As an evolution of the successful Z/I DMC II digital camera series Leica Geosystems introduced the Leica DMC III digital aerial camera. The Leica DMC III is equipped with a large format PAN camera head with a pixel size of 3.9μm only. A standard calibration stand does not provide the measurement accuracy for this small pixel size to provide a precise goniometer calibration. This presentation describes the Leica DMC III in flight calibration method and its quality assurance and quality control (QA/QC) procedures. It will explain how in flight calibration was implemented within the production process for the Leica DMC III camera. A detailed overview of achievable geometric accuracies for different flying heights at 5cm, 8cm and 11cm GSD will be given based on the QA/QC procedure which is established for the calibration and production procedure. Furthermore a first feedback of achieved practical experiences from the market will be presented.