New Unmanned Aerial Photogrammetric Mapping Solution

Drone manufacturer ScientificAerospace together with mapping company DroneMetrex from Adelaide, Australia, has developed a photogrammetric mapping solution that offers new possibilities for the geospatial industry. Building on the advantages of ScientificAerospace's experience over eight years on six continents, its technically advanced multi-rotor unmanned aerial vehicle (UAV) creates synergy with DroneMetrex's mapping accuracy technology to produce an innovative and complete photogrammetric mapping system: the TopoDrone-4Scight.

The TopoDrone-4Scight (TD-4Scight) easily collects photogrammetric mapping data of great accuracy (20mm horizontal and better than 25mm vertical) for rapid integration into a wide range of industries including surveying, urban mapping, civil engineering, mining, agriculture, bridge and dam wall mapping, post disaster mapping, waste management, recycling and other industries.

Challenging areas

The TD-4Scight can be used almost anywhere including urban areas and difficult-to-access areas because it is a vertical take-off and landing drone rather than a fixed wing.

The vented ducts of the rotors guarantee that TD-4Scight is the most efficient, stable VTOL drone mapping system, especially in stronger winds. They also provide safety advantages because of no exposed blades. The TD-4Scight can also easily capture aerial data in spark free safety conscious applications, because of its non-conductive airframe and brushless motors.

Accurate synchronisation

Users will benefit from a whole set of the TD-4Scight features such as mapping without ground control points. The TopoDrone-4Scight goes with PPK Direct Georeferencing Solution which logs all the high precision GNSS satellites (from US, Europe, Russia and China) on board theTD-4Scight, synchronised to the nano-second with the camera shutter.

The accurate synchronisation is very important to achieve high mapping accuracies. Differential GPS post-processing is then used to obtain the accurate camera positions that are required for the photogrammetric aerial triangulation. It significantly improves mapping accuracy for larger projects as well as quality of the photogrammetric mapping.

At the same time PPK Direct Georeferencing Solution significantly reduces time for the final photogrammetric aerial triangulation and data processing time.

Digital camera

The TD-4Scight uses modern compact digital camera technology, with a calibrated Hasselblad glass lens housed in a revolutionary Dynamic-stabilised Active Mount (DSAM). This DSAM ensures camera near-nadir position of each and every photo plus no "crab" (yaw). Another feature of the TD-4Scight is the mounting of DSAM with camera at the bow of the drone.

This allows for mapping in either nadir mode, landscape mode or zenith mode ("pointing-up"). Nadir mode is used for conventional mapping; landscape mode - for bridge deformation, dam wall measurement, or structure mapping; zenith mode allows the user to map and measure the underneath of bridges and structures.

The TD-4Scight mapping drone is being developed to be used with interchangeable sensors including thermal and HD video.

Flight control

The TD-4Scight system is completed with the inclusion of the “4Survey” flight planning and autonomous flight control software, along with “4Survey-Precision”: the GPS post-processing software enabling mapping with minimal survey ground control requirements. Both 4Survey and 4Survey-Precision were specifically developed for the TD-4Scight.

Managing director of DroneMetrex, Thomas Tadrowski, said this was the future of geospatial industry as it made accurate surveying and photogrammetric mapping easy. The new system will significantly increase surveying and mapping efficiency in response to a growing demand for fast and affordable mapping data of highest quality, he added.

ScientificAerospace and DroneMetrex also have formalised sales distribution agreements with distributors in Australia, New Zealand, South Korea, the UAE and Germany. Agreements would be in place with exclusive distributors in the United States and Great Britain in coming months.

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