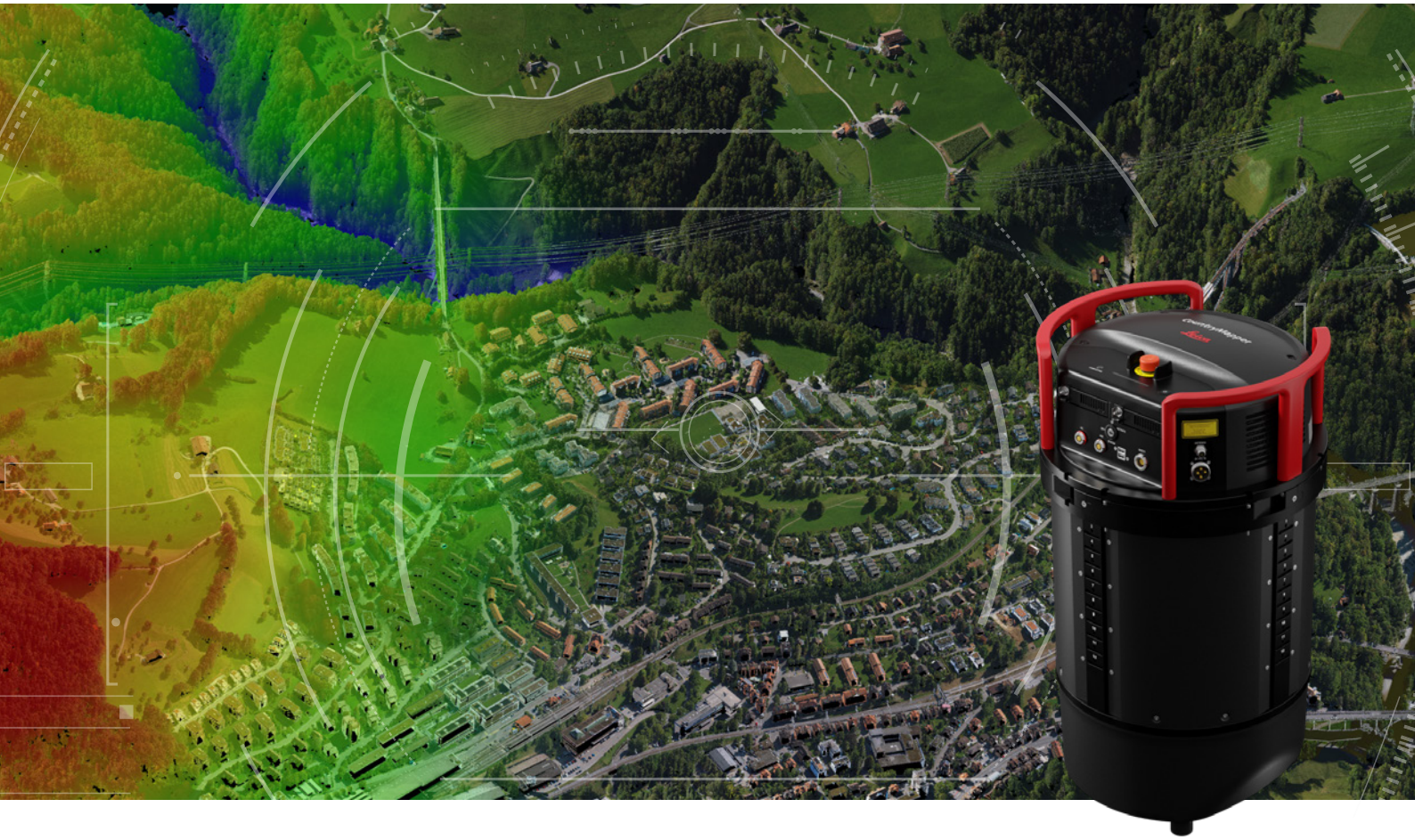
Leica CountryMapper
Hybrid sensor for large area data collection



Performance Booster

The Leica CountryMapper combines a large-format photogrammetric camera and a high-performance LiDAR unit to simultaneously collect foundational geospatial data. The system enables the acquisition of highly consistent data in fewer flying lines, reducing the carbon footprint of each mapping project.

Outstanding Flexibility

One aircraft? No problem. Leica Geosystems' exclusive modular design allows the CountryMapper to perform dedicated imaging, LiDAR or hybrid missions. Leica HxMap, the intuitive end-to-end multi-sensor workflow enables parallel data processing after landing.

Versatile Applications

Hybrid airborne technology allows for generation of the most accurate and comprehensive 2D and 3D geospatial data products. The CountryMapper supports a wide variety of applications such as orthophoto generation, forestry monitoring, and infrastructure management.

- when it has to be **right**

Leica Geosystems

Leica CountryMapper product specifications

LEICA COUNTRYMAPPER

CountryMapper-S	31,520 x 13,440 pixels RGBN Image FOV 58.0° LiDAR FOV 10° to 60°
CountryMapper-H	31,520 x 13,760 pixels RGBN Image FOV 45.0° LiDAR FOV 10° to 60°
CountryMapper-W	40,000 x 8,320 pixels RGBN Image FOV 66.2° LiDAR FOV 10° to 60°
RGB: NIR ratio	
CountryMapper-S	1:1.6
CountryMapper-H	1:2.1
CountryMapper-W	1:1.6

Collection parameters	GSD [cm] by AGL [m]			
CountryMapper Image GSD	**GSD**	**CTM-S**	**CTM-H**	**CTM-W**
	2	570	760	610
	5	1420	1900	1530
	7.5	2130	2850	2300
	10	2850	3800	3070
	15	4270	5700	4600
	Point Density [Points/m²] by AGL [m]			
CountryMapper LiDAR Point Density [1,2]	**PD**	**FOV-60°**	**FOV-45°**	**FOV-30°**
	16	797	1123	1750
	12	1073	1507	2375
	8	1624	2275	3100
	4	3050	3270	4150
	2	3900	4500	5300
	1	4950	5700	6000

Dimension	Height 770 mm Diameter 408 mm (bottom) / 435 mm (top)
Weight	55 kg

INTEGRATED GNSS/IMU SYSTEM

IMU	SPAN CNUS5-H, Class 5, 500 Hz, FOG no export license required US ECCN 7A994
GNSS	NovAtel SPAN OEM7, 555 channel multi constellation receiver with 10 Hz GNSS data rate
Additional features	Real-time deeply coupled solution for position and attitude at highest accuracies, fully integrated and embedded solution
Position RMS DGNSS	Post-processed (specification): X,Y ≤ 3-5 cm, Z ≤ 5-7 cm Post processed (typical): X,Y ≤ 2-3 cm, Z ≤ 3-5 cm
Attitude RMS	Post-processed (specification): R,P ≤ 0.005°, H ≤ 0.008° Post-processed (experienced): R,P ≤ 0.003°, H ≤ 0.004°

IMAGING SPECIFICATIONS

Sensor Type	BSI CMOS
Dynamic range	83 dB
A/D conversion	14-bit
Motion compensation	Mechanical forward-motion-compensation (FMC)
Min. frame interval	0.7 sec
Spectral bands	R (580 - 660 nm) G (480 - 590 nm) B (420 - 510 nm) NIR (720 – 850 nm, monochrome)
Shutter	Mechanical central shutter, designed for up to 500,000 cycles, field exchangeable
Aperture	Automatically controlled aperture 7 half f-stop steps
Real-time processing	• Data compression • Georeferenced thumbnails for in-flight visualisation and post-flight quality control

LIDAR SPECIFICATIONS

Field of view	10 - 60° programmable
Scan speed	33 - 166 Hz , programmable 66 - 333 scans per second
Scanner pattern	Oblique scanning
Pulse repetition frequency	Up to 2.0 MHz (height dependent)
Laser divergence	0.12 mrad (1/e) nominal 0.17 mrad (1/e²) nominal
Laser wavelength [3]	1,064 nm
Laser classification [3]	Class 4
Operation altitude [4]	300 m minimum AGL 6000 m maximum AGL
Return pulses	• Programmable up to 15 returns at all pulse rates, including intensity (14-bits digitisation) • Gateless Multiple-Pulses-in-the-Air (MPiA), zone independent operation
Min. vertical separation	0.5 m
Vertical accuracy [5, 6, 7]	< 5 cm 1 σ
Horizontal accuracy [5, 6, 7]	< 13 cm 1 σ

PERIPHERALS

Mass memory [8]	• Leica MM60 solid state drive,15,360 GB, 0.4 kg • Removable and portable • Two MM60 required, recording time about 8.0 hours
Operator console	Leica OC61 12.1" screen 3.9 kg
Pilot display	Leica PD61 6.3" screen 1.0 kg designed for cockpit mounting
Display stand	IS40-LW stand for Leica OC61 operator console 3.2 kg
Sensor mount	Leica PAV200 gyro-stabilised sensor mount for high-performance data acquisition, 36.0 kg compensation range: roll -7° to 7°, pitch -8° to 6°, drift -30° to 30°

ENVIRONMENTAL

Pressure	Non-pressurised cabin up to ICAO 25,000 ft
Humidity	0% to 95% RH according to ISO 7137 (non-condensing)
Operating temperature	-10°C to 35°C
Storage temperature	-10°C to 70°C

ELECTRICAL

Max. avg. power consumption of complete system	870 W / 28 VDC
Max. peak power consumption of complete system	1100 W (<60s) / 28 VDC
Fuse on aircraft power outlet	1 x 50 A recommended

SYSTEM WEIGHT

System installation	< 104.8 kg

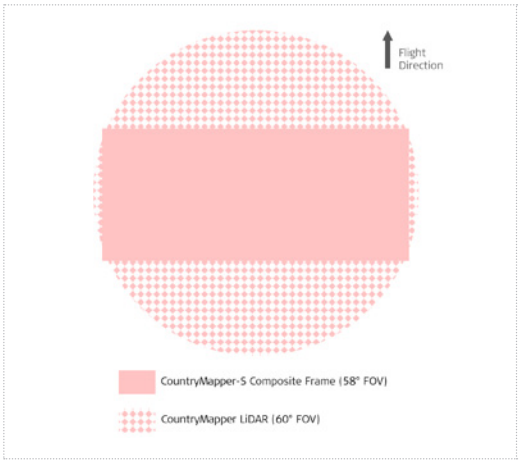
SOFTWARE

Mission planning	Leica MissionPro
Flight navigation & sensor operation	Leica FlightPro
GNSS/IMU processing	NovAtel Inertial Explorer
Point cloud/image processing	Leica HxMap

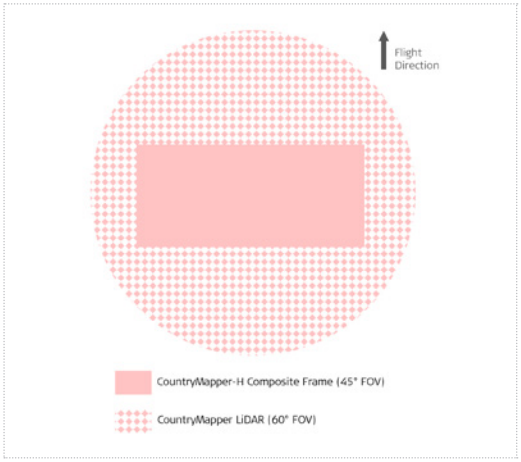
STANDARDS

RTCA DO-160G, EUROCAE-14G, USA FCC Part 15, ISO 7137, EN/IEC 60825-1:2014

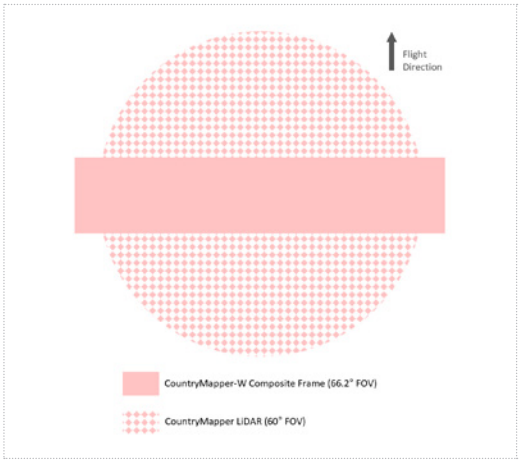
[1] LiDAR on 20% reflectivity target at 150 knots.
[2] USGS QL0 accuracy for point densities above 8 points/m².
[3] Invisible laser radiation, avoid eye or skin exposure to direct or scattered radiation. Class 4 laser product in accordance with EN/IEC 60825-1:2014.
[4] Maximum operating altitude is specified for 90% detection at 20% reflectivity (e.g., old dry asphalt), target larger than laser footprint, 100% laser output at 60 degrees FOV.
[5] Accuracy stated is acquired at 1,000 m AGL, max. FOV.
[6] The standard deviation σ represents the 68% confidence interval. Typically, the RMSE value represents 1σ.
[7] Stated vertical and horizontal accuracies after calibration and registration using Leica HxMap workflow and with an assumed GNSS position error of 4 cm.
[8] Data collection is based on typical image and LiDAR recording modes.



CountryMapper-S footprint



CountryMapper-H footprint



CountryMapper-W footprint

Revolutionising the world of measurement and survey for nearly 200 years, Leica Geosystems creates complete solutions for professionals across the planet. Known for premium products and innovative solution development, professionals in a diverse mix of industries, such as surveying and engineering, safety and security, building and construction, and power and plant, trust Leica Geosystems to capture, analyse and present smart geospatial data. With the highest-quality instruments, sophisticated software and trusted services, Leica Geosystems delivers value every day to those shaping the future of our world.

Leica Geosystems is part of Hexagon (Nasdaq Stockholm: HEXA B; hexagon.com), a leading global provider of information technologies that drive quality and productivity improvements across geospatial and industrial enterprise applications.

Swiss Technology
by Leica Geosystems

989162 en – 01.24

Leica CityMapper-2
More information,
smarter decisions

Leica DMC-4
Precision, efficiency,
versatility

Leica TerrainMapper-2
Highest accuracy
for regional mapping
projects

Leica Geosystems AG
leica-geosystems.com

- when it has to be **right**

Leica Geosystems