

Small and ready to conquer the world



A Canadian company has set itself the goal of building the world's smallest and most accurate industrial robot arm. The device is small enough to be held in one hand.

Mecademic was founded in 2013 by Jonathan Coulombe and Ilian Bonev. The two met at the ÉTS engineering university in Montreal where Bonev is a professor. Together, they developed a training robot for colleges and universities before taking a step further with Mecademic. Their goal was to develop an industrial robot that was smaller, more precise, and more intuitive to operate than any of the existing models.

The controller is integrated into the base

Three years later, Bonev and Coulombe finally made it: Their Meca500 is a robot arm with six degrees of freedom and is only half the size of a regular industrial robot. It weighs only five kilograms and the base is about the size of your palm. Nevertheless, it has a load capacity of 500 grams. The controller is integrated, which saves even more space and drastically simplifies operation. It only takes a 24 V power supply, a computer, and an Ethernet cable to program and operate the Meca500.

Compact size due to flat motors

Ilian Bonev is proud of his development: “It was quite a challenge to fit all the components into such a small space.” The drives needed to be small, powerful and compliant with high quality standards. “They simply have to be the best in terms of precision and long service life. After all, they must run for several years in continuous operation.” That’s why Mecademic decided to use brushless flat motors from maxon. These DC motors are renowned for their compact design and high torque. In the Meca500, they are combined with zero-backlash gearheads and high-resolution encoders for precise movements. The robot arm has a repeatability of 0.005 millimeters. That is twenty times less than the thickness of a sheet of printing paper.



The Meca500 has six degrees of freedom and weighs only five kilograms. The controller is integrated into the base.
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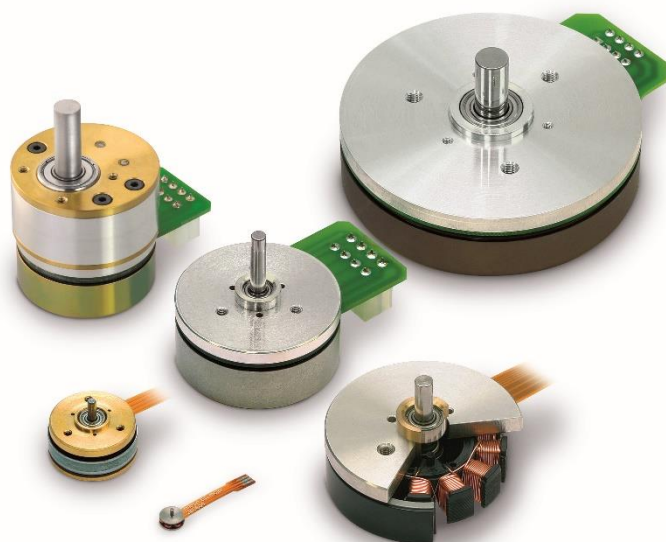


Collaborative robots through firmware updates

“Our goal is to create a new market for industrial robots and automation,” says Ilian Bonev. In the minds of its creators, the Meca500 is only the starting point for a whole line of robots. “We want to offer the smallest and most precise robots for industrial users to pave the way for new products, applications, and discoveries.” New types of robots are already being developed. The start-up is also working on a gripper for the arm. Customers receive firmware updates as soon as they become available. With these updates, the Meca500 will soon be able to function as a collaborative robot, with a function to prevent collisions and a zero gravity mode. Many other applications are possible - the robot arm is ideal to perform pick-and-place or inspection tasks.

Several Meca500 are already in use in various places all over the world, with many more to come. Mecademic handles the production of robot arms in-house to ensure quality. The start-up currently employs eight people. They machine the aluminum parts of the robot arm on precision equipment and assemble the components in-house. On request, the Meca500 can be shipped neatly packaged in a case.

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maxon motor offers a wide selection of brushless flat motors perfectly suited for applications in robotics.
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