

DJI Matrice 400

+ Zenmuse L3 LiDAR

DJI's first long-range, high-accuracy aerial LiDAR system. 1535 nm LiDAR reaching up to 950 m at 10% reflectivity, dual 100 MP RGB cameras with 107° combined FOV, up to 100 km²/day coverage, 59-minute endurance with the Matrice 400.

Aircraft: DJI Matrice 400 (IP55, 59 min, 6 kg payload)

Sensor: Zenmuse L3 (IP54, 1.60 kg)

Release: Zenmuse L3 — November 2025 | M400 — June 2025

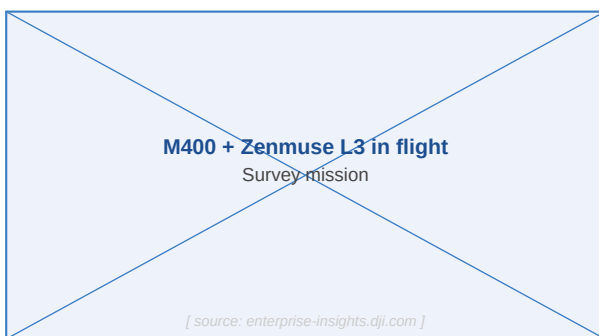
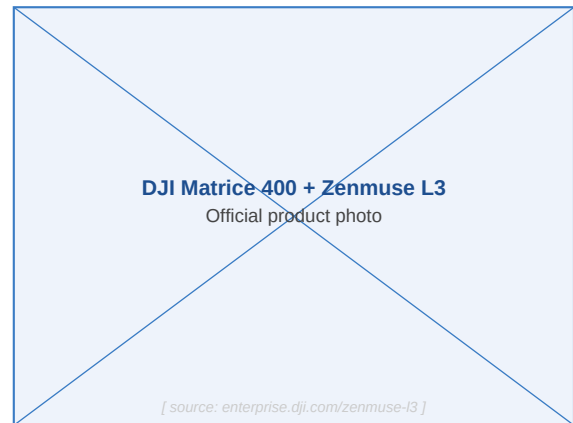


Fig. 1 — DJI Matrice 400 equipped with Zenmuse L3 LiDAR sensor

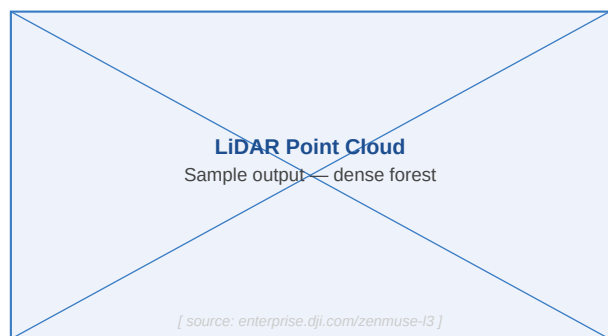


Fig. 2 — High-density LiDAR point cloud (superior vegetation penetration)

DESCRIPTION

The integrated **DJI Matrice 400 + Zenmuse L3** system is the benchmark solution for high-accuracy aerial topographic surveying. Announced in November 2025, the Zenmuse L3 represents a generational leap over the L2: laser spot reduced to one-fifth the size, range doubled to 950 m, returns per pulse up to 16, and dual cameras upgraded from 20 MP to 100 MP with a combined horizontal FOV of 107° (vs 73.7° for the L2).

The 1535 nm wavelength combined with high per-pulse energy density delivers superior vegetation penetration, enabling accurate reconstruction of complex terrains and structures. Mapping scales of 1:500, 1:1000, and 1:2000 are supported with vertical accuracy of 3 cm at 120 m, 5 cm at 300 m, and 10 cm at 500 m. Microsecond-level time synchronisation ensures perfect coherence between LiDAR, GNSS, and IMU data.

Paired with the **DJI Matrice 400** (June 2025), the system achieves 59 minutes of endurance, 6 kg payload, IP55 protection, and dual-technology obstacle sensing (rotating LiDAR + mmWave radar) capable of detecting powerlines at 25 m/s. A single mission at 300 m covers up to 10 km², for 100 km²/day. The DJI ecosystem — Pilot 2, Terra, Modify, FlightHub 2 — delivers DOM, DEM, and coloured point clouds from a single flight.

APPLICATIONS

■ Topographic & Cadastral Survey

High-resolution DTM/DSM for 1:500–1:2000 scale, cadastral boundary mapping, cartographic update. Vertical accuracy 3 cm at 120 m.

■ Infrastructure Monitoring

Powerline inspection (wire detection up to 300 m), viaducts, dams and critical infrastructure with high-density point clouds.

■ Forestry & Environmental Management

Timber volume estimation, canopy structure analysis, vegetation classification, landslide monitoring. Superior penetration with 16 returns.

■ Construction & Earthworks

Cut/fill volume calculation, construction progress monitoring, BIM model comparison, dusty environments (IP54/IP55).

■ Urban Planning

3D models of complex urban areas, facade and structure surveying, urban regeneration and building intervention planning.

■ Emergency Response

Rapid post-event assessment of landslides, floods, earthquakes: high-accuracy georeferenced data within hours.

ADVANTAGES OVER PREVIOUS GENERATION (L2)

- **Laser spot 1/5 of L2:** accurate detection of wires, branches and small details.
- **2× range — up to 950 m:** broader coverage per flight, higher operating altitudes.
- **Up to 16 returns per pulse** (L2 max 5): significantly superior vegetation penetration.
- **107° combined RGB FOV** (L2: 73.7°): fewer flights to cover the same area.
- **Dual 100 MP cameras** (L2: 20 MP): 3 cm GSD at 300 m, professional photogrammetric quality.
- **Improved POS accuracy** — Yaw 0.02°, Pitch/Roll 0.01° (L2: Yaw 0.05°).
- **Point cloud thickness halved** vs L2: more precise analysis and advanced applications.
- **Star-Shaped scanning mode** (new): balance between accuracy and multiple scan angles.

TECHNICAL SPECIFICATIONS — ZENMUSE L3

System

Compatible Aircraft	DJI Matrice 400 (requires single gimbal connector)
Weight	1.60 kg (without connector) + 145 g connector
Dimensions	192×162×202 mm (L×W×H)
Power	64 W typical / 100 W max
Ingress Protection	IP54
Operating Temp.	-20°C to +50°C
Accuracy at 120 m	3 cm vertical RMSE 4 cm horizontal RMSE
Accuracy at 300 m	5 cm vertical RMSE 7.5 cm horizontal RMSE

NOVATEST S.r.l.

Via Albertini, 36/F8
c/o Center Gross
60131 Ancona (AN)

T. +39 071.2415386
info@novatest.it
P.IVA 02475340424

www.novatest.it

Pt Cloud Thickness	1.2 cm @1 σ (120 m) 2 cm @1 σ (300 m)
Daily Coverage	Up to 100 km ² (300 m alt., 15 m/s, Matrice 400)

LiDAR

Laser Wavelength	1535 nm
Beam Divergence	0.25 mrad (1/e ²) — 1/5 of Zenmuse L2 spot
Max Range	950 m @10% refl., 100 kHz 700 m @10% refl., 350 kHz 2000 m @80% refl.
Range by Frequency	2000 kHz: 290 m 1000 kHz: 400 m 350 kHz: 700 m 100 kHz: 950 m
Wire Detection	300 m ACSR 21.6 mm 100 m PVC 18.4 mm (100 klx, 350 kHz)
Ranging Accuracy	Absolute: ± 10 mm Repeatability: <5 mm (1 σ) @150 m
Time Sync.	Microsecond-level
Pulse Frequencies	100 / 350 / 1000 / 2000 kHz
Returns	16, 8, 4 (100/350 kHz) 8, 4 (1000 kHz) 4 (2000 kHz)
Cross-Cycle Calc.	7 $\times$
Scanning Modes	Linear (80° $\times$ 3°) Star-Shaped (80° $\times$ 80°) Non-Repetitive (80° $\times$ 80°)
Laser Class	Class 1 (IEC 60825-1:2014)
Min. Distance	10 m

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Dual RGB Mapping Camera

Sensor	4/3" CMOS (×2 cameras)
Resolution	100 MP (12288×8192) 25 MP (6144×4096)
Combined FOV	107° horiz. (two cameras, 45° optical axis angle)
Focal Length	28 mm equiv. f/2.0–f/11
GSD avg (300 m)	3 cm — 1:1000 scale guaranteed
Shutter	Mechanical: 2–1/1500 s (f/2.0) 2–1/2000 s (f/2.8–f/11) 500,000 cycles
Min. Interval	JPEG 25MP: 0.5 s JPEG 100MP: 1 s RAW: 1.2 s
Video	4K 3840×2160@30fps FHD 1920×1080@30fps (HEVC/H.265)

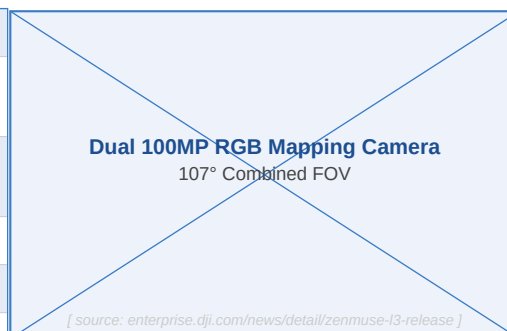


Fig. 3 — Dual 100 MP RGB mapping camera system, 107° combined horizontal FOV

Position & Orientation System (POS)

GNSS Update Rate	5 Hz
POS Update Rate	200 Hz
Attitude Error	Yaw: 0.02° (1σ) Pitch/Roll: 0.01° (1σ) — post-processed
RTK Positioning	H: 1.0 cm + 1 ppm V: 1.5 cm + 1 ppm
PPK Data Formats	DAT (D-RTK 3) / RINEX v2.1x, v3.0x / RTCM v3.x / OEM4, OEM6

Gimbal & Data Storage

Axes	3-axis — pitch, roll, yaw
Angular Accuracy	±0.01°
Pitch/Yaw Range	Pitch: -120°–+60° Yaw: -80°–+80°
Mounting	Detachable DJI SKYPORT (Zenmuse L3 single gimbal connector)
Memory Card	CFexpress Type B — sequential write ≥1,500 MB/s
Stored Data	Photos / IMU / Point cloud / GNSS / Calibration files

DJI Matrice 400 — Aircraft

59 min Endurance	6 kg Payload	20 km Transmission	IP55 Protection	7× Payloads
Takeoff Weight 9,740 ±40 g (with batteries) 5,020 ±20 g (without)				
Flight Endurance 59 min (with H30T, sea level, 10 m/s forward)				
Payload Capacity 6 kg (third gimbal connector, sea level)				
Transmission O4 Enterprise Enhanced: 20 km (CE) / 40 km (FCC)				

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Payload Ports	4× E-Port V2 — up to 7 simultaneous payloads
Obstacle Sensing	Rotating LiDAR + mmWave radar — wire detection at 25 m/s
Hovering Acc. RTK	±0.1 m vertical ±0.1 m horizontal
GNSS RTK Accuracy	1 cm + 1 ppm (H) 1.5 cm + 1 ppm (V)
Remote Controller	DJI RC Plus 2 Enterprise Edition (included)

Software Ecosystem

Data Collection	DJI Pilot 2
Processing	DJI Terra — LAS/LAZ/PLY/PCD/S3MB + point cloud optimisation
Application	DJI Modify — 3D analysis, classification, measurements
Fleet Mgmt.	DJI FlightHub 2 (cloud / on-premises)
RTK/PPK Station	D-RTK 3 Multifunctional Station (max 15 km baseline)
Deliverables	DOM · DEM · Coloured point cloud — from a single flight

[1] LiDAR range: 100 kHz, 10% reflectivity, 100 klx, 23 km atm. visibility. Default max 900 m; for extended range contact DJI. [2] 100 km²/day: 300 m altitude, 15 m/s, 20% side overlap, DJI Matrice 400. All data measured on production model in controlled environment; actual results may vary. Always refer to the latest official DJI documentation.

ACCESSORIES

D-RTK 3 Multifunctional Station	Multi-constellation GNSS reference station for RTK corrections and PPK data up to 15 km. Essential for maximum planimetric and altimetric accuracy. Formats: DAT/RINEX/RTCM.
Zenmuse L3 Single Gimbal Connector	Dedicated DJI SKYPORT adapter for mounting Zenmuse L3 on Matrice 400. Weight 145 g. Required for mechanical and electrical connection.
DJI RC Plus 2 Enterprise Ed.	Controller with 7" high-brightness display (1000 nit), IP54, extended battery life. Enhanced version: sub-2G SDR module for BVLOS and long-range relay (sold separately).
TB65 Intelligent Batteries (×2)	Hot-swappable batteries for 59 minutes of maximum endurance. Multi-charging hub for rapid consecutive field cycles.
DJI Terra Professional Licence	Mission planning, LiDAR processing (LAS/LAZ/PLY/PCD/S3MB), photogrammetric models, point cloud optimisation with DEM/DOM. Supports 1:500, 1:1000, 1:2000 scales.
DJI Modify	LAS import, automatic classification, volumetric analysis, sections and profiles, professional 3D visualisation. Output compatible with GIS and CAD software.
DJI FlightHub 2	Cloud fleet management: real-time monitoring, route planning, mission and data archive. Also available on-premises (FH2 AIO).
Manifold 3	Onboard AI edge-computing module >100 TOPS: in-flight object detection, customisable autonomous missions via PSDK/MSDK.

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DJI Care Enterprise

Accidental damage coverage, rapid unit replacement, priority technical support. 1 and 2-year plans for Matrice 400 and Zenmuse L3 separately.

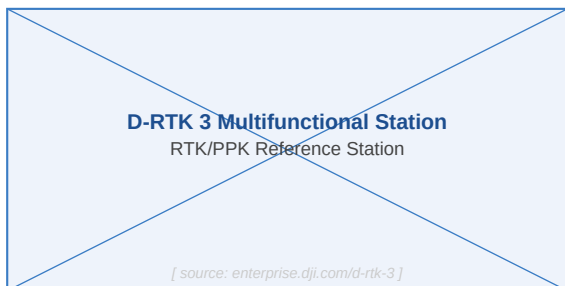


Fig. 4 — D-RTK 3 Multifunctional Station (RTK/PPK up to 15 km baseline)

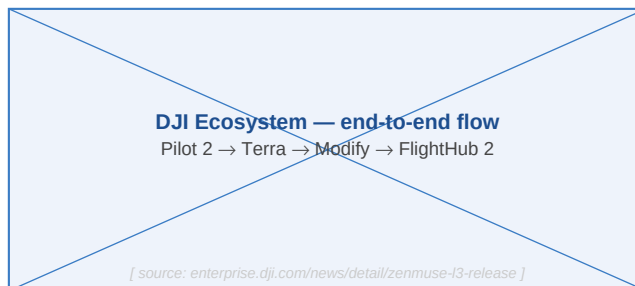


Fig. 5 — DJI integrated software ecosystem end-to-end

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