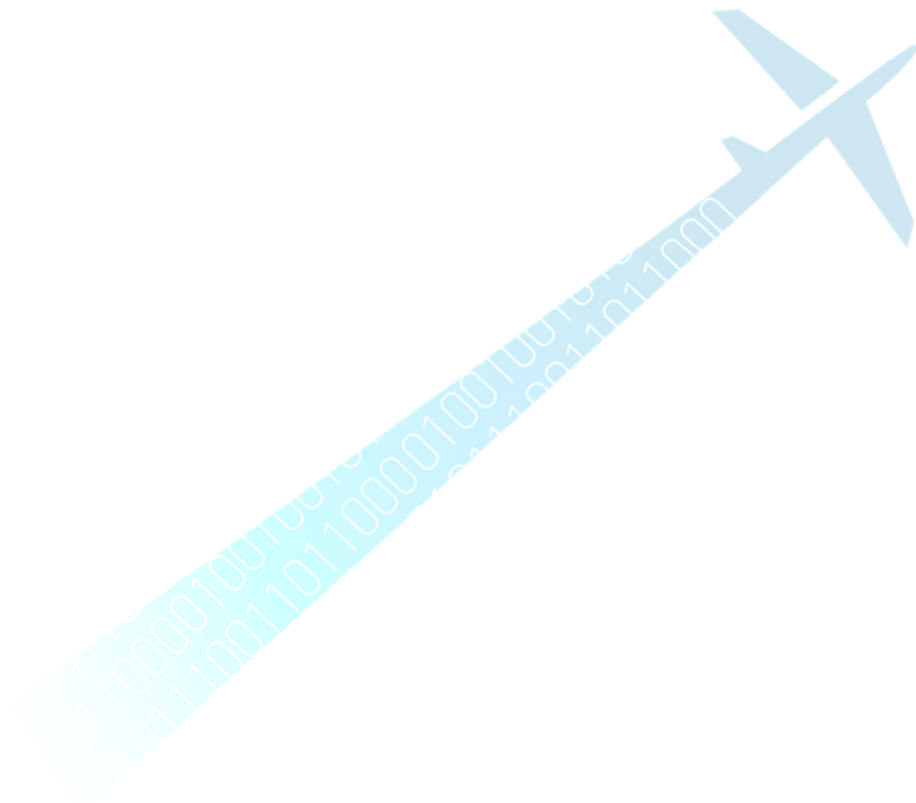




Hosted Flight Data Monitoring

Information Sheet



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FDM360 DESCRIPTION



FDM360 is a pure web-based Flight Data Monitoring solution built on industry standard Microsoft technology. Although much has changed in the years since Flight Data Monitoring (FDM) was first developed as an integral part of the aviation safety process, one fundamental thing has not; the data

collection and event detection process must be as robust and simple as possible in order that sufficient resources can be applied to the most important task of turning the data into meaningful information. FDM360 has been designed and developed to take advantage of modern web-based technology expected in the workplace today. FlightDataPeople has reviewed the FDM market and incorporated into FDM360 - and improved on - many features employed by its competitors. FDM360 is fast, highly functional and yet incredibly simple to use. FDM360 comes in a "light" version with minimal functionality which 'covers the basics' when operating with a limited budget, up to an advanced configuration, offering Crew playback, instrumentation views, APM, Fuel and Engine Health Monitoring extracts.

Our fully hosted, web-based FDM360 service includes the following features:

- ✓ Scalable secure web-based hosting with access via PC or Tablet - 24/7/52
- ✓ Scheduled transfer of flight data by most convenient method
- ✓ Auto data replay
- ✓ Operations feed support
- ✓ Weather feed
- ✓ SMS360 interface available
- ✓ Maintenance and support
- ✓ Automatic back-up, antivirus etc.
- ✓ All FDM360 housekeeping included
- ✓ Technical event validation (to remove any false events)

SYSTEM COMPONENTS

The system consists of the following primary components:

Replay manager	-	Control of data processing & viewing tools
Event Store	-	Access to validated event data, event management & trend tools
Portal	-	List of all available flights & viewing tools
Replay	-	Crew access to view own flights only
Usage	-	Maintenance view for recover statistics data viewing tools
Configuration	-	System setup and configuration tools
Reflight 3D	-	Offline 3D Playback capable of generating videos for the Event Store

FDM SERVICE COMPONENTS

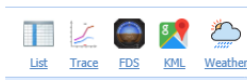
In its most basic form, FDM360 will have all of the tools required to accomplish a fully compliant FDM system at minimum cost, which will suit operators that are new to FDM, or those looking to setup a compliant program on a limited budget. FDM360 is fully modular, which means the basic (entry-level) system can be expanded in functionality as the operator seeks to gain more value data in the future.

- Hosted platform with 24/7/52 web access
- Hosted data processing
- Technical event validation and export to Event Store
- Raw flight data storage for 2 months
- Event flight data storage for 2 years
- System training
- Routine technical support service
- Setup of Logical Frame Layout (LFL) for each aircraft type
- Standard event set for each aircraft type
- Event store and presentation tools for event statistics
- Flight data viewing tools (Full flight)
- Instrumentation view
- Crew self-debrief facility
- Flight Data Portal
- Usage Charts
- Google Earth Tracks
- Measurements (data capture for all flights)
- Email notification of events
- EHM data extraction
- APM data extraction
- Fuel Data extraction
- Reflight 3D (Aircraft animation tool)
- IT support for VPN connectivity
- Re-processing/analysis of historical data
- Additional data storage (retention of historical raw flight data)
- Enhanced training & support

FLIGHT DATA VIEWER

A key element of any FDM system is the Flight Data Viewer and the ability to look at the data in the most appropriate way determines ultimate usefulness of the system to your organisation.

In FDM360, flight data can be accessed in a number of ways; from the replay manager, event store, portal etc. and wherever you see the following icons displayed, you can select whether to view a List or Trace view, Instrument animation, Google plot or weather details; the system will present the relevant data.



FDM360 viewing tools:

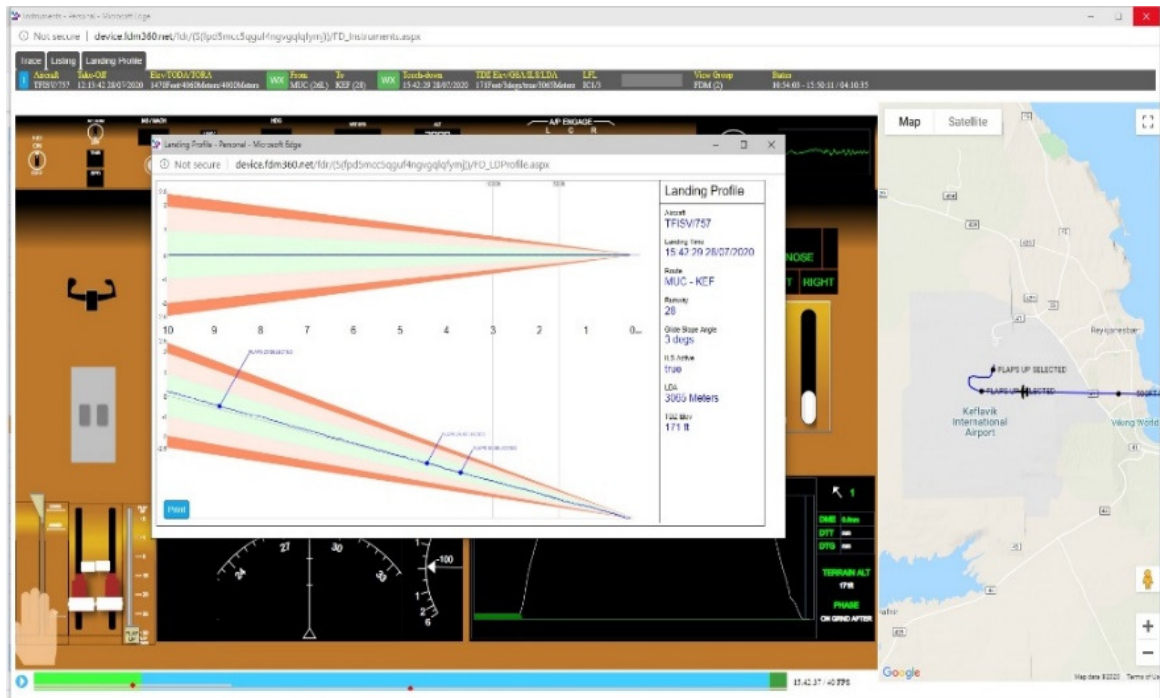
Instrumentation view with built in moving terrain.



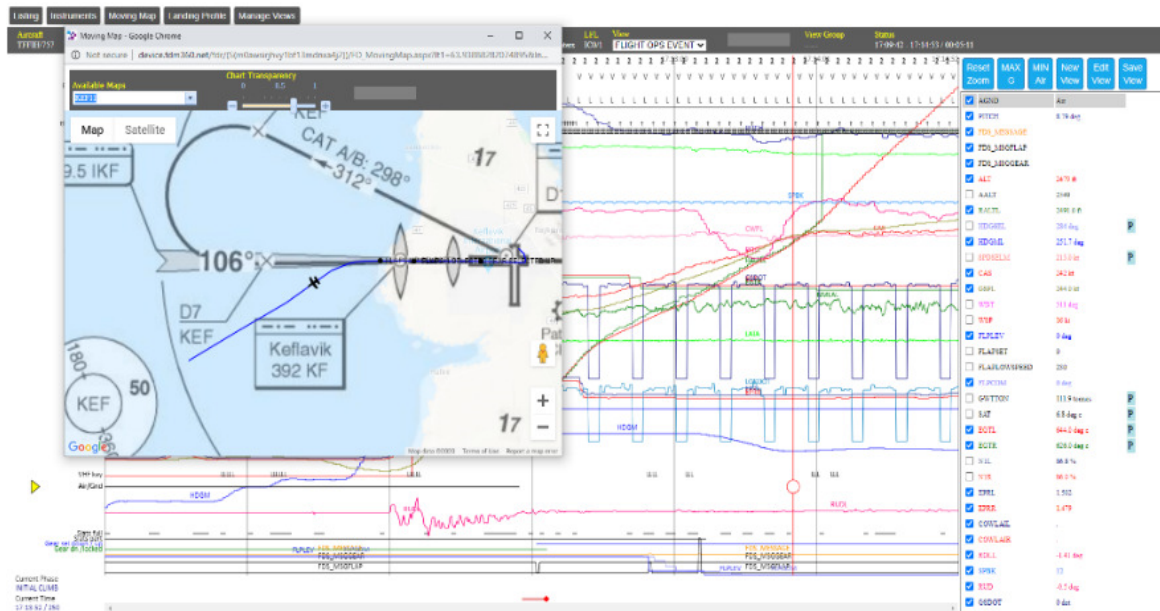
Graphical traces – with fixed and sliding-scales, zooming, parameter searches etc.



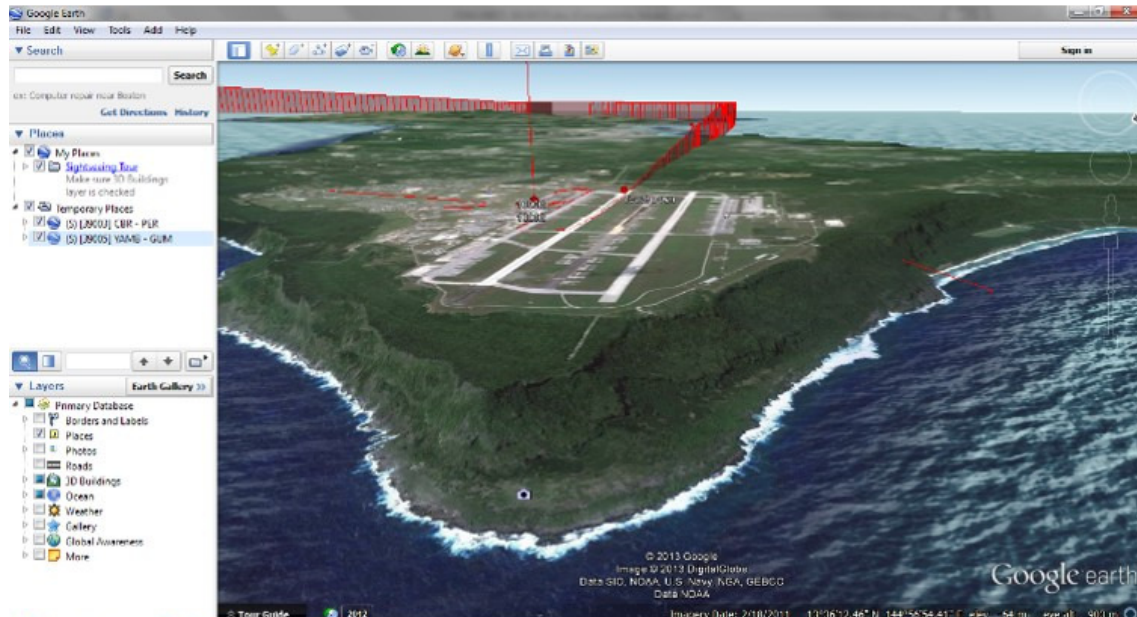
The landing profile is available with a single click of the mouse.



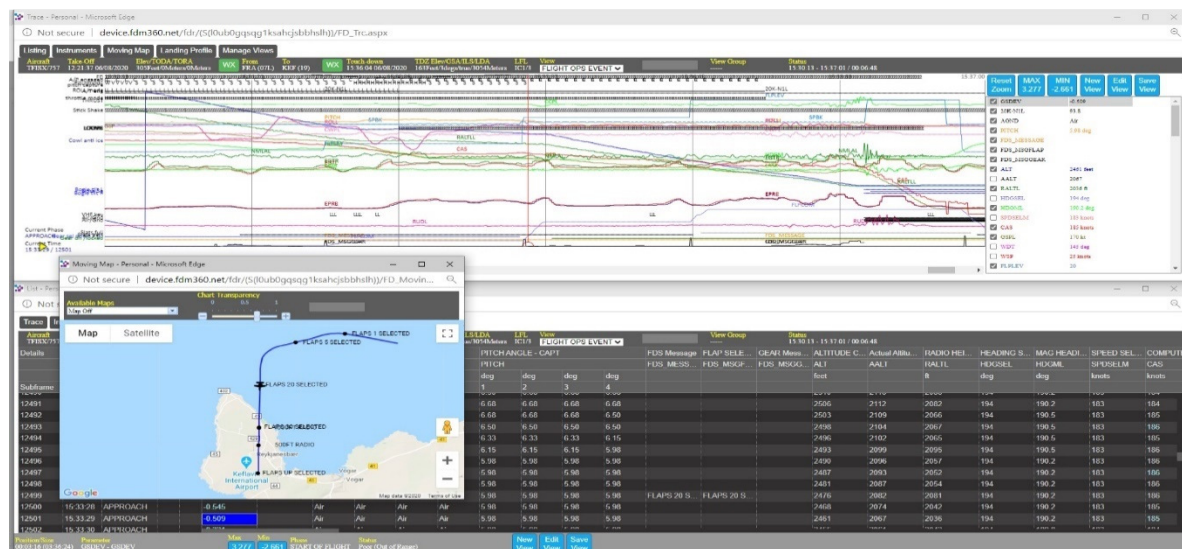
Synchronised moving map with your charts.



Export the flights/events as detailed Google Earth plots in order to add context.



Displays can be synchronised for maximum clarity.



CREW SELF DEBRIEFING

Depending on Company policy, once the replay process is complete, the system can make the data available to the flight crew immediately so that they can view their own flights. The only requirement is a suitable access device (laptop/tablet) and internet connection.

Data will remain available for viewing for an agreed period.

The crew can use their company 'Single Sign On' to login and view their personal dashboard and flight list.

Playback

My Dashboard Set Crew Filter By: Flight Records 95

Fleet	Flight No	Regn	Departure Date/Time	R/W	From	To	R/W	Arrival Date/Time	Type	Instruments
757			31/07/2020 13:30:42	26L			01	31/07/2020 17:00:52	FULL FLIGHT	Play
757			31/07/2020 07:36:53	01			26L	31/07/2020 11:21:33	FULL FLIGHT	Play
757			27/07/2020 20:46:05	22R			28	28/07/2020 23:27:25	FULL FLIGHT	Play
757			27/07/2020 16:30:14	01			22L	27/07/2020 19:15:04	FULL FLIGHT	Play
757			07/07/2020 15:38:34	22R			01	07/07/2020 18:34:30	FULL FLIGHT	Play
757			07/07/2020 11:20:29	01			22L	07/07/2020 13:58:33	FULL FLIGHT	Play
757			11/05/2020 16:57:45	33L			10	11/05/2020 21:33:23	FULL FLIGHT	Play
757			11/05/2020 09:59:21	01			33L	11/05/2020 14:58:26	FULL FLIGHT	Play
757			23/04/2020 14:52:31	22L			19	23/04/2020 19:37:50	FULL FLIGHT	Play
757			23/04/2020 08:23:13	19			22L	23/04/2020 13:32:04	FULL FLIGHT	Play
757			19/03/2020 12:08:08	22L			19	21/03/2020 15:13:50	FULL FLIGHT	Play
757			19/03/2020 07:49:21	19			22L	19/03/2020 10:22:03	FULL FLIGHT	Play
757			13/03/2020 12:15:24	25C			01	13/03/2020 15:39:50	FULL FLIGHT	Play
757			13/03/2020 07:36:56	01			25C	13/03/2020 10:49:32	FULL FLIGHT	Play
757			08/03/2020 00:38:55	04L			10	08/03/2020 05:51:44	FULL FLIGHT	Play
757			06/03/2020 17:10:31	28			04R	06/03/2020 23:09:41	FULL FLIGHT	Play
757			02/03/2020 12:28:34	08L			10	02/03/2020 16:04:05	FULL FLIGHT	Play
757			02/03/2020 07:30:32	10			08L	02/03/2020 11:06:34	FULL FLIGHT	Play
757			29/02/2020 12:00:33	01L				29/02/2020 14:34:07	FULL FLIGHT	Play
757			29/02/2020 08:07:19	19			01L	29/02/2020 10:26:46	FULL FLIGHT	Play
757			27/02/2020 12:41:08	04R			10	27/02/2020 16:28:50	FULL FLIGHT	Play
757			27/02/2020 08:34:38	10			04L	27/02/2020 11:37:10	FULL FLIGHT	Play
757			22/02/2020 13:50:23	26L			01	22/02/2020 16:51:28	FULL FLIGHT	Play
757			22/02/2020 08:32:40	01			26L	22/02/2020 11:23:31	FULL FLIGHT	Play
757			21/02/2020 12:34:21	23			01	21/02/2020 14:32:06	FULL FLIGHT	Play
757			21/02/2020 08:16:36	01			23	21/02/2020 10:12:29	FULL FLIGHT	Play
757			14/02/2020 17:06:27	10			27	14/02/2020 22:12:21	FULL FLIGHT	Play
757			12/02/2020 16:06:38	08			01	12/02/2020 21:19:19	FULL FLIGHT	Play
757			12/02/2020 09:47:24	19			08	12/02/2020 14:49:46	FULL FLIGHT	Play

Page 1 of 4 (95 items) 1 2 3 4

Paul Harrison (PAULH) (c) FDP SOFTWARE.COM 2019 Ver: 1.0

The crew member can then view their own flights as instrumentation.



FLIGHT DATA PORTAL

Sometimes it useful for Pilot Managers/Engineers to be able to view flight data even if there have not been any events detected; if for instance a Cabin Crew Report or Air Safety Report is raised.

FDM360 includes the Flight Data Portal which allows specified staff to review flight data from any replayed flight.

The Portal includes the built-in ability to schedule a remote debrief to a third party (crew, union, manufacturer etc.) where the host is able to control and playback a flight for the attendees.

Option	Fleet	Flight No	Regn	Departure Date/Time	R/W	From	To	R/W	Arrival Date/Time	Type
Head Camera	757			06/06/2020 07:29:44	19			08R	06/06/2020 11:06:10	FULL FLIGHT
Head Camera	757			06/06/2020 14:01:57	04R			19	06/06/2020 15:52:34	FULL FLIGHT
Head Camera	757			06/06/2020 19:32:12	10R			19	06/06/2020 22:38:12	FULL FLIGHT
Head Camera	757			06/06/2020 16:34:02	19			04R	06/06/2020 19:07:39	FULL FLIGHT
Head Camera	757			06/06/2020 15:38:10	04R			19	06/06/2020 18:33:28	FULL FLIGHT
Head Camera	757			06/06/2020 14:22:29	09			19	06/06/2020 19:17:14	FULL FLIGHT
Head Camera	757			06/06/2020 12:46:15	25C			19	06/06/2020 16:01:13	FULL FLIGHT
Head Camera	757			06/06/2020 12:30:33	05R			19	06/06/2020 15:21:13	FULL FLIGHT
Head Camera	757			06/06/2020 12:17:06	07L			19	06/06/2020 15:13:59	FULL FLIGHT
Head Camera	757			06/06/2020 12:16:04	28			19	06/06/2020 15:47:01	FULL FLIGHT
Head Camera	757			06/06/2020 11:55:32	10R			19	06/06/2020 14:21:53	FULL FLIGHT
Head Camera	757			06/06/2020 11:13:21	19			04R	06/06/2020 13:44:42	FULL FLIGHT
Head Camera	757			06/06/2020 08:13:21	19			04R	06/06/2020 13:32:30	FULL FLIGHT
Head Camera	757			06/06/2020 07:57:41	19			10R	06/06/2020 10:11:15	FULL FLIGHT
Head Camera	757			06/06/2020 07:54:30	19			02	06/06/2020 10:36:26	FULL FLIGHT
Head Camera	757			06/06/2020 07:45:58	19			05R	06/06/2020 10:58:51	FULL FLIGHT
Head Camera	757			06/06/2020 07:14:06	19			19	06/06/2020 10:56:20	FULL FLIGHT
Head Camera	757			06/06/2020 07:26:45	19			07R	06/06/2020 10:36:47	FULL FLIGHT
Head Camera	757			07/06/2020 23:03:47	18C			19	06/06/2020 05:54:08	FULL FLIGHT
Head Camera	757			07/06/2020 20:19:51	22K			28	06/06/2020 22:34:21	FULL FLIGHT
Head Camera	757			07/06/2020 16:58:56	19			09	07/06/2020 19:32:19	FULL FLIGHT
Head Camera	757			07/06/2020 16:30:15				22L	07/06/2020 10:18:31	FULL FLIGHT
Head Camera	757			07/06/2020 12:51:26	22K			28	07/06/2020 18:24:30	FULL FLIGHT
Head Camera	757			07/06/2020 13:48:03	04R			01	07/06/2020 18:26:17	FULL FLIGHT
Head Camera	757			07/06/2020 13:13:39	08R			28	07/06/2020 16:05:50	FULL FLIGHT
Head Camera	757			07/06/2020 12:09:41	08L			28	07/06/2020 16:06:24	FULL FLIGHT

EVENT STORE – MANAGEMENT OF EVENTS

The FDM360 Event Store tools allow events to be managed and investigated with a simple but yet sophisticated workflow. Some of these tools are shown below.

Options
Event Details
Flight Data
User Defined Fields
Attachments
Audit Information
Post FDM To SMS360
JD
Analysis
Control
Severity Profile
Manuals
PLA

Event Store

Flight Data: 5667

Reference: 3957 Fleet: 757 From: To: Location: Runway: Flap: Multiple: Flight No: Severity: Assessment: Status: (NON VALIDATED)

Event Date/Time: 22 June 2019 00:00 Take Off Date/Time: 22 June 2019 00:01 Registration: Flight Phase: LANDING Flight Type: Standard Ports: Quadrant: ASR:

Event Code: 27A Category: RUDDER Description: RUDDER DEFLECTION ABOVE 1000FT Description: DEFLECTION 121.673 (MPS) AT 59732.0 FT

Flight Data

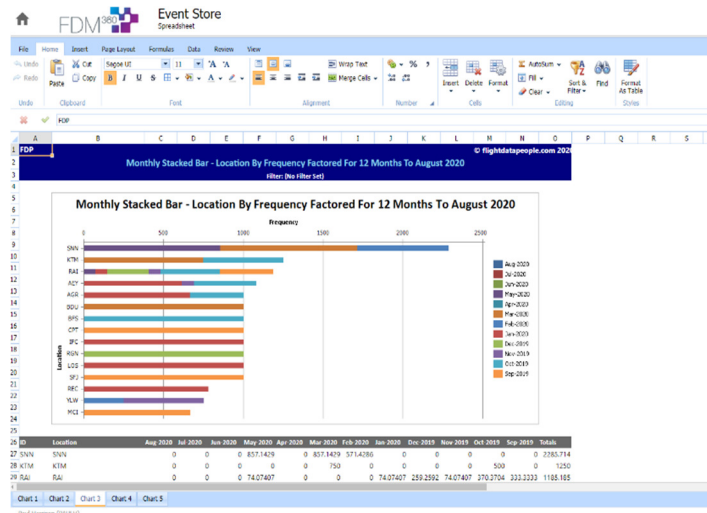
SEVERE EVENT 5067
27A - RUDDER DEFLECTION ABOVE 1000FT DEFLECTION 121.673 (MPS) AT 59732.0 FT
Start Date Peak PM Day Frame Trigger Value
2019-06-22 25 00:00:00 1 10 1035 6 50-47553
ALT CAS ALT RACH FLP A/P A/T
2.5 1 10000 0 0-7 0 F
TAKE OFF
ALT FLP R/W ALT 1000 FLP V2 FPM FPA G-043
2.5 1 1 50 mch 2 75 00 0 00 0 000
LANDING
ALT R/W ALT 1000 FLP 100 G
0 0 20 50000 95 1 1.020
WEATHER
- No weather data for this period (0)-

Views
A GROUP VIEW.VFD
FLIGHT OPS EVENT.VFD
FLIGHT OPS.VFD
MODES.VFD
PAUL.VFD
PMA.VFD
TESTPA.VFD

Events detected during the analysis are validated prior to exporting to the Event Store. False events are marked as such and may be used to modify event logic or identify aircraft recording problems.

Only validated events are exported to the Event Store.

FDM360 includes full integration to SMS360 allowing events to be linked or posted.



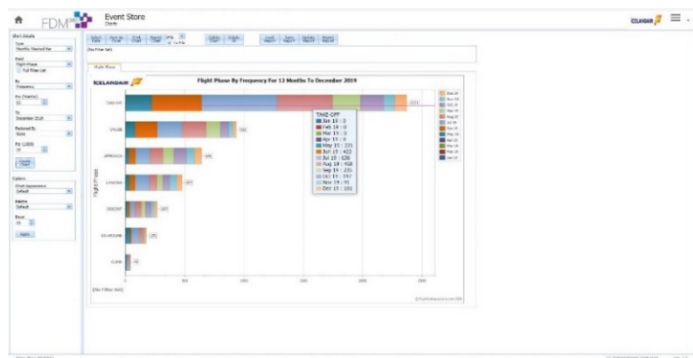
Powerful built-in drill down charts. Analysis can be performed on events by frequency, severity and by rate (operational data, replayed flights, flying hour).

Ability to save the trend collection as a report and then reload and update to the current date.

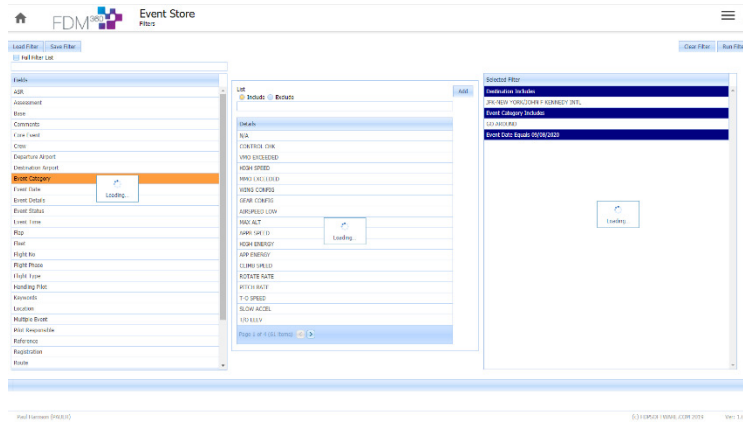
Ability to save the resulting trends into a multi-tabbed Excel spreadsheet. Full Excel functionality built into the web-browser!

Rect	Code	Event Description	# Events this month	# Events prev year	Expected # events	Poisson	# Sectors this month	# Sectors prev year
757	05A	EXCESSIVE OF MAX OPERATING ALTITUDE	0	224	5.1	0	646	23712
757	22H	ALTITUDE DEVIATION	3	445	12.12	0	646	23712
757	23B	HIGH NORMAL ACCELERATION IN FLIGHT (FLAPS IN)	0	108	2.94	0.05	646	23712
757	24C	GA ACTIVATION	0	358	9.78	0	646	23712
757	27A	RUDDER DEFLECTION ABOVE 1000F	0	273	7.44	0	646	23712
757	42C	AUTO PRESSURE FAULT	1	263	7.37	0.01	646	23712
757	44A	GPWS HARD WARNING	0	114	3.11	0.04	646	23712
757	44B	GPWS SOFT WARNING	1	196	5.34	0.03	646	23712
757	47C	REDUCED FLAP TAKEOFF	0	154	4.2	0.02	646	23712
757	48D	FLAP LOAD RELIEF SYSTEM OPERATION	0	132	3.6	0.03	646	23712

Advanced features like Poisson Prediction presents the user with unusual patterns of events by (event, location, runway, flight phase and event category).

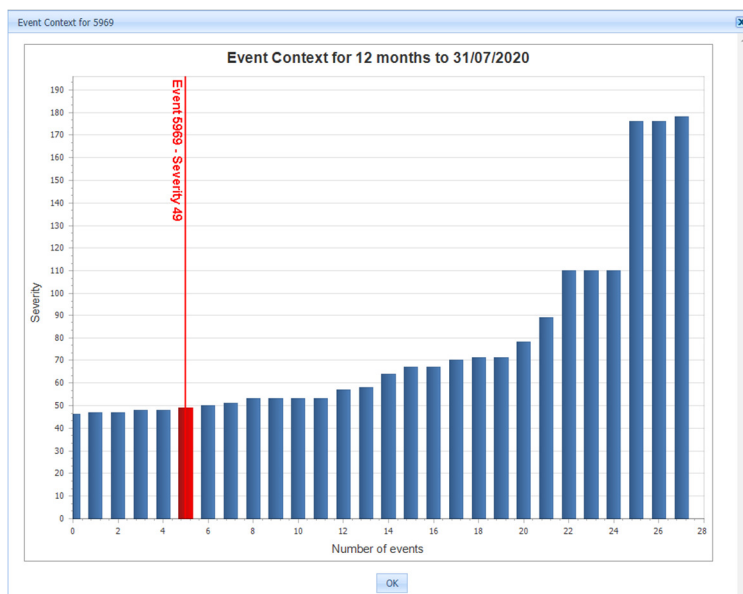


FDM360 has full drill-down capability to view the data behind any trend chart.



A comprehensive filter capability allows the user to slice and dice events,

Built into the grids, are features like sorting, grouping, column filters and query builder.



Event Context give an immediate indication of event significance in terms of exceedance value or severity.



FDM360 includes a dashboard facility with built in editor. Dashboard views can be used to give immediate visibility of key operational issues and risks.

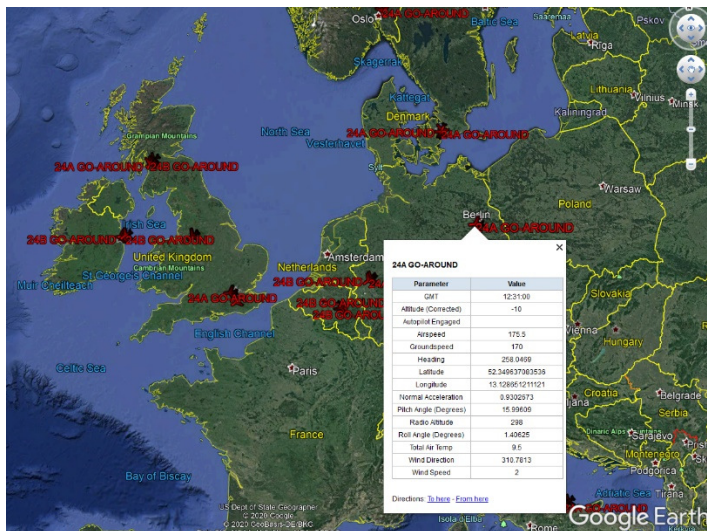
Crew profile for 86789

Flying activity for 12 months to 31/07/2020 for Crew ID 86789															
Jul 20	Jun 20	May 20	Apr 20	Mar 20	Feb 20	Jan 20	Dec 19	Nov 19	Oct 19	Sep 19	Aug 19	Year Total	Total Crew in fleet	Ranked by event freq	Ranked by severity
4	2	0	0	8	12	8	10	13	0	15	9	81	518	=417	=403

13 events for the same period															
Ref	Reg	Date	Flight No	Code	Details	From	To	Loc	Phase	SF	ASR	Union	HP	PR	
5969		JUL 2020		43A	SPEEDBRAKE ON APPROACH BELOW 1000FT				APPROACH	49		N			
242		MAR 2020		44B	GPWS SOFT WARNING				APPROACH	51		N			
671		FEB 2020		01E	HIGH SPEED BELOW 4500F AAL (Descent)				DESCENT	7		N			
871		JAN 2020		20C	ABNORMAL PITCH ATTITUDE LANDING LOW				LANDING	103		N			
1192		DEC 2019		03G	GEAR DOWN SPEED EXCEEDENCE				TAKE-OFF	0		N			
1416		NOV 2019		03A	FLAP PLACARD EXCEEDENCE				APPROACH	28		N			
1525		NOV 2019		09B	AVERAGE PITCH RATE HIGH ON TAKE-OFF				TAKE-OFF	15		N			
3149		SEP 2019		56A	DEVIATION UNDER GLIDESLOPE				APPROACH	34		N			
3521		SEP 2019		01E	HIGH SPEED BELOW 4500F AAL (Descent)				DESCENT	64		N			
3545		SEP 2019		43C	AUTO SPEEDBRAKE FAULT				CRUISE	1		N			
3546		SEP 2019		10A	UNSTICK SPEED HIGH				TAKE-OFF	54		N			
3580		SEP 2019		56A	DEVIATION UNDER GLIDESLOPE				APPROACH	30		N			
3581		SEP 2019		44B	GPWS SOFT WARNING				APPROACH	51		N			

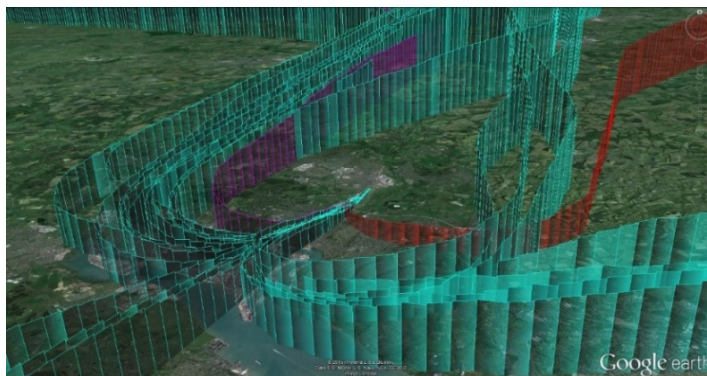
OK

Using an operations data feed from the customer rostering system, the replayed flights are matched to the ops data and this allows the crews to be added to the events automatically. Deidentified crew analysis is available through trending and filtering. Also, the crew's flight and event history is available should contact be required.



Google Earth is used extensively in FDM360 to produce either event collections, aircraft tracks or multiple airport tracks given a predefined criteria. This allows presentation of operational data in a geographic form.

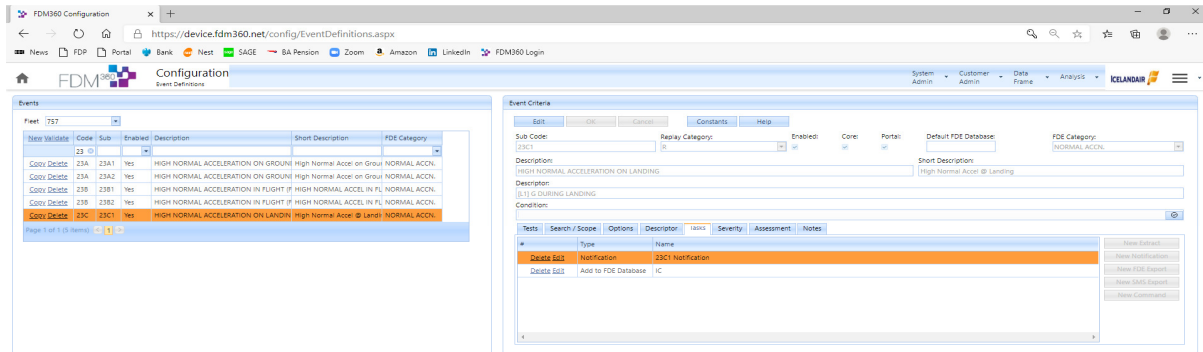
GOOGLE EARTH TRACKS



We understand the need for a smooth well thought out workflow. We believe that the methodology employed in this system for processing and analysing flight data is not only the best practice in the industry, it will also simplify your processes and reduce the time taken to turn your flight data into meaningful information.

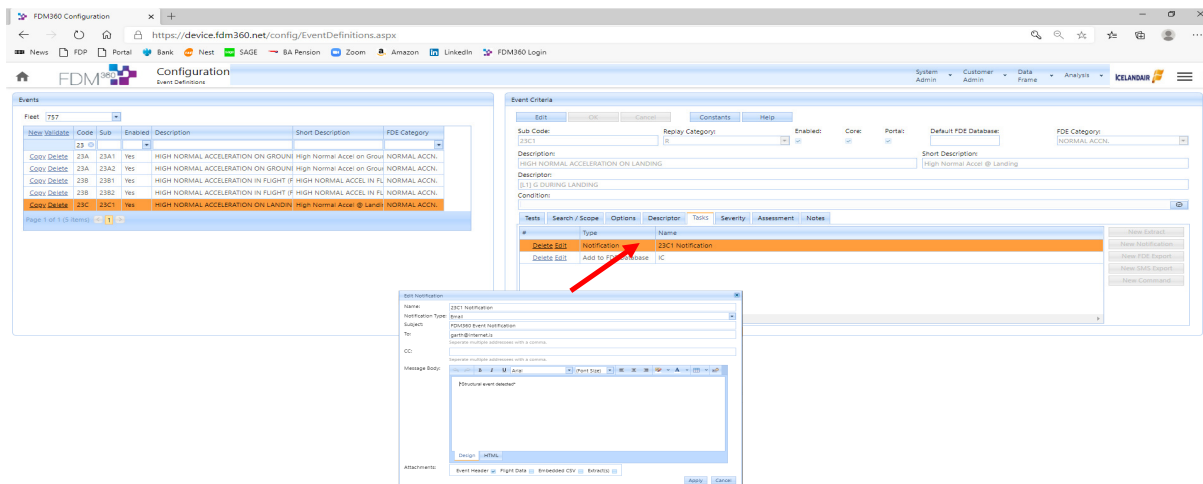
Event Notification

Events can be configured to provide an automated email notification whenever the detection criteria are satisfied. This can be particularly useful for structural events that would trigger a maintenance check. Event notification is triggered by the event detection process, it should be noted that this prior to any event validation process.



EMAIL NOTIFICATIONS

Notifications can be sent to any email address. The notification message can be configured as required, containing either a simple message that the event has occurred or more details, including the attachment of a file containing relevant parameters from the event.



The system can also send a daily email to a designated address list detailing the new validated events in the last 24 hours.

MEASUREMENTS

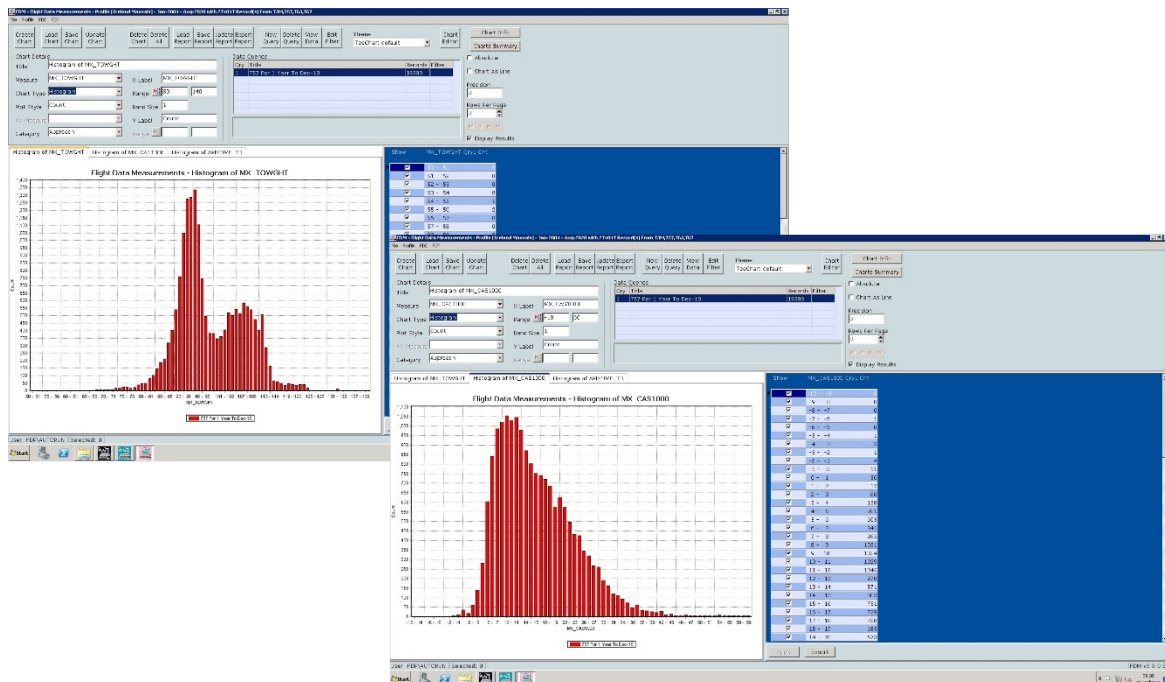
FDM360 can be configured to sample and store measurement data from every flight. These are usually setup as derived parameters and will capture key operational measures such as:

- Airspeed at 1000 ft on approach
- Height that the gear is lowered for landing
- Landing flap selection height

In some systems, values captured in this way can be subject to bad data, but FDM360 allows each value to be checked for validity against pre-defined criteria, this prevents the Measurement database from becoming corrupted by false values.

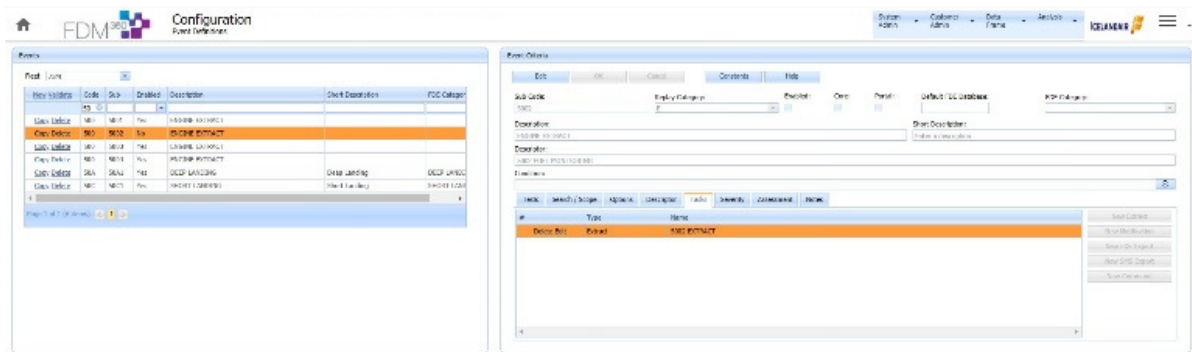
Filter tools allow selection of the required criteria so that the user can 'drill-down' into the data.

The screenshots below show the distribution of take-off weight and approach speed in relation to Vref (CAS-Vref) for the selected time period.



Fuel Extracts

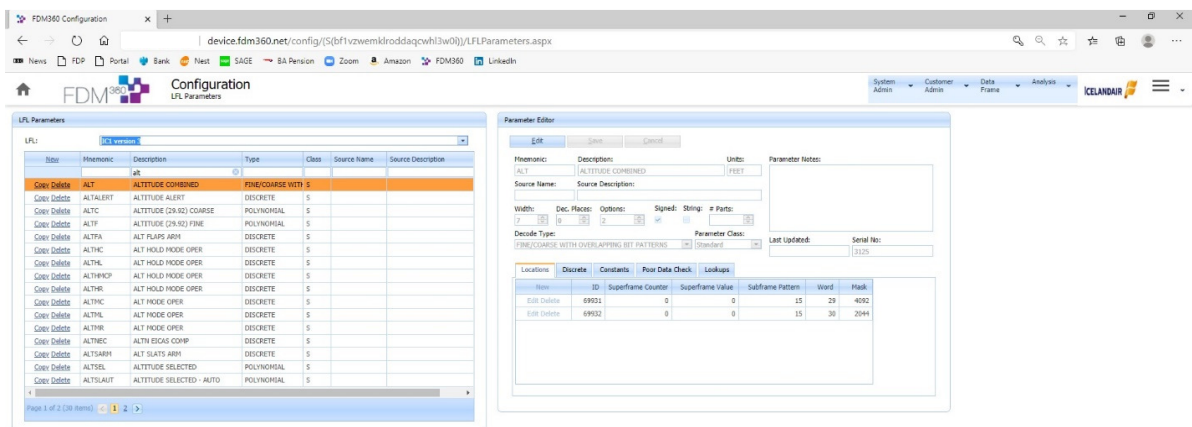
Most operators have a need to monitor fuel performance trends and supply data from routine operational flights to a specialist companies for analysis. FDM360 can be configured to automatically collect and store any combination of recorded or calculated parameters, at any point in the flight, in files for fuel analysis purposes. Fuel extracts are configured as engineering events, with actions assigned.



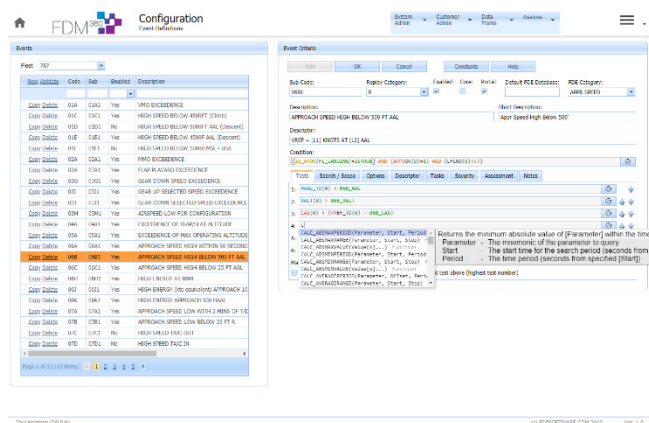
SYSTEM CONFIGURATION TOOLS

All system configuration tools can be accessed by users with appropriate access credentials. This is helpful when there is a need to understand, for example, the decoding of specific parameters or the logic employed for an event. The screen layouts are simple to understand users with the knowledge to implement changes can quickly be trained to implement and test changes.

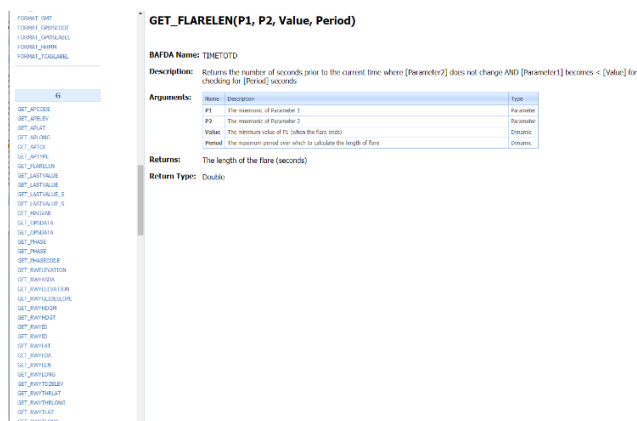
The screen below shows an example from the LFL configuration tool that allows access to all parameter definitions.



FDM360 supports all major flight data recorders and formats.



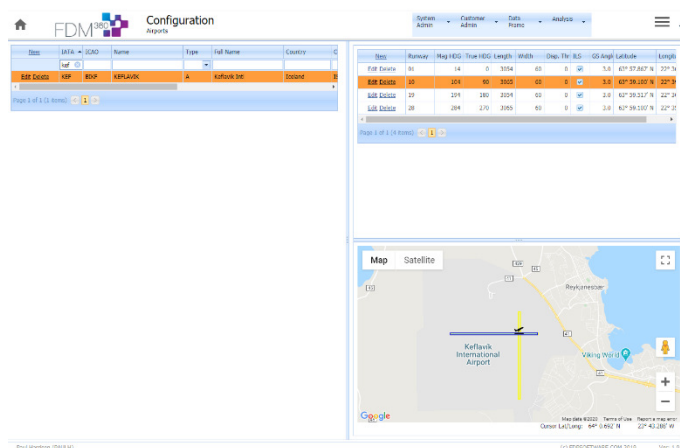
A comprehensive event configuration tool suite allows any recorded or derived parameters to be used in event definitions. The user interface is simple enough to allow even the 'novice' user to understand the event logic.



Advanced tools allow more experienced users to see and modify event logic.

Built into the expression engine are advanced features such as predictive typing which present the list of available functions, recorded parameters, derived parameters and constants.

Built in reference guides are provided for guidance.

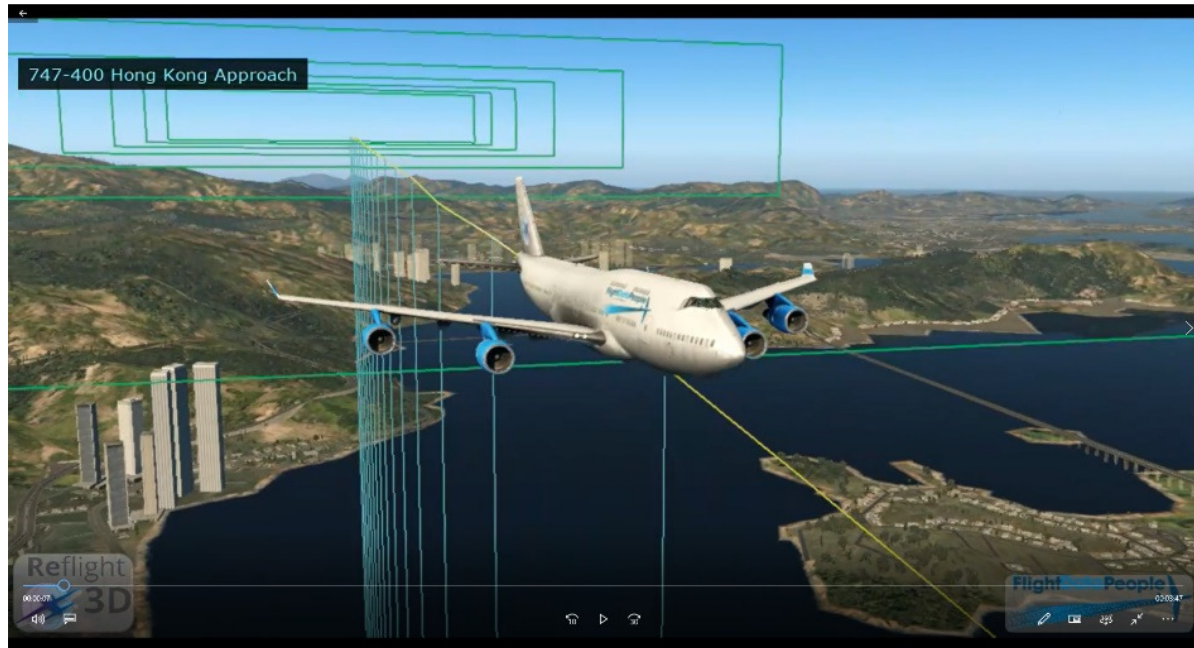


The airport database can be accessed and updated at any time.

The interface allows the airport and runways to be displayed over Google Earth. The provides a level of reassurance that the airport definitions are correctly defined.

RE-FLIGHT 3D – OPTIONAL

Our Flight Data Simulation tools allow flights and events to be visualised using flight data collected and stored by FDM360.



The simulations do not need to be refined as the data required is automatically generated with no need for human intervention.

3D Simulations can be produced using the FDM360

Re-Flight 3D module. Glideslope, localiser, gates and events can be indicated on the 3D simulation view. The view angle can be controlled and zoom in/out is also available giving you full control of the simulation.

RETURN ON INVESTMENT (ROI)

The primary reason for choosing FDM360 is to reduce safety risk within your organisation by proactively analysing flight data to look for underlying trends and putting in place mitigating actions to address them. However, FDM360 will also produce a Return on Investment (ROI) from savings in operational efficiency costs and reducing events which result in operational disruptions such as return to stands, air turnback's, go-arounds and delays. FDM360 can also produce extracts for EHM, APM and Fuel Management which also lead to operational efficiency gains.

FDM360 will also save time and manpower using the automated and efficient analysis and processes within the system. Additionally, FDM360 is a hosted solution which means that implementation, set-up and operational costs are minimised. This will also have a positive effect on the ROI.

HARDWARE AND SOFTWARE REQUIREMENTS

FDM360 is hosted by FlightDataPeople so there is no need to purchase hardware. FDM360 can be accessed by the popularly used web browser such as Internet Explorer, Firefox, Google Chrome and Safari. This means the system can be accessed via iPads and other portable devices with internet access.

The advantages of FlightDataPeople hosting the solution for you includes:

- ✓ Uninterrupted service with reduced internal manpower requirements allowing operator to focus on Safety Benefits rather than system operation
- ✓ Developed and proven system functionality
- ✓ Secure remote access from anywhere in the world with suitable internet connectivity. Access via Windows PC, iPad or Android device
- ✓ Secure data storage & retrieval
- ✓ Access to full range of Technical and Operational expertise and proven support infrastructure from FDP
- ✓ In-house system interfaces
- ✓ Compliance with all existing regulatory requirements

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