SQL KONFERENZ 2025

Sky Analytics: Turning Raw Drone Logs into Visual Stories with Power BI



Roman Tesolkin
Data Engineer @ Allianz Global Investors

Disclaimer

Got the paperwork ✓

Follow the rule ✓

Still learning every day ✓



Why Drone Log Analytics



Drone Enthusiast

Drone Pilot Analyst



SQL KONFERENZ 2025





Roman Tesolkin (he/him)

Data Engineer (Allianz Global Investors)

Data Adventurer, Power BI Geek, MS Certified Fabric Analytics Engineer, Databricks Certified Data Engineer Associate and Workshop Trainer

from Ukraine

Hands-On Hobbies: Drone building & 3D Printing

Frankfurt am Main, Germany

Agenda

Why Drone Log Analytics?
Possible drone log analytic options
Demo
Q&A



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Why Analyze Drone Logs?



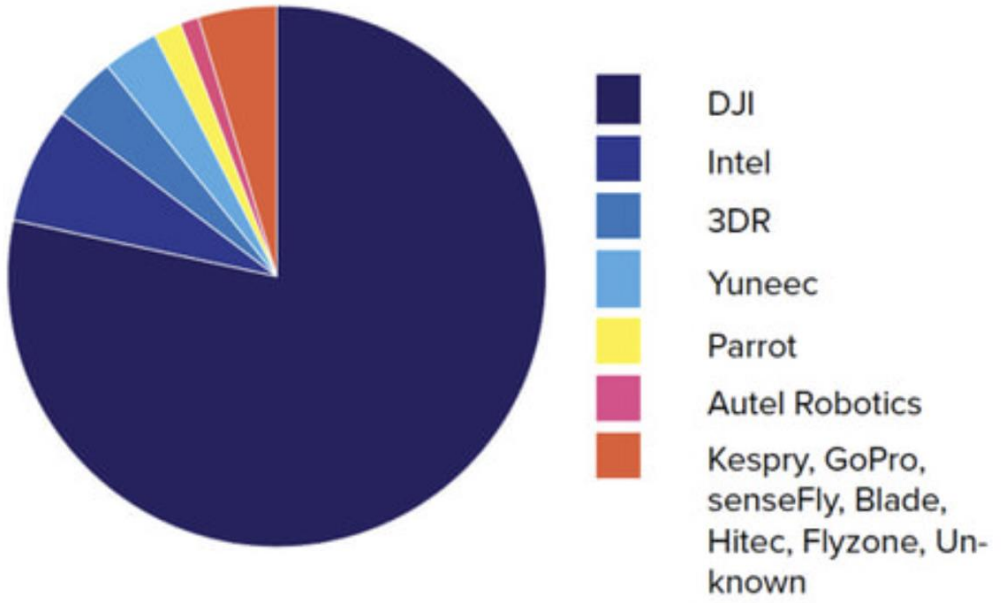
Improve How We Fly

Keep Things Safe

Make Smart Choices

Why DJI Drones?

Top 30 Non-Hobbyist Drone Manufacturers



Top 30 Non-Hobbyist Drone Types

Category	Number
Consumer	13
Prosumer	5
Commercial	9
DIY	1
Unknown	2

dronecenter.bard.edu

https://enterprise.dji.com/de/news/detail/dji-enterprise-empowers-commercial-drone-industry



Available logs

Device	Sample Location	Item	Sample File
Phone	Dji/dji.go.v4/FlightRecord/MCDatFlightRecords	Detailed flight record	19-10-20-03-06-54_FLY048.DAT
	dji/dji.go.v4/FlightRecord	Main flight record	DJIFlightRecord_2024-10-2-_[15-07-24].txt
	Dji/dji.go.v4/FlightRecord	Video cache	2024_10_20_15_07_14.mp4
Drone	Internal Storage (Use DJI Assistance 2 to export)	Drone flight record	DJI_ASSISTANCE_EXPORT_FILE_2024-10-25-08-14-49-DAT



DJI Support DAT file

support.nl <support.nl@dji.com>
to me

9 Oct 2024, 06:28

Hi Roman,

Greetings from the DJI Technical Support Team. We hope that everything is going very well with you.

We understand you would like to get the CSV file or text format of the flight logs and have access to the full history as similar TXT FlightRecords on your phone. Please allow me to shed some light on this for you.

Firstly, please understand that the .DAT files are proprietary to DJI and are utilized exclusively by our engineering team for in-depth analysis in the event of an incident or to investigate any unusual performance issues with the aircraft. These files are encoded in a format that requires specialized tools for interpretation, and as such, they are not accessible for customer review.

Second, the flight record can be viewed directly on the APP and the corresponding .txt file can be exported manually (but the .txt file cannot be viewed directly, a third-party software is required to view it, but DJI does not have recommended third-party software).

I hope I was able to shed some light on this for you. Of course, if you have any other questions, feel free to reach out, and I'll be happy to answer them. I want to make sure you're fully taken care of and I'm only an email away.

Please know that the system will automatically send out notifications if no reply is received within 2 days. You can continue replying when you have the time and if you have further questions, then the ticket will appear back in our view. Please don't worry as it won't affect the progress of your inquiry.

Thanks for contacting DJI. Take care and have a wonderful day!

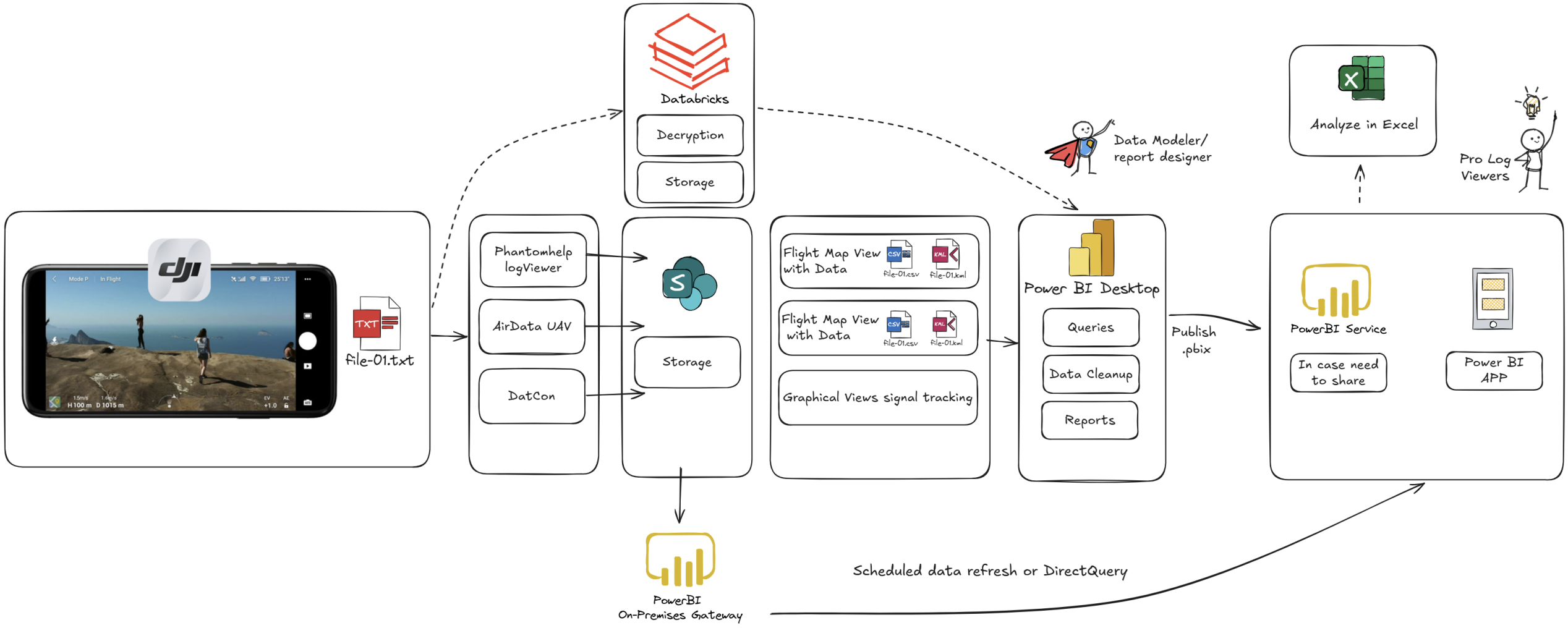
These files are encoded in a format that requires specialized tools for interpretation, and as such, they are not accessible for



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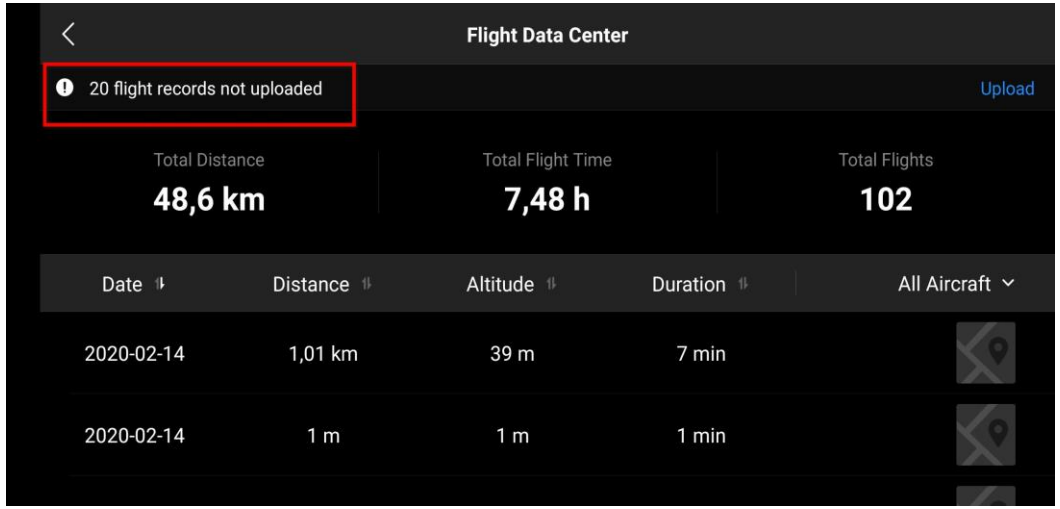
Main Flight Record (TXT) Analysis Options

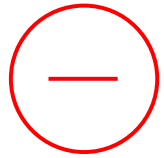


DJI Fly App



- ✓ Out of the box
- ✓ User-Friendly Interface
- ✓ Optimized Performance
- ✓ Compatibility





- – Limited Advanced Features
- – Basic Log Details
- – Only on smartphones and tablets



AIRDATA UAV

HOME MY LOGS EQUIPMENT UPGRADE MEDIA HELP

My Account
Free Logout

UPLOAD FLIGHTS MY BADGE MY CERTIFICATES REPORTS

All

1

OVERVIEW
May 1st, 2024 06:59PM



Upload Certificates

Free to upload. Auto detected. Access anywhere.

Metric / Imperial Settings

Display Map

Pilot in command: All Pilots

Drone: All Drones

Active Flights: **1**
Plan limit: **100**

Total Photos: **0**
Total Videos: **3**

Total Air Time: **0h 09m 31s**
Total Log Time: **0h 09m 33s**

Total Mileage (all flights)
2.6 Miles

Longest Flight Time: **09m 31s**
Beginner — Extreme

Hottest Battery Temp: **108.5 f**
Cool — It's Cooking

Farthest Home Distance: **658 ft**
Around Home — Far Far Away

Longest Mileage: **13,622 ft**
Hover around — Keep it moving

Highest Altitude: **76.4 ft**
Keep it safe — Cloud Seeker

Fastest speed: **28.90 mph**
Take it easy — Wind Surfer

The ranges provided are based on averages across all users data.

The maximum end of each range is **approximately** the 95th percentile, except for *Highest Altitude* which ends at the maximum configurable value of 500m.





All

1

OVERVIEW

May 1st, 2024 06:59PM

Metric / Imperial
Settings

Overview | Details | Equipment | Notifications | Large Map

GENERAL

POWER

SENSORS

CONTROLS

WEATHER

MEDIA

May 1st, 2024 06:59PM Edit

May 1st, 2024
06:59PM (+02:00)

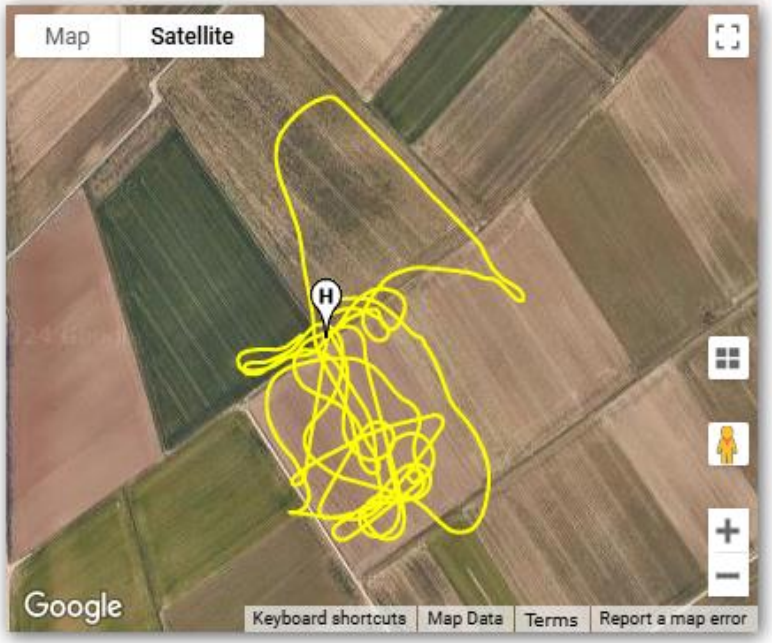
Plane Name
DJI Avata

Flight Air Time
09m 31s

Takeoff Battery
84% 15.4v

Landing Battery
14% 13.1v

Avata
DJI Fly 1.0.1



Total Mileage
13,622 ft

Max Distance
658 ft

Max Altitude
76.4 ft

Max Speed
28.90 mph

Max Bat Temp
108.5°f

Tips: **198**
Warnings: **139**

Download: KML GPX (?) CSV Original

Add tag

Add Flight Description



Download KML | Download CSV | Download Flight Log

Map Size: Small | **Medium** | Large

►1x ■

Time	Flight Mode	GPS	IMU Altitude	VPS Altitude	Speed	Home Distance	Battery	Battery Voltage	Cell 1	Cell 2	Cell 3	Cell 4	Cell Deviation	Message
1m 40.4s	P-GPS	26 satellites	0 ft	N/A	0 mph	0 ft	N/A	N/A	0 V	0 V	0 V	0 V	0 V	Flight mode changed to P-GPS.
1m 40.3s	P-GPS	26 satellites	0 ft	N/A	0 mph	0 ft	N/A	N/A	0 V	0 V	0 V	0 V	0 V	Motors starting.; Aircraft in low-power state. Image transmission ma
1m 40.5s	Starting Motors	26 satellites	0 ft	N/A	0 mph	0 ft	N/A	N/A	0 V	0 V	0 V	0 V	0 V	Flight mode changed to Starting Motors.
1m 40.8s	Starting Motors	26 satellites	0 ft	N/A	0 mph	4.1 ft	84%	16.138 V	4.04 V	4.04 V	4.04 V	4.04 V	0 V	Data Recorder File Index is 149.; Set Return to Home (RTH) altitud
1m 41.9s	Manual Takeoff	26 satellites	0 ft	N/A	0 mph	3.9 ft	84%	15.993 V	4.00 V	4.00 V	4.00 V	4.00 V	0 V	Flight mode changed to Manual Takeoff.
1m 42.3s	P-GPS	26 satellites	0.3 ft	N/A	0.4 mph	3.9 ft	84%	15.993 V	4.00 V	4.00 V	4.00 V	4.00 V	0 V	Flight mode changed to P-GPS.
1m 42.8s	P-GPS	26 satellites	1.3 ft	0.3 ft	1.6 mph	0.7 ft	84%	16.032 V	4.01 V	4.01 V	4.01 V	4.01 V	0 V	Home Point Updated.
1m 42.9s	P-GPS	27 satellites	1.3 ft	0.7 ft	2.3 mph	1.2 ft	84%	16.032 V	4.01 V	4.01 V	4.01 V	4.01 V	0 V	
1m 43s	P-GPS	27 satellites	1.3 ft	0.7 ft	2.4 mph	1.3 ft	84%	16.032 V	4.01 V	4.01 V	4.01 V	4.01 V	0 V	
1m 43.1s	P-GPS	27 satellites	1.3 ft	1.0 ft	3.8 mph	2.1 ft	84%	16.032 V	4.01 V	4.01 V	4.01 V	4.01 V	0 V	

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Documentation
CsvView
Introduction
Downloads
DatCon
Introduction
Downloads
Retrieve .DAT P3/Inspire 1
Retrieve V3 .DAT from AC
Retrieve V3 .DAT from Tablet
.CSV column descriptions P3/Inspire 1
.CSV column descriptions V3 .DAT
DatCon3 Intro

CsvView Introduction

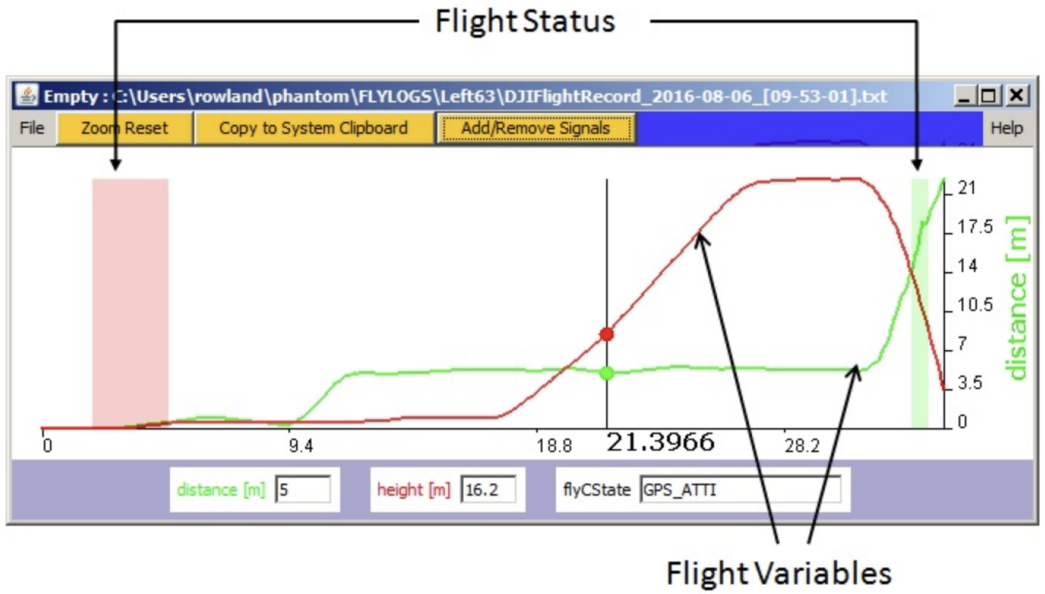
CsvView was conceived becasue it was difficult to visualize the .csv file that is produced by DatCon. As CsvView was being developed it became apparent that it could be generalized and used to visulaize data in other log files.

CsvView can accept these log file types

- .txt file produced by the DJI Go or Fly App. TXTlogToCSVtool is used to convert the .txt to a .csv. Note: The Mac version of CsvView can not accept .txt files.
- .DAT from the Phantom 3, Inspire 1, Mavic Pro, and Phantom 4, Phantom 4 Pro, Inspire 2, Matrice M100, M600
- .DAT created on the mobile device by the Go or Fly App for all platforms except the Mavic Mini2
- Litchi mobile device App

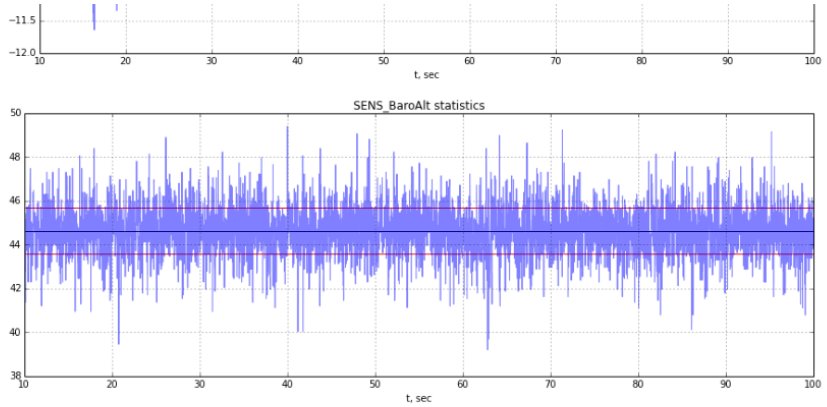
Note: The onboard .DAT for the Mavic Air, Mavic Air 2, Mavic 2, Mavic Mini and Mavic Mini 2 is encrypted and can not be processed by either DatCon or CsvView. In addition, the .DAT created for the Mavic Mini 2 by the Fly App is also encrypted and can not be processed by either DatCon or CsvView.

CsvView uses a SigPlayer to displays flight variables. The SigPlayer can also display flight status information.





Python Libraries

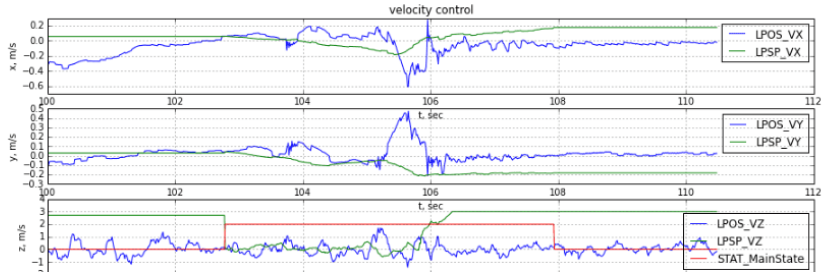


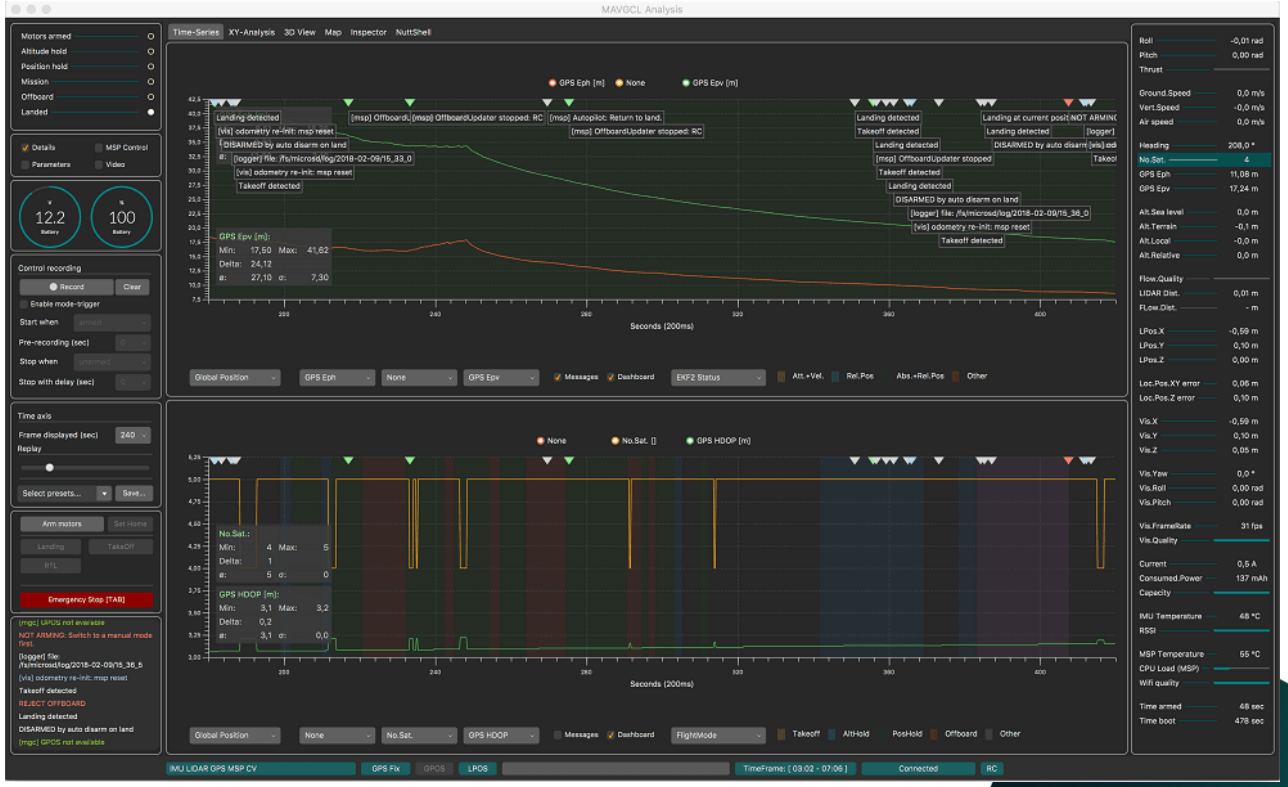

```
In [11]: px4tools.find_lpe_gains(data[10:100])

Out[11]: {'LPE_ACC_XY': 0.000735915925487951,
          'LPE_ACC_Z': 0.0013686317016863641,
          'LPE_BAR_Z': 1.0520127982555052,
          'LPE_GPS_VXY': 0.15151691018745062,
          'LPE_GPS_VZ': 0.15677723863580798,
          'LPE_GPS_XY': 0.53024927093676344,
          'LPE_GPS_Z': 2.0419812493429053,
          'LPE_LDR_Z': 0}

In [5]: px4tools.plot_velocity_loops(data1)
        data1.STAT_MainState.plot()

Out[5]: <matplotlib.axes.AxesSubplot at 0x7f702c5ea450>
```

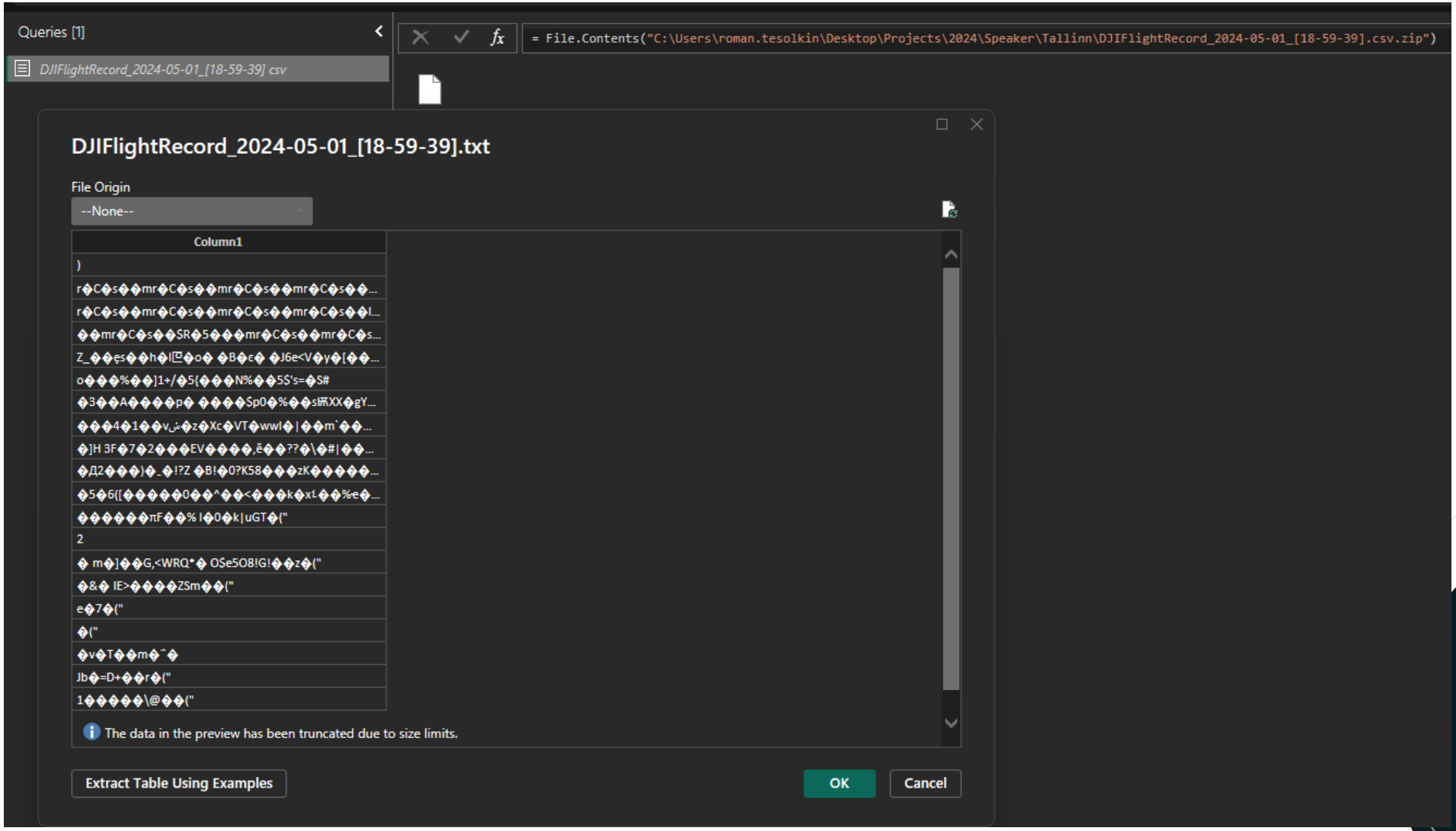




https://docs.px4.io/main/en/log/flight_log_analysis.html



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SQL
KONFERENZ
2025



DEMO & Use Case

MADEIRA CLIMBING CENTER.

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DRONE RESCUE





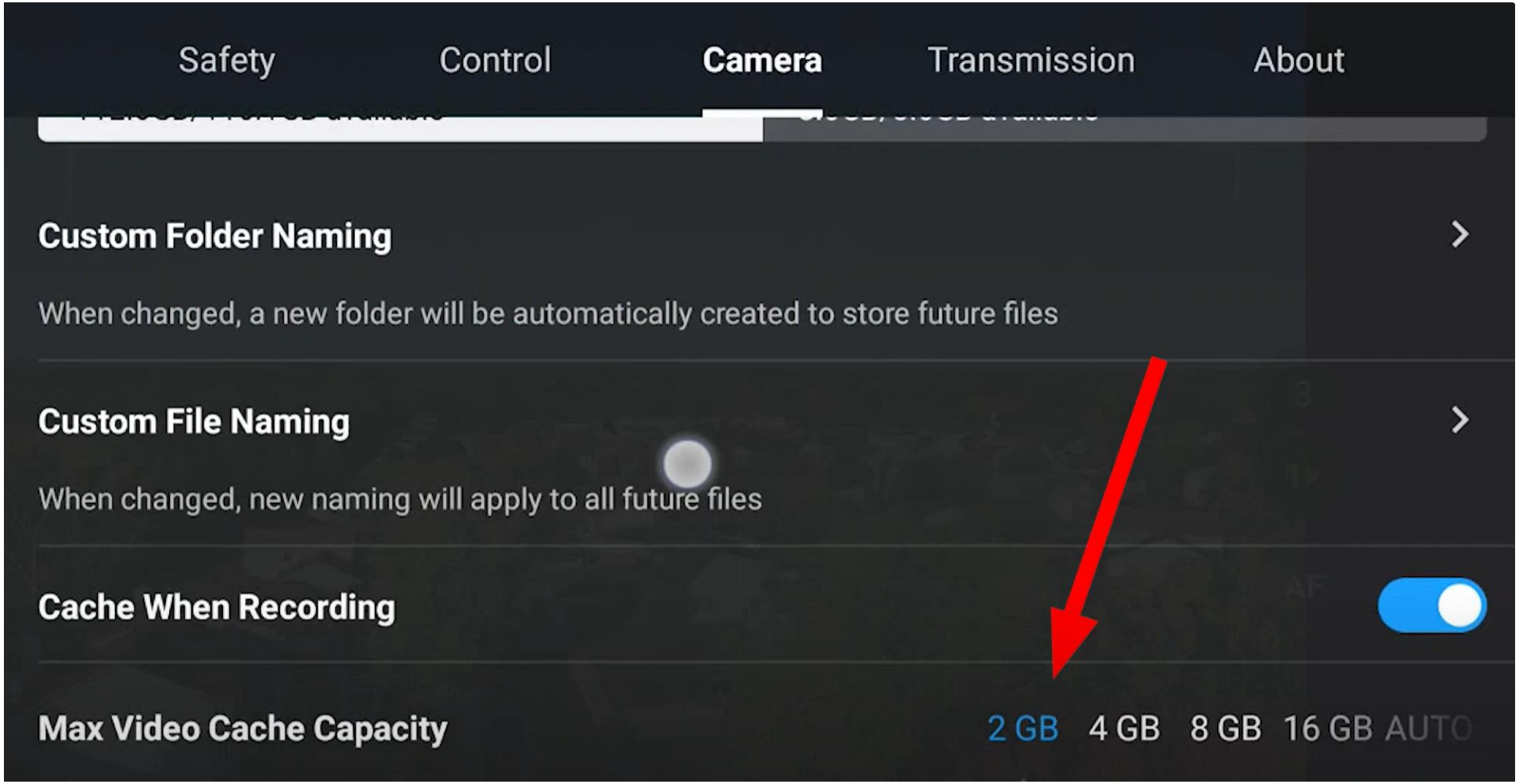


Dear Customer,

This message is from DJI Support. After testing your product, DJI has determined to provide you with free repair service. The repair is expected to be finished within 2 to 3 business days, after which the product will be sent back to you.Click REPAIR PROGRESS INQUIRY for the detailed damage information.Thank you for choosing DJI.

Remark: Dear Customer, DJI will provide free service for this case. The ownership of your original aircraft will be transferred to DJI once you have accepted this proposal. If you find your original aircraft after accepting the proposal, please send it back to DJI.




Safety
Control
Camera
Transmission
About
Custom Folder Naming
When changed, a new folder will be automatically created to store future files
Custom File Naming
When changed, new naming will apply to all future files
Cache When Recording
Max Video Cache Capacity
2 GB
4 GB
8 GB
16 GB
AUTO


SQL
KONFERENZ
2025

Advantages and Disadvantages of Power BI for DJI Drone Log Analytics

Data Integration

Advanced Analytics

Interactive Dashboards

Manual Decryption of DJI Logs

Performance on Large Datasets

Dependency on External Tools



Danke!

Share your feedback

romantesolkin
romateselkin@gmail.com
romanpowerbi



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