

Designing a drive system

The drive system is a basic building block for the performance of machines, robots, and hand-held devices. However, there is much more to consider than just the design and the motor selection.

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(Source: Maxon Group)

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Interdisciplinary thinking, specific engineering knowledge, depth of experience, and a clear understanding of the requirements are critical factors, when developing drive systems. Any kind of technological progress should focus on the application. At some point, improved performance characteristics or new technologies have to yield results in the form of better quality and/or reduced cost. With regard to drive technology for machines and hand-held devices, this means:

- better dynamics improve the production output,
- faster drive control improves precision and product quality, and
- a more efficient drive system improves the energy efficiency of the overall system.

In order to achieve these goals, drive systems must be selected in the overall context of the application and its requirements.

The first step in the specification and optimization of a drive system is to understand and correctly prioritize the technical and commercial requirements of the final system, which can be a machine, a robot, or a hand-held device. It's easy to miss the bigger picture and focus unilaterally on the considerations relevant for one's own field of expertise. As a rule, the drive selection happens in engineering. However, the performance, the cost, and the limitations of a drive solution are influenced by a multitude of factors as well as other system components. It is therefore critical to harness the know-how of experts from different fields during the idea and conceptualization phase.

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Building blocks of a drive system (Source: Maxon Group)

A system approach and interdisciplinary are two key success factors that should be considered from the concept design all the way to the mass production. Frequently, it is not possible to cover all competences in-house at the same level. External partners with a wide scope of experience provide an opportunity for a broader, interdisciplinary exchange of ideas. Ideally, the partner is also able to take responsibility for the development and production of partial systems, to reduce development risks and speed up the time to market.

With over 50 years of experience and more than 2600 employees worldwide, Maxon's scope of knowledge extends far beyond the "pure" drive motor. With inhouse development and production, the portfolio covers brushless and brushed DC motors, gear-heads, spindles, encoders, motor controllers, master controllers, and battery management systems. Our products and customer-specific drive systems are used in robotics, medical and laboratory engineering, industrial automation, the automotive industry, and in aerospace applications from Earth to Mars. With many projects, the key factor is not just the broad product portfolio but also the interdisciplinary and depth of experience of our application teams, as well as the possibility of developing completely new drive solutions.

Our experts for motors, gear-heads, electronics, and control are available in the early stages of discussing an idea and are familiar with the requirements of specific fields of application. Why covering various fields of expertise can be so decisive for a drive system becomes clear when we take a look at the individual components and their influencing factors.

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