

Design, and testing of a Range Extender Module for Hybrid Vehicle

DESCRIPTION

Among different hybrid vehicles topologies, series hybrid is a viable option. In such topology Traction drive is purely electric, while internal combustion engine is connected to electrical generator in order to charge the battery and thus extend the operation range of the vehicle. Thus the name Range Extender Module. Our task was to design electric part of the module, where electrical generator was designed in cooperation with Hidria d.o.o. company. The power stage and control electronic was designed and tested solely by us. In order to keep the system integration as simple as possible, air cooling was preferred. Therefore high efficiency was one of main design criteria. We achieved peak efficiency of 99.2 % with wide operational range where efficiency is above 95%. Maximum losses of 15 kW power stage were just 120W, which are easily dissipated using air cooling.

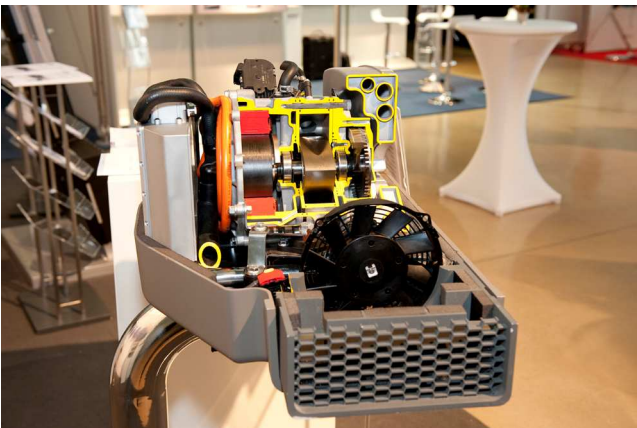


Fig: Mock-up of complete Range Extender Module along with PMSM generator and internal combustion engine (left). Power stage and control board during development (below)

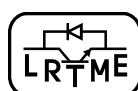


KEY ADVANTAGES/SKILLS

High efficiency, Rapid development of custom solutions, Advanced control algorithms

Contact: mitja.nemec@fe.uni-lj.si

Phone: +386 1 4768 477



Laboratory
of Control Engineering and
Power Electronics

University of Ljubljana
Faculty of Electrical Engineering

