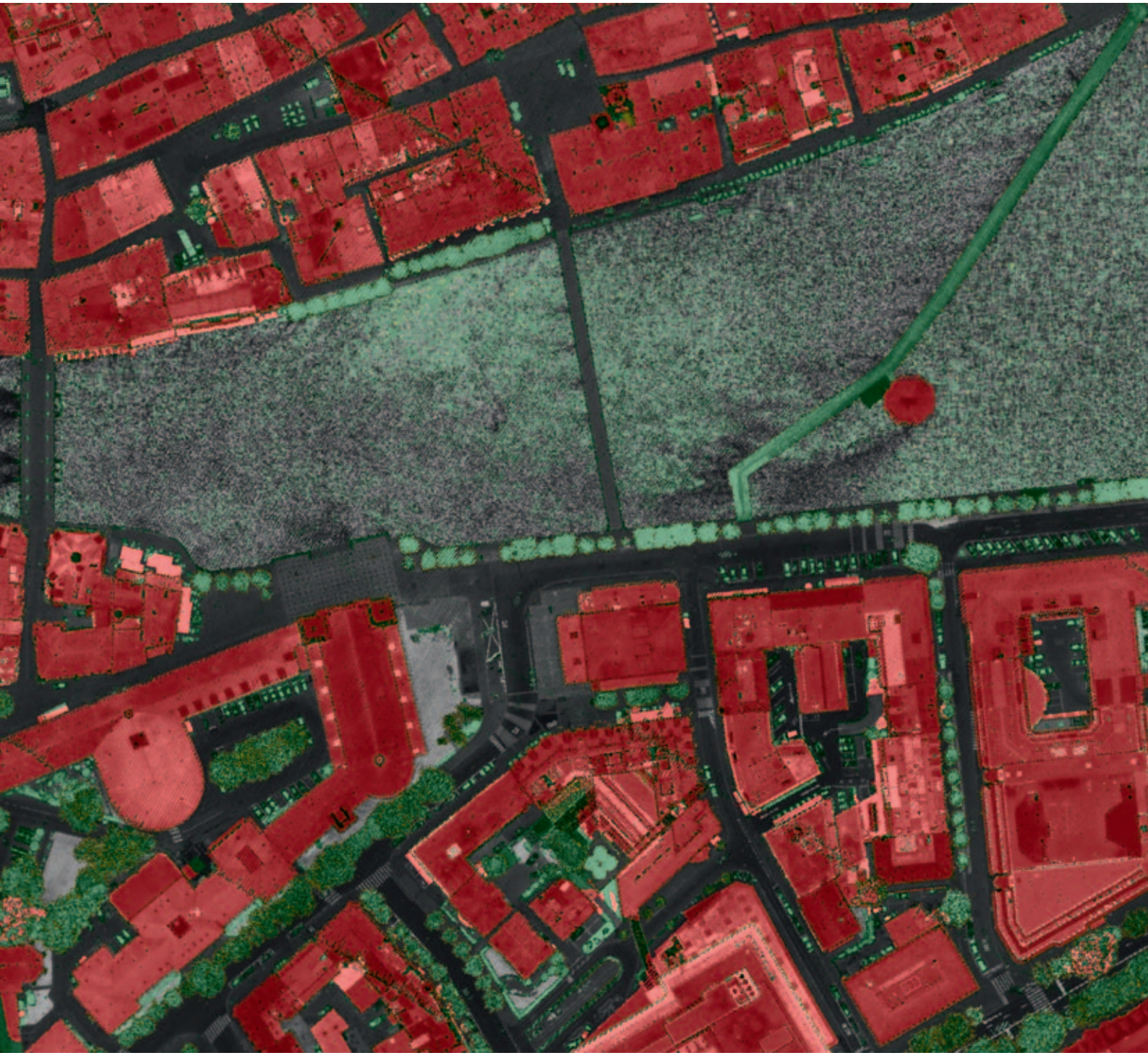
Leica ALS70

Airborne Laser Scanners

Performance for diverse Applications



- when it has to be **right**

Leica Geosystems

Three Models, One Result.
Highest Productivity in all Applications.

Imagine an affordable 500 kHz pulse rate city-mapping LIDAR system capable of meeting your specialized needs now, and for that is easily upgradable to a full-capability configuration as your business grows.

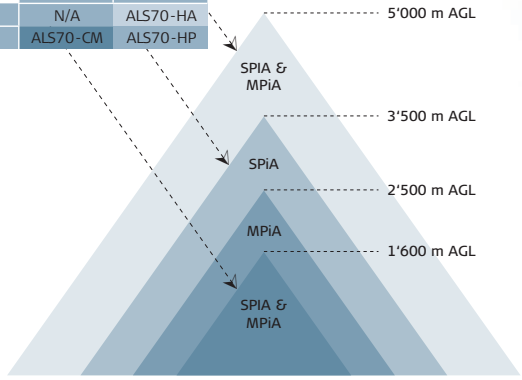
Imagine producing high density point clouds for corridor, urban, flood plain or general-purpose airborne mapping in a fraction of the time it took previously.

Imagine being able to perform wide-area mapping from high altitudes to obtain nearly 8 km swath.

The Leica ALS70 is a single family of systems that offers this level of flexibility and productivity, without compromising on quality and accuracy. Three models, Leica ALS70-CM, Leica ALS70-HP and Leica ALS70-HA, share a common platform (of a high-performance laser, scanner, range counting electronics, position/attitude measurement subsystem and user interface, flight planning and execution software), to create a range of laser scanners designed to meet the varied needs of the airborne survey market.

Two Laser Scanner configurations and two System Controller configurations are combined to create the three models in the Leica ALS70 range:

		System Controller	
		SC70-CM	SC70
Scanner	LS70-HA	N/A	ALS70-HA
	LS70-LP	ALS70-CM	ALS70-HP



CM

Leica ALS70-CM is designed for city and corridor mapping applications from lower flying heights. Ultra-high-density can be achieved by flying in small aircraft or mounted in helicopter pods, taking advantage of the low-profile scanner.

HP

Leica ALS70-HP is designed for general-purpose mapping at the flying heights most widely used, and can accommodate greater terrain relief due to its higher maximum flying height.

HA

Leica ALS70-HA is a high-altitude variant, allowing the market's highest flying heights, for wide-area mapping on a state or national level.

Need room to grow? No problem.

The unique modular design of the Leica ALS70 offers numerous benefits, including easy growth options. Did your business start with lower-altitude corridor mapping, but is expanding? Any Leica ALS70-CM can become a Leica ALS70-HP at the user's site. Need truly high altitude performance? Leica ALS70-CM and Leica ALS70-HP can be factory-reconfigured into an ALS70-HA and vice versa. Expanding your business into forestry and environmental areas? Add the optional Full Waveform Digitizer at any time, at any location.

ALS70 – a total package

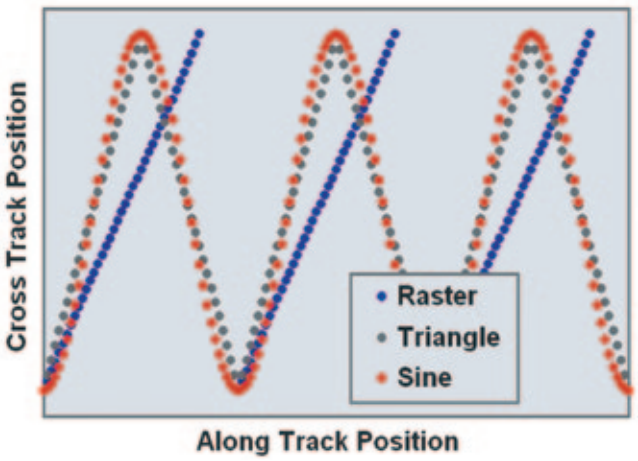
ALS70 systems come complete with peripheral products and software that provide a seamless workflow from mission planning through point cloud generation.

Point Density Multiplier – the key to high productivity

Point Density Multiplier is a combination of optical and electronic technologies that allows a quantum increase in measurement and scan rates over that available previously.

All models in the Leica ALS70 range feature a revolutionary new system control and range measurement module. This new module significantly reduces range measurement cycle overhead, allowing pulse rates that approach the maximum theoretical limits and yielding higher pulse rates at any given altitude. In addition, this same measurement technology makes the proven MPiA feature even easier to use. Additional features include:

- Unlimited range returns from each outbound pulse for greater detail in forest canopy
- 40% reduction in inter-return range separation for better ground detection in low vegetation
- 25% reduction in circuit board count for increased reliability
- 3 user-selectable scan patterns, sinusoid, triangle and raster, for unrivaled control over point pattern
- AutoScan: automatic adjustment of scan rate to keep more uniform along-track spacing (Leica ALS70-CM and Leica ALS70-HP) as aircraft speed varies
- Optional fully-integrated Full Waveform Digitizer (FWD) for waveform data collection at up to 120 kHz



Choice of sine, triangle and raster scan patterns

Leica ALS70-CM and Leica ALS70-HP models also feature a unique multiple-output scanning system. This new scanning approach allows the system to more than double the pulse rate of previously available systems, and double the scan rate of current systems, without the use of multiple scanner assemblies or lasers. The elegance of this implementation adds to the stability and consistency of the high-point-density data product delivered by the system, without increasing the complexity of system control.

Mission planning and system control

All of Leica ALS70 mission planning are accommodated in the Leica FPES Flight Planning and Evaluation Software, including optimizing both system settings as well as flight line layout. The intuitive AeroPlan70 pull-down menu allows manual or automated optimization of system settings in three ways:

- Fixed settings on all lines with fixed flying altitude for all lines
- Variable settings for each line with fixed flying altitude for all lines
- Variable settings for each line with different flying altitudes for each line

This third optimization mode can cut the number of flight lines by 40% in large-relief terrain.

FPES and FCMS – fully connected to ensure proper mission execution

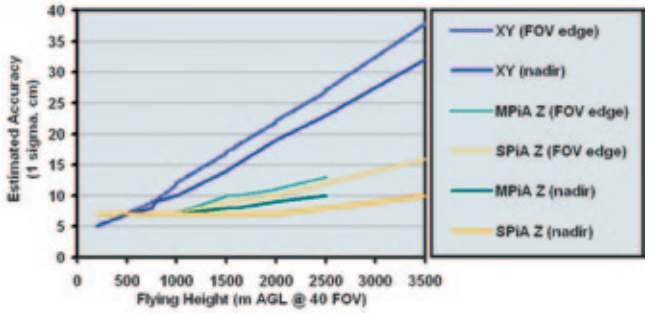
Leica FPES mission planning software works hand-in-hand with the Leica FCMS Flight and Sensor Control Management Software, by transferring the entire mission plan, both sensor settings and flight navigation information, from planner to system in a single digital file. Direct transfer of the mission plan minimizes the chance for operator error, and ensures that the mission is flown exactly as intended.

Leica FCMS provides an information-rich user interface for both operator and pilot, allowing both crew members access to critical data on flight navigation, progress and system performance. The optional "remote control" software module allows the operator and pilot to view different presentations simultaneously to maximize productivity.

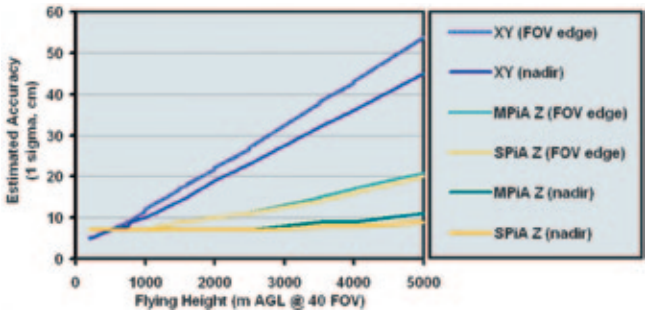
Leica LS70-LP Scanner

Post processing

Post-flight data processing uses Leica IPAS TC for GNSS/IMU data reduction and the ALS Point Processor for generation of the point cloud. Leica IPAS TC utilizes "tightly-coupled" GNSS/IMU data processing to allow full trajectory accuracy, even when satellites are temporarily obscured, reducing the need for inefficient and lengthy low-bank-angle turns from one flight line to the next.



Leica ALS70-CM and ALS70-HP provide high accuracy, even in MPiA mode



Leica ALS70-HA carries accuracy to an industry-leading 5'000 m AGL

System performance

Leica ALS70-CM and Leica ALS70-HP systems achieve measurement rates of 500 kHz, reducing on-line flying time by up to 60%. And with scan rates that allow well-matched cross-track and along-track spacing.

Leica ALS70-HA offers an extended flying height with lower scan rates appropriate to wide-area, low-point-density data acquisition.

		Model		
		ALS70-CM	ALS70-HP	ALS70-HA
Maximum Flying Height (m AGL)		1'600	3'500	5'000
Maximum Measurement Rate (kHz)		500	500	250
Field of view (degrees)		0 – 75 (full angle, user adjustable)		
Roll stabilization (automatic adaptive, degrees)		75 – active FOV		
Scan patterns (user selectable)		sine, triangle, raster		
Maximum Scan Rate (Hz)	sine	200		100
	triangle	158		79
	raster	120		60
Numbers of returns		unlimited		
Number of intensity measurements		3 (first, second, third)		
Accuracy		see graph		
Storage media		removable 500 GB SSD		
Storage capacity (hours @ max measurement rate)		6		12

Summary specifications for a complete family of airborne LIDAR solutions

Physical specifications

		Model	
		ALS70-CM ALS70-HP	ALS70-HA
Size (cm), Weight (kg)	Scanner	37 W x 68 L x 26 H 43 kg	37 W x 68 L x 27 H 43 kg
	Control Electronics	45 W x 47 D x 36 H 45 kg	
Operating Temperature	Scanner	0–40°C cabin-side temperature	
	Control Electronics	0–40°C	
Flight Management		FCMS	
Power Consumption (average, DUS5 IMU)		927 W @ 22.0 – 30.3 VDC	

Whether you want to capture airborne data of an agricultural area or of a city, record the challenges in a disaster area or the expanse of a high tension line, you need reliable measurements and solutions for your entire workflow to build image-based maps. Leica Geosystems' broad array of airborne sensors and integrated software solutions capture data efficiently, reference imagery accurately, measure easily, analyze and present spatial information in 3D.

Those who use Leica Geosystems products every day trust them for their precision, their seamless integration and their superior customer support. When data really counts, Leica Geosystems delivers geospatial imaging solutions with precision, integration and service.

When it has to be right.

Cover image
Lucerne, Switzerland, June 2009 flown from 1600 m AGL At 100 knots, with a 15-degree FOV, 50 Hz scan rate and 140 kHz (MPiA) pulse rate. Point density ~25 points/m², average post spacing 20 cm. Fusion of intensity image and classified point cloud.

TQM
ISO 9001 / ISO 14001

Total Quality Management – our commitment to total customer satisfaction.

Laser class 4 in accordance with IEC 60825-1 resp. EN 60825-1

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Leica ADS80
Product brochure

Leica RCD30
Product flyer

Leica FCMS
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Leica FPES
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Leica PAV80
Product flyer

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