
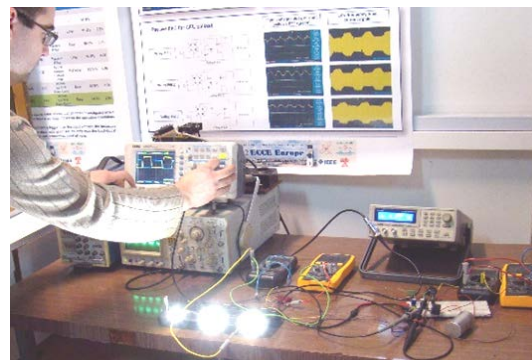


RESEARCH LABORATORY AND SUSTAINABLE DEVELOPMENT ÎN ELECTRONICS AND POWER ELECTRONICS

Contact details

Name	Research Laboratory and Sustainable Development in Electronics and Power Electronics
Acronym	RLSDEPE
Logo	
Site	http://emd.utcluj.ro/rlsdepe
Address	26-28 G.Baritiu Str., Room A6, Cluj-Napoca, Romania
Faculty Department	Faculty of Electrical Engineering Electrical Machines and Drives Department
Telephone	+40 264 202375
Director	Prof. Dr. Eng. Richard Marschalko
e-mail	Richard.Marschalko@emd.utcluj.ro



Areas of expertise

**DC and AC high efficiency converters ;
 PWM and PFM converters control strategies ;
 High power factor and/or power conditioning converters;
 Power electronics for high efficiency lighting systems;
 High frequency, high power density converters for motor drive and renewable energy.**

Team

Prof. Dr. Eng. Richard Marschalko, Assoc. Prof. Eng. Ștefan Mățiș, Assist. Dr. Eng. Petre-Dorel Teodosescu, Assist. Eng. Mircea Bojan, Assist. Eng. Melinda-Sollange Radian-Kreiszer

Representative projects

"Research on the Ecological Energy Conversion Methods with the help of PWM AC- to - DC Converters", CNCSIS, (2004-2006)
"Influence of DC-Link capacitor aging on the PWM converters operation", Mobility and Environment: Researches in the fields of motor vehicle industry, energetics and environment in the Middle - and west -Transdanubian Regions of Hungary, by European Union and co-financed by the European Regional Development Fund" (2010-2013)
"Resonant converter for LED lighting applications", NextPhase S.A. Company Partner, (2013-)
"High frequency resonant inverter for motor control and renewable energy applications", NextPhase S.A. Company Partner, (2013-)

Significant results

The most representative publications of the past 5 years:

1. Teodosescu P.D., Negrea S.T., Bojan M., Marschalko R., Local Grid Power Quality Improvements by the use of a High Power Factor LED Device, 49th International Universities Power Engineering Conference (UPEC), Cluj-Napoca, ROMANIA, Sep 02-05, 2014
2. L. Kovács, D. Fodor, R. Marschalko, "Power Converter Based Test Bench Design for Aluminum Electrolytic Capacitor Development", IYCE 2013, International Youth Conference on Energy 2013, 978-1-4673-5556-8/13. <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6604139&queryText=test+bench+capacitor>
3. P. D. Teodosescu, M. Bojan, I. C. Vese, R. Marschalko, "Study of the improvement of a CFL's power factor by using a valley fill filter", in *Acta Electrotehnica*, vol. 53, no.1, 2012, pp. 74-80
4. P. D. Teodosescu, M. Bojan, I. C. Vese, R. Marschalko, "LED Drive Technology Based on CFL Ballast Topology",

in *Acta Electrotehnica*, vol. 53, no. 3, 2012, pp. 235-241

5. P. D. Teodosescu, M. Bojan, A. A. Pop, R. Marschalko, "Buck-Boost Corrector Implementing for Compact Fluorescent Lamp Applications", in *BOOK OF ABSTRACTS of the 13th International Conference on Optimization of Electrical and Electronic Equipments OPTIM 2012, Brasov*, 24-26 Mai 2012, Chapter TT03- Power electronics and power conversion, pp. 157, Proceedings IEEE, pp. 833 – 838
6. P. D. Teodosescu, M. Bojan, F. Denes, R. Marschalko, "Research concerning appropriate PFC methods for classic CFL lighting devices", *Proceedings of the 15th International Power Electronics and Motion Control Conference, EPE-PEMC 2012 ECCE Europe*, September 4-6, 2012, Novi Sad, Serbia, IEEE CATALOG Number: CFP1234A – USB, pp. DS3c.11-1-DS3c.11-7.
7. P. D. Teodosescu, M. Bojan, I. C. Vese, R. Marschalko, "Practical Implementation of a LC Resonant Converter for LED Lighting Applications", in *Proceedings of The 16th National Conference on Electrical Drives CNAE 2012, Suceava*, 10-12 Oct. 2012, Buletinul AGIR nr.4/2012 octombrie-decembrie, ISSN 1224-7928, pp. 124 – 129.
8. R. Marschalko, D. Fodor, P. D. Teodosescu, M. Bojan, "Influence of DC-Link Capacitor Aging on the PWM Converters Operation", in *Acta Electrotehnica*, vol. 52, no.4, 2011, pp. 197-202
9. R. Paku, P. Balogh, M. Bojan, R. Marschalko, "Investigation of a new Matlab/Simulink/Sim-Power-Systems toolbox for a PWM ac-to-dc converter applied in active line conditioning", in *IEEE International Conference on Automation, Quality and Testing, Robotics, AQTR 2010*, 2010, pp.231-236
10. R. Paku, P. Balogh, R. Marschalko, "Investigation of a new Matlab/Simulink/Sim-Power-Systems toolbox for a PWM ac-to-dc converter applied in active line conditioning", in *IEEE International Conference on Automation, Quality and Testing, Robotics, AQTR 2010, Cluj – Napoca, Romania*, 2010, pp.231-236
11. R. Paku, R. Marschalko, "Matlab/Simulink/Sim-Power-Systems model for a PWM AC-to-DC converter with line conditioning capabilities", in *Acta Electrotehnica*, vol. 51, no. 2, 2010, pp.152 - 159
12. P. Balogh, R. Marschalko, "New Control Method for Complex Power Factor Correction", in *Acta Electrotehnica*, vol. 51, no. 1, 2010, pp. 69 - 75
13. P. Balogh, M. Bojan, D. Fodor, R. Marschalko, "Completing the Line Conditioning Strategies with PWM DC Converters by Complex Power Factor Correction", in *Acta Electrotehnica*, vol. 49, no.1, 2008, pp. 95-101
14. P. Balogh, M. Bojan, D. Fodor, R. Marschalko, "Investigations Concerning the Application Possibilities of the Complex Power Factor Correction", in *Proceedings of the 11th International Conference on Optimization of Electrical and Electronic Equipments OPTIM 2008, Power Electronics, Electrical Machines and Drives Brasov*, 22-24 May 2008, vol. II-A, pp. 227-233
15. R. Paku, R. Marschalko, "Operating Space of a Bidirectional PWM AC-to-DC Converter Applied in Active Line-Conditioning, AQTR 2008", in *2008 IEEE International Conference on Automation, Quality and Testing, Robotics*, 22-25 May, Session A-M4, Paper A-M4-1, Cluj, Romania, 2008

Significant solutions:

1. Introducing the new concepts of Line Conditioning Strategies - Simple Line Conditioning, Active Line Conditioning, Complex Line Conditioning and Complex Power Factor Corrections – with the help of PWM AC- to - DC Converters.
2. Development and practical implementation of several methods for Active Line Conditioning and Complex Power Factor Corrections strategies.
3. Development and practical implementation of new electronic converters for motor control, renewable energy and LED lighting applications.

The offer addressed to the economic environment

Research & development	RLSDEPE can cover fundamental research and development activities regarding electronics and power electronic domain, thus the mathematical analyses, software simulations, practical implementation and testing for different AC/DC power converters for small to medium power applications. The research activities can cover domains as: Energetics (power conditioning converters, uninterruptible power supplies, renewable energy converters and control strategies), Automotive (main power traction and battery charge converters, auxiliary converters for ventilation, trajectory control, electronic lighting, etc.), Lighting (High Efficiency LED drivers), converters for general motor control applications and Aeronautics (High power density converters for motor control).
Consulting	The experience of the RLSDEPE members in the field of electronics and power Electronics could offer to the private sector technical consulting, documentation and feasibility studies. The practical implementation services is one of the strongest assets regarding RLSDEPE, thus the Laboratory can offer services regarding fundamental and theoretical research, concept studies, simulations, modeling and practical experimentations.
Training	RLSDEPE, trough the experience of his members could coordinate theoretical and/or applicative training services in the field of Electronics, Power Electronics, Energetics Power Electronics Systems, CAD Electronics Circuits Modeling and Simulation, Development, Testing and Technical Services of Electronic Equipment.