

A look inside our world of drive systems

We are maxon



↖ Two components, endless possibilities: the stator and rotor of our EC frameless High Torque Motor. The Frameless Series is designed for applications where seamless integration and high performance go hand in hand.

Discover our portfolio starting **on page 43**.

Editorial

Whoever wants to get to know maxon is best off starting not with the products, but with the questions behind them:
How can surgeries be made more precise?
How can robots become more capable?
How can greater efficiency be brought to industry and mobility?

For more than 60 years, maxon has been focused on challenges like these. The result is drive systems used in surgical robots, logistics vehicles, industrial equipment, and even in space. Usually invisible, but often serving a critical function.

What defines our company is the combination of engineering thinking and curiosity. New technologies are not viewed as an end in themselves, but as an opportunity to solve real-world problems. This applies to robotics and digitalization just as much as it does to the next generation of intelligent drive systems.

In this issue, we take a look behind the scenes at maxon: the people, the technologies, and the ideas that shape the company. And, of course, the products that drive us forward.

We hope this publication provides you with an exciting insight into the world of maxon.

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We are maxon

The story of maxon began in Switzerland in 1961 with eight employees. Before long, the company invested in its first own facilities and a small production hall. Today, 3,200 people work for maxon – and we call the whole world our home.



A view of maxon's headquarters in Switzerland: idyllically located on the edge of the village of Sachseln, with Lake Sarnen to the left.

Picture: Jeremias Wieland

Every journey has a beginning – and maxon's began with a government mandate. The German company Braun operated a distribution subsidiary in Switzerland. In the 1950s, Swiss authorities approached Braun with an ultimatum: if the company wanted to continue distributing its products in Switzerland, it would also need to establish manufacturing operations in the country. Preferably in an economically weaker region.

The Braun family complied, choosing the canton of Obwalden in the heart of Switzerland. In 1961, Interelectric AG was founded with eight employees (later renamed maxon) and soon began production. At the time, the company manufactured foil cutters for Braun shavers. But the young company's future was

suddenly at risk: in 1967, Braun was sold to the Gillette Company. Gillette wanted to produce the foil cutters in-house but granted maxon a transition period.

The ironless winding

A new idea was needed and the pioneering era of maxon began. The leadership team saw potential in the production of small, precise electric motors. After a brief research phase, they developed a complete range of DC motors featuring a special patented innovation: the ironless winding. This gave the motors high efficiency, and their long service life set new standards for reliable drive technology.

That first motor series was only the beginning. Innovation has always been a top priority at maxon. Over the years, the

small pioneering operation evolved into a global company. Today, maxon has 3,200 employees worldwide, operates ten production and assembly facilities, and maintains over 40 sales locations.

The company remains owned by the Braun family. Five million drive units leave its production sites each year. The range of applications for our motors is vast: from insulin pumps to logistics robots to NASA's Mars rover, they perform reliably in demanding environments.

What began with regulatory pressure has become an innovative company that has grown and thrived – while never abandoning the pioneering spirit of 1961. That legacy remains deeply rooted in the company to this day and continues to shape its identity.

What we do

System approach

The maxon system approach is diverse. On one hand, we build integrated units consisting of a motor, gearbox, electronics, and, if needed, software. On the other hand, we offer customized solutions for applications in which maxon drives are integrated into a higher-level system.

Customized solutions

We offer the right solution and know-how for every drive challenge. Sometimes a small adjustment is enough, which we are happy to make. But for more complex projects, we also have the expertise required to integrate the drive system into demanding environments.

Frameless BLDC Motors

Frameless Motors consist of a separate stator and rotor and can be integrated into customer-specific designs – including adaptations such as bearings or cable routing. They are ideal for systems engineering, robotics, and high-end applications.

Gearheads

Planetary gearheads are among the smallest precision gearheads and are known for their reliability. Right-angle gearboxes are available in many sizes and can be customized. Strain Wave gearheads enable precise motion and high torque in a compact form factor.

Modularity

maxon drive solutions are based on a modular system. As a customer, you select a drive and can then choose matching gearheads, sensors, controllers, and accessories – either with the selection guide in the catalog or using the configurator in the online shop at www.maxongroup.com.

Servo Motors

Servo Motors enable precise movement thanks to integrated encoders or Hall sensors. They are robust, compact, and easy to integrate – with maxon electronics, customized solutions, or plug-and-play. Their high power density also makes them suitable for mobile applications.

Brushed DC Motors (DC)

Brushed DC Motors feature maxon's patented ironless winding and offer high dynamics, smooth operation, and easy handling. With a broad product range and excellent compatibility with gearheads, they are ideal for fast, cost-efficient solutions.

Sensors and Control Electronics

Sensors and Control Electronics enable precise regulation of position, speed, and torque. Encoders provide accurate feedback, while the electronics link the drive and software into an intelligent, safe, and robust system.

Safety

We continuously expand our portfolio with new safety functions. Our servo motors are available with integrated functional safety. And for safety-critical applications such as aerospace or medical technology, we have extensive expertise with the required certifications.

Brushless DC Motors (BLDC)

BLDC motors offer long service life, low noise, and precise speed control with minimal wear. Their compact design and optional integrated electronics make them well-suited for equipment manufacturing and mobile applications.

Linear Solutions

Linear actuators are ideal for applications such as pipetting, XY-tables, or pick-and-place. They feature robust axial bearings and require no additional external bearings. The spindle mechanism ensures reliable linear motion, while various options allow flexible integration.

Ceramic

Technical ceramics enable precise and robust components for systems where conventional materials reach their limits. They offer high hardness, wear resistance, and stability, making them ideal for components that must operate reliably even under extreme conditions.



Discover maxon

Discover more about maxon, our products, technologies, and solutions – as well as our global presence and the people behind our company.

“We want to help our customers bring their ideas to life”

maxon develops drive systems for Mars missions, surgical robots, industrial automation and many other applications. But what drives the company and where is the technological journey heading? A conversation with CEO Eugen Elmiger about innovation, technology, corporate culture, and the future of maxon.

Eugen Elmiger, if you had to describe maxon in a few sentences: What makes this company special?

maxon stands for precision, quality and the willingness to take on technical challenges. What particularly excites me is that our products fit completely different applications. For example, our drives are used in surgical robots, in industrial plants, in aerospace or even in everyday applications. This diversity shows how broad our technological foundation is. At the same time, we are united by a common attitude: We want to solve problems and help our customers bring their ideas to life. That was the case 30 years ago and is more true today than ever.

You have been with the company since 1991, as CEO since 2011. What has changed the most during this time?

The technology has become much more compact and complex. When I joined maxon, a 10-millimeter motor was considered exceptional. Today, we develop complete drive systems with motor, transmission, sensors and electronics in sizes of just a few millimeters. Our

smallest motor measures just four millimeters in diameter. This also reflects the mindset of our engineers: We never assume that we have reached the end of a technology. This is not just about miniaturization. With each generation, we increase the performance, efficiency and intelligence of our products. This enables applications that were previously hardly imaginable, for example in minimally invasive surgery or in modern robotic systems.

Innovation is an important driver at maxon. What does that mean to you personally?

Innovation starts with curiosity. You have to be willing to ask questions and also pursue ideas that seem unrealistic at first. Many developments do not arise in a regular meeting or in formalized processes. They arise in the exchange between people, in conversation with customers, sometimes even in the case of a spontaneous idea. That's why openness is a central part of our corporate culture for me. We must keep a close eye on how markets and technologies develop, and at the same time have the courage to

invest in new topics at an early stage. But innovation also needs tenacity.

Can you give a concrete example?

A good example is our collaboration with ANYbotics, the Zurich-based company that manufactures four-legged robots. At that time, it was not clear whether walking robots would prevail at all. Nevertheless, we worked with the company early on. Over the years, this collaboration has resulted in our High Efficiency Joints and thus our current robotics platform. Today we see the dynamics that robotics is developing. Such decisions show how important it is to look not only at existing markets, but also at technologies that are in their infancy. This sometimes takes a lot of patience – innovations like this are a matter of years, not months.

Robotics is generally an important future field for maxon.

Absolutely. Robotics has the potential to impact virtually all of our target markets. The combination of robotics, electronics, and intelligent control is particularly exciting. With the High Efficiency Joints,



Eugen Elmiger

→ Eugen Elmiger has served as Chief Executive Officer (CEO) and Vice Chairman of the Board of Directors of the maxon Group since 2011. He began his career at maxon in 1991, where he played a key role in expanding the company's sales business in Asia. Eugen holds a degree in Electrical Engineering from Lucerne University of Applied Sciences and Arts, as well as executive education credentials from the University of St. Gallen and the Stanford Graduate School of Business.

we have developed a product that has met with great customer interest and where we are constantly entering into technological partnerships. We see great potential in industrial applications, medical technology, logistics and many other areas.

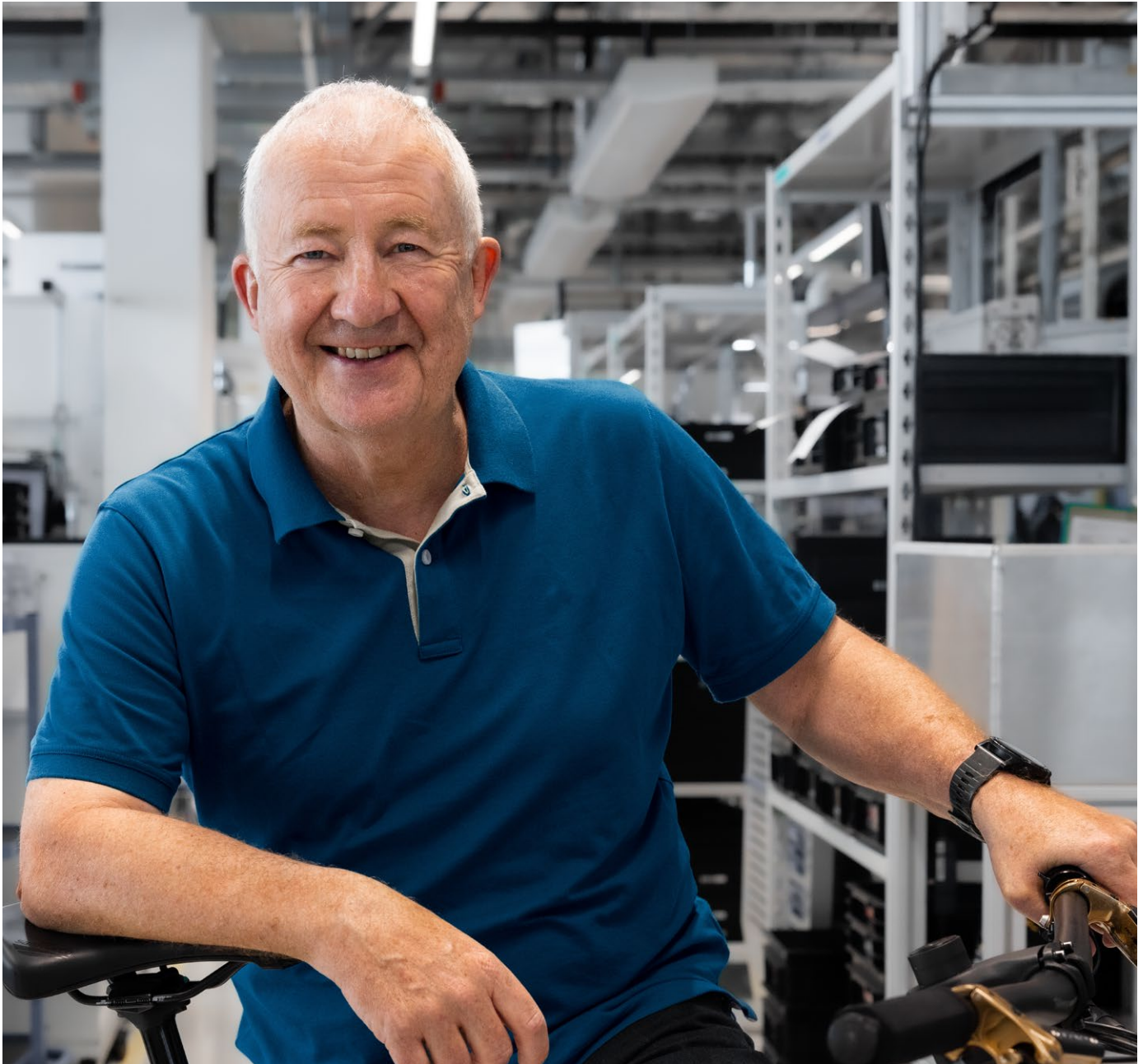
Electronics is also a market that is gaining in importance. What role does it play at maxon?

The motor alone is often no longer sufficient today. The decisive factor is the interaction of mechanics, electronics, software and data. We have thus made targeted investments in the further development of our control systems. Of course, our drive solutions can also be combined with the customer's own electronics. But if the customer relies on our solutions, he gets everything perfectly coordinated and from a single source. In addition, the same applies to electronics as it does to the rest of our portfolio: we can deliver tailor-made solutions to meet every customer need.

maxon also invests in software solutions: with maxon MIND (motion)

Eugen Elmiger in a production hall at maxon's headquarters.

Pf: Andrew Bamford



Eugen Elmiger with a bike: E-bike motors are one of maxon's business areas.

Picture: Jeremias Wieland

insights and diagnostics), our customers can use the drive system as a key element for predictive maintenance. What are the benefits of this solution?

The electric motor is one of the best sensors in an application. Many conclusions can be drawn from the data of a drive. We can see if a system is working optimally or if problems are imminent. This means that we can monitor conditions and identify at an early stage when maintenance makes sense. Such digital services will play an increasingly important role – and they protect customers from downtimes or unpleasant surprises.

In your opinion, which technologies will have the greatest influence on the future in the field of drive technology?

Artificial intelligence will speed up many processes. It can support us in the development, production and analysis of data. In the long term, I see even greater potential in medical technology and biotechnology. People are getting older and want to stay healthy and active for as long as possible. Technologies that improve treatments or create new medical possibilities will therefore become enormously important. Robotics and modern drive systems play a key role here.

For many years, maxon saw itself as a manufacturer of components. For the future, however, the company also wants to give more priority to the systems business. What does that mean exactly?

This brings us to the fundamental question: What is a system? Depending on who you ask in the company, the answer can be different. One thing is clear: When it comes to motors, controls or gears, we have decades of know-how. And often the customer himself does not want to worry about the configuration of each component; he wants a plug-and-play solution that causes him

“The motor alone is often no longer sufficient today. The decisive factor is the interaction of mechanics, electronics, software and data.”

as little headache as possible. That's what we want to provide. I would like to mention the High Efficiency Joints for robotics again: Anyone who orders our robotic joints installs these modules and no longer has to worry about this aspect of a robot. The joint contains everything you need: a motor, a gearbox, electronics and the appropriate firmware. Another example is our Wheel Drive for logistics robots: Here, too, we deliver a finished system, of course tailored to the customer's requirements as always.

Another example of such an integrated system is our BIKEDRIVE AIR S e-bike drive. maxon is also demonstrating endurance in this market.

Yes, we have been working on the topic for ten years, and with heart and soul. Our headquarters are surrounded by wonderful nature, so it's not surprising that there are many bike fans among our employees. So combining this passion with our motor know-how was an obvious choice. The BIKEDRIVE AIR S is the latest iteration of our e-bike drive, and again, it took patience to get to today's solution. I'm convinced of the result: it's compact, it has power, the individual components are perfectly matched to each other – that's how a system has to work.

maxon's solutions are not only used on Earth, but also in space. Is this still an exciting market?

In 1997, the first NASA rover with maxon engines landed on Mars. The space business has gained enormous momentum since then. At that time, space travel

was a state story, today there are also private players in this business. We are seeing this demand; private space companies are moving forward quickly, so we need to ensure short delivery times for them. But we are also interested in manned space travel to the moon as part of NASA's Artemis mission. This is probably the first time that maxon drives will be used in manned spaceflight.

Where do you see further potential in the future maxon portfolio?

Functional safety is a major issue, and our customers are increasingly asking for it. This is a major topic in robotics, for example, because robots and humans are coming into contact more and more closely. But of course also in other areas where safety is paramount. We now have the first solutions on the market, but we will continue to delve into this topic.

The industry is currently in a challenging environment. How do you experience the current situation?

The past few years have shown how important adaptability is. Geopolitical tensions, trade conflicts or supply chain challenges can have a very rapid impact on international companies. What impresses me is the reaction of our teams. When problems arise, our employees look pragmatically for solutions. It is precisely in such phases that the strength of a company becomes apparent.

What did these challenges reveal about maxon?

That we are very resilient as a global organization. We have production and assembly capacities in different regions of the world and are therefore flexible. But even more important is the attitude of our employees. Many teams are working hard to ensure that we can reliably supply our customers. For me, this cohesion is one of maxon's greatest strengths.

Where do you want maxon to develop in the coming years?

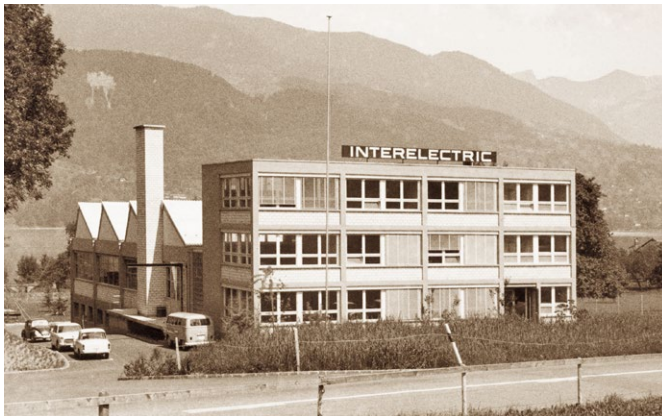
Our strategy focuses on growth areas such as robotics, medical technology, intralogistics, industrial automation and aviation. We want to further expand our position in these markets while strengthening our innovative capabilities. This also includes building up new competencies, for example in system solutions, digitization or functional safety. Our goal is clear: We want to develop the best technical solutions for our customers and grow faster than our markets in the long term.

A final question: What drives you personally?

The opportunity to make a positive contribution with technology. I find it fascinating when our products help to heal people, improve their mobility or make applications possible that were previously unthinkable. In the end, it's always about people. And that's exactly what motivates me: to use our technologies to create solutions that make life a little better. It's something worth striving for every day.

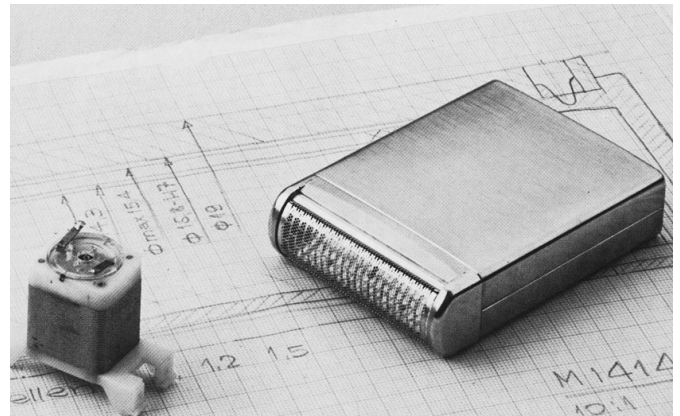
65 years in business

maxon has always been driven by one goal: pushing the boundaries of what's possible even further. When necessary, the company has also reinvented itself. There have been many highlights throughout its history, and we present some of them here.



1961: Founding of Interelectric

On December 5, 1961, Interelectric was founded by the Braun family (and later renamed maxon). Shortly after its founding, the company was able to acquire land in the village of Sachseln in the Swiss canton of Obwalden.



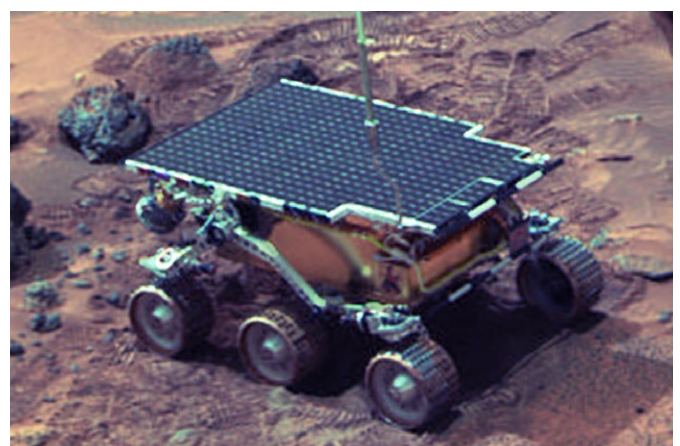
1963: Foil-cutter production

On the newly purchased land, the first production facility is built. It begins manufacturing shaving foils for the legendary "Braun Sixtant" razor. In 1964, the development of electric motors is also initiated.



1983: 10 million motors

maxon needed 11 years to produce its first five million motors. The second five million took only three and a half years. In October 1983, the production of the ten-millionth motor is celebrated.



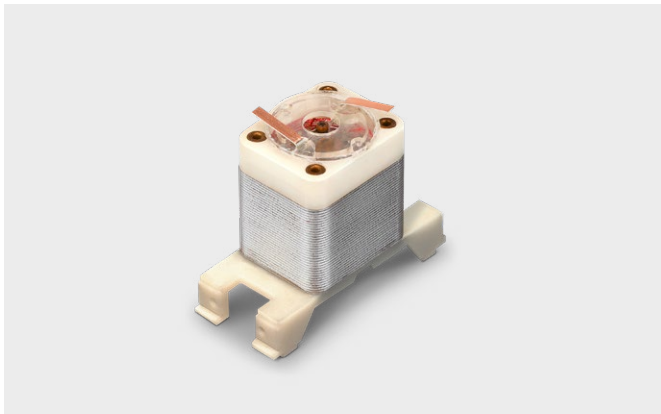
1997: maxon on Mars

On July 4, 1997, NASA's "Sojourner" rover lands on Mars. The probe is powered by eleven maxon motors. This was a sensation and made the small company from Obwalden widely known to the public.

Short film “Dear little Razor”



This short film is a visual journey through maxon's history. It was created for our 60th anniversary in 2021.



1967: The first motors

Braun is sold to Gillette, and Interelectric now fully commits to producing electric motors. During this time, maxon engineers invent the principle of the ironless winding and secure world-wide patents for it.



1979: First subsidiary

Interelectric is already supplying products abroad, but now it begins building its own sales structures. In Munich, the company establishes its first subsidiary, which from then on serves its German customers.



From 2000: Expansion

Since its founding, maxon has grown steadily. In the year 2000, the company reaches 1,000 employees for the first time. maxon continues to invest in innovation and production, expanding its capacities.



2025: Third innovation award

In November, maxon receives the Innovation Award from the Central Switzerland Chamber of Industry and Commerce. The “High Efficiency Joint” robotics joint is honored. maxon previously won the award in 1996 and 2010.

Quality as the foundation of our success

Quality at maxon is more than a technical promise. It is the result of decades of experience, consistent innovation, and a company-wide understanding of quality that shapes every detail.



This is where implantable systems are created: the cleanroom at maxon's headquarters in Sachseln, Switzerland.

Quality shapes all business and production processes at maxon. Clear design standards, defined technical specifications, and strict process control ensure that products consistently meet the highest requirements. This understanding of quality goes beyond measurable product characteristics: it influences how our employees think and act and is firmly rooted in the so-called maxon Quality Mindset.

Uniform standards for quality, safety, and processes apply worldwide. Business and production procedures comply with international standards such as ISO 9001 and ISO 14001. The maxon medical division is certified according to ISO 13485, and drive systems for aerospace applications meet the

requirements of EN 9100. These regulatory frameworks create transparency, comparability, and safety throughout the entire product life cycle – from development to series production. Compliance with these standards is reviewed regularly.

Requirements in the cleanroom

Particularly high standards apply to implantable systems used inside the human body. Their assembly takes place in GMP-certified cleanrooms covering around 1200 square meters. In these areas, particle concentration and microbiological contamination of air and surfaces are continuously monitored and checked for traces of spores, bacteria, or fungi. Employees working in these

cleanrooms receive specialized training and are qualified to comply with the strict requirements.

At maxon, quality is understood holistically and extends beyond products and production processes. All employees must adhere to a Code of Conduct, which serves as a guideline for ethical behavior and professional standards.

There is also a Code of Conduct for suppliers. It defines expectations regarding ethical behavior, social responsibility, and environmental awareness. It is an integral part of the business terms and must be accepted by suppliers upon registration. Compliance is verified through audits and analyses to ensure that suppliers meet the standards of the maxon Group.

Certified to international standards

External audits of our products, structures, and processes provide an outside perspective that ensures compliance with international standards. For our customers, our certifications help simplify their own approval procedures and risk assessments.



Quality: SN EN ISO 9001

The quality management standard ISO 9001 defines quality as the degree to which given requirements are fulfilled. It establishes the requirements for a quality management system that an organization needs to comply with in order to provide products and services that meet customer expectations as well as regulatory requirements. Among these requirements is the need for the management system to undergo a continuous improvement process.



Environment: SN EN ISO 14 001

The internationally recognized standard SN EN ISO 14 001 defines the requirements for an effective environmental management system. It covers all environmentally relevant processes within a company. The standard obliges management and employees to act in an environmentally responsible manner, comply with legal requirements, and continuously optimize processes. Its goal is to reduce environmental impact, use resources efficiently, and sustainably minimize emissions.



Aerospace: EN 9100

Since 2012, maxon has been certified according to EN 9100. This standard is specifically designed for companies that develop and produce components for the aerospace industry. It defines specific requirements for design, development, production, and maintenance to ensure the highest product quality, safety, and reliability. At maxon, it is applied to customer-specific products with the exception of A-max motors and controllers.



Medical devices: SN EN ISO 13485

The international quality standard for medical devices confirms that maxon medical meets the requirements of medical technology to minimize potential risks for patients. All processes and procedures are documented, ensuring full traceability throughout the entire manufacturing and quality assurance process. At maxon, this standard is applied upon request for customer-specific products manufactured at the company's sites in Switzerland and Germany.



Automotive: IATF 16 949

The International Automotive Task Force (IATF) is an association of automotive manufacturers and industry groups that defines quality requirements for the automotive sector. The IATF 16949 standard is an international quality management standard for the automotive supply chain, based on ISO 9001, and outlines the requirements for manufacturing products for the automotive market. At maxon, implementation takes place as part of customer-specific projects.



Information security: ISO/IEC 27001

ISO/IEC 27001 is the globally recognized standard that defines the requirements for establishing, operating, and improving an information security management system (ISMS). The goal of an ISMS is to manage risks to the confidentiality, integrity, and availability of information assets in alignment with an organization's objectives. ISO 27001 includes a set of best-practice controls designed to mitigate risks associated with sensitive information.

“Customer-specific solutions are in our DNA”

Stefan Müller is responsible for maxon’s technological direction. In this interview, he explains why systems thinking, close customer collaboration, and technological depth are inseparable – and why motion control is increasingly becoming a core capability.

Stefan Müller, if you were introducing maxon today to someone who does not yet know the company, how would you describe the essence of what we do?

At our core, we develop drive solutions comprising compact, highly efficient motors and gearheads, generally for highly demanding applications. Our solutions are used in medical technology, robotics, automation and aerospace. The easiest way to explain this is through applications. In laboratory automation, we move samples. In intralogistics, our drive solutions enable mobile robots to store and retrieve goods precisely and safely. In medical technology, we ensure the reliable delivery of insulin. Examples like these help most people understand what we actually do. Ultimately, all these applications are about motion control: adapting movement precisely to the task at hand and meeting the customer’s requirements as effectively as possible.

How has maxon’s approach changed in recent years?

What has not changed is the way we work. We are at our best when we collaborate very closely with our custom-

ers and develop solutions together. That has been part of maxon’s DNA for many years. What has changed most is the applications – and, with them, our products. They have become more powerful and more complex. Today, we deliver far more highly integrated mechatronic solutions in which the motor, gearhead, encoder, electronics and software work together. Integrated systems that include control electronics are becoming more important – solutions in which mechanics, electronics, and software are considered as a single unit. We are increasingly taking responsibility for the integration ourselves. This brings maxon closer to the customer’s actual application, making close collaboration with the customer even more important.

What personally excites you about technology and development at maxon?

My background is in electrical engineering, and I have worked with electric drives for many years. What particularly fascinates me is the interaction between the motor, electronics, gearhead and control system. Truly optimal solutions can only be created when these disciplines are considered together – and

that is something we place great importance on at maxon.

maxon has a very broad portfolio. From a developer’s perspective, what is the real strength of that breadth?

The strength lies in our deep technology base. Depending on the application, we can select precisely the right solution – from different motor concepts and gearheads to electronics. This breadth allows us to think freely and choose the solution that makes the most sense, both technically and commercially. It also enables us to develop system solutions without being constrained by a particular technology from the outset.

Where does a component end, and where does a system begin?

That depends very much on the customer and the application. Some customers deliberately want components only, while others are looking for integrated solutions. Both approaches have their place. The important point is that systems only perform well when the underlying components are first-class. Motion control becomes the central element precisely at this interface – where



The importance of integrated systems is continuously increasing, says maxon CTO Stefan Müller.

Picture: Philipp Schmidli

The High Efficiency Joint from maxon:
An integrated robotic joint consisting of a
motor, gearbox, controller, and firmware.
Bild: Jeremias Wieland



“maxon's strength lies in our deep technology base. Depending on the application, we can select precisely the right solution.”



Stefan Müller

→ Dr Stefan Müller has been Chief Technology Officer of the maxon Group since 2022 and is responsible for the company's technological strategy. He joined maxon in 2017 and holds a doctorate in electrical engineering from the University of Stuttgart (Germany).

individual components become a functioning system. That is why we continue to invest heavily in the development of key technologies and develop systems wherever they provide clear added value for the customer. It is not an either-or choice, but a deliberate balance.

What role do platforms and customization play in this combination?

Platforms provide the foundation for implementing customer-specific solutions efficiently and with manageable risk. Once the core technology and production processes have been established, we can respond more quickly and make targeted adaptations. Not every project can be based entirely on existing platforms. In such cases, it is important to communicate development risks openly – particularly with highly integrated systems.

How do you balance innovation and stability in development?

It is a classic trade-off. That is why we have dedicated advanced development teams that focus on new technologies while working closely with customers, universities and partners. For us, innovation does not mean immediately pursuing every new idea. It means deliberately deciding which technologies offer genuine added value and are mature enough to be integrated into products and platforms for the long term.

Many current trends revolve around AI, robotics and automation. What role does motion control play here?

These topics are closely connected.

AI is fundamentally changing robotics. Robots are leaving protected areas and moving into unstructured environments. They are also interacting increasingly with people, for example in logistics or industrial applications. In these applications, motion control becomes a key technology because systems are becoming more complex, more connected and more dependent on context. This requires functional safety, as humans and machines work in increasingly close proximity. This development is not a short-term hype. It will remain with us for many years. Alongside these visible trends, there are also topics that may seem less exciting, such as new regulatory requirements and ensuring robust production processes and supply chains. However, these are crucial if innovative technologies are to be used reliably in practice.

What advice would you give young engineers starting at maxon today?

Find what genuinely interests you and become good at it – without allowing yourself to be guided too much by short-term trends. I have seen for myself how hypes change. Ultimately, what matters is doing something that continues to give you satisfaction over the long term.

What distinguishes a good technical solution from a truly compelling one?

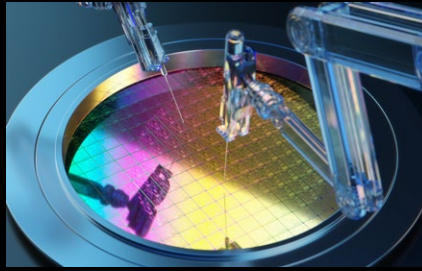
A truly compelling solution does not only work under ideal conditions. It is well thought out, stable and reliable in everyday use. That is where genuine technological depth and systems understanding become apparent.

Our expertise

Mechatronic drive solutions from maxon are used in a wide variety of applications. They help keep the air clean and support medical systems. They enable scientific observation in space and make mobility on Earth safer and more comfortable. They help preserve quality of life, use resources more efficiently, and drive technological progress. On the following pages, we provide an overview of the markets and fields in which maxon has extensive experience and specific expertise.



Medical technology – page 20



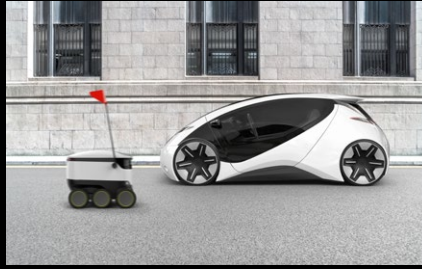
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System solutions – page 40

In service of better quality of life

When our health is at stake, trust and responsibility matter more than data sheets. Questions of safety and long-term partnership therefore stand at the beginning of every development in the medical field.



The closer technology gets to the human body, the more important it becomes that mechanical movement is executed exactly as the task requires – whether during robot-assisted surgery, in hand and leg prosthetics, or in an implant that performs vital functions. Only when safety has top priority can trust in technology emerge.

Innovation in a regulated market

Work on or inside the body often takes place in extremely tight spaces. It is no coincidence that our smallest drive comes from the medical field. It is based on a platform product that has been enhanced through targeted modifications.

From prototype to series production, all processes remain traceable and verifiable. This requires long-term product

- Precise, quiet, and durable drive systems for use in and on the human body
- Predictable behavior, low heat generation, and long product availability
- Suitable for use in safety-critical applications

availability, controlled supply chains, and documented manufacturing. At the same time, applications demand extremely compact dimensions, high power density, low heat generation, and as many sterilization cycles as possible. Only

under these conditions is innovation in a regulated environment enabled.

By relying on proven technology and deep process expertise, it was possible to achieve the necessary additional certifications – for example, to power implants, for which the 4-millimeter-diameter drive is particularly well suited.

Trustworthy technology requires not only safety but also time. Development under strict regulatory conditions, long product life cycles, and consistent performance over many years leave no room for shortcuts. When it comes to reliable medical technology and quality of life in everyday use, our responsibility does not end with delivery – it begins there, supporting healthcare professionals patients dependable performance throughout stage of the product lifecycle.



In the operating room

In the operating room, there is no space for imprecision. Our force-feedback solutions transmit slightest resistance. Movements of scalpels, lasers, or tools stop where they are supposed to. Dynamic processes follow paths. We develop drives so that technology remains controllable at times.



Inside the body

Medical technology cannot fully replace a heart. But it can relieve it, stabilize it, and take over some of its functions. maxon develops solutions for use inside the body that people can trust. Reliability and predictability are essential when technology is expected to provide support over long periods of time.



In therapy

When every drop counts: dialysis machines or insulin pumps enable quality of life when they operate with precision and reliability. Our drives must prove themselves over long periods in daily use, whether mobile or stationary. Reproducible movements and controlled delivery volumes are essential for this.

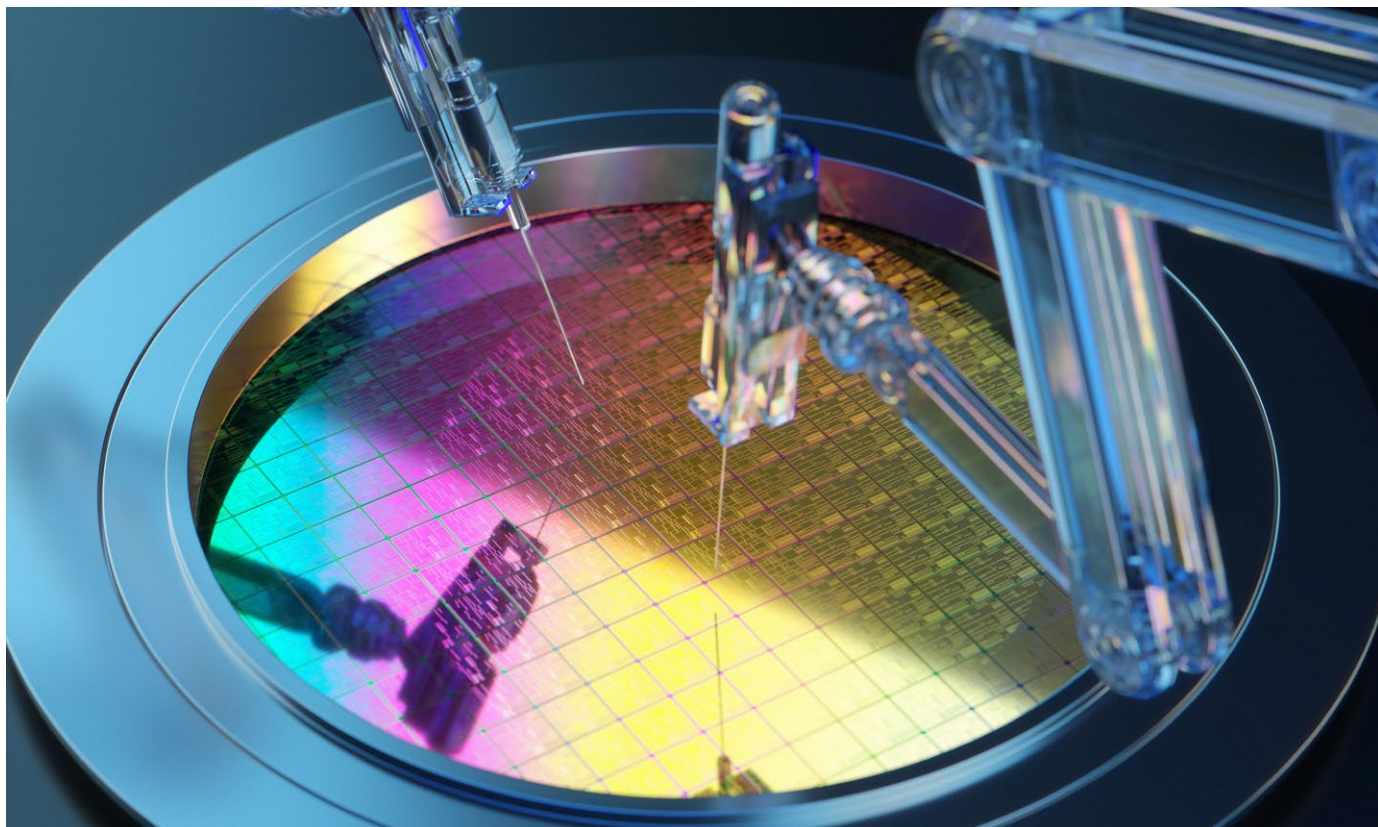


Rehabilitation and prosthetics

Regaining health is a process that can sometimes take years. It almost always requires individual solutions – just like the ones we develop at maxon. In this dialogue, people and technology benefit from each other: prosthetics and training devices become more ergonomic, and people regain freedom of movement.

The learning factory

Processes are becoming more efficient, machines more flexible, and production systems increasingly autonomous. Modern installations not only automate workflows, they also capture states, detect deviations, and respond to them in a targeted way.



Driven by productivity, quality, and reliability, systems are emerging that continuously optimize themselves – from individual process steps to fully networked production environments.

The key to this is the interaction of mechanics, drive technology, control systems, and software. Only when motion, control, and system logic are considered as an integrated whole does automation become a learning system. In production lines, robotic cells, or autonomous systems, drive solutions provide far more than motion. They capture loads, dynamics, and operating states, making processes transparent – revealing data that was previously hidden.

As a central element of many machines, the drive is an ideal indicator of the overall system's condition. Combined with intelligent electronics and

- High-precision and reproducible movements for automated processes
- High integration, long service life, and certifiable safety functions
- Stable operation from standalone machines to full production lines

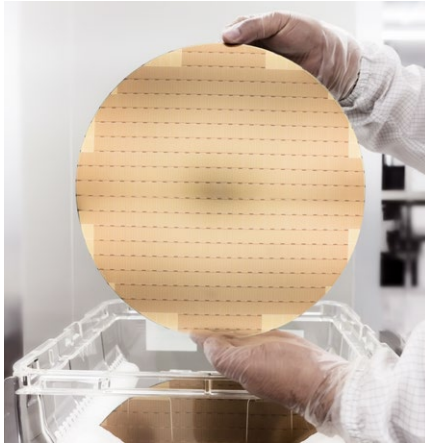
software, temperature profiles or deviations in operating behavior can be continuously analyzed. Solutions such as maxon MIND use this data to provide insights into machine condition, process stability, and remaining service life. In this way, the drive becomes a sensor; data

becomes the foundation for predictive maintenance and optimized processes. Safety is a fundamental requirement of modern automation solutions. As human-machine collaboration increases, production concepts grow more flexible and systems more connected, raising the demands on planning and implementation in industrial environments.

Safety as part of the system design

Functional safety is not a standalone measure but part of the entire system design. It begins at the drive level, continues through control and software, and spans the entire life cycle of a system – from design and commissioning to daily operation.

Only through comprehensive systems thinking can safety, performance, and flexibility be brought into alignment.



Semiconductor industry

In semiconductor manufacturing, precision, repeatability, and process reliability are essential. maxon drive systems are designed specifically to meet these requirements. As integrated solutions combining motor, gearhead, encoder, and controller, they are used in both wafer production and wafer processing, as well as in PCB assembly.



Energy and infrastructure sector

In energy and infrastructure applications, reliability, long operating times, and robust design are essential. Our drives are engineered to operate under varying environmental conditions as well as high mechanical loads. This is why they are used in solar-tracking systems, maintenance robots, and decentralized energy installations.



Measuring and testing

Measuring and testing systems require controlled movements and high repeatability. Drives from maxon are engineered for precise positioning, smooth operation, and stable reference points. They are used in test benches, calibration systems, and automated testing equipment where measurement results must remain reliably comparable.



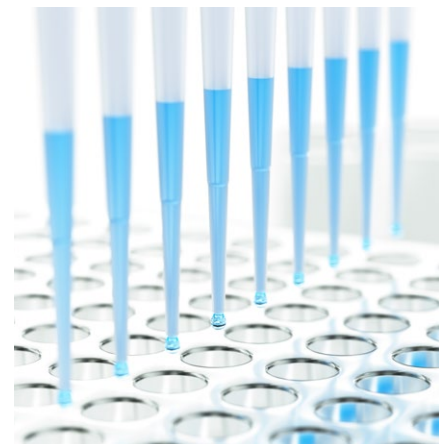
Power tools manufacturers

Power tools place high demands on power density, robustness, and controllable behavior. maxon drive systems are built for dynamic load changes and for use under real and tough working conditions. They are used in professional hand tools as well as specialized industrial tools, even under the most extreme conditions.



Optical systems

In optical systems such as cameras, sensing equipment, or laser technology, the smallest, reproducible movements determine focus, alignment, and image quality. What is required are drives that enable precise and stable positioning movements in a compact design. This ensures that optical performance can be reliably reproduced over long periods of time.



Laboratory automation

In automated laboratories, precision, throughput, and reproducible results are essential. maxon's drive solutions are designed for continuous movements and exact positioning in analysis and handling processes. They are used in areas such as dispensing systems, sample handling, decapping, and automated analysis devices.

Responsibility above the clouds

Building an aircraft means accountability – from the hangar to takeoff and landing. This is only possible with experienced partners.



The service life of an aircraft is 25 to 35 years. New and replacement parts must remain available in consistent quality throughout the product life cycle. The aviation industry is highly regulated and requires evidence, traceability, and certified processes down to the component level.

Requirements have increased in years. Drive systems and actuators must be durable and. At the same time, efficiency, material origin, and environmental compatibility are gaining importance. documentation is essential.

Because of the high altitudes of up to 10 000 meters, our drives are designed to withstand environmental conditions. Drive systems are designed and tested for temperature fluctuations, shocks, vibrations, and moisture to ensure predictable and reliable behavior. A long

- Reliable drive solutions for safety-critical onboard applications
- Haptic feedback and controllable operating forces for human-machine interfaces
- Proven in aerospace applications with high demands on safety and service life

service life is both expected and required, even under harsh conditions.

maxon relies on many years of experience from aviation projects and on processes that meet the requirements of the aerospace industry (EN 9100). A equipped test laboratory, test procedures, and design considerations are

based on real operating profiles. Reliable data and models form the basis for flawless functionality and maintenance. maxon develops electric drive solutions in the context of their application. Mechanics, electronics, control, and integration are considered together.

Stable and predictable solutions

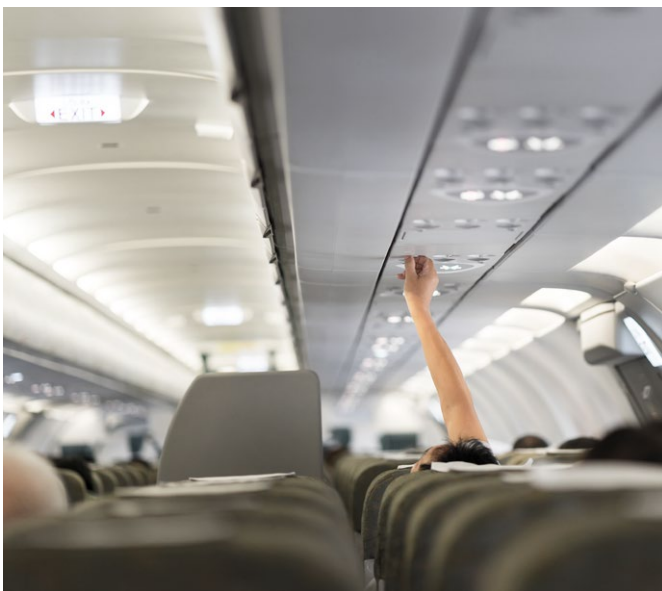
Where customer-specific solutions are required, we support projects from the concept phase through series production. The focus is on stable, predictable solutions throughout the entire life cycle – whether in the cockpit, the passenger cabin, or ground systems.

The electrification of aviation is progressing. Concepts such as drones, small aircraft, or ground-based drive solutions will rely less on fossil fuels in the. The responsibility remains.



In the cockpit

Haptic feedback, clearly defined operating forces, and predictable behavior support pilots in every phase of flight. Whether classic control elements or new cockpit concepts, maxon ensures that the interaction between human and machine is clear, precise, and fully controllable – from takeoff to landing.



On board and in operation

maxon drive solutions perform many tasks: they regulate climate and airflow, move cabin or seat components, and contribute to the comfort of crew and passengers over thousands of flight hours. Quiet operation, a compact design, and an architecture that remains stable and low-maintenance over decades are essential.



Reliable in the background

Many systems wait in the background until they are needed. Our drives for locks, flaps, valves, pumps, and release and redundancy mechanisms remain unobtrusive during normal operation and respond reliably in critical situations. They also contribute to safety in radar, antenna, tracking, and support systems.



In electric aviation

This is where maxon's proven experience meets new applications: electric flight concepts and new platforms place different demands on drive systems and infrastructure. Efficiency, weight, and scalability move into focus – without compromising on safety, quality, or traceability.

Between market logic and mission assurance

The space sector was long a closed system with clearly defined rules. In this environment, maxon gained experience over many years. Today, this know-how is equally relevant in “New Space.”



Space was governed for a long time by the principle of “mission assurance”: every mission must work on the first attempt. Errors are eliminated before launch. Meticulous tests, reviews, and redundancies are intended to mitigate every possible risk. In short: the chances of success are maximized on Earth before a rocket ever leaves the ground.

The result of this approach: low volumes, but extensive testing and quality assurance of all delivered components. maxon has around 30 years of experience in this environment and has built long-term partnerships along the way.

Space becomes a market

The situation has changed significantly in recent years. In addition to established government organizations, private space companies have emerged. They have

- Space-proven drives for precise movements with minimal resources
- Modular platforms for single missions and series applications in New Space
- Balance between mission assurance and iteration for new market requirements

distinguished themselves with spectacular missions and innovations: reusable launch vehicles, satellite constellations, even plans for the colonization of Mars. And with the growing number of objects in orbit, also projects to clean up accumulating space debris.

The private actors in New Space take a different approach: no less demanding, but closer to the market. Costs are to be optimized, and development cycles are becoming faster. Mission assurance is replaced by an iterative approach: a rocket that does not reach its target is not a failure but a valuable source of data – following the premise “fly early, learn often.” The consequence: higher volumes and the expectation that development, testing, and production be much more tightly integrated.

maxon's role in New Space lies in combining mission-assurance expertise with iterative development capability. The foundation is repeatable, modular platforms and differentiated risk management. In space, old and new are not opposites – they drive progress on Earth and beyond.



In unfamiliar environments

Whether rovers, robotic arms, or sample handling: precise drives enable controlled movements – even under the extreme conditions found on planets, moons, or in space. maxon combines flight experience with modular platforms, from single missions to repeatable systems.



In orbit

In satellites, our drives ensure alignment, deployment, and secure locking. They must deliver reliability, a compact design, and scalability – from single units to series applications. This applies even under repeated maneuvers, limited energy resources, and long mission durations.



On launch and beyond

Drives in launch systems, valves, or coupling mechanisms must withstand high loads. They operate under vacuum, temperature fluctuations, and strong accelerations. This is where traditional mission-assurance requirements meet the efficiency and cost pressures of new market actors.

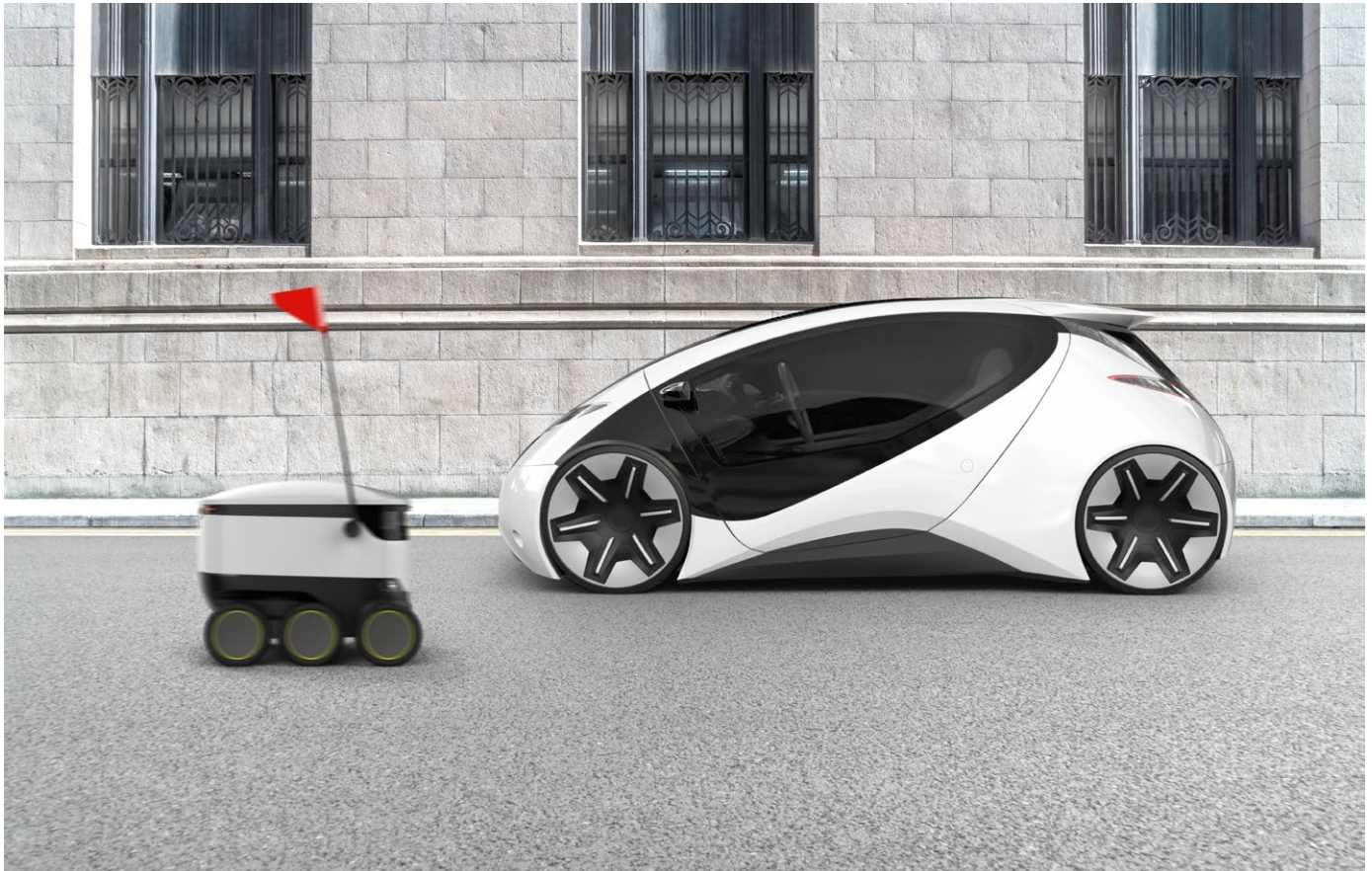


In scalable missions

Satellite constellations require higher volumes and short development cycles. maxon supports this approach with industrially proven, space-capable platforms and tiered qualification depending on the mission profile. This allows series production to be meaningfully combined with mission-specific requirements.

Engineered for motion

Mobile systems must prove themselves on roads, rails, in factory halls, underwater, or in the field – all while constantly cycling through acceleration, travel, braking, and standstill.



What moves in the field is constantly exposed to external influences. Dust, moisture, vibrations, temperature fluctuations, and changing loads are part of everyday operation. Many applications also carry their own energy supply. That's why the drives must offer high efficiency, compact integrability, and optimized weight. In continuous operation, they must, of course, remain stable.

Developed for mobile systems

This situation places special demands on how drive components work together. Installation space, weight, energy management, and thermal behavior must be considered just as much as integration into moving or mobile platforms.

- Reliable and safe drive systems for mobile applications
- Compact design with high power density and efficiency for autonomous and semi-autonomous systems
- Functional safety as part of the integrated system

maxon combines motors, gearheads, encoders, electronics, and software into fully harmonized drive systems specifically developed for mobile, battery-powered systems. For developers, this means less coordination effort, clearly

defined interfaces, and a reliable foundation for series implementation.

Adaptable in operation

Mobile applications are exposed to changing environmental conditions as well as varying load and regulatory requirements. That's why maxon develops efficient, compact, and weight-optimized drive systems that are designed from the outset for real operating profiles.

Customer-specific configurations – from modified interfaces to fully integrated, certified system solutions – are standard. Integrated safety architectures and life-cycle-oriented further development ensure reliable and safe operation for our customers.



In logistics

Autonomous vehicles, shuttles, and lift systems shape modern logistics processes. These require maximum operational safety and 24/7 system availability. maxon supplies application-optimized drive systems designed for the real load profiles and environmental conditions found in logistics.



In the automotive industry

Modern vehicles integrate a wide range of actuators. maxon develops scalable drive solutions for pumps, valves, and safety-relevant functions. The systems are designed for high mechanical robustness, excellent control performance, and maximum fault tolerance in accordance with automotive standards.



In everyday life

Automatic doors and locking systems in elevators, trains, or buildings must operate quietly, precisely, and with long-term reliability. maxon offers robust and highly efficient drives that meet demanding lifetime requirements and deliver strong performance and high power density.

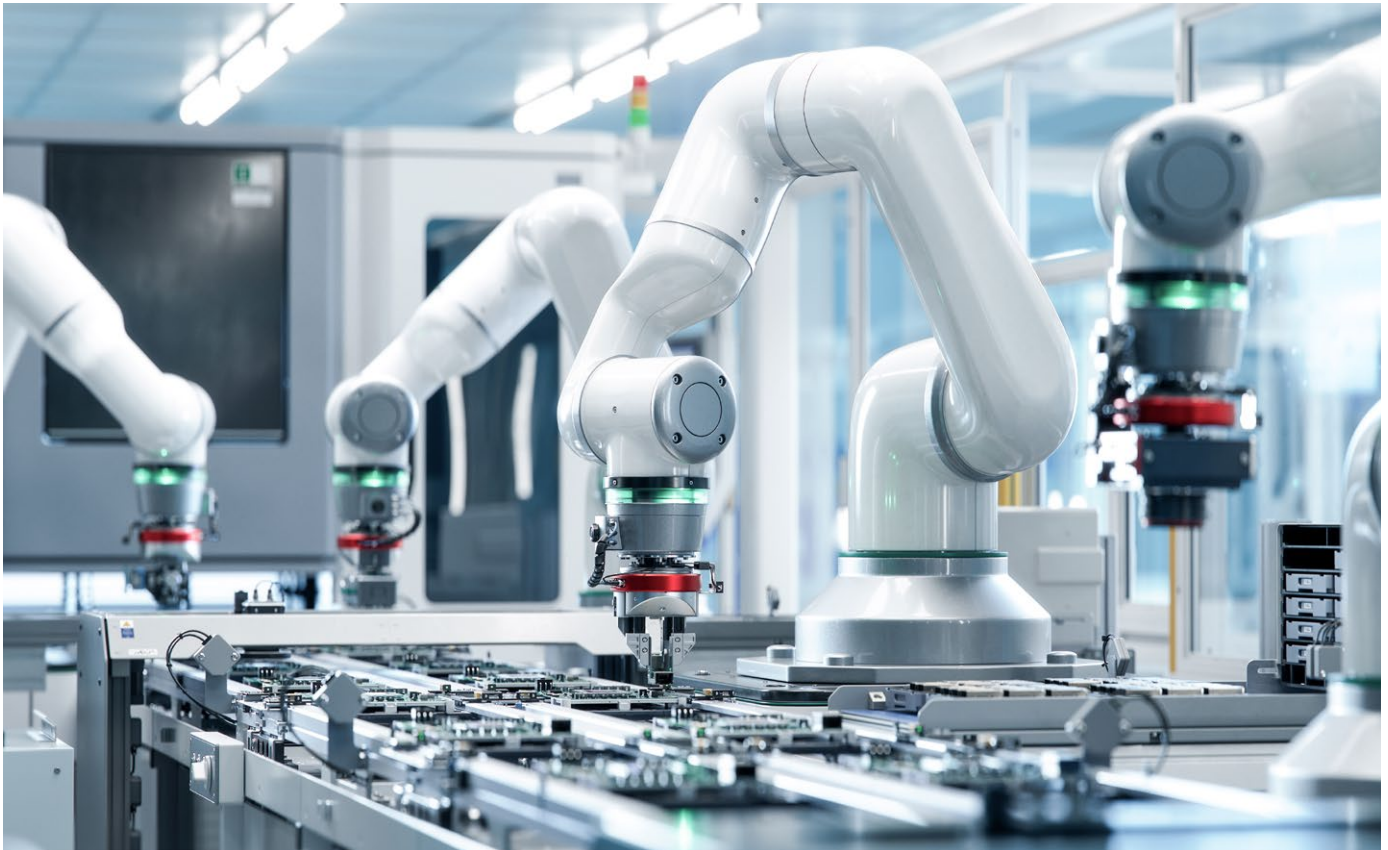


In maritime environments

Maritime applications are exposed to extreme environmental conditions. Our drive solutions are designed for high hydrostatic pressure, corrosive saltwater exposure, and long operating durations. This includes standardized thrusters and actuators that withstand pressures of up to 600 bar (6000 m water depth).

The force behind robotics

Building a robot requires expertise in mechanics, electronics, software, and system integration. When all drive components come from a single source, it changes the rules of the game.



Robotics is the search for the perfect combination of mechanics, electronics, software, safety, and life-cycle management. More than almost any other field, it shows that complexity does not arise from individual parts, but from how they interact.

It is not the weight of a single drive that matters, but the weight distribution of the entire system. It is not only the precise control of individual axes that counts, but the robot's behavior within its environment. Added to this are standards and certifications that every component must meet.

Robots operate in widely different environments: on Earth, in space, underwater, or in settings they share with humans. Today, they perform tasks ranging from surgical procedures to industrial

- Integrated drive systems for dynamic and energy-efficient movements
- Functional safety as part of the system architecture for human-robot interaction
- Scalable from individual axes to complex robotic system

manufacturing and mobile or autonomous systems. Accordingly, the requirements for dynamics, safety, integration, and service life vary greatly.

Building a robot should therefore begin with a discussion of architecture, safety, and life-cycle considerations. This becomes significantly easier when

drive and control are conceived and integrated as one coherent system – exactly as maxon has implemented for years in platform-based robotics solutions such as our High Efficiency Joints.

Clarity from the planning phase

This not only makes the process simpler, but also more efficient: more compact joints, integrated actuators, and reduced interfaces are created already during planning. This saves cables and connectors while simplifying integration, project communication, and certification.

This clear division of roles creates freedom in the development process. Integration risks are recognized early, and iterations become faster. These are ideal conditions for a long-term partnership: you design robots – we power them.



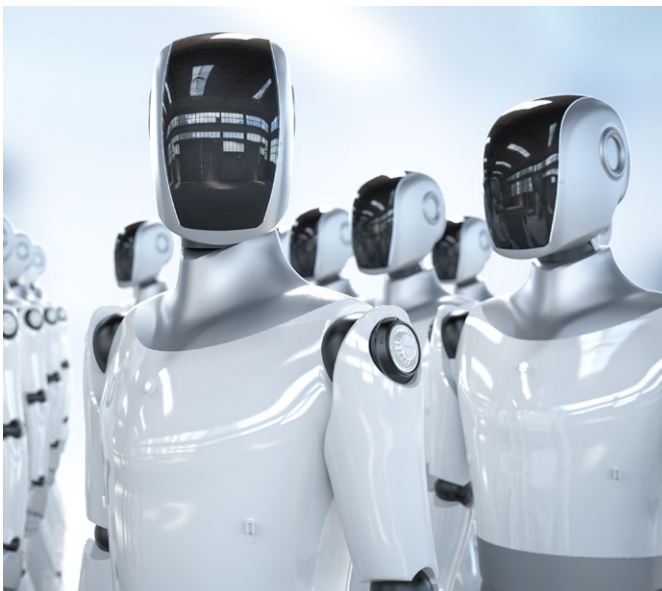
For delicate movements

Robots take on tasks where motion must be precise, repeatable, and controllable. This applies to industrial applications as much as to mobile systems or precision-critical fields such as surgical robotics. What matters is the interaction between drive, control, and mechanics.



In industry

Industrial robots are designed for continuous operation. They move, grip, and position in a fixed rhythm – often over millions of cycles. What matters is that drive units work together reliably and can be seamlessly integrated into higher-level systems. Our solutions are designed precisely for this.



In motion

Mobile and humanoid robots move in environments that are not predictable. Stability does not come from mechanics alone, but from integrated drive systems that balance weight, dynamics, and energy efficiency. Our experience with different platforms flows directly into these systems.



Working together

In warehouses, hospitals, or public spaces, robots are part of everyday life. They must operate reliably without drawing attention or disrupting workflows. A systemic approach to the drive simplifies integration and operation – and provides the foundation for long deployment times under changing requirements.

Tech meets ride

Anyone who rides a bike can tell whether a drive fits. Not because it draws attention to itself, but because the technology fades into the background. maxon's BIKEDRIVE AIR S provides support when needed – while leaving room for the pure riding experience.



The e-bike drive BIKEDRIVE AIR S was developed as a lightweight full-power system with a clear philosophy: it should be light, powerful, yet quiet and unobtrusive. Not as much power as possible, but exactly the right amount. The full extent of maxon's expertise has gone into its development.

Light and adaptable

The result adds not a gram too much. Battery, control unit, and drive system fit together seamlessly. Insights from real riding profiles enable finely tuned power delivery. Optional fine-tuning of system characteristics allows the behavior of the drive system to be tailored even more directly to individual needs. The riding experience is the focus – this is

- Drive as part of the overall system of bike, battery, software, and interface
- Natural riding feel through finely tuned power delivery
- Lightweight construction with power reserves for sporty e-bike concepts

where the maxon development team places its uncompromising attention. When more power is needed, transitions remain smooth, like a subtle tailwind. The rider remains at the center of the experience.

The philosophy behind the drive becomes evident at first glance – or not: the technology is barely noticeable at first sight. But with the first pedal stroke, the support becomes tangible. The design and form factor allow the system to integrate perfectly into the frame. This gives bike manufacturers more freedom and flexibility in bike design.

Developing an e-bike drive is a discipline of its own because it doesn't just move a machine; it directly amplifies human muscle power. This expertise and these values can also be felt on the trail. Designed for continuous operation, changing conditions, and long life cycles. After all, what works under extreme conditions on Mars should also prove itself on the mountain trail.



In the drive

When the terrain gets steep or the surface changes, support is needed. The BIKEDRIVE AIR S delivers it instantly – with up to 90 Nm of torque at just 2 kilograms of weight. When support isn't needed, the drive fades into the background; the power remains noticeable but never dominant. The rhythm of the ride stays intact.



Engineered as a system

A drive does not operate on its own. Weight, form factor, and power delivery in the BIKEDRIVE AIR S are designed to work in harmony with the frame, kinematics, and suspension. The result is a bike that feels balanced – whether riding uphill or downhill. The drive disappears into the frame.



The right energy

Energy must match the application. The BIKEDRIVE AIR S is available with 400 or 600 Wh and can be expanded with a 250 Wh range extender if needed. This keeps the system light and balanced, while the range is available where it's needed. The bike isn't unnecessarily weighed down.



Immediate insight

A quick glance downward is all it takes: the display shows the riding mode and the battery's charge level clearly and reliably. The interface is intentionally minimal so you can stay focused on the trail at all times. Anyone who wants more information can connect the control unit to a smartphone via Bluetooth.

How intelligence enters the drive

When fractions of micrometers and seconds determine the success or failure of a task, control electronics become essential. Motion control is the art of generating mechanical movements, regulating them precisely, and perfecting them.



Motion control appears in a surgical robot operating with micrometer precision between vital organs. In a satellite that adjusts its position. In a turntable that orchestrates tonearm and vinyl so music plays steadily and without distortion. Or in a humanoid robot whose movement appears almost alive.

No matter how delicate, powerful, or dynamic the task may be – mastering the interplay of drive, sensing, control, and mechanics requires intelligence in the drive. Motion control keeps the entire system in view: How does a movement behave when a single parameter changes? How does a machine remain functional when dynamics shift?

Movement is not the random result of rotating motors; it is the true function of the application. Its core. Motion control

- Motion control at maxon connects drive, electronics, and control
- Focus on predictable behavior, repeatability, and integration, including in safety-critical applications
- Our control electronics are scalable from simple applications to complex multi-axis systems

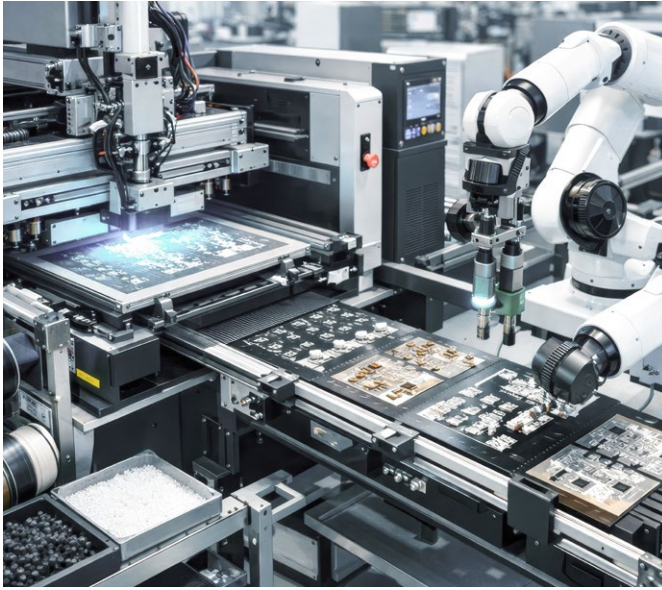
ensures that this core beats continuously and reliably.

At maxon, motion control does not emerge in isolation but from the

interaction of all levels – from the drive and control electronics to system integration and software. Not as a fixed concept, but as a variable interplay of feedback, control loops, and dependencies.

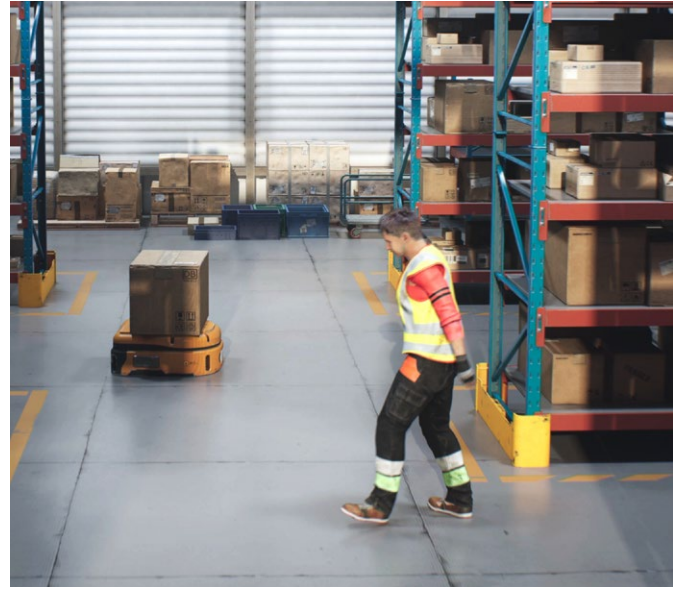
Performance and movement

Our drive units deliver the necessary performance; that is the foundation. What matters, however, is how motors can be controlled in real-world operation: in real time, with stability and precision. Even under load and in demanding environments. Whether in an operating room, in space, or out in the field. Only when complex motion sequences can be reliably repeated – dozens, hundreds, or thousands of times – are we satisfied. Rigorous testing procedures under extreme conditions provide this foundation.



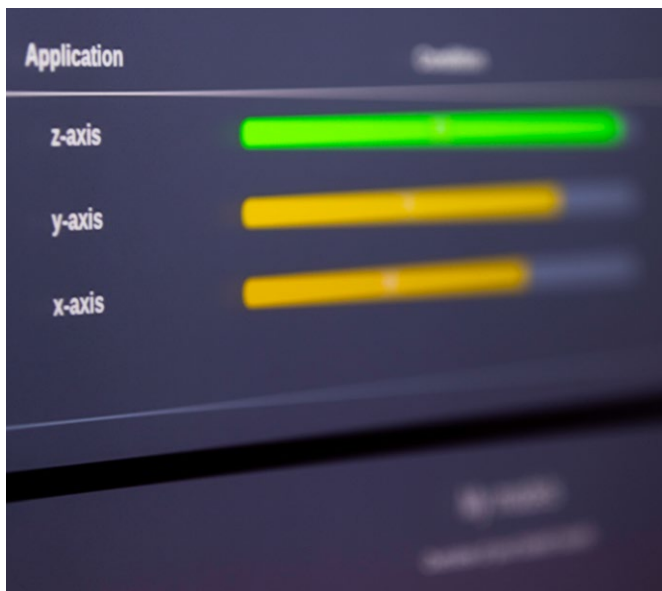
Thinking in systems

Every system brings its own logic. This requires thinking in variables and dependencies. The right feedback makes behavior traceable. Motion control arises from the interplay of mechanics, drive, and control electronics all the way to integration into the overall system and the software.



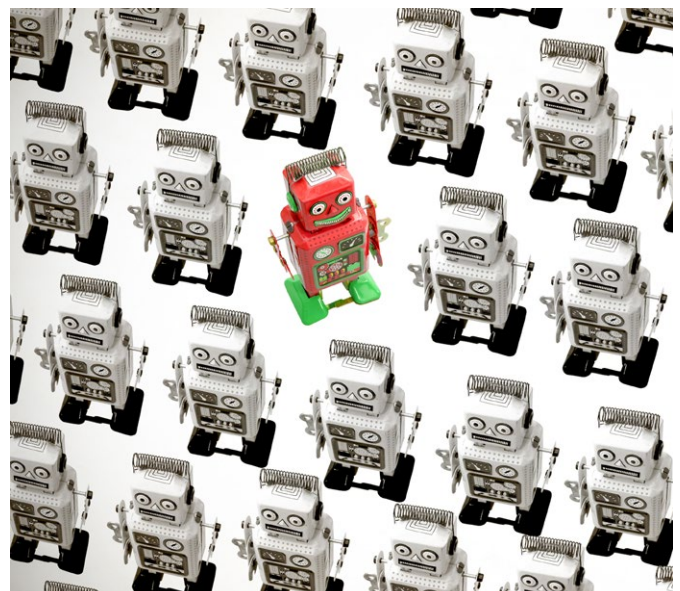
Functional safety integrated

Robust, repeatable, predictable: especially when machines operate close to people or within critical infrastructure, these characteristics of the control electronics ensure the necessary safety, even in the event of faults. We regard functional safety as an integral part of the system architecture.



Data from the drive

Because the drivetrain is tightly coordinated, the controller's data can be used beyond its control function. System data can be captured, aggregated, and analyzed. This makes deviations visible and allows components nearing the end of their service life to be identified – without additional sensors.

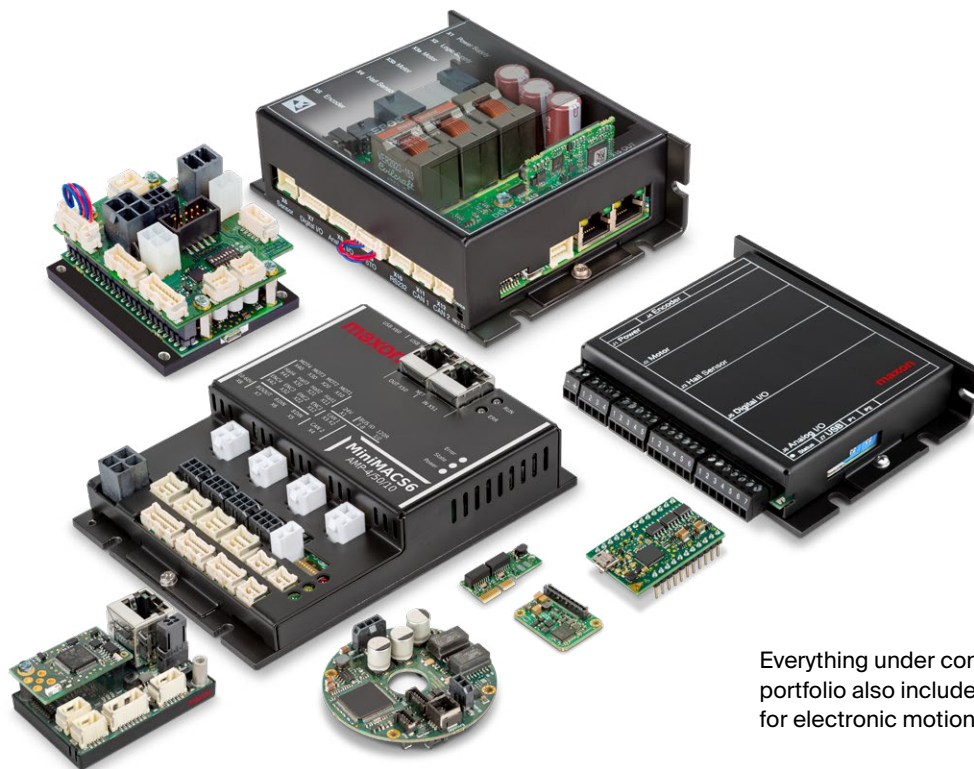


Individuality as standard

Solutions with control electronics are rarely created according to a fixed formula. Requirements for function, interfaces, and integration differ from one application to another. maxon combines proven platforms with targeted adaptations in software, firmware, and hardware – for uncomplicated commissioning.

Questions and answers about controllers

Motion control at maxon is more than choosing a controller. It describes the ambition to design motion intentionally within the context of the application – built on a broad foundation of drives, electronics, and control.



Everything under control: maxon's portfolio also includes the right solution for electronic motion control.

What does motion control mean at maxon – and what distinguishes this approach from a purely component-driven perspective?

For maxon, motion control begins with the task, not the component. A motor that drives a fan follows different rules than a motor in a drilling application – and different ones again than a drive in a robot joint. Only control, regulation, and integration into the mechanics make movement functional. That's why we view motion control as the ability to design movement specifically for the application, from the individual drive to the entire motion chain.

In which applications is the added value of motion control evident?

Movement is more than “turning or stopping.” In laboratory automation, a pick-and-place system must execute exactly the same sequence thousands of times. A robotic arm in industry, on the other hand, must react to changing loads or external influences. Motion control ensures that such differences are taken into account already in the design phase – from simple speed control to synchronized multi-axis motion. The added value becomes especially clear in highly integrated systems with tight constraints on space, efficiency, and thermal behavior.

Here, the coordinated design of motor, electronics, and control determines whether a system remains stable, efficient, and manageable over its entire life cycle.

Motion control is “boring in the best possible way” in safety-critical applications. What does that mean?

“Boring” means predictable. In medical technology or in machines that operate close to people, motion must never deliver surprises. A surgical robot or a safety-relevant axis in a production system must behave the same way at all times – even under load or in the event

of a fault. Repeatability is not a limitation, but the prerequisite for safety and trust.

Where are the limits of predictability, especially with software and data-driven approaches?

Data and AI help identify patterns or optimize processes. However, safety-critical movements must remain deterministic. AI can monitor, but it cannot control a safety-critical motion. In this respect, motion control intentionally operates within boundaries: optimization is welcome – as long as the control remains transparent.

How does maxon approach functional safety over the entire life cycle?

Safety does not end with commissioning. Already when defining an axis or a drive, it is determined how the system should behave over many years. Development, testing, and verification follow a clear model – and every change is checked against it. This ensures that safety remains manageable, even for variants or further developments.

Why is repeatability a prerequisite for detecting deviations and wear?

Because you can only detect deviations when you know the reference. If you know exactly how a drive behaves under nor-

mal conditions, you will notice when something changes. If a motor in an axis suddenly requires more current, it may indicate increased friction or a bearing issue. Motion control provides the baseline to detect such changes long before a system stops.

What can realistically be predicted – and where are the intentional limits?

States and trends can be predicted, such as maintenance intervals or behavior under load. In this way, a drive becomes a sensor for the entire system. maxon sets limits where statements would become speculative. Predictions are based on physical correlations and validated data, not assumptions.

What role do partners play in motion control and functional safety?

Not every key technology has to be developed internally. What matters is that it is integrated reliably. maxon works with selected partners to provide access to complementary technologies. For customers, the approach remains the same: a seamless motion-control solution from a single source.

How does maxon ensure that know-how in motion control and safety remains firmly anchored for the long term?

Through platform-based development and ongoing exchange between busi-

ness units. Insights from one application – for example in robotics – flow back into other areas. Knowledge does not remain within a single project but becomes part of the organization.

Which development will most strongly shape motion control in the future?

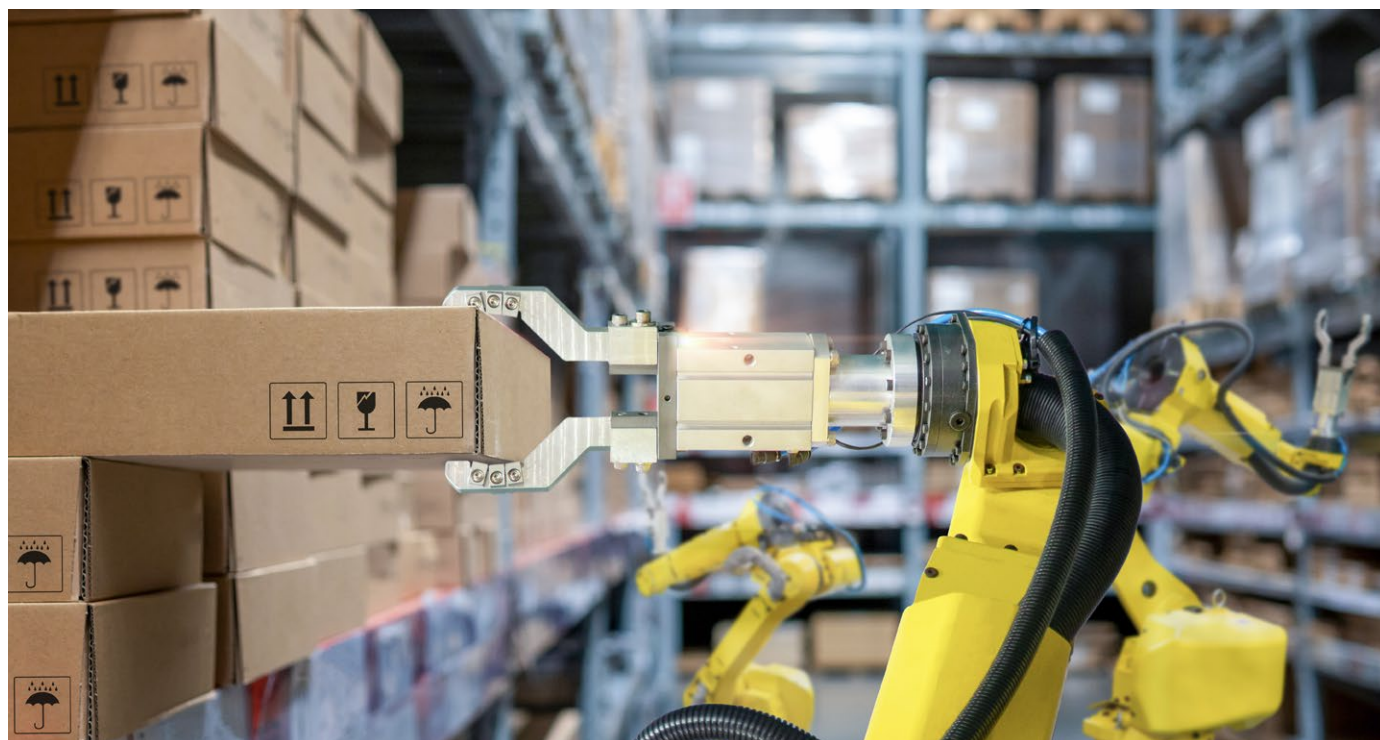
Motion will become more context-sensitive. Whether in humanoid robotics or flexible automation solutions, systems must recognize what is happening around them while still remaining controlled. Motion control combines robust drive technology with intelligent evaluation – without losing control.

Why are platforms the foundation for individual motion-control solutions?

Platforms make it possible to adapt proven components in a targeted way. A motor that has proven itself in one machine can take on an entirely different task with adjusted control or mechanics.

Where does customization begin – and how does it remain manageable?

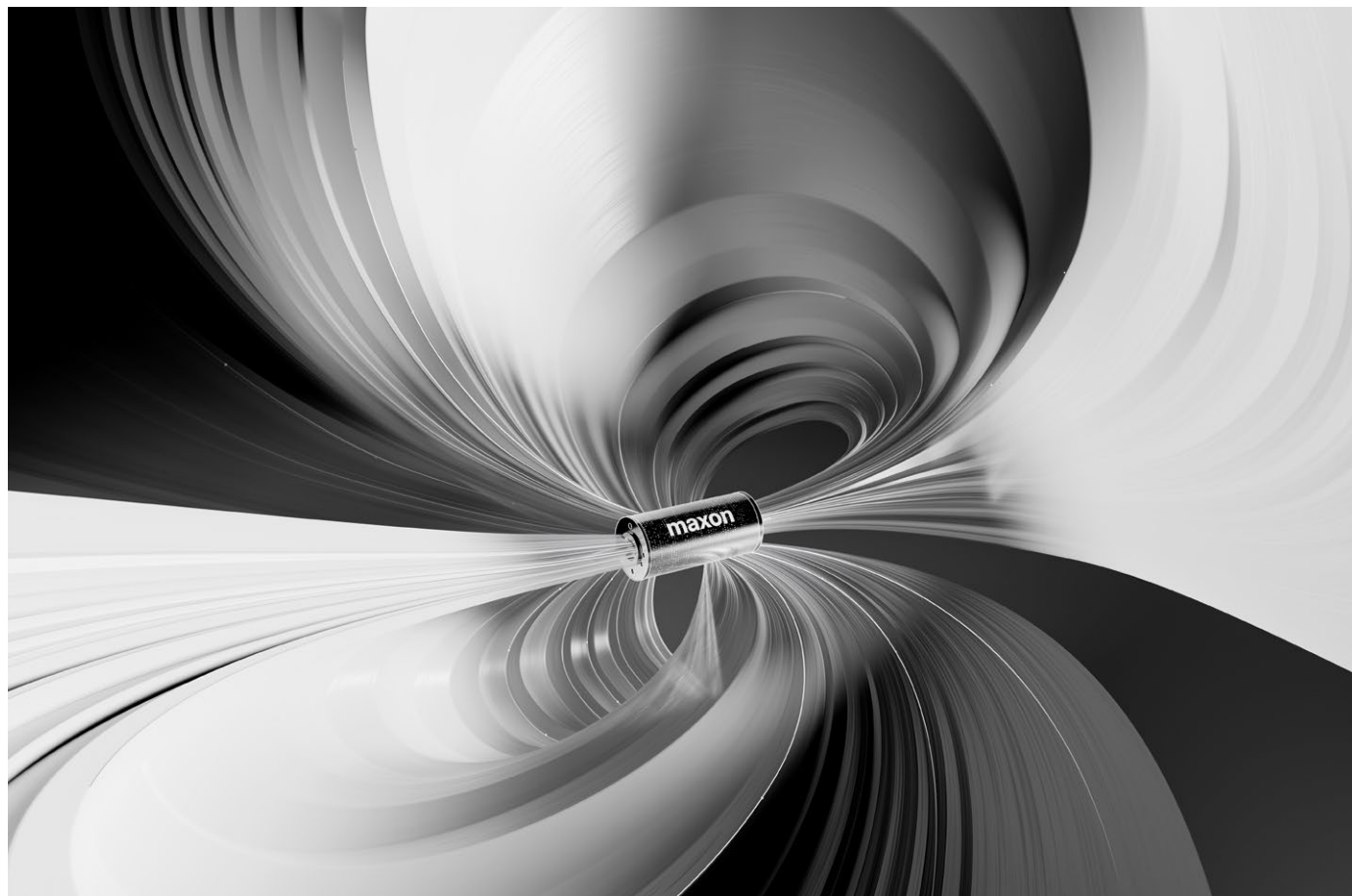
Customization begins where the application requires it. It remains manageable when variants are clearly documented and built in a repeatable way. This ensures that individual solutions remain stable across series production and throughout the entire life cycle.



When a fragile package needs to go from A to B, every movement has to be precise.

The motor as a sensor

The motor as a source for monitoring the condition of a machine: that is the goal of maxon MIND (motion insights and diagnostics). The foundation for this is machine learning, physical expertise, and an open architecture. Here we present the system.



In industrial drive technology, the motor has long been more than just an actuator. It provides valuable information about the condition of the entire system – provided you know how to interpret the data correctly. This is exactly where maxon's new solution, maxon MIND (motion insights and diagnostics), comes in.

The system uses motor signals to draw conclusions about the condition of the drive system and its environment. This turns the motor into the best sensor in the machine. maxon MIND was developed to take condition monitoring and predictive maintenance to a new level. It analyzes data read from the controller during machine operation and detects patterns that indicate

- The drive as a sensor for condition and process data
- Analysis of deviations and wear without additional sensors
- Basis for predictive maintenance and data-driven optimization

wear or malfunctions. It's not just about monitoring the motor itself, but the entire drive system. This allows deviations to be detected early. The possible applications are diverse. maxon MIND is suitable for scenarios where unexpected

failures must be detected early – such as increasing personnel safety or minimizing downtime. It also identifies issues that remain hidden in traditional tests.

Explainable, optimized AI

Technologically, maxon MIND is based on explainable artificial intelligence. This ensures that all diagnoses and predictions are traceable – a key requirement for safety-critical and highly regulated applications.

The machine learning model developed by maxon also requires minimal data and can run on simple hardware. The advantage: minimally invasive integration into the application and low time investment for model training. Furthermore, the



You can find more information about maxon MIND by contacting our sales team.
contact.maxongroup.com



Use cases for maxon MIND

■ Medical devices

Ensuring operational readiness in life-critical systems: In medical technology, even brief interruptions can jeopardize patient safety. maxon MIND enables early detection of anomalies in drive systems used in surgical, diagnostic, and life-support devices.

■ Industrial automation

Avoiding downtime on the production line: In high-throughput environments, the failure of a single motor can bring the entire operation to a halt. maxon MIND provides real-time insights that help detect wear early and prevent failures before they disrupt production. This improves overall equipment effectiveness (OEE).

■ Laboratory automation

In automated laboratory systems, the reliability of the drives is crucial for sample integrity and throughput. With historical trend analysis and predictive alerts, laboratories can fine-tune system performance, reduce maintenance efforts, and ensure consistently high quality.

model does not require GPU infrastructure, which is a cost advantage for new developments. Retrofits in existing applications are also possible.

Data processing follows a clearly structured workflow. First, raw data is collected during machine operation. It is then preprocessed before entering the machine learning model. The model checks the data and analyzes any deviation from a healthy operating state. The result can then be accessed by an API interface. Glassbox instead of black box: every processing step is traceable.

A key feature of maxon MIND is the integration of domain-specific expertise into the model. The physical relationships of a mechatronic system flow directly into the modeling process. This achieves high prediction quality with minimal data requirements. The system also learns from real-world applications:

during machine commissioning, an initial state is recorded that describes the motor in the context of its environment. During operation, new data is regularly fed in and compared with the model. Depending on the application, this happens hourly, daily, or simply as needed.

Data quality plays a central role. To achieve valid results, the recorded signals must sufficiently represent the machine's operating state. That's why maxon works closely with customers to define suitable measurement cycles. These may include standardized motion sequences that reflect typical load situations. This creates a robust model tailored to the customer's application.

Anonymized data

Data handling also plays an important role in maxon MIND. By default, data processing takes place in the cloud.

Customers can view and download their data. No personal information is required, and all data can be anonymized by the customer.

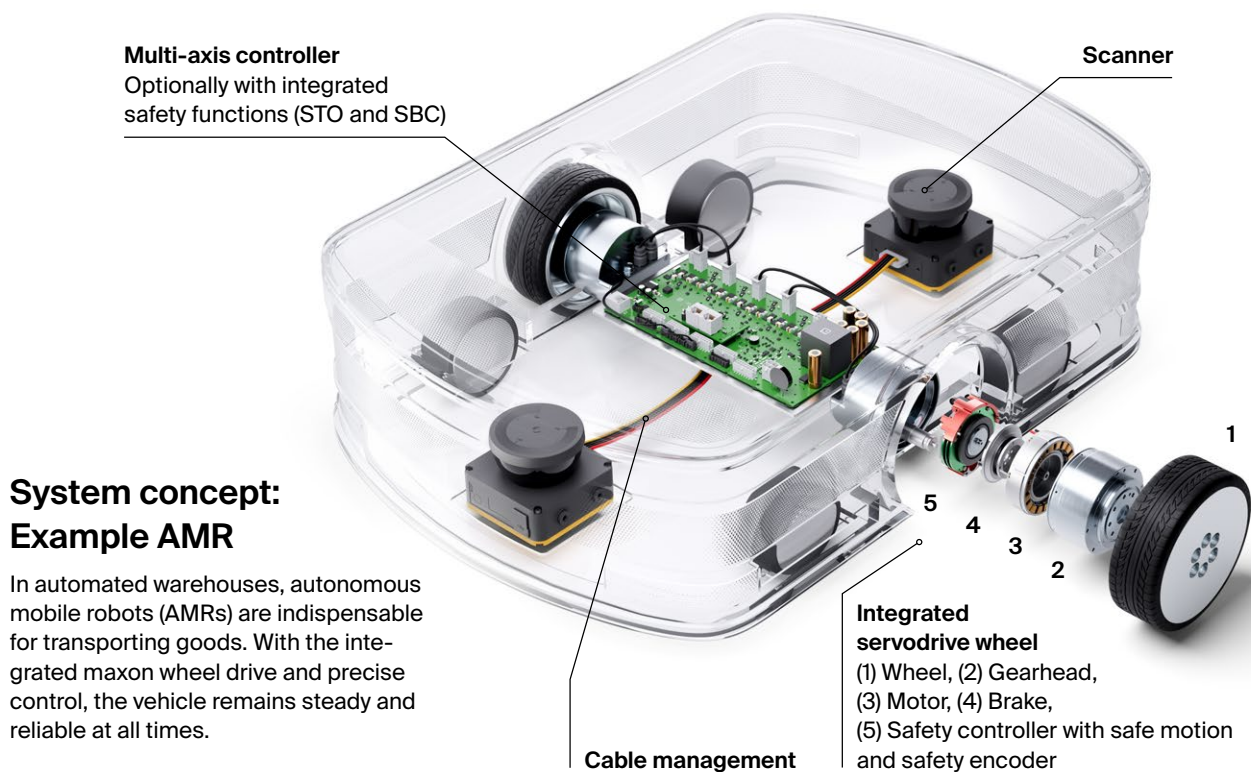
The solution is minimally invasive: existing motors, electronics, and controllers remain unchanged. The only requirement is installing a software package on the master controller that transmits data via a protocol.

Real insights

In the market, maxon MIND positions itself as a highly specialized solution for demanding applications. maxon pursues a focused approach that deeply analyzes the physical properties of the drive system. This combination of technical focus, industrial robustness, and open architecture makes maxon MIND a solution that not only collects data but delivers real insights.

Every system follows its own design

With flexible, scalable system solutions, maxon enables reliable performance – no matter how much loads, standards, or environments vary, even in the most demanding applications.



Systems at maxon have two meanings: they can form a subsystem as stand-alone building blocks – or become part of a higher-level architecture as an integrated solution. Everything starts with understanding the requirements. The common foundation of all applications is to generate motion. The paths to achieving this are diverse and often decided in the details.

Individuality has been part of everyday life at maxon since the beginning. Customized solutions, even in smaller volumes, are a core element of how we work. At the center is a broad selection of

components based on proven, well-established platforms. This not only creates a wide range of options but, above all, freedom of design. This makes it possible to implement requirements flexibly.

Modification or custom product

The variety of drives, gearheads, controllers, and configuration options forms the starting point – clearly reflected in this catalog. We contribute our system and application expertise early on and develop the solution that fits. Often, there is more than one technically sound option. What matters is choosing the

approach that suits the application and enables the desired scalability.

Taking a system-based approach does not necessarily mean developing everything from scratch. Often, the added value lies in thoughtfully extending existing architectures, leveraging interfaces, and seamlessly integrating functions. And when the requirements call for it, a completely new product is created together. Our platforms and 65 years of experience in building drive systems provide the foundation for this. Because no system is like another – but many of them rely on maxon.



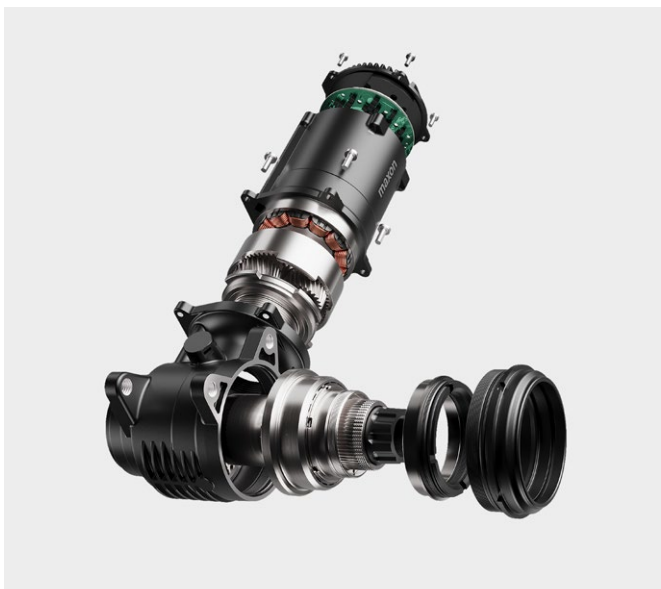
The agile one

The High Efficiency Joint (HEJ) was created to implement motion safely in highly dynamic robotic systems. Lightweight construction, high torque, and strong control performance work seamlessly together. It is a subsystem with a clearly defined function and at the same time a building block for higher-level architectures.



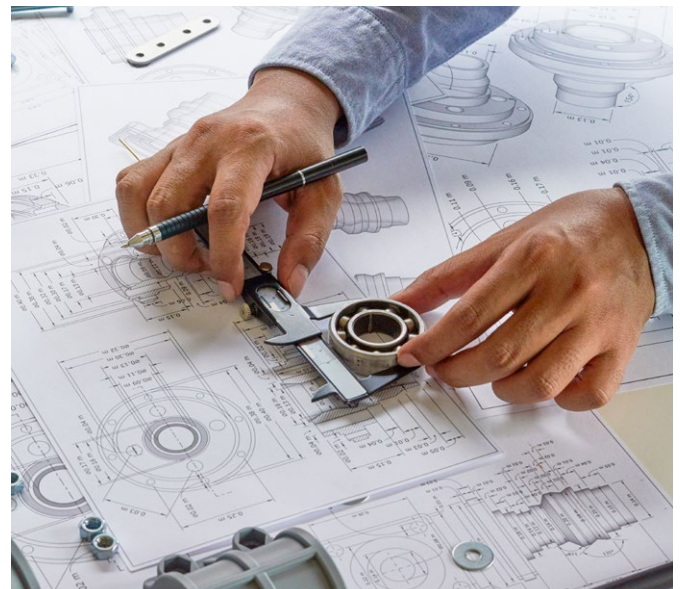
The industrial drive

In industrial applications, performance is just as important as the reliability of the system. The IDX is an integrated drive for existing machines, mobile systems, and new plant concepts. High integration and modern safety functions enable new designs as well as the further development of existing systems.



The integrated bike system

The BIKEDRIVE AIR S represents the interaction between rider, bike, and environment. The drive is part of a finely tuned overall concept of frame, battery, software, and interface, developed from real riding profiles. Frame builders receive a package that allows them to create bikes with a strong and distinctive character.



Your solution

Not every application starts on the drawing board. Often, the task is to integrate new functions into existing systems or to further develop what already works. Thanks to a broad portfolio, deep integration, and a platform-based approach, maxon creates customized, industrial-grade solutions.

From the component to the customized system solution

Depending on the requirements, maxon offers solutions with different levels of integration. These can be categorized into four levels.

4th Level:

Customer application. Tailored solutions reducing your time-to-market.

Custom Application

3rd Level:

Systems & Sub-systems with higher complexity. Complete systems and sub-systems for production or service applications.



2nd Level:

Sub-systems with lower complexity. Combinations of standard components. Application-specific firmware.



1st Level:

Components. Motors, gears, brakes, sensors, Motion Controllers, Multi-axis Controllers, Firmware, Software



Our portfolio

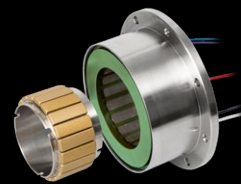
DC and BLDC motors, gearheads, sensors, control electronics, mechatronic drive systems and more. Everything from a single source. All to the highest standards of quality. From individual prototypes to large-scale production.



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Brushless DC Motors (BLDC)
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Frameless BLDC-Motors
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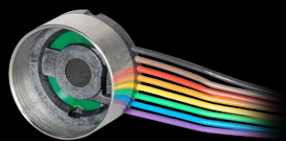
Brushed DC Motors (DC)
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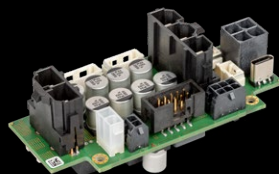
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Servo Motors

Servo motors ensure precise motion control in industrial applications. Thanks to integrated encoders or Hall sensors, they provide exact control of position, speed, and torque. maxon servo motors are robust, compact, and easy to integrate – whether with maxon control electronics, customer-specific electronics, or as a plug-and-play system. With high power density and built-in safety functions, they are ideal for mobile applications such as logistics robots and battery-powered systems. Servo motors combine efficiency, safety, and simple integration in a compact format.



Motors for systems and machines

Servo motors with
integrated electronics



Servo motors without
integrated electronics



Brushless DC Motors (BLDC)

BLDC motors offer long service life, low noise, and precise speed control. They operate without mechanical brushes, which minimizes wear. BLDC motors are available with an ironless winding or as an iron-core variant. The ironless winding – a key maxon technology – provides maximum power density and easily handles extreme overloads and short peaks. Iron-core motors stand out for their torque density and dynamic performance. Whether long and slender or short and flat, BLDC motors are perfect for device engineering and mobile applications thanks to their compact design. They are available with integrated electronics for simple control and can also be connected to maxon control electronics or customer-specific controllers.



For maximum service life and excellent dynamics

Motors with
Integrated Electronics



Speed Motors



Torque Motors

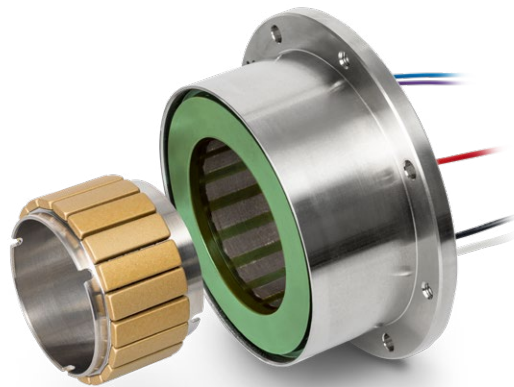


Flat Motors



Frameless BLDC Motors

Frameless BLDC motors consist of a separate stator and rotor. They are the perfect solution for applications with a high degree of system integration, as they can be built directly into customer-specific designs – including individual adaptations such as bearings or cable routing. This makes frameless motors indispensable in systems engineering, robotics, and complex high-end applications. Frameless motors require additional know-how during integration, which maxon provides with comprehensive support. For anyone seeking maximum freedom in design, this is the solution for highest efficiency and performance.



Maximum torque integrated directly into your application

EC frameless DT



EC frameless HT



Brushed DC Motors (DC)

Brushed DC motors feature an ironless winding, giving them exceptional dynamics and smooth operation. Their greatest advantage lies in their simplicity: no complex control system, just two wires – ready to use immediately and easy to integrate. These characteristics make them the preferred choice for applications where fast and cost-efficient implementation is essential. Thanks to their high compatibility with gearheads and a broad product range, maxon DC motors offer flexibility for a wide variety of requirements.



Outstanding smooth running for precise motion

DCX



RE



DC-max



Linear Solutions

Linear actuators are the ideal solution for applications such as pipetting, XY tables, or pick-and-place systems. They offer strong axial support and require no additional bearings. The integrated spindle mechanism ensures reliable linear motion. maxon linear actuators are available in numerous variants – from trapezoidal and metric spindles to ball screws, ceramic options, and different leads. This flexibility enables precise adaptation even for demanding systems.



Your solution for precise linear motion – fast, accurate, efficient

Screw Drive



Gearheads

We offer a wide selection of planetary, right-angle, and strain wave gearheads. Planetary gearheads combine high power density with our motors. Options for quieter operation, reduced backlash, or higher torque ensure perfect adaptation to the required application. Ultra-performance planetary gearheads deliver high efficiency and long service life. For specialized requirements, we offer right-angle gearheads in various sizes that can be customized to customer needs. Strain wave gearheads, in turn, enable precise motion control and high torque transmission in a compact space – meeting the highest integration demands in robotics and high-end systems.



Precise, compact, and powerful

**Planetary
gearhead**



**Strain wave
gearhead**

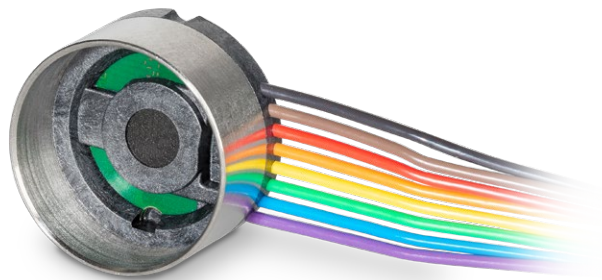


**Right angle
gear**



Sensors

Sensors turn a motor into a servo drive and enable precise control of position, speed, or torque. Whether optical encoders for highest accuracy or magnetic principles for dusty environments – the application determines the right technology. Incremental and absolute encoders offer solutions for a wide range of requirements. Multiturn systems are also possible, capturing the exact angle over multiple revolutions. Our sensors are robust and fully integrable without significantly increasing the motor size. They provide precise feedback, easy connectivity, and maximum reliability to control every movement perfectly.



Integrated sensor technology for the highest level of precision

**Incremental
Encoders**

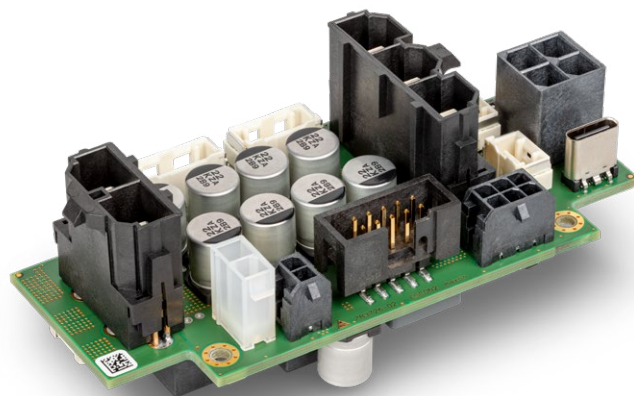


**Absolute
Encoders**



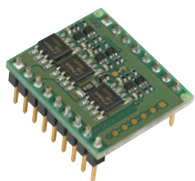
Control Electronics

The control electronics connect the drive, sensing, and firmware into an intelligent system. They determine the accuracy, safety, and performance of every movement. Our system approach ranges from integration into existing architectures to functional safety and customer-specific adaptations in hardware, firmware, and software. It includes servo controllers for precise control of individual axes as well as motion controllers for coordinated control of multiple axes. All controllers can be integrated flexibly and configured, commissioned, and analyzed with powerful software tools. This creates solutions that not only operate reliably but deliver their performance repeatably – thousands of times. For maximum control and safety in every movement.



Staying in control. It has never been easier.

**1-Q-EC
servoamplifier**



**ESCON2 servo
controllers**



**EPOS4 positioning
control units**

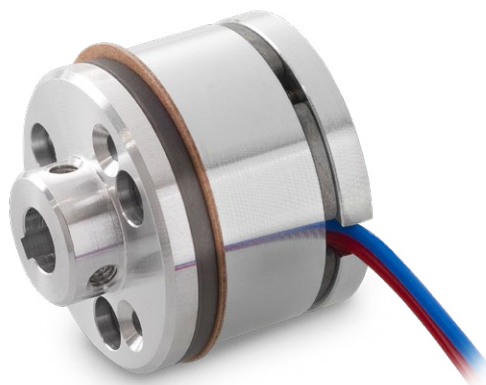


**MACS Multi-Axis
Motion Controller**



Accessories

Our accessories complement the drive system and provide additional safety and efficiency, for example through holding brakes. These can be mounted externally or integrated and operate on the “energize-to-release” principle to ensure reliable holding. With customized solutions, we make sure every movement remains safe.



Connect and secure

Brakes



Connection cables



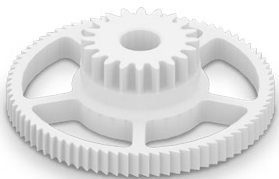
Ceramic

Technical ceramics comprise materials developed specifically for demanding industrial applications. At maxon, the focus is on oxide ceramics such as zirconium oxide and aluminum oxide. Zirconium oxide offers exceptional hardness, high wear resistance, and a density comparable to steel – ideal for high-precision gears, shafts, and spindles. Aluminum oxide is used primarily for insulation tasks and is available in various purity grades. The choice of material depends on requirements such as dielectric strength, surface quality, friction, or wear. Technical ceramics enable solutions that perform reliably even under extreme conditions and deliver maximum precision in applications where conventional materials reach their limits.



Harder than steel

Ceramic



maxon X drives

Your drive, configured online: Configure your drive to meet your individual requirements. Mechanical and electrical data, dimensional drawings and CAD files are then available for direct download.

Brushless DC Motors (BLDC)



ECX SPEED

The high-speed drive for grinders, fans, sterilizable hand-held tools, etc.



ECX PRIME

The high-performance drive with outstanding speed-torque gradient.



ECX TORQUE

The high-torque drive for power tools like screw drivers, pruning shears, etc.



ECX FLAT

The space-saving drive with lots of torque. Optional with integrated speed controller.

Brushed DC Motors (DC)



DCX

The powerful drive available in a variety of versions.



DC-max

Maximum performance in minimal space with the best price-performance ratio.

Servo motors with and without integrated electronics



IDX Safe with integrated electronics

The safe drive system with IP65 protection, integrated controller, and certified Safe Torque Off (STO) functionality.



IDX with integrated electronics

The intelligent drive system with IP65 protection, integrated controller, and optional holding brake.



IDX without integrated electronics

The flexible drive system with IP65 protection for use with an external controller and an optional holding brake.



maxon online configurator

Configure and combine brushed or brushless motors, gearheads, and servo motors according to your individual requirements. We guide you step by step through our configurator.

Planetary gearhead



GPX A, C, LN, LZ

A: Standard
C: Ceramic axes
LN: Reduced noise level
LZ: Reduced backlash



GPX SPEED

High-speed, sterilizable gearhead for surgical applications.



GPX HP

High-power planetary gearhead with reinforced output. Also available as a sterilizable version.



GPX UP

Ultra-performance planetary gearhead with optimal efficiency and reinforced output.

Encoder



ENX MILE

High-resolution and high-precision inductive encoder integrated in ECX FLAT.



ENX MAG

Magnetic incremental encoder, 3-channel, for small motor diameters.



ENX GAMA

Radiation-resistant, magnetic incremental encoder, 2-channel.



TSX MAG

Magnetic incremental encoder integrated into EC frameless DT motors.



ENX IMR & ENX EASY

Magnetic incremental encoder, 2- or 3-channel, differential.



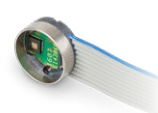
ENX EASY Abs

Absolute single-turn encoder (SSI/BiSS-C)



ENX EMT

Absolute multi-turn encoder (SSI/BiSS-C)



ENX RIO

High-resolution, optical incremental encoder, 3-channel, differential.

The Sarnersee and the Swiss Pre-Alps shape the landscape of the canton of Obwalden.

Picture: Adobe Stock



Obwalden: The home of maxon

maxon is a global company deeply rooted in Obwalden. This is where the success story began, and for over 65 years, the headquarters have been located here. It is a portrait of a small but remarkable region in the heart of Switzerland.



maxon and the canton of Obwalden have been connected for more than sixty years. But how did maxon end up in this region blessed with such beautiful scenery in the first place?

For many years, people have told the following legend: The Braun family, founders of maxon, sent a trusted representative to inspect three potential locations. First on the list was the canton of Graubünden. It was snowing, everything seemed gloomy, and it was cold. The journey continued to the Bernese Oberland. There, heavy rain was falling, and the area appeared inhospitable.

Finally, they traveled to the canton of Obwalden, where the sun was shining and the gentle pre-Alpine landscape was bathed in soft light. The decision was clear: Obwalden would become the home of Interelectric, the predecessor company of maxon. The favorable location in the center of Switzerland and a business-friendly regulatory environment probably also played a role, but those are rather sober facts that do not lend themselves to legends.

The arrival of maxon's founders in the 1960s was important for the canton of Obwalden. At the time, aside from agriculture and skilled trades, there were only a handful of companies with a presence beyond the region, let alone an international reputation.

From Lopper to Brünig

Obwalden is a relatively gentle pre-Alpine valley situated between roughly 500 and 700 meters above sea level. At its center lies Lake Sarnen, on whose shores maxon established itself. Around 40,000 people live between the mountain peaks that attract cows, mountain bikers, and hikers in summer, and skiers and ski tourers in winter. "From Lopper to Brünig," locals like to say: the now-tunneled Lopper marks the northern entrance, while the Brünig Pass marks the southern exit.

A special position is held by the village of Engelberg. This monastery and tourism destination lies at around 1,000 meters above sea level as an exclave. Politically, it belongs to Obwalden, but geographically it lies outside the valley.

With Mount Titlis, it is home to one of the Alps' most popular excursion destinations. But that is another story, one that will not be told here.

A hero, a saint, and a hard cheese

Back to legends: anyone exploring the founding myths of Switzerland inevitably encounters Obwalden. The cantonal capital of Sarnen preserves the so-called "White Book," written around 1470 by the state clerk Hans Schriber.

In his chronicle, he recounts the Rütli Oath, the destruction of the castles, the legendary expulsion of the Habsburg governors and seizure of their fortresses, and for the first time presents a connected account of a certain William Tell. The same man who refuses to salute the governor's hat and is therefore forced to shoot an apple from his son's head, which, of course, he successfully does.

Where history ends and myth begins will likely remain a matter of debate. What is beyond dispute is how deeply these stories have shaped Switzerland and its inhabitants.



The Art Nouveau Hotel Pax Montana in Flüeli has been around for over 130 years and is now a protected historical monument.

Bild: Sven Gallinelli



The 'Titlis Tower' in Engelberg: Once a radio tower, it is now an architectural landmark amidst a snowy landscape.

Picture: Titlis Bergbahnen

Historically documented, however, is Niklaus von Flüe (1417–1487), better known as Brother Klaus. The hermit, peace-maker, and Swiss national saint grew up in Flüeli above Sachseln and later lived in the Ranft, which remains a pilgrimage destination to this day. It is also home to the Art Nouveau Hotel Pax Montana, a Belle Époque jewel that has welcomed guests for more than 130 years.

Obwalden remained largely agricultural for a long time, but the valley was never isolated. Trade routes crossed the Alpine passes into Italy. As early as the 16th century, the hard cheese Sbrinz from central Switzerland was transported south along the "Sbrinz Route." Whether Sbrinz was invented before the similar Parmesan is open to debate. That Parmesan achieved worldwide fame while Sbrinz did not is a topic people in Obwalden prefer not to discuss.

These long-established trade routes have also left traces in the local language. In the Obwalden dialect, a handkerchief is called a "Fazäneetli," a word derived from the Italian "fazzoletto." The word "Paraplü" comes from the French

Anyone exploring the founding myths of Switzerland inevitably encounters Obwalden.

"parapluie," meaning umbrella. Residents of Obwalden are known as "Tschifeler," a term derived from the Lombard word "Civéra," referring to a woven backpack basket. In the village of Lungern, people say "kalatznä" when they mean "to have breakfast," probably a variation of the Italian word "colazione."

When industry came to the valley

For a long time, Obwalden's economic history was shaped by agriculture. During the economically difficult years before the First World War, Switzerland experienced a wave of emigration that also

affected Obwalden. Nearly 1,000 people left the valley, most of them bound for America. That represented around seven percent of the population at the time. Industrialization arrived relatively late compared to the rest of Switzerland; in the 19th century, the timber economy remained a key sector.

After the Second World War, the authorities began actively encouraging business development. This led to the founding of numerous well-known companies that continue to shape the local economy and are recognized far beyond Switzerland's borders. One of them was



maxon, founded in 1961 in the Obwalden village of Sachseln with just eight employees. Today, 3,200 people work for the company worldwide.

More than a headquarters

Despite its growth, maxon has remained headquartered in Sachseln. It is the company's largest site, employing around 1,000 people. This makes maxon the largest employer in the canton of Obwalden. Successes such as the motors that reached Mars in the 1990s made maxon famous, but they also brought recognition to the region of Obwalden itself.

It remains something special that from the production halls where high-precision drive systems are manufactured, it is sometimes possible to watch a calf being born in a nearby meadow.

The close connection is also reflected in local engagement. maxon supports the cultural festival OBWALD, where traditional yodeling and alphorn music meet the cultures of changing guest nations, as well as regional wrestling festivals and running events such as the Sarnensee Run.

The company also leaves its mark on society by offering highly specialized career paths. There are even families in which several generations have worked at maxon.

Employees who commute to work by train often speak of "the most beautiful commute in Switzerland." It is easy to see why. The rail line between Lucerne and Interlaken, which runs through the heart of Obwalden, is one of Switzerland's premier panoramic routes, one that many tourists make a point of experiencing.

In Obwalden, many things are smaller than elsewhere: the villages, the canton, the houses, and perhaps even people's egos. In a landscape that looks like a postcard, none of that really matters because the scenery overshadows everything. Perhaps that is also why the people of Obwalden are not inclined to boast. Everyone already knows how beautiful it is here, and constantly pointing it out simply is not the Obwalden way.

Text: Urs-Ueli Schorno und Sven Gallinelli



Left: Sarnen is the capital of the canton of Obwalden and has a population of 6,300. History is visible everywhere here: pictured is the town hall, which was built around 300 years ago.

Center: This cogwheel railway connects the town of Alpnachstad with Mount Pilatus, which rises 2,073 meters above sea level. With gradients of up to 48 percent, it is the steepest cogwheel railway in the world.

Right: Niklaus von Flüe, popularly known as "Brother Klaus," is the patron saint of Switzerland. He lived from 1417 to 1487, spending most of his life in the Obwalden village of Flüeli-Ranft, which is now a pilgrimage site.

Pictures: Sven Gallinelli (1), Adobe Stock (2)



The culinary highlight of Obwalden you can cook yourself

When it comes to food in the canton of Obwalden, there is one essential question above all others: where can you find the best Älplermagronen? “Magronen” (macaroni) are a classic Swiss Alpine dish. In Obwalden, they are prepared in a special way known as “Hindersi Magronen” (“hindersi” means “backwards”). Here, the ingredients are added to a single pot in reverse order. If you would like to enjoy this culinary specialty, there are two options.

Option 1 is located high above the village of Giswil at 1,538 meters above sea level. There you will find Fluonalp, with its alpine dairy and mountain restaurant. The view stretches across Lake Sarnen all the way to Mount Pilatus, Rigi, and Stanserhorn. Those who wish can set out on a mountain hike to Giswilerstock (1,825 m above sea level).

You should allow about two hours for the round trip and wear sturdy footwear. With a bit of luck, you may spot chamois sunbathing along the trail or an eagle

soaring overhead. Back at the Fluonalp, the reward awaits: Hindersi-style Älplermagronen with Sbrinz cheese produced right on site.

Option 2: cook it yourself. Here is the recipe:

Hindersi magronen for four hungry people

Ingredients:

- 2 to 3 tbsp butter
- 1 to 2 onions, finely chopped
- 300 g firm boiling potatoes, diced
- 300 g Älplermagronen (alternatively: macaroni or penne)
- About 1 liter strong vegetable broth and hot water
- 3 dl heavy cream
- 300 g Sbrinz cheese, grated
- Applesauce

Preparation:

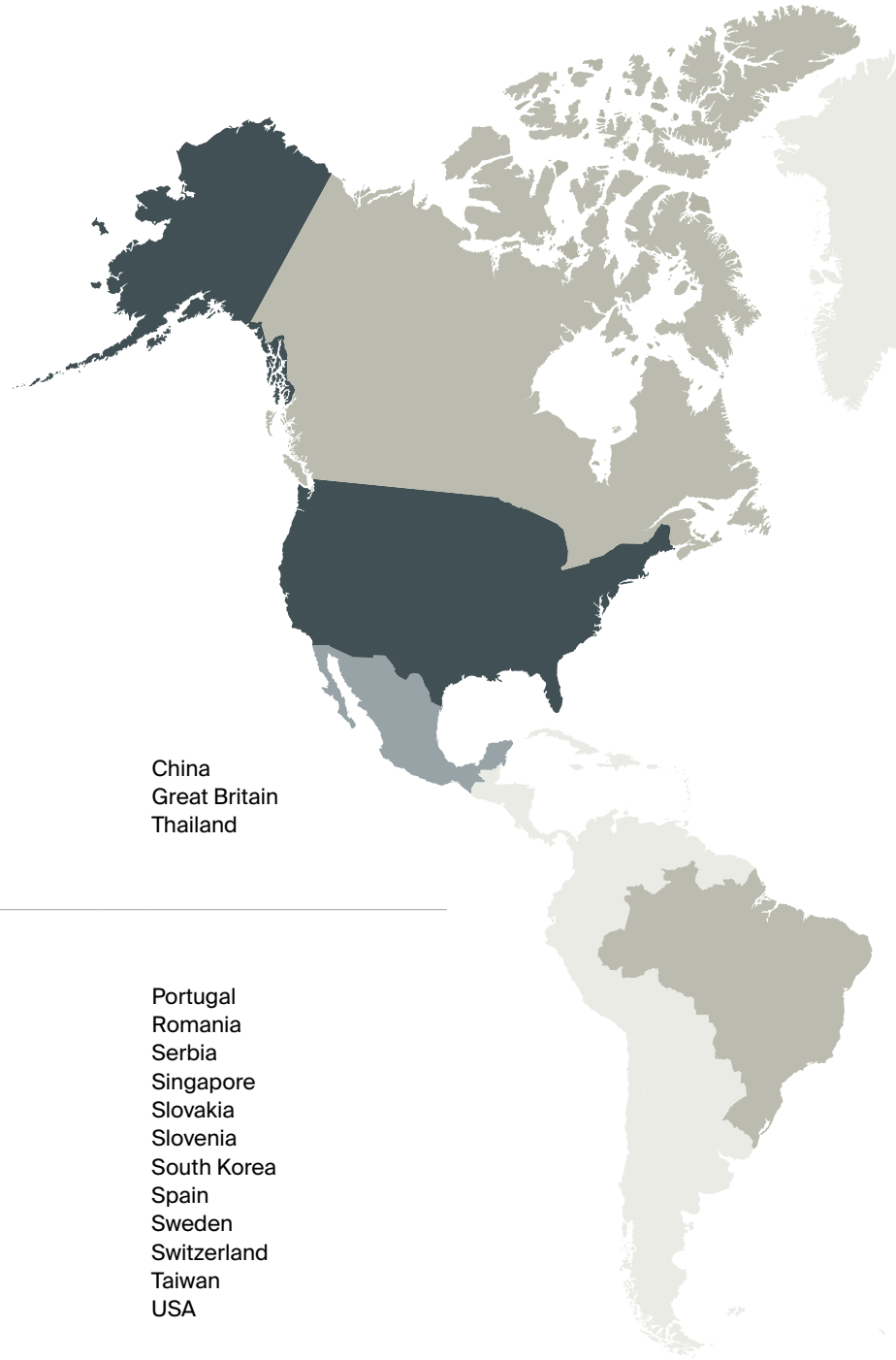
- Sauté the onions in the butter until golden brown
- Add the potatoes and fry for two to three minutes

- Add the pasta on top
- Pour in the broth and enough hot water to cover the pasta by one to two centimeters.
- Cook for about eight minutes until almost all the liquid has been absorbed.
- Stir occasionally to prevent the pasta from sticking to the bottom of the pot.
- Add the cream and Sbrinz cheese and let stand for two minutes.
- Serve with applesauce (yes, really: on the same plate. Anything else would be considered very un-Obwaldner).

And one more word about the cheese: in Obwalden, Sbrinz is practically sacred. You could replace it with Parmesan. But it is best not to tell anyone.

Incidentally, there is a third option: the maxon staff restaurant at the headquarters serves the dish regularly. However, the canteen is only accessible to maxon employees and visitors. The Magronen are among the highlights of the menu.

A global network



maxon Manufacturing Companies

Switzerland (Headquarters)
Germany
Hungary
South Korea

France
Netherlands
USA

China
Great Britain
Thailand

maxon Sales Companies

Austria
Australia
Benelux
Bulgaria
China
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Great Britain
Hungary

Iceland
India
Indonesia
Ireland
Israel
Italy
Japan
Latvia
Lithuania
Mexico
New Zealand
Norway
Philippines
Poland

Portugal
Romania
Serbia
Singapore
Slovakia
Slovenia
South Korea
Spain
Sweden
Switzerland
Taiwan
USA

Sales Agents

Brazil
Canada
Hong Kong

Malaysia
South Africa
Thailand

Turkey
Vietnam



Do you have a drive system challenge? Our engineers will solve it for you. Get in touch with us.

contact.maxongroup.com

