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POWER LINE COMMUNICATION SYSTEM AND ITS USE IN SIGNAL PROCESSING

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Abstract

In this paper, we present the design of a Broadband Power Line Communication receiver optimized complexity. To this end, the Radio-Frequency stage uses a direct conversion architecture while some innovative solutions are used in the base-band signal processing, such as a new frequency offset synchronization scheme based on the frequency domain. Signal processing techniques to combat the adverse communications environment on power lines are addressed, so as to enable reliable high speed data communications over low voltage. In particular, it is argued that the methods can successfully mitigate the influence of the principal impairments in channels, namely time-varying channel attenuation, multipath frequency-selective fading, multiple-access interference, and background noise. Strategies to deal with the most unfavorable noise source, the impulse noise, are also discussed.

Keywords and phrases: power-line communication, OFDM, wireless communications.