



FLYABILITY
INSPECTOR

USER MANUAL

VERSION 2.1
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1 Overview and setup

Inspector is the Flyability official application used to analyze the inspection footage gathered by the ELIOS 1 and ELIOS 2 systems.

1.1 First-time installation

1.1.1 System requirements

Inspector requires a 64-bit or 32-bit machine running Windows 7 or newer.

1.1.2 Get the application

The application is distributed as a standard executable installer (.exe), available on my.flyability.com.

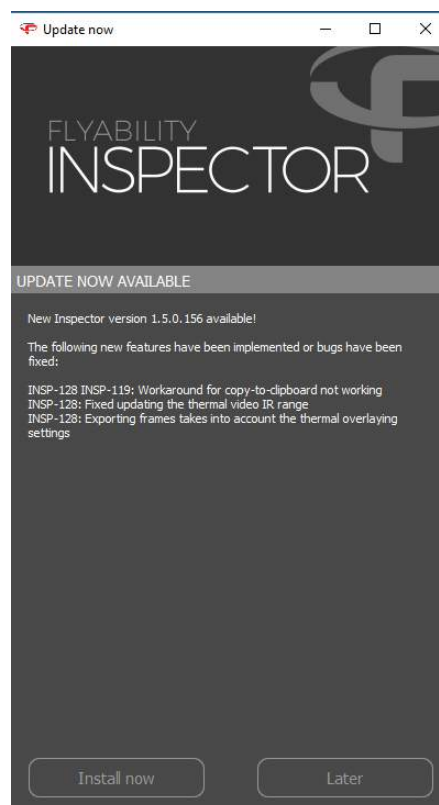
1.1.3 Install the application

Run the installer and follow the instruction displayed. If a previous version of Inspector is already installed, the installer will uninstall the latter before installing the new one.

1.2 Updating an already installed application

Updates to an already installed application can be done in two different ways.

1.2.1 Internet update process



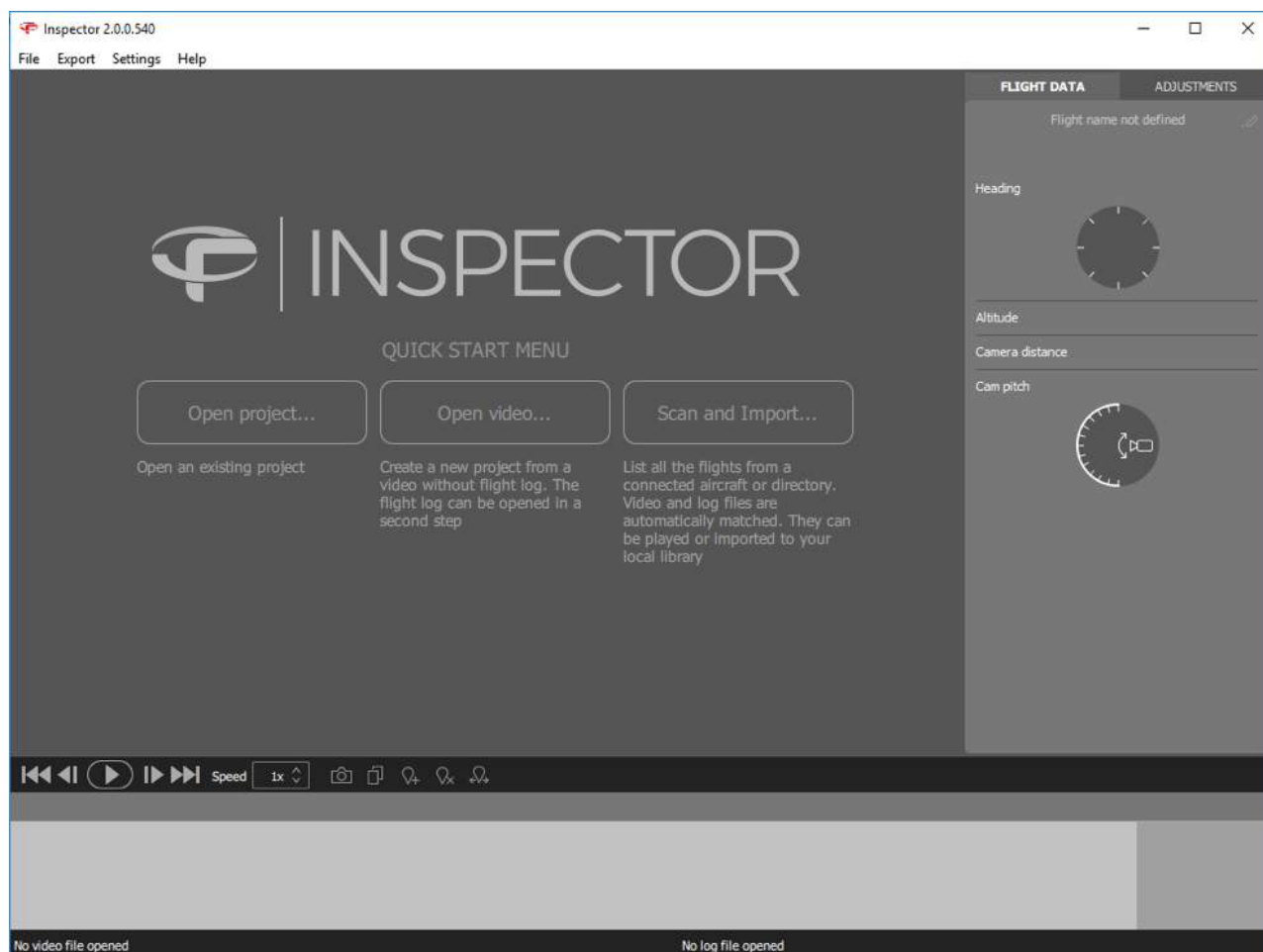
Be sure your computer has Internet access. As you start Inspector, the availability of updates is checked.

Should a more recent version be available, you will be notified and prompted to proceed with the update or decline it. If you proceed, the installation of the newer version begins automatically.

1.2.2 Manual update

Follow the steps noted in the "[Installing the application for the first time](#)" section.

2 Home menu



OPEN PROJECT

Open an existing .efly project and load the corresponding video and LOG file.

OPEN VIDEO

Create a new project from a video without flight log. The corresponding LOG file can be added separately.

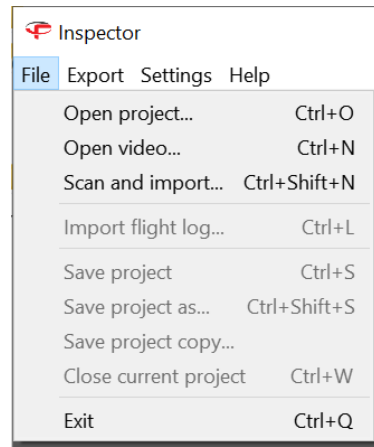
SCAN AND IMPORT

List all the flights from a directory or a connected aircraft. The browser can automatically match videos and LOG files. They can be played or imported in an other directory.

3 Import data and create a new project

There are two ways to create a new inspection project. Manually matching the video and the LOG file, or use the matching feature to scan a directory of videos and LOGs to pair them.

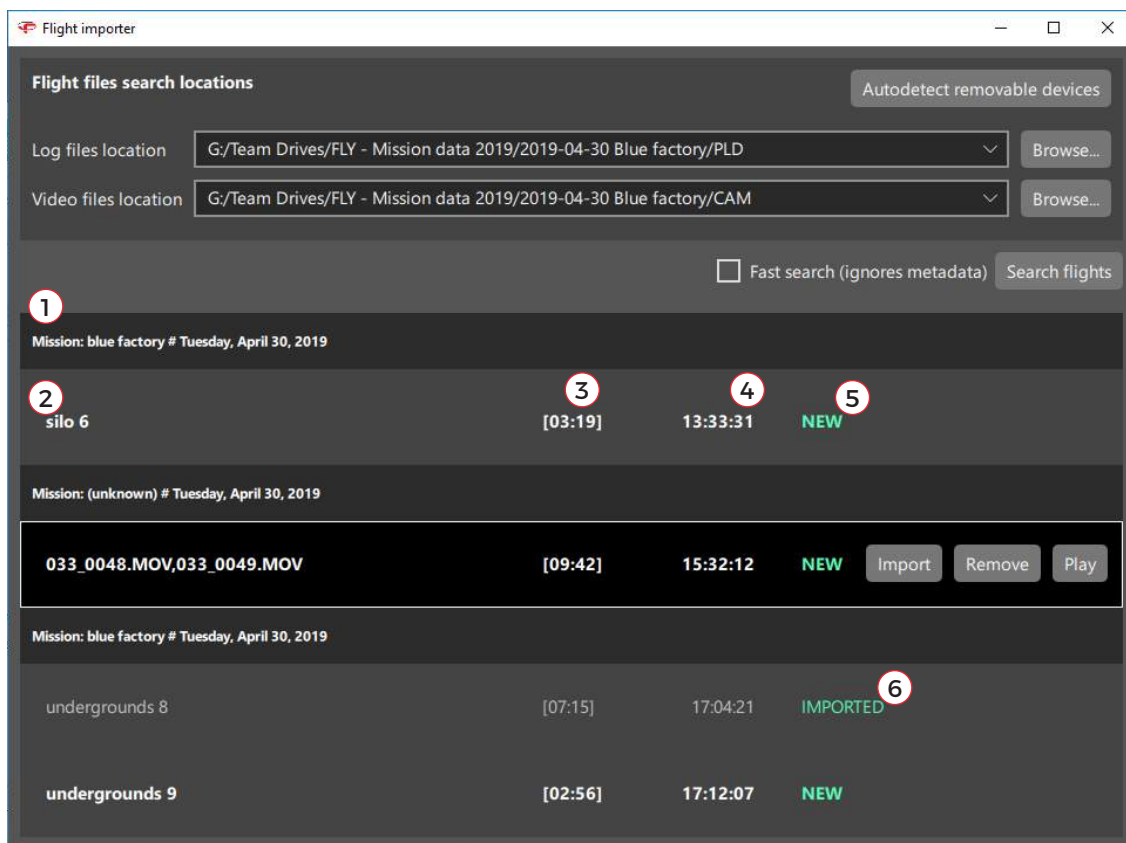
3.1 Create a project from a video



By clicking on “Import video” or “File > New project > From video file... (Ctrl+N)”, Inspector is loading the video. To add telemetry data, click on “File > Import flight log... (Ctrl+L)”.

3.2 Scan a directory or import from the aircraft

By clicking on “Scan removable devices” or “File > New project > From video file... (Ctrl+Shift+N)” or connecting an ELIOS 2 to your computer, Inspector is opening the auto-importer window.



- 1- Mission name and date
- 2- Flight name and number
- 3- Flight duration
- 4- Takeoff hour
- 5- Flight located in the source location or drone
- 6- The flight has been imported to the desired location

The auto-importer window is scanning a directory to list all the flights; A flight is composed of a video and its corresponding telemetry LOG file.

The auto-importer can either scan a given folder, SD cards connected to the computer, as well as an ELIOS 2 aircraft. By clicking on “Autodetect removable devices”, Inspector is assessing if an ELIOS 2 or if LOGs and CAM SD cards are connected to the computer.

3.2.1 Search flights

FAST SEARCH DISABLED

If the fast search is disabled, the auto-importer is not reading the content of the LOG files and tries to match the flight's files based on creation time and name. This method is fast but not robust.

FAST SEARCH ENABLED

The auto-importer is parsing the LOG file to extract matching information. This process is longer but more robust.

3.2.2 Import or play flight

From the window, it is possible to:

IMPORT

The flight's files are copied to the destination folder.

REMOVE

The flight's files are deleted from the source.

PLAY

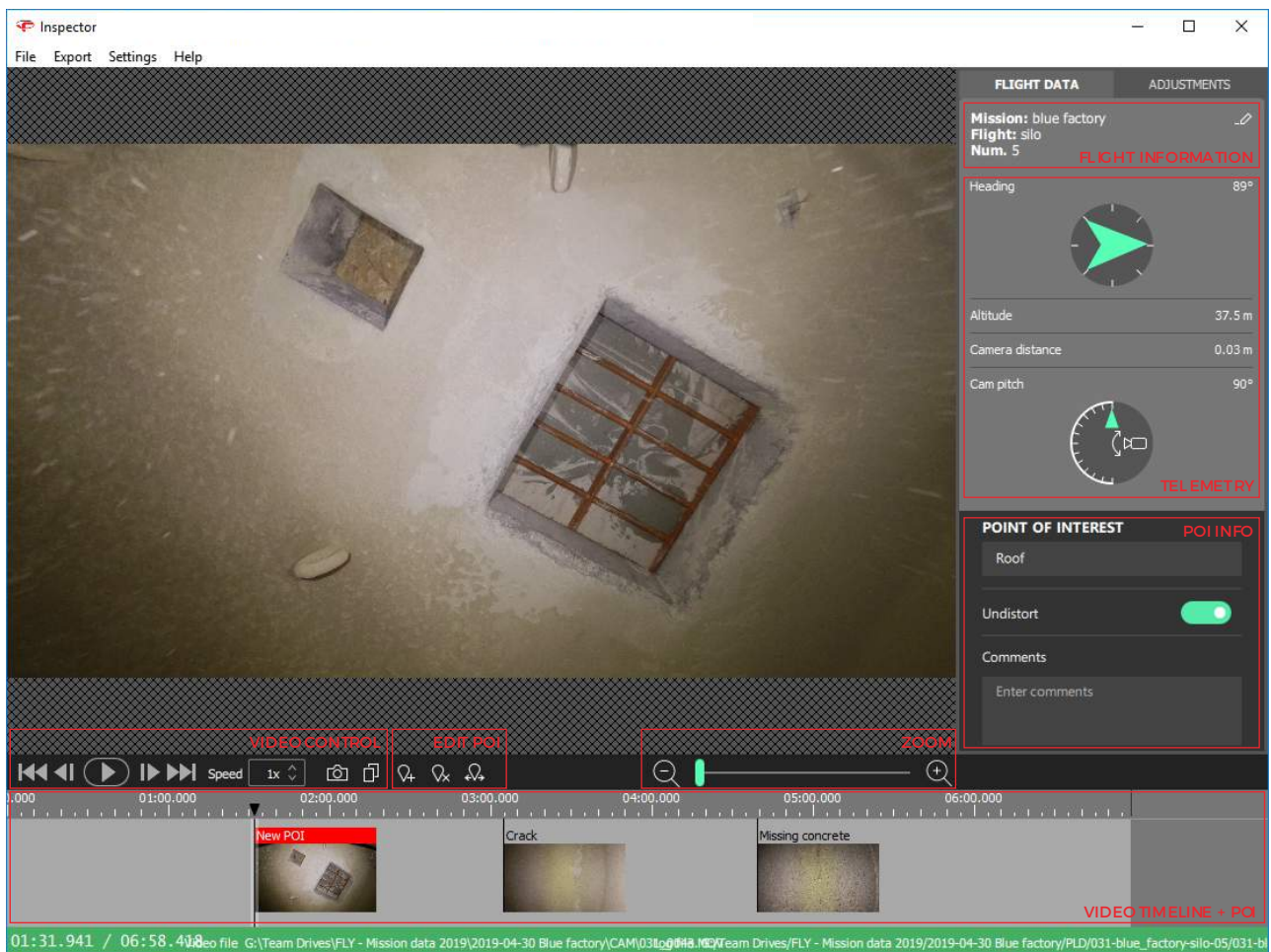
If the flight was previously copied, the flight will be open from the destination folder. If not, it will be played from the source.

3.3 Save a project

Once a project is created, it is possible to save it by clicking on “File > Save project (Ctrl+S)” or “File > Save project as...” (Ctrl+Shift+S). Saving the project will create a .efly project file linking flight's file together for later use.

4 Analyze data

Once a flight is open, the inspection interface is displayed.



4.1 Flight information



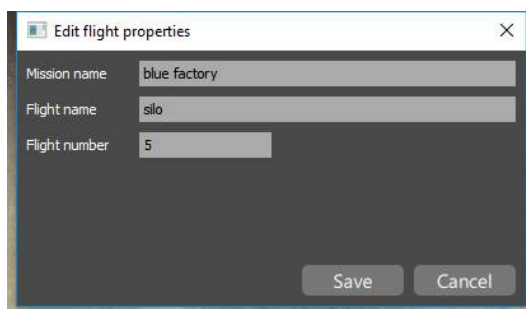
If previously inputted in Cockpit, Inspector is displaying the flight information:

- Mission name (on the picture blue factory)
- Flight name (on the picture silo)
- Flight number (on the picture 5)

If no flight information was filled in Cockpit, it will be displayed as not defined.



Clicking on edit  allows to add or edit the flight information.

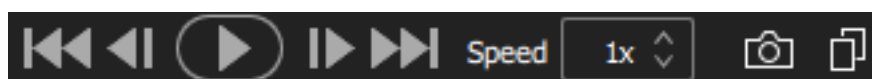


4.2 Telemetry

If a LOG file has been inputted, Inspector can display the drone telemetry. It contains the following information:

- Heading
- Altitude
- Camera distance, the distance between the camera and the surface.
- Camera pitch

4.3 Video control



play or pause the video



move to the previous / next frame



move to the beginning / end of the flight



set the playback speed



Extract current frame



Place the current frame in the clipboard to be pasted elsewhere. This action can also be performed with (Ctrl+C)

4.4 Point of interest (POI)



Create a POI with the current frame. This action can also be performed with (N)

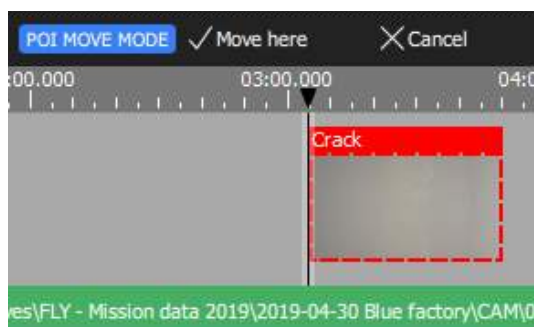


Remove the selected POI. This action can also be performed with (X)



Move the selected POI. This action can also be performed with (M)

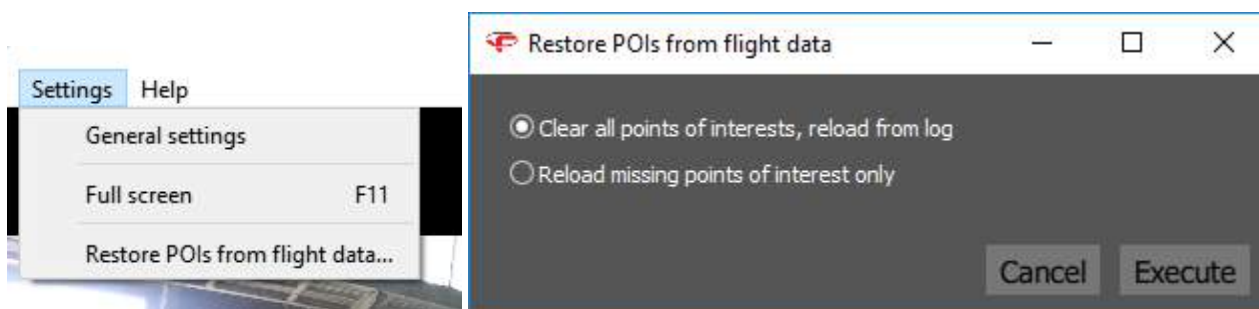
4.4.1 Move a POI



To adjust the time of a point of interest:

- Select the point of interest
- Click the Move button from the toolbar or press M
- Inspector is now in move mode. In this mode, the toolbar changes.
- Seek to the actual time where you want to reposition your point of interest. You can choose the new location with the keyboard arrow, the next/previous frame button, or by clicking on the timeline. You cannot reposition it over another existing Point of interest.
- To validate, click "Move here" or press Enter.
- To cancel the operation, click "Cancel" or press Esc.

4.4.2 Restore original POIs



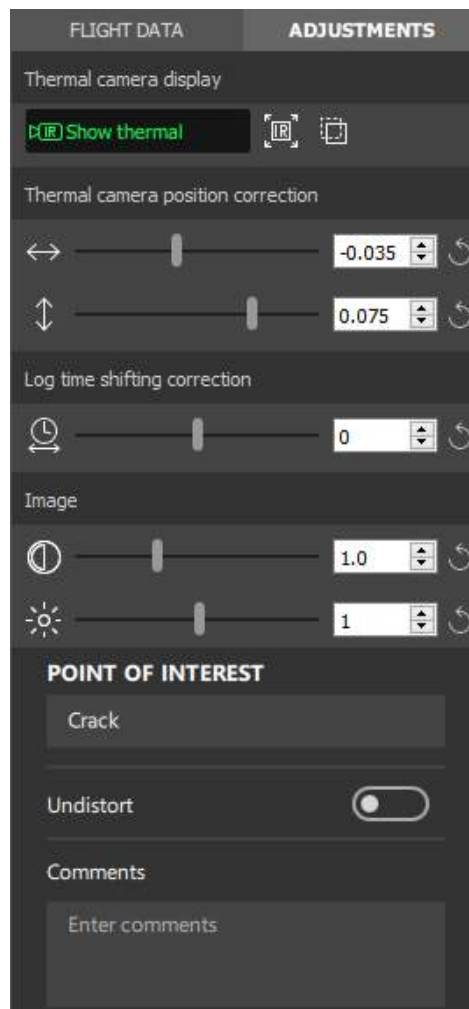
To restore points of interest from log files:

- From the menu, use "File > Restore POIs from flight data..."
- A dialog box appears to let you choose the restoration strategy.
- Select "Clear all points of interests" to clear the entire timeline and restore original Points of interest from the log file
- Select "Reload missing points" to preserve manually added points of interest and restore missing ones only. The absence of a point of interest at its original time is enough to consider it as missing.
- Click Execute to apply the changes.

4.4.3 POI information

When a POI is selected, it is possible to edit its name and add comments. Those inputs will be used while exporting a report from the flight.

4.5 Adjust image



4.5.1 Thermal camera



Enables or disables thermal image overlay on top of the visible image



Full-screen thermal image



Thermal overlay transparency.
This feature works on systems with Windows 8 or higher.



Horizontal shift of thermal image overlay



Vertical shift of thermal image overlay



Adjustment of the time difference between video and information from LOGs, including thermal imagery. It is used to compensate for an eventual lack of synchronization between camera and flight recorder.

4.5.2 Optical camera



Main image contrast

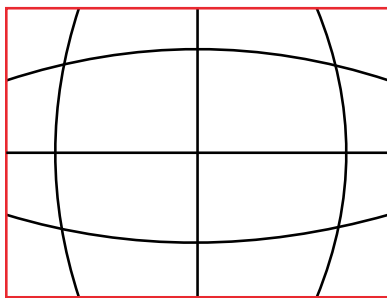


Main image brightness

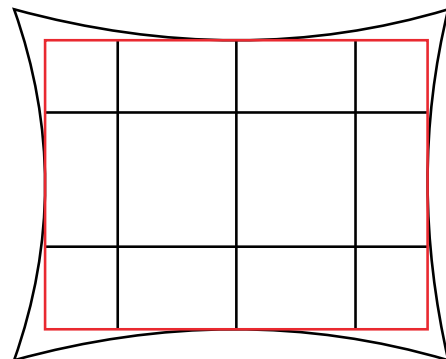


Any setting can be brought back to its default value by clicking the Reset button on the right


4.5.3 Undistortion



ORIGINAL IMAGE – DISTORDED

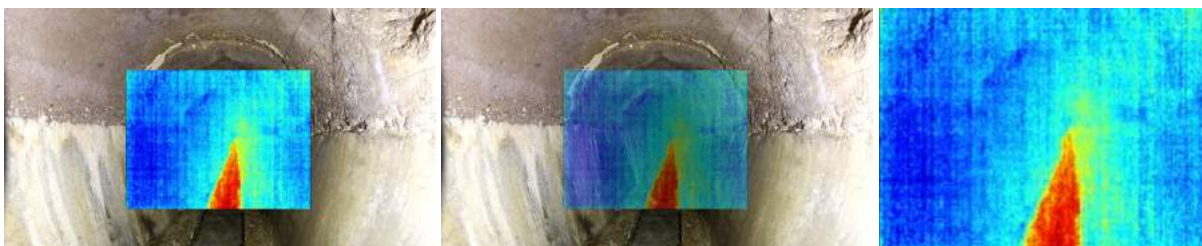


UNDISTORDED

 Border of displayed imaged

Due to the fish-eye nature of the optical camera, the image is distorted. Meaning, the straight lines are bent. In a POI, the image can be undistort or flatten. As the transformation stretches the image, the resulting frame displayed is slightly cropped.

4.6 Thermal camera



The thermal camera can be displayed in three different ways:

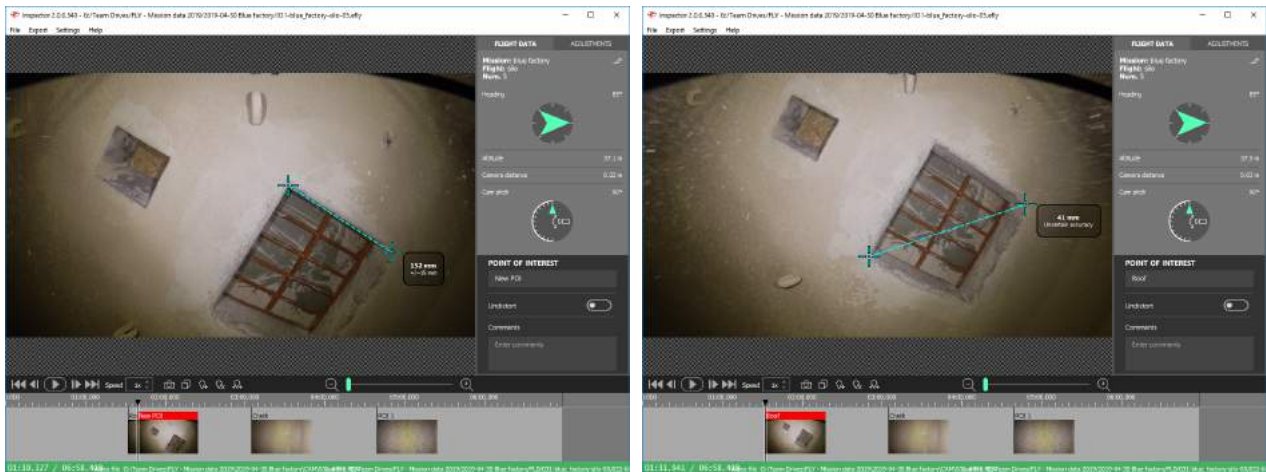
- Overlay
- Transparent overlay. This feature works on systems with Windows 8 or higher.

- Full screen

4.7 Camera distance

The telemetry displays the distance measured by the Camera distance sensor. This value can be used to assess the distance from the drone to the surface located in front.

4.8 2D measurement



- Create or edit a POI
- Click on the frame where to place the first crosshair
- Click on the frame where to place the second crosshair
- To redo the 2D measurement click on the image and repeat those steps



The 2D measurement result is displayed on the frame with its estimated accuracy.

If the 2D measurement is not available due to missing or unreliable Camera distance data, Inspector is issuing the warning "Unable to perform 2D measurement on this frame".



**THE USER MUST ASSESS IF THE MEASUREMENT MAKES SENSE BY UNDERSTANDING ITS LIMITATIONS AS DESCRIBED IN THE CHAPTER 2D MEASUREMENT AND IF THE CAMERA DISTANCE MAKES SENSE.
FLYABILITY DOES NOT GUARANTEE ITS ACCURACY.**

5 Export data

5.1 Export current frame

- Seek to the frame you want to export or click the point of interest.
- Click the camera button (export frame) on the toolbar
- Specify file to save in the file browser

Alternately, you can copy/paste the active frame:

- Seek to the desired frame
- Click the Copy button from the toolbar or press Ctrl+C
- Use the Paste feature of the software in which you want to export the frame or the system file browser

5.2 Export report

Inspector can generate a Microsoft Word document with detailed pages for each point of interest.

A report includes the following information:

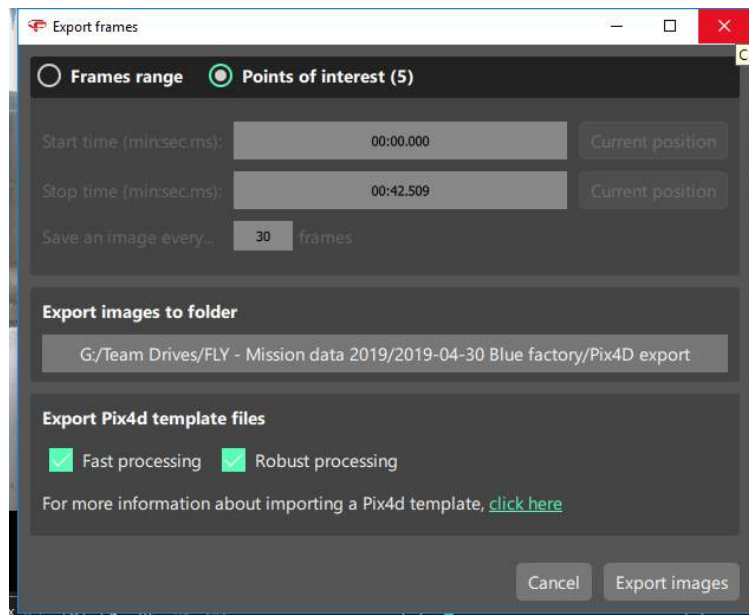
- Cover page with flight properties
- One page per point of interest with image and properties of that point of interest

To export a Word report:

- From the menu, use "File > Export inspection report..."
- Specify the location at which the document should be saved using the file browser
- Wait for the operation to finish (should take a few seconds)

5.3 Export POIs

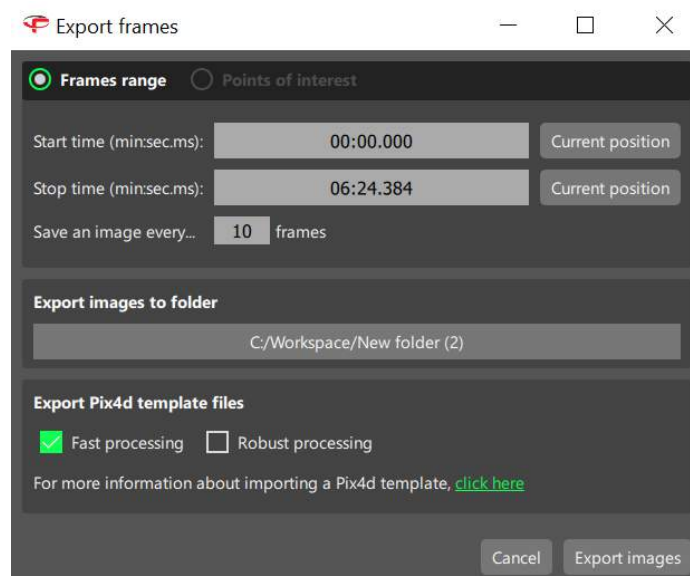
- Make sure your project has, at least, one point of interest set.
- From the menu, use File > Export frames as images...



- In the export dialog, on the top selector, choose Points of interest
- Select the folder in which images should be exported using the file browser.
- Click Export images to process.
- Wait for the operation to complete

5.4 Export to multiple frames – Photogrammetry with Pix4D

- From the menu, use "File > Export frames as images..."



- In the export dialog, select Frames range on top.
- Seek to start time in the main window and click Current position in front of the Start time.
- Seek to end time and click Current position in front of Stop time.
- Set the desired frame interval in Save an image every...

- Select the folder in which images should be exported using the file browser.
- If you desire to use Pix4D to create a photogrammetric model from the exported frames, the user can ask Inspector to create a Project file with the correct processing parameters. Two settings are available:
 - o Fast processing: Less robust, less accurate, but fast.
 - o Robust processing: Increased robustness and accuracy. Computation time drastically increased.
- Click Export images to process.
- Wait for the operation to complete.

5.5 Export video file

- From the menu, use "File > Export video file..."
- Specify the video file location using the file browser
- Click OK to start operation
- Wait for the operation to complete; it can last for a few minutes



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Content subject to change.

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