

UNIVERSIDAD POLITÉCNICA DE MADRID UPM



The Center of Industrial Electronics (CEI) is a research center at the Universidad Politécnica de Madrid (UPM) created to generate knowledge and develop applications related to Industrial Electronics, in cooperation with industry partners.

CEI activities focus on electronic system designs, both analog and digital. Research lines are related to **power electronics**, **power quality** and **embedded systems**.

Strong Industrial Program

CEI is recognized for its strong industrial program and the large number of direct collaborations with industry, worldwide. The funding scheme is a combination of public funds and direct contracts with International industry partners in **Europe** (ABB, Airbus, Alcatel, Boeing, Bosch, EADS, Crisa, Fagor, Indra, Philips Hearing Implants, Premo, Sedecal, Sener, Siemens, Thales Alenia Space, Tecnobit), **USA** (Ansoft/Ansys, Agere Systems, APEX, GE,

Enpirion, Intel), **China** (SISC, Huawei), and **Australia** (Cochlear).

Power Electronics activities at CEI are related to Power Supply Systems of any nature, ranging from low power (5mW) in cochlear implants to high power (100kW) X-ray applications. Most of the activities deal with DC-DC, AC-DC or DC-AC conversion. CEI researchers have strong expertise in the following areas:

- **Powering Digital ICs**
- **Powering RF amplifiers**
- **Renewable Energy converters: Grid, Batteries & PV panels**
- **Automotive, Aircraft and Space applications**
- **Wireless Power**
- **Control, Modeling, Design & Optimization Tools**

Knowledge in power electronics is of a matrix nature, where a technology

developed for a specific application may be adapted for another application. Supplying energy for biomedical, aerospace, low power ICs or high power PV plants share some core technologies. Examples of this are digital and non-linear controls, fast-dynamic techniques, multi-phase converters, modeling of magnetic components, optimization algorithms, etc..

Education & research

Young researchers are of fundamental importance in a University research center. Besides the Master and Doctoral Programs, and besides the specific research projects, we organize at CEI our **"Annual Meeting"**, where students and industry partners share results and discuss their vision on the future of power electronics. This interaction facilitates technology transfer from university through people, and a real synchronization between industry and academia.

