

## Inhaltsverzeichnis

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Seitenbild	<div style="text-align: center;"> <p>2011 IEEE International Symposium on Power Line Communications and Its Applications</p> <h3>Comparison of PLC G3 and PRIME</h3> <p>Martin Hoch Institute for Information Transmission, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany hoch@lnt.de</p> </div> <p><b>Abstract</b>—For the emerging IEEE 1901.2 standard on Narrow-Band Power Line Communications there are two proposals regarding the Physical and Medium Access Control Layer—PLC G3 and PRIME. In this paper, the Physical Layers of both drafts are compared to each other, by theoretical analysis as well as simulation results.</p> <p><b>I. INTRODUCTION</b></p> <p>Power Line Communications (PLC) have not been standardized for a long time, but only some regulations have been established like CENELEC norm EN 50065-1. In addition to the standardization efforts on Broad-Band PLC for in-home PLC-based Local Area Networks and internet access (IEEE P1901.1 [1]), standardization of Narrow-Band PLC for SmartGrid applications has been started, too.</p> <p>The committee has to discuss two proposals regarding the Physical and Medium Access Control Layer: PLC G3, which has been launched by ERDF and Maxims, and PRIME, initialized by the PRIME Alliance (Iberdrola, Texas Instruments et. al.).</p> <p>In this paper we will focus on the respective Physical Layers, only, which are specified in [2] and [3].</p> <p>Both drafts intend to use CENELEC A band by Cyclic Prefix (CP) Orthogonal Frequency Division Multiplexing (OFDM) in combination with coded Differential Phase Shift Keying (DPSK), which is known to be a simple and robust technique for data transmission over frequency selective channels as OFDM can be implemented highly efficiently by the Fast Fourier Transform (FFT) and DPSK modulation allows for receivers without any channel estimation algorithms.</p> <p>In the following short overviews of PLC G3 and PRIME will be given in Sections II and III, respectively. After that, Section IV discusses the differences of both proposals from a theoretical point of view while Section V presents simulation results for typical power line channels. Finally, conclusions are given in Section VI.</p> <p><b>II. PLC G3</b></p> <p>The PLC G3 system is operating at a sampling frequency of <math>f_s = 400</math> kHz and uses an FFT size of <math>M = 256</math>, leading to a subcarrier spacing of <math>\Delta f = 1.5625</math> kHz. Thus by modulating carriers No. 23 to 58, only, G3 occupies the frequency range 35.9–90.6 kHz.</p> <p>Fig. 1 shows the block diagram of a PLC G3 transmitter. For data transmission G3 offers three modes “Robust”, “DBPSK”, and “DQPSK”<sup>1</sup>, facilitating packets of data of at maximum</p> <p><sup>1</sup>In [4] a “DBPSK” mode is announced, too.</p> <p><b>III. PRIME</b></p> <p>In PRIME the sampling frequency has been chosen to <math>f_s = 250</math> kHz, while the FFT size is <math>M = 512</math>, i.e. the subcarrier spacing accounts for <math>\Delta f = 488</math> Hz. As carriers 86–182 are used for transmission, the PRIME signal is located in the frequency range 42–89 kHz.</p> <p>The signal processing in a PRIME sender is depicted in Fig. 2. By selecting the modulation scheme DBPSK, DQPSK, or DBPSK and switching on or off the convolutional coding</p>

## Seitenschutz

Bearbeiten	Alle Benutzer (unbeschränkt)
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Hochladen	Alle Benutzer (unbeschränkt)

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## Versionsgeschichte

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Seitenersteller	<a href="#">OE1MHZ</a> ( <a href="#">Diskussion</a>   <a href="#">Beiträge</a> )
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