



The Rio de Janeiro State University - UERJ
Laboratory of Photogrammetry and Remote Sensing
The E-Foto project

Photogrammetric Project Creation and Management

Authors: Lia de Souza e Simões Figueiredo and Patricia Farias Reolon

Revision: Jorge Luis Nunes e Silva Brito

Introduction

After executing the integrated version of the e-foto, you will see the opening screen of the software, as shown in **Figure 1** below. The main menu has the following options: **Project, Execute and Help**. We can use the software to create and/or modify a photogrammetric project. For didactic purposes, we show an example of use of the software for the first time. For this, we will choose the option called **Project**



Figure 1 - The Main Screen of the e-foto Photogrammetric Project Creation and Management

Creating a photogrammetric project

We must first perform data entry of the Photogrammetric Project so that it can be used later. Click in **Project**, then choose the option **New**, or use the keyboard shortcut **Ctrl+N**. It will appear a screen asking the name of the project, then the data entry screen appears, as shown in The Figure 2 below.



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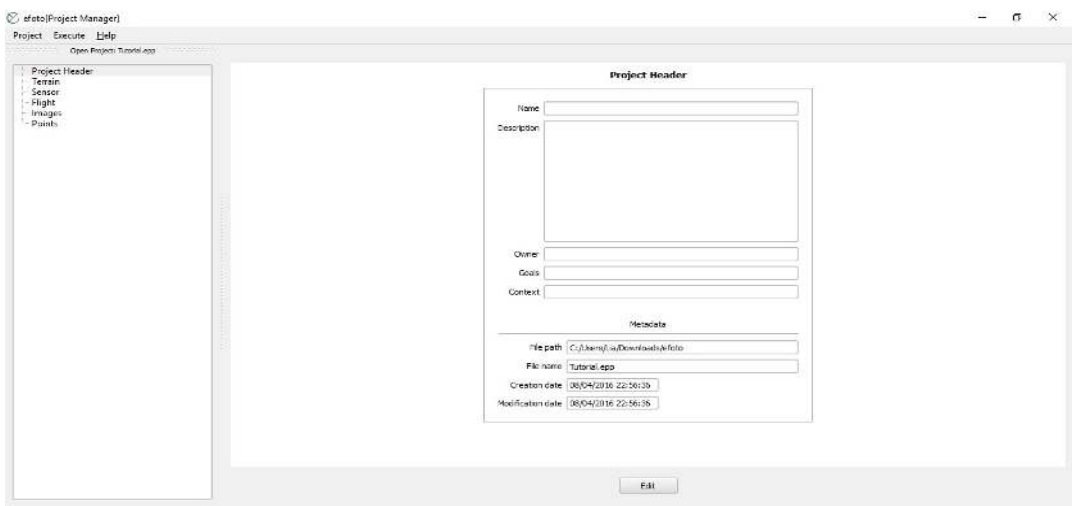


Figure 2 - The project Header Form

In the item **Project Header**, we must provide the information regarding the **Name of The Project, Description, Owner, Goals, and Context.**

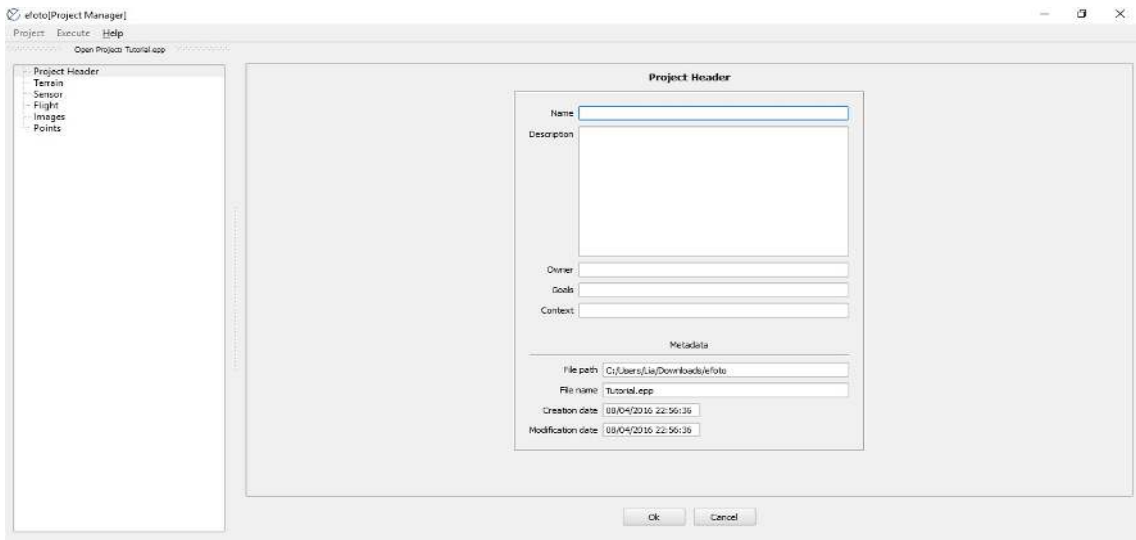


Figure 3 - The Edit Button in the Project Header Form

Edit mode: By clicking in the **Edit** button on the bottom of the screen, we enter in the **Edit Mode**. The indication that we are in the Edit Mode is the fact of



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the form become gray and the options **Project** and **Execute** are disabled, as shown in the Figure 3.

To confirm the changes made in Project Header just click **OK**, to discard click **Cancel**.

- Saving a project: To save a Project we should go to the Main Menu and choose **Save File As** or use the keyboard shortcut **Ctrl+A**. You must be out of edit mode to access the main menu and the project should NOT be saved in directories whose names contain accents, spaces or special characters.
- The metadata (file path - File name - Creation date – Modification date) appear in the Project Header form only when the project is saved, as shown in Figure 4.

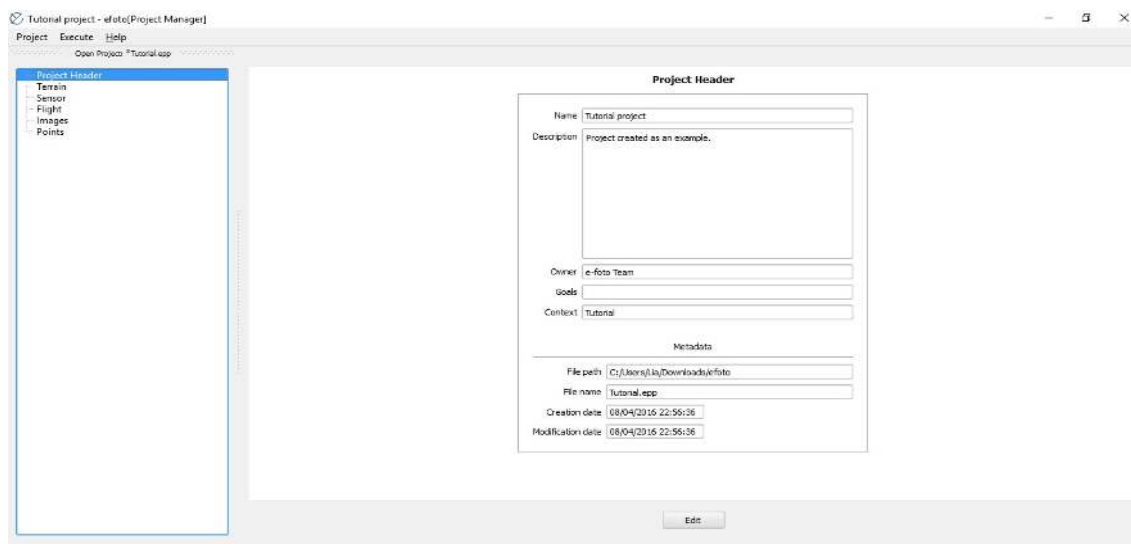


Figure 4 - The Project Header Form

Once the photogrammetric project is created, we now need to enter the data about the Terrain. To do this, simply click on the **Terrain** item just below Project Header, as shown in the Figure 5.



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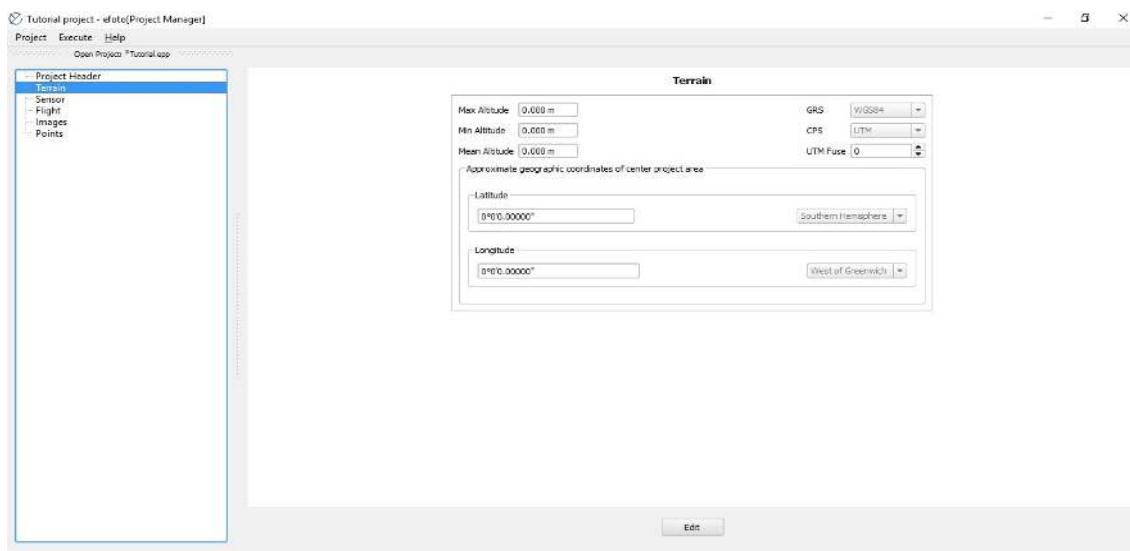


Figure 5 - The Project Header Form

In the **Terrain** form, we must fill the following information:

- Maximum, minimum and mean Altitude (The altitude is referred to the geoid, the Average Level of the Seas);
- GRS (Geodetic Reference System) with the following options:
 - SIRGAS2000 ;
 - SAD69 (original version);
 - WGS84 ;
- CPS (Cartographic Projection System) with the only option for UTM;
- UTM Fuse: Selection of the UTM zone of the geographic area of the project;
- Latitude, measured in degrees, minutes and seconds and also the Hemisphere indication: Northern or Southern;
- Longitude, measured in degrees, minutes and seconds and the indication of East Greenwich or West Greenwich, as appropriate.



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- We now need to enter the information about the sensor. To do this, simply click on the item sensor just below Terrain as shown in Figure 6 and Figure 7.

The screenshot shows a software window titled "efotoProject.Manager" with a menu bar (Project, Execute, Help) and a toolbar (Open Project: tutorial.app). On the left is a tree view with "Sensor" selected. The main area displays the "Sensor" form with the following fields and options:

- Sensor ID: [text input]
- Description: [text area]
- Type: Detector (film), Platform (aerial), Geometry (frame), Energy Source (natural), Calculation Model (With Fiducial Marks)
- Camera Calibration Certificate: Number, Dispatch, Expiration
- Sensor Parameters: Calibrated Focal Length (mm), Standard Deviation (Not Available), Coordinates of Principal Point (mm), Xc (0,000), Yc (0,000), Standard Deviations (Not Available)
- Distortion Coefficients: Radial Symmetric (Not Considered), Standard Deviations (Not Available)

An "Edit" button is located at the bottom right of the form.

Figure 6 - The Sensor Form



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Figure 7 - The Sensor Form (cont)

In this form, we must fill out the information related to the sensor, such as:

- Sensor Id - Identification of the sensor or camera;
- Description of the sensor or camera;
- Type:
 - Detector: can be film (analogic) or digital (CCD);
 - Platform - in this version is only available the "Aerial" option;
 - Geometry (frame);
 - Energy Source (Natural) and;
 - Calculation Model (With Fiducial Marks, Sensor dimensions, Fixed Parameters): This is the calculation model to be used in implementing the Interior Orientation of the images;
- Camera Calibration Certificate Number:
 - Dispatch date;



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- Expiration date;
- Sensor Parameters: (should be derived from the Calibration Certificate):
 - Calibrated Focal Length and its standard deviation, if available;
 - Coordinates of Principal point (x_0 , y_0 and their respective standard deviations, if available);
- Lens distortion coefficients (Figure 8):
 - Radial Symmetric (K_0 , k_1 , k_2 , k_3 and their respective standard deviations, if available);
 - Decentered (P_1 , P_2 and their respective standard deviations, if available);
- Fiducial marks (if the calculation model is With Fiducial Marks):
 - Number of fiducial marks (are allowed 4 or 8 fiducial marks) and;
 - Coordinates of fiducial marks from the camera calibration certificate (x_i , y_i and their respective standard deviations, if available).

The screenshot shows the 'eFoto Project Manager' application window. On the left is a 'Project Header' tree with nodes for Terrain, Sensor, Flight, Images, and Points. The main area contains the 'Sensor Form' with the following sections:

- Radial Symmetric:** Four rows of input fields for K_0 , k_1 , k_2 , and k_3 , each with a corresponding 'SIDev' field set to 'Not Available'.
- Decentered:** A dropdown menu set to 'Not Considered', a 'Standard Deviations' dropdown set to 'Not Available', and two rows of input fields for P_1 and P_2 , each with a 'SIDev' field set to 'Not Available'.
- Fiducial Marks (mm):** A dropdown menu set to '4 marks', a 'Standard Deviations' dropdown set to 'Not Available', and eight rows of input fields for x_i and y_i coordinates, each with a 'SIDev' field set to 'Not Available'.

An 'Edit' button is located at the bottom center of the form.

Figure 8 - The Sensor Form



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- Sensor dimensions (if the calculation model is **“With Sensor Dimensions”**)(Figure 9):

- Pixel size;
- Sensor size (in columns and rows);

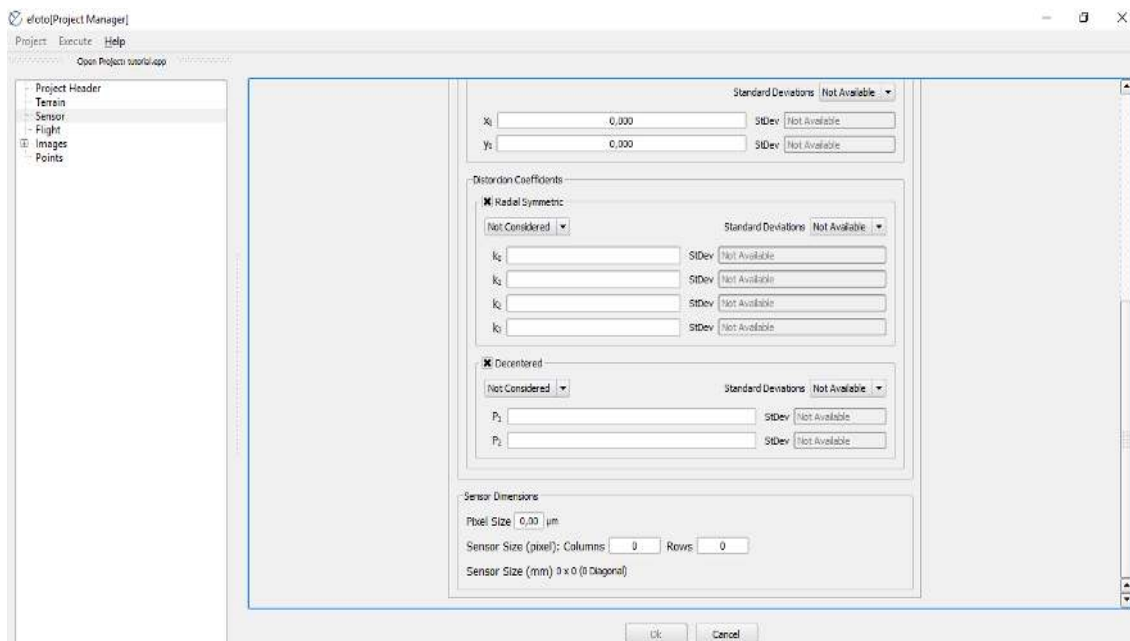


Figure 9 - The Sensor Form

- Xa (if the calculation model is **“With Fixed Parameters”**)(Figure 10):
 - a_0, a_1, a_2, b_0, b_1 and b_2 .



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Figure 10 - The Sensor Form

We now need to enter the information about the flight. To do this, simply click on item **Flight** just below Terrain as shown in the Figure 11.

Figure 11 - The Flight Form



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In this entry screen, we must fill out the information related to the flight, such as:

- Flight ID, Producer's name, description and date of execution
- Flight parameters:
 - Nominal flight height (flight altitude above the sea level);
 - Nominal scale of the imagery;
 - Longitudinal overlap (along the line of flight);
 - Transversal overlap (between two tracks of flight).

Now, we must enter the images that will be used in the project. To do that, we should click on the item **Images**, just below **Flight** in the menu, as shown in the Figure 12.

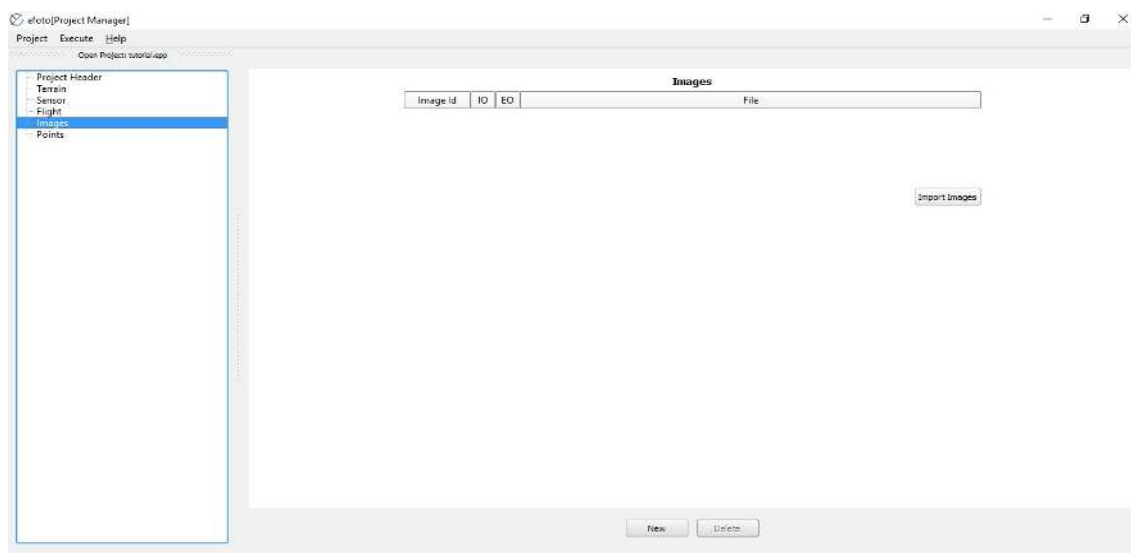


Figure 12 - The Image Form

Adding images: just click in **Import Images** and select all images you want. After selecting the images, the software will ask you if all images has the same dimensions and what is its geometric resolution (the value in dpi);



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Points: We now need to enter the information from the ground control points. To do this, simply click on the item **Points** just below Images, as shown on the screen in Figure 13.

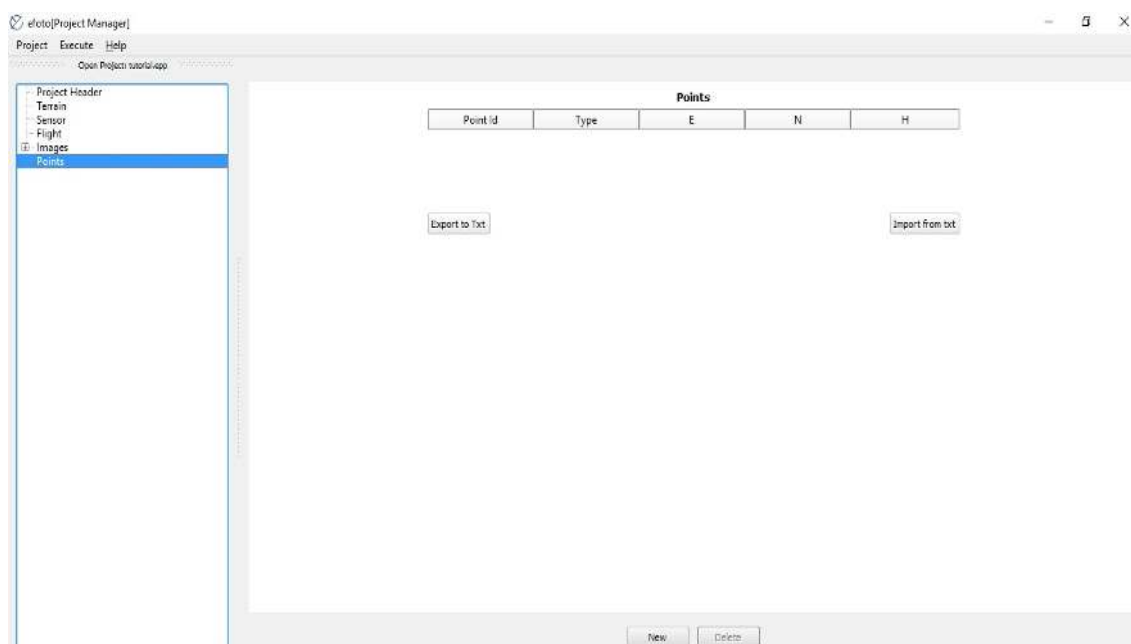


Figure 13 - The Points Form

- Adding points from a txt file: if you have a txt file with the coordinates of all ground control points, you just need to click in the **Import from txt** button and select the file you want;
- Adding points manually: when you click in **New** the e-foto will open the form of the point (Figure 14):



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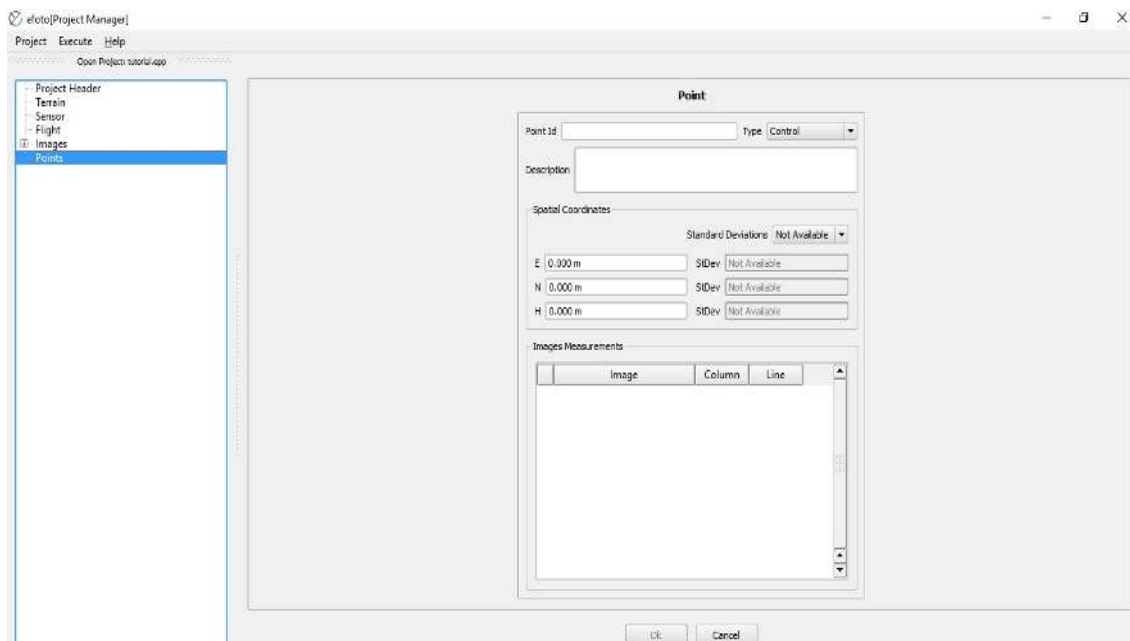


Figure 14 - The Point Form

In this screen, you must fill the information about the point you are adding: Id of the point, type of the point (control, check or photogrammetric) and its ground coordinates.

There is a possibility of generating the report of your photogrammetric project. Figure 15 shows the generation of the report, the options for selecting what do you want to report, and the option to choose between two file formats: text file or XML file. You can also use the shortcut **CTRL+J** to generate the report.



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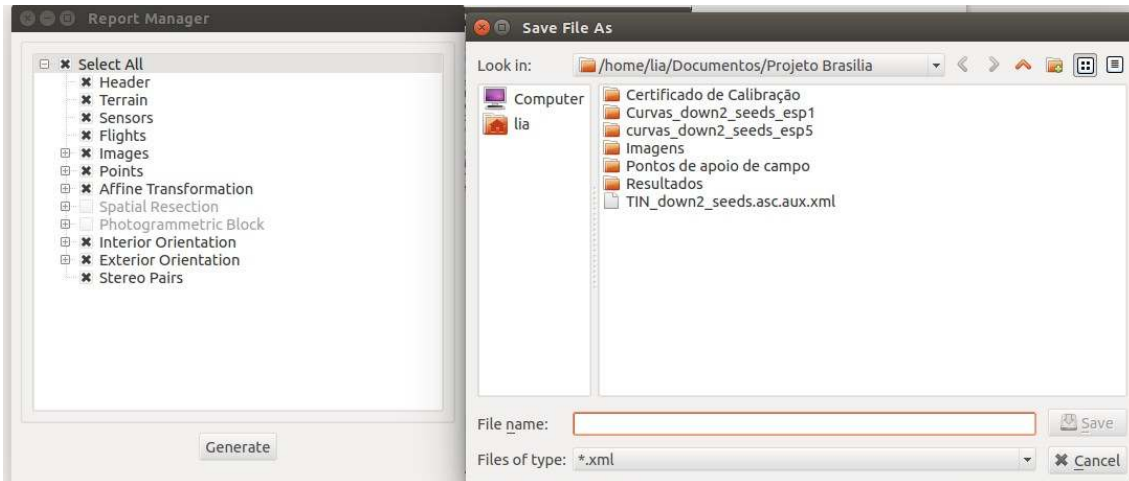


Figure 15 - The Photogrammetric Point Report Generation

Any contribution for correcting and improving this tutorial is very welcome. Please send your comments and/or suggestions to the e-foto team at <http://www.efoto.eng.uerj.br/forum>

<END OF TUTORIAL>