

Aerosight FDM User Guide

Issue 4 / September 2023

Records of Revision

Number	Effective Date	Prepared By	Highlights
Issue 1	May 2017	Ivan Monov	Initial issue
Issue 2	1 April 2021	Valentin Ivanov	New platform features
Issue 3	15 September 2021	Valentin Ivanov	ECM and Pilot Performance optional features expanded
Issue 4	19 September 2023	Denitsa Kamenova	New logo amendment

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1. Introduction

Aerosight FDM is an online, cloud-based platform which aids in the translation of flight data recorder data to an easy to interpret and user-friendly format. It provides suitable means for application of the Operator's Flight Data Monitoring Program, required by EASA Annex III (Part-ORO) to Com. Reg. (EU) No 965/2012, UK CAA CAP 739 and FAA 14 CFR Part 121.

Digital flight data downloaded from the aircraft is analyzed to determine if deviations from structural aircraft limits or Standard Operating Procedures (SOPs) have occurred. The events that are monitored constitute a customer-defined set which is continuously revised in order to best adapt to the company procedures in place and help in the identification and measurement of safety risks, as well as in aircraft condition monitoring.

Throughout this document, the words 'platform', 'system' or 'software' are frequently used to describe the Aerosight FDM platform. These terms are interchangeable.

2. System Access

Your access to Aerosight FDM is restricted by the terms of the license agreement that was signed between your organization and Aerosight Ltd. Some system features may not be accessible due to account restrictions. Different roles and privileges in the access to flight data shall be agreed upon in your organization to aid the proper setup of all user accounts.

How to access the system?

1. Open your browser and go to: <https://fdm.aero-sight.com>

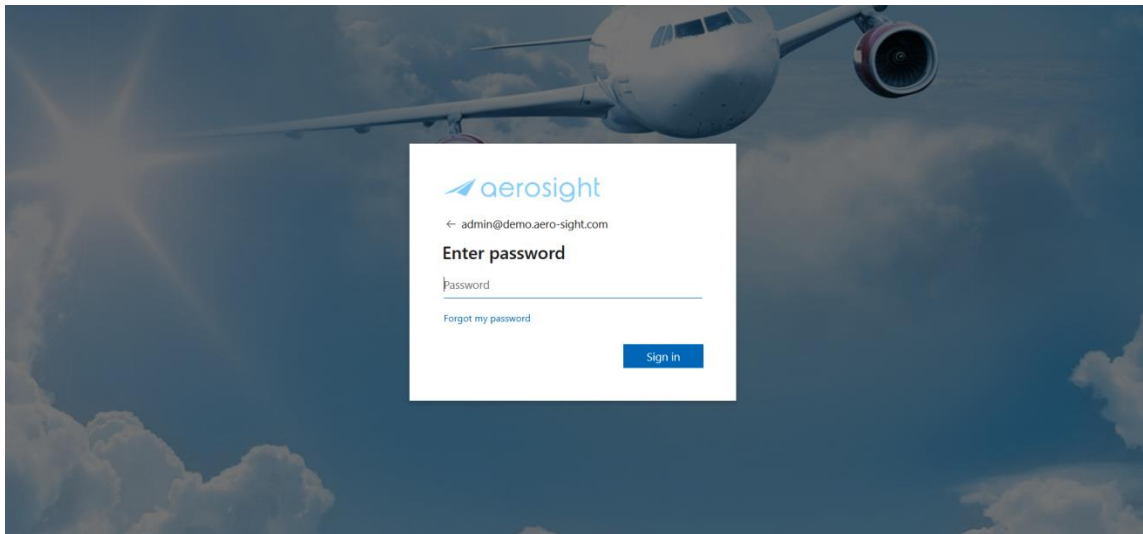


Figure 1 – the Aerosight FDM login page

2. Login with your credentials (Figure 1) in the username and password fields.

3. Processing Raw Files

How to upload a raw data file in the system?

1. Open the **Raw Files** page from the side menu on the left (Figure 2).



Figure 2 – the **Raw Files** subtitle

2. Click on the **Add** button in the top right corner (Figure 3).

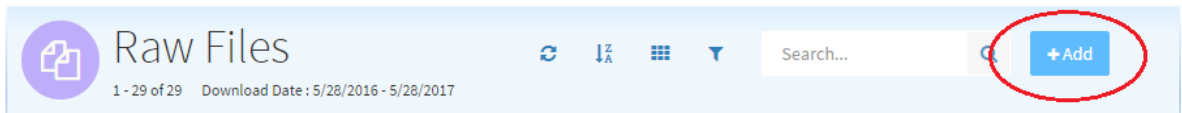
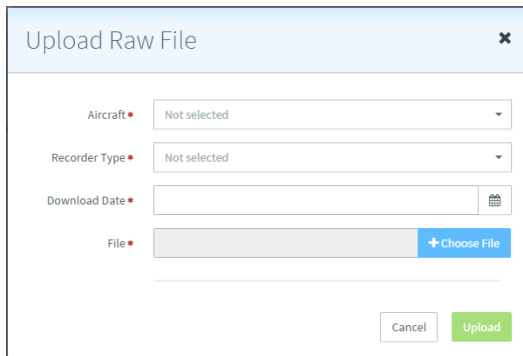


Figure 3 – the top part of the **Raw Files** page with the **Add** button marked

3. Enter the file details in the popup dialog and choose the file to upload (Figure 4).



The dialog box titled "Upload Raw File" contains the following fields and controls:

- Aircraft**: A dropdown menu with "Not selected" as the current value.
- Recorder Type**: A dropdown menu with "Not selected" as the current value.
- Download Date**: A date input field with a calendar icon.
- File**: A file input field with a "+ Choose File" button.
- At the bottom, there are "Cancel" and "Upload" buttons.

Figure 4 – the **Upload Raw File** dialog

Note: The system accepts files with unique file names only. Therefore, a proper and consistent convention for naming of the files shall be established from the beginning.

Example of good naming: <ACREG>_<DATE_OF_DOWNLOAD> (AB-XYZ_2021-03-01.fdr)

Note: Wait for the upload to complete. The upload time depends on the file size and connection speed. An upload progress bar is shown during the operation.

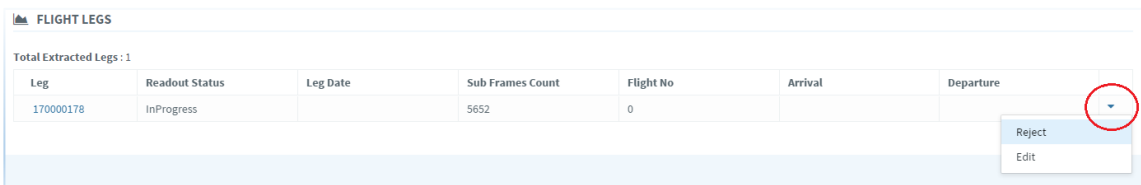
Note: It is desirable to use the **zip** format for uploading raw files as the cloud technology of the platform works better with smaller file sizes. It is recommended to have only one file per each zip archive.

How to analyze an uploaded file?

4. After some short time an automatic analysis is performed to detect the different flight sectors (legs) in the file. The status field will change from **New** to **Split in Progress**.
Wait for the file analysis to complete until a **Split Finished** status is shown.
5. Click on the filename to open the **Raw File Details** page where the segmented legs are listed.
6. The split can be **deleted** if the aircraft is wrong or all detected legs are considered to be invalid, and the file can be uploaded again.

How to start the parameter analysis and event detection?

7. If everything in the split looks good, the split must be **confirmed** from the button in the top right corner.
8. After the split is confirmed, first the automatic leg parameters readout and afterwards the automatic event detection are started for each leg. During the process the readout status changes to **In Progress**.
9. Legs can be **rejected** with a reason if they are incomplete or shall not be analyzed (Figure 5). **Tip:** The **Sub Frames Count** column represents the leg length (in seconds) and can be used for reference to determine if the leg has been detected correctly.



Leg	Readout Status	Leg Date	Sub Frames Count	Flight No	Arrival	Departure
170000178	InProgress		5652	0		

Figure 5 – the **Reject** option

10. After the leg readout is complete, the readout status field will change to **Accepted**.

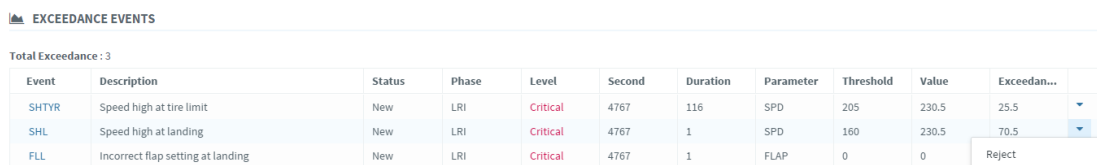
How to view the flight readout information?

11. Click on the generated **Leg No** field (example in Figure 6) to go to the **Flight Leg Details** page where the readout details can be reviewed.



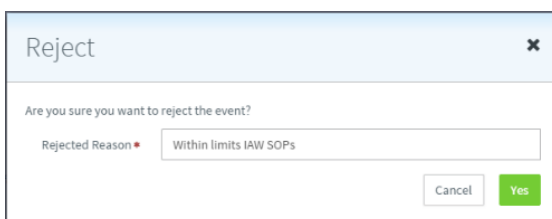
Figure 6 – the generated leg number

12. All detected leg events (Figure 7) must be inspected for validity and if necessary can be **rejected** with reason, e.g. a false positive. A short comment may be entered (Figure 8).



Event	Description	Status	Phase	Level	Second	Duration	Parameter	Threshold	Value	Exceedan...
SHTYR	Speed high at tire limit	New	LRI	Critical	4767	116	SPD	205	230.5	25.5
SHL	Speed high at landing	New	LRI	Critical	4767	1	SPD	160	230.5	70.5
FLL	Incorrect flap setting at landing	New	LRI	Critical	4767	1	FLAP	0	0	Reject

Figure 7 – the events detected for the leg



Reject ✕

Are you sure you want to reject the event?

Rejected Reason *

Figure 8 – the leg rejection dialog with a free space for a comment

13. An interactive flight trace can be viewed from the **Flight Trace** button (Figure 9):

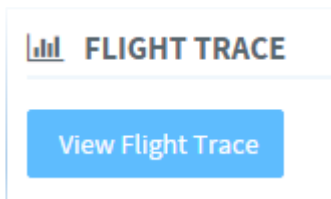


Figure 9 – the **Flight Trace** button

The user can display a set of parameters of their choice by adding or removing parameter tags in the parameter field highlighted in Figure 10 and then clicking the green **Apply** button. The tools in the top right corner of the dialog allow for zooming the graphs in and out, viewing single parameter values at a given time point or comparing parameters.



Figure 10 – the **Flight Trace** dialog with the parameter choice field highlighted

14. Flight readout reports can be downloaded from the **Report** button in the top right corner.

15. All finished legs with no **Departure** and **Arrival** airport detected must be **edited** from the button in the top right corner (Figure 11 and Figure 12).

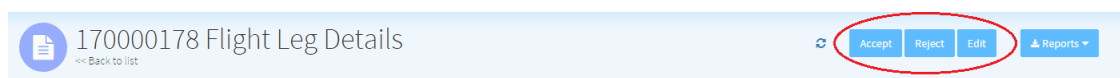


Figure 11 – the **Accept, Reject** and **Edit** buttons

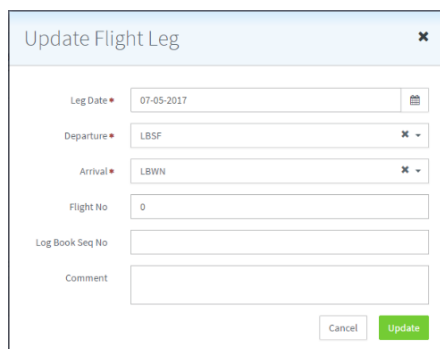


Figure 12 – the **Update Flight Leg** dialog

How to include the leg analysis in the safety statistics?

16. All finished legs with the complete destination information entered can be **accepted** either from the button in the top right corner or from the **Raw File Details** page (Figure 13).

FLIGHT LEGS

Total Processed Legs: 1

Leg	Status	Leg Date	Leg End Date	Departure	Arrival	Duration	Flight No	Critical	Major	Minor	Engine Status
210000009	ForReview	24-10-2020 11:48	24-10-2020 12:33	HCMM	HCMM	00:45:28	0	1	1	4	<div style="border: 1px solid red; padding: 2px;"> Accept Reject Edit </div>

Figure 13 – the leg dropdown menu

Note: Accepted flights and their events are shown in the Flights Legs and Flight Events pages which are used for the statistical analysis.

Note: Accepted flights cannot be modified.

4. Flight Legs

This section lists all flights. The list (Figure 14) contains the following:

- Leg number
- Status
- Aircraft registration
- Raw file
- Leg Date
- Leg End Date
- Duration
- Departure
- Arrival
- Flight No
- Critical Events
- Major Events
- Minor Events



Figure 14 – the properties shown on the **Flight Legs** page

The field **Leg** contains a leg number generated automatically by the system.

The **Status** field can read one of the following – *In Progress, Suspended, Finished, Accepted or Rejected*, depending on the readout and acceptance status of the flight data.

Aircraft displays the registration of the aircraft from which data was downloaded and analyzed. It is defined during the Raw Files Upload process.

Raw File refers to the raw data file name from which the flight leg was segmented.

The **Departure/Arrival, Leg Date, Flight No** fields are automatically extracted from the raw file (if the corresponding parameter data is recorded).

The **Critical/Major/Minor** fields provide the events count for the flight leg.

How to review a selected flight leg?

Clicking on the leg number from the list opens the **Flight Leg Details** page, which contains Flight information, Aircraft information, Readout information, Data quality analysis, Parameter check, Exceedance Events and Flight Trace. This is also where the user can view the relevant flight reports using the **Reports** button in the top right corner (Figure 15).



Figure 15 – the **Reports** button

The following reports are available for download:

- Readout Report
- Appendix A. Parameter Listing
- Appendix B. Parameter check report
- Appendix C. Flight Trace
- Take Off Google Earth
- Landing Google Earth

The latter two represent a plot of the flight trajectory on Google Earth for visualization.

The **Flight Information** section gives information about the readout, including Flight Leg Number, Flight Leg Date, Flight No, Log Book No, Raw File name and any comments. In case the corresponding parameters data is recorded, the fields are automatically updated from the raw file. In any other case the information should be entered manually by the user.

The **Readout Information** section lists the readout date and status and the sub frames count.

The **Data Quality Analysis** section provides an overview of bad data contained in the file.

The **Parameter Check** section provides an overview of the recorded parameter readout status. A detailed report can be downloaded from the **Report** function button (Appendix B).

The **Aircraft Details** section lists the Operator, Aircraft MSN and Line Number, FDR P/N, QAR P/N and FDAU S/N, as defined in the system.

The **Readout Details** section contains the Recorder Type, FDR Layout version, Events Layout version and Readout Software version.

The **Exceedance Events** section (Figure 16) lists all the exceedance events detected by the system in the flight data. The exceedance events are listed by Event ID, Description, Phase of flight, Level, Time of occurrence (second), Duration, Parameter (by which exceedance is detected), Threshold, Value (of the parameter) and Exceedance value. It is down to the independent professional judgment of the viewer to determine whether an event is genuine or not and accept or reject it. This is shown by the status icon on the left (green/red thumb).

EXCEEDANCE EVENTS												
Total Exceedance Events : 6												
Event	Description	Phase	Level	Second	Time	Dur(sec)	Parameter	Unit	Thld	Value	Exc	
SHFLB1	Flap placard speed exceedance Boeing (conf.1)	CLB	Minor	656	00:10:56	8	SPD	kt	210.00	218.00	8.00	
SHC30	Speed high between 3000 and 10000 ft	CLB	Minor	742	00:12:22	45	SPD	kt	265.00	273.00	8.00	
EGTC	EGT limit (continuous)	CRZ	Critical	1 059	00:17:29	27	EGT1	degC	895.00	1 001.00	106.00	
SHFLB1	Flap placard speed exceedance Boeing (conf.1)	DES	Minor	2 183	00:36:23	26	SPD	kt	210.00	216.00	6.00	
SHFLB5	Flap placard speed exceedance Boeing (conf.5)	APP	Minor	2 233	00:37:13	1	SPD	kt	200.00	200.00	0.00	
SHFLB15	Flap placard speed exceedance Boeing (conf.15)	APP	Major	2 421	00:40:21	68	SPD	kt	180.00	184.00	4.00	

Figure 16 – the Exceedance Events section

In case that the viewer decides that an event is not genuine and the parameter exceedance detected was justified under the circumstances, they can **reject** the event. Rejection does not erase the event, but only excludes it from the statistical analysis discussed further in the text. The dropdown menu on the right of the event (Figure 17) provides the **Reject** option.

kt	210.00	216.00	6.00	▼
kt	200.00	200.00	0.00	▼
kt	180.00	184.00		

Reject

Figure 17 – the **Reject** option, excluding an event from the statistics

Each detected Event can be reviewed by selecting the Event ID from the list.

The **Flight Trace** section shows the interactive graphic representation of the flight data which is displayed by the **View Flight Trace** button (Figure 18).



Figure 18 – the **View Flight Trace** button

As previously shown (Figure 10), the **Flight Trace** dialog is a graphical representation of flight parameters chosen by the user. The full trace can be downloaded from the **Reports** function (Appendix C). Using the icons in the upper right side of the dialog (Figure 19), the user can:

- download the graphic as an image file;
- zoom in and out;
- pan;
- autoscale;
- show closest data on hover;
- compare data on hover;
- choose between UTC and Flight time for the X axis;
- Show/Hide the Y axis.



Figure 19 – the **Flight Trace** dialog viewing tools

With the option **Show closest data on hover** selected, with the mouse over the graphic, the value of the parameter closest to the pointer will be displayed.

With the option **Compare data on hover** selected, with the mouse over the graphic, the values of all parameters will be displayed.

Two other view options are located to the left of the parameters choice field (Figure 20). The **Named Set** option allows the user to create a custom set of parameters to view and give it a name. The **Cockpit** option (Figure 21) allows the user to watch a replay of the flight data in a cockpit-like viewing setting. It is opened by ticking the **Cockpit** box and clicking **Apply**. The visualization can be slewed forwards or backwards like a video clip by using the video controls at the bottom of the popup window.



Figure 20 – the **Named Set** and **Cockpit** visualization features

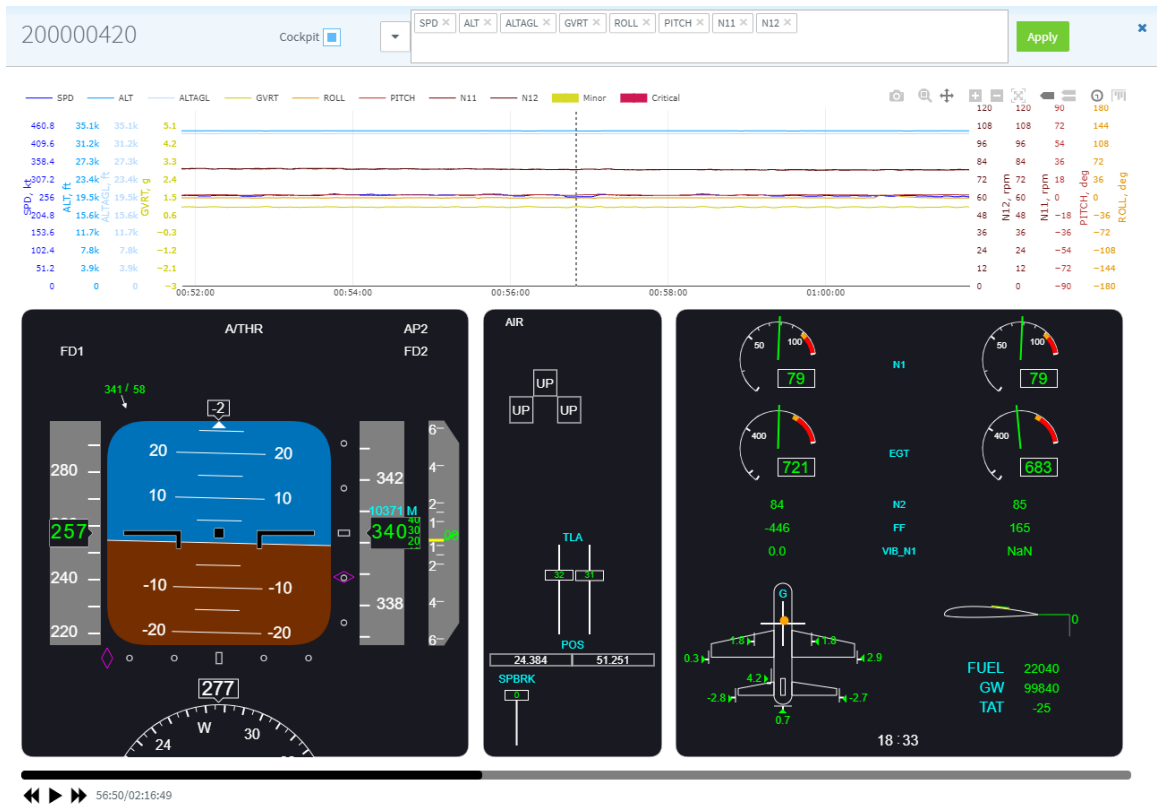


Figure 21 – the cockpit visualization window

5. Flight Events

The **Flight Events** page (Figure 22) lists all exceedance events detected by the system.

Event	Description	Level	Phase	Time	Dur(sec)	Aircraft	Leg Date	Leg	Airport
SHFLB15	Flap placard speed exceedance Boeing (conf.15)	Major	APP	00:40:21	68		24-10-2020 11:48	210000009	
SHFLB5	Flap placard speed exceedance Boeing (conf.5)	Minor	APP	00:37:13	1		24-10-2020 11:48	210000009	
SHFLB1	Flap placard speed exceedance Boeing (conf.1)	Minor	DES	00:36:23	26		24-10-2020 11:48	210000009	
EGTC	EGT limit (continuous)	Critical	CRZ	00:17:39	27		24-10-2020 11:48	210000009	
SHC30	Speed high between 3000 and 10000 ft	Minor	CLB	00:12:22	45		24-10-2020 11:48	210000009	
SHFLB1	Flap placard speed exceedance Boeing (conf.1)	Minor	CLB	00:10:56	8		24-10-2020 11:48	210000009	

Figure 22 – the **Flight Events** page

The events are listed by Event ID, Event Description, Level, Flight Phase, Aircraft registration, aircraft type, Flight leg date, Flight Leg No, Departure / Arrival Airport. Clicking on any column title sorts the list in an ascending or descending order by the selected column.

Using the buttons in the upper right side of the screen, you can:

- navigate through the list (left/right arrow);
- refresh the list;
- sort the list (by Event, Level, Phase, Aircraft registration, Leg Date, Leg No, Departure airport; Arrival airport);
- show all (clears filter/sorting);
- filter the list (by Event type, Event level, Phase, Aircraft registration, Arrival airport, Departure airport, date).

You can search for specific wording by the **Search** field.

All listed events can be downloaded in tabular format by clicking the **Download** button.

How to investigate an event occurrence?

Selecting an Event from the list opens the **Flight Event Details** window, containing the **Flight Information** and **Event Information** sections (Figure 23).

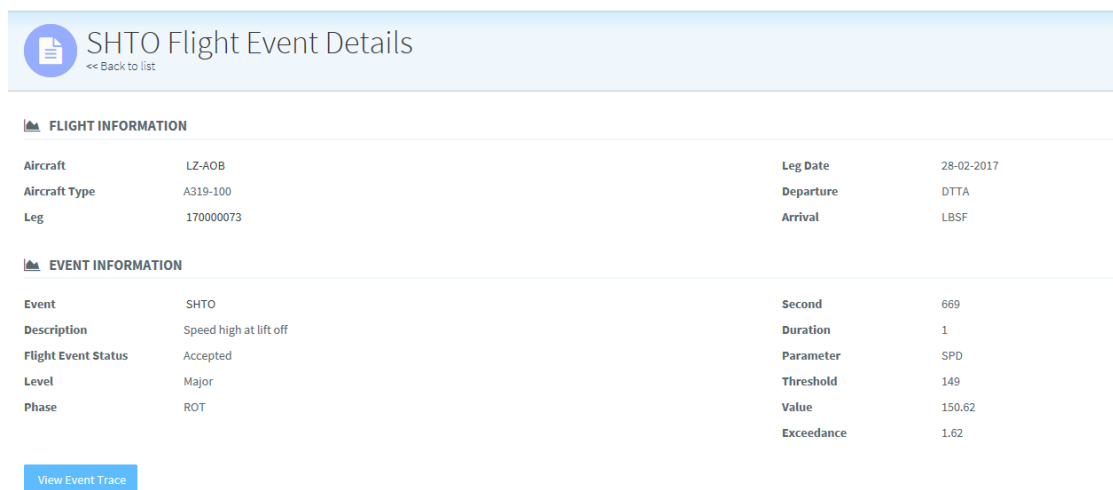


Figure 23 – the **Flight Event Details** window

To view an interactive graph of the Event, click on the **View Event Trace** Button (Figure 24).



Figure 24 – the interactive event trace graph

Parameter values can be added to show their correlation for investigation purposes.

6. The OP Statistics feature

How to use the statistics capabilities of the system?

The **Overview** page (Figure 25) gives you a quick overview of the top detected events, as well as the distribution of events per flight phase.

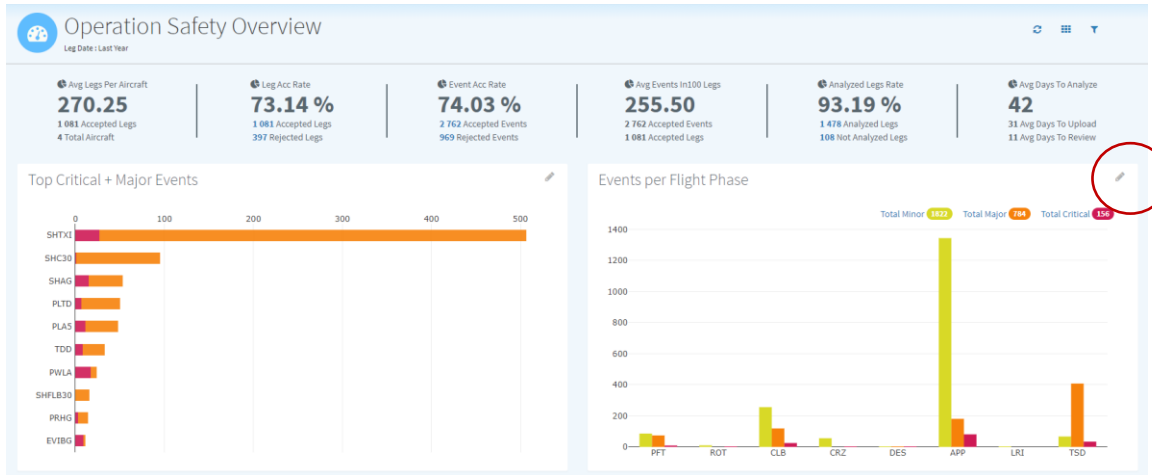


Figure 25 – the **Operation Safety Overview** page

It includes the following graphs:

- Top 10 Critical and Major Events;
- Events per Flight Phase.

A mouse-over on the graphic displays the events count. Clicking the *Edit* button highlighted in the upper right corner of the graphic will load the following options (Figure 26):

- Show list/chart - changes the view between chart graphic and list of source data;
- Refresh - updates the chart/list;
- Show All - clears the applied filter and displays all system data available;
- Filter – allows for selection of data relevant to fleet, A/C registration, and for a specific term – 1 week, 1 month, 3 months, 6 months, 1 year, CR-since creation or selected period.

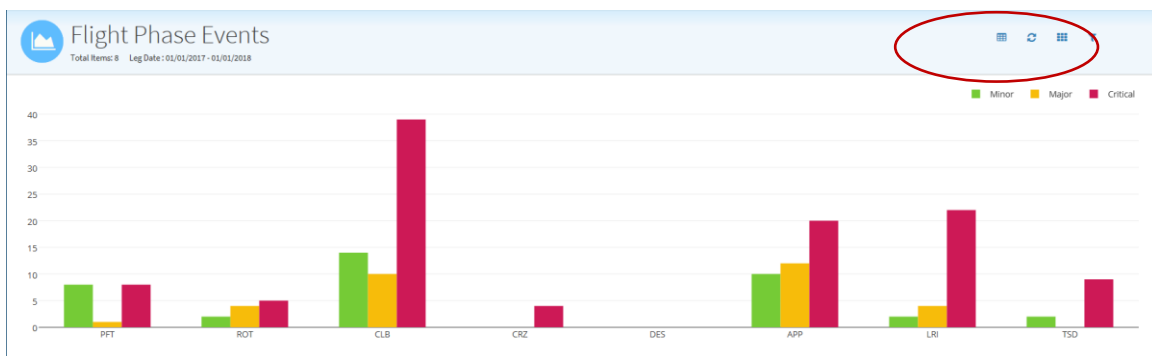


Figure 26 – the options for displaying flight phase events

The **Year to Date** subtitle presents an overview of statistics and trends for the past year. It allows for comparison of event trends, as well as legs per aircraft trends (Figure 27).

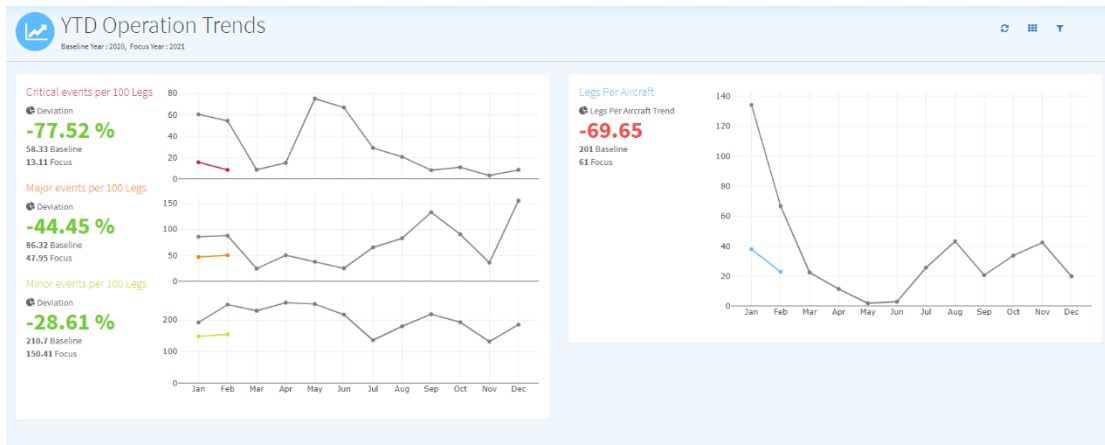


Figure 27 – The Year to Date Operation Trends

7. Fleet and organization management

How to manage the fleet?

The **Aircraft** subtitle in the side menu lists the aircraft set up in the system by Aircraft Registration, Family, MSN. The list can be sorted. Selecting a particular aircraft, opens the Aircraft Details screen with basic information for the aircraft and buttons allowing viewing the associated legs, files and statistics.

How to assign roles within the organization?

A role in the context of this paragraph is a combination of privileges which each user from a given organization has. Each organization has a different approach towards FDM management – for example, some small organizations may have the entire FDM department run by the Safety Manager only while a larger organization might wish to assign staff from other departments to some of the routine tasks, i.e. uploading raw files. The **Roles** subtitle from the **Administration** title in the side menu provides an overview of the roles currently set up in the organization, as well as their individual privileges (Figure 28).

Name	Privileges
user	ReadLog, DetailLog
User Admin	UserManagement
ECM Operator	ViewDetails, ECMManagement
Demo User	ViewFileUpload, ViewStatistics, ConfigLog, ViewDetails, EDRLog, ReadLog, ReadLogECM, ManagementECM, UploadRawLog, DetailLog, ECMManagement
Uploader	ViewFileUpload
Viewer	ViewFileUpload
Auditor	ViewStatistics, ConfigLog, ViewDetails, EDRLog, ReadLogECM, ManagementECM
Safety Manager	ViewStatistics, ConfigLog, ViewDetails, EDRLog, ReadLogECM, ManagementECM, UploadRawLog, DetailLogECM, DetailLog

Figure 28 – the **Roles** page with individual roles and privileges

The Safety Manager can create new roles and assign their privileges by using the **Add** button in the top right corner of the page. The dropdown menu to the right of each role can be used to add or remove privileges to this role, as per business demands. While roles can be customized as per organization needs, available privileges are the same for all system users. They allow or deny access to the corresponding system features.

8. Optional Features

Engine Condition Monitoring (ECM)

Engine Condition Monitoring (ECM) can be optionally supported upon customer request. **At the time of writing, this optional feature is only supported for the Boeing 737 CL/NG CFM56 engines. Other aircraft types might be supported in the future.**

To access the ECM optional feature, the **Raw Files** subtitle shall be selected from the side menu and the raw file title shall be clicked on to open the **Raw File Details** page for it (Figure 29). On condition that all legs in the raw file have been either accepted or rejected, the Summary button in the top right corner opens the dropdown menu that gives access to the ECM options.

The **Export To Diagnostics** option allows the user to download the ECM reports archived in the .sge file format accepted by the engine vendor.

The **Export to Excel Diagnostics** option allows the user to download the Excel table with the ECM data snapshots.

Note: The time of each ECM parameter snapshot is determined automatically by an engine stability monitoring algorithm set by the engine vendor and cannot be modified.



Figure 29 – the Engine Condition Monitoring option, Raw File Details page

The ECM Cruise snapshot is taken for each flight leg, regardless the preflight condition of the aircraft. However, the ECM Takeoff snapshot is only taken when the engine is considered Hot at takeoff – which, by definition of the engine vendor, is when the time elapsed since the last engine shutdown was no more than 6 hours. The platform automatically determines whether the engine was Cold or Hot by using the flight leg times; however, in case of system error, this choice can be overridden by the user using the dropdown side menu (Figure 30).



Figure 30 – the dropdown menu for changing the engine Hot/Cold status

Pilot Performance

The Pilot Performance function is a custom option available on request. It allows each individual flight leg to be matched with the pilot who performed it, thus giving the user a summary of all events triggered by each pilot. This option requires integration of the FDM software with the flight operations software of the customer. Details concerning the implementation process can be provided on request.

Code	Minor Count	Major Count	Critical Count	Rejected Events Count	Performed Flights
	14	0	0	10	11
	15	0	0	12	22
	70	0	0	5	74
	58	0	0	15	40
	48	0	0	80	46
	16	0	0	2	14
	15	0	0	4	39
	31	0	0	14	41
	45	0	0	8	49
	33	0	0	12	41

Figure 31 – The Pilot Performance dropdown menu

If installed, the Pilot Performance function is accessible from a separate dropdown menu, as shown in Figure 31. The Pilots subtitle provides a summary of all minor, major and critical events for each pilot, as well as the number of flight legs performed by the pilots. Identification of the pilots follows the same convention as in the flight operations platform. The **Download** button in the top right corner allows for an automatically generated Excel export of the data to be downloaded. **The customer remains responsible for the establishment of proper organizational procedures ensuring treatment of this information as confidential and its restricted use. Access to this feature can be restricted to certain users, e.g. to the Safety Manager only.**

No	Matched Leg	Aircraft	Departure Date	Arrival Date	Departure	Arrival	Pilot Flying	Created On
1 - 25 of 1275 Not Matched Only: true								

Figure 32 – the Performed Legs dropdown menu

The *Performed Legs* page (Figure 32) provides a list of all flight legs recorded in the operations system. The *Matched Leg* column displays the leg number of the QAR leg matched to each one of them, if any. The *Filter* option (top right) allows for unmatched legs only to be displayed. Any match between a leg and a pilot has to be approved by the user. To do this, the **Match Performed Leg** button on *Flight Leg Details* page is used, as shown in Figure 33.

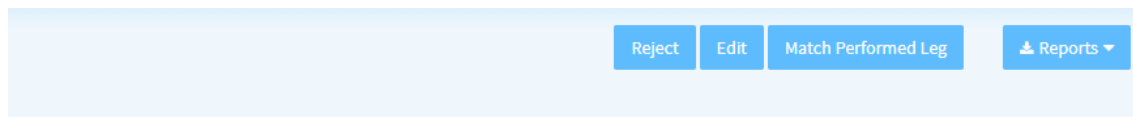


Figure 33 – the **Match Performed Leg** button on the Flight Leg Details page

9. Support

Password reset

On your first login, you will be required to change your default password provided during training for your own one (Figure 34). **This is important in order to ensure data security.** Use a strong password and keep it in a secure place.

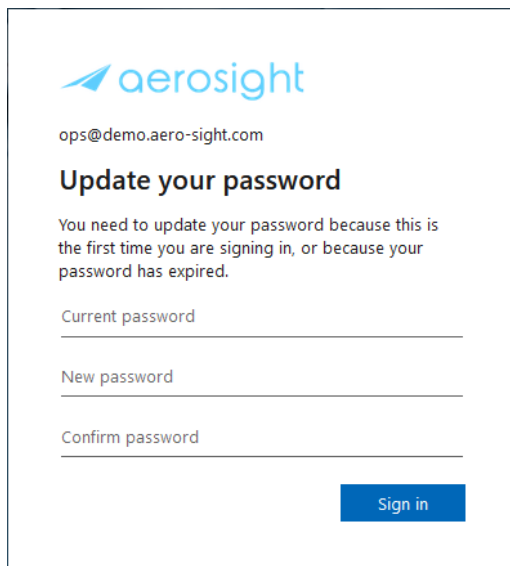
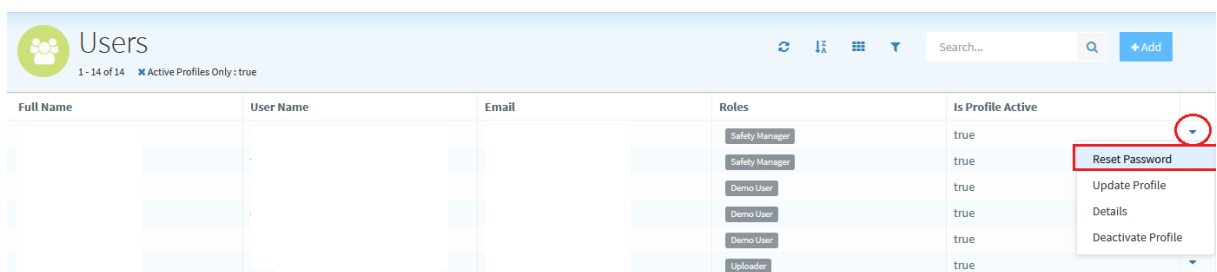


Figure 34 – the change password prompt on your first login

If you forget your password, it can be reset by the Safety Manager from the **Administration – Users** section (Figure 35), or contact AeroSight Support for a password reset.



Full Name	User Name	Email	Roles	Is Profile Active
			Safety Manager	true
			Safety Manager	true
			Demo User	true
			Demo User	true
			Demo User	true
			Uploader	true

Figure 35 – the reset password option

At the time of writing, automatic email notifications for system changes (events, new uploads etc) are not supported. It remains the responsibility of each individual user to check the relevant pages frequently for new entries.

It is recommended that your organization has a nominated coordinator for support issues. In order to reduce the number of duplicate enquiries and provide faster response, we will only respond to issues raised by this person.

If you can't find the answer to your question in this document, or you need additional information - please send an email to our Support Team: support@aero-sight.com