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maxon develops ultra-efficient UAV drive with startup Flybotix

maxon has collaborated with drone startup Flybotix to develop performance-optimized brushless DC motors for a new kind of inspection drone. With the know-how gained from this and other projects, maxon is making inroads into the new UAV market, where the reliability and quality of components are becoming more important.

Two rotors instead of four was the approach used by startup Flybotix to develop the ASIO inspection drone, which is set to conquer the market. This indoor drone for industrial facilities is built around a patented drive system powered by brushless DC motors from maxon. maxon worked closely with Flybotix to develop electric motors that are optimized for weight and performance and specifically adapted to this application. These drives will allow the ASIO to carry out long missions, reach distant locations, and save costs. "This world-class level of performance could not have been reached without the excellent work of maxon," said Samir Bouabdallah, CEO of Flybotix. "We are very excited about this partnership and will intensify it in order to advance the industrialization of our drone."

Flybotix is a Swiss company in the EPFL Innovation Park in Lausanne, which is also home to one of maxon's innovation labs. CEO and founder Samir Bouabdallah has 15 years of experience in developing drone technology at the EPFL and at ETH Zurich. The drive system he developed with his team is an algorithm-controlled propulsion and steering mechanism with two degrees of freedom. "That gives the drones the aerodynamic performance of a helicopter and the mechanical reliability of a quadcopter." ASIO is surrounded by a protective cage, is collision-proof, and allows access to tight spaces to carry out inspections safely. An on-board camera, combined with a high-quality display on the remote control, allows pilots to fly safely in hazardous areas such as oil storage tanks, underground mines, or power plants.

For drones, it's not just the motor that matters

The market for unmanned autonomous aerial vehicles (UAV) is new, but very dynamic—many startups like Flybotix are involved, and there are potential applications in areas like inspection, agriculture, security, and transport. Following the industry's initial ventures and a few setbacks, the safety requirements placed on unmanned aerial vehicles and their components has increased.

maxon has the high-quality drives and the knowledge to develop specialized drone motors that meet these requirements. In 2019, a number of initial drives were constructed for special projects, with matching ESCs (Electronic Speed Controllers). In the drone market, the motor is not the only thing that matters. What is far more important is the perfect interplay of BLDC motors, motor controllers, and matching propellers. That is the only way to get the most out of the system in terms of thrust and energy efficiency. maxon's engineers were eager to learn as much as they could from experts like Samir Bouabdallah and to foster information exchange, right from the start. With the experience gained, maxon is ready to support customers in the fast-growing UAV market with customized motors and systems.

Incidentally, the most talked-about drone in the world, “Ingenuity,” which will take off from the surface of Mars in 2021, is equipped with six maxon DC motors.

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Flybotix' inspection drone ASIO.



The customized maxon BLDC motor.

The Swiss specialist for quality drives

maxon is a developer and manufacturer of brushed and brushless DC motors, as well as gearheads, encoders, controllers, and entire mechatronic systems. maxon drives are used wherever the requirements are particularly high: in NASA's Mars rovers, in surgical power tools, in humanoid robots, and in precision industrial applications, for example. To maintain its leadership in this demanding market, the company invests a considerable share of its annual revenue in research and development. Worldwide, maxon has more than 3000 employees at nine production sites and is represented by sales companies in more than 30 countries.

Flybotix

Flybotix Inc. is a company based in Lausanne, Switzerland. The company develops the inspection drone ASIO, which operates inside industrial facilities and will go on the market at the end of 2020. Flybotix's vision is for drones to autonomously navigate, inspect, and interact with their environment. The company's 10-person team is in the top 100 of Switzerland's best startups. Flybotix is supported by: Venturekick, ESABIC Switzerland, Innosuisse, the Swiss canton of Vaud, and the Platinn network. Its founder and CEO, Dr. Samir Bouabdallah, is a recognized drone expert with 15 years of experience. The main partners of Flybotix include: maxon, Solvay, HEIG-VD, and EPFL. The company closed its seed financing round in 03/2020 (CHF 1.5mio, oversubscribed) and will open its series A round shortly. www.flybotix.com