⊕ Trimble®

Camera QC

Frequently Asked Questions

Q1. What is Camera QC for?

Camera QC is a tool used to calibrate the angular misalignment between the Inertial Measurement Unit (IMU) and the image sensor (camera) to produce accurate direct geo-referencing data for aerial images from a single or multi-head constellation. This is achieved by determining the three misalignment angles, also known as boresight parameters.

Additionally, Camera QC can be used as a Quality Control tool to evaluate the absolute accuracy (RMS) from GNSS/INS direct-georeferencing by loading a subset of an image block along with a few Ground Control Points (GCPs) or Check Points (CPs).

Q2. Is Camera QC an aerial triangulation (AT) software?

The application is designed for calibration purposes, not for adjusting large image blocks, although adjusted parameters are generated as site outputs.

Q3. Do I need Ground Control Points (GCP's) for Camera QC?

GCPs are not required for boresight calibration, but are necessary if camera parameters are also being calibrated. Ideally, one GCP should be placed in each corner and one in the middle of the image block for good redundancy. GCPs can also help to resolve potential datum defects. By turning some GCPs into checkpoints, absolute accuracy and direct geo-referencing performance can be verified.

Q4. What are tie points?

Tie points are matching points across multiple images that are used to connect images and strips. High-quality tie points are those that connect multiple strips, not just images within a single strip.

Q5. What is the kappa cardinal rotation (KCR)?

The coarse rotation between the camera coordinate system and the global mapping coordinate system is defined as the kappa cardinal rotation. This parameter can be estimated by Camera QC as of Applanix® POSPac™ version 9.4 and does not necessarily need to be provided by the user.

### Q6. Can I import tie points generated by another software?

Yes, there are multiple formats supported, for instance the PATB file format.

Q7. What is a good boresight flight pattern?

A sufficient data collection flight plan consists of four east-west strips and two perpendicular strips with 70/40 overlap. For further details, please refer to the technical note about the boresight flight pattern available from our CS Hub or from: **techsupport@applanix.com** See below the suggested boresight flight pattern.
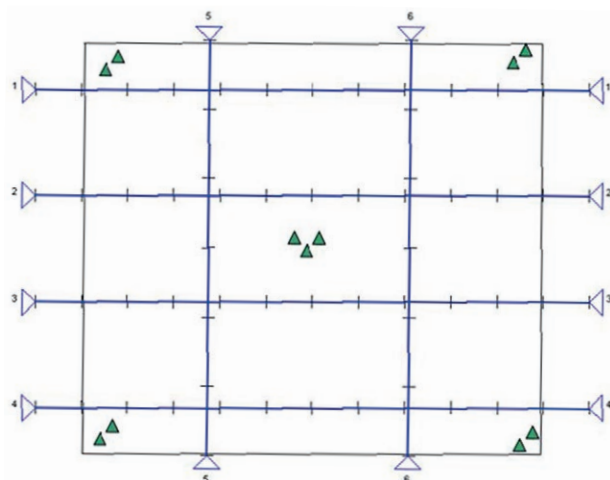
Q8. Can the datum shift be estimated?

The XYZ translation parameters can be floated and estimated. However, at least one GCP is necessary to estimate the datum shift. Due to correlation issues, the Z datum shift should not be floated if the focal length is also being estimated.

Q9. What are the input files for Camera QC?

- SBET file
- Images (TIF)
- PhotoID File(s)
- Event File(s)
- Interior Orientation Camera(s)
- GCP's and/or Check Points (Optional)

Q10. Can I use images of pyramids generated by another software?

Likely not. Please use the raw image format (ideally scanline tif) and run the pyramid creation in Camera QC.

Q11. What is the "average ground height" useful for?

The average ground height drives the success of the tie point matching. Commencing POSPac v9.4, the average ground height is automatically extracted by Camera QC if the user doesn't provide it.

Q12. How do I know the results from Camera QC are acceptable?

The boresight RMS should match the angular specification of the system in use (e.g. Applanix® POS AV™510, Applanix® AVX-210 etc.). Another check is the RMS at the GCP's or Check Points. Depending on camera stability and the POS AV/APX product used, you can typically expect 1 pixel horizontal and 3 pixel vertical error.

Q13. How do I apply the calibrated boresight values in my future projects?

The boresight angles can be saved in a POSPac template and applied to new projects. Alternatively, they can be manually entered from the report in the settings before running POSPac's Exterior Orientation Processor. If you have camera calibrated values, you'll need to enter them into the photogrammetric software used for further image processing.

Q14. What camera models are supported in Camera QC?

The software supports a wide range of standard cameras, including large format sensors from Vexcel or PhaseOne. Users can also create custom camera models to support other large or medium format cameras.

Q15. Can I process multiple missions from different days?

Multiple missions, where multiple flights flown on different occasions or days can be processed in a single project for quality control purposes.

Q16. Can I export the adjusted EO parameter from Camera QC?

Yes, that is supported.

Q17. What is the difference between the Camera QC GUI mode and Camera QC BST mode?

The Camera QC GUI mode supports a wider range of photogrammetric features such as image loading, GCP measurements and datum shift estimation. This implies deeper learning effort. Camera QC BST, on the other hand, is a one-click solution for the boresight angles, being more intuitive and effortless – the user points to the images and camera calibration file and starts the process.

Q18. Can I get a detailed calibration report which is sharable with my customer?

The report can be printed in different formats and includes all statistical parameters, including the number of images, tie point quantity, RMS values, and boresight angles.