Drone-based Visual Aids inspection

CANARD´s solution is a smart tool that automates the inspection, maintenance and commissioning of visual aids such as PAPI, ALS and aerodrome lighting.
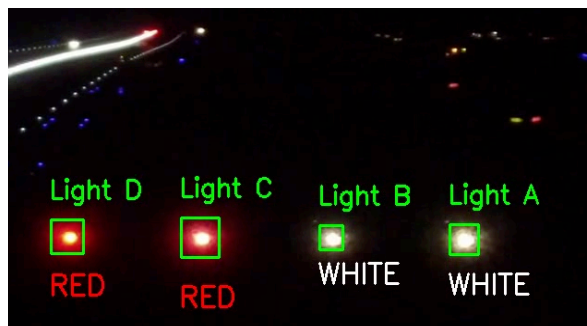
We offer a unique, fast, truly reliable and economical alternative to conventional flight inspections.

APPLICATIONS

PAPI verification & Calibration

Our solution can be used in commissioning, inspection & calibration of PAPI systems. The operation can be carried out during the day or night, which allows flexible scheduling. Flight checks by aircraft for PAPI can now be fully replaced by our solution, which only takes a few minutes to perform all the measurements. Our inspection method is more precise thanks to custom software, specific procedures, RPAs with precise GNSS & computer vision which automatically detects colour transitions.

ALS inspection

Our solution allows a quick & precise inspection of ALS (Approach Lighting Systems) and provides key information: a check that all lights are operational, a verification of all lights correct alignment and relative brightness & colour.

This solution is more accurate than flight checks and faster and more reliable than ground checks, which are less accurate and not always possible.

Aerodrome lighting

Lights across runways and taxiways require constant verification & maintenance. We have developed a reliable solution that quickly detects malfunctions such as lights off or with incorrect colour.

Our solution can perform these inspections autonomously and provides automatic reports with detailed information of any faults with lights.

FEATURES

Tested and Validated procedures based on ICAO & FAA standards
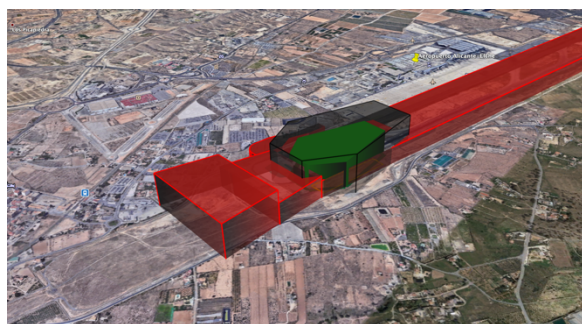
Our Visual Aids inspection procedures have been designed following recommendations from ICAO and FAA documents. All procedures translate to validated measurements and checks that allow the generation of inspection reports including all the required data to comply with regulation.

These procedures take place on the runway or close to it.

Platform & database for operation planning and data storage
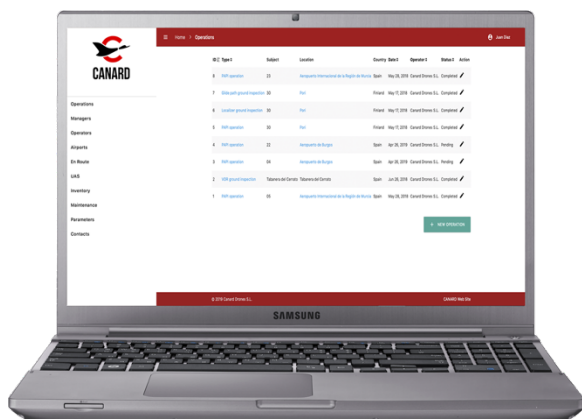
Our Platform is a web tool and database to manage all phases of the operation, from planning to storing the results. Any airport or Visual Aid can be updated or added to the system in seconds.

Every report and data from inspections are uploaded and stored in the database, and can be visualised or analysed instantly from any device with internet access.

The platform also notifies when maintenance is due for a drone and tracks the record of all operations a drone has been involved in.

Custom Software that runs on any Android tablet

Our Calibration Tool mobile app runs on any Android tablet or smartphone. The operator can select an inspection to be performed and the drone will autonomously execute the flight required for that measurement and display the data and images. This means that the software implements the procedures as they are designed and validated.

The real-time visualisation of measurements is similar to flight inspection consoles, as it displays not only the drone telemetry, but also calculated parameters such as angles, distances to visual aids, etc. It is a tool with interfaces specifically designed for these inspections.
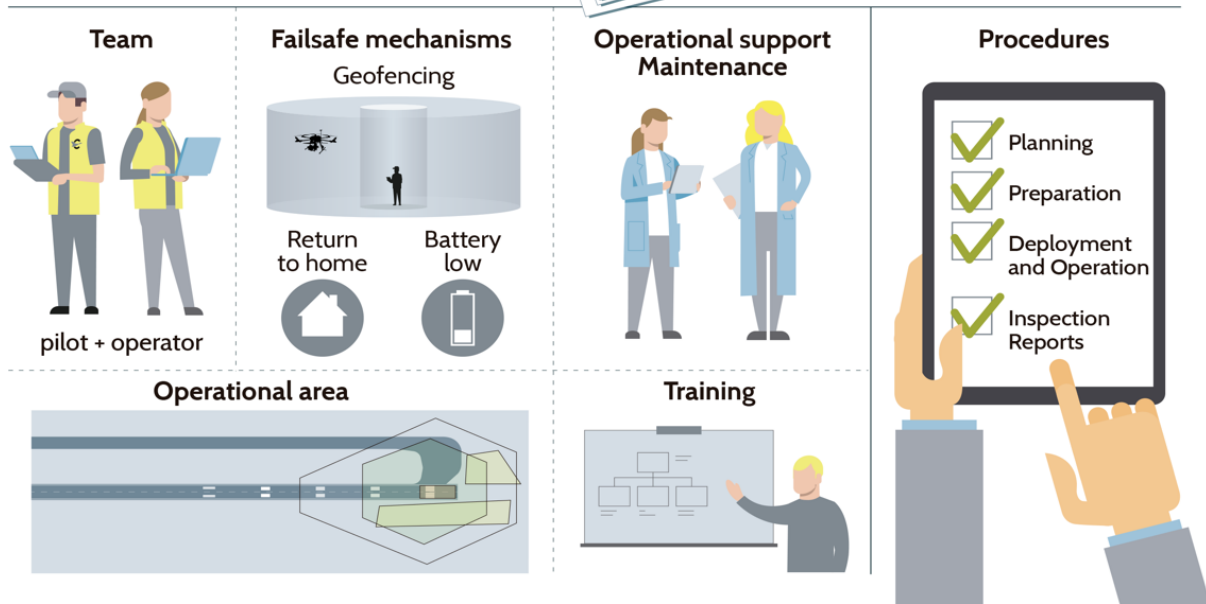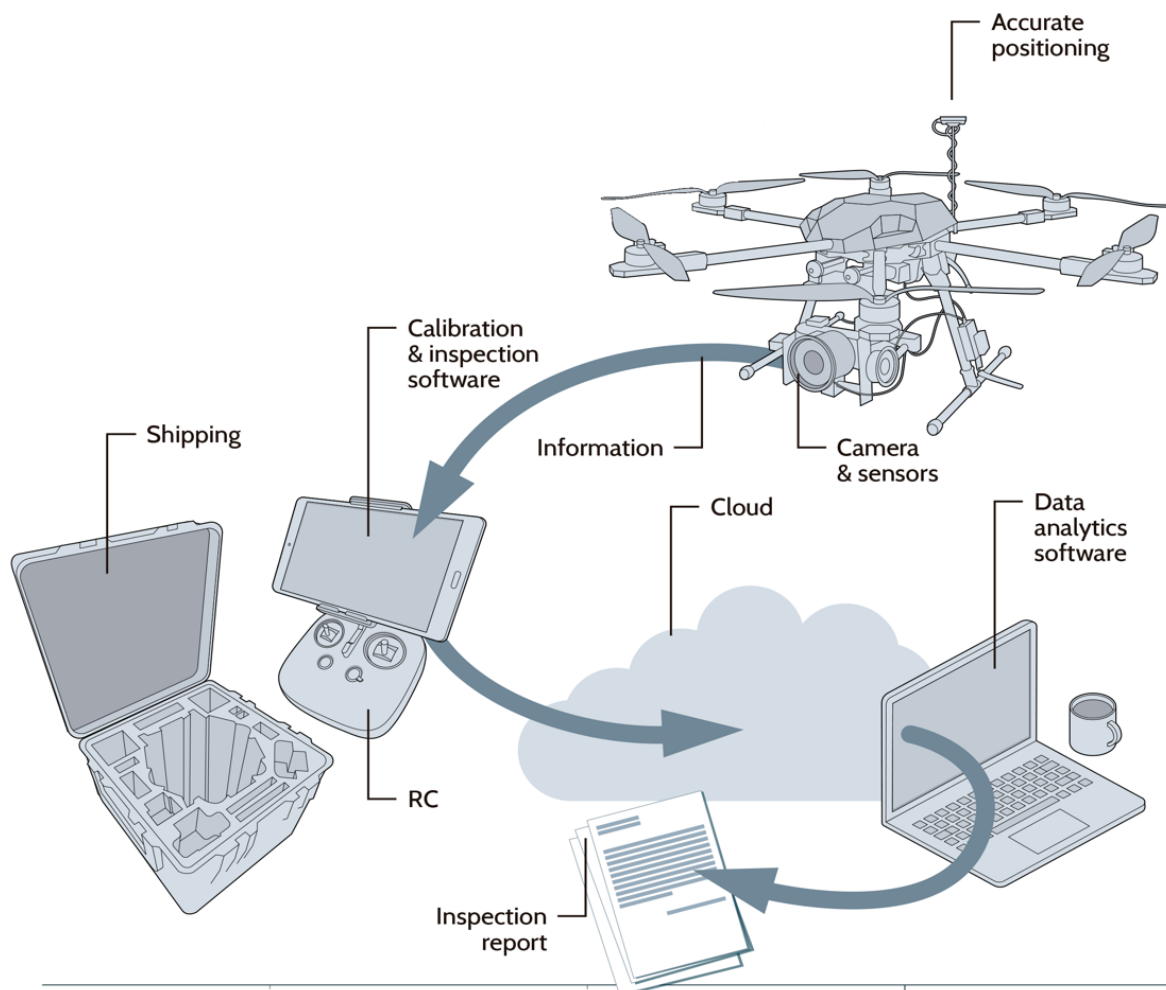
Truly portable and easy to ship

The complete system, including the drone, fits in a 75x75x75 cm rugged transport case. The case can be shipped with any courier or carried as special checked-in baggage with most airlines.

The drone and its case can also be carried inside most utility vehicles typically used inside the airport or on the field.

It takes less than 3 minutes to deploy the drone and start taking measurements. It takes also less than 3 minutes to fold it and store it inside the case.

CHARACTERISTICS

Accurate positioning

Calibration & inspection software

Shipping

Information

Camera & sensors

Cloud

Data analytics software

RC

Inspection report

Team
pilot + operator

Failsafe mechanisms
Geofencing

Return to home

Battery low

Operational support Maintenance

Procedures
Planning
Preparation
Deployment and Operation
Inspection Reports

Operational area

Training

### 1. Create operation & download mission plan

Preparing the operation is as easy as selecting the airport and runway from our database, taking less than 1 minute. All the required data is generated automatically: missions, waypoints, distances, altitudes, etc. There is no need to read the procedures and try to figure out which measurements are to be made and where. Once the operation is created in our platform, just access our Calibration Tool app and download it to the tablet that is used in the field.
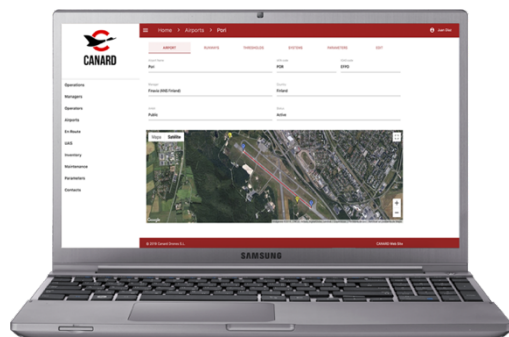
This database of airports, runways, Visual Aids and more can be expanded and updated with an easy-to-use web interface.
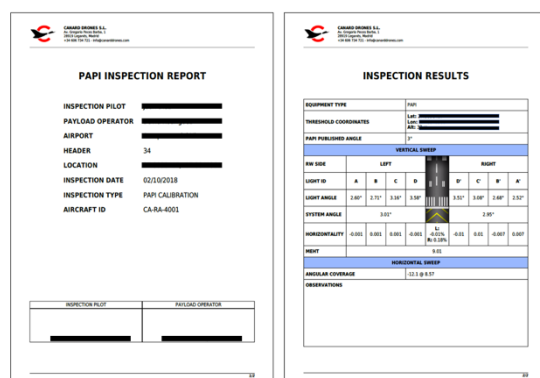
2. Execute the measurements

Once the operation is downloaded to the Calibration Tool app, all its measurements are available and pre-programmed. This means that inspecting an ALS is as easy as selecting that measurement and the interface will present the data in real time.

Each inspection takes a few minutes of flight, and can be repeated as many times as needed, with all the data recorded accessible through the app.

PAPI	ALS	Airdrome lights
Installation horizontality	Vertical alignment	Threshold
Unit angles	Angular coverage	RWY centre
System angle	Intensity levels	RWY end
Angular coverage	Dirt & aging	RWY edge
Symmetry		Touchdown zone
Relative intensity		Stop bars
MEHT		TWY centre & edge

3. Real-time reports & stored results & videos

As soon as measurements are taken, the reports can be generated in PDF through the Calibration Tool app. These reports are available on the field, without having to download the data to laptops or having to go back to the office. The reports have all the relevant measurements and parameters as they would appear on any report from flight inspection aircraft, organised in tables and images.

The reports, along with all the measurements and images or videos generated, are uploaded to our platform, so they are accessible for future reference or for additional processing or review if needed.

KEY ADVANTAGES & BENEFITS

Improves inspection Accuracy, Reliability & Repeatability

Differential GNSS (RTK) provides centimetre-level positioning. Our solution repeatedly achieves accuracy of under 3 minutes of a degree. Our computer vision algorithms reduce human error and improve automatization.

Improves safety & integrates with airport operations

The procedures are designed to easily integrate with airport operations and maintenance activities, allowing quick entry & exit. Safety measures are included such as geo-fencing, onboard transponder IN, smart "return-to-home", battery and loss of GNSS or control failsafe.

Improves flexibility for scheduling

Inspections can be performed during small time-windows, scheduled runway closings and even at night.

Cost saving solution

Our solution is much more economical than flight inspections with aircraft. In addition to the reduced operational costs, a more efficient improves profitability, as it minimises impact on airport operations.