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IEEE Standard for Power-Line Carrier Line-Tuning Equipment (30 kHz to 500 kHz) Associated with Power Transmission Lines

IEEE Power and Energy Society

Sponsored by the
Power System Communications Committee

IEEE
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Abstract: Power-line carrier (PLC) line-tuning equipment connected between the coupling capacitors and PLC transmitter/receiver terminals operating in the frequency range of 30 kHz to 500 kHz over power transmission lines and cables or to similar line-tuning equipment in a carrier bypass are addressed in this standard. PLC line-tuning equipment includes assemblies and components: tuning inductor, impedance matching transformer, balancing transformer, tuning capacitor, inductance-capacitance (LC) tuning unit, hybrid, filter, protective unit, interconnecting cables, and enclosure. This standard includes the protective devices that facilitate the safe operation and maintenance of the line-tuning components under normal and usual operating conditions. This standard will develop technical definitions, performance ratings, testing methods, and manufacturing requirements for the included line-tuning equipment.
Keywords: hybrid, IEEE C93.4™, line tuners, PLC, power-line carrier, protective device

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

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The following members of the individual balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

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Introduction

This introduction is not part of IEEE Std C93.4-2012, IEEE Standard for Power-Line Carrier Line-Tuning Equipment (30 kHz to 500 kHz) Associated with Power Transmission Lines.

This standard was last published in 1984. It was approved on August 7, 1984, by the American National Standards Institute, Inc. (ANSI) and published by them. At that time the Secretariat was the National Electrical Manufacturers Association (NEMA). The copyrights for all the ANSI C93 standards were transferred to the IEEE on January 20, 2004. The C93™ standards consist of the following four standards:

ANSI/NEMA C93.1-1999, American National Standard Requirements for Power-Line Carrier Coupling Capacitors and Coupling Capacitor Voltage Transformers (CCVT).

ANSI/NEMA C93.3-1995, American National Standard Requirements for Power-Line Carrier Line Traps.

ANSI C93.4-1984, American National Standard for Power-Line Carrier Line-Tuning Equipment (30 kHz to 500 kHz) Associated With Power Transmission Lines (now this standard, IEEE Std C93.4-2012).

ANSI/NEMA C93.5-1997, American National Standard Requirements for Single Function Power-Line Carrier Transmitter/Receiver Equipment

IEEE placed the responsibility for maintaining these standards with the Power System Communications Committee (PSCC). In turn the PSCC assigned the responsibility to the Power Line Carrier (PLC) Subcommittee.

This standard has been almost completely rewritten from the version last published in 1984. As well as rewriting the requirements for PLC line-tuning equipment, the requirements for auxiliary equipment, such as hybrids and filters, for combining multiple transmitters and receivers so that they can communicate over one coaxial cable, have been added.

This standard is dedicated to Mr. Edo Derencinovic, posthumously, as he was an expert in the field of power-line carrier and contributed significantly to the information in this document.

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IEEE Standard for Power-Line Carrier Line-Tuning Equipment (30 kHz to 500 kHz) Associated with Power Transmission Lines

1. Overview

1.1 Scope

This standard applies to power-line carrier (PLC) line-tuning equipment connected between the coupling capacitors and PLC transmitter/receiver terminals operating in the frequency range of 30 kHz to 500 kHz over power transmission lines and cables or to similar line-tuning equipment in a carrier bypass. PLC line-tuning equipment includes assemblies and components: tuning inductor, impedance matching transformer, balancing transformer, tuning capacitor, inductance-capacitance (LC) tuning unit, hybrid, filter, protective unit, interconnecting cables, and enclosure. This standard includes the protective devices that facilitate the safe operation and maintenance of the line-tuning components under normal and usual operating conditions. This standard will develop technical definitions, performance ratings, testing methods, and manufacturing requirements for the included line-tuning equipment.