IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS

Special Issue on:

Advanced Topologies, Control Techniques and Modeling Methodologies for Bidirectional DC/DC Converters

In recent years, much attention has been paid to renewable energy and massive demands for diverse dc loads are emerged, such as electric vehicles and energy storage devices, which imposes higher flexibility requirements on power systems. Bidirectional dc/dc converters with both forward and reverse directions power flow are utilized as the fundamental blocks in these applications for power flow control and voltage/current regulation to ensure stable, reliable, and efficient operation. With the continuous development of power electronics, how to achieve high power density and high efficiency has been the focus and difficulty in bidirectional dc/dc converters design. The increase of switching frequency and the application of wide band gap devices also challenge the traditional design methodologies. Hence, the current research focus is to minimize the weight, volume, losses and cost, and to maximize the reliability, efficiency and power density. The purpose of this special section is to collect the latest achievements from researchers and engineers in the field of bidirectional DC/DC converters, from the aspects of topologies, control techniques and modeling methodologies.

Editors encourage researchers working in this area to submit papers to this Special Issue. Topics of interest include, but are not limited to:

- Isolated and non-isolated bidirectional DC/DC topologies
- Bidirectional DC/DC converters with wide voltage gains
- Modeling of bidirectional DC/DC converters
- Advanced control of bidirectional DC/DC converters
- Partial power bidirectional DC/DC converters
- Multi-input and/or multi-output bidirectional DC/DC converters
- Bidirectional DC/DC converters based on wide band-gap devices (GaN and SiC)
- Magnetic components design methods for bidirectional DC/DC converters
- High power bidirectional power conversion structure
- Converter dynamics and control design for stability
- Protection and condition monitoring of bidirectional DC/DC converters
- EMI/EMC issues of bidirectional DC/DC converters

Submission Guidelines

Authors who wish to submit a paper for consideration must submit an extended abstract (2-page, free format, PDF version) to Prof. Shanshan Gao (gaoshanshan@hit.edu.cn). The extended abstract should also include the manuscript title and authors information. The Guest Editors will use the abstracts to select the manuscripts which will be reviewed for this Special Issue by the IEEE Industry Applications Society. Authors of the manuscripts selected for review will receive a formal invitation with detailed instructions for submission of the complete manuscript to the IAS ScholarOne Manuscripts review site.

Important Deadlines

- October 01, 2024: Deadline for extended abstract submission.
- December 01, 2024: Deadline for notification to invite full paper submissions.
- February 01, 2025: Deadline for full paper submission for review in S1M.
- August 15, 2025: Deadline for notification of final decision.
- November 15, 2025: Deadline for submission of Final Files in S1M.
- Jan/Feb 2026: Publication on the IAS Transactions.

Guest Editors:

- Shanshan Gao, Harbin Institute of Technology, China. gaoshanshan@hit.edu.cn
- Concettina Buccella, University of L'Aquila, Italy. concettina.buccella@univaq.it
- Ziwei Ouyang, Technical University of Denmark, Denmark. ziou@dtu.dk
- Yijie Wang, Harbin Institute of Technology, China. wangyijie@hit.edu.cn