



# cees

A bright future



## New robots work with people

– Autonomous and mobile robots are dependent on power electronics

Robots used to need special routes and electronic tracks in order to manoeuvre around factories, hospitals etc. Now robots move freely in the corridors, taking care not to collide with the people they mix with. They have become autonomous and mobile, thanks in part to advanced power electronics.

Robots are small. But they need both energy and motor power. They also have four-wheel steering, making them extremely manoeuvrable. This all demands efficient power electronics, which can rapidly and precisely regulate and provide the necessary electrical energy for the many different functions.

### Denmark in a strong position

Denmark has a solid position in relation to small self-propelled intelligent robots. Denmark has long been very good at applications for power electronics. International companies are becoming more and more aware that we are very good at optimising power electronics in relation to the various applications.

Drones are really just flying robots, and this is yet another area where our special expertise can help generate growth and jobs. The aim of development in this field is to gain a larger radius of operation and greater

power. This means focusing on things like optimising the motor system, battery and power electronics, to reduce the weight as much as possible.

### Collaboration is the key to success

“Compared to the rest of the world, we have a strong position in the field of power electronics,” says Morten Nymand, Associate Professor and Head of Section at the University of Southern Denmark (SDU).

“We are a small country, but we have been good at working together and utilising resources.”

The collaboration between universities and the business community has not only led to greater attention from abroad on what we can do. The whole awareness of the transition to green energy and the increased use of electricity it involves has led to more and more students becoming aware of and interested in power electronics.

“We are seeing a steady increase in graduates in the field. But one should never be satisfied,” says Morten Nymand of SDU, and notes that power electronics is an area which is expected to see considerable growth in the coming years.

NO. 09-2016

Centre for Electrical Energy Systems (CEES) is a Danish network for companies and research institutions. We research and develop electrical energy systems, the global market for which is DKK 300 billion annually.

The partners in the network are universities and companies in Denmark. Our goal is to consolidate Denmark's strong position in the field of power electronics and to train enough qualified manpower. We also research the intelligent control of power electronics.

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