



2025 IEEE 4th International Conference

Smart Technologies for Power, Energy and Control (STPEC 2025)

December 10-13, 2025

Department of Electrical and Electronics Engineering,
National Institute of Technology Goa, Goa, India



Special Session 15 (SS15)

Design and Control of Power Converters for Smart Microgrid with Hybrid Energy Storage and EV Charging Systems

Organized and co-chaired by:

- Dr. Manash K Mishra, NIT Manipur, Manipur India
- Dr. Vivek Nandan Lal, IIT(BHU), Uttar Pradesh, India
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Call for Papers

• Technical Outline of the Session:

This special session aims to bring together researchers, academicians, and industry professionals to explore cutting-edge developments in the control of power electronics converters for smart microgrids with hybrid energy storage and EV charging systems. More specifically, it will present advanced power electronics topologies used for power quality enhancement in such applications. Model-based or intelligent control algorithms ensuring compliance with grid requirements, especially regarding power quality issues in smart microgrid with EV charging systems, and EV-related standards, are also considered as major topics in this session. The session will provide a platform for knowledge exchange, fostering discussions on challenges, breakthroughs, and future research directions in energy-efficient and intelligent converter technologies to bring together experts and researchers from academia and industry in power converter design and control.

• Topic of the Session includes, but are not limited to:

- Designing of power electronics converter for smart microgrid and EV charging systems
- Power converter topologies for integrating renewable energy sources and energy storage systems.
- Designing of grid forming and grid following converter
- Power quality issues in smart microgrid with EV charging stations
- Model based control design for smart microgrid
- Coordinated control of multiple converters in hybrid renewable energy system
- Artificial intelligence and digital twin enabled solutions for power converters and battery charging systems
- Cybersecurity challenges specific to power converters and smart microgrids

• Important Dates:

- Special Session Paper Submission Due : June 15, 2025
- Notification of Paper Acceptance : July 31, 2025
- Camera Ready Paper Submission Due : August 31, 2025
- Regular Registration Due : October 30, 2025

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