INTERNATIONAL STANDARD

ISO/IEC 15149-1

First edition
2014-07-01

Information technology — Telecommunications and information exchange between systems — Magnetic field area network (MFAN) —

Part 1: Air interface

Technologies de l'information — Téléinformatique — Réseau de zone de champ magnétique (MFAN) —

Partie 1: Interface radio

Reference number
ISO/IEC 15149-1:2014(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, Subcommittee *SC 6, Telecommunications and information exchange between systems*.

This first edition of ISO/IEC 15149-1 cancels and replaces ISO/IEC 15149:2011, of which it constitutes a minor revision.

ISO/IEC 15149 consists of the following parts, under the general title *Information technology — Telecommunications and information exchange between systems — Magnetic field area network (MFAN)*:

— *Part 1: Air interface*

— *Part 2: In-band Control Protocol for Wireless Power Transfer*

Relay Protocol for Extended Range and *Security Protocol for Authorization* will form the subjects of future Parts 3 and 4, respectively.

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Introduction

This International Standard provides protocols for magnetic field area network (MFAN). MFAN can support the service based on wireless communication and wireless power transfer in harsh environment. MFAN is composed of four protocols: air interface, in-band control protocol, relay protocol, and security protocol.

This part of ISO/IEC 15149 specifies the physical layer and media access control layer protocols of wireless network over a magnetic field.

ISO/IEC 15149-2 specifies the control protocol for wireless power transfer based on magnetic field area network.

ISO/IEC 15149-3 specifies the relay protocol to extend effective network coverage of magnetic field area network.

ISO/IEC 15149-4 specifies the secuity protocol to authorize nodes to communicate in magnetic field area network.

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Information technology — Telecommunications and information exchange between systems — Magnetic field area network (MFAN) —

Part 1: Air interface

1 Scope

This part of ISO/IEC 15149 specifies the physical layer and media access control layer protocols of wireless network over a magnetic field in a low frequency band (~300 KHz) for wireless communication in harsh environment (i.e., around metal, underwater, underground, etc.).

The physical layer protocol is designed for the following scope:

— low carrier frequency for large magnetic field area and reliable communication in harsh environment;

— simple and robust modulation for a low implementation cost and error performance;

— variable coding and bandwidth for a link adaptation.

The media access control layer protocol is designed for the following scope:

— simple and efficient network topology for low power consumption;

— variable superframe structure for compact and efficient data transmission;

— dynamic address assignment for small packet size and efficient address management.

This part of ISO/IEC 15149 supports several Kbps data transmission in wireless network within a distance of several meters. It can be applied to various services such as the following areas:

— environmental industry to manage pollution levels in soil and water using wireless underground or underwater sensors;

— construction industry to monitor the integrity of buildings and bridges using wireless, inner-corrosion sensors;

— consumer-electronics industry to detect food spoilage in wet, airtight storage areas and transfer the sensing data from the inside to the outside;

— agricultural industry to manage the moisture level as well as mineral status in soil using wireless, buried sensors;

— transportation industry to manage road conditions and traffic information using wireless, underground sensors.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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