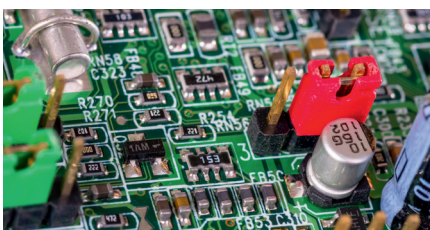


## THE CENTRE FOR INDUSTRIAL ELECTRONICS

The Centre for Industrial Electronics (CIE) is part of the Mads Clausen Institute at the University of Southern Denmark. CIE was founded in 2017 by an academia-industry-public partnership and specialises on power electronics, motor control, reliability, simulation and acoustics in production. Within power electronics the activities cover power converters and systems, passive devices, simulation and EMC with currently six associate professors and two PhD students. The number of CIE staff will grow over the next years to more than 30 academic employees.

### Power converters and systems

CIE has a strong expertise in power electronics with a focus on components and topologies. Furthermore, we are developing our expertise into power electronics systems such as drives and other inverters. On component level we work with the latest active and passive power electronic devices such as GaN and SiC. We combine these new materials in advanced topologies to subsystems for any kind of inverters. Academic and industrial partners benefit from insights into state-of-the-art and future opportunities of advanced power electronics for ensuring reliability and new product.



### Passive Devices

CIE has a strong interest in developing the next generation passive components matching the performance levels of new semiconductors. We focus on new electrolytic capacitor systems with low ESR behaviour (Polymer electrolytes), film capacitors with new dielectric materials for high temperature application  $> 150^{\circ}$  grad C and magnetic materials with low losses. Another focus is on thermal, life time and electrical simulation based on the acquisition of physical chemical data.

### EMC/EMI

CIE partners with companies to solve EMC and EMI issues early in the design process of electronics components, devices and systems. The aim is to reduce development time and costs. We focus on the simulation of EMC/EMI issues or specific components and PCB.

### Simulation

CIE will work on the development of holistic system simulation models based on the physics and chemistry of failures

of components. The aim is to improve existing lifetime models of those components and extend it to the system level. At the end the total system level test effort should be reduced.

### Labs and equipment

The CIE will establish by end of 2019 following laboratories with state-of-the-art equipment: EMC/EMI, Inverters, Motor, Control and Actuators, Noise lab, Passive Components lab (capacitors and magnetics), Reliability (passive and active components, simulation), High-resolution X-ray tomography, Helium Ion Microscopy.

