

MULTISTANDARD POWER-LINE COMMUNICATION MODULE PROTOTYPE CREATION FOR SMART LIGHTING APPLICATIONS

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In today's modern technology era, all developed countries understand the importance of nature preservation and undoubted technological achievement contribution to this process. One of the most obvious solutions to improve ecological situation is to try to reduce electrical energy consumption. Luckily, advances in control systems give huge possibilities to optimize electrical devices, thus reducing electricity consumption without refusing any conveniences, provided by these devices.

Nowadays, PLC (power-line communication) technology is being "reinvented" and becoming more and more popular for different solutions as safe and low noise-dependent technology, which can transfer small data packages using existing power line cables. Despite many advantages, PLC, being unpopular for a long time, wasn't properly standardized. As a result, several alliances were created and each of them developed their own PLC standard, which of course is unique and not supported by other standards. Therefore, there is a demand for cheap and simple solution to act as an intermediary for different standard-based PLC systems.

During this study, we tried to develop a concept for such device. According to our previous PLC standard analysis, we managed to create a simple phase modulation based hardware concept, which theoretically can manage connection between different standard PLC systems or act as an independent system. The concept was tested by Multisim simulation and circuit design software and after being confirmed, two prototypes were created. It is strongly believed that created prototypes would be able to solve existing Smart City PLC communication problems and create possibilities to add new features.

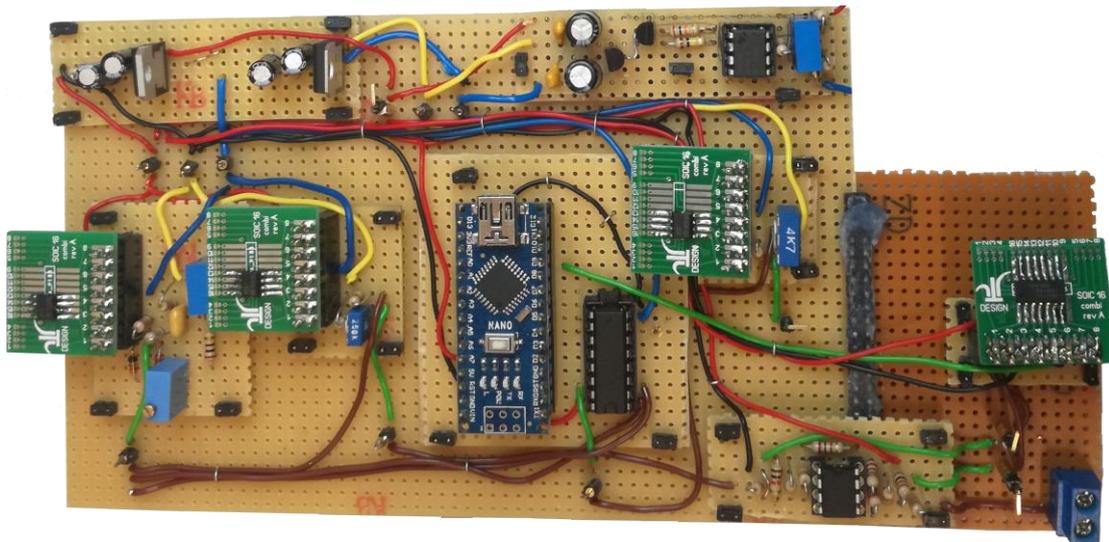


Fig. 1. Created PLC module prototype.

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- [1] H.C. Ferreira et al., *Power Line Communications: Theory and Applications for Narrowband and Broadband Communications over Power Lines*, Wiley & Sons, 528 (2010).
[2] K. Sharma, L. Saini, *Power-Line Communication for Smart Grid: Progress, Challenges, Opportunities and Status*, *Renewable and Sustainable Energy Reviews* **67**, 704-751 (2017).