



Smart Solutions for Smart Airports

# Drone-based NAVAIDs inspection

CANARD's solution is a smart tool to carry out inspection, maintenance and commissioning of radio navigational aids such as ILS and VOR.

The drone provides measurement data for areas that cannot be accessed by portable and vehicle mounted masts, providing more flexibility and additional information for the maintenance technicians.

Additionally, by taking measurements higher and further away from antennas than other methods, our solution supports flight inspection activities.



[www.canarddrones.com](http://www.canarddrones.com)

## FEATURES

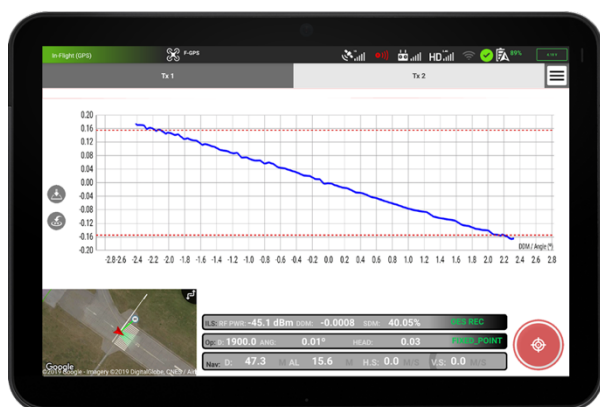
### Tested and Validated procedures based on ICAO & FAA standards



The procedures for measuring NAVAIDs have been designed following ICAO (Doc 8071) and FAA (8200) recommendations. All procedures translate to meaningful and relevant measurements that are used in ground checks, commissioning and flight inspections.

These measurements take place on the runway or close to it, covering reference points.

### Custom Software that runs on any Android tablet



Our Calibration Tool mobile app runs on any Android tablet or smartphone. The operator can select a measurement to be performed and the drone will autonomously execute the flight required for that measurement and display the data in a graph. 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 geo-tagged data in graphs, but also calculated parameters such as width, alignment,

displacement sensitivity, etc.

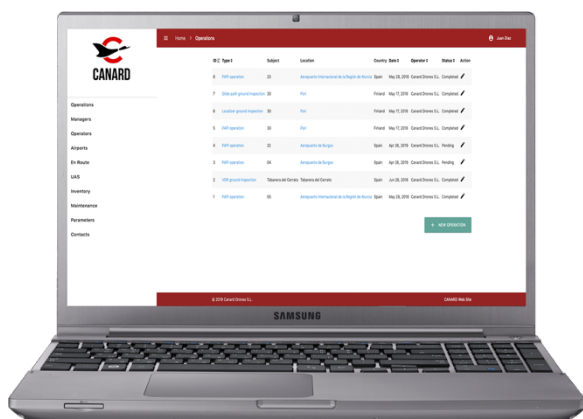
### Light and accurate receiver that can also be used as stand-alone



Our onboard receiver has been designed specifically for this purpose, weighing less than 1.5kg with 8-hour battery autonomy. It makes use of digital signal processing to analyse NAVAIDs signal, meaning that no additional hardware is required for measuring each type of NAVAID. All measurements are geo-tagged by the drone itself with accuracy of under 2cm, thanks to differential GNSS or RTK. The receiver has been tested in laboratory with calibration equipment and meets ICAO 8071 requirements for accuracy.

Thanks to the internal battery and light weight, receiver itself can be used without the drone as a portable tool with its own app. The app connects directly to the receiver through a wi-fi network and allows remote configuration and data visualisation in real-time. It also stores data for further analysis.

## 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 NAVAID 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 on a drone and tracks the record of all operations a drone has been involved in.

## 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.

## CASE SCENARIOS

### Better ground inspections

CANARD's solution can reach specific areas where other methods cannot, providing accurate and continuous measurements at different locations and altitudes. This translates to quicker, more insightful and repeatable ground checks.

### Reduced flight inspection time and frequency

By taking measurements at relevant locations and altitudes, data can be correlated with flight checks, reducing flight inspection time. It also sets the base for extending the time between flight inspections with aircraft.

### Better and economical commissioning

Our solution is especially useful for NAVAIDs commissioning, providing relevant and accurate measurements for the initial installation and adjustments, requiring the flight inspection only for the final certification.

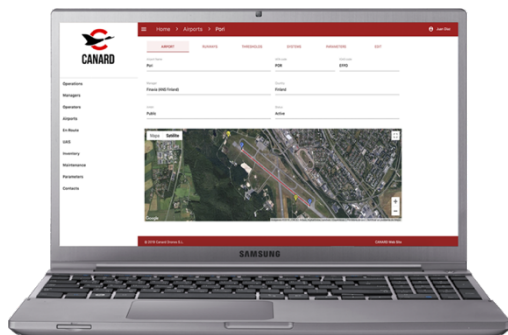
### Support interference and fault detection

When issues such as interferences and faults due to terrain, structures or buildings, our solution provides a flexible and helpful tool to detect, analyse and correct.

## HOW IT WORKS

### 1. Create operation & download mission plan

Preparing the operation is as easy as selecting the NAVAID 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, NAVAIDs 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 measuring course alignment is as easy as

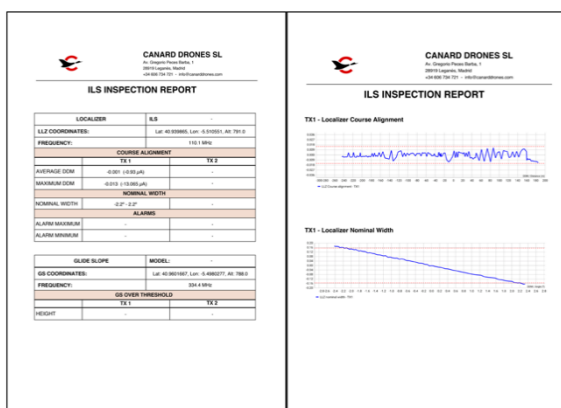
LOC	GP
Displacement sensitivity	Displacement sensitivity
Width	Width
Max&min alarms	Max&min alarms
Course alignment	Angle
Course alarms	Angle alarms
Clearance	Clearance
Structure	Structure

selecting that measurement and the drone will perform the manoeuvre and present the data in real time.

Each measurement takes less than 3 minutes of flight, and can be repeated as many times as needed, with all the data recorded accessible through the app. The measurements are organised in the same way as a flight console or typical report, including Tx1/Tx2.

### 3. Real-time reports & stored results

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 graphs. Again, these measurements and parameters are automatically calculated from the ILS data, without having to look at formulas or calculate angles.

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