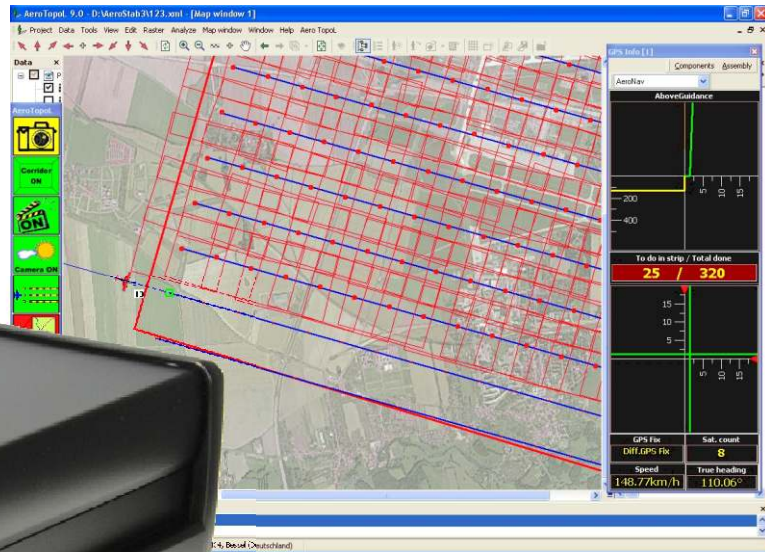


AeroDiDOS

Deeply Integrated
Direct-Orientation-System

direct georeferencing
for your camera or scanner



AeroDiDOS-2 is the second generation of a deep integration of GPS and INS Technology for aerial surveying applications. Synchronized Position Attitude and Navigation Technology combines GNSS and inertial functionality to provide continuous operation with accurate position and attitude measurements. Use AeroDiDOS with frame cameras to reduce or eliminate costly ground control.

AeroDiDOS enabling user-choice of various supported IMUs such as the Imar FSAS, the Litef LCI, Northrop Grumman LN200 or the Honeywell HG1700. Tight coupling in both real time and in post processing is supported.

The AeroDiDOS Main Unit simultaneously manages the camera shutter release at planned image centres through its interface with AeroTopoL, and logs the mid-exposure pulses. Scanning sensors can automatically be started and controlled.

AeroDiDOS Main Unit logs raw GPS and IMU data at up to 200Hz refresh rates directly to memory cards redundantly for post processing. This eliminates the need for an additional PC for on-board data logging, and simplifies data transfer for your post flight workflow. Real-time data can be used to control airborne stabilizers like the AeroStab Twin.

AeroDiDOS includes AeroTopoL Flight Management System software which now supports direct access to real-time data. The GPS-INS solution is used for navigation and for pre-orientation of image footprints in real time.

AeroTopoL's Flight Management application makes use of 10Hz refresh rate to enable extremely smooth and precise navigation.

Waypoint's *Inertial Explorer*, the market-leading post processing software package, is bundled with AeroDiDOS. Once processed in *Inertial Explorer*, the precise data can be transferred to AeroTopoL for further processing, enabling a smooth workflow.

Direct Georeferencing:

- 0.1 m Positioning Accuracy
- Highly Accurate Attitude Values
- Redundant Raw Data Storage
- registration of floating leverarms

Post-Processing:

- Waypoints Inertial Explorer
- PPP and Multibase Processing

AeroTopoL Flight management:

- DTM Planning and Navigation
- IMU control in AeroTopoL
- real-time Footprints and Scancarpets
- Smooth and Precise Navigation

technical Data: AeroDiDOS-2

GPS-Board

NovAtel OEM V3: 72 Channels, L1 C/A code, L2 P(Y), L2 C, RTK 2 cm, Up to 20 Hz PVT & 50 Hz RawData, up to 200 Hz IMU, L2 CP, DGPS, OmniSTAR HP/XP/VBS, CDGPS, SBAS, smoothed D/GPS Receiver, WAAS / EGNOS

System Performance¹

Horizontal Position Accuracy (RMS)

Single Point L1	1.5 m
Single Point L1/L2	1.2 m
SBAS	0.6 m
DGPS	0.4 m
RT-20 ⁰²	0.2 m
RT-2™	1 cm+1 ppm

GPS-Antenna

GPS-L1/L2 Antenna + Glonass, L-Band, kinematic, Zero-Offset

Optional: Dual Antenna GPS for dynamic aligning and improvement of

Heading stability,
GPS and Glonass capabilities (Galileo when operational)

IMU (Litef LCI)

Acceleration Accuracy	0.004 m/s ² RMS
Max Velocity ⁴	515 m/s
Data Rate ⁵ :	IMU Measurements 200 Hz
	INS Position 200 Hz
	INS Velocity 200 Hz
	INS Attitude 200 Hz
Gyro Input Range	±800 deg/sec
Gyro Rate Bias	<1.0 deg/hr
Gyro Rate Scale Factor	<500 ppm
Angular Random Walk	<0.05 deg/vhr
Accelerometer Range ⁶	±40 g
Accelerometer Scale Factor	<1000 ppm
Accelerometer Bias	<1.0 mg
Dimensions	168 x 195 x 146 mm
Weight	4.25 kg
Power Consumption	16 W (typ)
Input Voltage	+12 to +28 V
Input/Output Connectors:	MIL-C-38999-III, 22 pin
Operating Temperature:	-40°C to +60°C
Storage Temperature	-40°C to +71°C
Humidity	95% non-condensing
Random Vibe	MIL-STD 810F 10g RMS
Shock	MIL-STD 810F 30g RMS

¹ Typical values. Performance specifications subject to GPS system characteristics, US DOD operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources.

² Expected accuracy after static convergence.

⁴ Export licensing restricts operation to a maximum of 515 metres per second.

⁵ If raw IMU measurements are logged (200 Hz), the maximum rate position, velocity, attitude logs that can be requested is 50 Hz.

⁶ GNSS receiver sustains tracking up to 4 g.

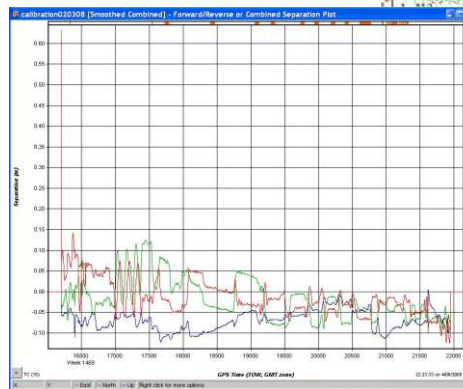
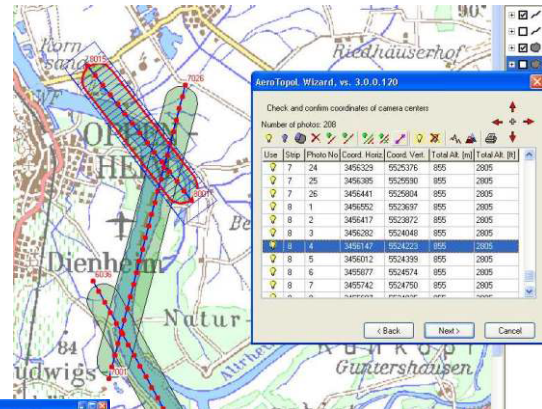
⁷ Post-processing results using Inertial Explorer software.

AeroDiDOS-MU (Main Unit)

Power:	10-30 VDC, 12-14W (without IMU)
Storage:	Raw Data on Memory Card + 2 redundant Internal storages
File-System:	Automated data-handling
Configuration:	Auto-configuration at power on
Interface IMU:	Power, Sync, Data
Interface Camera:	4 independent Release- and Event-ports
Interface Scanner:	PPS, NMEA (Option), Start-stop (Option)
FMS AeroTopoL:	Interface via bi-directional RS232
Ports:	4 RS232, 1 Ethernet, 2 USB
Set-Up:	via configuration Port
Status LEDs for:	Logging, GPS, IMU
Size (mm):	280*190*90
Weight:	3.5 kg
Operating Temp.:	-30 to +55°C

AeroT opoL Flight Management System

- AeroTopoL DTM+ Version for Planning and Navigation
- Mission planning for areas and corridors
- Adjustment over terrain including ramps and save-zones
- Navigation using moving map and virtual avionic instruments
- using 10Hz GPS/IMU data for navigation and triggering the camera shutter
- Separate Interface to UltraCam, Riegl RiAquire, JAIR, DIMAC...
- Using event based GPS-IMU data for generating image footprints and/or scan-carpets
- Monitoring IMU and alignment status
- Storage of real-time data with image ID
- Computation of orientation parameters X, Y, Z, Omega, Phi, Kappa
- Re-integration of postprocessed data



Waypoints Inertial Explorer

- Most efficient postprocessing tool
- Tightly and loosely coupled processing
- Forward and backward iterations
- Enhanced smoothing algorithms
- PPP Processing
- AdVance™ RTK performance
- Multibase functionality
- Many graphical tools to control and refine the results
- Interface to Aero-Formats
- manual and automated use of GPS to IMU Leverarms and IMU-Sensor offsets
- Integration of floating Leverarms

Content of Delivery

- AeroDiDOS-Main Unit
- L1/L2 GPS Antenna
- IMU-LCI
- AeroTopoL DTM+ (one Full and one Planning Version)
- Waypoint's Inertial Explorer
- Cable set
- Manuals and Tutorials
- Transport and shipping case

OPTIONS:

- Dual Antenna (GPS-Compass) integration
- Upgrade to use Glonass (Galileo)
- Scanner-Interface
- Choice of different IMU e.g. FSAS, LN200, HG1700...
- AeroTopoL Options (Scanning, Oblique, MDG ...)
- Interface to control stabilized Platforms e.g. AeroStab-Twin



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