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IEEE Standard for Low-Frequency (less than 500 kHz) Narrowband Power Line Communications for Smart Grid Applications

Amendment 1

IEEE Communications Society

Sponsored by the
Power Line Communications Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 1901.2a™-2015
(Amendment to
IEEE Std 1901.2™-2013)

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Approved 3 September 2015

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Abstract: Changes to clarify how and when to encrypt header and payload information elements, update the interleaver design in order to eliminate some drawbacks in certain channels, a new PHY data primitive attribute so sub-band SNR data can be obtained from the PHY, modification to the frame counter size for security to make it consistent with IEEE Std 802.15.4e™-2012, and adding a beacon attribute and change the zero crossing detector text are addressed in this amendment.

Keywords: coexistence, G3-PLC, IEEE 1901.2a™, IFFT OFDM, MAC, medium access control, narrowband, PHY, physical layer, PLC, power line communications, PRIME.

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Introduction

This introduction is not part of IEEE Std 1901.2a™-2015, IEEE Standard for Low-Frequency (less than 500 kHz) Narrowband Power Line Communications for Smart Grid Applications—Amendment 1.

This standard is designed to enable low-frequency (<500 kHz) narrowband power line communications (PLC) over indoor and outdoor electrical wiring. The standard supports data rates of up to 500 kb/s and was developed as the result of a collaborative effort undertaken by a large cross section of the PLC industry's technical experts and stakeholders.

It also contains a coexistence mechanism that was developed based on the requirements provided by the industry and with the input from the Smart Grid Interoperability Panel (SGIP) Priority Action Plan 15 (PAP15). This coexistence mechanism may be used by any PLC technology in this band without implementing the rest of the standard and will be maintained through the IEEE-SA.

The project was authorized 25 March 2010. The first draft was available in early January 2011. The first letter ballot was started in January 2012 and received final working group approval on 29 May 2013. Sponsor ballot was completed on 7 September 2013. The document was approved by the IEEE-SA Standards Board on 31 October 2013. The base standard amendment project was authorized 26 March 2015 and approved by the IEEE SA Standards Board on xx Month 2015.

The scope of this amendment is as follows:

- Change to clarify how and when to encrypt header and payload information elements.
- Change to the interleaver design to eliminate some drawbacks in certain channels.
- Insert an attribute into a PHY data primitive so sub-band SNR data can be obtained from the PHY.
- Change to the frame counter size for security to make it consistent with IEEE Std 802.15.4e™-2012.
- Insert a beacon attribute
- Change the zero crossing detector text.

Contents

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NOTE—The editing instructions contained in this amendment define how to merge the material contained therein into the existing base standard and its amendments to form the comprehensive standard.

The editing instructions are shown in ***bold italic***. Four editing instructions are used: change, delete, insert, and replace. ***Change*** is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by using ~~strikethrough~~ (to remove old material) and underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. ***Replace*** is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editing instructions, change markings, and this NOTE will not be carried over into future editions because the changes will be incorporated into the base standard.