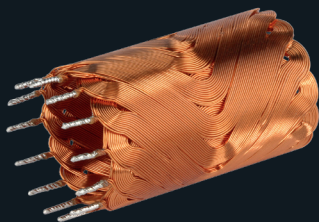


## Drive systems for the aerospace industry



# Change the world with a reliable partner

At maxon, we believe that outstanding engineers and technicians can make a positive impact on the world. This is why we support them in their efforts to go off the beaten path and provide the perfect drive system for their ideas.



View the entire range of products online  
[shop.maxongroup.com](https://shop.maxongroup.com)

# Motors that are out of this world

For more than 20 years, maxon's drive technology has been driving the Mars rovers on the Red Planet. Today, hundreds of drive systems can be found in modern long-haul aircraft. Back here on the ground, maxon and its customers develop drive solutions consisting of individual components or sophisticated technical systems for passenger aircraft, helicopters, spacecrafts and even unmanned aerial vehicles. maxon guarantees the unrivaled quality of its efficient, reliable and powerful drive systems for the aerospace industry. maxon has been EN 9100 certified since 2012. This standard was created especially for companies that develop and produce components for the aerospace industry. In our in-house laboratories, we test our drives for resistance to vibration, shock, cold, heat and vacuum.

The name maxon is synonymous with customized precision and stands for an extensive support network that guarantees the highest Swiss standards all over the world. Our dedicated aerospace team assists customers with simple applications as well as complex, multi-year development projects.

maxon engineers have used the knowledge they have gained from numerous special projects, such as the drives for the Mars missions, to other aerospace projects and have further developed this expertise for serial production. Our state-of-the-art technology and extensive laboratory tests make this possible. We're opening up entirely new possibilities for manned and unmanned aerospace technology.

Here on the ground, maxon and its customers develop drive solutions consisting of individual components.

Our experts can advise you in the following areas



## Aerospace

- **Aircraft control systems:** actuators for small control surfaces, air and liquid valves of all types, fly-by-wire control systems, flaps, air-conditioning systems
- **On-board communication and cabin equipment:** actuators for antennas, window shade systems, power seat adjustment, washing rooms, locking devices for overhead baggage compartments



## Space travel

- Drives for rocket engine valves, solar array drive and deployment. Actuators for docking and separating systems
- Mission-specific mechanisms for research spacecraft and robotic probes, in particular for the Moon and Mars



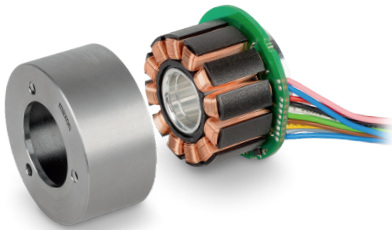
## Unmanned aerial vehicles

- **Infrastructure:** actuators for docking, servicing, starting and landing systems, robotic systems for maintenance work
- **Payload mechanisms:** control surface actuators, electro-optics, gimbal and load drives, winch and load locking mechanisms
- Drive systems consisting of an optimized combination of motor, controller and propeller for multirotor, fixed-wing and VTOL aircraft

## Popular products

### maxon DCX

maxon DCX motors and gearheads feature impressive power density, and their rugged design makes DCX motors a highly dynamic drive for almost any application. For example, the DCX 22 is the champion among maxon's brushed motors. It is easy to configure online and features incredible power and energy efficiency, which can be crucial for battery-operated applications. For space missions, the drive is often reinforced so that it can survive brutal vibrations and impacts.



### EC frameless flat range

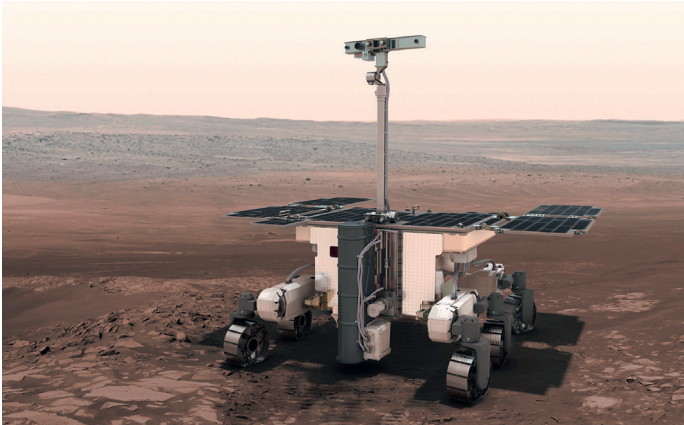
The frameless motor kits consist of only a rotor and stator – with no bearings or motor shaft. With outer diameters of only 45 to 90 mm, they are extremely compact. Their flat design, high torque and plenty of space for cable glands allow for maximum integration with your application.

### maxon EC-4pole 32 HD

maxon's heavy duty product range is specially designed for extremely harsh operating conditions and temperatures up to 200 °C. The maxon EC-4pole 32 HD is ideal for use in environments that are subjected to extreme temperatures, heavy vibrations or ultra-high vacuum. As a result, these drive systems can be used in a variety of aerospace applications, such as: gas turbine starters, the generators of jet engines, regulating combustion engines, or for exploration robots. The motors are often used in conjunction with gearheads. For this, maxon offers the GP 32 HD, a powerful and robust planetary gearhead.



# Actuators for rovers, satellites and spacecrafts



US and European space agencies are relying on maxon drives for their upcoming rover missions to Mars.

NASA's Opportunity rover has been collecting data on Mars for 14 years and has covered more ground than the length of a marathon race. This is thanks to 36 maxon DC motors, which were specially optimized for the red planet. So it comes as no surprise that both the US and European space agencies are relying on maxon drives for their upcoming rover missions to Mars. Our products can also be found in satellites, on the ISS and on space missions exploring alien worlds. The accumulated knowledge from all of these projects benefit our customers here on Earth.

Brushed DC motors, planetary gearheads, and encoders from the maxon X drives series. DCX 22 with graphite brushes combined with a GPX 22 HP. Configurable online. Ready for shipping in 11 working days. [xdrives.maxongroup.com](http://xdrives.maxongroup.com)

- High energy efficiency ensures long battery life
- High power packed into extremely small spaces
- Precise speed or position control
- Very high output torque



# Drives for complex flight systems

maxon quality drives can be found in complex flight systems. Some examples include: autopilot systems for controlling flight altitude via mechanical control surfaces, in auto-throttle systems, as well as in the force feedback joystick of fly-by-wire flight control systems. To meet the requirements of the aviation industry, maxon has developed new production methods to electronically record the data of each individual product automatically during manufacturing. This means even the highest certification requirements can be met.



To meet the requirements of the aviation industry, maxon has developed new production methods.

The brushless ECX Speed 19 combined with a GPX 19 planetary gearhead is configurable online and ready to ship in 11 working days. [xdrives.maxongroup.com](http://xdrives.maxongroup.com)



- High power packed into extremely small spaces
- Precise speed or position control
- Very high output torque
- Negligible cogging torque
- Very narrow tolerances in the motor parameters
- Modifiable to meet DO-160 ambient condition requirements

