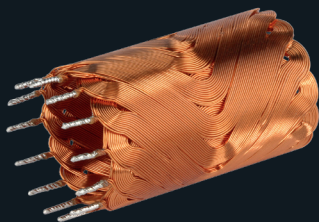


## Drive systems for the automotive industry



# 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)

# Our motors will meet the requirements of the future

With growing pressure to reduce emissions, things are changing in the automotive industry. Electric vehicles are now part of our everyday lives. Each of the approximately 90 million vehicles built worldwide every year contains around 80 electric motors. Over seven billion motors are needed for starters, compressors, pumps, seat adjusters, window regulators, wind-screen wipers, door locks, steering columns, and much more. Many of these motors are based on familiar technology.

But not exclusively: **X-by-wire** is appearing everywhere, together with higher requirements for power, compactness, and safety. At maxon, we develop the motors that will meet the requirements of the future generation of vehicles. As an IATF certified supplier, we are pleased to support our customers from the automotive industry in their new developments.

**There is a big change coming:** A wave of new applications around electrification and autonomization of electric cars. This calls for a new generation of drives with the highest standards of compactness, safety, and precision.

At maxon, we develop the motors that will meet the requirements of the future generation of vehicles.

**x-by-wire:** All functions that were originally driven manually by the driver and that will be actuated by an actuator in the future. For example brake-by-wire, drive-by-wire, shift-by-wire, steer-by-wire.

## Drives for safety-relevant support systems



### Advanced driver assistance systems

→ For example LiDAR

maxon supports its customers by co-creating the safe, flat, and precise drives that are required.



### X-by-wire and actuation

→ For example steer-by-wire, shift-by-wire, brake-by-wire, and many other chassis and powertrain units

maxon supports its customers by co-creating the compact, safe, and powerful motors that are required.

## Advanced driver assistance – LiDAR system

### Compact motor

→ LiDARs need flat and silent motors to safely drive the optical systems

### Robust and high-precision spindle

→ A long lifetime can be achieved by using best-in-class bearing systems that are permanently preloaded

### Accurate and safe position sensor

→ Various position sensing technologies available with different ASIL grades from QM to ASIL-B



### Result: Optimum LiDAR spindle

**LiDAR:** Light Detection and Ranging, a 3D environment scanning system that uses mainly laser light.

# Brake-by-wire – electric service brakes

## **3-phase or 6-phase from 12 V to 48 V**

- The maxon automotive motor concept is suitable for both configurations, coil winding is tailored to precisely match the required working points
- Extremely high copper filling and excellent magnet grade provide unrivalled compactness

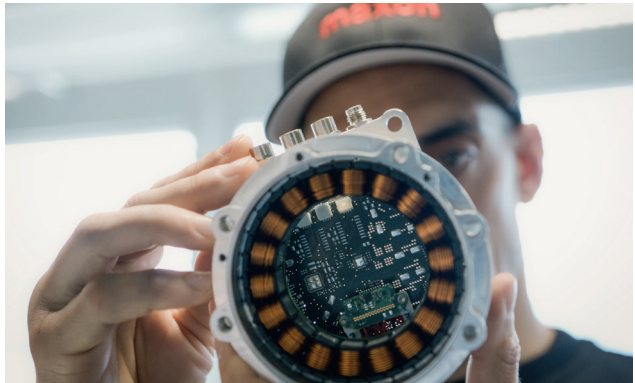
## **Suited to extreme conditions**

- Excellent thermal behavior and highly robust mechanical design to cope with thermal and mechanical loads
- maxon simulation experts are able to perfectly size the required motors and support the customers in achieving the best integration

## **Accurate and safe position sensor**

- Various position sensing technologies available with different ASIL grades from QM to ASIL-B

**Result: Optimum motor integration for safe and powerful actuation.**



Sébastien Buemi, Formula E driver and maxon ambassador, exploring maxon technology

## Our competences



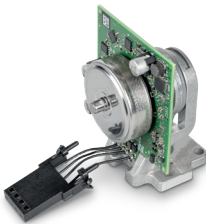
### Technology first

- Competence centers: Motors, magnetic materials, drives, sensors, control units, mechanical integration, gear trains
- Simulation: Strength, physical models, systems, electromagnetism



### Quality

- maxon's quality management system received IATF certification for the development and production of motors with integrated sensors
- maxon has in-house capability for functional safety according to ISO 20262



### Flexible production layout and footprint

- **High volume:** From B-samples to mass production, maxon has capabilities for both manual and fully automatic production lines
- **Premium:** maxon is a specialist in the production of small volumes

Our experts can advise you in the following areas



## Race cars

- The products in our extensive catalog can easily be modified to suit the most varied applications in motor racing: variable geometry turbocharger actuation, pumps, throttles, etc.
- Several levels of customization possible, from small changes to fully tailored designs or processes



## Premium cars

- Cabriolet windshield actuation: High-efficiency motors, planetary gear trains are integrated in a die-cast housing to create the most compact and robust actuator
- Active suspension: High-temperature, highly dynamic application for continuous wheel height adjustments on high-end SUVs



## Automotive high volumes

- Adblue pumps for trucks: EC motor with integrated ECU and die-cast housing
- LiDAR: High-precision spindle with integrated high-accuracy position sensor for LiDARs (under development)
- Electric brake: Motor with high power density for safety applications (under development)

