

DJI ZENMUSE L2 UNVEILED AT INTERGEO

Significant leap forward for UAV-Lidar mapping



DJI selected Intergeo in Berlin as the stage for unveiling the DJI Zenmuse L2. This highly integrated Lidar system builds on the success of DJI's Zenmuse L1 to bring new benefits to the geospatial community. Thanks to the enhanced RGB camera, upgraded Lidar module and improved precision, professionals utilizing the DJI Matrice 300 RTK or DJI Matrice 350 RTK platform can now achieve

heightened accuracy, efficiency and reliability in 3D data acquisition. Furthermore, when combined with DJI Terra, the DJI Zenmuse L2 delivers a comprehensive solution for 3D data collection and high-accuracy post-processing. This product launch marks a significant leap forward for DJI – a global leader in civilian uncrewed aerial vehicles (UAVs or 'drones') and cutting-edge camera technology – in the geospatial UAV-Lidar market.

"The DJI Zenmuse L2 marks a new era of 3D data acquisition," said Christina Zhang, senior director of corporate strategy at DJI. "Three years ago, we were excited to introduce our reliable and cost-effective Lidar system for aerial platforms used by land surveyors, powerline inspectors, forestry professionals and more. This solution is paramount in providing real-time 3D data, efficiently capturing the details of complex structures and

delivering highly accurate reconstructed models. In line with our aim of promoting industry development in all enterprise verticals, we are continuing to tackle user pain points through technical innovation and reshaping industry productivity."

Increased hardware power and greater efficiency

With the help of aerial Lidar technology, professionals in land surveying, mapping, powerline inspection, forestry and infrastructure management can obtain large-scale, three-dimensional spatial information in a short time. When compared with traditional manual measurement technology, this approach can greatly reduce the workload, accelerate field measurement and improve detection efficiency.

The all-new [Zenmuse L2](#) integrates Lidar, a self-developed inertial measurement unit (IMU) system, 4/3 CMOS RGB camera and three-axis gimbal. When equipped with the DJI Matrice 300 RTK or Matrice 350 RTK drones, this results in accurate, efficient and reliable data collection. The high-accuracy IMU system has been significantly enhanced and is ready for use the moment it is powered on, delivering an optimized in-field experience. Combined with the drone's RTK positioning system for data fusion during post-processing, it gives the Zenmuse L2 access to highly accurate and absolute position, speed and attitude information. In addition, the IMU system's enhanced environmental adaptability improves the operational reliability and precision.



The DJI Zenmuse L2 is considered a groundbreaking leap in 3D data acquisition. (Image courtesy: DJI)

Improved detection range

According to DJI, the Zenmuse L2 boasts a 30% increase in detection range in comparison to its predecessor. The new system can detect objects from 250m at 10% reflectivity and 100k Lux, and up to 450m at 50% reflectivity and 0k Lux. The typical operational altitude now extends up to 120m, notably enhancing operational safety and efficiency.

With a reduced spot size of 4×12cm at 100m (only a fifth of that of the Zenmuse L1), the Zenmuse L2 detects smaller objects with more details, generating more accurate digital elevation models (DEMs). Additionally, it supports five returns, making it capable of penetrating denser vegetation and capturing more ground points beneath the foliage. Moreover, in both single and multiple return modes, the Zenmuse L2 can reach a maximum point cloud emission rate of 240,000 points per second, allowing the acquisition of more point cloud data in a given timeframe.

The RGB mapping camera features a 4/3 CMOS with a mechanical shutter and enlarged pixel size to 3.3µm. The effective pixels now reach 20MP, resulting in a significant improvement in overall imaging, as well as more enriched colourized point cloud details. The minimum photo interval has been reduced to 0.7 seconds and the mapping camera has a shutter count of up to 200,000 times, further reducing operational costs. If point cloud collection is not needed, the RGB camera can still take photos and videos, or collect images for visible light mapping.

Attaching the Zenmuse L2 to DJI's flagship Matrice 350 RTK improves operational efficiency, since both Lidar point cloud and RGB data can be collected from a 2.5km area in a single flight. By combining GNSS with the high-accuracy IMU system, the solution achieves 4cm vertical accuracy and 5cm horizontal accuracy.

DJI Pilot 2 software features

During operation, [DJI Pilot 2](#) is used. It supports three display modes – RGB, point cloud and point cloud/RGB side-by-side display – to present the operational results in an intuitive way.

Activating Laser Rangefinder (RNG) enables access to the distance information between the Lidar module and the object in the centre of the field of view (FOV), enhancing flight safety. It also supports four real-time point cloud colouring modes: reflectivity, height, distance and RGB. Additionally, operators can quickly preview the recorded 3D point cloud model to experience real-time monitoring of operational progress.

Through DJI Pilot 2, the Zenmuse L2 can automatically generate route-operation quality reports after the completion of route tasks, with point cloud playback and splicing functions. A quick preview of the point cloud results can be viewed at the job site. If the data is abnormal, shots can be retaken to avoid repeated outings.

In combination with DJI Terra, the Zenmuse L2 enables efficient and reliable one-stop point cloud post-processing. After the point cloud trajectory is solved and the point cloud accuracy is optimized, a 3D point cloud in standard format can be generated with one click. The ground point is then classified, and DJI Terra creates the DEM. Accuracy control and inspection functions can then be used to analyse the result.

Multi-industry solution

In combination with the DJI Matrice 300 RTK or DJI Matrice 350 RTK platform and DJI Terra, the Zenmuse L2 is a fitting solution for land surveying, forestry, key asset management and many other industries.

- In topographic mapping, for example, the Zenmuse L2 can help operators to complete large-area surveys not only quickly but also accurately. Once the raw point cloud data has been collected, it can be automatically processed to generate a variety of results, such as 3D point clouds in standard format or DEMs, and be used for further measurements.
- For forestry professionals, the Zenmuse L2's Lidar can penetrate through the canopy. Characteristics such as crown width and tree height can be analysed to dynamically monitor the growth of plants.
- In the powerline inspection industry, it has always been difficult to use photogrammetric methods to reconstruct lines and components. Now, with the Zenmuse L2, point cloud data can be collected efficiently. Inspection specialists can also measure the distance between vegetation and powerlines to spot any potential risks, or to plan automated inspection missions based on the point cloud data.

For more information on the Zenmuse L2, [see here](#).



DJI's Zenmuse L2 UAV mapping solution enables operators to efficiently and precisely conduct extensive surveys. (Image courtesy: DJI)