

**KOLLMORGEN**®



# Moving Toward a Better World



# KOLLMORGEN®

*A modern business with a rich history, Kollmorgen is a leading global provider of precision motion systems and components for OEMs that has been active in the industry for over a hundred years.*

**Written by Samita Sarkar**

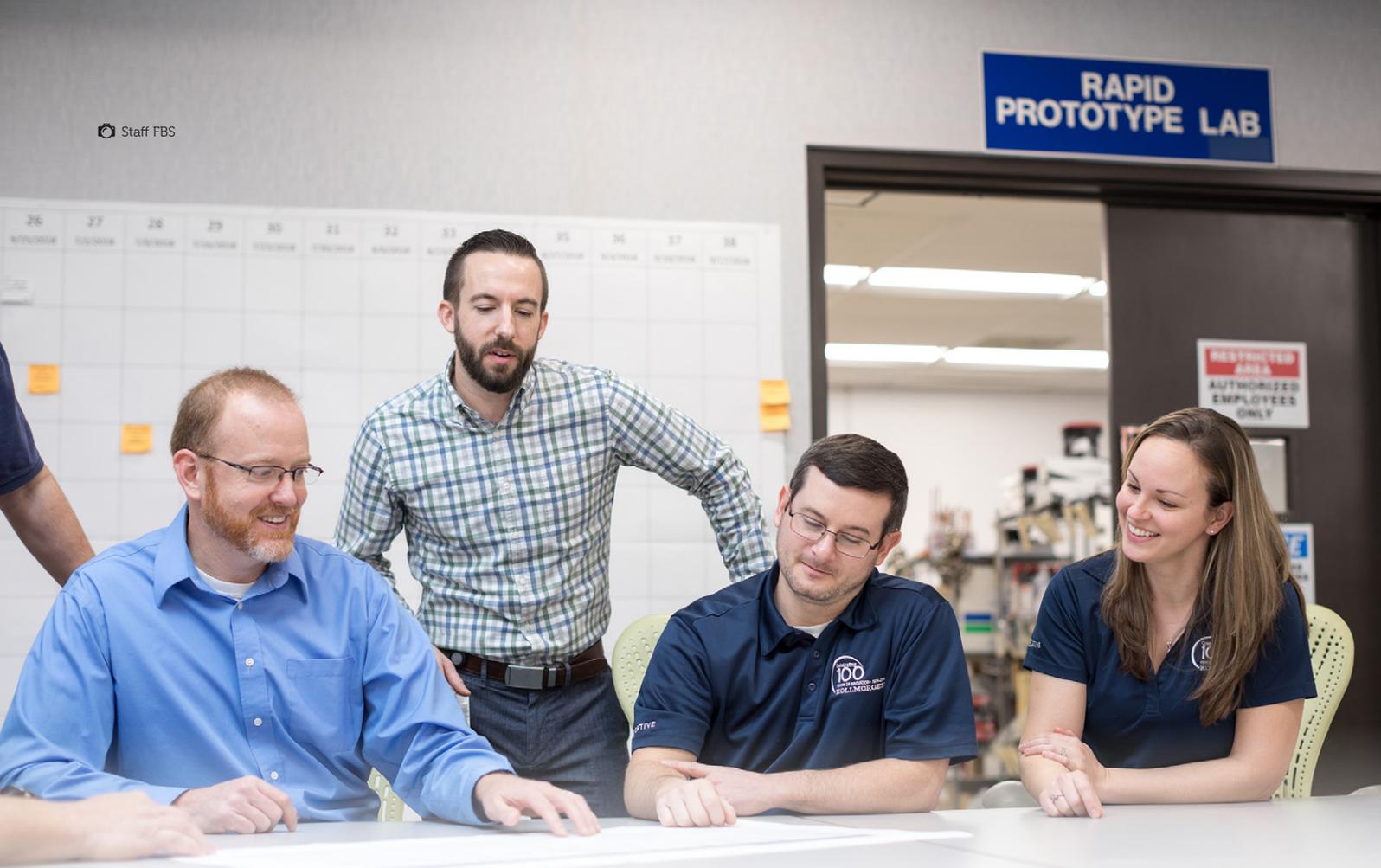
The company was founded by Friedrich Ludwig Georg Kollmorgen, who was born in Germany during the Industrial Revolution. Inspired to travel, navigate oceans, and design solutions to change the world, he immigrated to New York and patented a two-telescope design in 1911, his first U.S. periscope patent. In 1916, he incorporated Kollmorgen and developed periscope optical sets for U.S. navy submarines during WWI. To this day, Friedrich Kollmorgen's dreams are echoed in the company vision: "Enabling innovators to make the world a better place."

Today, the ISO-certified motion systems powerhouse employs 1,500 people from all over the world. It has shipped over 5 million stepper motors and is closing in on its two-millionth servo motor.

The Radford, Virginia-based manufacturer has more than ten design, manufacturing, and application centers around the world. This includes Radford, Boston, Chicago, Santa Barbara, Tijuana and São Paulo in the Americas; Shanghai and Beijing in China; And Italy, Germany, Sweden and the Czech Republic in Europe.

"Being an automation company, we understood from the start that automation was a way to stay competitive, not just moving factories to low-cost regions. We believe you should set up factories in regions where the product is consumed," remarks Scott Evans, Director of Strategic Marketing.

Kollmorgen is part of Fortive (FTV:NYSE), an industrial conglomerate. Under the Fortive umbrella, Kollmorgen and its sister companies leverage **FBS (Fortive Business System)**, striving ▶



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► for a culture of continuous improvement, sharing best practices across all companies; In fact, kaizen, a Japanese concept meaning “change for the better,” is one of Kollmorgen’s (and Fortive’s) core values.

“Many operating companies are part of a larger company. But very few share best practices across operating companies. In fact, most are siloed in their businesses and might be oblivious to ideas and improvements their sister companies are making. Not Kollmorgen, not Fortive. We work together efficiently and in the FBS framework. And we all enjoy doing so,” Evans states.

Kollmorgen’s diversified portfolio is two-pronged: **Industrial Automation** with strong success in robotics, packaging, medical, A&D, etc.; and **AGV** with an industry-leading position in warehouse logistics and natural navigation.

The industry leader’s embedded technologies for robotics help robot designers and manufacturers create smaller, lighter, quicker robots in a variety of industries including industrial, surgical, education/research, and—continuing the company’s military legacy—aerospace and defense (A&D). Since its founding, Kollmorgen has been a preferred motion supplier

to A&D prime contractors, as power generation systems and motor-driven equipment, unmanned vehicles, radar pedestals, and tracking stations.

Additionally, Kollmorgen’s industrial automation products for factories and manufacturing as well as medical facilities and labs help its customers perform critical procedures with little to no human assistance. This entails precise cutting for manufacturers, high performance motors on the food production line, precise bottle and capsule filling for pharmaceutical companies, and even surgical automation, which uses robotics to perform minimally invasive surgeries with the utmost accuracy. Better precision means better products and yields in manufacturing, and better healthcare for end users with more accurate diagnoses, and with shorter recovery times.

While many of Kollmorgen’s robot OEM clients are based in Europe, Josh Inman, VP of Marketing, also sees a growing demand in Chinese high-tech manufacturing. Many China-based OEMs are interested in robotics technology to augment their workforce. “As a motion supplier, we want to enable quick time-to-market for all robotic OEMs: With the aging workforce and technological demand that is driving global increase in quality of life, time is of the essence,” says Inman.

Kollmorgen's focus on warehouse logistics includes AGVs, or automated guided vehicles, which allow facilities to move products around warehouses without any manpower—or any driver on the vehicle—saving companies time while improving workplace safety conditions. Kollmorgen's **NDC Solutions** commands a dominant market share of vehicle automation kits for AGVs. In 2016, Kollmorgen has released natural navigation, a groundbreaking technological development which allows warehouse AGV robots to operate not only without human drivers, but also without markers or reflectors. Kollmorgen refers to this technology broadly as part of the autonomous robotic vehicle revolution.

"We asked ourselves, what if we could develop a navigation system for automated guided vehicles, without any need for changes to the infrastructure? We decided to go for it, and the natural navigation vision was born," recalls Markus Johansson, VP/GM EMEA of Kollmorgen, in a [video](#) on AGVs.

"We don't add anything to the environment," he continues. "We use only what is already there. We thereby meet the market needs for high flexibility and quick installation and start-up... Our passion is to create smarter, more efficient, flexible, and intuitive solutions that meet the dynamic needs of tomorrow's market."

Kollmorgen's NDC Solutions for AGVs and mobile robots leverage artificial intelligence (AI) for smart factories and warehouses. The software allows customers to easily track where each AGV is in the warehouse or factory and facilitates flexible and highly efficient material handling; and dramatically reduces the customer's investment in start-up and change-over.

Looking forward, Kollmorgen will continue to develop AGV and mobile robotics technology. "In the future, we envisage AGV systems that can be deployed by users in one day. The roadmap is there, and we are systematically moving toward this target," adds Peter Bladh, Director of Product Management and Marketing for AGVs.



**"The industry award-winning, 102-year-old firm has developed many new and notable products in addition to its natural navigation technology."**

Evans points out that Kollmorgen's focus on robotics tech, automation products, and logistics is just one of its many distinguishing factors: "Although these technologies have historically been sold to different customers in disparate industries, the technologies are dovetailing into autonomous robots, vehicles and other equipment for use 'everywhere.' Our broad experience and knowledge easily outpace younger companies who tend to offer a single solution looking for a problem. "Our customers truly value our innovation, knowledge, experience, scale, breadth and global reach."

Kollmorgen's innovations are appreciated by clients: Kollmorgen is among precious few companies that have won or been a finalist for *Design News'* Golden Mousetrap Award for the last six years, recognizing innovation in North American advanced design and manufacturing.

Kollmorgen has also been recognized by Toyota Industries Corporation. "We recently received two awards from TICO for ►





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► operational excellence; Kollmorgen was one of just 11 suppliers, and the only U.S.-based supplier among a total of 417 suppliers to receive an award. Kollmorgen received awards for Global Sourcing Special Award for Value-Add and was also recognized by TICO for No Delivery Delays for the fifth consecutive year. Additionally, TICO acknowledged Kollmorgen for its engineering collaboration, which has helped to make next-generation TICO products more productive and cost effective,” Evans reveals.

Consistently seeking innovative solutions, the industry award-winning, 102-year-old firm has developed many new and notable products in addition to the natural navigation technology previously mentioned, including its TBM, AKM2G, and AKD2G series, and well as its KAS system.



As mentioned on its corporate website, the Kollmorgen **TBM** (Torquer Brushless Motor) series is designed to be directly embedded in your machine, using the machine’s own bearings to support the rotor. TBMs are designed for applications that need high power in a compact form (such as robotic joints, medical robotics, sensor gimbals, and guidance systems), and customers can choose from a selection of standard motors or request a co-engineered modification.

For example, a custom brushless DC motor stator was incorporated into the HeartAssist5® LVAD (left ventricular assist device) design, providing medical heart patients with a better device that reduced power consumption while eliminating infection risks. Variants of these products are also deployed in robotics companies’ cobots (also called collaborative robots).

Kollmorgen’s **AKM2G** and **AKD2G** are next-generation versions of its flagship industrial automation product families, and they leapfrog its competitors in torque density and power density. The AKM2G series of AC synchronous servo motors launched in late 2017, and provide over 30 percent more torque per rating than current designs without an increase in installed size. This energy efficient series is the latest of Kollmorgen’s AKM servo systems series. Kollmorgen has recently shipped its millionth AKM.

Launching this year, the AKD2G servo drives series features new processors which increase the computational power available and therefore support faster control performance. AKD2G servo drives offer important safety functions in the form of Safe Brake Control (SBC) and Safe Brake Test (SBT), which make vertical axes safe without the need for protective fences.

Finally, Kollmorgen’s **KAS** system (Kollmorgen Automation Suite™) is a general-purpose automation suite that contains the software and hardware you need to quickly bring your machines to market. Evans tells us that the KAS system not only outperforms PLCs and PC-based controllers in servo motion performance, but the solutions have embedded certain elements of Industry 4.0 (such as web-based control, artificial intelligence for auto-tuning, predictive maintenance, and even self-healing).

Always looking forward, Evans suspects that embedded and mobile technologies are going to mushroom in industry like they have at the consumer level. Always at the industry forefront, Kollmorgen is preparing for the significant R&D that will be required in the low-voltage space, including new levels of precision and orders-of-magnitude increase in power density, while decreasing in weight.



Inman adds that with advancements in AI, he sees robots becoming smaller, smarter, more flexible, and less stationary over time. As a leading motions systems company, Kollmorgen is in an advantageous position to help robot makers as they take their technology to the next level.

“There is tremendous upside and astounding growth ahead,” he muses. “We must think about robots beyond the manufacturing or e-commerce environments; agriculture, for example, is a labor-intensive industry where ruggedization and weather resistance are needed in the fields.”

Nimbler, smarter robots may be able to pick oranges off trees in agriculture, assemble parts in manufacturing, submit test samples for analysis and collect results in laboratory science, and operate defense equipment or deactivate bombs in the military. Inman says the future of this robotic world is on the near horizon.



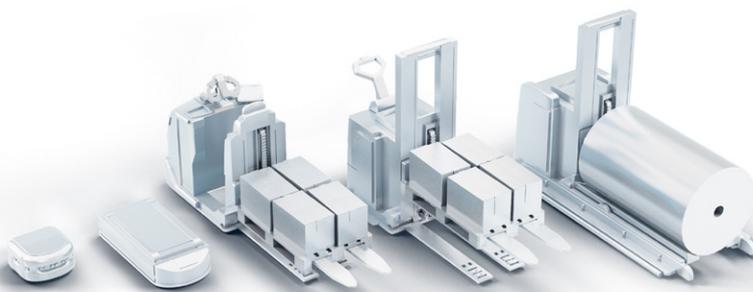
Photo credit: iStock photo

**“Since its founding, Kollmorgen has been a preferred motion supplier to aerospace and defense contractors.”**

Showing no signs of slowing down, the motion systems solutions provider seeks candidates who are not only creative, but also driven to execute under its FBS culture of continuous improvement as it works toward a better and more technologically advanced world.

“Our kaizen events involve people from all levels of the organization, who leave their titles at the door, and who collaborate on incremental improvements, executing the improvements, and managing these daily to sustain. This requires emotional intelligence, an attitude of collaboration, and desire to succeed. We want people who are motivated, yet humble. We want people who are customer-focused, yet can see the forest through the trees,” Evans concludes.

If these values align with those of your own OEM, you can learn more about Kollmorgen by visiting the company website at [www.kollmorgen.com](http://www.kollmorgen.com) ■



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