EVENT 38

UNMANNED SYSTEMS

Agisoft Processing Guide

Revision: May, 2023

Overview

The following guide describes the standard processing steps for processing ppk data collected by the E400 without ground control points (GCPs) in Agisoft Metashape Profession edition.

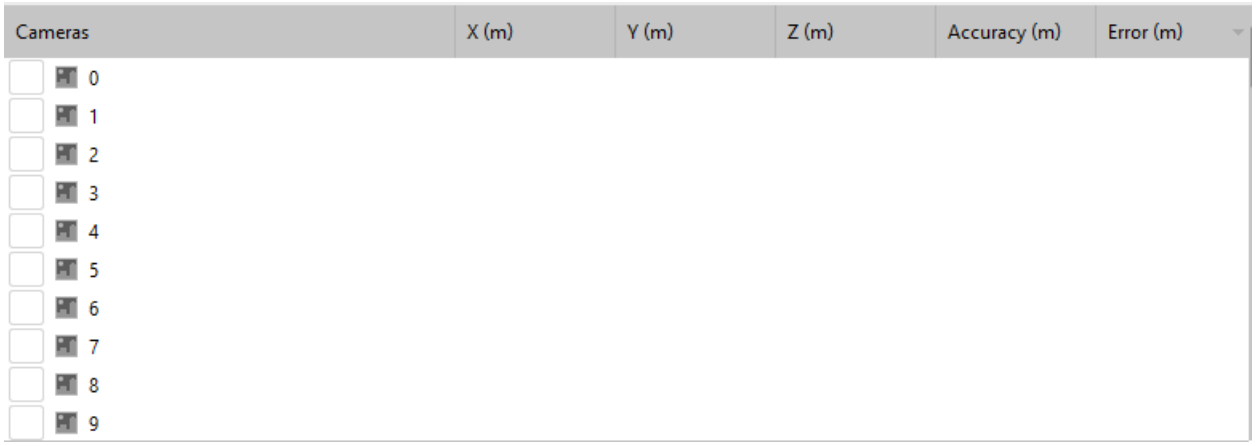
Requirements

1) Imagery from flight
2) Geotags for imagery
3) Agisoft metascan professional

Adding photos for standard cameras

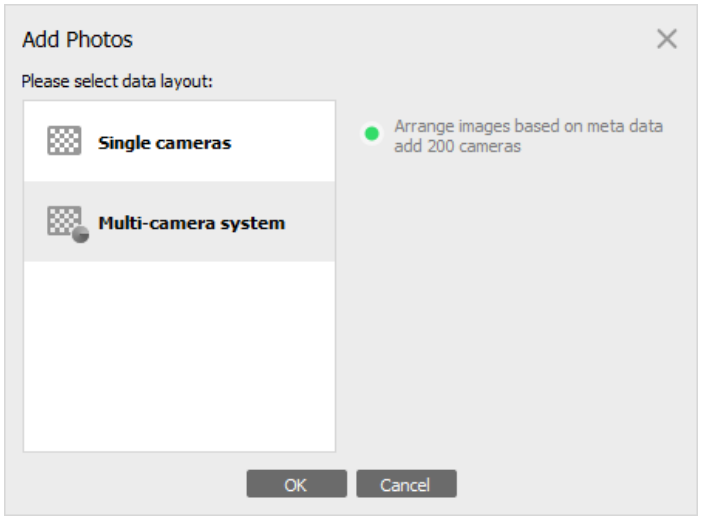
Select the ***Add photos*** command from the *Workflow* menu.

Browse the source folder and select files to be processed then click ok. The images will be added to the cameras tab.



Adding photos for multispectral cameras

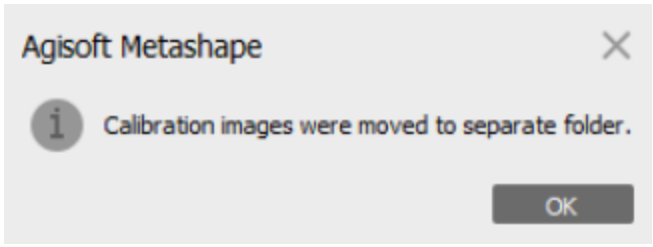
If working with a RGB camera skip to the importing references section of this manual. Open the Workflow menu and choose the Add Photos option. Select all images including reflectance calibration images and click the OK button. In the Add Photos dialog choose Multi-camera system option:



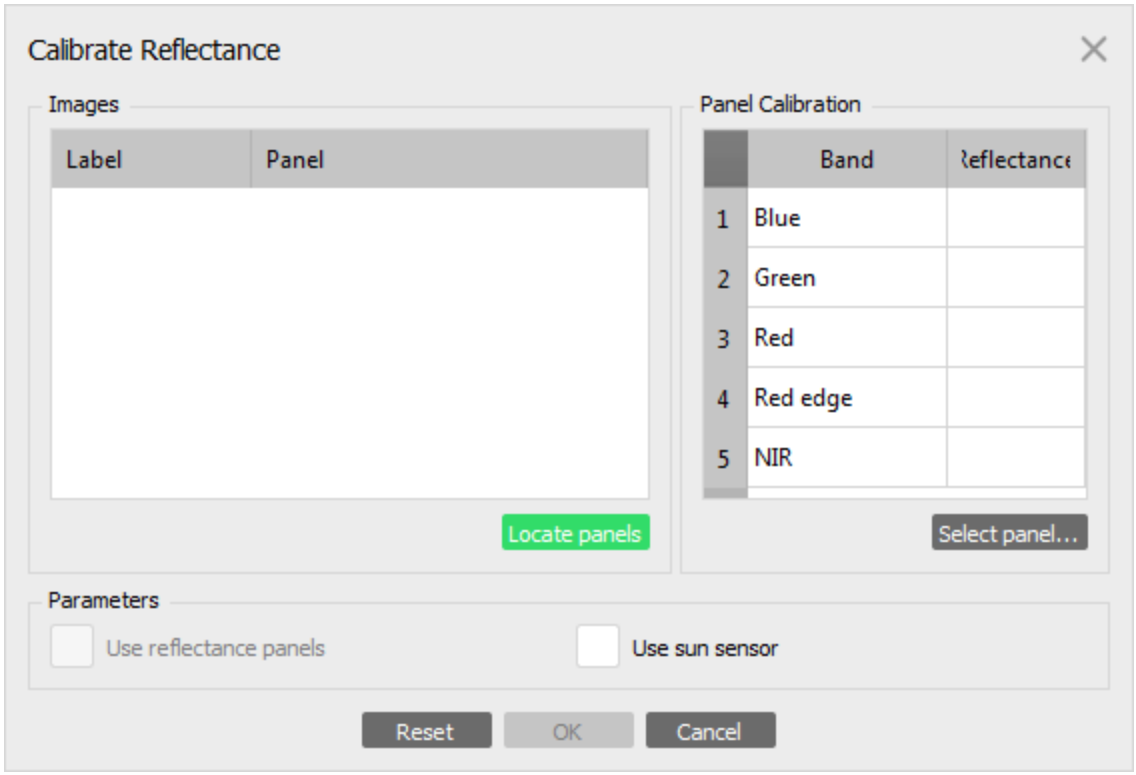
If the images are stored in several folders, the same operation should be repeated for each folder.

Reflectance calibration **(for multispectral cameras only)**

Agisoft will automatically detect reflectance calibration images taken before and after flight.



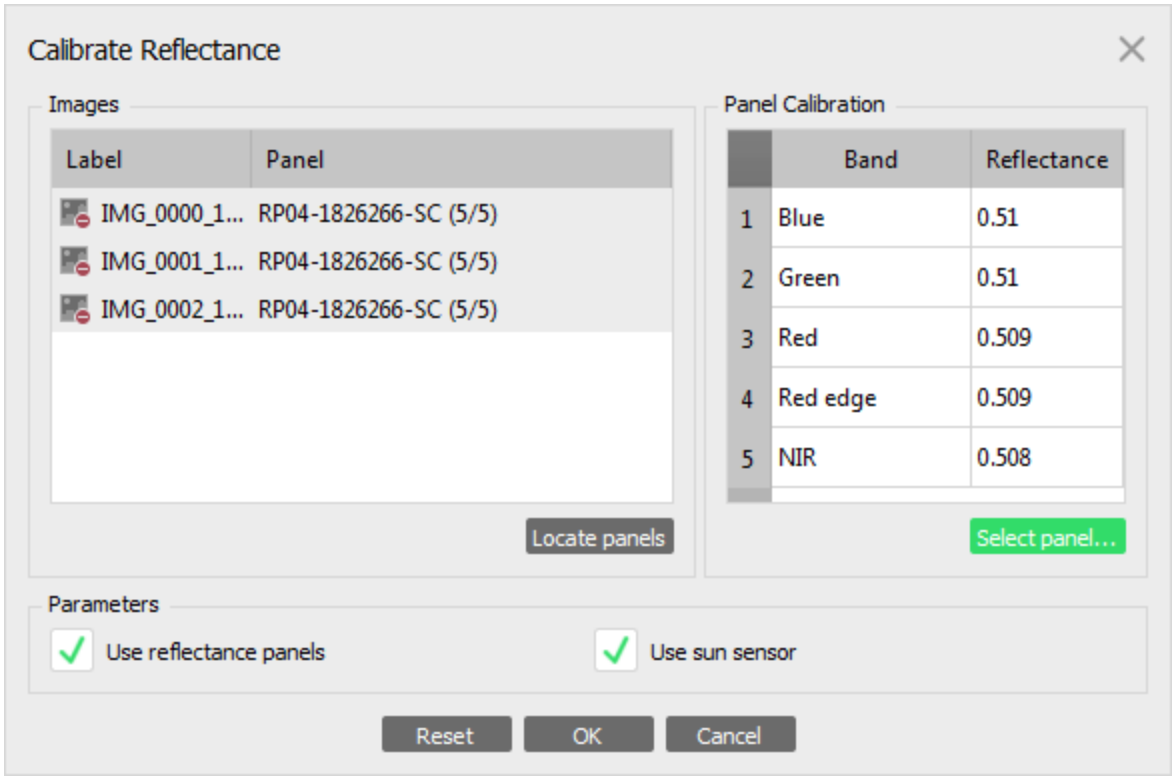
Open Tools menu and choose the Calibrate Reflectance option. Press Locate Panels button:



As a result, the images with the panel will be moved to a separate folder and the masks would be applied to cover everything on the images except the panel itself. If you are using the panel for the first time, and its calibration is not added to Metashape Pro internal database yet, you will be prompted to load a calibration from a CSV file:

If you don't have a CSV file with calibration information, you can input calibration values manually at the next step. If you own MicaSense radiometric panel, you can request the corresponding CSV file from MicaSense directly: https://www.micasense.com/prv

After the panels are located, the reflectance values corresponding to each band should be input according to the panel certificate.

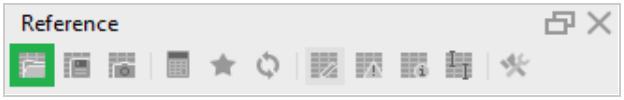


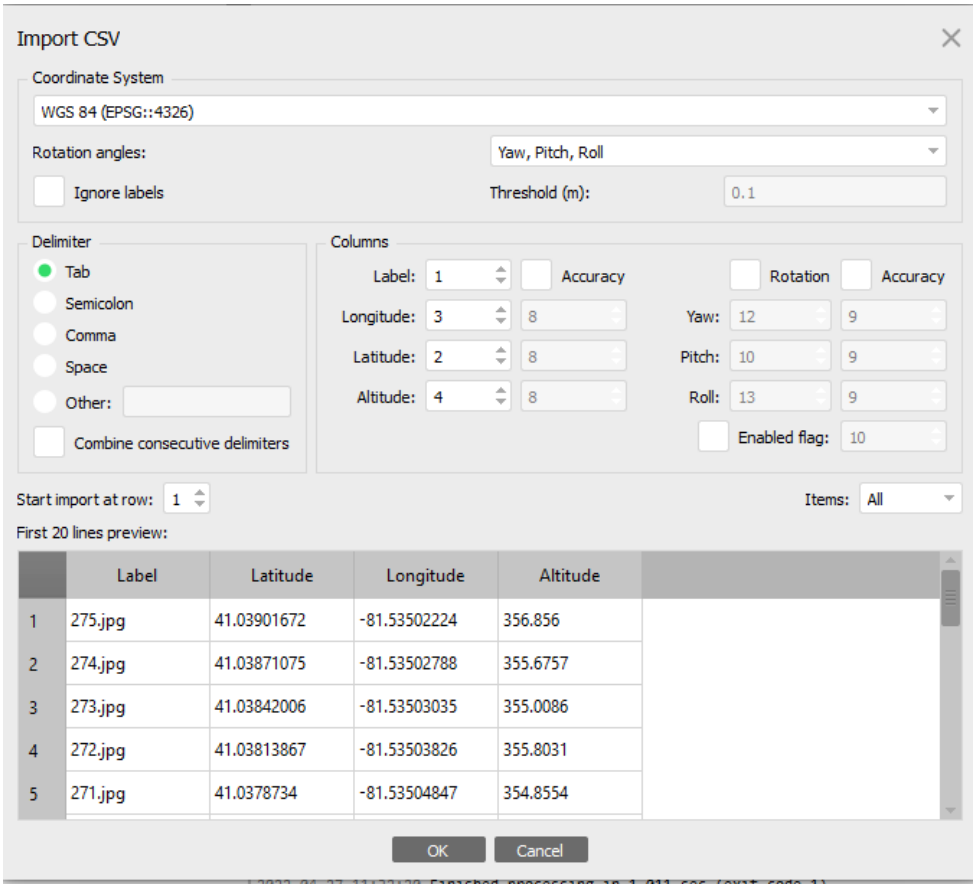
Run reflectance calibration **(for multispectral cameras only)**

Check on Use reflectance panels and Use sun sensor options in the Calibrate Reflectance dialog to perform calibration based on panel data and/or image meta information. Click OK to start the calibration process.

Importing references

To import the camera coordinate data from the CSV file, click *the **Import Reference*** button on the ***Reference pane***. Brows*e* to the file containing recorded reference coordinates and click the ***Open*** button.

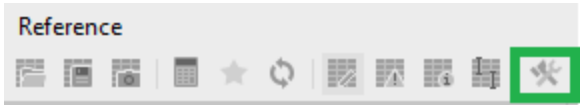




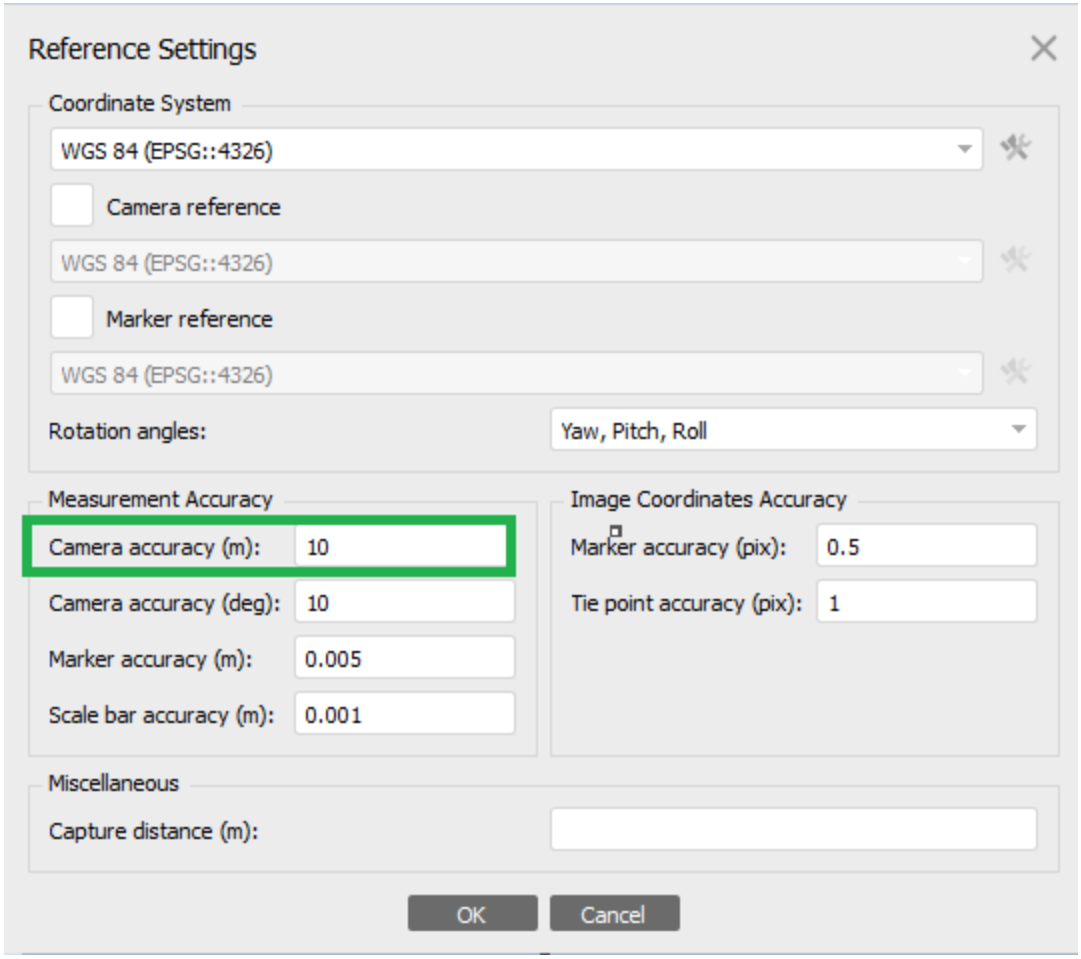
In the ***Import CSV* dialog**, set the parameters for import (coordinate system, delimiter, columns, etc.)

Geotagging method	**Latitude**	**Longitude**	**Altitude**
PPK	Dependant on base coordinate	Dependant on base coordinate	Dependant on base coordinate
Companion Computer	WGS84	WGS84	MSL

Setting Geotag Accuracy



Click the reference settings tab.

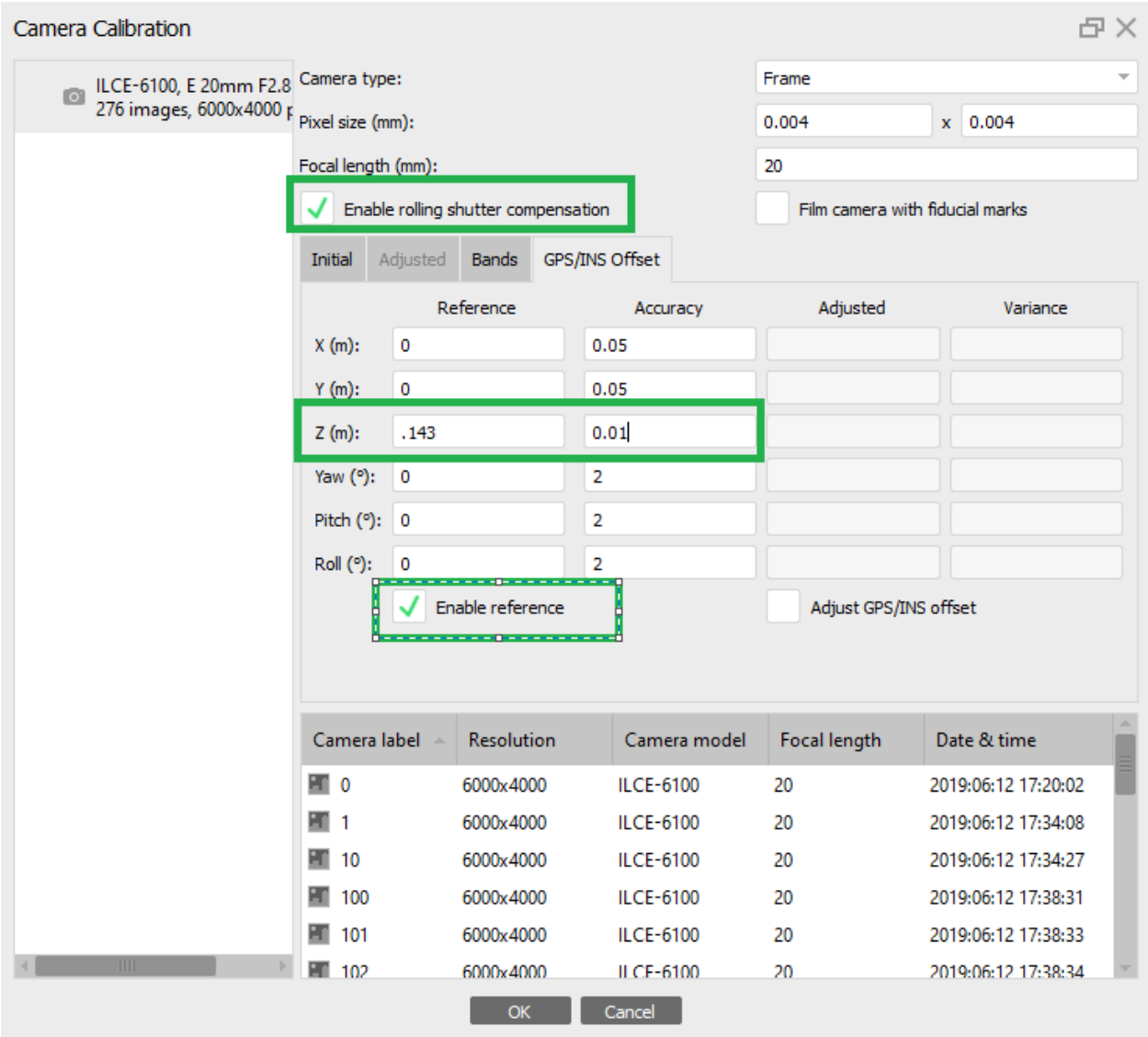


Change the ***Camera accuracy*** based on your geotag accuracy.

Geotagging method	**Accuracy**
PPK	.05m
Standard Accuracy	5m

Camera Calibration

Select ***Camera Calibration*** from the ***Tools*** menu.



Select the following settings depending on your camera.

A6100	
Rolling shutter	Enabled
PPK Z offset (m)	.143
PPK Z accuracy	.001

RX1RII	
Rolling shutter	Disabled
PPK Z offset (m)	.1529
PPK Z accuracy	.001

A7R IV	
Rolling shutter	Disabled
PPK Z offset (m)	.149
PPK Z accuracy	.001

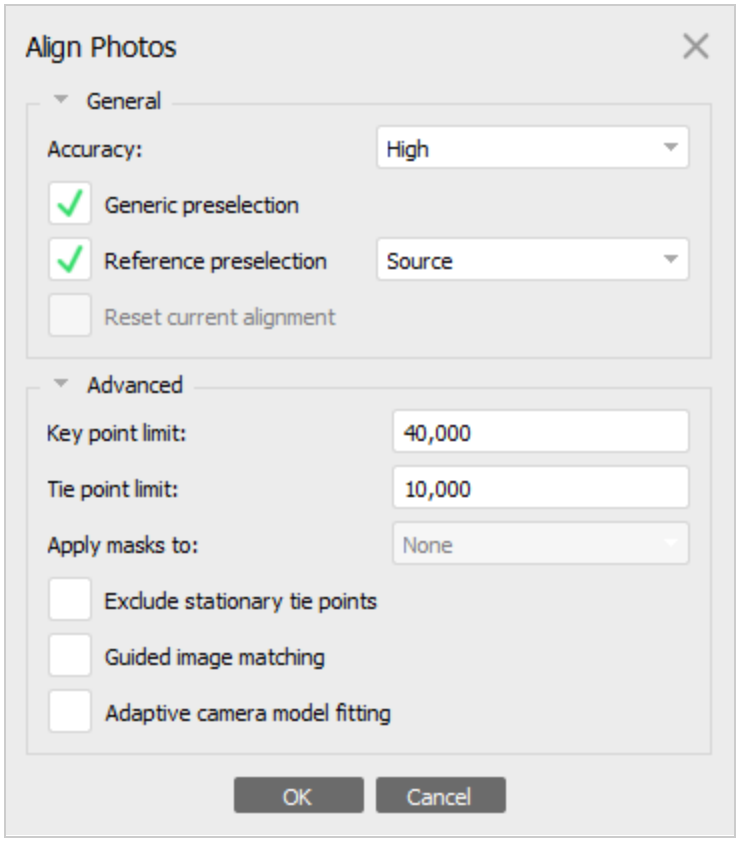
Altum-PT	
Rolling shutter	Disabled
PPK Z offset (m)	.113
PPK Z accuracy	.001

RedEdge-P	
Rolling shutter	Disabled
PPK Z offset (m)	.144
PPK Z accuracy	.001

Align Photos

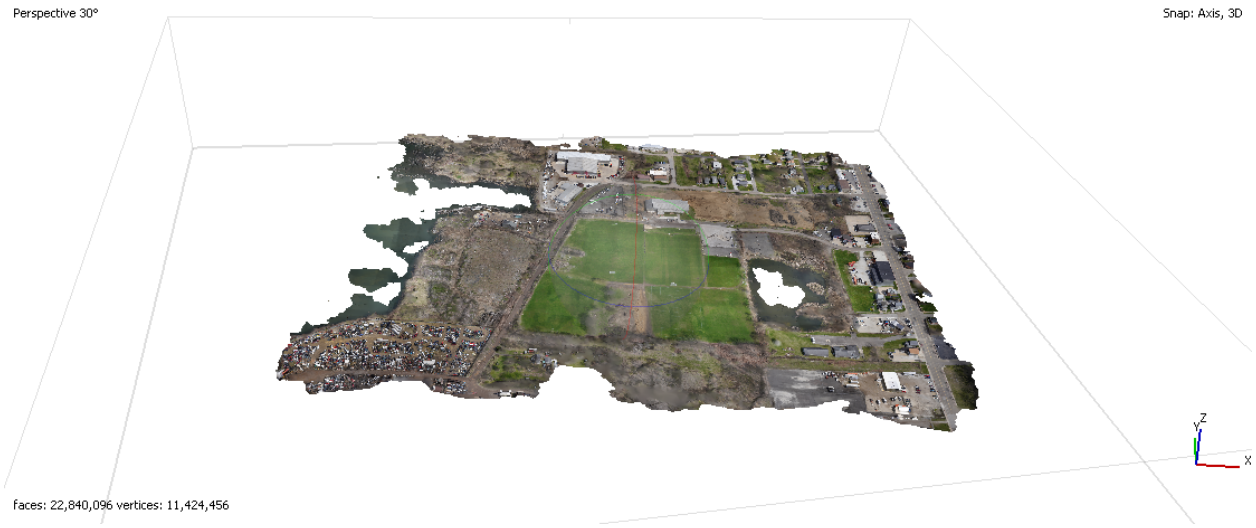
Select the ***Align Photos*** command from the ***Workflow*** menu.

Set the parameters in the ***Align Photos*** dialog window:



Click the ***OK*** button. The progress dialog box will appear displaying the current processing status. To cancel the processing, click the *Cancel* button.

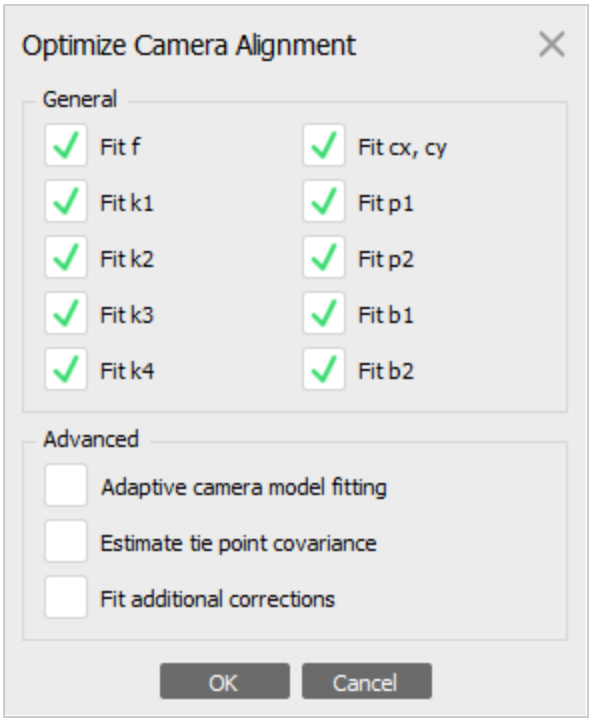
Alignment having been completed, computed camera positions, and a sparse point cloud will be displayed in the *Model* view.



Optimize camera locations

Click the ***Optimize*** toolbar button on the ***Reference*** pane.

In *the* ***Optimize Camera Alignment*** dialog box, check additional camera parameters to be optimized.

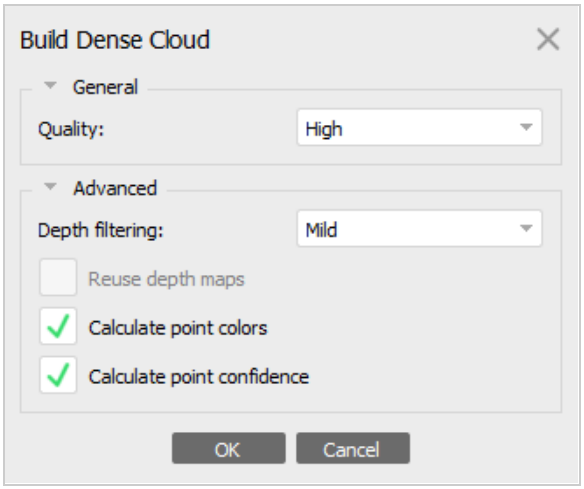


Click the ***OK*** button to start optimization.

Build Dense Cloud

1. Select ***Build Dense Cloud*** command from the *Workflow menu.*

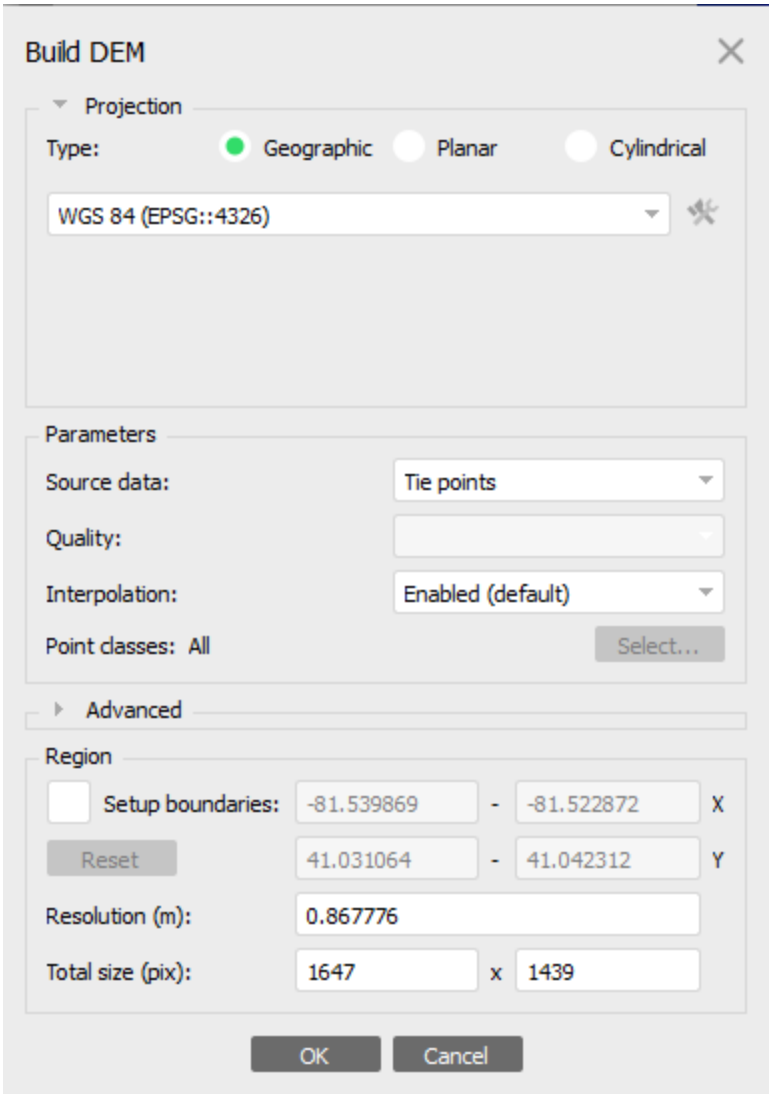
2. In the ***Build Dense Cloud*** dialog box select the desired reconstruction parameters and click *the* ***OK*** button.



The progress dialog box will appear displaying the current processing status. To cancel the processing, click on *the* ***Cancel*** button.

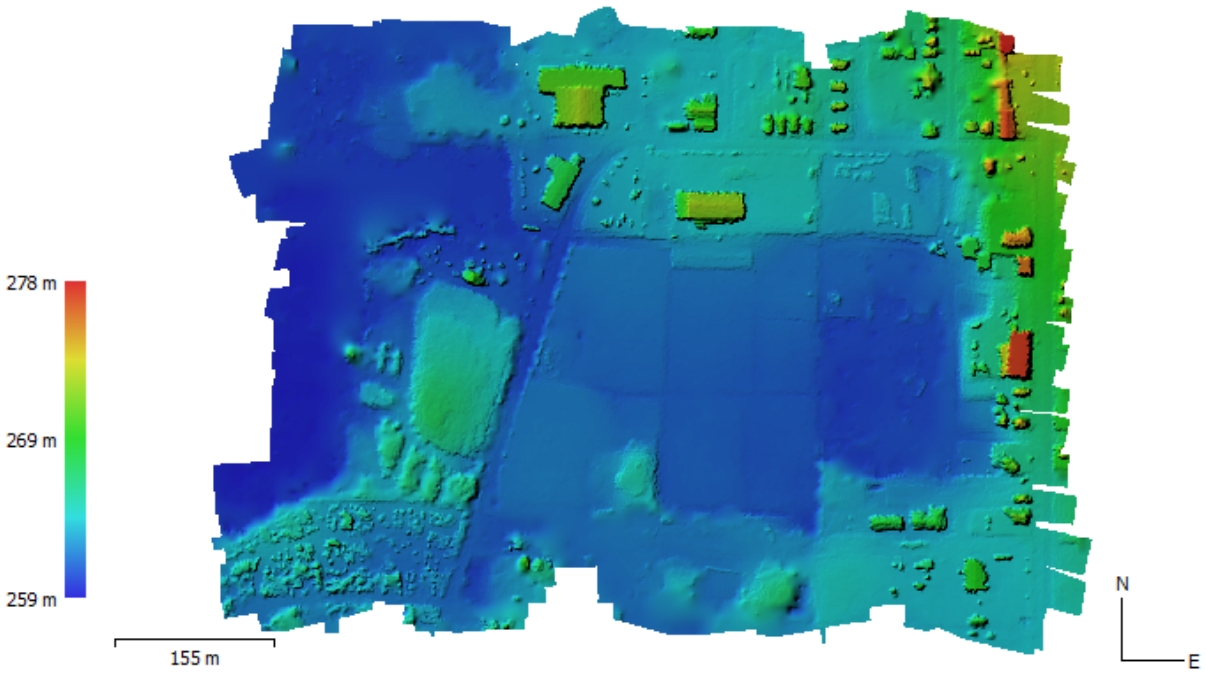
Build DEM

Select the ***Build DEM*** command from the ***Workflow*** menu.



In the ***Build DEM*** dialog box, set your required parameters.

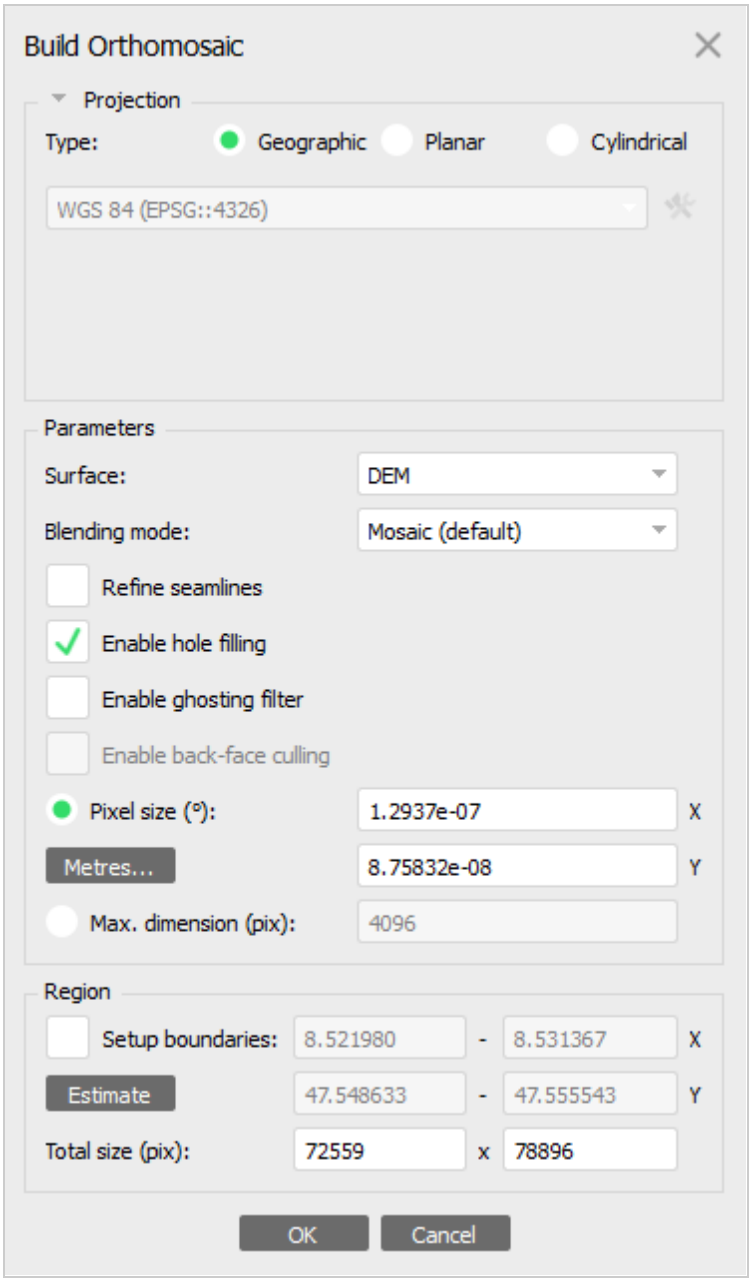
Click *the* ***OK*** button. The progress dialog box will appear displaying the current processing status. To cancel processing, click *the Cancel* button.


278 m
269 m
259 m
155 m
N
E

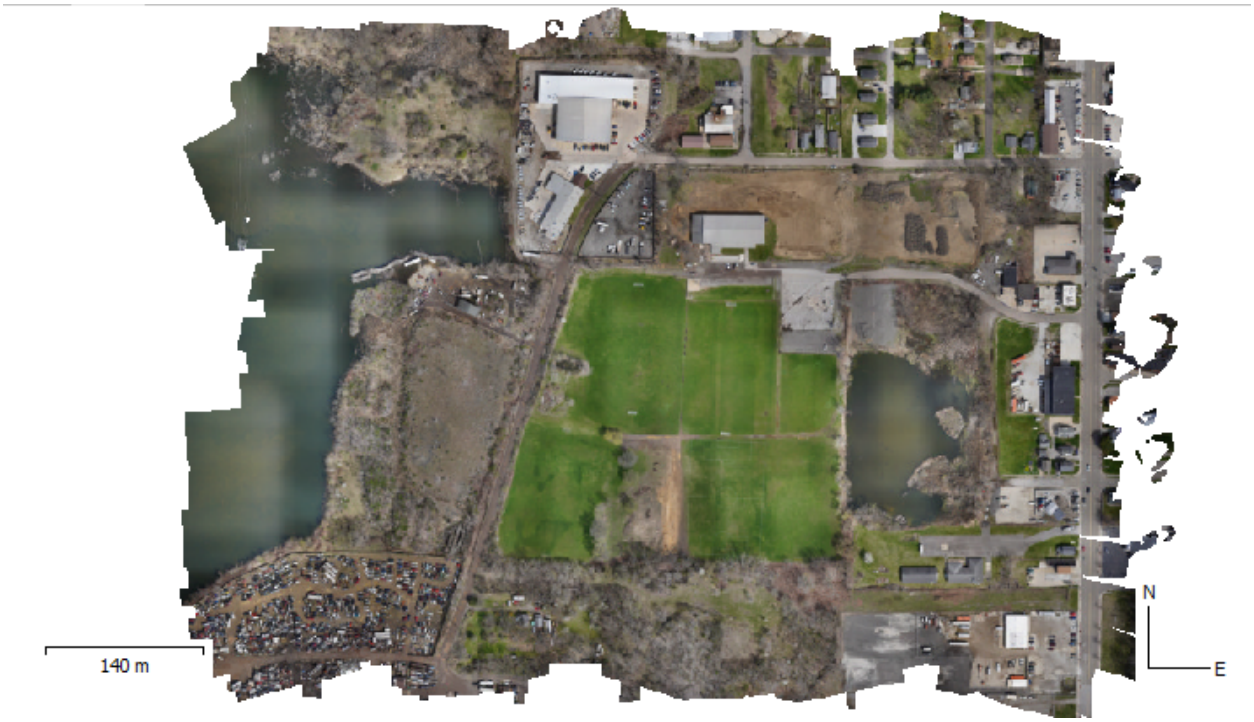
Build Orthomosaic

Select the ***Build Orthomosaic*** command from the ***Workflow*** menu.

Set parameters in the ***Orthomosaic*** dialog window.



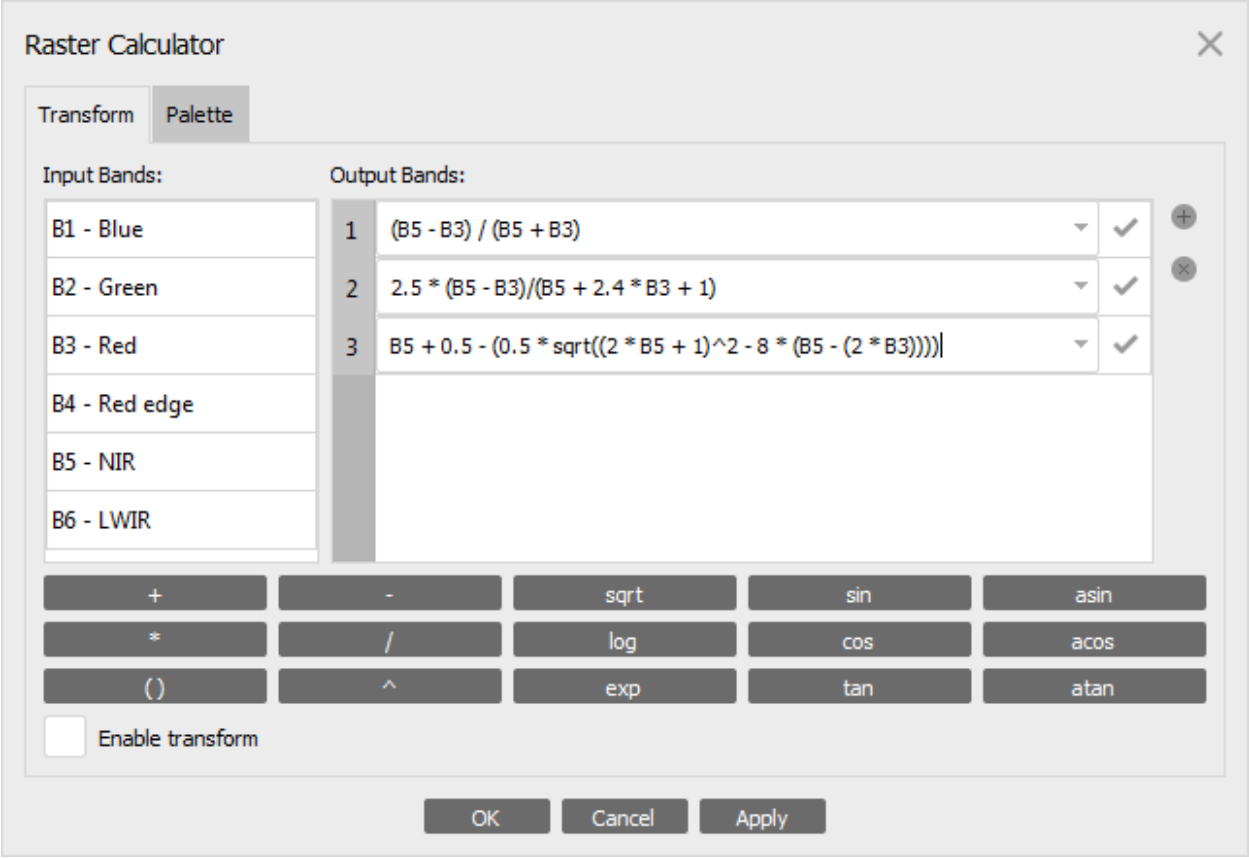
3. Click *the* ***OK*** button. The progress dialog box will appear displaying the current processing status. To cancel the processing, click *the* ***Cancel*** button.



Calculating required index information **(for multispectral cameras only)**

Use the Set Raster Transform option from the Tools menu to open the Raster Calculator dialog.

On the Transform tab specify the index values that you would like to calculate from the source data.

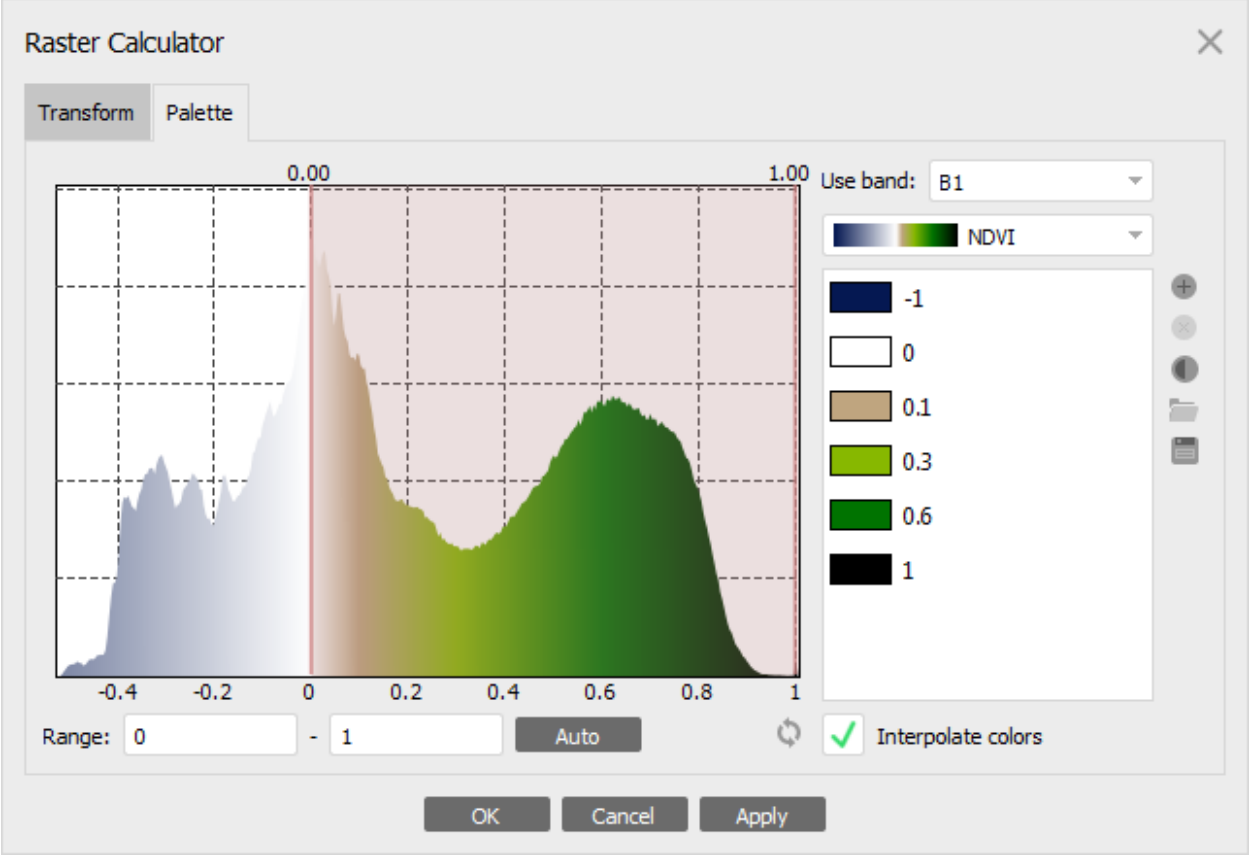


More than one formula can be input, if it is necessary to export the orthomosaic with several output bands related to the different indices, or if the calculated indices should be represented in false colors mode.

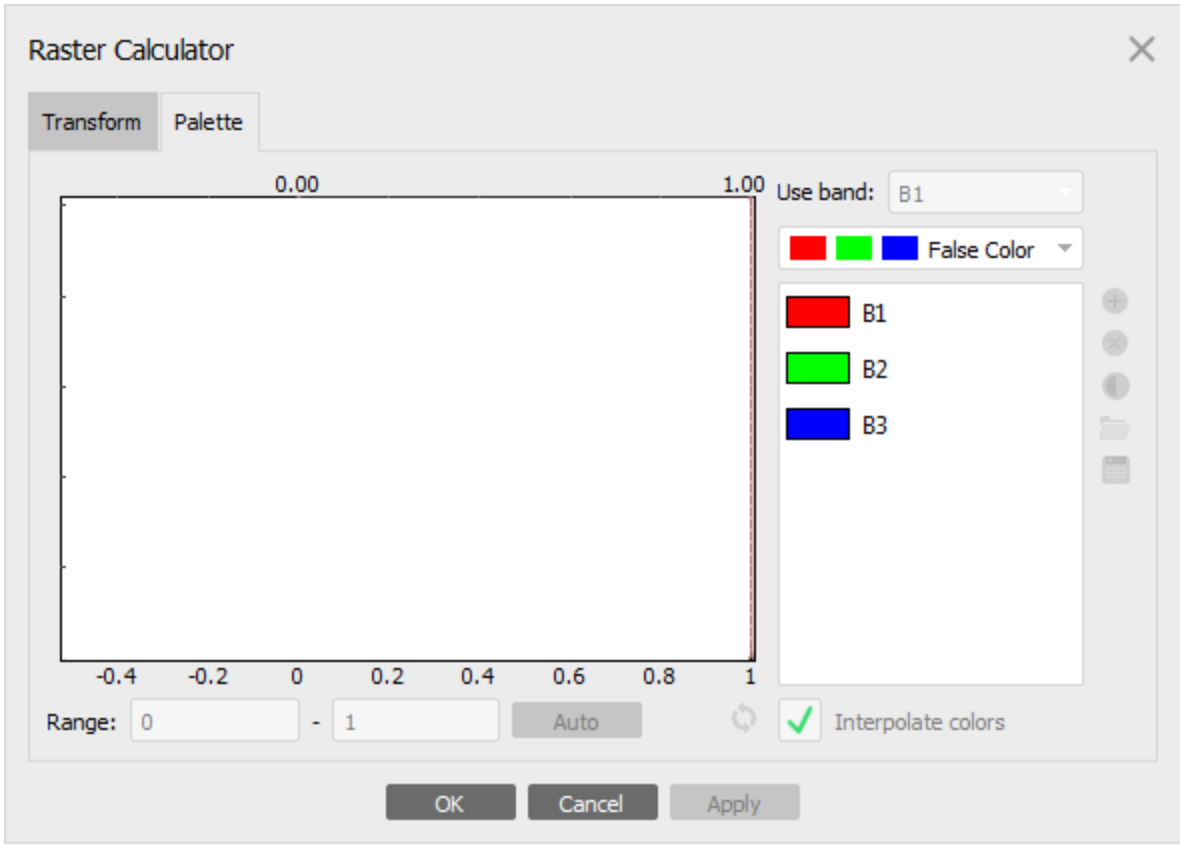
On the Palette tab select how one of the calculated indices should be visualized or use False Colors representation for three output bands (note that for this approach the values of the output bands used should be in 0 - 1 range for proper RGB representation, the values would be automatically scaled to 8-bit RGB representation in False Colors mode).

The following picture shows the representation of the single output band defined on the Transform tab (B1 in this case). The color representation of the index can be selected from the list of presets, loaded from *.clr file or modified manually, if necessary.

Range values under the histogram define the absolute values for the selected index (output band), the color values from the palette section will be scaled to the selected range in the following way: Min. Range value corresponds to the 0 value in the palette color scale and Max. Range value corresponds to 1 value of the color palette:



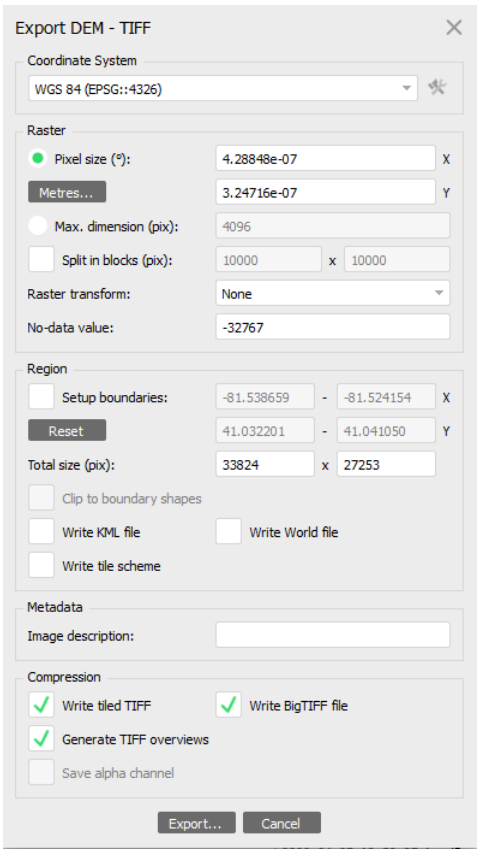
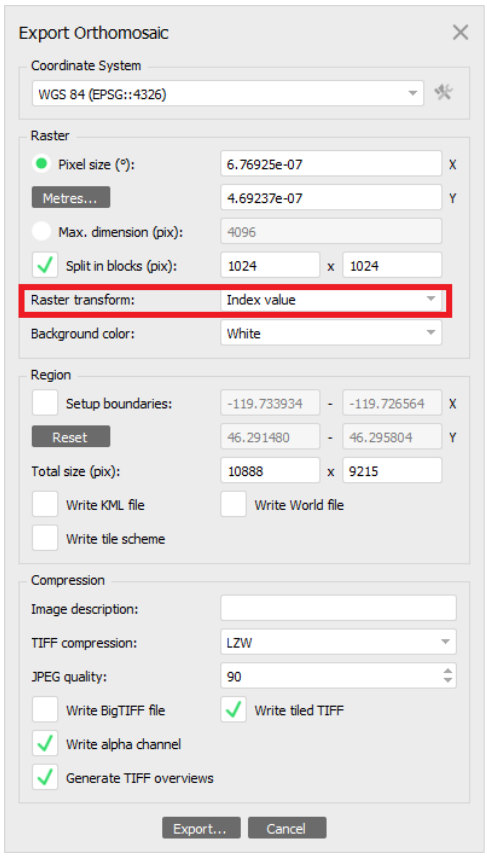
When the False Colors option is selected the histogram area can be ignored. It is only necessary to select the correspondence between the output bands and RGB colors in the False Colors mode:


Raster Calculator
Transform
Palette
0.00
1.00
Use band:
B1
False Color
B1
B2
B3
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
Range:
0
-
1
Auto
Interpolate colors
OK
Cancel
Apply

Exporting the results

Select ***Export DEM*** command from the ***File*** menu.

In the ***Export DEM*** dialog, specify the desired coordinate system for DEM export. Check *Write KML file* and/or *Write World file* options to create files needed to georeference the orthomosaic in the Google Earth and/or a GIS-application, if necessary.

RGB camera example settings	Multispectral example settings
	

Click *the* ***Export*** button to start the export.

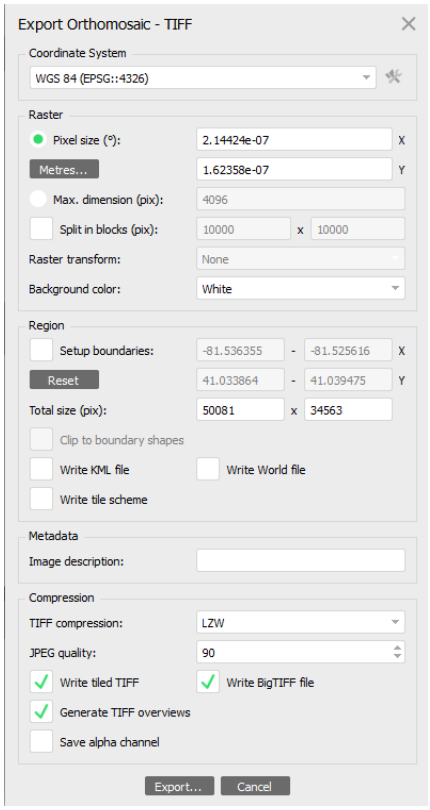
Browse the destination folder, choose the file type, and print in the file name. Click *the* ***Save*** button.

The progress dialog box will appear displaying the current processing status. To cancel the processing, click *the* ***Cancel*** button.

Export Orthomosaic

Select ***Export Orthomosaic*** command from the *File* menu.

2. In the ***Export Orthomosaic*** dialog box specify the coordinate system for the Orthomosaic to be saved in.



Click *the* ***Export*** button to start the export.

Browse the destination folder, choose the file type, and print in the file name. Click *the* ***Save*** button.

The progress dialog box will appear displaying the current processing status. To cancel the processing, click *the* ***Cancel*** button.