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Industrial networks – Coexistence of wireless systems – Part 4: Coexistence management with central coordination of wireless applications

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Réseaux industriels – Coexistence des systèmes sans fil – Partie 4: Gestion de coexistence avec coordination centralisée des applications sans fil

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INDUSTRIAL NETWORKS – COEXISTENCE OF WIRELESS SYSTEMS –

Part 4: Coexistence management with central coordination of wireless applications

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Draft	Report on voting
65C/1164/FDIS	65C/1170/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62657 series, published under the general title *Industrial networks – Coexistence of wireless systems*, can be found on the IEC website.

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INTRODUCTION

The IEC 62657 series provides background, foundations, process and examples to achieve wireless coexistence. With a coexistence management process according to IEC 62657-2, a predictable assuredness of coexistence can be achieved for a given spectrum while ensuring that application requirements continue to be met. The present document provides an automated coexistence management.

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INDUSTRIAL NETWORKS – COEXISTENCE OF WIRELESS SYSTEMS –

Part 4: Coexistence management with central coordination of wireless applications

1 Scope

This part of IEC 62657 specifies a concept and methods for central coordination (CC) of automation applications using wireless communications to extend the coexistence management according to IEC 62657-2. It establishes system elements, interfaces and relationships for a central coordination. Functions, data, and data exchange for assessing and maintaining the coexistence state are specified.

This document specifies the central coordination point (CCP) approach as one example of the usage of the formal description given in IEC 62657-3.

This document is applicable to develop, implement, or modify procedures or solutions.

This document provides requirements for automated coexistence management systems.

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This document provides requirements for:

- determination of the coexistence state,
- automated coexistence management procedures,
- CC amendments for existing wireless communication solutions,
- CC functions that coordinate legacy and new wireless communication systems.

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This document is not restricted to a specific radio frequency range nor is it restricted to a specific wireless communication technology.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62657-2:—[1], *Industrial networks – Coexistence of wireless systems – Part 2: Coexistence management*

IEC 62443 (all parts), *Security for industrial automation and control systems*

ISO/IEC 10731, *Information technology – Open Systems Interconnection – Basic Reference Model – Conventions for the definition of OSI services*

[1] Under preparation. Stage at the time of publication: IEC FDIS 62657-2:2022.

3 Terms, definitions, abbreviated terms and conventions

3.1 General

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.2 Terms and definitions specific for this document

3.2.1
allocation
entry in the table of frequency allocations of a given frequency band for the purpose of its use by one or more radio communication services or the radio astronomy service under specified conditions

3.2.2
coexistence distance
difference between the threshold value for the coexistence state and the actual value of the coexistence state function expressing the distance before reaching the coexistence state

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3.2.3
coexistence margin
difference between the actual value of the coexistence state function and the threshold for the coexistence state expressing the reserve before leaving the coexistence state

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3.2.4
database service
service officially operated under the rules of the local regulatory authority that provides a list of available channels and possibly the maximum EIRP allowable on these channels based on queries containing the geolocation of the wireless regional area network (WRAN) devices

3.2.5
geolocation
process of acquiring the location data of a device, determining its latitude and longitude

3.2.6
harmful interference
any emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunications service operating in accordance with the ITU and local Regulations

3.2.7
incumbent radio system
wireless communication system that is not under the control of, and is not affected by, the coexistence manager

3.2.8
logical link
application oriented communication relationship which enables the transmission of user data between one logical end point of the reference interface in a source device and one logical end point of the reference interface in a target device

3.2.9
master station
data station that has been designated by the control station to ensure data transfer to one or more slave stations

Note 1 to entry: At a given instant, there can be only one master station on a data link.

[SOURCE: IEC 60050-721:1991, 721-19-12]

3.2.10
service flow
QoS parameters for the PDUs that are exchanged on a connection, and provide a mechanism for upstream and downstream QoS management

3.2.11
service flow identifier
SFID
unique identifier for a service flow dealing with how higher layer packets/application sessions are mapped to their QoS requirements and scheduling constraints

3.2.12
slave station
data station that is selected by a master station to receive data

3.3 Additional terms and definitions for the templates

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3.3.1
array of frequency
collected values from sensing start frequency to sensing end frequency during the sensing process

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3.3.2
array of power spectral density
collected values of power spectral density from sensing start frequency to sensing end frequency during the sensing process

3.3.3
CCP address
communication partner identification of the central coordination point for a service

3.3.4
communication link ID
identifier (ID) as part of the response of a service execution related to the communication link

3.3.5
destination address
communication partner identification for a service

3.3.6
limits of performance parameter
value returned with the limit for a performance parameter

3.3.7
medium sensing report type
requested type of information related to the generation type of medium resource report

Note 1 to entry: The type is represented by a number with the following code: 1: Event driven; 2: Cyclic; 3: Requested.

3.3.8
parameter ID
identifier (ID) of a parameter that is specified by a standard or vendor and identifies the parameter whose value is returned

3.3.9
parameter value
contains the value of the parameter to be returned

3.3.10
performance parameter type
requested type of information related to a communication link ID

Note 1 to entry: The type is represented by a number with the following code: 1: Transmission time; 2: Update time; 3: Response time; 4: Data throughput; 5: Communication availability.

3.3.11
radio regulation database ID
identifier (ID) of the radio regulation database

3.3.12
received signal strength indication
RSSI
value of the power present in a received radio signal

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3.3.13
received signal strength indication mean
RSSI mean
mean value of the power present in a received radio signal

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3.3.14
received signal strength indication standard deviation
RSSI standard deviation
standard deviation value of the power present in a received radio signal

3.3.15
report interval
interval time of cyclic reports

Note 1 to entry: This belongs to the cyclic "medium sensing report type".

3.3.16
sensing duration
parameter specifying the duration of a sensing process

3.3.17
sensing end frequency
parameter specifying the stop frequency of sensing

3.3.18
sensing interval
parameter specifying the interval between sensing processes

3.3.19
sensing start frequency
parameter specifying the start frequency of sensing