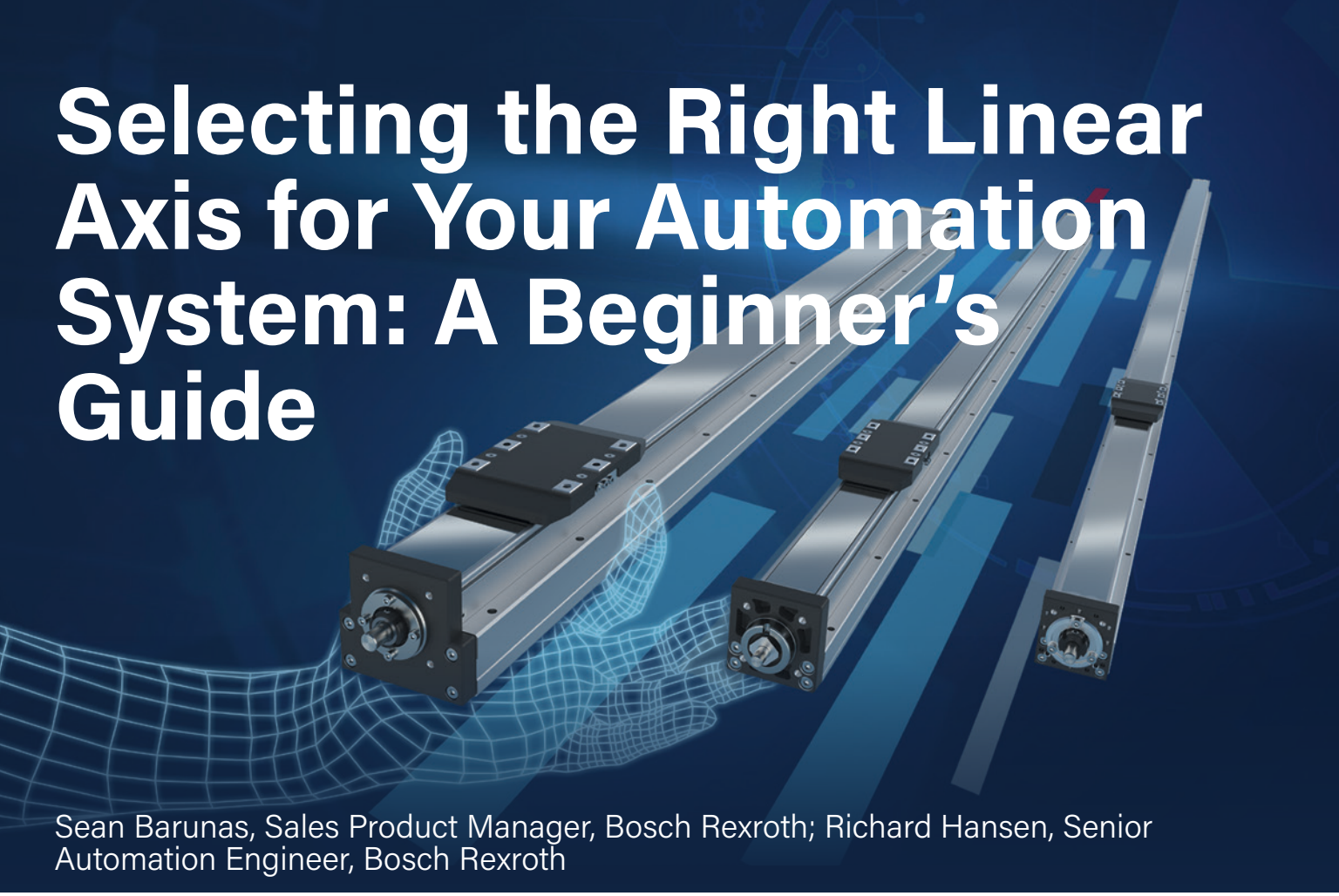
Selecting the Right Linear Axis for Your Automation System: A Beginner's Guide



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Foundational to factory footprints across a breadth of industries and applications, linear motion systems and the axes they operate on remain critical components that OEMs and end-users rely on daily. As diverse as their use cases, linear axes are not a one-size-fits-all solution and, as such, need to be configured and leveraged properly to ensure optimal performance. Manufacturers and end-users should view this article as a roadmap to understanding linear axes and how they'll continue to play a key role in manufacturing and logistics applications in the future.

Transparent Evaluation

At the heart of any successful manufacturing operation is a culture of consistent, transparent evaluation. Managers need to have a thorough comprehension of all processes and should constantly monitor performance to identify opportunities for improvement. While legacy processes are typically the foundation for meeting objectives consistently, it's worth exploring modern and advanced technology to further improve productivity. Linear axes can be applied to a variety of processes and should be considered as a potential solution for many manufacturing needs.

When evaluating axes' integration with a process, manufacturers need to first identify a clear objective regarding speed, payload, and accuracy. How will the actuator(s) move objects safely and effectively to align with an established goal? Equally as important as reaching current

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throughput metrics is considering future needs as well. What's the range that may be required of the axes so they can adjust to meet shifting objectives? Having a clear understanding of those parameters will help narrow down the type of axes that may be required.

Additionally, having an understanding of an objective can help manufacturers avoid unnecessary and complex requirements. While linear axes are an inherently simple solution, some manufacturers can complicate their implementation by overengineering them for applications that aren't aligned with their design. This can hinder an entire process and lead to higher costs, longer lead times, and project delays.

Design At Your Fingertips

One of the most important advancements in implementing linear axes solutions is how they're being selected by the end-user. Previously, individual components may have been chosen out of a catalog, and sometimes, a follow-up call was conducted to confirm what it was being used for. The process was imperfect, as it was susceptible to miscommunication that led to incorrect specifications for a solution, or one not perfectly designed for a task.

Now, modern software has streamlined the design phase, as many end-users want to digitally build their custom linear motion solution themselves and see a CAD model designed to their exact specifications. They can avoid selecting unnecessary components and easily cycle through multiple solution options before making a final selection. This speeds up the process of getting the solution into the end user's hands, which can have a faster impact on overall productivity.

Selecting the best linear axis should be based on the application requirements, load capacity, speed and precision.

While the initial design phase rests mostly on the customer, it's still important to maintain a relationship with the supplier. Within certain verticals, linear motion solutions are trending towards established standards, and suppliers need to provide direction to end-users on whether their solution is aligned with how other end-users may be integrating similar technology.

Not surprisingly, the digital development of linear motion solutions falls in line with the overall digitalization of manufacturing processes. End-users who embrace this transition are positioning themselves as attractive employers to the younger generation of workers who are utilizing digital technology in their daily lives.

An Evolutionary Environment

Advancing in parallel to the digitalization of manufacturing is the design of linear axes themselves. Because many OEMs and end-users are trending towards a fully automated operation, linear axes are being leveraged for a greater variety of tasks and must evolve to meet those needs. There's a consistent push to move objects faster and more accurately, as well as an increasing need to accommodate heavier payloads. A key example of this is battery manufacturing, which remains in the spotlight as the global EV industry continues to grow. Heavy battery modules need to be produced at faster speeds to meet demands and linear axes must be able to transport them effectively and repeatedly while bearing a heavier load.

Here to stay

While there are a variety of solutions within manufacturing, linear axes continually prove their worth in their breadth of applications and longevity of effectiveness. OEMs and end-users need to fully understand their capabilities, especially in greenfield environments, before implementing or integrating them. Furthermore, modern design software allows customers to design axes and solutions to their exact parameters, which ensures they're getting the exact one they need and in a timely manner compared to the catalogs and phone calls of previous generations. This allows operators to maintain productivity with a proven solution that will remain a key component in the manufacturing industry as it evolves to meet emergent needs.

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