

ADS40 Airborne Digital Sensor



***Photogrammetric Accuracy and
Remote Sensing Insight Combined***

Leica
Geosystems

ADS40 Airborne Digital Sensor

A New System For A New Era

Benefits

-
- Three sensors in one — black and white, color and false color
 - Wide area coverage for cost savings
 - Perfect RGB co-registration through special trichroic beam splitter and filter
 - High quality DTMs from three-line stereo sensor data
 - Reduced ground control requirements
 - End-to-end digital flow — no film processing or scanning
 - Touch screen operator interface screen
 - Smooth data flow to SOCET SET® or other software
 - Complements LIDAR, even at flying heights above 2000m
 - Seamless strip imagery along each flight line

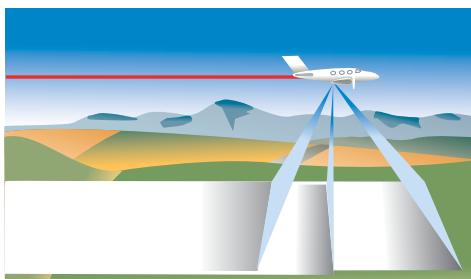


The ADS40 Airborne Digital Sensor unites photogrammetric precision for positional accuracy of processed data with multispectral capabilities for image analysis and interpretation.

Developed jointly with world experts in high performance digital sensors (DLR — German Aerospace Center), the ADS40 enables users to create geospatial products smoothly, efficiently and profitably in an end-to-end digital environment.

Features

Comprehensive, Intuitive, Precise



Expert Design

The basis of the design of the ADS40 is the three-line-scanner principle, whereby linear arrays on the focal plane capture imagery looking forwards, downwards and backwards from the aircraft. The entire ground surface is imaged three times, far superior to the 60% triple coverage in typical film aerial photography.

Simultaneous Capture of All Spectral Data

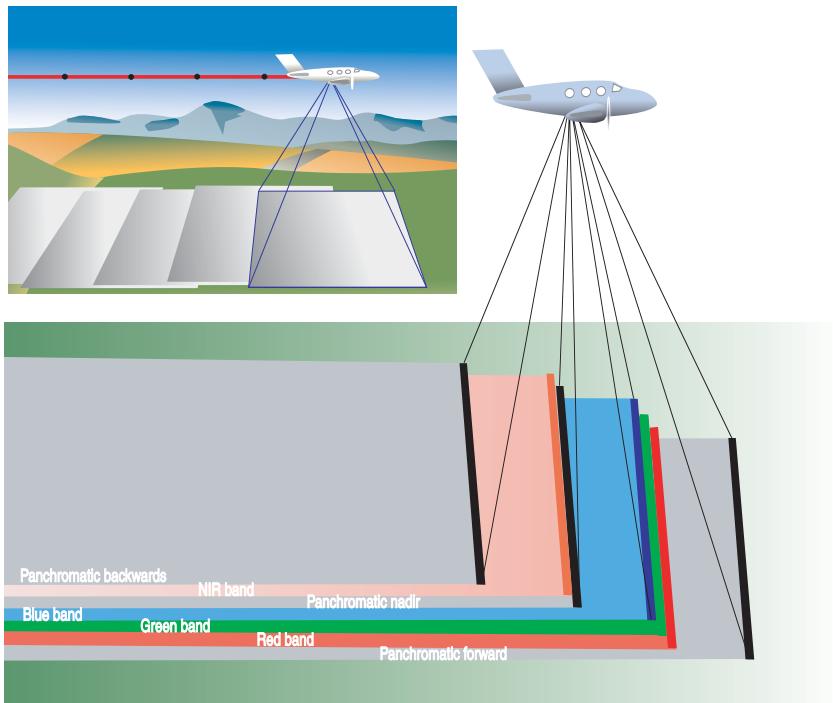
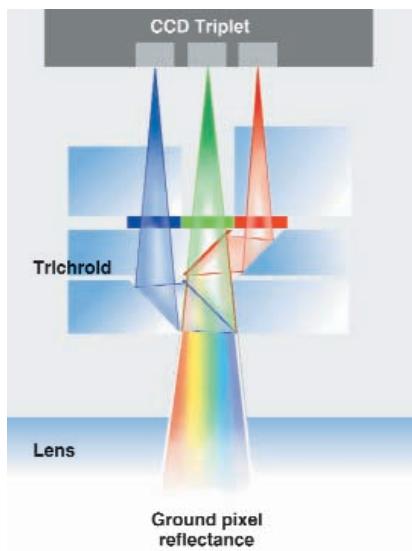
The ADS40 simultaneously captures data from three panchromatic and four multispectral bands — avoiding the need to make a difficult choice between panchromatic, color and false color film.

Perfect RGB Co-Registration

In the ADS40, the red, green and blue arrays are physically separate on the focal plane, but each receives information from exactly the same portion of the earth's surface, so there can be no registration problems in the visible spectrum regardless of the mode of processing adopted.

The trichroic beam splitter, designed for minimum loss of energy, ensures that the incoming RGB light from the same area of the ground is detected by three RGB-sensitive linear arrays.

A separate linear array on the focal plane captures data in the near infrared.



Features (continued)

Comprehensive, Intuitive, Precise

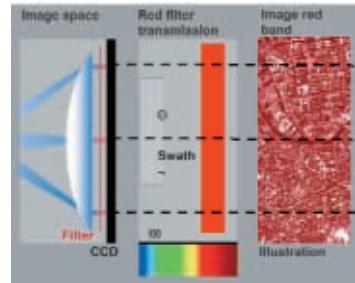
Exact Spectral Performance

The performance of the CCD arrays and the filters is maximized through the use of an innovative telecentric lens, whereby light rays impinge upon the focal plane at right angles regardless of their angle of incidence at the front nodal point. The lens of the ADS40 delivers high performance at an optical resolution of 130 lp/mm at maximum aperture of f/4.

The Flight Sensor Control Management System (FCMS) manages the routine operation of the ADS40



Right: in the ADS40, the telecentric lens ensures that light impinges on the focal plate at right angles, for best filter performance.



Left: the situation in the traditional film camera where light impinges on the focal plate at angles (in red) and the performance of the filters is compromised.

ADS40 spectral bands (nm)

Panchromatic	465-680
Blue	430-490
Green	535-585
Red	610-660
Near infrared	835-885



The IMU (Inertial Measurement Unit) of the POS (Position and Orientation System) was specially designed for the ADS40 by Applanix Corporation.

Reduced Ground Control Requirements

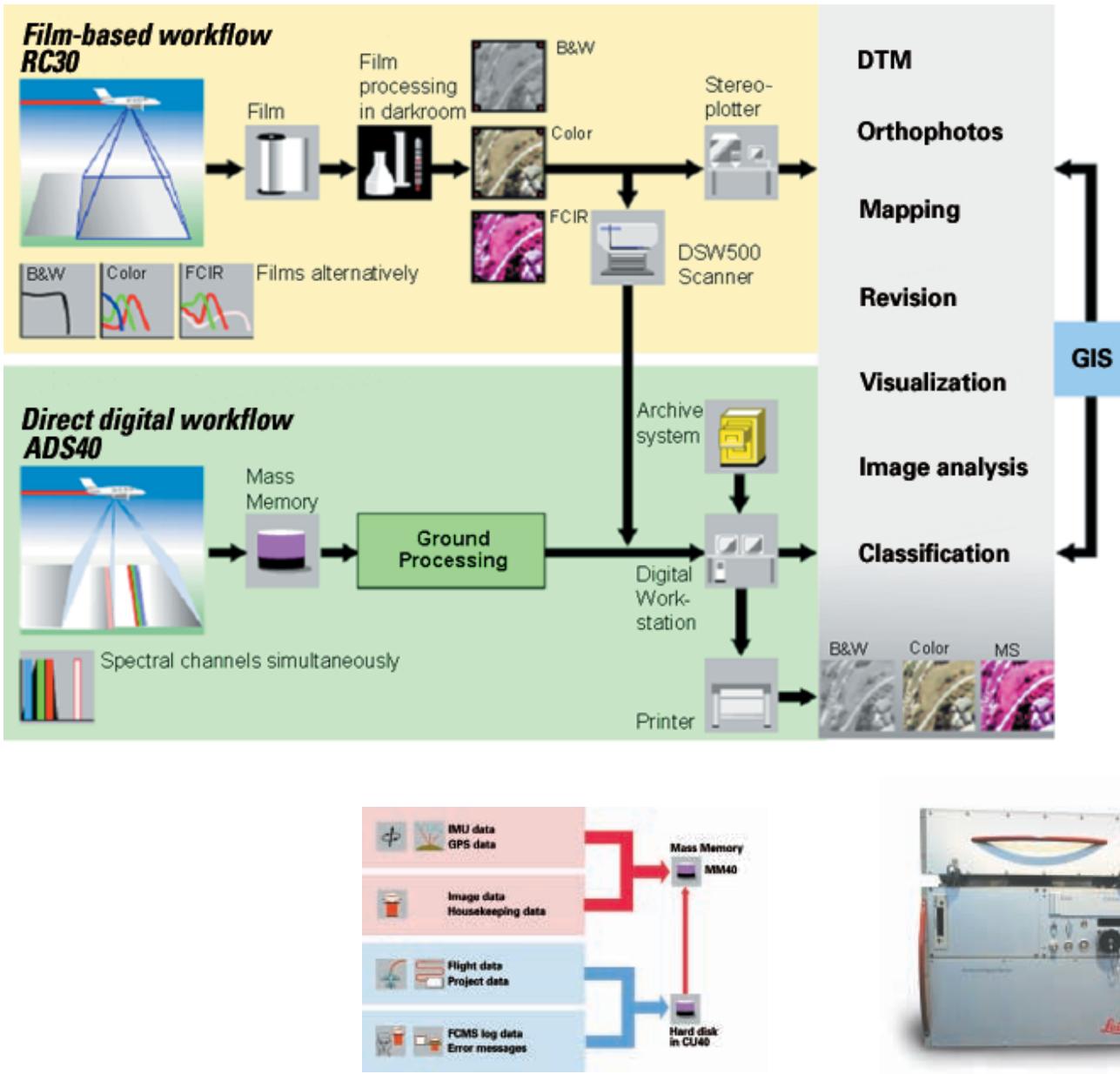
The ADS40 captures high resolution panchromatic and multispectral data together with position and attitude information to facilitate ground-processing. The tight integration of the IMU, focal plate and GPS, combined with the absence of film errors, greatly reduces ground control requirements.

User-Friendly Interface

The high resolution touch screen of the Flight & Sensor Control Management System (FCMS) and large, easy-to-use icons allow for quick, intuitive navigation and control. The predefined system configurations may be modified to suit different users. The FCMS is easy to learn and is delivered with an integrated tutorial.

Functionality

Cost-Effective, End-To-End Digital Dataflow



Data Storage

All necessary data from the flight mission resides on the MM40 mass memory, which can be easily removed from the aircraft after landing and connected to a workstation for ground processing. The MM40 is capable of receiving and storing up to 100 GB of data per hour of flight.

Data Transfer

After flight, the MM40 is removed from the CU40 control unit and connected (via a high speed SCSI connection) to a PC workstation for ground processing. End products can be generated using photogrammetric and remote sensing software products from Leica Geosystems and other suppliers.

Functionality (continued)

Cost-Effective, End-To-End Digital Dataflow

Image Rectification

Following data download, rectification based on position and attitude data from the integrated GPS/IMU unit provides stereo viewable images, both manual measurement of ground control points and automatic measurement of tie points can proceed.



Seamless Strip Imagery

The ADS40 captures imagery seamlessly along the flown strip, reducing administrative overhead in the software by eliminating tedious mosaicing of numerous individual images. The continuous stereo model is a seamless scene in all stages of photogrammetric processes such as rectification, minification, automatic point matching, block adjustment, DEM generation and orthophoto generation.

Smooth Flow to SOCET SET® or Other Software

Processing and triangulation can be accomplished with Leica Geosystems' SOCET SET and ORIMA products or with third party digital photogrammetry software using ADS40 modules developed with Leica Geosystems' InfoKit. ERDAS IMAGINE® software is available for multispectral processing.

Advantages

State-Of-The-Art Airborne Imaging



The ADS40 Airborne Digital Sensor is capable of producing imagery of sufficient geometric and radiometric quality for the full range of both photogrammetric and remote sensing processing. A high performance system for earth data collection from airborne platforms, the ADS40 uses state-of-the-art technology to offer photogrammetric performance in the same range as the refined aerial film cameras that underlie the success of aerial photography and photogrammetry. It also provides multispectral data.

The Advantages Include:

- Wide area coverage — easier to work with than multiple images from small format CCD array cameras
- Captures all spectral bands simultaneously — no film-type restrictions
- Only one lens system to calibrate
- Automatic drift setting
- Performance of gyro-stabilized mount enhanced by input of IMU data to maximize image quality
- Automatic calculation of CCD integration time (exposure time)
- Direct linear response of CCD — no variation due to exposure settings and processing conditions
- Linear CCDs, telecentric lens and interference filters deliver well defined spectral bands — essential for successful multispectral analysis
- Single focal plate operates at a constant temperature — critical for maintaining operating status and signal-to-noise ratio
- Well known supplier with decades of expertise in supplying and supporting aerial film cameras.

Customer Support

The ADS40 is installed and tested by Leica Geosystems engineers. At Leica Geosystems, you will find the professionals with whom to discuss your requirements and with the expertise to address them: specialists for aerial photography, experienced photogrammetrists, engineers, as well as service and maintenance specialists. Leica Geosystems' skilled personnel advise customers on questions of application techniques, installation, interfaces, accessories, upgrades, and maintenance.

Regular user training courses and workshops given at various Leica Geosystems locations help users with the operation and maintenance of our technology. These courses also give the opportunity to exchange practical experience with other operators. In addition, Leica Geosystems organizes specific customer training courses at customer sites.

Check our Web site www.gis.leica-geosystems.com for relevant product announcements. If you need more information, contact your local Leica Geosystems office distributor, or contact us by e-mail at info@gis.leica-geosystems.com.

GIS & Mapping DIVISION



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