



From soaring heights: Camera stabilization with maxon drives

Aerial images can be beneficial for many businesses and industries. Often things are revealed from above that are hidden to the observer on the ground. Drives from maxon motor are used in camera stabilizer systems.

Mining companies, for example, survey mines from the air, oil and gas suppliers monitor their drilling rigs, and energy utilities monitor their overland lines. All these applications have one big challenge in common: In these often rough operating environments, the camera needs to be protected against wind, turbulence and the vibration of the carrier aircraft while being kept in a stable position. This is the job of a high-precision stabilization camera gimbal. These gimbals provide users with a stable and level platform that allows them to capture high-quality aerial images.

The company Photo Higher is based in Wellington, New Zealand. They specialize in the design, development, and manufacture of precision camera gimbal systems for Vertical Takeoff and Landing (VTOL) Rotary Wing Unmanned Aircraft Systems. The Photo Higher gimbals are lightweight, smooth and very stable. The device's core is the drive unit for the stabilizing platform, for which the company uses small brushless DC servo motors. The initial requirement was to have a DC servo motor combination with zero backlash, 40 rpm and 2 Nm output torque. The total weight of the motor combination needed to be less than 100 grams and the overall length needed to be less than 50 mm.

Energy efficiency for extended survey flights

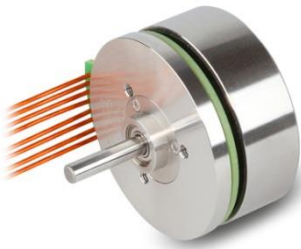
Power consumption is an important consideration for unmanned aerial vehicle (UAV) applications. With higher power density and higher efficiency, maxon brushless DC servo motors offer lower energy consumption than other motors, allowing the UAV to remain airborne for longer periods of time. After numerous trials with a variety of drive units, including the use of an angular gearhead that turned out to be too heavy, an ideal solution was found: the maxon EC 32 flat, a brushless DC servo motor that drives the gimbals directly. This customized drive is flat and compact while still fulfilling the speed and torque requirements. Most importantly, the output has zero backlash, making these drives a perfect solution for camera gimbals. With the new design, the end user can always adjust the gimbal and balance the center mass of the entire system, irrespective of the camera brand or model. With a balanced center of mass, fast acceleration and quick response can be achieved with minimum effort from the DC servo motors.



*The Halo 2000 by Photo Higher is a three-axis camera stabilizer system made from 100 percent carbon fiber. The stabilization is provided by maxon motors and servo controllers.
Image © Photo Higher*

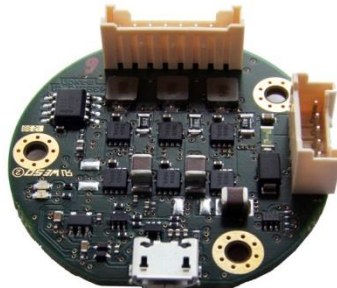
In addition to the brushless DC servo motors for the various camera gimbals, Photo Higher uses a custom maxon servo controller for the DC motors. The customizations included the PCB shape, control parameters, gain and connectors; all have been tailored to the special requirements of the application. The camera gimbals of the AV and Halo series by Photo Higher were designed for demanding applications. This allows the system to be used for film shoots. Combined with an unmanned aircraft, the system provides users with an easy way to collect and capture high definition aerial imagery and geospatial data. In addition to UAVs, the gimbals can also be mounted on various types of platforms, such as helicopters, airships, cranes, and boats.

maxon products in this article



maxon EC 32 flat

The brushless DC servo motor is flat and compact while still fulfilling the demanding speed and torque requirements.



maxon ESCON servo controller

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