
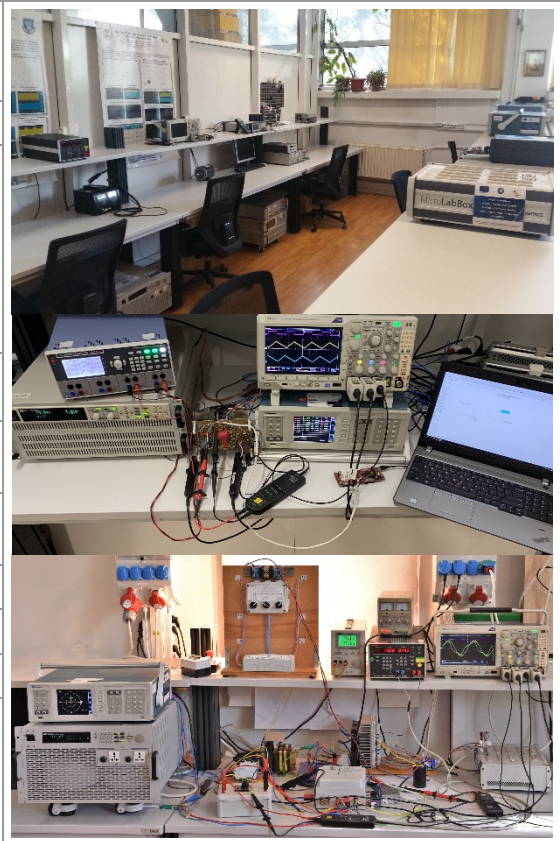


# RESEARCH LABORATORY AND SUSTAINABLE DEVELOPMENT ÎN ELECTRONICS AND POWER ELECTRONICS

## Contact details

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## 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

Assoc. Prof. Ph.D. Eng. Petre-Dorel Teodosescu, Assoc. Prof. Ph.D. Eng. Mircea Bojan, Assoc. Prof. Ph.D. Eng. Ioana Gros, Lect. Ph.D. Eng. Călin Mărginean, Assist. Ph.D. Eng. Norbert Csaba Szekely, Assist. Ph.D. Eng. Vasile Mihai Suciuc, Lect. Ph.D. Eng. Sorin Ionuț Salcu, Assist. Ph.D. Eng. Lucian Nicolae Pintilie, Assist. Ph.D. Eng. Mihai Adrian Iuoraș, Eng. Alexandru Mădălin Păcuraru.

## Representative projects

**MICROINV – "High-power density and high efficiency micro-inverters for renewable energy sources";** Action: POC-A1-A1.2.3-G-2-15 Knowledge Transfer Partnerships, (2017-2021);  
**CIA\_CLIM - "Smart buildings adaptable to the effects of climate change"** - PNIII-P1-1.2 PCCDI 2018, (2018-2020);  
**IEDPFC – "Innovative Electronic Device for Power Factor Correction"**, PN-II-PT-PCCA-2013-4-0914, (2014-2017);  
**"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 teh Middlele - and west -Transdanubian Regions of Hungary, by European Union and co-financed by the European Regional Development Fund" (2010-2013);  
**"Research on the Ecological Energy Conversion Methods with the help of PWM AC- to - DC Converters"**, CNCSIS, (2004-2006).

## Significant results

### The most representative publications of the past 5 years:

1. Teodosescu, P.D., Bojan, M., Marschalko, R., Resonant LED driver with inherent constant current and power factor correction, *IET Electronics Letters*, vol.50, no.15, pp.1086,1088, ISSN: 0013-5194, July 17, 2014

2. Teodosescu, P.D., Bojan, M., Vese I.C., Marschalko, R., Research Concerning Unified Electronic Lighting Devices, Proceedings of the Romanian Academy - series A: Mathematics, Physics, Technical Sciences, Information Science, ISSN : 1454-9069, Vol. 16, No.2, 2015
3. Chirca, M.; Dranca, M.; Oprea, C.A.; Teodosescu, P.-D.; Pacuraru, A.M.; Neamtu, C.; Breban, S. Electronically Controlled Actuators for a Micro Wind Turbine Furling Mechanism. *Energies* 2020, 13, 4207.
4. V. M. Suci, S. I. Salcu, A. M. Pacuraru, L. N. Pintilie, N. C. Szekely, and P. D. Teodosescu, "Independent Double-Boost Interleaved Converter with Three-Level Output," *Applied Sciences*, vol. 11, no. 13, p. 5993, Jun. 2021.
5. S. Breban, M. Dranca, M. Chirca, A.-M. Pacuraru, P.D. Teodosescu, and C.-A. Oprea, "Experimental Tests on a Spoke-Type Permanent Magnets Synchronous Machine for Light Electric Vehicle Application," *Applied Sciences*, vol. 12, no. 6, p. 3019, Mar. 2022
6. N. C. Szekely, S. I. Salcu, V. M. Suci, L. N. Pintilie, G. I. Fasola, and P. D. Teodosescu, "Power Factor Correction Application Based on Independent Double-Boost Interleaved Converter (IDBIC)," *Applied Sciences*, vol. 12, no. 14, p. 7209, Jul. 2022
7. S. I. Salcu, V. M. Suci, P. D. Teodosescu, and Z. Mathe, "The Condition Number Perspective in Modeling and Designing an Electronic IDBIC Converter," *Electronics*, vol. 13, no. 7, p. 1302, Mar. 2024, doi: 10.3390/electronics13071302.
8. A.M. Iuoras. S.I. Salcu, V.M. Suci, L.N.Pintile, N.C.Szekely, M. Bojan, P.D.Teodosescu, AC-DC Microgrid Analyses using a hybrid Real-Time HiL approach, 7th International Congress on Information & Communication Technology ICICT 2022, [INSPEC, Scopus].
9. A. M. Păcuraru, V. M. Suci, L. N. Pintilie, S. I. Salcu, A. B. Cristian and P. D. Teodosescu, "Analysis and Practical Implementation of an Independent Double Buck Interleaved Converter," *2022 International Conference and Exposition on Electrical And Power Engineering (EPE)*, Iasi, Romania, 2022, pp. 472-477, [IEEE].
10. A. M. Păcuraru, S. I. Salcu, M. A. Iuoraș, Ș. Breban, Z. Mathe and P. D. Teodosescu, "Practical Implementation of an Electronic Controlled Actuator for Micro Wind Turbine Overspeed Protection," *2022 International Conference and Exposition on Electrical And Power Engineering (EPE)*, Iasi, Romania, 2022, pp. 478-483, [IEEE].
11. L. N. Pintilie, H.C. Hedeșiu, C.G. Rusu, P.D. Teodosescu, C.I. Mărginean, S.I. Salcu, V.M. Suci, N.C. Szekely, A.M. Păcuraru, "Energy Conversion Optimization Method in Nano-Grids Using Variable Supply Voltage Adjustment Strategy Based on a Novel Inverse Maximum Power Point Tracking Technique (iMPPT)," *Electricity*, vol. 4, no. 4, pp. 277–308, Oct. 2023 [Scopus].

#### Patents:

1. [EP3121952B1](#)- Operating method of switched reluctance motor (21.07.2015)
2. [RO131169B1](#)- Electronic device for led lighting systems (23.11.2015)
3. [RO131166B1](#)- Electro-mechanical actuator with electronic control device (06.01.2016)
4. [EP3300462B1](#)- Capacitor direct current (DC)-link arrangement (21.09.2016)
5. [RO134350B1](#) – INTERLEAVED VOLTAGE STEP-UP/STEP-DOWN ELECTRONIC CONVERTER (19.12.2019)
6. [RO134348A3](#) – Patent Application – DC Micro-grid and its control method (30.07.2020)
7. [RO137573A0](#) - Patent Application - Method for compensating the reactive energy from the common coupling point, as a secondary electronic function (30.08.2022)
8. [RO137574A0](#) – Patent Application – Electronic micro inverter for conversion of energy from photovoltaic panels (30.08.2022)

#### 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. Research, development and practical implementation of new electronic converters for renewable energy, electric grid and automotive 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.
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 are one of the strongest assets regarding RLSDEPE, thus the Laboratory can offer services regarding fundamental and theoretical research, concept studies, simulations, modelling and practical experimentations.
Training	RLSDEPE, through 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 Modelling and Simulation, Development, Testing and Technical Services of Electronic Equipment.

Last updated: January 2025