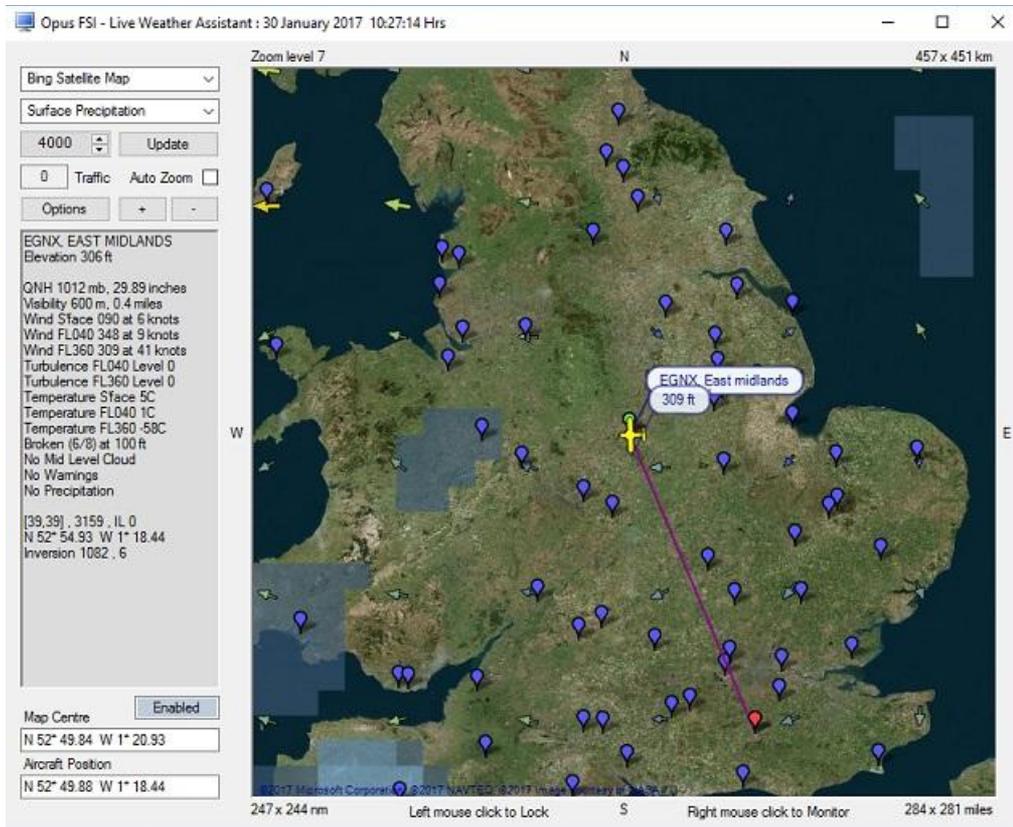


The **LWA Map** option displays a large dialog containing a graphic weather map in which various types of weather data can be displayed. You can choose between the following geographic map background options using the drop down menu,

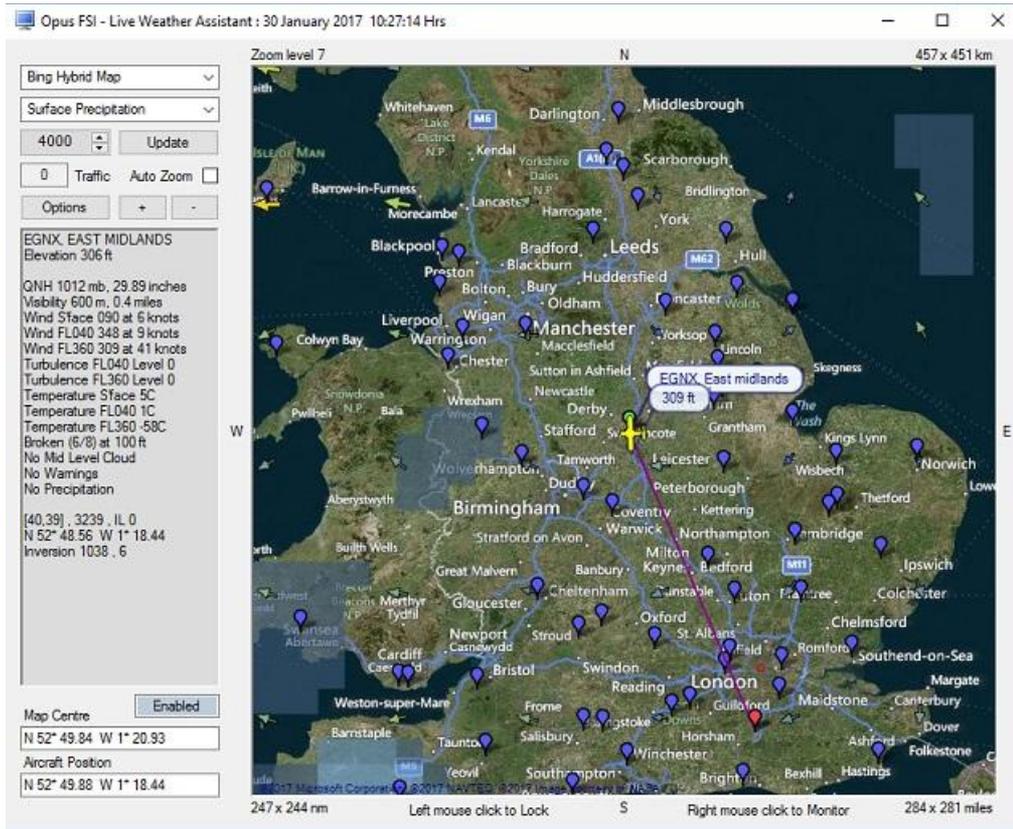
- Bing Street Map



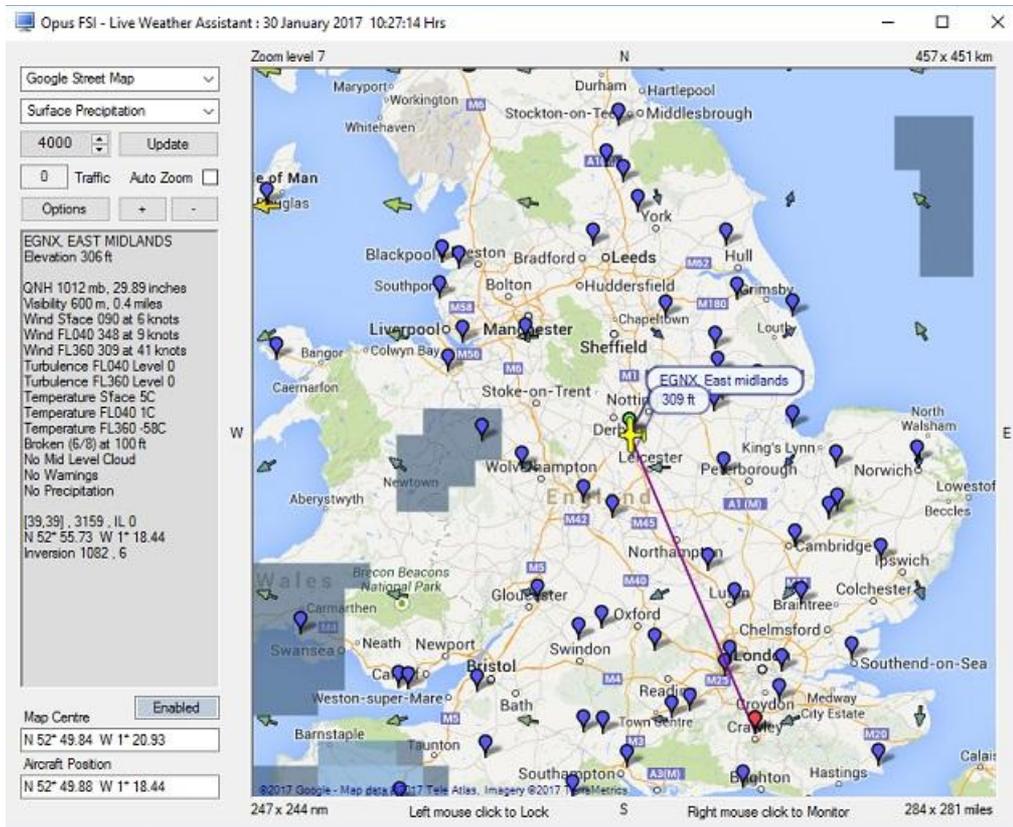
- Bing Satellite Map



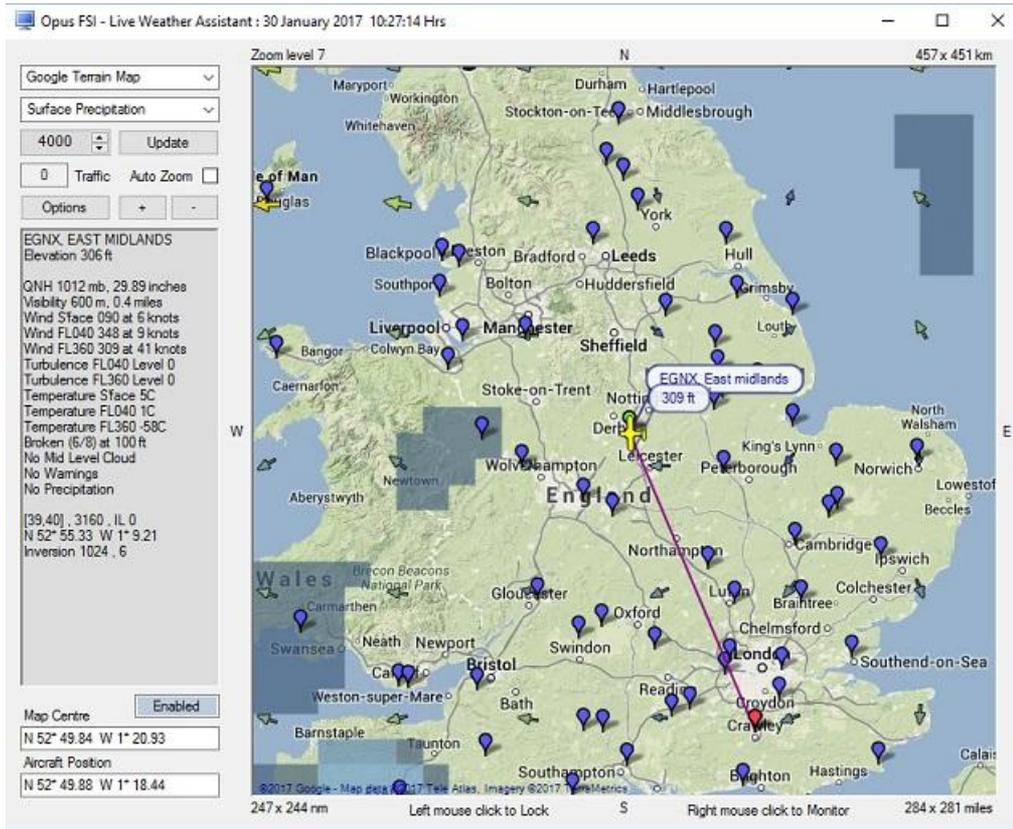
- Bing Hybrid Map



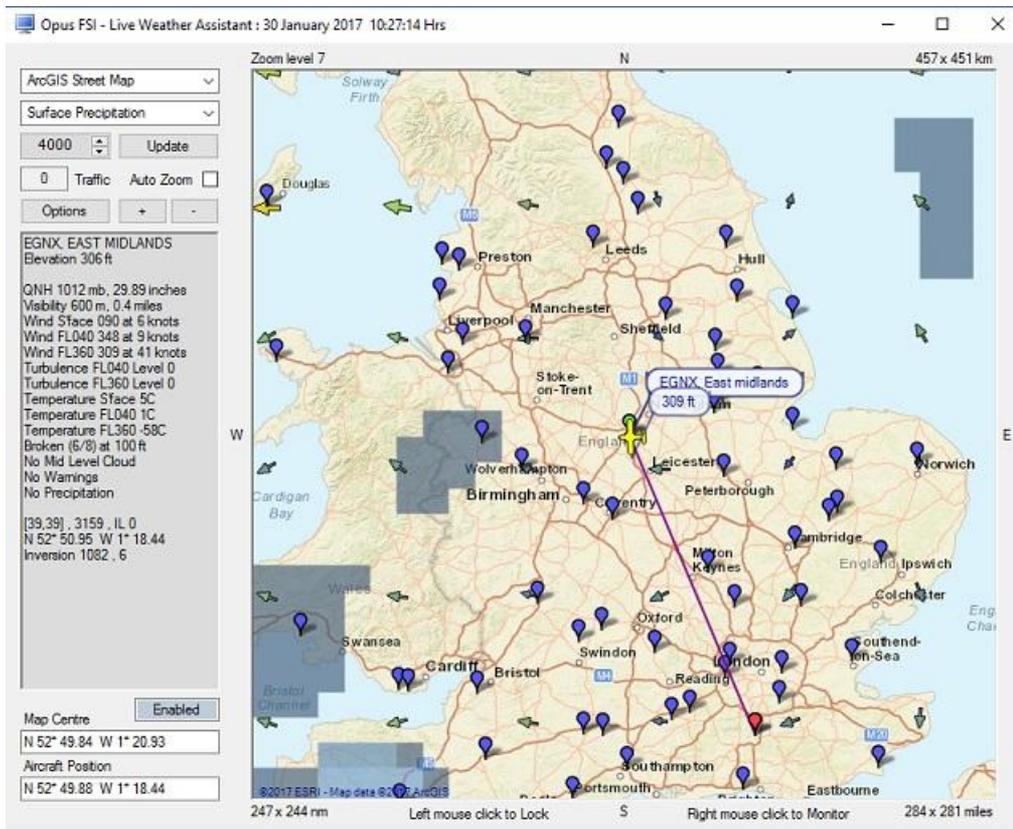
- Google Street Map



- Google Terrain Map



- ArcGIS Street Map



The type of data displayed on the map is selected from the drop down menu,

- **No Data**
- **Surface Visibility**
Various shades of grey, from light to dark, represent the areas of reduced Surface Visibility.
- **Surface Precipitation**
Four shades of light blue represent rain and four shades of grey to white are used for snow fall. The Precipitation map also shows the approximate location of any cumulonimbus and towering cumulus cloud formations. Active thunderstorms (CBs) are identified using a red exclamation mark, towering cumulus cloud formations (TCUs) are identified using an orange exclamation mark (in zoom levels 6 to 16).
- **Surface Pressure**
The Surface Pressure (or Surface QNH) map is colour coded about the average surface pressure for the region, blue and green tints indicate areas of lower than average pressure, orange and red tints indicate areas of higher than average pressure. The full range extends +/- 15mb about the regional average.

- **Surface Temperature**
All Met Stations on the smaller Wx Temperature map are displayed in black as the full spectrum of colours are used to represent temperature ranges from -18C and below (blue) through to 42C and above (red).

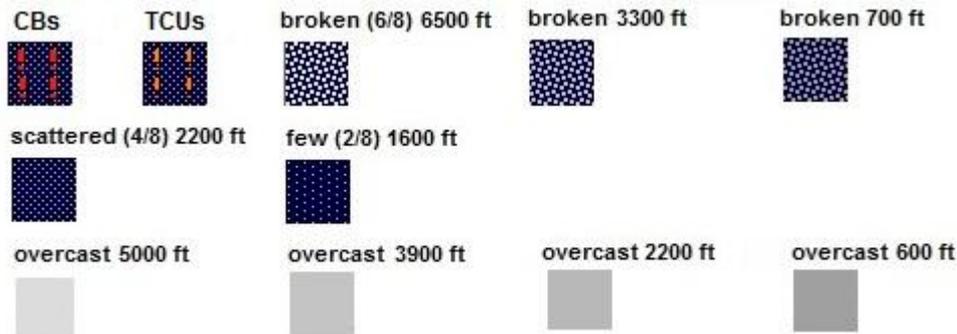
- **Cruise Level Temperature**
Colour coded about the average temperature for the region with at least a 30 degree spread.
- **Upper Level Temperature**
Colour coded about the average temperature for the region with at least a 30 degree spread.
- **Surface Wind**
The Surface Wind speeds are colour coded using blue - green - yellow - orange - red tints to indicate calm (2 knots) to strong (32 knot plus) winds.

- **Cruise Level Wind**
Colour coded about the average wind for the region with at least a 30 knot spread.
- **Upper Level Wind**
Colour coded about the average wind for the region with at least a 30 knot spread.
- **Cruise Level Turbulence**
The Turbulence Levels are colour coded using blue - green - yellow - orange - red tints to indicate calm to strong Turbulence levels 1 to 8.

- **Upper Level Turbulence**
The Turbulence Levels are colour coded using blue - green - yellow - orange - red tints to indicate calm to strong Turbulence levels 1 to 8.
- **Lower Cloud Cover and Medium Cloud Cover**
The **Lower Cloud Cover** map shows the maximum cloud cover under 6,000 feet AGL along with an indication of the reported cloud base, cloud cover in octas, and any thunderstorm and towering

cumulus warnings. The **Medium Cloud Cover** map shows the maximum cloud cover between 6,000 feet and up to 26,000 feet AGL .

Therefore the maps do not show all the cloud layers, they report the most significant cloud layer that has the greatest cloud cover. Lower cloud bases are depicted in darker shades of grey and various brush patterns have been used to indicate areas of few, scattered, or broken cloud. Solid colour fills indicate areas of overcast conditions. Active thunderstorms (CBs) are identified using a red exclamation mark, towering cumulus cloud formations (TCUs) are identified using an orange exclamation mark (in zoom levels 7 to 16).



Upper Level Altitude Setting

An altitude can be selected for the Upper Level Temperature, Wind or Turbulence. Press the **Update** button to refresh the map.

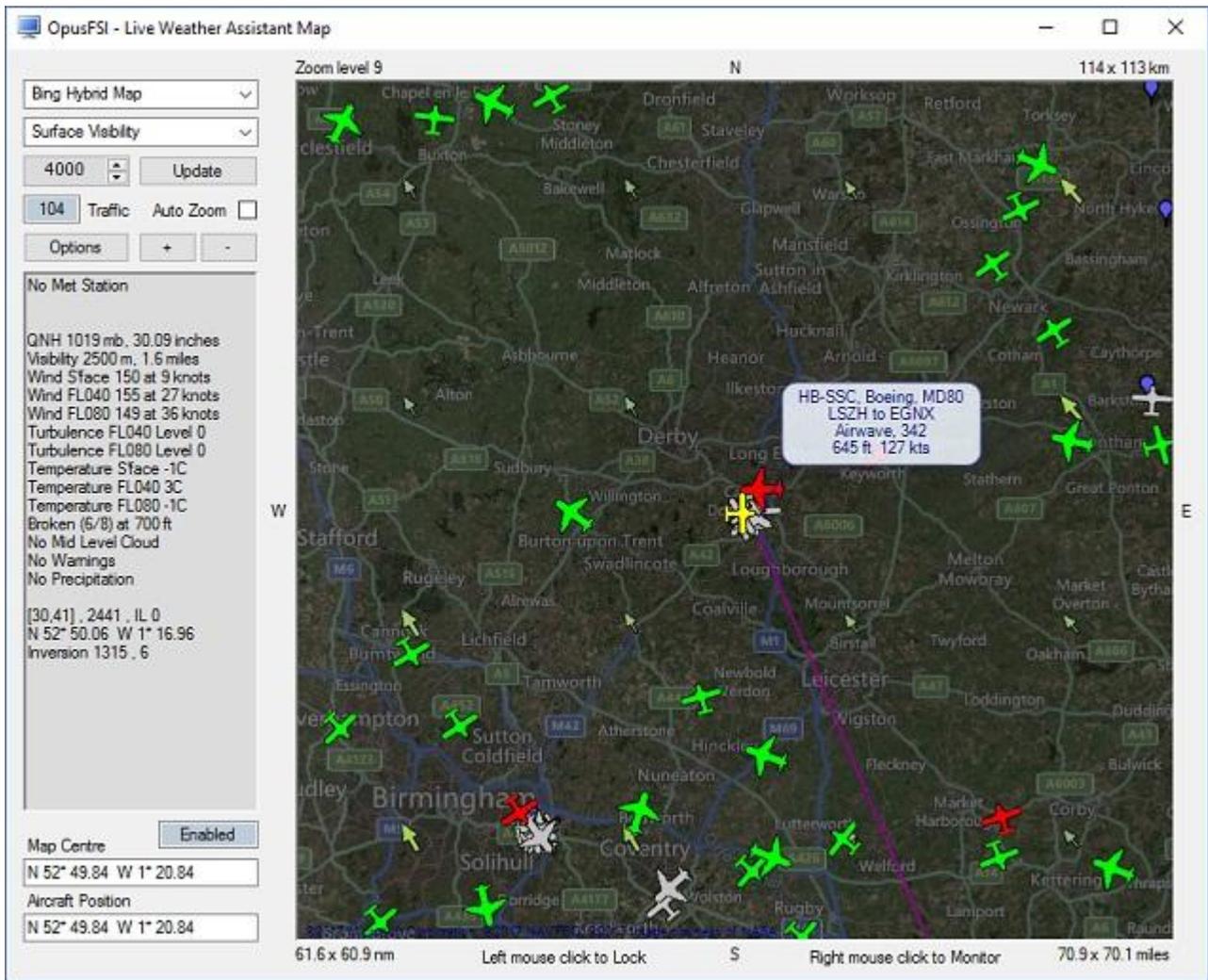
N.B. The Update button will only work if the weather and GRIB data have been updated. The LWA Weather Map will not show any cruise or upper level data if none exists and the LWA information box will append the messages 'No Cruise Altitude' and/or 'No Upper Level Data' as appropriate.

Local Traffic

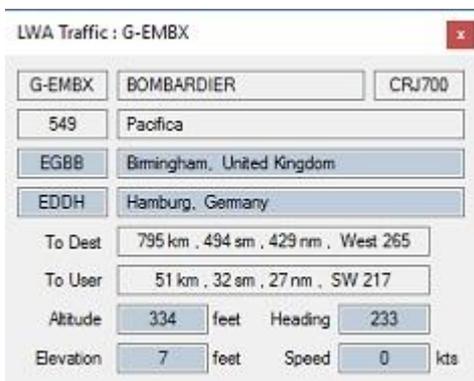
To get the traffic data on the server and client LWA Maps you must tick the **Enable Live Traffic Updates** option in the OpusFSI SERVER and OpusFSI CLIENT Configure dialogs. The traffic radius can be adjusted in the Configure dialog and can range from 32km (20 miles) to 192km (120 miles). The **Reset** button for Live Traffic data is used to force a change to the reported Live Traffic radius. The option cannot be used to disable Live Traffic once enabled, you will have to restart the OpusFSI SERVER program for that.

Enabling **Show Traffic** (Options button) will display all local traffic within a 50 mile (80 Km) radius of your current position. A count indicates the total number of aircraft. The traffic markers are displayed as coloured aircraft symbols whenever the zoom level is set to Zoom Level 7 or more. GREY symbols are used to depict traffic on the ground, GREEN symbols depict airborne traffic that is not in conflict with your current altitude, and RED symbols are used to depict all airborne traffic that is within 2000 feet of your current altitude. The traffic symbols depict the traffic type based on the engine type and mode of flight, distinguishing between piston aircraft (light), jet aircraft (heavy), and rotorcraft types. P3D does not generate any rotorcraft type AI traffic without an appropriate addon. Hovering over an aircraft symbol with the mouse cursor will display the traffic data (callsign, type, model, point of departure, destination, airline, flight number, elevation,

ground speed). For example, G-AJLY, BOEING, B738 : EDDL to EGBB : 2147 ft 201 kts : World Travel, 3226.

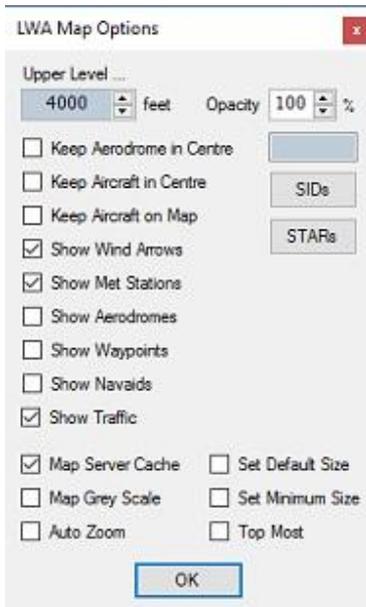


Right-clicking over a traffic symbol will display a LWA Traffic Monitor box for real time monitoring of the selected aircraft or rotorcraft traffic. The LWA Traffic Monitor box will display the callsign, type, model, flight number, airline, point of departure, destination, distance and bearing from destination, distance and bearing from your aircraft, altitude, elevation, heading, and ground speed.



Options

Click on the **Options** button to set further map options.



An altitude can be selected for the **Upper Level** Temperature, Wind or Turbulence.

Opacity specifies the opacity for a map down to a minimum of 30%.

Enable the required options to **Keep Aerodrome in Centre** (enter the required aerodrome ICAO code in the adjacent box), **Keep Aircraft in Centre** or **Keep Aircraft on** the visible **Map**.

You can **Show Wind Arrows** on the LWA Map or disable them via the checkbox. The wind arrows will show the Cruise Level winds if any cruise data types are selected, and the Upper Level winds if any upper level data types are selected. For all other data types the wind arrow data will automatically change according to whether your current aircraft height is closest to the Surface, Upper or Cruise levels. Wind arrows will not be displayed if the winds are calm.

The **Show Met Stations** checkbox enables you to overlay the Met station locations as **blue** balloons.

The **Show Aerodromes** checkbox enables you to overlay the aerodrome locations as **white** balloons.

The **Show Waypoints** checkbox enables you to overlay the aerodrome locations as **brown** balloons. The **Show Nav aids** checkbox enables you to overlay the aerodrome locations as **yellow** balloons. To prevent clutter on the maps a minimum zoom level of 9 is required before these markers are displayed.

The **Show Traffic** option is as described in the Local Traffic section above.

Selecting **Map Server Cache** will speed up the display of the geographic map by saving it to cache instead of downloading it via the internet. Note that for Google and Bing maps you are limited to the number of downloads you can perform during a session.

The **Map Grey Scale** option makes it easier to view certain data against the geographical map. All LWA and Wx Maps all default to a monochrome map display if no user preferences have been set.

The [Auto Zoom](#) option is as described in the section above.

Set Default Size changes the LWA map or small maps to their default size.

Set Minimum Size changes the LWA map or small maps to their smallest size, this is the same as its default size for the LWA map.

Top Most (default true) displays the map top most on the screen.

SIDs and STARS

The **SIDs** and **STARS** button options are accessible from either the LWA Map Options dialog or the Aerodrome or Met Station Monitor dialog. These options use the current **Keep Aerodrome in Centre** ICAO code (or the currently selected station if you have selected the option from an Aerodrome or Met Station Monitor) and displays either the LWA SIDs or the LWA STARS dialog displaying the Standard Instrument Departures (SIDs) or Standard Terminal Arrival Routes (STARS) for the specified aerodrome.

Combo boxes select the runway and fix point of interest. These both default to 'ALL RUNWAYS' and 'ALL FIXES' when the dialog is first displayed. These options are available on all LWA Maps however only one SID and one STAR dialog can be displayed at any one time. This allows you the freedom to either use separate LWA Maps to examine the available SIDs and STARS, or examine the SIDs and STARS on the same LWA Map, changing the specified aerodrome ICAO code as appropriate.

Individual fixes listed within the SIDs, STARS, and Airways dialogs can be selected with the mouse cursor. Once selected the LWA or Wx Map will be automatically centered on the selected navigation point and the map's zoom level will be checked to ensure a minimum zoom level of 10. To use this feature it is best to have selected the 'Plot Route On Map' option first, otherwise the navigation point may not be visible on the map. It is also necessary to turn off the map centering options if you wish to alter the zoom level and examine the area surrounding the selected navigation point.

Name	Rwy	Fix	Distance	Heading
ASNI2N	27	ASNIP	128km (69nm)	NW 304
ASNI3P	09	ASNIP	128km (69nm)	NW 304
BPK2P	09	BPK	146km (79nm)	SE 144
DTY3N	27	DTY	74km (40nm)	SSE 168
DTY4P	09	DTY	74km (40nm)	SSE 168
POL2P	09	POL	114km (61nm)	INW 333
TNT2N	27	TNT	34km (18nm)	NW 317
TNT3P	09	TNT	34km (18nm)	NW 317
WAL2N	27	WAL	136km (73nm)	WNW 298
WAL3P	09	WAL	136km (73nm)	WNW 298

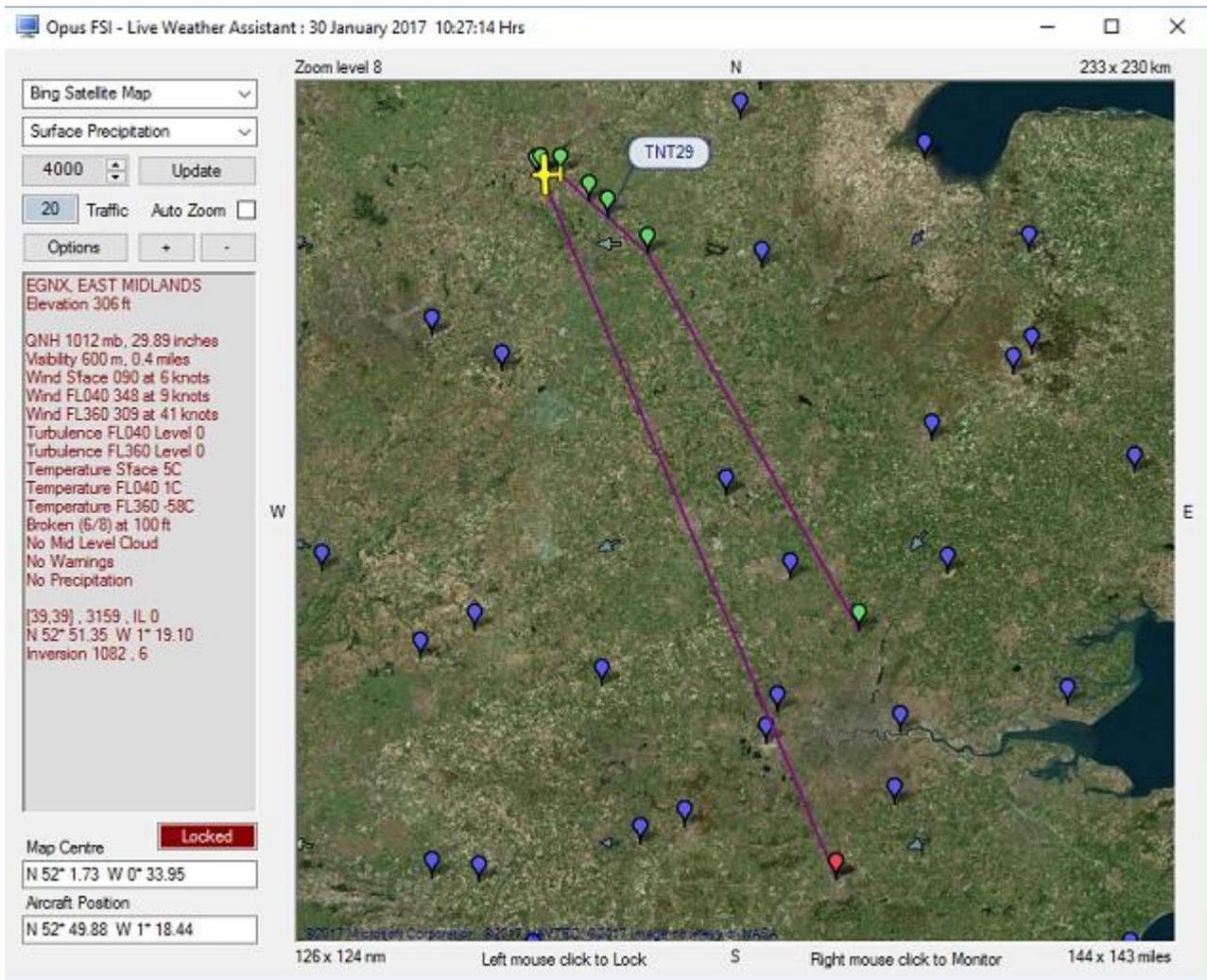
RW09	Distance	Heading
IEMW2	6.3 km (3.4 nm)	E 089
IEMW7	10.0 km (5.4 nm)	SE 132
TNT29	6.3 km (3.4 nm)	SE 130
NUTBA	14.2 km (7.7 nm)	SE 131
BPK	114.0 km (61.6 nm)	SSE 150

ALL RUNWAYS ALL FIXES

Click on **Plot Route on Map** to display your selected route on the map. You can click again on the same route to remove it from the map. The text box immediately above the **Plot Route On Map** button displays the sequence of SID or STAR fixes in a sequential format so that they can be easily copied (highlight + Ctrl C) and pasted (Ctrl V) into your flight plan.

The new LWA Maps plot all route lines in a dark magenta colour, all flight plan waypoints in magenta, the departure in **green**, the destination in **red**, all alternates in **red**, all SID fixes in **green**, and all STAR fixes in **red**. In other words,

Magenta = Route Lines and Flight Plan Waypoints,
 Green = GO = Departure Point and SID Fixes,
 Red = STOP = Destination and STAR Fixes.

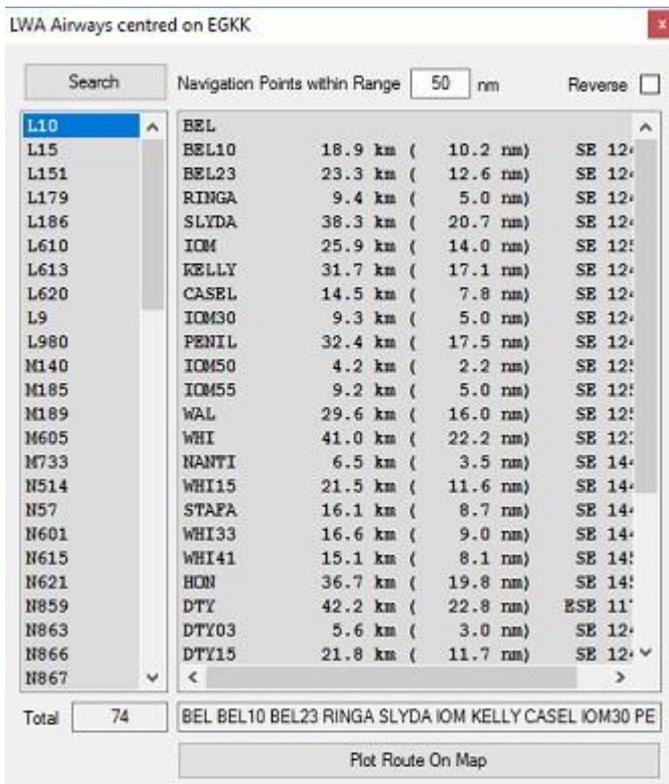


Airways

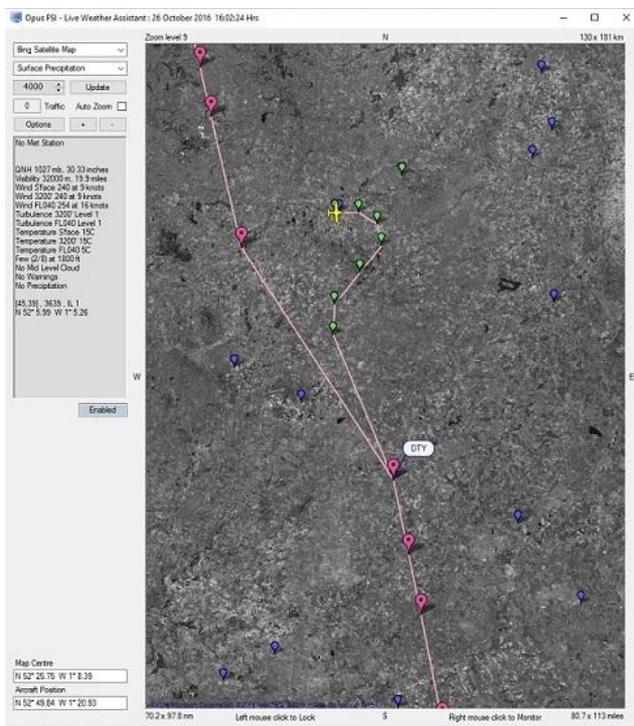
The **Airways** button is accessible from an Aerodrome or Met Station Monitor dialog. The button option opens the LWA Map Airways dialog which can be used to search for all Airways that have Navigation Points within the specified distance from the station (default 50nm).

Clicking on any listed Airway displays a list of its Navigation Points.

The **Reverse** checkbox option can be used to reverse the order of the Navigation Points making it handy to cut and paste from the lower text box.



The **Plot Route On Map** option will plot the Airway's route on the LWA Map. Large pink dotted markers along the route are used to identify each of the Airway's navigation points.



Individual fixes listed within the Airways dialog can be selected with the mouse cursor. Once selected the LWA or Wx Map will be automatically centered on the selected navigation point and the map's zoom level will be checked to ensure a minimum zoom level of 10. To use this feature it

is best to have selected the 'Plot Route On Map' option first, otherwise the navigation point may not be visible on the map. It is also necessary to turn off the map centering options if you wish to alter the zoom level and examine the area surrounding the selected navigation point.

The Airways option is not available on the small footprint maps.

N.B. At present the new 'Airways' LWA Map feature is not functional on OpusFSI CLIENT systems.

The **Map Centre** and **Aircraft Position** coordinates are displayed at the bottom of the LWA dialog.

The Live Weather Assistant (LWA) dialog can be resized and maximised on the screen.

If the map is not displayed then it is possible that your map may be hidden behind the sim window, if so minimise the sim, reposition the Weather Map and continue.

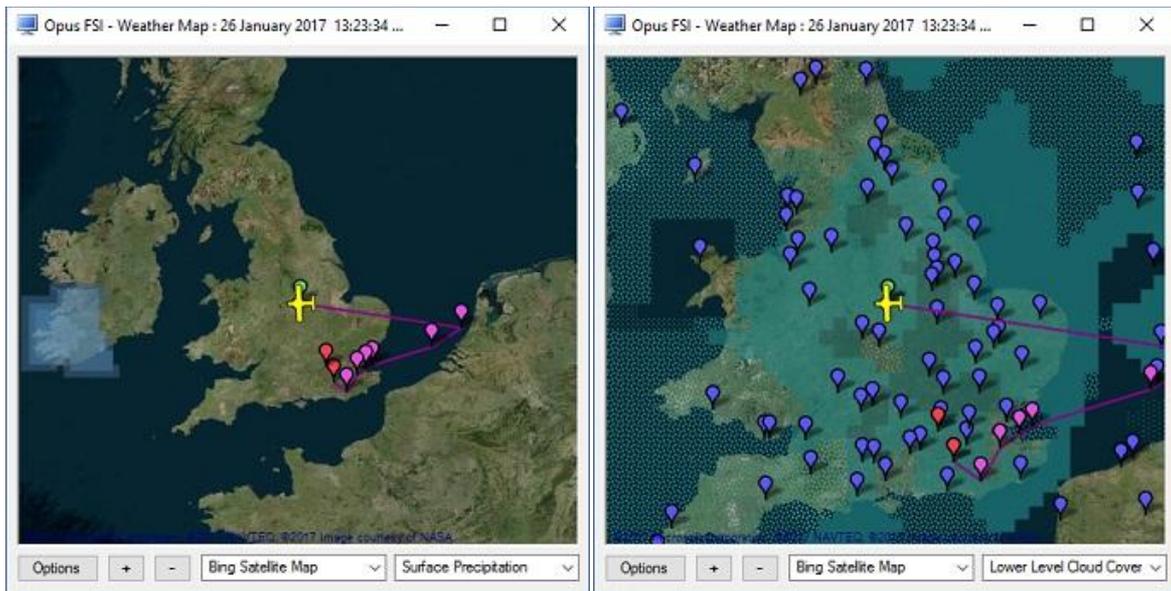
Small Footprint Weather Maps

The **Wx Map** option displays weather data but with a much smaller screen footprint. Select the geographic map type and weather data options from the dropdown menus, you can also scroll through the data displays using your mouse scroll button.

The **Options** button enables you to select further options as described above for the LWA Maps with the exception that you cannot display airways.

The + plus and - minus buttons are used to zoom in and out. Up to four small maps may be displayed.



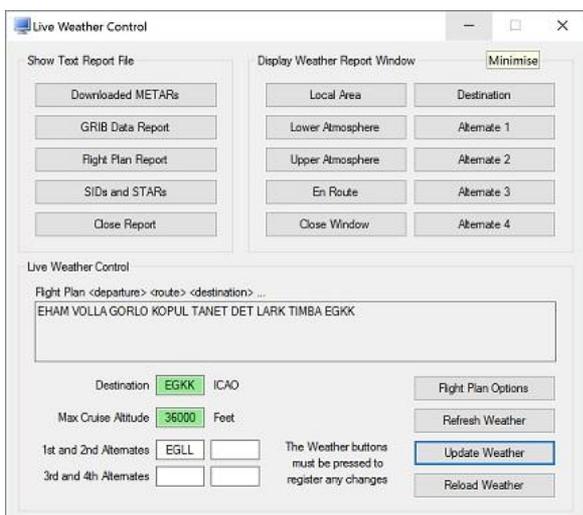


Live Weather Assistant can also be used on networked client PCs/laptops. If you are using a networked client only for Live Weather Assistant (and/or Client Side Live Weather Control) then NO license, sim, or FSUIPC is needed on the client, they are only required if you are using Live View.

Client Side Live Weather Control

If you are using the networked client PC only for live weather control (i.e. entering weather or flight plan data, or requesting reports via the client dialogs) then NO license, sim, or FSUIPC is needed on the client. Configure your client PC in accordance with the Getting Started Networked PCs guide.

On the Client main form there is a button labelled **Live Weather Control**. Select this to display the Live Weather Control dialog.



You are presented with options to display the text reports, weather report windows, edit the flight plan and other flight parameters. Text reports are displayed on the client, weather report windows are displayed on the server.

Reload Weather (no cloud/visibility smoothing) and **Update Weather** always checks the GRIB for currency and downloads all required METARs from your specified Weather Server (the NOAA site is the Primary source). **Refresh Weather** updates the weather using the previously downloaded METARs, it builds a new weather map and refreshes the weather within the sim. If no previous weather data has been downloaded then the Refresh option does the same as the Update option.

Weather Location and Displaying Weather Maps on the Client

You can also use the client for locating weather using the **Wx Locator** button option on the main Client form and for displaying weather maps using the **LWA Map** and **Wx Maps** buttons.

PMDG FMC Wind/Temp Data Request

You must have a PMDG aircraft selected.

Enable GRIB data. You must enter or Import your flight plan into Opus, then the FP must be activated either via the OpusFSI Process option in the Flight Plan dialog or via the P3D options. Specify your Destination and Cruise Altitude, then Update the weather.

Only after this will Opus be able to generate the file. The PMDG weather report is generated in "OpusPMDGData.txt" and copied as XXXXYYYY.wx (where 'XXXX' is the departure's ICAO code and 'YYYY' is the destination's ICAO code) into the <sim>\PMDG\WX folder.

There is no need to cut and paste anything. In the airplane on the LEGS page select WIND DATA, press WIND DATA REQUEST and the data will automatically load the values into the FMC, press EXECUTE to finish. Note that it is best if your cruise altitude is already entered on the PERF INIT page before you do this as it helps the PMDG algorithm narrow down the correct altitudes to use.

If you are using PFPX to generate your flight plan then it must be exported in two formats, one for the PMDG to its dedicated folder, and one in P3D .pln format to your docs/<SIM>/ folder so Opus can read it.

Trouble shooting ...

Make sure the GRIB data has been downloaded and decoded, if not check your \OpusFSI_v6\FSIDECODER.log file.

Check the content of your OpusPMDGData.txt text file in the OpusFSI_v6\Weather folder. Is your wx data in this file? If so then it's a simple case of not being able to copy the OpusFSI.wx file into your <P3D>\PMDG\WX folder. Perhaps it's a sharing and permissions issue.

OpusFSI uses the English (GB) culture for the decoding format, do not change any settings in this culture especially the decimal separator type.

FSUIPC Settings

FSUIPC is not required on the OpusFSI SERVER system unless you intend to run P3D at increased simulation rates. FSUIPC is required on Live View OpusFSI CLIENTs that are used to display camera views.

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

Turn everything off in FSUIPC, we recommend disabling all settings. We do not use FSUIPC for any weather or turbulence related effects.

If you choose not to install/activate FSUIPC then at the moment Opus will not be able to pause the sim, it is normally paused when opening certain Opus dialogs. Hence you will have to pause and unpause the sim manually.

To disable FSUIPC simply remove the associated <Launch.Addon>...</Launch.Addon> entries within the simulator's dll.xml file.

```
<Launch.Addon>
  <Name>FSUIPC 5</Name>
  <Disabled>False</Disabled>
  <Path>Modules\FUIPC5.dll</Path>
</Launch.Addon>
```

Reporting Anomalies and Errors

Please email your **c:\OpusFSI_v6\Weather\OpusWeather.txt** file along with any report. This text file contains a copy of all the downloaded METAR data along with the identity of your nearest weather station. We can use this file to import the same meteorological conditions into our system and check the results.

Please email reports to opusfsi@opussoftware.co.uk

FAQ

I can't get the dynamic weather to work

Ensure you have identified the correct sim type (for the sim you are currently running) and installation folder in the Configuration dialog and have sharing enabled, and set sharing and security permissions as per the Getting Started guide.

If you don't have Opus options within the add-on menu then it hasn't been installed correctly. Follow the OpusFSI Getting Started Guide (or OpusFSI Getting Started Guide) very carefully. Do not

install Opus in a sub-folder of Opus Software, Prepar3D or Program Files since it causes permission problems.

Run your sim before running Opus. Make sure your internet connection is working. Ensure you have **Enable Live Weather Engine** checked in the Configure dialog. You may have **Disable Weather Update on Startup** enabled in the Weather dialog. Ensure you have **unchecked Import METAR Data From File, unchecked Enable World Weather Theme, and unchecked Global METAR Conditions** in the Weather dialog. If you open the spy window and force a weather update via the sim Add-ons menu (or click on Update in the Weather dialog) then you should see the weather being generated. Also if you open the weather report window via the sim add-on menu it will show the last time of update.

Unable to view Live Weather or "Unable To Update Dynamic Weather" spy message

This error most likely results from a failure to copy the generated OpusWeather.WTB file. The software needs to copy this from ... <opus_install_folder>\Weather\OpusWeather.WTB to ... <sim_install_folder>\Weather\Themes\OpusWeather.WTB

So, you have either,

not specified the sim option and identified your sim installation folder correctly within the OpusFSI Configuration dialog,

or,

your system does not have sharing enabled, or security and permissions set to allow OpusFSI to write to the sim installation folder.

You can check the first by confirming there is a Weather sub-folder.

You can check the second using the Command Prompt, navigating to c:\OpusFSI_v6\Weather and trying to manually copy the file. Most probably you have installed the sim in the Program Files folder and there is no sharing or access rights to this folder. Refer to our Getting Started guide for details on how to set up sharing and security permissions.

I can't load or decode GRIB data

Tick **Enable GRIB Forecast Data** in the Weather Download Options dialog. Check the Upper Atmosphere Weather Report window, it will notify you if there is no GRIB data.

Check your \OpusFSI_v6\FSIDECODER.log file for errors.

If you use a proxy server or have configured Internet Explorer to use a proxy server (IE settings, Internet options, Connections tab) then it may not allow you to download files in which case you will not get GRIB data

If your GRIB data is not decoding then it may be caused by a setting in the Windows operating system culture setting. OpusFSI automatically selects and uses a generic English (GB) culture to ensure correct floating point number conversion. We have had problems where people have edited the English culture setting and changed the Windows Number format decimal separator from a dot to a comma. Ensure the dot character is assigned as the decimal separator in the Windows Number format, not the comma.

If you can't extract or decode GRIB data then delete everything except the degrib.exe program from your OpusFSI_v6\GRIB folder. If this doesn't work delete the GRIB folder and reinstall OpusFSI since the degrib.exe program may be corrupted.

Ensure you don't have more than one copy of OpusFSI_v6 installed via Control Panel. If you do then uninstall all versions and reinstall the latest version. Do not install OpusFSI in a sub-folder of **Opus Software, P3D or Program Files** since it causes permission problems.

Never run antivirus software when using the sim, all AV software will adversely affect the sim performance.

Weather keeps changing erratically

Ensure you don't have any other software packages injecting the weather. In P3D, Weather, set your Current Weather to any weather theme, just don't enable the real world weather options. Check that no other weather engines are running. Disable AS16 weather using their tool prior to running Opus since their DLL will corrupt the weather. If flying online don't inject weather from FSInn etc.

Too much haze or bad visibility in P3D

If you have a pea soup fog around your aircraft when flying with P3D then you most likely have Volumetric Fog enabled in P3D and do NOT have the option enabled within the OpusFSI Weather Preferences dialog.

P3D can't load weather theme error message

It could be that you are loading a saved flight which is referring to a non-existent weather theme. Click OK to that sim error message, update the weather once more, then resave your flight.

P3D crashes when I load a saved flight

Load the flight without running OpusFSI, save the flight, then run OpusFSI.

I see horizontal 'bands' of haze with clear areas between

This is a known issue with 3rd party packages, make sure you have disabled your 3rd party weather engines and in addition disabled/removed all their visibility, haze and fog effects.

A way to remove it with AS2012 is:

- 1: Start AS2012
- 2: Start P3D, load a flight
- 3: Once you are at airport of choice, open AS WX Options / Visibility
- 4: Make sure the following options are ticked;
 - a: fog layer generator
 - b: Untick 'Use stratus for fog'
 - c: Tick 'Enable Visibility Graduation and Smoothing' and set to 9000ftThe sliders should be set from top to bottom 0,65,65
Save and Apply.
Do this in the Status page also.

5: Shut down AS and P3D

Now repeat steps 1-3.

This time you will do the reverse,

- a: Untick fog layer generator
- b: Untick 'Use stratus for fog'
- c: Untick 'Enable Visibility Graduation and Smoothing'

Save and Apply as above.

I get a consistent static cloud layer that forms above the aircraft (cloud of doom)

This is not an OpusFSI problem, we have just provided a solution to a problem that occasionally occurs on some systems due to a corrupt or faulty cirrus overcast bitmap mask file in the P3D Texture folder. If your system has a faulty bitmap file it will be quite obvious, there will be a thick cloud hovering above you wherever you fly.

If your system suffers from this problem then please follow the instructions below for the cure.

Make sure you have disabled your 3rd party weather engines and in addition disabled/removed all their visibility, haze and fog effects. You must replace the cirrus_overcast03.bmp file within your flight simulator's Texture folder as follows,

1. Navigate to your simulator's texture folder, <Prepar3D>\Texture
2. Rename your cirrus_overcast03.bmp file to cirrus_overcast03_foggy.bmp.
3. Truncate our cirrus_overcast03_Opus.bmp filename to cirrus_overcast03.bmp.
4. Restart your P3D simulator.

I tried importing METAR data from a user specified import file but it didn't work.

METARs are specific to a location unless you use the GLOB ICAO code which is global. If you use a METAR for a specific station and try to import it when you are outside the 1280km x 1280km area of the weather region then the Live Weather Engine will not accept the report since the met station is not within your area. The met station must also coincide with one used within the sim so that OpusFSI, which has a list of all valid sim met stations, can identify its lat/long coordinates, and hence its location relative to your aircraft's current location. If you only have one METAR then change the ICAO code to GLOB and import that.

Overspeed and Underspeed warnings

If you are flying with the sim rate speeded up, especially above x2 then it is possible to get overspeeds or underspeeds. Even at x2 speed, your auto pilot or P3D may oscillate the air speed repeatedly causing repeated overspeeds. You should disable the P3D stress causes damage option.

Overcast

Low Overcast Effects come into force whenever the overcast cloud cover is less than about 6000 feet AGL. You must be IN the Low Overcast Effect to see it. Overcast by definition means 90% or more cloud coverage. Don't expect to see solid blanket type overcast when looking vertically downward ... you WILL see transparent holes just like you do in real life until you get IN an OpusFSI Low Overcast Effect (an overcast below 6000 feet).

Wind shifts

The possibility of wind shifts cannot entirely be ruled out, this is due to bugs in the P3D code, that's why you should always disable the '**Aircraft stress causes damage**' sim option.

If you are flying with the sim rate speeded up, especially above x2 then it is possible to get wind shifts. Certain aircraft sims are more susceptible to wind shifts.

If the sim is struggling to cope due to the number of add-on packages, detailed scenery, high definition high resolution cloud textures (we recommend non HD low resolution textures) etc then wind shifts are more likely.

If your system has wind shifts enable the **Adjust Sim Friendly** options (Weather Download).

PMDG 737 NGX Problems

Problems with "S" turns, auto pilot disconnects, wind shear alerts at cruise altitude and severe wind shifts may be cured by putting in an assumed temp in the NGX FMC Perf page, which you can get from your GRIB report (OpusWeatherReport.txt or Upper Atmosphere weather report window), for cruising altitude, ensure you don't omit the minus sign if appropriate.

Winds are incorrect

If the surface winds are not correct check that you don't have the **Relocate Weather, Import METAR Data from File, Global METAR Conditions** or **World Weather Themes** enabled by mistake.

Set all weather defaults before flight, specify your **Destination** and **Max Cruise Altitude**, and update the weather. Ensure the GRIB data is downloaded by monitoring the download in the OpusFSI Weather Reports, Lower or Upper weather reports, or the Spy window. Consult the various weather information, the Lower and Upper weather reports, the OpusWeatherReport (GRIB) report text file, your OpusFlightPlan.txt report file, the weather maps etc.

My temperatures are too high

Make sure you put in an assumed temp where possible for your aircraft sim (e.g. in the NGX FMC Perf page), which you can get from your GRIB report (OpusWeatherReport.txt or Upper Atmosphere weather report window), for cruising altitude, ensure you don't omit the minus sign if appropriate.

Ambient temperature = SAT (Static Air Temp) = OAT (Outside Air Temp)

SAT = Static Air Temp ... i.e. what the air temp would be if it were static (or when your airspeed is zero).

TAT = Total Air Temp ... the effective air temp taking into account your airspeed.

The TAT is a calculated value, it is calculated within the sim or the aircraft sim and is always warmer than the SAT due to compressional heating of the air molecules. The air has to be slowed down to be measured and hence gets heated. Hence the TAT is dependent on your airspeed (actually the square of your airspeed as a Mach number) and also on the ratio of specific heats of the ambient air (i.e. how dry or moist the air is - which effects air density - which determines the number of air molecules being heated).

At the typical airliner cruise speeds (0.75+ Mach) a TAT of 20 to 28 degrees warmer than SAT is perfectly normal.

I don't have any turbulence

If you are not using Live Camera then enable General DHM in the Server's Configuration dialog.

For turbulence on the aircraft itself select both the **Bump Aircraft** (not for P3D) and Turbulence Effects options (**Turbulent Motion** and/or **Turbulent Bump**) within DHM. Enable sim turbulence (which is set via the sim menu option - Options, Settings, Display. Select the Weather tab, there is an option for turbulence and thermal effects on the aircraft).

If you can't see the DHM effect on your aircraft then set the "\\OpusFSI_v6\P3DSERVER.EXE" file properties (compatibility tab) to "Run as Administrator". This can be done by right clicking on the program in Windows Explorer or right clicking on the desktop shortcut.

I don't have any wing flex

To see wing flex enable sim turbulence, also the 'Advanced Animations' option in the sim menu option - Options, Settings, Display - Graphics tab.

Cloud popping

*We have introduced our new **Cloud Smoothing** software in Beta 3.38. This software preserves all localised cloud coverage during weather updates and hence prevents all major cloud popping during the weather updates.*

You should note that,

- P3D is responsible for positioning all clouds on the screen, the weather engine cannot do this, it can only specify the cloud coverage and associated parameters such as cloud type, cloud base, depth etc.
- P3D will reposition all clouds each time the weather is injected, nothing can stop this.
- P3D selects all cloud bitmap textures and renders them on the screen, the weather engine specifies the cloud coverage, type, and other parameters, but it is P3D that does the rest.
- P3D will, for good reasons, extend patterns of cloud coverage, including areas of clear sky, across cell boundaries, each weather cell being 10 x 10 miles in size. If P3D strictly adhered to the cellular pattern then the weather would look completely phoney and unreal. So it 'bleeds' the weather across the cell boundaries, extending or retreating areas of cloud coverage as it see fit.

This last effect is what most people refer to when they talk about cloud popping, really as a result of not knowing how P3D depicts the weather and wrongly assuming the weather engine is causing it or can stop it.

If you don't have Cloud Smoothing enabled and after a weather update you see the cloud around you disappear then take a look behind you, its odds on that P3D had previously decided to extend this cloud cover all around you and after the weather update it gives more precedence to the new weather and cloud cover that is either in front or around you. It is also possible to notice cloud that is around you retreating away into the distance some miles in front of you. Again this is just P3D extending or retreating the cloud boundaries as it sees fit in an attempt to eliminate the cellular structure and prevent a mosaic effect in the sky.

If you actually monitor the Opus Lower Cloud Cover weather map you will see that the map and the cloud coverage is very stable, it obviously will change to reflect the reported cloud coverage in the METAR reports, so if they change the map will change but in a very predictable way. However you may notice that during weather updates or refreshes P3D has decided to reposition the cloud boundaries, extending some and retracting others, so that the cloud coverage around you changes drastically. Nothing much can be done about this as no engine has control over the P3D code.

You can try setting the 'Cloud Smoothing' Opus weather option, this guarantees to preserve the cloud cover surrounding your aircraft whenever it can. This can help minimise cloud popping although nothing can stop it altogether bar rewriting the P3D code.

Error message "access denied" when trying to display reports on the client LWE Control PC

You must set the sharing, sharing permissions, and security permissions on your server for the OpusFSI installation drive and folder so that the client will be able to access the files in your OpusFSI_v6\Weather folder on your server. See the **Getting Started Guide for Networked PCs** for details.

In the client configuration dialog when specifying the network identity (name or IP address) of your main sim server machine if you are using *Computer Names* in the configuration then try using *IP addresses* and vice versa.

Error message " The network name cannot be found" when trying to display reports on the client LWE Control PC

All drives should be shared using their same letter code (drive share name of C or D etc) otherwise the remote software will not be able to build its correct file specifications.

Why can't I run the Live Weather Engine on a client PC?

The LWE does not affect the performance of the simulator at all so does not need to be offloaded onto a client. If it were offloaded it would actually be far less efficient and may even impact on the simulators performance since all data would not only have to be communicated via the LAN but it would also make it more difficult to supervise the real world intelligent turbulence in real time. Hence, the clients can be used to control and monitor weather related data but the LWE itself runs on the main server system.

Ensuring AI traffic uses the correct runway

To ensure your AI traffic uses the correct runway you can do one of two things,

1. Check the current wind and specify that wind manually within the sim before loading the flight. It doesn't matter about any other weather parameters since Opus will update it, but it will allow you to stipulate what the wind is going to be (matching the RW) BEFORE the flight is loaded.
2. Simply select RW Weather in the sim Weather settings, update the sim weather and ensure at least the correct wind has been injected. This requires that your point of departure is a met station and has a valid METAR in the now almost defunct Jeppesen database. Again this will set the wind BEFORE the flight is even loaded.

Now you can take your time, process your flight plan, specify your intended destination and cruise altitude and finally instruct Opus to generate and load the weather. The Opus LWE will automatically put the sim back into custom weather mode.

I think you will find using this simple procedure will always ensure your AI traffic start out using the correct runway.