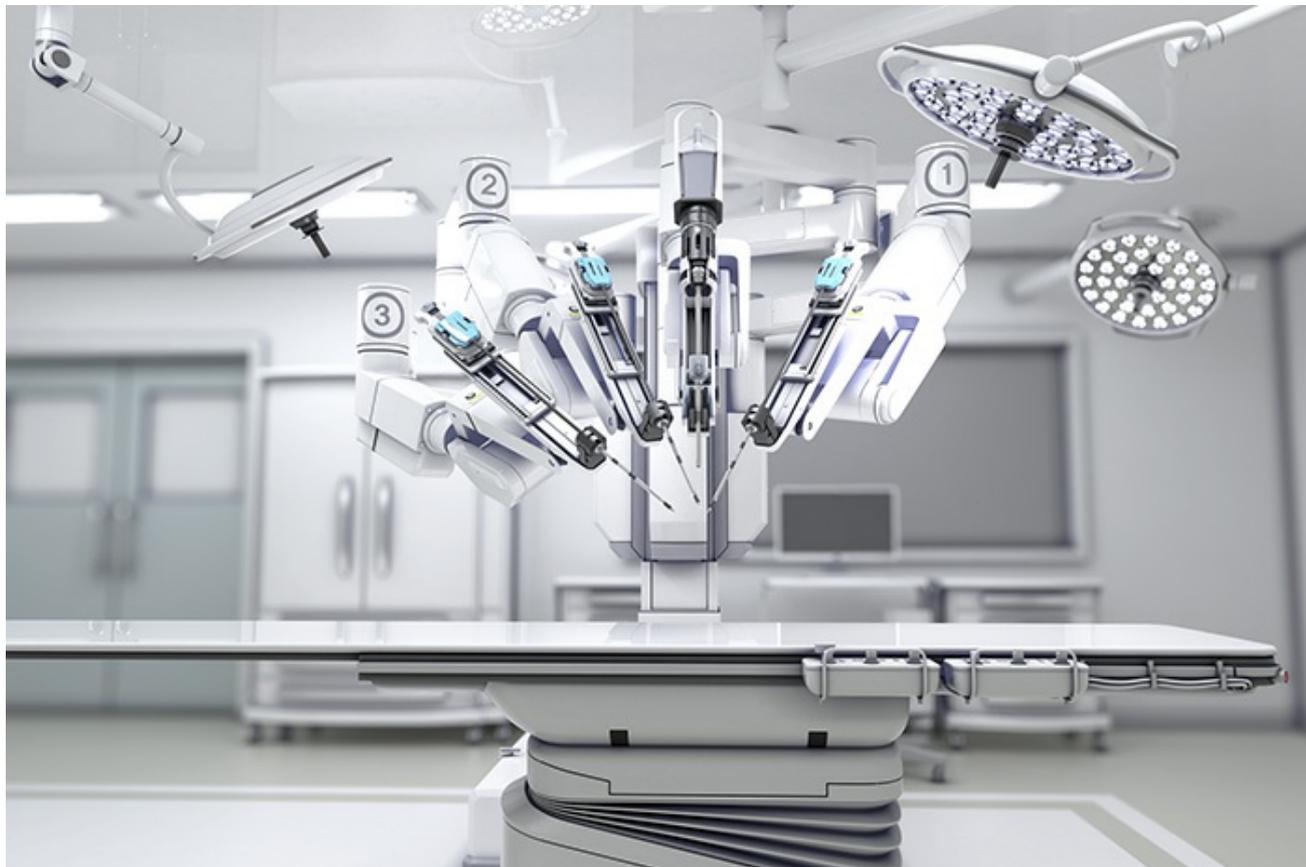


# CAN Newsletter Online

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## Robotics, analysis, and handling systems with CANopen

Robotics, analysis, and handling systems require a compact integration of a large number of energy-efficient drives, combined with dynamic controllers and a serial network system. Maxon provides solutions with CANopen.



(Source: Maxon)

The complete article is published in the [June issue](#) of the CAN Newsletter magazine 2021. This is just an excerpt.

In particular, surgical robots, analysis devices in medical and laboratory technology, and multileaf collimators in radiation technology rely on miniaturized drive systems which can be installed densely packed due to their efficiency. In addition to motors, the ideal "drive package" also includes motor controllers that can be integrated directly in the device close to the motors and sensors. The requirements are compact multi-axis system concepts. An operation robot is a typical application with multi-axis systems (see photo above).

The most important features of the motor controllers are energy efficiency and power density for the space-saving integration of all components. The motor controller should be able to provide its rated power without the need for any additional cooling measures like heat sinks or fans which would increase the overall dimensions strongly again. Equally important are connections for various sensors and actuators as well as a fast network interface. The Epos Micro modules offer a standardized range of functions, control algorithms, a compact power stage, and a CANopen interface – while being similar in size to a postage stamp (from 32 mm x 22 mm). Device manufacturers can integrate the plug-in modules in their own electronics in the required number of axes. This makes cost-optimized multi-axis systems with compact dimensions possible. The Epos4 Micro 24/5 digital positioning controller for example, provides a CANopen (responder) interface. It complies with the CANopen application layer and communication profile CiA 301, CiA 305 CANopen layer setting services (LSS) and protocols, as well as the CiA 402 CANopen device profile for drives and motion control.



The size of the Epos4 Micro compared with an USB stick (Source: Maxon)

### CANopen: The backbone of the overall system

Each drive unit exchanges command and status data with the commander controller (e.g. programmable logic controller or Maxon Mastermacs) by its network interface in a fast cycle rate. One commonly used serial network system is CANopen. It has been industry-proven by an endless number of medical and industrial applications. It is the backbone of any reliable real-time data exchange of multi-axis applications, e.g. drives or robotic joints which demand for some coordinated or synchronized motion.

Any data exchange and commanding of the Epos4 Micro complies with the CiA 402 protocol. The standardized operating modes PPM – profile position mode, PVM – profile velocity mode, HM – homing mode, CSP – cyclic synchronous position, CSV – cyclic synchronous velocity, and CST – cyclic synchronous torque, are supported. As a standardized motion control responder, Epos4 Micro (like all Epos4 product types) can be integrated by the system manager tools and motion libraries of different PLC (programmable logic controller) manufacturers. Applications commanded by a PC or Raspberry Pi and Maxon's Epos Command Library are possible too.

*If you would like to read the full article from Juergen Wagenbach (Maxon), you can [download](#) it free of charge or you [download the entire magazine](#).*

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