

Leica ADS80

Airborne Digital Sensor

Digital Airborne Imaging Solution



The new Leica ADS80 offers performance in data acquisition and data processing superior to any other large-format digital sensor.

Simplicity

From flight planning with Leica FPES and data acquisition with the Sensor Heads SH81/82 to data delivery with Leica XPro, the Leica ADS80 represents a complete digital airborne imaging solution that is easy to use and fast to implement. Since pan-sharpening and "virtual images" are not necessary, Leica Geosystems line sensor technology constitutes a viable and simple digital alternative to those familiar with the traditional analog workflow.

Flexibility

Depending on the desired product, two available configurations, SH81 and SH82, acquire perfectly co-registered image data with equal resolution in panchromatic, color and color-infrared. The improved data throughput of the Control Unit CU80 facilitates simultaneous data acquisition of imagery for photogrammetry and remote sensing applications, offering you maximum flexibility.

Productivity

The best imagery in the world becomes less attractive if it cannot be produced and delivered in a reasonable time. The new Leica XPro ground processing software pairs the best airborne digital sensor with the fastest workflow. Leica XPro's "processing at the speed of flight" will make the Leica ADS80 the most productive sensor solution available.

Efficiency

The Leica ADS80 digital airborne imaging solution consists of subsystems and components, which almost entirely are developed and manufactured in-house. This way, Leica Geosystems can provide the tight integration necessary to deliver what you expect from your chosen airborne digital sensor: best results, highest productivity and lowest costs.

Reliability

Leica Geosystems' RC30 and many other products have for decades set the gold standard for the geospatial industry. The Leica ADS80 airborne digital sensor follows in this tradition and is the complete sensor solution available from the industry leader. Our worldwide support network ensures that you stay ahead of your competitors.

- when it has to be **right**

Leica
Geosystems

Leica ADS80

Product Specifications

Electronic Characteristics of Data Acquisition Chain

Dynamic range CCD chain
12-bit

Resolution A/D converter
16-bit

Data channel
16-bit

Sensitivity
4x that of SH40

Data modes
ADS80 data format, low compression, raw

Data compression factor
~2.5x and ~3.6x

Data normalization modes
non-linear

Radiometric resolution of compr. data
10-bit and 12-bit

Recording interval per line (cycle time)
≥ 1 ms

Spectral Range and Filters

Spectral range
Panchromatic, RGB, Near-infrared

Spectral bands

Band	λ (nm)
Panchromatic (trapezoidal)	465–680 (at λ = 50 %)
Red (rectangular)	608–662
Green (rectangular)	533–587
Blue (rectangular)	428–492
Near-infrared (rectangular)	833–887

Optics D064

Field of View (FoV)
64° across track (swath angle)

f-number
4

Spectral range
420 nm – 900 nm

Resolution
~130 lp/mm, optimized for CCD's

Registration accuracy
1 μm

Lens design

Telecentric lens design
Maintains position & width of filter edges over whole FoV
Thermic & Pressure compensation for high accuracy

Video camera

Oblique view	Swath width	Zoom steps	10° behind nadir	64° normal	40° forward	narrow
			wide	1x	1.2x	2x 4x 5x 8x

Mapping Accuracies

Average GSD with ADS80	Map Scale	Map standard	
		x-y accuracy RMSE	contour interval
5 – 10 cm	1:500	0.125 m	0.25 m
10 – 15 cm	1:1000	0.25 m	0.5 m
15 – 20 cm	1:1500	0.40 m	0.75 m
20 – 30 cm	1:2000	0.50 m	1 m
25 – 35 cm	1:2500	0.60 m	1.25 m
30 – 50 cm	1:5000	1.25 m	2.5 m
40 – 60 cm	1:10000	2.50 m	5 m
50 – 70 cm	1:20000	5.00 m	10 m
50 – 80 cm	1:25000	6.25 m	12.5 m
50 – 100 cm	1:50000	12.5 m	20 m
50 – 100 cm	1:100000	25 m	50 m

Focal Plates (FPM)

One 4-band beamsplitter in Sensor Head SH81
Total: 8 CCD lines with 12000 pixels each, pixel size 6.5 μm
2 single Pan lines
1 pair of Pan lines staggered by half a pixel
4 Spectral lines: Red, Green, Blue, Near Infrared

Two 4-band beamsplitters in Sensor Head SH82
one in nadir and one in 16° BW
Total: 12 CCD lines with 12000 pixels each, pixel size 6.5 μm
2 single Pan lines
1 pair of Pan lines staggered by half a pixel
8 Spectral lines: 2x Red, 2x Green, 2x Blue, 2x Near-infrared

Mechanical Interface

Sensor Heads SH81 & SH82
Weight: 61 kg – 65 kg, depending on integrated IMU type
Diameter: 39 cm
Height: 79 cm
Fits PAV30 mount

Control Unit CU80

Weight: 32 kg; 19" rack mountable
Width: 49.5 cm; height: 36.5 cm; depth: 62 cm

Mass Memory MM80

Flash disk: weight: 2.5 kg, removable, portable

Operator Interface OI40

15" touch-screen with a resolution of 1024 x 768 pixels

Interface Stand IS40

IS40 stand fits RC30 NAV-sight installation

IMU integrated in Sensor Head

Leica IPAS20-NUS4
Leica IPAS20-DUS5
Leica IPAS20-NUS5
Leica IPAS20-CUS6

GNSS/IMU system integrated in CU80

Leica IPAS20 embedded (GPS & GLONASS)

Mount

Leica PAV30 gyro-stabilized mount

Pilot Interface OC50

6.3" screen with 1024 x 768 pixel resolution

Guidance Indicator GI40

LED array display designed for cockpit mounting

Total weight installed

193 kg – 197 kg (depending on IMU)

Operational

Capacity of Mass Memory (Pair)

768 GB Disk for up to 11.4 h recording in ADS80 data format at 2.5 msec with 3 Pan and 4 Spectral bands
384 GB Disk for up to 5.7 h recording in ADS80 data format at 2.5 msec with 3 Pan and 4 Spectral bands

Firmware & Software

FCMS Flight and Sensor Control Management System

Maximum Ground Speed (GS) for various

post-processed GSD

max. GS = 90 kts for GSD of 1.2" / 3 cm
max. GS = 140 kts for GSD of 2" / 5 cm
max. GS = 190 kts for GSD of 3" / 7.5 cm
max. GS = 240 kts for GSD of 4" / 10 cm
max. GS > 300 kts for GSD of > 6" / 15 cm

Environmental

Pressure

Non-pressurized cabin up to ICAO 25,000 ft (7,620 m)

Humidity

0% to 95% RH according ISO 7137

Operating temperature

-20°C to +55°C

Storage temperature (except SH81/82)

-40°C to 85°C

Storage temperature SH81/82

-40°C to 70°C

Electrical

Average power consumption

(incl. Sensor Head, CU80, PAV30, OI40, OC50, GI40)

<790 W / 28 VDC

Fuses on aircraft power outlet

Typically 1 x 35 A or 2 x 20 A

Standards

General standards for temperature, electronics environment, etc.

ISO 7137; RTCA DO-160E, EUROCAE-14E

Standard for emergency landings

FAR § 25.561

Conformity to national regulations

USA: FCC Part 15, EU: Directive 1999/5/EC

Data Formats

Output from GPro/XPro post-processing:
JPEG and TIFF tiled

Quality of external orientation of Leica ADS80 images depending on mission parameters and based on the application of PPP (Precise ephemeris data)

Mission Type	Mission Parameters				5 cm GSD		10 cm GSD		15 cm GSD		20 cm GSD	
	GNSS data	GNSS ground ref station	Aero-triangulation	GCPs	relative	absolute (cm)	relative	absolute (cm)	relative	absolute (cm)	relative	absolute (cm)
1			no	no	5 pixels	< 100	5 pixels	< 100	5 pixels	< 100	5 pixels	< 100
2	PPP	no	yes	no	1 pixel	< 50	1 pixel	< 50	1 pixel	< 50	1 pixel	< 50
3			yes	yes	0.5 pixels	< 5	0.5 pixels	< 10	0.5 pixels	< 15	0.5 pixels	< 20
4			no	no	5 pixels	< 100	5 pixels	< 100	5 pixels	< 100	5 pixels	< 100
5	phase differential	yes	yes	no	1 pixel	< 50	1 pixel	< 50	1 pixel	< 50	1 pixel	< 50
6			yes	yes	0.5 pixels	< 5	0.5 pixels	< 6	0.5 pixels	< 8	0.5 pixels	< 10

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