



FLYABILITY

ELIOS 3

July release notes

Bug fixes, new features and known limitations

June 28th, 2023

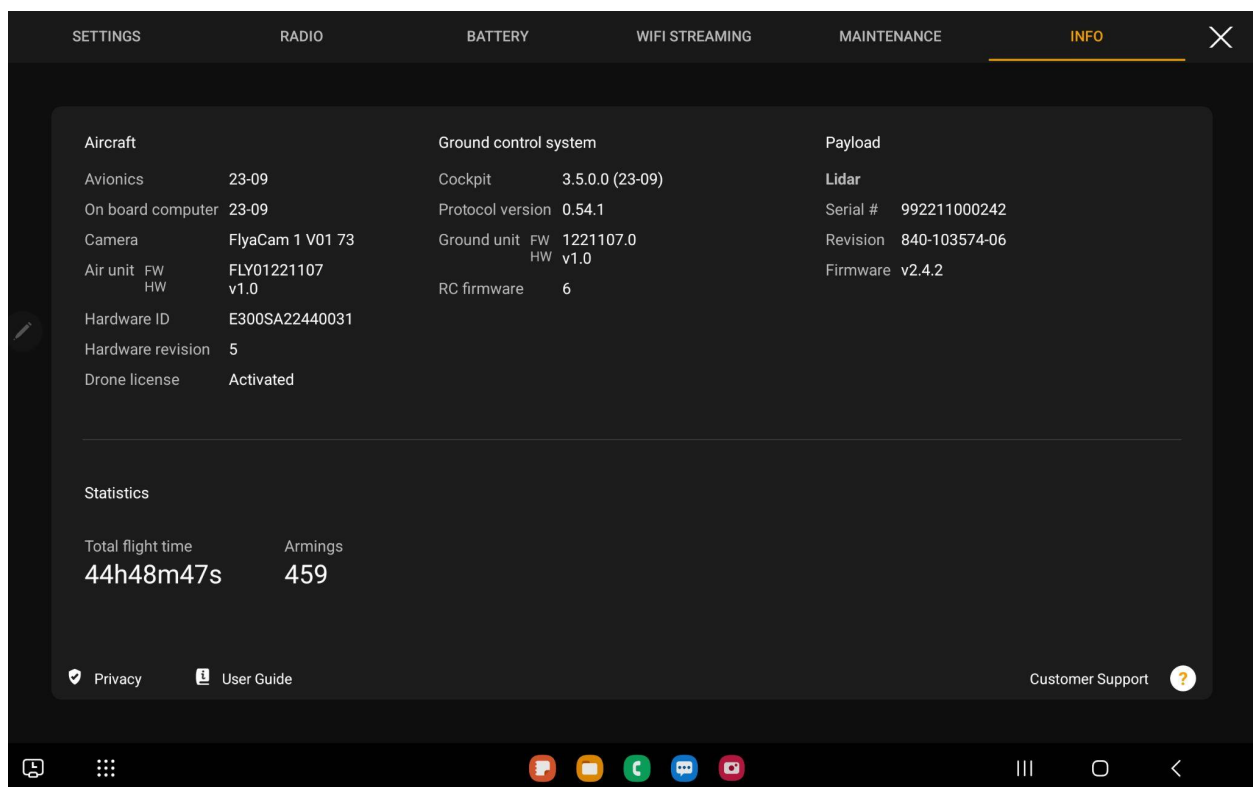
Updated E3 components versions

NEW : Drone firmware: gaston_23-09.swu

NEW : Cockpit software: Flyability-Cockpit-3.5.0.0-18-full-release.apk

NEW : Inspector software: InspectorSetup-4.5.0.303-x64-Release.msi

INFO panel version after update



What's new?

Lidar stability

If a lidar is mounted on the drone, the drone will not switch to forced-ATTI anymore when ASSIST based on the VIO cameras fails. Instead it will first try to stabilize the drone with the lidar, showing LIDAR-ASSIST mode. Only when LIDAR-ASSIST also does not work, will it switch to forced-ATTI.

To demonstrate this feature, one can simply put a tape on the three VIO cameras to force the control system to fly in LIDAR-ASSIST mode, or when flying in a dark space turn off the drone lights.

Note that lidar stability mode is not performing as high as VIO stability in terms of precision, however it has the same level of robustness to collisions.

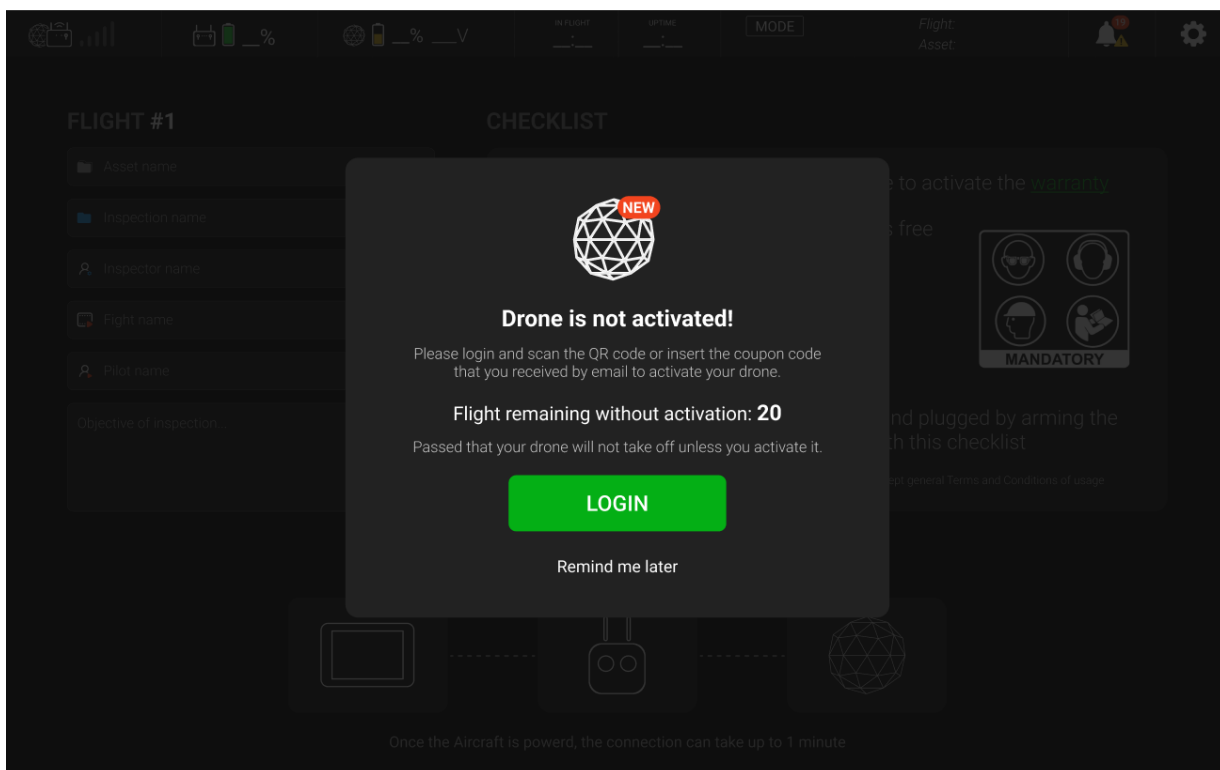


E3 license system

Users will be prompted to activate their drone starting with the July release. The reason for this is to create SW upgrades subscriptions and activate warranty in our ERP, with first date of use as starting date.

Users will just be asked to connect to the internet and login with their Flyability account after updating drone and Cockpit to this release. No need to scan coupons or insert codes.

NOTE : Users will have up to 20 free armings from the moment they see the activation window, until they effectively activate the drone.



Mirion Radiation Sensor functionality in Cockpit

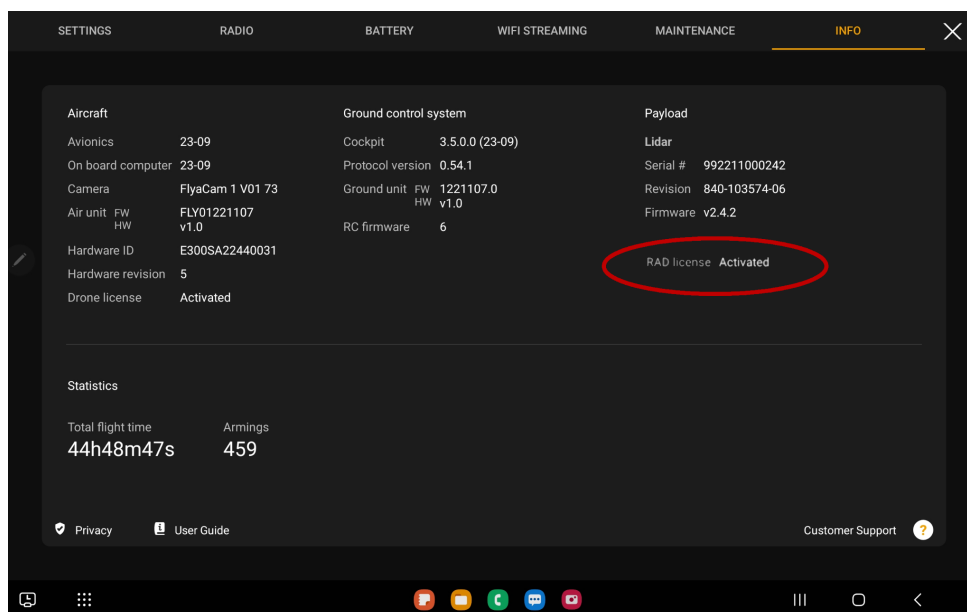
Adding the Mirion Radiation Sensor payload as a new feature, different elements were developed on Cockpit to display multiple radiation information received from the sensor. The new features are the following :

- Live Radiation Mapping** : The user can review while flying the dose rate mapping thanks to the colorization of the drone trajectory in the live map with the dose rate. It allows him to easily detect hot spots within the area he is flying in. Which means in details :
 - Drone trajectory colored with radiation readings ;
 - Color scale allows the user to understand the measurements range ;
 - The color scale is logarithmic ;



Cockpit with RAD User interface

- RAD license status** info available in General Settings tab in Cockpit :



General settings in Cockpit with RAD license status

- **Live Radiation Reading :**

- Displayed on the RAD dashboard, in a widget:
 - Current dose-rate ;
 - Graph : Measurement historic displays the dose rate trends from the last minute ;
 - Max dose rate (MAX) ;
 - Cumulative dose of the flight (CML) ;
- Warning pops if the sensor is saturating or delivering wrong information ;
- Warning pops if the Radiation alarm threshold is reached (settable in the settings) ;
- In RAD settings panel :
 - Units can be selected between Sv and Rem ;
 - Cumulative dose of the flight ;
 - Lifetime dose of the drone ;
 - Settable radiation alarm ;

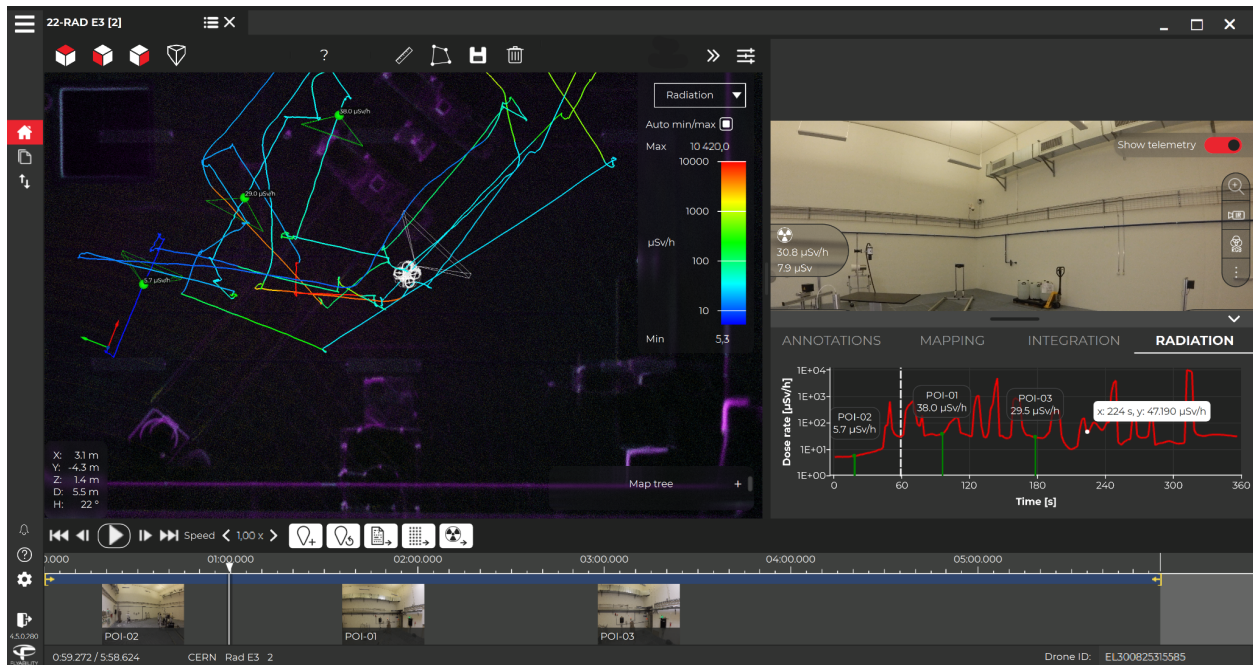


Mirion radiation sensor functionality in Inspector

Adding the Mirion Radiation Sensor payload as a new feature, different elements were developed in Inspector to display multiple information received from the sensor.

The user can review after a flight, the dose rate mapping thanks to the colorization of the drone trajectory in the live map with the dose rate. It allows him to easily detect hot spots within the area he is flying in. The new features are the following :

- **Video review**
 - While reviewing the video feed, the current dose rate value is displayed ;
- **Mapping**
 - Drone trajectory colorized with radiation readings ;
 - Color scale allows the user to understand the measurements range ;
 - The color scale is logarithmic ;
 - POI displays the radiation values next to them ;
- **Radiation graph**
 - A radiation graph shows the dose rate over time ;
 - The dose rate scale is logarithmic ;
 - POIs are highlighted and their values are displayed ;
 - The user can zoom, and navigate in my graph ;
 - Clicking on the graph, I can jump to the right place in time ;
 - Selecting a region of the graph, the user can measure the cumulative dose and the average dose rate.
- **Report export**
 - The exported report has Radiation readings (dose rate) for each POIs ;
- **Data export**
 - A plain text file (e.g. csv) contains the Radiation readings (dose rate) with means to link it with the trajectory file (e.g. timestamp) ;
 - RAD measures export button (with RAD icon) under the 3D live map ;



Bug fixes

Lidar communication timeout warning A03 appears upon initialization

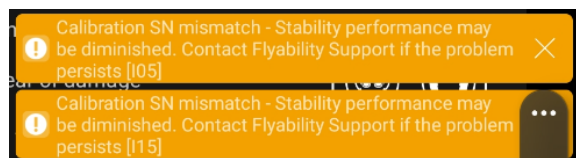
The lidar is systematically reconfigured and restarted prior to starting the live map algorithm, which causes the “*lidar communication timeout warning A03*” to appear shortly after the drone has already finished initialization.

Lidar live map only appears after initialization finishes and drone is already in ASSIST

The lidar is systematically reconfigured and restarted prior to starting the live map algorithm, which causes an additional delay of 20 to 30s before the live map appears. The end result is that the drone stability system has already finished initialization and the drone can already take-off prior to the mapping algorithm running and live map being shown.

Calibration SN mismatch warnings I05 and I15 - false positives

Sometimes the I05 and I15 warnings are falsely triggered and shown in Cockpit. It consists of a functional regression bug that was introduced in the March release.



IMU error I16 - false positives

A new IMU self-check was introduced in the March release. However, in a rare case it can be falsely triggered, blocking the pilot from arming the drone while the I16 error is shown: “IMU error - Cannot fly, please restart the drone. If problem persists contact Flyability Support [I16]”.

Known product limitations so far

Stability may fail in very dusty AND symmetric environments

When an environment is both very dusty, inhibiting the VIO camera based stabilization to work, while at the same time being very symmetrical or large, then the lidar stability will not work either, making the drone automatically switch to ATTI mode. Obviously, without lidar payload mounted, the drone will directly switch to ATTI mode, without passing through lidar-based stability first.

Wobbliness in very confined spaces

Elios 3 is inherently more susceptible to its own turbulence, and also creates more turbulence due to its higher weight compared to Elios 2.

Thermal camera lags on RGB video in Cockpit

The delay on the thermal camera video stream is higher than the one on the RGB video. Since the first is overlaid on the latter, it is quite noticeable. This delay is inherent to the different HW and SW architecture.

Barometer does not work below 1300m below sea level

The barometer saturates at 1200hPa of pressure, which typically corresponds with a depth between 1300 to 1700m below sea level, depending on temperature and humidity.