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Information technology — Telecommunications and information exchange between systems — MAC/PHY standard for ad hoc wireless network to support QoS in an industrial work environment

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Norme MAC/PHY pour un réseau ad hoc sans fil qui supporte QoS dans un environnement de travail industriel

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Foreword

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

This second edition cancels and replaces the first edition (ISO/IEC 24771:2009), which has been technically revised.

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Information technology — Telecommunications and information exchange between systems — MAC/PHY standard for ad hoc wireless network to support QoS in an industrial work environment

1 Scope

This International Standard defines a protocol for the physical layer (PHY) and the data link layer in order to construct a reliable and high-speed data transmission network between devices on industrial sites such as factories and plants. This network specification provides a standardized protocol to provide a framework for various industrial devices to establish a simple, low-cost, energy-efficient, and high-speed network between them. In order to fulfil the service requirements of the factories and large plants, this network specification is designed to enable devices to establish a network by themselves without help of any infrastructure and reliably exchange various kinds of data, including real-time audio and video data, between them. In addition to high transmission rates, Quality of Service (QoS) for multimedia data - such as video - is also provided.

The devices mentioned in this International Standard refer to equipment that is and can be used in industrial sites such as factories and automated assembly lines. Such devices include PLC (Programmable Logic Controller), and CNC (Computerized Numerical Controller) and manufacturing robots. However, beyond such conventional devices, devices mentioned in this International Standard include personal IT devices that workers may carry and use while working, including cellular phones, personal industrial digital assistants (PDA), and laptop PCs.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 9797-1, *Information technology — Security techniques — Message Authentication Codes (MACs) — Part 1: Mechanisms using a block cipher*

ISO/IEC 18033-3, *Information technology — Security techniques — Encryption algorithms — Part 3: Block ciphers*

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3 Terms and definitions, and abbreviations

3.1 Terms and definitions

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

3.1.1
Access control
control process to prevent unauthorized use of resources or bandwidth

3.1.2
Ad-hoc network
network that is spontaneously formed usually without system installation

NOTE Such networks are mainly characterized by time and space limitations.

3.1.3
Association
service used to connect authorized devices in the network

3.1.4
Authentication
device verification process allowing devices within the network to connect to one another

3.1.5
Camellia
128-bits secure block algorithm defined in the ISO/IEC 18033-3 standard

3.1.6
Coverage area
territory over which two devices can achieve acceptable quality and performance while exchanging data

3.1.7
Dissociation
service used in an established network

3.1.8
Frame
format of bits in a data exchange

3.1.9
K
prefix indicating multiplication by 1024

3.1.10
Kμs
unit of 1024 μs

3.1.11
k
prefix indicating multiplication by 1000

3.1.12
Logical Channel
data link channel sitting distinctly above the physical layer

3.1.13
Master
station that manages the network by periodically transmitting a beacon frame

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