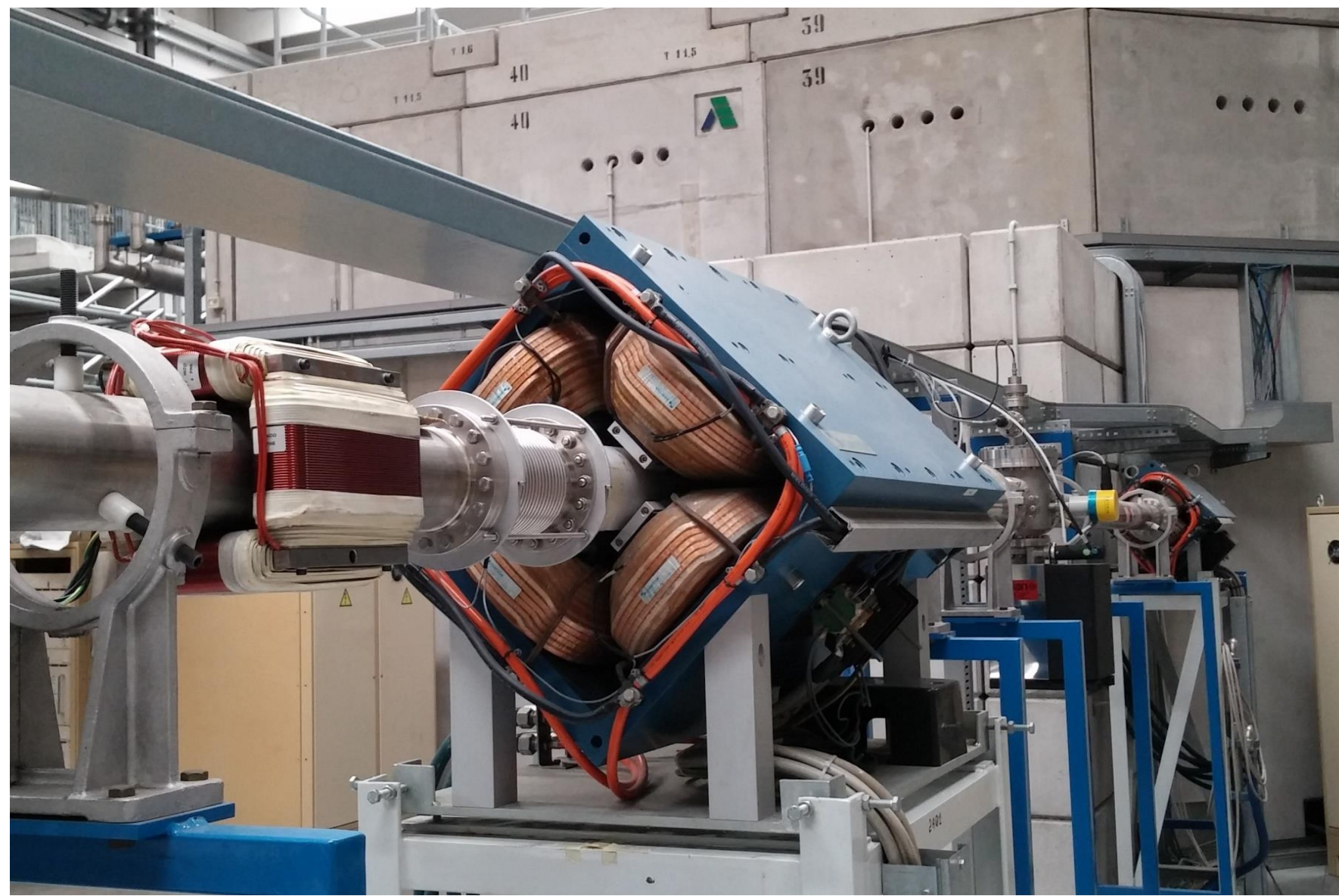




Custom Hardware Platform Based on Intel Edison Module

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What Inspired This Work



The necessity to extend the control reach to small groups of magnet power supplies around the SPES accelerator suggests the design of a low power, low cost, microprocessor based embedded controller, capable of running the EPICS IOC software together with one or more RS232/RS422 interfaces.



The Solution



Intel Edison compute module integrates a 22 nm Intel Atom Processor dual-core 500 MHz.

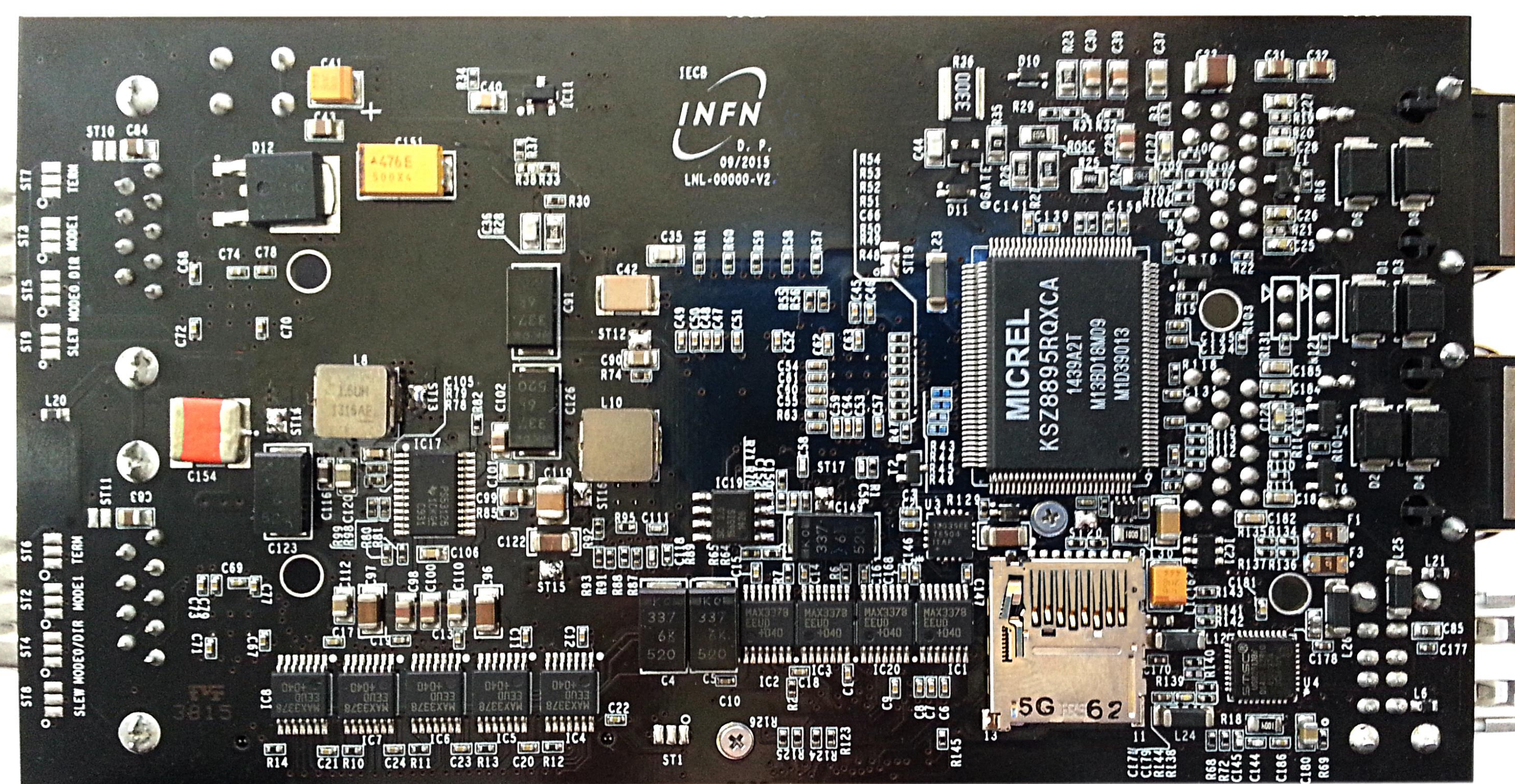
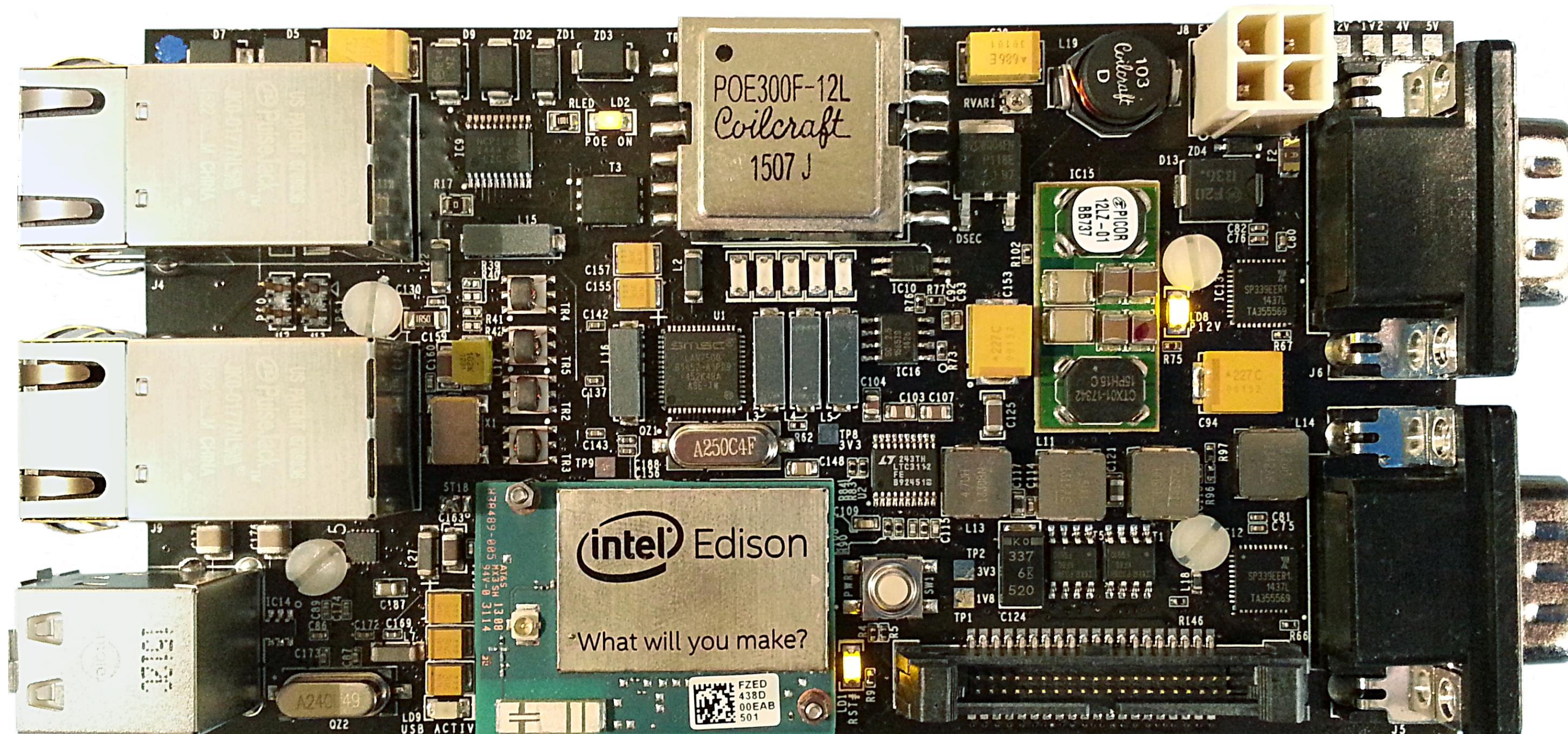
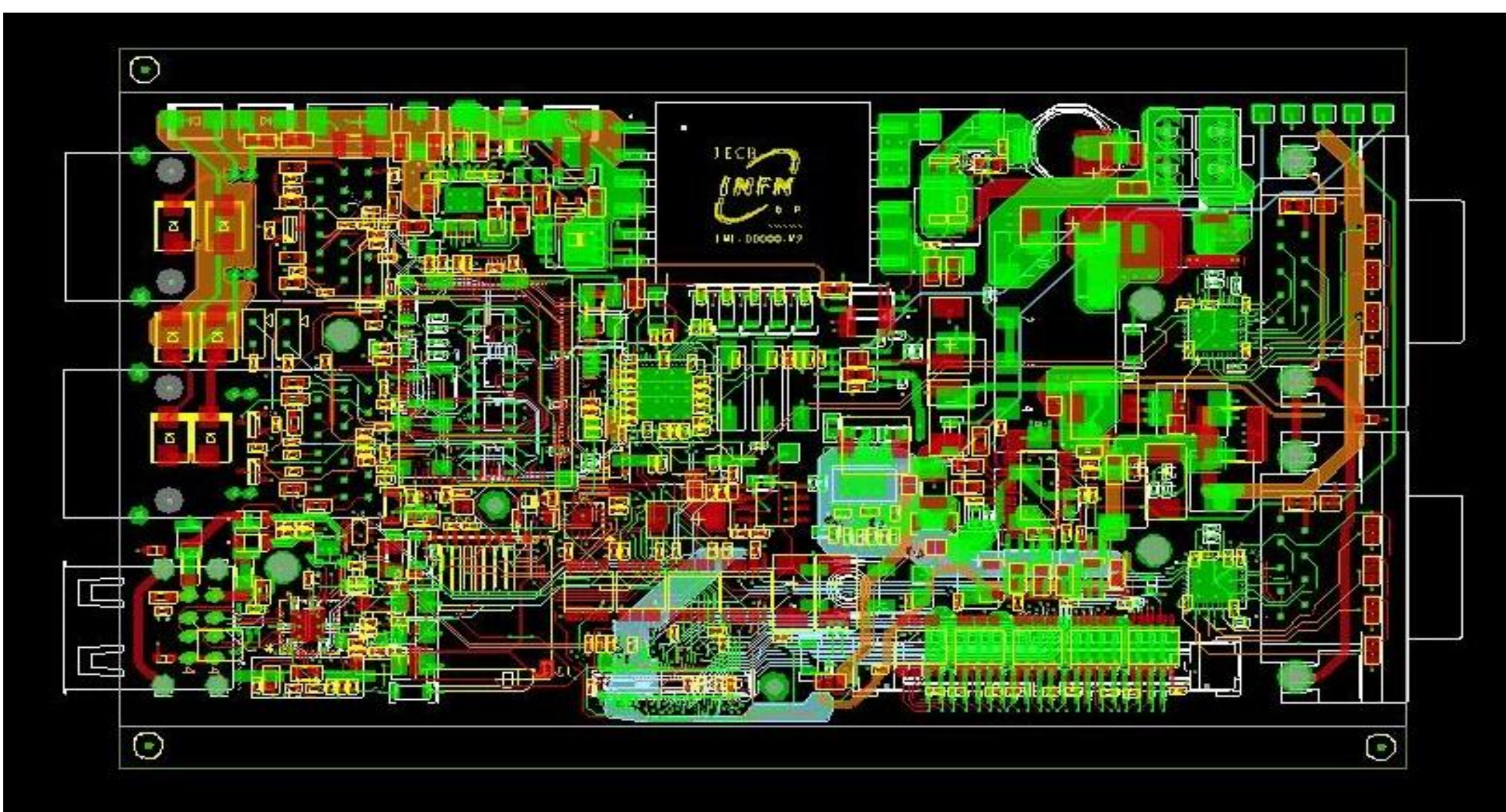
SPES Project



SPES (Selective Production of Exotic Species) is a second generation ISOL radioactive ion beam facility actually in construction at the National Laboratory of Legnaro, Italy. The aim of SPES is to provide high intensity and high-quality beams of neutron-rich nuclei to perform forefront research in nuclear structure, reaction dynamics and inter-disciplinary fields. SPES's control system requires a big effort embedding the control of different devices and their subsequent integration into EPICS framework.

A Simple Custom Desktop PC

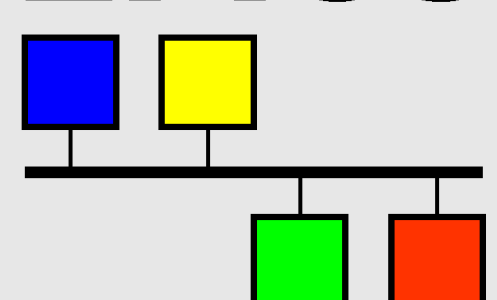
The possibility of designing a custom hardware platform based on a Computer on Module represents a big step toward a "General Purpose Embedded System", bridging the gap between custom developments and commercial off-the-shelf personal computer.



- 8 layers PCB, FR-4 glass epoxy dielectric
- 132mm x 72mm (DIN-RAIL mounting)
- PoE+ 30 W
- Low power (observed up to 3 W)
- ATX-P4 bidirectional 12V power supply
- Wi-Fi dual-band (IEEE 802.11 a/b/g/n)
- Two RS232/422 DSUB connectors
- Dual stacked USB 2.0 type A connector
- microSD
- Two ethernet interfaces
- 20 x GPIO flat cable connector

Key Features

EPICS



The prototype proved to be an adequate solution for embedding the control of different devices in our accelerator complex. The possibility to boot a full Linux distribution and the x86 architecture make the EPICS IOC development straightforward.

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Thanks to Prime Elettronica for assembly the prototype.