

Honeywell Weather Information Service User Manual

Proprietary Notice

This document and the information disclosed herein are proprietary data of Honeywell Inc. Neither this document nor the information contained herein shall be reproduced, used, or disclosed to others without the written authorization of Honeywell Inc., except for use on recipient's equipment.

Notice - Freedom Of Information Act (5 USC 552) And
Disclosure Of Confidential Information Generally
(18 USC 1905)

This document is being furnished in confidence by Honeywell Inc. The information disclosed herein falls within exemption (b) (4) of 5 USC 552 and the prohibitions of 18 USC 1905.

This document contains technical data and is subject to U.S. export regulations. These commodities, technology, or software were exported from the United States in accordance with the export administration regulations.

Diversion contrary to U.S. law is prohibited.
ECCN: 7E994, NLR Eligible

Honeywell

Honeywell International Inc.
Global Data Center
15001 NE 36th Street
Redmond, WA 98052
U.S.A.
CAGE: 97896

Telephone: 1-888-634-3330 (U.S.A./Canada)
Telephone: 1-425-885-8100 (International)
Web site: <http://www.mygdc.com>

Honeywell-Confidential

THIS COPYRIGHTED WORK AND ALL INFORMATION ARE THE PROPERTY OF HONEYWELL INTERNATIONAL INC., CONTAIN TRADE SECRETS AND MAY NOT, IN WHOLE OR IN PART, BE USED, DUPLICATED, OR DISCLOSED FOR ANY PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF HONEYWELL INTERNATIONAL INC. ALL RIGHTS RESERVED.

Honeywell Materials License Agreement

The documents and information contained herein (“the Materials”) are the proprietary data of Honeywell International Inc. and Honeywell Intellectual Properties Inc (collectively “Honeywell”). These Materials are provided for the exclusive use of Honeywell Service Centers; Honeywell-authorized repair facilities; operators of Honeywell aerospace products subject to an applicable product support agreement, their wholly owned-subsiidiaries or a formally designated third party service provider; and direct recipients of Materials from Honeywell’s Aerospace Technical Publication Distribution. The terms and conditions of this License Agreement govern your use of these Materials, except to the extent that any terms and conditions of another applicable agreement with Honeywell regarding the operation, maintenance, or repair of Honeywell aerospace products conflict with the terms and conditions of this License Agreement, in which case the terms and conditions of the other agreement will govern. However, this License Agreement will govern in the event of a conflict between its terms and conditions and those of a purchase order or acknowledgement.

1. License Grant - If you are a party to an applicable product support agreement, a Honeywell Service Center agreement, or an authorized repair facility agreement, Honeywell hereby grants you a limited, non-exclusive license to use these Materials to operate, maintain, or repair Honeywell aerospace products only in accordance with that agreement.

If you are a direct recipient of these Materials from Honeywell’s Aerospace Technical Publication Distribution and are not a party to an agreement related to the operation, maintenance or repair of Honeywell aerospace products, Honeywell hereby grants you a limited, non-exclusive license to use these Materials to maintain or repair the subject Honeywell aerospace products only at the facility to which these Materials have been shipped (“the Licensed Facility”). Transfer of the Materials to another facility owned by you is permitted only if the original Licensed Facility retains no copies of the Materials and you provide prior written notice to Honeywell.

2. Rights In Materials - Honeywell retains all rights in these Materials and in any copies thereof that are not expressly granted to you, including all rights in patents, copyrights, trademarks, and trade secrets. No license to use any Honeywell trademarks or patents is granted under this License Agreement.

3. Confidentiality - You acknowledge that these Materials contain

information that is confidential and proprietary to Honeywell. You agree to take all reasonable efforts to maintain the confidentiality of these Materials.

4. Assignment And Transfer - This License Agreement may be assigned to a formally designated service designee or transferred to a subsequent owner or operator of an aircraft containing the subject Honeywell aerospace products. However, the recipient of any such assignment or transfer must assume all of your obligations under this License Agreement. No assignment or transfer shall relieve any party of any obligation that such party then has hereunder.

5. Copies of Materials - Unless you have the express written permission of Honeywell, you may not make or permit making of copies of the Materials. Notwithstanding the foregoing, you may make copies of only portions of the Material for your internal use. You agree to return the Materials and any copies thereof to Honeywell upon the request of Honeywell.

6. Term - This License Agreement is effective until terminated as set forth herein. This License Agreement will terminate immediately, without notice from Honeywell, if you fail to comply with any provision of this License Agreement or will terminate simultaneously with the termination or expiration of your applicable product support agreement, authorized repair facility agreement, or your formal designation as a third party service provider. Upon termination of this License Agreement, you will return these Materials to Honeywell without retaining any copies and will have one of your authorized officers certify that all Materials have been returned with no copies retained.

7. Remedies - Honeywell reserves the right to pursue all available remedies and damages resulting from a breach of this License Agreement.

8. Limitation of Liability - Honeywell does not make any representation regarding the use or sufficiency of the Materials. THERE ARE NO OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, (i) WARRANTIES ARISING FROM COURSE OF PERFORMANCE, DEALING, USAGE, OR TRADE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED, OR (ii) WARRANTIES AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES, EVEN IF HONEYWELL HAS BEEN ADVISED OF ANY SUCH INFRINGEMENT. IN NO EVENT WILL HONEYWELL BE LIABLE FOR ANY INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, SPECIAL DAMAGES, INDIRECT DAMAGES, LOSS OF PROFITS, LOSS OF REVENUES, OR LOSS OF USE, EVEN IF INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. TO THE EXTENT PERMITTED BY APPLICABLE LAW, THESE LIMITATIONS AND EXCLUSIONS WILL APPLY REGARDLESS OF WHETHER LIABILITY ARISES FROM BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING BUT NOT LIMITED TO NEGLIGENCE), BY OPERATION OF LAW, OR OTHERWISE.

9. Controlling Law - This License shall be governed and construed in accordance with the laws of the State of New York without regard to the conflicts of laws provisions thereof. This license sets forth the entire agreement between you and Honeywell and may only be modified by a writing duly executed by the duly authorized representatives of the parties.

Copyright - Notice

Copyright 2014, Honeywell International Inc. All rights reserved. Honeywell and Flight Sentinel are registered trademarks of Honeywell International Inc.

All other marks are owned by their respective companies.

Table of Contents

1. Introduction	6
2. Getting Started	8
2.1. Downloading and Installing Weather Information Service.....	8
2.1.1. iPad installation:.....	8
2.1.2. Windows installation:	8
2.1.3. License deployment for Weather Information Service application	8
2.2. Running the Weather Information Service	9
2.3. Application startup and initial configuration	10
2.4. Quick overview of the Weather Information Service application	12
3. General Procedures	13
3.1.1. Main Menu	13
3.1.2. Weather products selection	13
3.1.3. Observations Menu.....	13
3.1.4. Forecasts Menu	13
3.1.1. Airport Search box	14
3.1.2. Map	14
3.1.3. Flight level selector	18
3.1.4. Time controller	19
3.1.5. Issue time window	20
3.1.6. Zoom Control	21
3.1.7. Map scale.....	22
3.1.8. Showing legend	22
3.2. Flight plan view.....	23
3.2.1. Loading Flight Plan from remote Honeywell Global Data Center.....	23
3.2.2. Loading flight plan manually from directory	24
3.2.3. Clearing flight plan	25
3.3. Updating and Changing Uplink Weather.....	26
3.3.1. Update intervals of weather products:	26
3.4. Showing Map Overlays.....	26
3.5. Using Tools.....	26
3.5.1. Showing manual	26
3.5.2. Using Vertical Profile	27
4. Limitations	28
4.1. Networking.....	28
4.2. Power Plan Settings for Windows Devices	28
5. Appendix A – Weather Products Descriptions	29
5.1. Weather observations.....	29
5.1.1. Viewing radar observation	29
5.1.2. Viewing Satellite observation.....	32
5.1.3. Viewing airport weather (METAR, TAF, DATIS).....	33

METAR:	33
5.2. Weather forecasts	36
5.2.1. Viewing CB tops forecast.....	37
5.2.2. Viewing Winds aloft forecast.....	38
5.2.3. Viewing Clear air turbulence forecast	39
5.2.4. Viewing Icing potential forecast	40
5.2.5. Viewing SIGMETs.....	41

1. Introduction

Thank you for choosing Honeywell's Weather Information Service (abbreviated as "WIS" further in the document) graphical weather application. Through WIS, users receive graphical and textual weather reports and forecasts that can be used to improve situational awareness during the preflight and en-route phases of flight.

Note: Weather Information Service is not intended to be used as a tactical onboard weather radar display. WIS navigation data is not intended to be used for aircraft navigation purposes. WIS is to be used as a supplementary situational awareness aid only.

Weather Information Service iPad Application

The WIS iPad Application is available for download from the Apple App store. Once the application has been installed, deploy the license file provided by WIS Account Services to enable data update functionality.

Weather Information Service Windows Application

The WIS Windows Application is available for download and installation from the WIS website: <https://www.mygdc.com/new/static/wis.php>. Follow standard windows installation setup procedure. Once the application has been installed, deploy the license file provided by WIS Account Services to enable online data update functionality.

Weather Information Service Customer Support

Customer Support information is available on WIS website: <https://www.mygdc.com/new/static/wis.php>

An electronic version of this publication is available on the Honeywell Pilot Gateway. The Pilot Gateway can be accessed via <https://pilots.honeywell.com>, or through the iOS and Android apps available in the Apple App Store.

Acronyms and terminology

Term	Definition
AIRMET	Airmans' Meteorological Information
ATC	Air Traffic Control
CAT	Clear Air Turbulence
Cb	Cumulonimbus (cloud)
CPT	Captain
D-ATIS	Digital Automated Terminal Information Service
dBZ	Decibels of Z
DD	Display Device
D-VOLMET	Digital meteorological information for aircraft in flight
EASA	European Aviation Safety Agency
EFB	Electronic Flight Bag
ETOPS	Extended range Twin (engine) Operations
F/O	First Officer
FAR	False Alarm Rate
FIR	Flight Information Region
FL	Flight Level
FMC	Flight Management Computer
FMS	Flight Management System
FPLN	Flight plan
GDC	Global Data Center
GDW	goDirect Weather application
HF	Human Factors
HON	Honeywell
ICAO	International Civil Aviation Organization
Kts	Knots
LAT/LON	Latitude/Longitude
METAR	Meteorological report from observation station
MPI	Miles per inch
NAVAID	Navigation Aid
NOTAM	Notice to Airmen
PF	Pilot Flying
PIREP	Pilot Report
PM	Pilot Monitoring
PMO	Project Management Offices
PSI	Potentially Shippable Increments
SIGMET	Significant Meteorological Information
SOP	Standard Operating Procedure
SPECI	Special meteorological report
TAF	Terminal Aerodrome Forecast
TFR	Temporary Flight Restriction
TOD	Top Of Descent
VOLMET	Meteorological information for aircraft in flight
WAFC	World Area Forecast Center
WIS	Weather Information Service
WPNT	Waypoint

2. Getting Started

2.1. Downloading and Installing Weather Information Service

2.1.1. iPad installation:

The Weather Information Service iPad Application is available for download from the Apple App Store.

- Open the App Store and search for Weather Information Service.
- Select the Honeywell Weather Information Service application and Install.

The installed app will appear on one of the iPad home screens.

2.1.2. Windows installation:

Follow procedure mentioned in introduction section:

- Download Windows installation package from WIS website:
<https://www.mygdc.com/new/static/wis.php>
- Double-click exe file to run installation and follow standard Windows installation setup procedure.
- Once application is installed you can run it from desktop icon “Weather Information Service”

2.1.3. License deployment for Weather Information Service application

Normally, airline IT administrator is responsible for license deployment on user's EFB tablet. Whenever manual installation is required, proceed with following information. License is required to enable online data update functionality.

Manual license deployment

- You should have received license file (email, iTunes, other channel like shared drive) from your airline IT or business department. If not, please contact responsible persons for installation.
- If you've received license file (*.winnlic extension) by email – double click to an attachment, select WIS application to open such file, WIS application shall associate license file with itself.
- After the successful license deployment, you can see license file in WIS application Documents

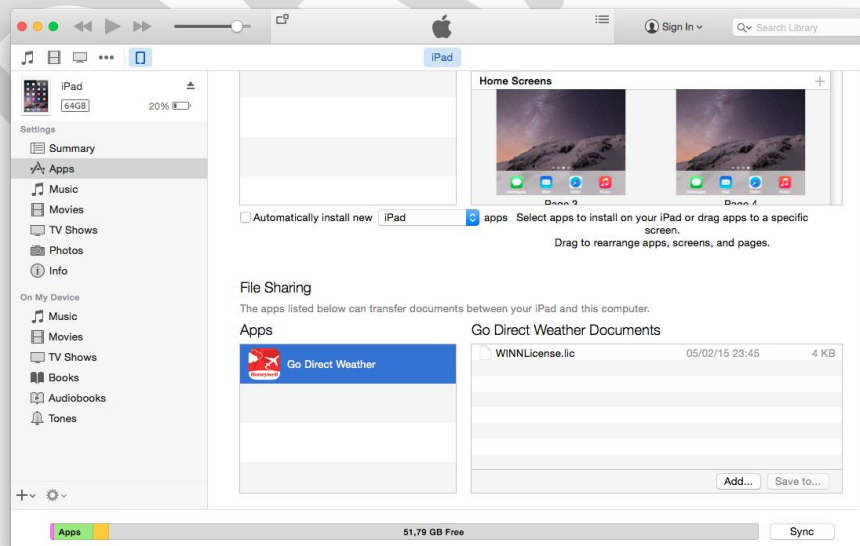


Figure 1 - iTunes of WIS application

-2 - License deployment via iTunes

License deployment by airline IT administrator

As airline IT administrator you should have received email from business department (or whoever is in contact with Honeywell company) with zip file in attachment. Zip file contains list of individual license files. One particular file shall be distributed on concrete device (iPad, Windows tablet).

Manual distribution:

- When installing on iPad, connect target device, put individual file in device's application Documents (see previous chapter). Name of the license file has to be changed to WINNLicense.lic
- When installing on Windows, connect target device, put individual file in directory where is WIS application installed (e.g. c:\Program Files (x86)\Weather Information Service\WINNClient\). Name of the license file has to be changed to WINNLicense.lic

2.2. Running the Weather Information Service

On iPad: tap "Weather Information Service" icon placed on iPad home screen.

On Windows: "Weather Information Service" shortcut is available on desktop or in start menu.

2.3. Application startup and initial configuration

- Once the application has been installed and license is deployed to app, following disclaimer information is revealed after startup:

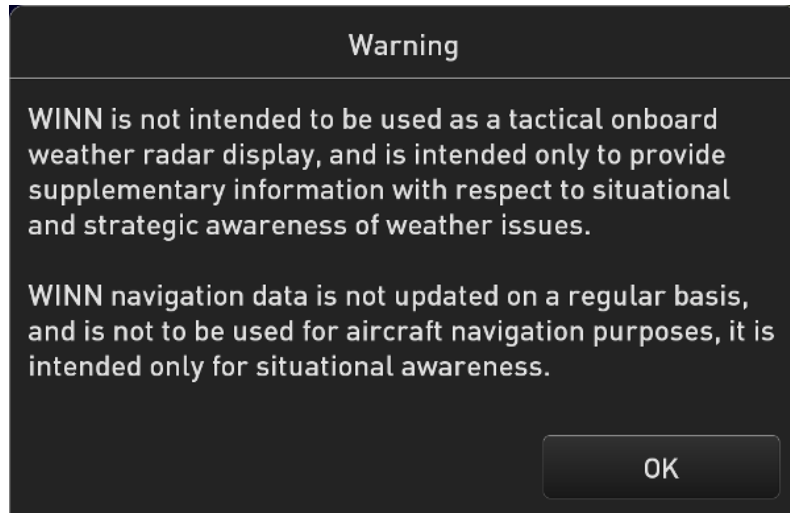


Figure 3 - Disclaimer dialog

- Tap "OK" to confirm.

After confirmation of disclaimer, user is prompted to select area and weather products for downloading weather data:

Figure 4 – Uplink settings window

- Select the tiles in the **Area** section to define the weather uplink coverage area as shown in Figure 4. Tiles turn green when selected.
- Select the desired Wx OBS (weather observation) and Wx FCST (weather forecast) products on the right side of the screen.
- Select time interval (in past history for observations, or in future for forecasts) for which you want to download data of selected product.
- Select 'auto update' interval for which will be data repeatedly requested.
- Confirm your changes (tap OK)

NOTE: Settings for weather uplink can be invoked from main menu: Uplink Wx → Settings

CAUTION: Uplink of weather data is not initiated right after the confirmation; it depends on auto-update option. If user wants to perform immediate uplink, select 'Uplink Wx → Uplink now' from main menu.

Note: If application is not used for 3 hours or more, the weather uplink settings dialog is shown again.

2.4. Quick overview of the Weather Information Service application

WIS is designed for simple and intuitive navigation. The application features seven components that allow users to access the functions and variables that control the application.

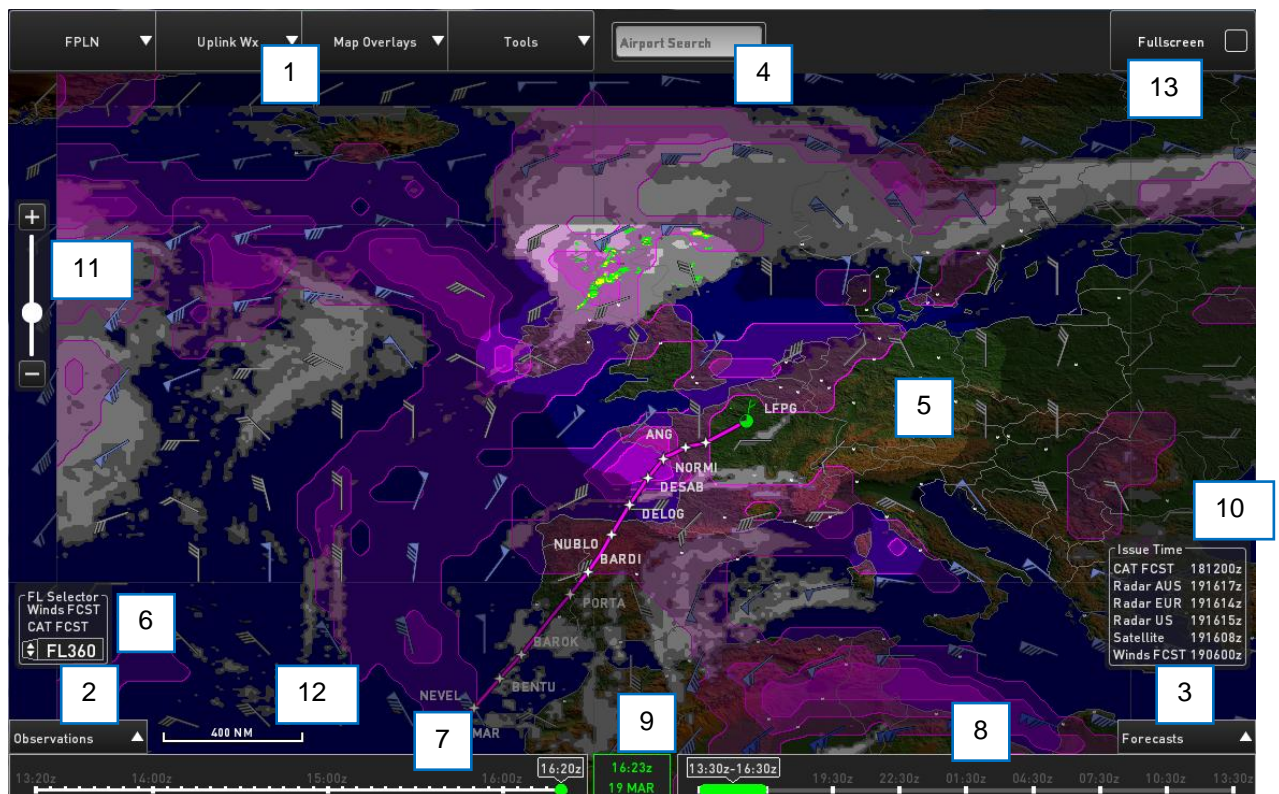


Figure 5 - WIS application window

1. Main Menu
2. Observation menu
3. Forecast Menu
4. Airport search box
5. Map and graphic weather products view pane
6. Flight level (FL) selector for selecting the FL at which the weather products are viewed
7. Observation Time selector for selecting the UTC time at which the weather products are viewed
8. Forecast Time selector for selecting the UTC time interval at which the weather products are viewed
9. Current UTC time
10. Time when a particular weather product was issued
11. Zoom slider
12. Map scale indication

13. Full screen toggle

3. General Procedures

3.1.1. After completing step License deployment for Weather Information Service application

Normally, airline IT administrator is responsible for license deployment on user's EFB tablet. Whenever manual installation is required, proceed with following information. License is required to enable online data update functionality.

Manual license deployment

- d) You should have received license file (email, iTunes, other channel like shared drive) from your airline IT or business department. If not, please contact responsible persons for installation.
- e) If you've received license file (*.winnlic extension) by email – double click to an attachment, select WIS application to open such file, WIS application shall associate license file with itself.
- f) After the successful license deployment, you can see license file in WIS application Documents

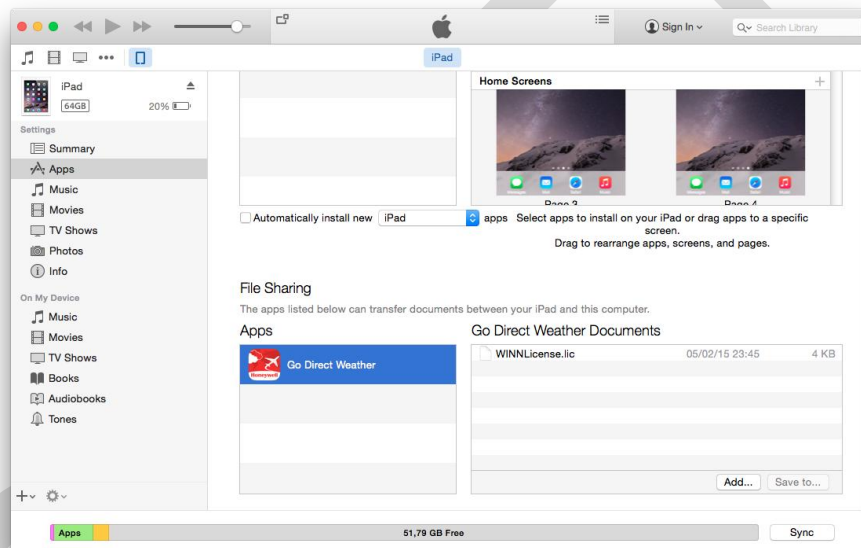


Figure 1 - iTunes of WIS application

-2 - License deployment via iTunes

License deployment by airline IT administrator

As airline IT administrator you should have received email from business department (or whoever is in contact with Honeywell company) with zip file in attachment. Zip file contains list of individual license files. One particular file shall be distributed on concrete device (iPad, Windows tablet).

Manual distribution:

- When installing on iPad, connect target device, put individual file in device's application Documents (see previous chapter). Name of the license file has to be changed to WINNLicense.lic
- When installing on Windows, connect target device, put individual file in directory where is WIS application installed (e.g. c:\Program Files (x86)\Weather Information Service\WINNClient\). Name of the license file has to be changed to WINNLicense.lic

Running the 2.1.3 and selecting the desired weather products from the Observations and Forecasts menus, users can load flight plan, adjust map overlays and views, and use the tools included in WIS. Detailed description of application is in following sub-chapters.

3.1.2. Main Menu

The menu area located in the upper part of the screen is organized as follows on table below:

FPLN	
Load...	Opens the <i>Load Route</i> dialog from local directory/folder or from remote GDC database
Clear...	Removes the flight plan from map, operation is confirmed by confirmation dialog.
Uplink Wx	
Update now...	Sends request for updating weather, command confirmed by confirmation dialog for data update
Settings...	Opens <i>Uplink Settings</i> dialog, see chapter 3.3
Map Overlays	
3.1.3. Airports	Toggles display of Airports. More items are displayed at higher zoom levels. More details in 3.1.2
3.1.4. Nav aids	Toggles display of Nav Aids.
3.1.5. Waypoints	Toggles display of Waypoints.
3.1.6. Terrain	Toggles display of terrain on map.
Tools	
3.1.7. Inspector	Toggles display of Inspector window.
3.1.8. Manual...	Opens this application manual

3.1.9. Weather products selection

3.1.10. Observations Menu

The **Observations Menu** is located in the bottom-left corner of the main screen and allows users to select which weather observation products they want displayed on the map. Available products are Radar, Satellite, and Airport Weather (see appendix A for detailed description of wx products).

3.1.11. Forecasts Menu

The **Forecasts Menu** is located in the bottom-right corner of the main screen and allows users to select which weather forecast products they want displayed on the map. Available products are CB Tops FCST, Winds FCST, CAT FCST, Icing FCST, and SIGMET (see appendix A for detailed description of wx products).

3.1.1. Airport Search box

The search box allows users to perform searching for an airport on map based on ICAO code. The results of search are presented in a drop-down list, which contains results of search. The user can select the airport in list to be presented on map – application will get centered on selected airport. User can use auto-complete function based on typed first two letters of ICAO code of airport.

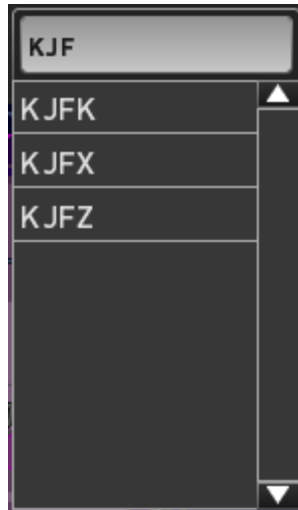


Figure 6 - Airport search box

3.1.2. Map

The Map covers the majority of the main screen, and allows users to “Pinch to Zoom”, “Pan and Scroll”, and “Tap to Select” gestures of touch screen, similar to how most tablet-based applications function. The map can also be controlled by a mouse or track ball on applicable devices. For more information about using these features on a specific device, consult that device’s user manual.

The lateral map is used for geo-referencing of the weather products to facilitate users’ awareness and comprehension of the spatial location of a given weather phenomena with respect to navigation cues.

Note: The lateral map uses plate carrée projection also known as equirectangular projection or the equidistant cylindrical projection. It has implication for showing scale – see chapter 3.1.7.

The lateral map also increases the users’ comprehension of why certain phenomena occurs at given locations with respect to the orography (e.g., occurrence of CAT, mountain obscuration etc.).

In order to allow the high level functions described above, the lateral map includes:

- Political borders
- Orography
- Airports
- Navaids
- Wayoints
- Flight plan (if available)

3.1.2.1 Geopolitical map

The geopolitical lateral map is the main viewer for the geo-referenced weather products and their relative position according to the flight plan, state borders, land and oceanic areas, terrain, and navigation database data.

The lateral map shows in default:

- Political borders (not selectable)
- Orography (selectable)
- Airports (selectable)
- Nav aids (selectable)
- Waypoints (selectable)

3.1.2.2 Update of navigation data

Navigation data contains information (name, position) about airports nav aids, waypoints. These data are periodically updated from GDC ground database and depends on AIRAC cycle period.

NOTE: If navigation data are going to be outdated and new set of data is available on the server, dialog for confirming navigation data uplink is displayed – see figure Figure 7.

CAUTION: Do not update navigation data, when connected in-flight with low-bandwidth connectivity (e.g. ACARS). Data size is about 2-3MB and therefore data transfer might be expensive for airline.

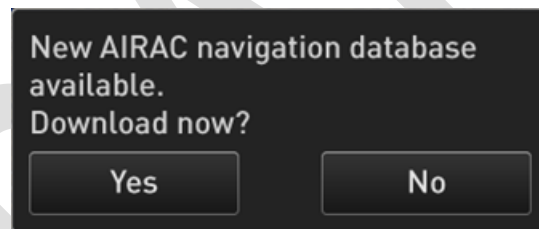





Figure 7 - AIRAC navigation database uplink

3.1.2.3 Terrain and oceanic areas

The lateral map shows land and oceanic areas. In the terrain off mode, the land and oceanic areas are displayed using two colors according to the rules listed in table below.

Area	Sample
Land	
Ocean	
Geopolitical border	

An example of the map with terrain switch off is shown in Figure 8.

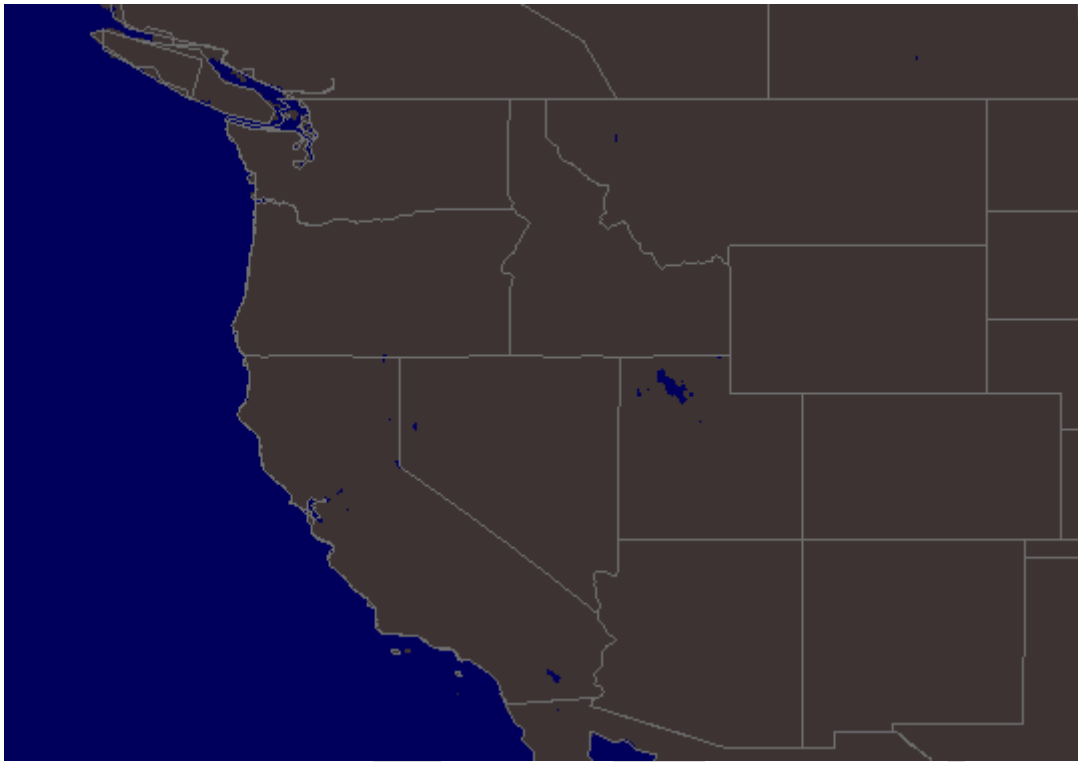


Figure 8 - Map with terrain off example

If the terrain is switched on, the color coding for the oceanic areas remains the same as in the terrain off mode, but colors used for presenting the land areas change to display the terrain elevation.

An example of the map with terrain switch on is shown in Figure 9.

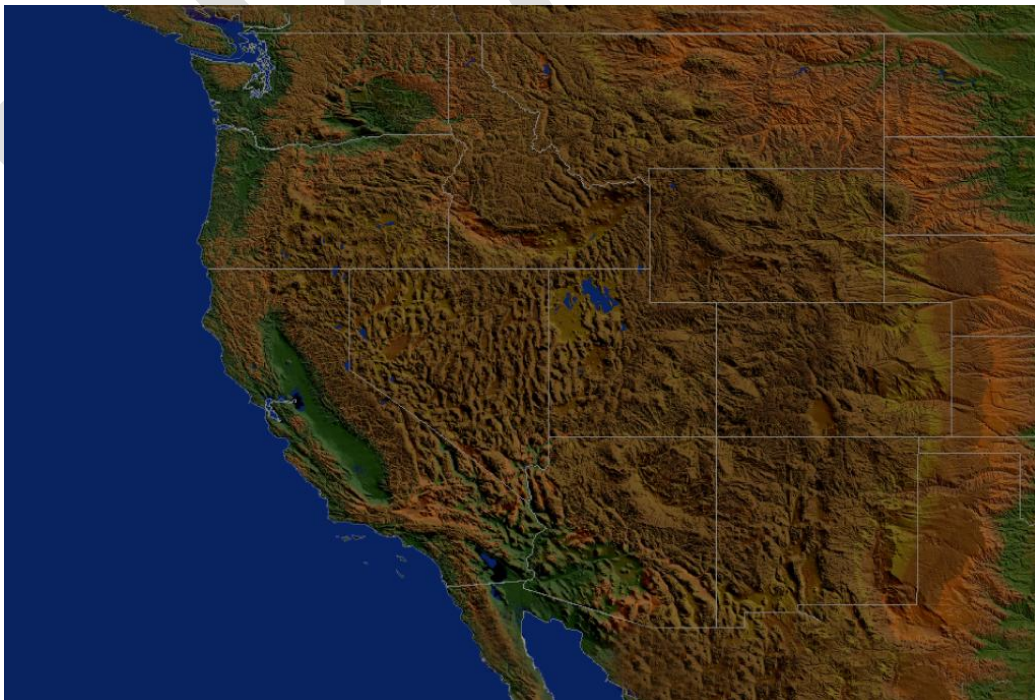


Figure 9 - Map with terrain switched on

3.1.2.4 Zoom Levels

Pinch to zoom in and out gesture is used to zoom in and out the map. Alternatively, it is possible to use plus and minus buttons or marble on the zoom indicator See chapter 3.1.6.

3.1.2.5 Map De-clutter

A de-cluttering scheme is implemented for navigation cues based on the zoom level; de-cluttering schemes for weather products is not part of this chapter.

While a de-cluttering scheme based on the zoom level is proposed here, it is assumed that the main de-cluttering will be performed by the user by selecting and de-selecting map overlays and weather products layers.

3.1.2.6 Airports

Airports are divided into the following categories:

- Major – when the airport has at least two runways with length equal or greater than 6,000 feet and it is a civil or joint airport.
- Medium – when the airport has exactly one runway with length equal or greater than 6,000 feet and it is a civil airport.
- Minor – when the airport's longest runway has length less than 6,000 feet or any civil or joint airport.

3.1.2.7 Nav aids(VOR/DME/NDB)

- Terminal nav aids are excluded – only enroute nav aids are presented on map overlay.
- Nav aids used in flight plan follows different de-clutter rules than nav aids not used in flight plan.
- Nav aids are visible on more detailed zoom level, when zoomed-out, nav aids are invisible.

3.1.2.8 Waypoints

- Terminal waypoints are excluded – only enroute nav aids are presented on map overlay.
- Waypoints are presented as a star symbol (figure below) on map or as an dot at lower zoom level.
- Waypoints are visible on more detailed zoom level, when zoomed-out, nav aids are invisible.



Figure 10 - Navigation data on map (airports, navaids, waypoints)

3.1.3. Flight level selector

The FL selector is used to select a FL for which the weather products are displayed on the map. The weather products which are presented according to the FL selected are:

- CAT FCST
- Winds FCST
- Icing FCST

CAUTION: FL selector is visible only if one of the 3D weather product is selected on map overlay. Affected weather forecast products (available in 3D grid) are Icing, Winds, CB tops, Clear air turbulence.

The FL selector is a window titled “FL Selector” and it is placed in the bottom left corner of the screen. It is detached from the corner of the screen to allow for more comfortable operation by a thumb.

- 1) The FL selector is presented in a compressed and extended view. In the compressed view, the FL selector window consists only of a box with currently selected FL number (e.g., FL230) See below.



Figure 11 - Compressed view of the FL selector example

- 2) If user taps anywhere in the box or on the extended view indication, the FL selector enters the extended mode. In the extended view, swiping the FL box or turning wheel down to select a higher FL or by swiping it down to select a lower FL.

An example of the extended view is presented in Figure below.

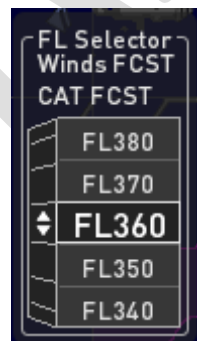


Figure 12 - Extended mode of the FL selector example

NOTE: The maximum FL which can be selected is FL500, the minimum FL which can be selected is FL190.

- 3) User can tap outside of flight level selector to compress it back.

3.1.4. Time controller

Time controller is used for viewing weather observations and weather forecasts effective at time which is selected. The time controller is composed by two individually controlled time sliders for weather observation history and weather forecasts located at the bottom of the display. The current time is located between the two time sliders. An example of the time controller is presented in figure below.

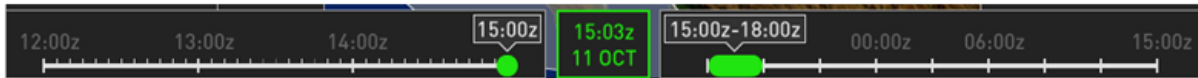


Figure 13 - Time controller example

2.4.4.1 Current time

Current time is a readout of current system zulu time. It is presented in a green framed box using green font.

CAUTION: System time in the EFB tablet has to be set-up is always correct (it is not dependent on time-zone, application recalculates automatically to zulu time). If system time is wrong, application might request data for different timeframe than expected by user.

2.4.4.2 Observations time slider

Observation time slider is located left from the current time. It is composed of a timeline starting 3 hours in the history from the current time. It includes marked times representing the highest granularity of the data of weather observations – Radar (i.e. 5 min). The marker is white if data is available for the selected products at that time. The marker is grey when the data is not available for the selected weather products at that time.



Figure 14 - Observation time slider in disabled state



Figure 15 - Observation time slider presenting the most recent data



Figure 16 - Observation time slider presenting not the most recent data

The slider is a solid circle. By default when no observation product is selected, the slider is disabled (Figure 14). When enabled, it can be either white or green colored based to indicate whether the effectivity of the selected time falls within the current time period (green color, Figure 15) or not (white color, Figure 16) .

- 1) User has to select from observations menu radar and/or satellite observation (METAR is not controlled by time controller, it has no historical overview)
- 2) The user may select a specific time in the weather history to be viewed in the view pane by swiping the slider or by selecting it by tapping specific time.

- 3) When the current time is selected, the time is “snapped” to the current time and the time selection will automatically move with the current time in order to present always the most recent data.

Note: Whole hours are marked above the time markers. A box above the slider presents the selected time.

CAUTION: Time slider reflects only downloaded data valid at selected time, so it depends on Uplink settings. If no observation or forecast is available (slider control is grey), user has to configure and download data for required time frame. See chapter 3.3 .

CAUTION: METAR text weather observation is not driven by observation time-slider. METAR text weather observation shows latest data relevant for current time.

2.4.4.3 Forecasts time slider.

Forecasts time slider is located right from the current time. It is composed of a timeline starting with the beginning of the interval of a forecast which is still effective at the current time. It includes marked times representing the highest granularity of the data of WAFC weather forecasts - 3 hours. The forecasts time slider includes next 24 hours from the current time (8 forecast intervals in total).

The slider can be either white or green colored based to indicate whether the effectivity of the selected time interval falls within the current time period (green color) or not (white color).



Figure 17 - Color indication of current time effectivity

- 1) The user may select a specific time interval in the weather forecasts to be viewed in the view pane by swiping the slider or by selecting it by tapping time interval.

To indicate that data is missing, the color of the timeline changes to grey within a time interval for which data from the selected products is missing.



Figure 18 - Color indication of unavailable forecast

CAUTION: The Forecast slider controls time for every forecast products, except for SIGMETs. SIGMET weather forecast is only relevant for current time.

CAUTION: Do not combine past historical observations with future forecasted data on one map overlay – displayed situation is then for different timeframes.

3.1.5. Issue time window

Issue time window is a displayed window located at the bottom right corner of the view pane. It includes information about product issue time for the currently selected weather products at selected time on time slider(s). In other words it shows recency of the data.

An example of the data issue time window is presented in figure below.



Figure 19 - Issue time window example

- 1) User has to select any weather product from observation or forecast menu, issue time window will display time of when was selected weather product issued.
- 2) The issue time is presented with six digits (day in month, hour, minute). Issue time is in zulu time zone.

Note: Issue time is different for observations and forecasts and might have slightly different meaning, see chapter (description of wx products) where is comprehensive description of issue time of each product.

Note: The window is removed when no weather product is selected.

CAUTION: Although the application displays only products which are effective at time selected, the use of the data for decision making is significantly influenced by the issue time in case of forecast products. Reliability of forecast is lower when difference between issue time and forecast time (based on selection on forecast time slider) is bigger.

3.1.6. Zoom Control

The **Zoom Control** is located on the left side of the main screen and provides zoom-in and zoom-out functionality as shown in figure belowError! Reference source not found..

- 1) User can do stepwise zoom-in or zoom-out by tapping + or – buttons
- 2) User can smoothly zoom-in or zoom-out by sliding the marble of controller.
- 3) User can smoothly zoom-in or zoom-out by “Pinch to Zoom” gesture on map area of touch screen.



Figure 20 - Zoom Controller

3.1.7. Map scale

Due to used map projection, it is impossible to use a range indicator, so linear scale is used instead. Purpose of the linear scale on map is to visually indicate current scale of a map. It is located on the right bottom of map.

CAUTION: Linear scale is valid only at a place where it is displayed, due to used plate carrée map projection.

- 1) Minimal range is displayed when map is zoomed to maximal zoom level and displays 20nm on equator
- 2) Maximal range is displayed when map is zoomed to minimal zoom level and displays 1500nm between 40°S - 60°S of latitude.



Figure 21 - Linear scale indicating current map scale 500nm

3.1.8. Showing legend

Legend for individual weather products can be visible on map overlay in order to provide user the information about severity levels of displayed wx product.

Note: Legend is dependent on selected weather products on the map overlay.

- 1) Tap or click on the map where is displayed graphical overlay of weather product
- 2) Legend of weather product description is displayed

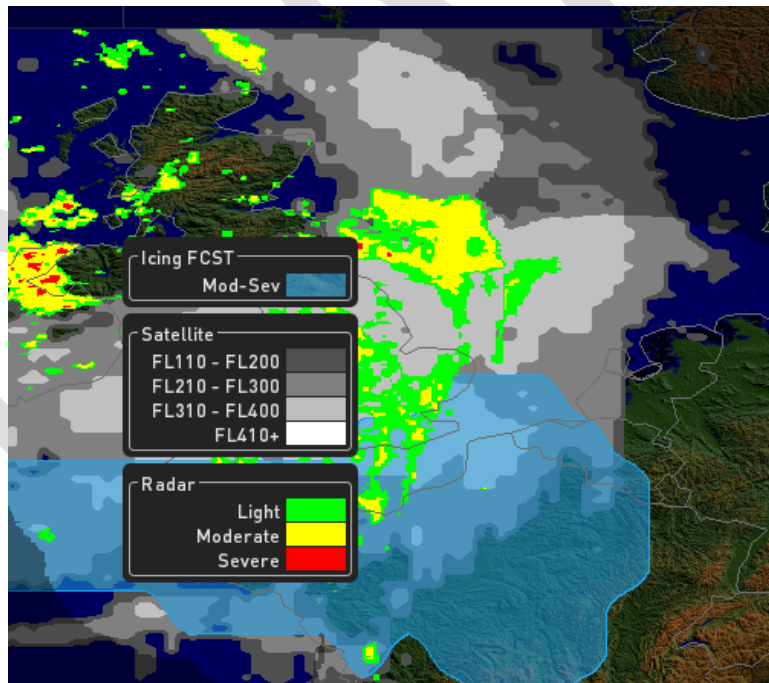


Figure 22 - Legend window

- 3) Tap once again on map area to hide legend

Note: Legend is shown only for weather products which has some observed or forecasted severity in area where user has tapped.

CAUTION: Legend shows semi-transparent colors (background terrain in legend is depicted for illustration purposes) for forecast weather products. On the other hand, observation weather products are depicted by solid colors.

3.2. Flight plan view

Flight plan of given flight can be displayed on map overlay of WIS. There are two sources to get flight plan into WIS application.

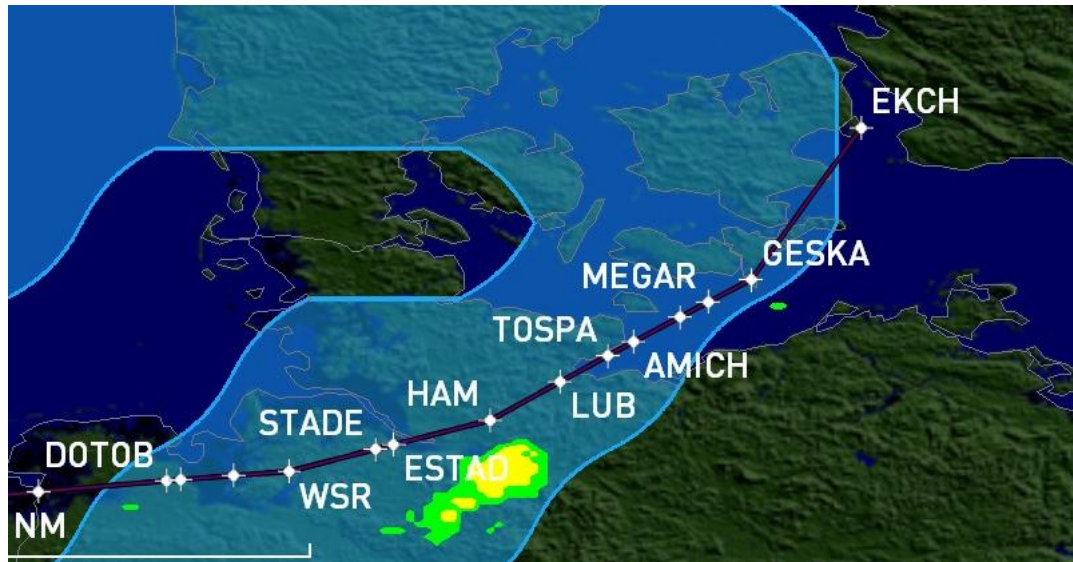


Figure 23 - Flight plan example

3.2.1. Loading Flight Plan from remote Honeywell Global Data Center

Preparation of data:

- In case you want to get information about way of integration of flight planning system with Honeywell Global data Center, contact Honeywell support.

Loading flight plan from Honeywell Global Data Center (GDC) database:

- In the WIS application, go to FPLN -> Load, select remote tab and fill all flight identification information. All fields shall be filled in order to match right flight plan.
- Confirm with OK and flight plan will be loaded and displayed on the map. The format of the identification information is shown on the screenshot.

Load Route	
<div> <div>Remote</div> <div>User</div> </div>	
Flight #	AFR459
Departure date	2014-08-15
Departure time	22:10
Departure apt	SBGR
<div> <div>OK</div> <div>Cancel</div> </div>	

Figure 24 - Load remote flight plan window

CAUTION: if required flight plan is unavailable at Honeywell Global Data Center or input parameters were entered incorrectly, user is notified by message “Requested flight plan not found”.

3.2.2. Loading flight plan manually from directory

Preparation of data:

User flight plans are defined in directory (**Windows version only**):

%INSTALL_DIRECTORY%\WINNClient\Data\ for *.usr files. These are flight plans, which can be loaded from the menu. Use text editor to explore .usr flight plan format. It is straightforward (name, lat, lon, flight level always on one line).

You can prepare your own flight plan and load it into INSTALL_DIRECTORY%\WINNClient\Data. After app is restarted the app will find the new .usr flight plan and can load it. Please do not use FMS and COMPANY tabs in Main menu: FPLN -> Load.

iPad version:

CAUTION: If you want to use locally stored flight plan on your iPad device, please contact your airline IT administrator.

Loading manual user flight plans:

- 1) Select the **FPLN -> Load...** from the **Main menu**.
- 2) Click on local tab and select user flight plan you want to load.
- 3) Tap OK, to confirm. User flight plan will be visible and map will be centered to departure airport.

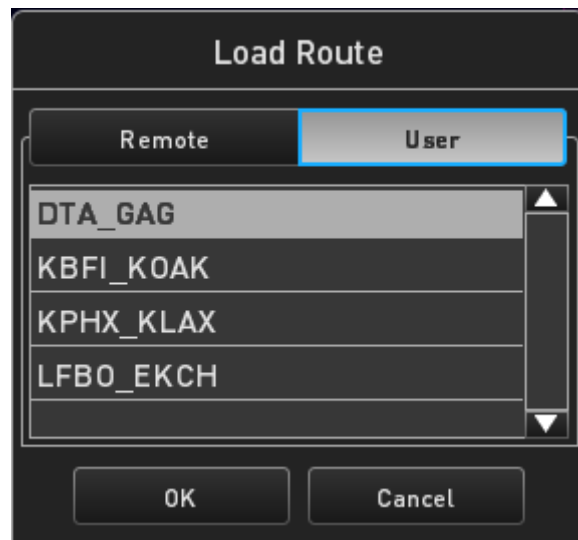


Figure 25 - Load user flight plan window

3.2.3. Clearing flight plan

- 1) Select the **FPLN -> Clear** from the **Main menu**.
- 2) Confirm to clear flight plan from view of application.

3.3. Updating and Changing Uplink Weather

The **Uplink Wx** tab on the **Menu** provides options to update the weather, change Uplink Weather settings.

- 1) Goto main menu: Uplink Wx → Settings

A step-by-step procedure for changing Uplink Weather Settings is provided in section 2.3 of this manual.

3.3.1. Update intervals of weather products:

Update intervals determine how often are individual weather products updated on ground GDC database.

Note: Update interval rate depends on weather data provider at GDC.

Observations:

Radar – update interval rate 5 mins, maximally 3 hrs into history (until now)

Satellite – update interval rate 15 mins, maximally 3 hrs into history (until now)

METAR - update interval rate 1hour, maximally 3 hrs into history (until now)

Forecasts:

All WAFC forecasts (except SIGMETs) have update interval 3hrs, from actual time forecast until 24h forecast in future.

SIGMET – update interval 5 mins, only currently valid SIGMETs are presented

3.4. Showing Map Overlays

The **Map Overlays** tab on the **Main menu** provides selectable checkboxes for overlaying **Airports**, **Nav Aids**, **Waypoints**, and **Terrain** on the main screen map. Zooming in or out on the map will change the level of detail that each of these overlays provide (see chapter Map for more details).

- 1) Select Map Overlays in Main Menu
- 2) Select or deselect checkboxes for viewing Airports, Nav aids, Waypoints or Terrain
- 3) Map will show selected layers on map based on level of detail when zooming

3.5. Using Tools

The **Tools** tab on the **Navigation Bar** provides access to the manual (iPad version only) and Vertical Profile tools.

3.5.1. Showing manual

- 1) Select the **Manual from Tools** main menu.
- 2) PDF version of this manual is shown by system PDF viewer.

Note: Windows version manual is accessible also from start menu icon shortcut.

3.5.2. Using Vertical Profile

Vertical Profile tool shows a vertical “slice” of available weather information along the previously loaded flight plan.

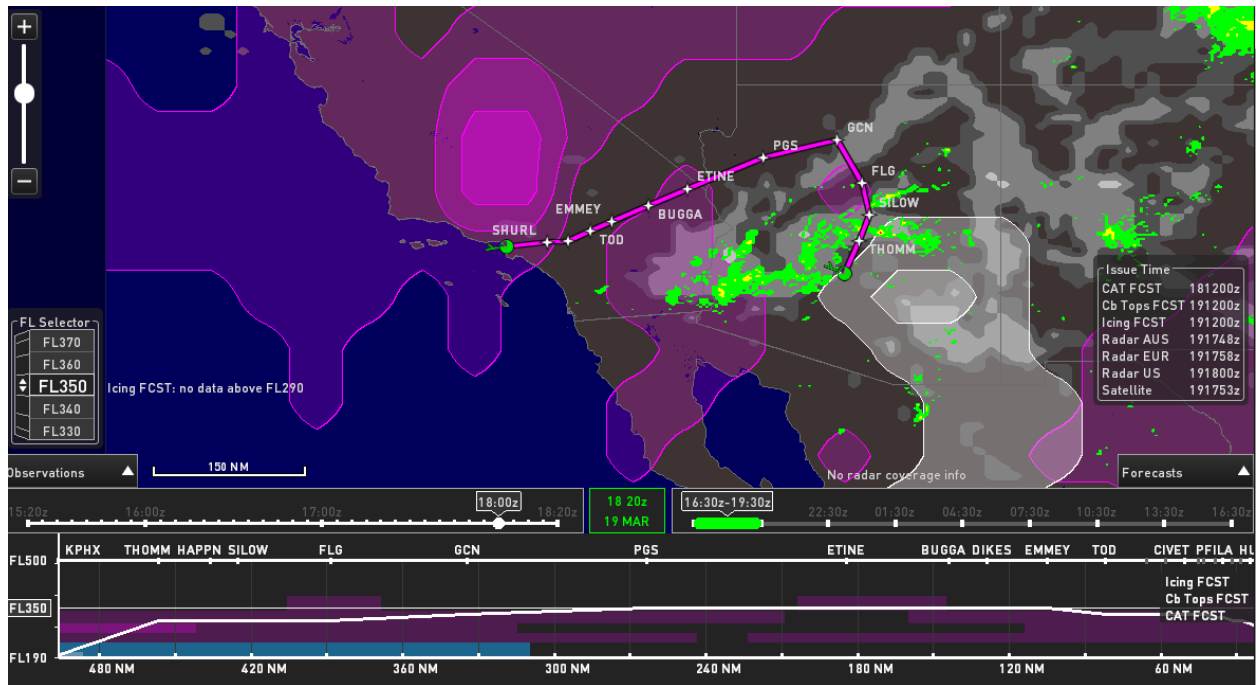


Figure 26 - Vertical profile

- 1) Selecting **Vertical...** from the **Tools** tab on the **Main menu**
- 2) Vertical profile is then visible on bottom of application window

Description:

- Vertical profile is available only when flight plan is loaded.
- Tap the Vertical profile area and move left or right to move vertical profile window to see detail of vertical slice of flight plan.
- On upper horizontal scale is list of visible waypoints along flight.
- On lower horizontal scale is distance to go in nautical miles.
- On vertical scale is lowest limit of flight level at bottom, and highest limit of flight level at top. In between these values is currently selected value of flight level in white box, which is depicted by white line on Vertical profile window.
- Vertical profile of flight plan is depicted by thick white poly-line on vertical profile window.
- Only selected 3D weather forecast products can be shown on vertical profile by adequate color, which is matching legend on lateral map. These are Icing, CB Tops, CAT forecasts.

4. Limitations

- Weather Information Service application cannot currently receive and depict approximated aircraft position.
- Connectivity from aircraft is limited to TCP/IP protocol. No ACARS interface is currently available.
- Historical data of METAR product is currently not available, only newest METAR data are displayed.

4.1. Networking

When working within a corporate VPN, connect first to any website via any internet browser, then connection to GDC from WIS will work. This is to enable the app to go through proxy server. When available, WIS application uses TCP/IP AMQP protocol communication.

Note: WIS application uses host: copper-qa.mygdc.com, port: 5671.

4.2. Power Plan Settings for Windows Devices

If you are using Windows tablet (like Iconia W700), power plan has to be changed to “High Performance” for both plugged and unplugged situation. Furthermore, this “High Performance” power plan has to be further adjusted via “Advanced power settings” for the “High Performance” plan:

- Intel Graphics Settings, Intel Graphics Powerplan to max
- Intel Dynamic platform and Thermal Framework Settings, Config TDP level on max
- Processor power management, minimum processor state to 100%

Processor power management, system cooling policy to active.

5. Appendix A – Weather Products Descriptions

5.1. Weather observations

Issue time of observations should be near to the time, when observation was taken. However it strongly depends on data provider and can differ on individual weather product.

CAUTION: Do not use observation weather products for tactical purposes during flight.

5.1.1. Viewing radar observation

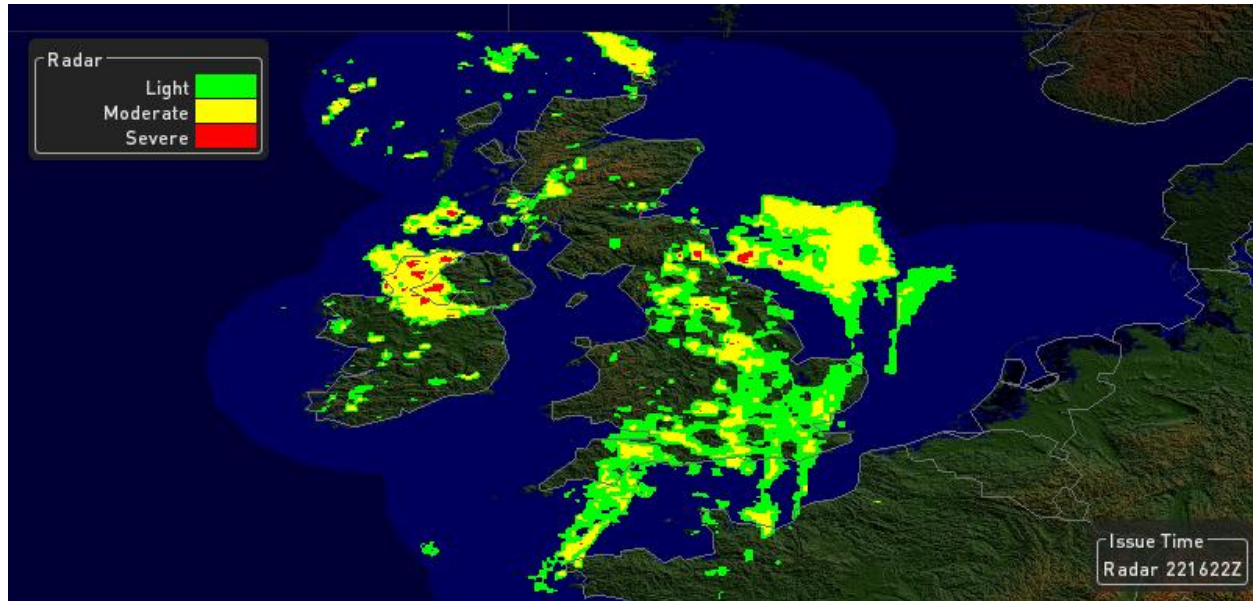






Figure 27 - Weather radar observation

Description:

Ground based meteorological radar stations provide information about location of precipitation and its intensity. The meteorological radar product overlay presents information about the observed maximum reflectivity on each grid point in three severity levels (i.e. composite weather radar image); reflectivity is dependent on number and size of cloud particles and hence the precipitation intensity can be deduced from the measured reflectivity.

The areas with low, medium, or severe reflectivity are filled with solid green, yellow, or red colour (RTCA DO-267A) representing the severity and overlaid on the lateral map according to the rules listed in table below.

DBZ	Legend	Color	Sample
<20	No precipitation	Clear	N/A
20 - 30	Low precipitation	Green	
30 - 40	Moderate precipitation	Yellow	
>40	Severe precipitation	Red	
N/A	No radar coverage	40% black transparent	

Coverage: North America, core EU, Australia with coverage information
Hawaii, Alaska without coverage information

The areas not covered with ground meteorological radar installations are presented as 40% black transparent overlay. The color and shape coding will be accompanied with a text label “No Radar coverage” as presented in Figure 28.

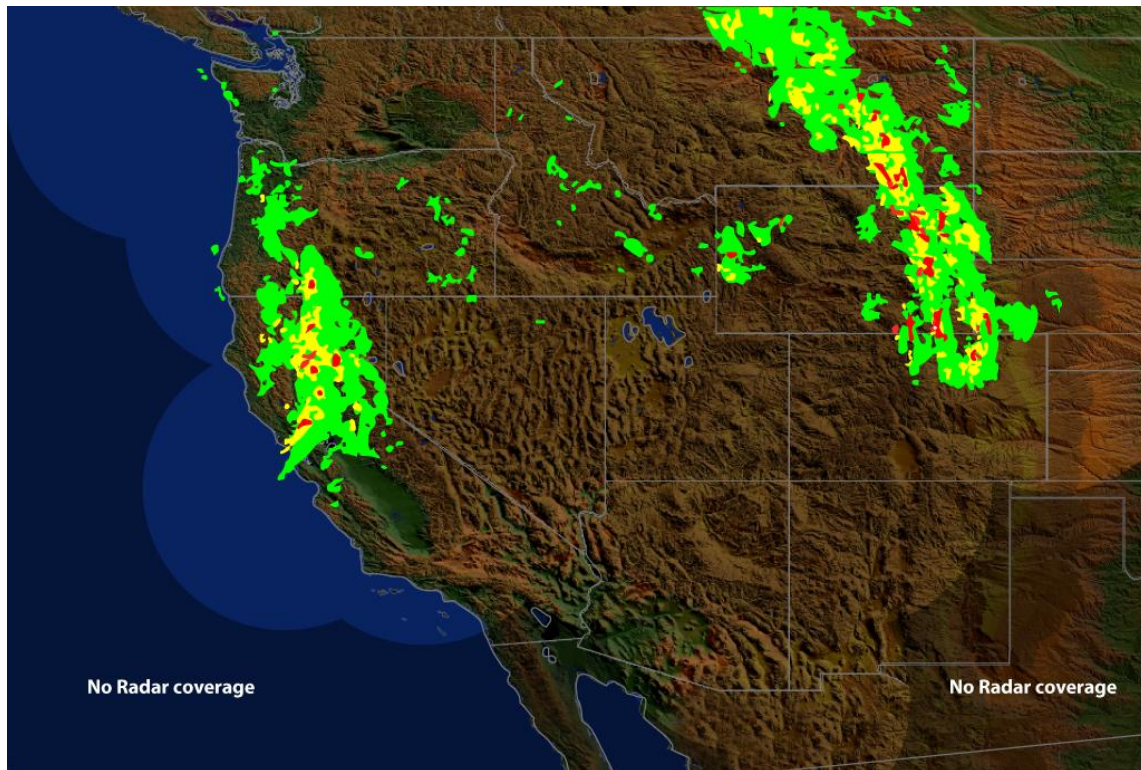


Figure 28 - Meteorological radar product overlay with data coverage indication example

The areas for which information about the meteorological radar coverage is missing (Alaska, Hawaii) are presented as 40% black transparent overlay and accompanied with label "Limited Radar coverage information available". An example is presented in figure below.

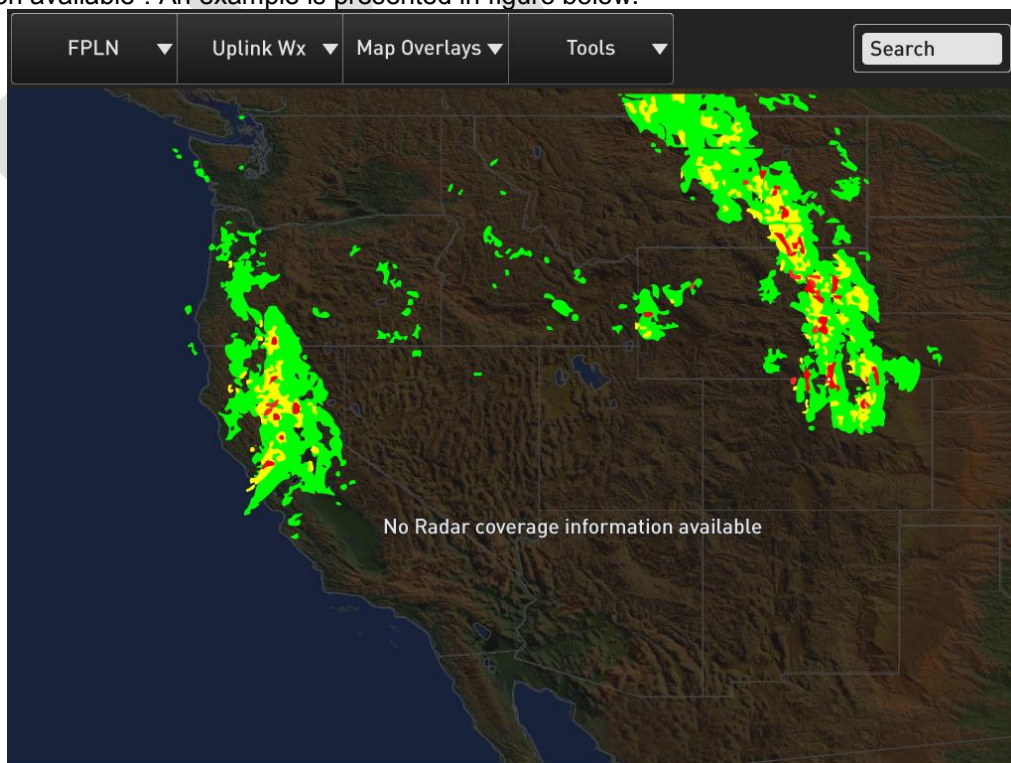


Figure 29 - Depiction of areas with missing information about the radar coverage boundaries

Issue time: Displayed issue time is near to observation, however is dependent on processing of radar data. Displayed time shows time when radar image is completely processed and therefore there is time lag between observed situation of precipitation and issue time.

CAUTION:

Although such situations are not believed to be typical, in extreme latency and mosaic-creation scenarios, the actual age of the oldest NEXRAD data in the mosaic can EXCEED the age indication in the cockpit by 15 to 20 minutes.

DRAFT

5.1.2. Viewing Satellite observation

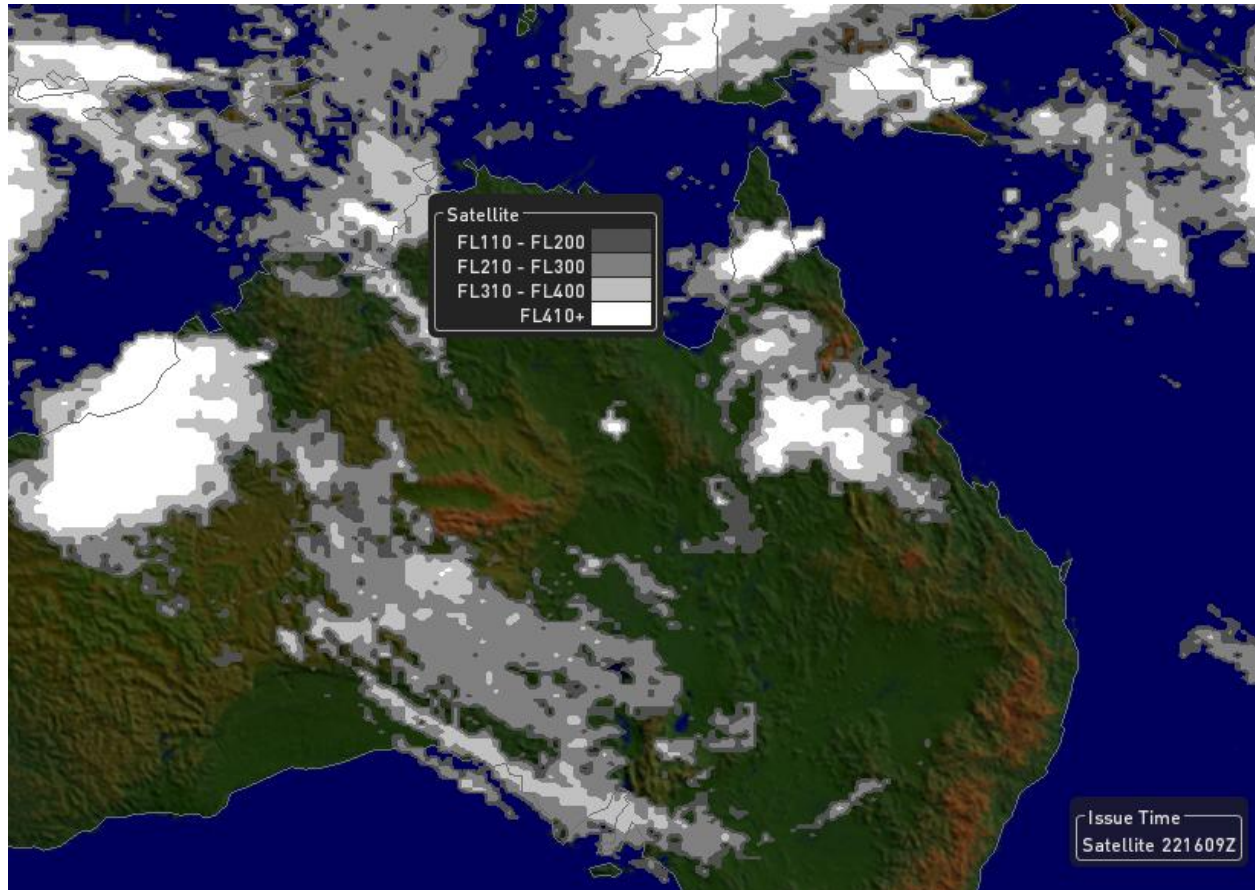


Figure 30 - Satellite observation

Description:

The Satellite cloud top is the highest altitude of the visible portion of the cloud. The satellite derived cloud top height overlay presents information about the estimated cloud top height in four FL level intervals above FL110 according to the rules listed in table below on the map. Estimated cloud top height is computed from measured brightness temperature and forecasted vertical situation display of temperature. Brightness temperature is derived from satellite IR channel and temperature profile forecast is obtained from numerical weather prediction model. Cloud tops higher than flight level 110 are represented as solid areas filled with three gradients of grey color and white color; the brighter the color is, the higher are the cloud tops. All clouds higher than FL410 are presented with white color.

FL interval	Legend	Color	Sample
<110	Clouds top lower than FL110	Clear	N/A
110-200	Clouds top in FL110-200	Grey gradient 1	
210-300	Clouds top in FL210-300	Grey gradient 2	
310-400	Clouds top in FL310-400	Grey gradient 3	
410+	Clouds top higher than FL410	White	

Coverage: from 65° N to 65°S of latitude. analogous to radar – no coverage area is presented as 40% black transparent overlay.

Issue time: Real observation time might sooner (up to 15 minutes) than issue time displayed in application.

5.1.3. Viewing airport weather (METAR, TAF, DATIS)



Figure 31 - Airport weather example

Description:

The airport weather overlay presents three (respective four) pieces of weather information about the terminal area around airport including:

1. Meteorological Terminal Air Report (METAR) / Special report of forecast (SPECI)
2. Digital Automatic Terminal Information Service (D-ATIS)
3. Terminal Aerodrome Forecast (TAF)

METAR:

METAR is a format for transmitting observational weather data in the terminal airspace area. METARs typically come from airports or permanent weather observation stations. Reports are generated once an hour or half-hour, but if conditions change significantly, a report known as a special report forecast (SPECI) may be issued.

Airport weather comprises of two components:

1. METAR graphic
2. Airport weather text (METAR, D-ATIS, and TAF)

METAR graphic. The graphic airport weather information presents the user with visibility, sky cover, and winds direction and speed at an airport in symbolic form on map included in the METAR text message. The visibility conditions are presented with a color coding of the whole symbol, the sky cover is presented with a modification of the fill of the symbol, and winds heading and speed is presented using a wind barb. When SPECI is issued for an airport a text label "SPECIAL" is presented below the airport symbol. The coding of airport visibility is provided in

Table 1, coding of sky cover is provided in

Table 2, and coding of wind winds is provided in (winds aloft chapter).

Note: When only METAR graphic overlay is selected for presentation (without displaying the airport map overlay), only graphic METAR graphic is presented at the location of an airport. When no METAR data is available at an airport, standard airport symbol is presented on map.

Table 1. Overview of the airport visibility states.









Conditions	Cloud ceiling (ft AGL)	Visibility (s.m.)	Color	Sample
VFR	> 1000	> 3	Green	
IFR	500-999	1 to <3	Yellow	
LIFR	<500	<1	Red	

Table 2. Overview of the airport sky cover states.

Sky cover	Symbol
Clear Skies	
Few Clouds	
Scattered Clouds	
Broken Clouds	
Overcast Clouds	

The airport text weather information which includes METAR, D-ATIS, and TAF can be accessed by tapping on the relevant airport symbol from the map or by searching the airport in the search box located in the main menu bar. This action calls an airport window with details. The airport window is divided in two parts:

1. Tabs for selection between METAR/SPECI, D-ATIS, TAF, and runway layout
2. METAR/SPECI legend

The abbreviated METAR text message is processed and presented in human-readable text if possible. Widely used acronyms and abbreviations are not presented in human-readable text. The METAR text message is divided into ten parts:

1. Issue time – the time when the METAR was issued
2. Wind heading and speed
3. Visibility
4. Sky condition
5. Pressure
6. Temperature / Dew point
7. Visibility conditions

The METAR/SPECI legend is presented in the lower part of the window. It presents the color coding and symbols used to present METAR/SPECI information (i.e., visibility conditions, sky cover, and wind speed).

DATIS:

D-ATIS is aeronautical information issued at busier terminal areas. D-ATIS contains essential information, such as weather information, which runways are active, available approaches, and any other information required by the pilots, such as important Notice to Airmen (NOTAM). D-ATIS is updated in fixed intervals or when there is a significant change in the information, like a change in the active runway.

D-ATIS text message is shown in source text format.

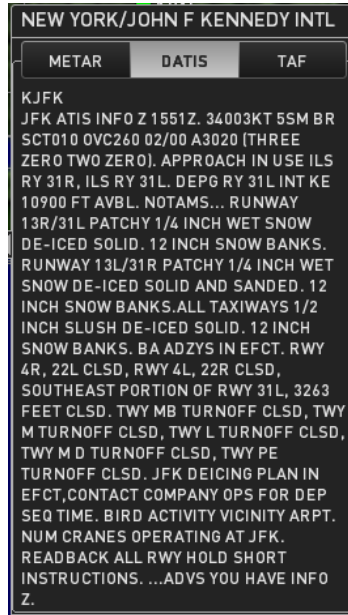


Figure 32 - DATIS example

TAF:

TAF is a format for reporting weather forecast information. Generally, TAFs apply to a 24 or 30-hour period, and an area within approximately five statute miles from the center of an airport runway complex. TAFs complement and use similar encoding to METAR reports.

Only text TAF information is presented upon tapping on the TAF button in the toggle panel.

Only TAF which is effective with respect to the current UTC time is presented. No TAF history is available.

If no TAF was uplinked, a text saying "No valid TAF available" is presented under TAF tab.

The header of TAF includes only TAF label as no history is available for TAFs.

5.2. Weather forecasts

Issue time information (visible in lower-right corner of window) of forecast means issue time of weather data from WAFC centers. WIS application shows actual forecasts issued 6h or more before. WAFC met offices (London, Washington) computation time of forecast data is 6h in advance before the first forecast become valid. So data are e.g. issued at 6am and first forecast becomes valid for 12am (from 10:30am to 1:30pm)

Issue time is not validity time; user does not need to care about validity of the displayed data; the application displays only data valid for the selected time on forecast time controller (See 3.1.4).

DRAFT

5.2.1. Viewing CB tops forecast



Figure 33 - CB tops forecast example

Description:

Cb tops represents a special category of clouds with a significant vertical extent. Such clouds are usually associated with complex highly convective vertical nimbus storm clouds with potential to produce moderate to heavy precipitation and may represent a safety hazard for an aircraft.

The Cb tops presents the user with information about the forecasted Cb top height (WAFC Cb Cloud Top Height) in three FL intervals at specified potential above FL210 (may be customized). The potential for encountering the Cb top is determined by the defined threshold level.

Coverage: global

Note: CB tops weather forecast is 2D product, presented as one layer on map, so it is not affected by selected flight level in FL selector (see 3.1.3).

Note: Default threshold level of Cb horizontal extent (entire atmosphere) is set to 40% by default.

By recommendation of ICAO, 50% CBHE is threshold value, from which can be convection markable.

Example: If there is convection top in FL410 and CBHE hor. extent is 30% (less than default threshold), then convection output value is set to 0.

FL interval	Legend	Color	Transp	Sample
<210	Cb tops lower than FL210	Clear	N/A	N/A
210-300	Cb tops in FL210-300	Grey gradient 2	40%	
310-400	Cb tops in FL310-400	Grey gradient 3	40%	
410+	Cb tops higher than FL410	White	40%	

5.2.2. Viewing Winds aloft forecast

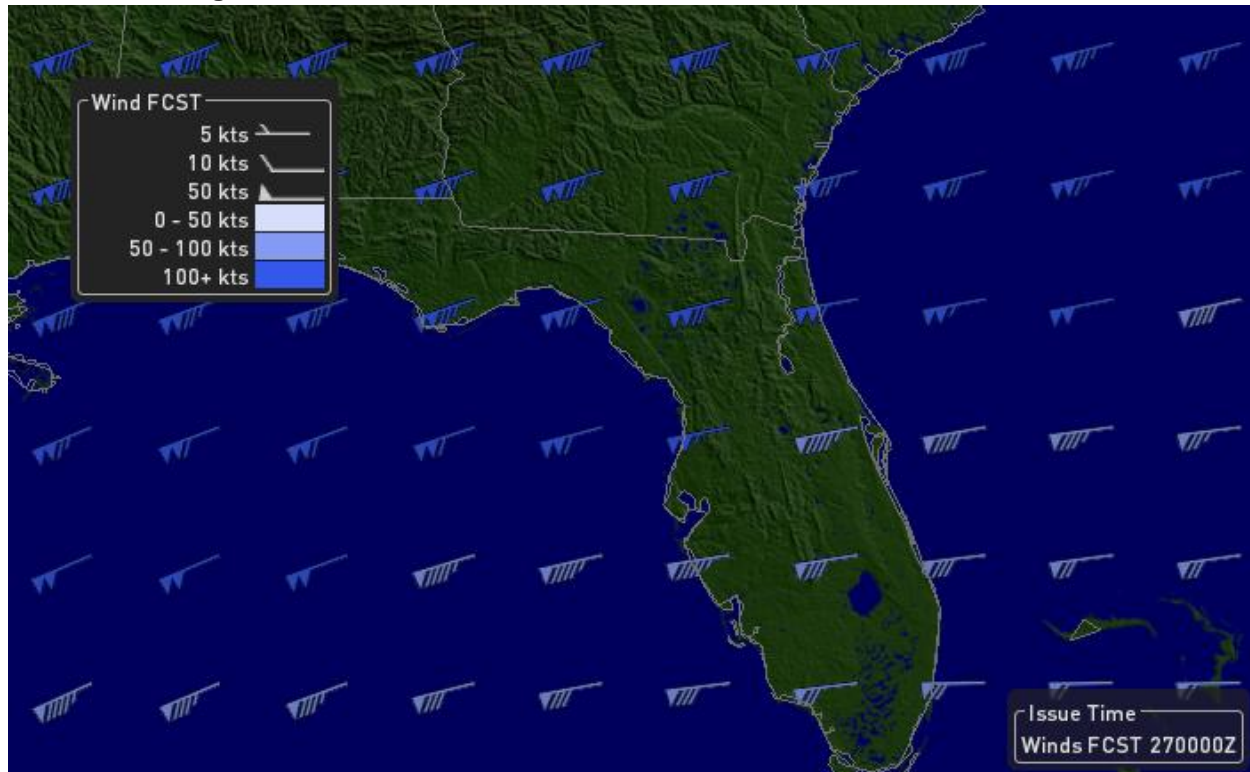


Figure 34 – Winds aloft example

Description:

The winds aloft product presents information about the forecasted speed and direction of winds (WAFS Upper Wind & Temp) in a selected flight level on the map (3D product).

Wind direction and speed is coded with traditional wind barbs.

The direction is represented by the orientation of the whole wind barb and the speed is represented by the shape, size, and number of barbs. The shape and size coding of the wind speed is presented in . The user needs to count up the amount of the wind barbs of different shapes, assign them with the relevant meaning to obtain the final wind speed. Even though the final value of the wind speed is one number, it actually represents an interval of a speed; each wind barb needs to be interpreted as +/- 2 kts above and below the wind speed represented by the wind barb to reflect the forecast uncertainty.

Speed increment	Legend	Symbol
5 kts	Speed increment of 5 kts	
10 kts	Speed increment of 10 kts	
50 kts	Speed increment of 50 kts	

Note: Color is used to facilitate identification of areas with similar wind speeds. Three intervals of wind speeds are coded with three gradients of blue color according to rules listed in table be;pw.

Speed interval	Legend	Color	Sample	R	G	B
<50 kts	Winds speed below 50 kts	Blue gradient 1		214	222	251
50-100 kts	Winds speed 50 – 100 kts	Blue gradient 2		255	128	255
>100 kts	Winds speed above 150 kts	Blue gradient 3		255	0	255

The wind barbs are overlaid on the map in a fixed grid format. The grid density does not change with the zoom level.

Coverage: global, multiple flight levels

5.2.3. Viewing Clear air turbulence forecast

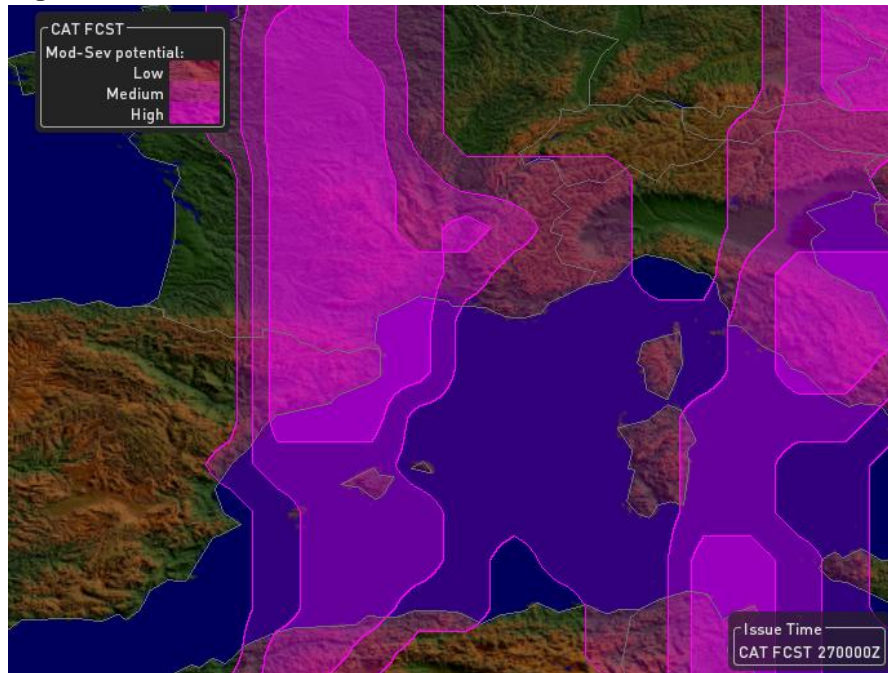


Figure 35 - Clear air turbulence forecast example

Description:

CAT represents the turbulent movement of air masses in the absence of any visual cues such as clouds, and is caused when bodies of air moving at widely different speeds meet (3D product).

The atmospheric region most susceptible to clear air turbulence is the high troposphere at altitudes of around FL230-FL390 at point where it meets the tropopause. At the high altitudes, the clear air turbulence is most frequently encountered in the regions of jet streams. At the lower altitudes it may also occur near mountain ranges. Clear air turbulence can be also indicated by thin cirrus cloud.

CAT forecast product presents information about the potential for encountering medium to severe CAT (WAFC Maximum CAT) in a selected flight level in up to three potential levels on the map.

Note: The potential for encountering CAT presented to the user is determined by selected a threshold level (or up to three threshold levels). Turbulence specific thresholds for determining severity levels of turbulence are listed below. Value means potential of turbulence in percentage.

Threshold for low severity CAT potential = 5%

Threshold for medium severity CAT potential = 9%

Threshold for high severity CAT potential = 12%

Coverage: global, multiple flight levels – 3D product

Threshold	Legend	Color	Transp.	Sample
0	No CAT potential	Clear	N/A	N/A
1	Low CAT potential	Magenta	60%	
2	Medium CAT potential	Magenta	40%	
3	High CAT potential	Magenta	20%	

5.2.4. Viewing Icing potential forecast



Figure 36 - Icing potential forecast example

Description:

Icing conditions are atmospheric conditions that may lead to the formation of water ice on the objects' surfaces. In-flight airframe icing occurs when super-cooled water freezes on impact with any part of the external structure of an aircraft during flight. Although the nominal freezing point of water is 0°C, water in the atmosphere does not always freeze at that temperature and often exists as a "super-cooled" liquid. If the surface temperature of an aircraft structure is below zero, then moisture within the atmosphere may turn to ice as an immediate or secondary consequence of contact. The proportion of such super-cooled water decreases as the static air temperature drops until by about -40°C. This is also why the aircraft operating in lower altitudes are mostly affected by in-flight icing conditions.

Icing product is a forecast that presents information about the potential for encountering the parameter. The potential for encountering Icing presented to the user is determined by selected threshold level.

Note: Default threshold for determining icing potential is 70%.

Coverage: global, multiple flight levels (3D product)

Severity levels: moderate-severe severity (light blue)

Threshold	Legend	Color	Transp.	Sample	R	G	B
0	No Icing potential	Clear	N/A	N/A	N/A	N/A	N/A
1	Moderate-severe Icing potential	Blue	40%		24	173	255

5.2.5. Viewing SIGMETs



Figure 37 - SIGMETs example

Description:

Significant Meteorological Information (SIGMET) is information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations of all aircraft in the region. Although SIGMET is not a typical forecast product because it includes both, forecasts and observations, it is treated as a forecast product. SIGMET usually includes information about forecasted time validity of the weather phenomena even for the observed products. Observed (confirmed) phenomena include a forecast information piece.

SIGMETs are issued when a significant weather phenomenon reaches certain intensity or it covers areas reaching pre-defined threshold, or both at the same time. SIGMET is a text information which comprises of several pieces of information including SIGMET issue office, report type, issue date, expiration time, phenomena description, and location. The precision of the SIGMET localization differs across Flight Information Regions issuing SIGMETs.

Note: While in the Federal Aviation Authority (FAA) airspaces the localization of SIGMETs is quite precise in definition of the boundaries where the significant weather can be encountered, in Europe it is typically associated with the whole Flight Information Region (FIR).

Two categories of SIGMETs are recognized based on the location of the issuing office:

1. Conterminous US (CONUS) SIGMETs
 - a. US Convective SIGMET issued for CONUS
 - b. Non-convective SIGMET issued for CONUS
2. International SIGMETs

Non-convective SIGMETs include:

- Severe icing not associated with thunderstorms
- Severe or extreme turbulence or CAT not associated with thunderstorms
- Widespread dust storms or sandstorms lowering surface visibilities to below 3 miles
- Volcanic ash

In Alaska and Hawaii, SIGMETs are also issued for:

- Tornadoes
- Lines of thunderstorms (squall line)
- Embedded thunderstorms

- Hail greater than or equal to 3/4 inch in diameter

A convective SIGMET may be issued for any convective situation that the forecaster feels is hazardous to all categories of aircraft. Any convective SIGMET implies severe or greater turbulence, severe icing, and low-level wind shear. Convective SIGMETs include severe thunderstorm due to:

- Surface winds greater than or equal to 50 knots
- Hail at the surface greater than or equal to 3/4 inches in diameter
- Tornadoes
- Embedded thunderstorms
- A line of thunderstorms (squall line)
- Thunderstorms producing precipitation greater than or equal to heavy precipitation affecting 40 percent or more of an area at least 3,000 square miles

The criteria for issuing international SIGMETs are:

- Thunderstorms occurring in lines, embedded in clouds, or in large areas producing tornadoes or large hail
- Tropical cyclones
- Severe icing
- Severe or extreme turbulence
- Dust storms and sandstorms lowering visibilities to less than 3 miles
- Volcanic ash

SIGMET graphic:

SIGMET graphic presents information about the area for which an issued SIGMET is applicable and SIGMET type in a symbolic form. The SIGMET symbols are assumed to help the users to search multiple SIGMETs on the display and to facilitate identification of the SIGMETs of interest.







The text label “SIGMET”, which is positioned in the centre of the greatest incircle of SIGMET area, is accompanied with a SIGMET symbol and SIGMET vertical extent.

The SIGMET symbol and SIGMET vertical extent are centered above the SIGMET label.

SIGMET symbol is framed with white line and it is justified and placed above the SIGMET label.

The list of all SIGMET symbols and the rules for coding are listed in table below. Only a subset of all potential SIGMETs is associated with a symbol. When the SIGMET text does not allow for associating with a symbol, text label SIGMET is displayed without a symbol.

SIGMET type	Text string for decoding	Symbol
Tropical cyclone	TC	
Thunderstorm	TS	
Severe squall line	SQL (or SEV SQL)	
Hail	GR	
Volcanic eruption	ERUPTION	
Sand storm	SS	
Dust storm	DS	
Visible ash cloud Volcanic ash	VA	
Severe icing	SEV ICE	

Moderate Icing	MOD ICE	
Severe turbulence	SEV TURB	
Moderate turbulence	MOD TURB	
Rain	RAIN	
Freezing rain		
Mountain waves		

Vertical extent of a SIGMET (if included in the SIGMET text) is presented to the right of the symbol. Vertical extent is vertically arranged. The lower limit of the vertical extent is in the bottom and the upper limit is placed on the top of the lower limit. A text "SFC" for surface can be used instead of a number for SIGMETs with a lower limit starting at the surface.

As part of de-cluttering scheme, the individual SIGMETs are collapsed if the SIGMET boxes overlap each other or when multiple SIGMETs are issued for an area (e.g., in European airspace) and presented under one label "Multiple SIGMETs". Symbols are not presented above the label when collapsed.

Note: Clicking on icon reveals SIGMET description.

Note: All currently valid SIGMETs at all flight levels are presented, since SIGMET overlay is not influenced by the Time Controller or FL Selector.

Coverage: global