AEROcontrol™

AEROcontrol is IGI's GPS/IMU system for the precise determination of position and attitude of an airborne sensor. This can be the position of the projection center and the angles omega, phi, kappa of the aerial camera system or an airborne laser scanner.

The *AEROcontrol* system consists of an Inertial Measurement Unit (IMU-IIe) based on fibre-optic gyros (FOG) and a Sensor Management Unit (SMU) with integrated high end GPS receiver. There are three different systems available with different accuracies.

AEROcontrol can be operated either as a stand-alone system or combined with other Sensor Management Units via its Ethernet interface. Because of its modular design, the *AEROcontrol* SMU can be adapted to customer needs easily. Its the state-of-the-art position and attitude determination system for aerial & thermal photography, SAR, hyperspectral and LiDAR sensor systems!

AEROcontrol Sensor Management Unit

AEROcontrol benefits

The accuracy ot the *AEROcontrol* is sufficient for direct georeferencing for almost all aerial sensors. The obtained angular accuracy matches nicely with the "single pixel FOV" of modern digital aerial cameras and the geometrical resolution of airborne LiDAR systems.
In case the directly measured positions and orientations should be used to support an automatic aerial triangulation process, *AEROoffice* provides an easy interface for photogrammetric software packages. For large scale photogrammetric projects, where a higher accuracy is required, the use of *AEROcontrol* results as additional information for an aerial triangulation (Integrated Sensor Orientation) leads to large savings in GCP's and processing time. Together with digital imaging sensors, this ISO (Integrated Sensor Orienation) results in an optimal georeferencing result with a minimum of manual interaction.

AEROcontrol SMU with IMU-IIe

AEROoffice software package:

The *AEROoffice* software package for post-processing the *AEROcontrol* data provides:

- Forward / backward Kalman filter algorithm to achieve optimal results even under challenging conditions
- Transformation to more than 600 local coordinate systems
- Coordinate System Editor for customized coordinate systems
- Export to standard formats, GoogleEarth™ (*.kml) format and defined customized formats
- Simplified user interface to obtain optimal results for all users without extensive training and experience

www.igi-systems.com

AEROcontrol™ - Precise Positioning & Attitude Determination

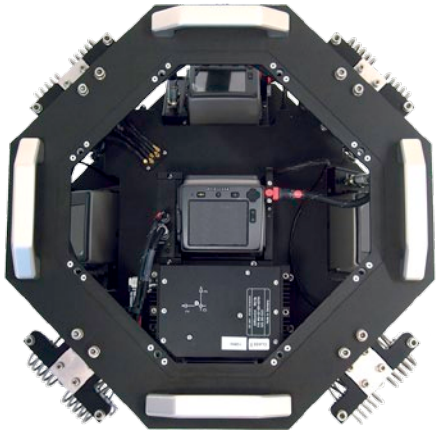
CCNS4 combined with *AEROcontrol* is the standard guidance and GPS/IMU system for the Intergraph DMC, *LiteMapper* airborne LiDAR and *StreetMapper* mobile LiDAR systems. Installation material for the IMU, including a mechanical adapter plate, are available in stock for the following aerial camera systems:

Digital Aerial Camera Systems

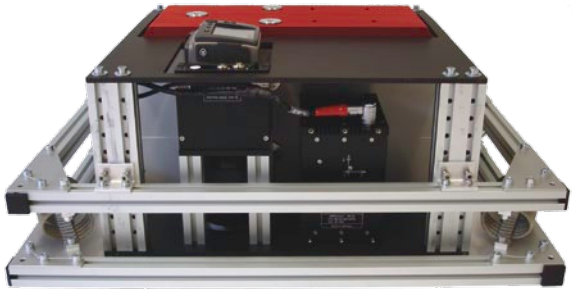
- IGI:
  Complete *DigiCAM* camera range
  Complete *DigiTHERM* camera range
- Microsoft/Vexcel:
  Complete UltraCam camera range
- Intergraph:
  DMC camera range
- DiMAC Systems:
  DiMAC series
- Wehrli/Geosystem:
  3-DAS-1
- Rollei Metric:
  AIC series
- Jena-Optronik:
  JAS 150s

Analog Aerial Camera Systems

- Leica Geosystems:
  RC10, RC10A, RC20, RC30
- Carl Zeiss Jena:
  Complete UltraCam camera range
- Zeiss-Oberkochen / Z/I Imaging / Intergraph:
  RMK-A, RMK-TOP



IMU-IIe inside of *Penta DigiCAM*



IMU-IIe with *DigiCAM* and *LiteMapper* LiDAR system

Depending on GPS constellation and distance from GPS Base/Monitor Station, a positioning accuracy better than 0.05m RMS and an attitude accuracy of 0.007deg RMS for heading and 0.003deg RMS for roll and pitch is achievable in post-processing.

SPECIFICATIONS AEROcontrol

Performance*	AEROcontrol-I**	AEROcontrol-II**	AEROcontrol-III
Position [m]	0.05	0.05	0.05
Velocity [m/s]	0.005	0.005	0.005
Roll / Pitch [deg]	0.008	0.004	0.003
True heading [deg]	0.015	0.01	0.007
Available data rates	128 Hz or 256 Hz	128 Hz or 256 Hz	400 Hz

* Post Processing
** Upgrades to AEROcontrol-II or -III possible at any time

SPECIFICATIONS IMU-IIe

FOG-Bias [deg / h]	0.03
FOG-RW [m]	0.005
Accelerometer Bias [mg]	0.3
Update and transmission rate	128, 256 or 400 Hz

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