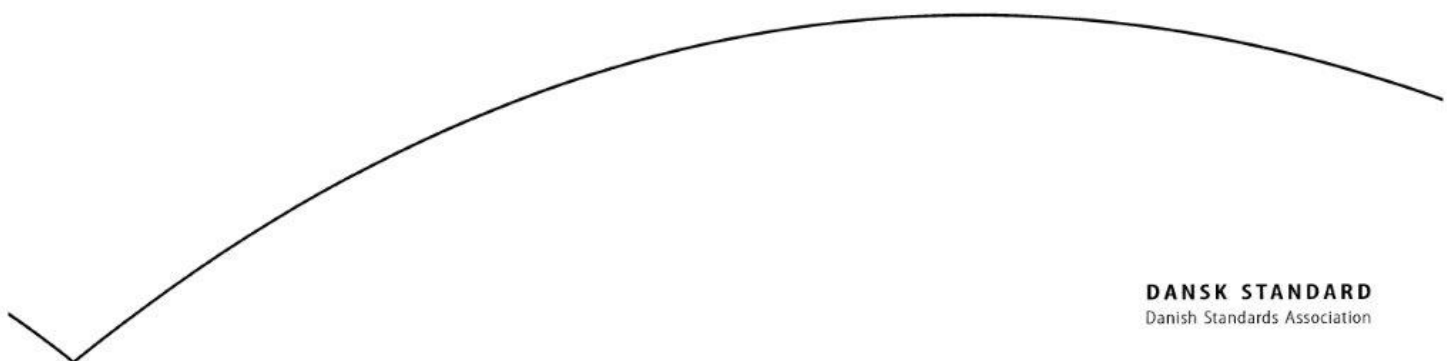


2017-07-17

# Industrielle kommunikationsnetværk – Trådløse kommunikationsnetværk – Del 2: Koeksistensmanagement

Industrial communication networks – Wireless  
communication networks – Part 2: Coexistence  
management



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Supersedes EN 62657-2:2015

English Version

Industrial communication networks - Wireless communication  
networks - Part 2: Coexistence management  
(IEC 62657-2:2017)

Réseaux de communication industriels - Réseaux de  
communication sans fil - Partie 2: Gestion de coexistence  
(IEC 62657-2:2017)

Industrielle Kommunikationsnetze - Funk-  
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(IEC 62657-2:2017)

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The text of document 65C/861/FDIS, future edition 2 of IEC 62657-2, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62657-2:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-03-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-06-15

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61158 Series	NOTE	Harmonized as EN 61158 Series.
IEC 61360 Series	NOTE	Harmonized as EN 61360 Series.
IEC 61784-1	NOTE	Harmonized as EN 61784-1.
IEC 61784-2	NOTE	Harmonized as EN 61784-2.
IEC 61918	NOTE	Harmonized as EN 61918.
IEC 62591	NOTE	Harmonized as EN 62591.
IEC 62601	NOTE	Harmonized as EN 62601.
IEC 62734	NOTE	Harmonized as EN 62734.
IEC 62890	NOTE	Harmonized as EN 62890.

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(normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62657-1	2017	Industrial communication networks - Wireless communication networks - Part 1: Wireless communication requirements and spectrum considerations	EN 62657-1	201X <sup>1</sup>
IEC 62443	Series	Industrial communication networks - Network and system security	EN 62443	Series <sup>1</sup>

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<sup>1</sup> At draft stage.

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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Industrial communication networks – Wireless communication networks –  
Part 2: Coexistence management**

**Réseaux de communication industriels – Réseaux de communication sans fil –  
Partie 2: Gestion de coexistence**

## CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	10
2 Normative references .....	10
3 Terms, definitions, abbreviated terms and conventions.....	10
3.1 Terms and definitions.....	10
3.2 Abbreviated terms.....	21
3.3 Conventions.....	22
4 Coexistence concept in industrial automation .....	22
4.1 Overview.....	22
4.2 Objective .....	24
4.3 Necessity to implement a coexistence management.....	26
4.4 Interference potential.....	28
4.5 Ancillary conditions .....	29
4.6 Requirements to wireless devices for support of coexistence management .....	30
4.7 Concepts .....	30
4.7.1 Manual coexistence management .....	30
4.7.2 Automated non-collaborative metrics-based coexistence management .....	31
4.7.3 Automated collaborative metrics-based coexistence management .....	31
4.8 Best practices to achieve coexistence.....	32
4.9 Coexistence conceptual model.....	34
4.10 Coexistence management and selection of a wireless solution.....	36
4.11 Coexistence management system.....	38
5 Coexistence management parameters .....	38
5.1 General.....	38
5.1.1 Definition and usage of parameters .....	38
5.1.2 Physical link .....	38
5.2 Adjacent channel selectivity.....	38
5.3 Antenna gain .....	39
5.4 Antenna radiation pattern.....	39
5.5 Antenna type .....	39
5.6 Availability .....	39
5.7 Bandwidth.....	40
5.8 Bit rate of physical link.....	40
5.9 Centre frequency .....	40
5.10 Characteristic of the area of operation .....	40
5.11 Communication load .....	40
5.12 Cut-off frequency .....	42
5.13 Data throughput.....	43
5.14 Device type information .....	43
5.15 Distance between wireless devices .....	43
5.16 Duty cycle.....	44
5.17 Dwell time.....	46
5.18 Equivalent isotropic radiated power.....	47
5.19 Equivalent radiated power.....	47
5.20 Frequency band .....	47



5.21	Frequency channel .....	47
5.22	Frequency hopping procedure .....	48
5.23	Future expansion plan .....	48
5.24	Geographical dimension of the plant .....	48
5.25	Infrastructure device .....	48
5.26	Initiation of data transmission .....	48
5.27	ISM application .....	49
5.28	Length of user data per transfer interval.....	49
5.29	Limitation from neighbours of the plant .....	49
5.30	Maximum number of retransmissions .....	49
5.31	Mechanism for adaptivity .....	49
5.32	Medium access control mechanism .....	50
5.33	Modulation .....	50
5.34	Natural environmental condition.....	50
5.35	Network topology .....	50
5.36	Packet loss rate .....	51
5.37	Position of wireless devices .....	51
5.38	Power spectral density.....	51
5.39	Purpose of the automation application .....	52
5.40	Receiver blocking .....	52
5.41	Receiver input level .....	52
5.42	Receiver sensitivity.....	53
5.43	Regional radio regulations .....	53
5.44	Relative movement .....	53
5.45	Response time.....	53
5.46	Security level .....	54
5.47	Spatial coverage of the wireless communication network .....	54
5.48	Spurious response .....	54
5.49	Total radiated power .....	54
5.50	Transfer interval.....	54
5.51	Transmission gap.....	55
5.52	Transmission time.....	56
5.53	Transmitter output power .....	59
5.54	Transmitter sequence .....	59
5.55	Transmitter spectral mask.....	60
5.56	Update time .....	60
5.57	Wireless device density .....	61
5.58	Wireless communication network density .....	61
5.59	Wireless technology or standard .....	62
6	Coexistence management information structures .....	62
6.1	General.....	62
6.2	General plant characteristic .....	63
6.3	Application communication requirements .....	64
6.3.1	Overview .....	64
6.3.2	Requirements influencing the characteristic of wireless solutions .....	65
6.3.3	Performance requirements.....	66
6.4	Characteristic of wireless system type and wireless device type .....	66
6.4.1	Overview .....	66
6.4.2	Wireless system type.....	67

6.4.3	Wireless device type.....	67
6.5	Characteristic of wireless solution.....	70
6.5.1	Overview.....	70
6.5.2	Characteristic of a wireless network solution.....	70
6.5.3	Characteristic of a wireless device solution.....	71
7	Coexistence management process.....	72
7.1	General.....	72
7.1.1	Overview.....	72
7.1.2	Documentation.....	72
7.1.3	Suitable documentation method.....	75
7.1.4	Application of tools.....	76
7.2	Establishment of a coexistence management system.....	76
7.2.1	Nomination of a coexistence manager.....	76
7.2.2	Responsibility of a coexistence manager.....	77
7.2.3	Support by radio experts.....	77
7.2.4	Training.....	77
7.3	Maintaining coexistence management system.....	78
7.4	Phases of a coexistence management process.....	78
7.4.1	Investigation phase.....	78
7.4.2	Planning phase.....	81
7.4.3	Implementation phase.....	83
7.4.4	Operation phase.....	84
8	Coexistence parameter templates.....	86
	Bibliography.....	90
	Figure 1 – Issues of consideration.....	25
	Figure 2 – Applications using frequency spectrum.....	26
	Figure 3 – Progression of expense to achieve coexistence corresponding to the application classes.....	30
	Figure 4 – Separation of wireless systems according to frequency and time.....	33
	Figure 5 – Coexistence conceptual model.....	35
	Figure 6 – Flow chart of the coexistence conceptual model.....	36
	Figure 7 – Selection of a wireless system in the coexistence management process.....	37
	Figure 8 – Communication load in case of two wireless devices.....	41
	Figure 9 – Communication load in the case of several wireless devices.....	42
	Figure 10 – Cut-off frequencies derived from maximum power level.....	43
	Figure 11 – Distance of the wireless devices.....	44
	Figure 12 – Duty cycle.....	45
	Figure 13 – Maximum dwell time.....	46
	Figure 14 – Power spectral density of an IEEE 802.15.4 system.....	52
	Figure 15 – Communication cycle, application event interval and machine cycle.....	55
	Figure 16 – Minimum transmission gap.....	56
	Figure 17 – Example of the density functions of transmission time.....	57
	Figure 18 – Example of the distribution functions of transmission time.....	58
	Figure 19 – Transmitter sequence.....	59
	Figure 20 – Transmitter spectral mask of an IEEE 802.15.4 system.....	60

Figure 21 – Example of distribution functions of the update time .....	61
Figure 22 – Principle for use of coexistence parameters .....	63
Figure 23 – Parameters to describe the general plant characteristic .....	63
Figure 24 – Parameters to describe application communication requirements .....	65
Figure 25 – Parameters to describe wireless network type and device type .....	66
Figure 26 – Power spectral density and transmitter spectral mask of a DECT system .....	68
Figure 27 – Medium utilization in time and frequency of a DECT system .....	68
Figure 28 – Parameters to describe a wireless solution.....	70
Figure 29 – Relations of the documents in a coexistence management system specification.....	75
Figure 30 – Planning of a wireless system in the coexistence management process .....	82
Figure 31 – Implementation and operation of a wireless system in the coexistence management process.....	85
Table 1 – Example of a classification of application communication requirements .....	24
Table 2 – Application profile dependent observation time values.....	45
Table 3 – Parameter options for frequency channel .....	48
Table 4 – List of parameters used to describe the general plant characteristic .....	64
Table 5 – List of parameters used to describe the requirements influencing the characteristic of wireless solutions.....	65
Table 6 – List of parameters used to describe performance requirements .....	66
Table 7 – List of parameters used to describe the wireless system type.....	67
Table 8 – List of parameters used to describe the transmitter of a wireless device type .....	69
Table 9 – List of parameters used to describe the receiver of a wireless device type .....	69
Table 10 – List of parameters used to describe a wireless network solution .....	70
Table 11 – List of parameters used to describe the transmitter of a wireless device solution.....	71
Table 12 – List of parameters used to describe the receiver of a wireless device solution.....	72
Table 13 – Template used to describe the general plant characteristic.....	86
Table 14 – Template used to describe the application communication requirements .....	87
Table 15 – Template used to describe the wireless system type .....	87
Table 16 – Template used to describe a wireless device type .....	88
Table 17 – Template used to describe the wireless network solution.....	88
Table 18 – Template used to describe a wireless device solution.....	89
Table 19 – Template used to describe an ISM application.....	89

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### **INDUSTRIAL COMMUNICATION NETWORKS – WIRELESS COMMUNICATION NETWORKS –**

#### **Part 2: Coexistence management**

#### **FOREWORD**

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International Standard IEC 62657-2 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

This second edition includes the following significant technical changes with respect to the previous edition:

- a) update of the normative references, terms, definitions, symbols and abbreviations;
- b) addition of terms;

- c) checking of the life-cycle terms of this document versus the terms used in IEC 62890:—<sup>1</sup> and addition of explanations;
- d) addition and modification of text to make the text more readable;
- e) alignment of some definitions and specifications of coexistence parameters in order to facilitate their future inclusion in the IEC Common Data Dictionary (IEC CDD) maintained by the IEC.

The text of this standard is based on the following documents:

FDIS	Report on voting
65C/861/FDIS	65C/873/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts of the IEC 62657 series, under the general title *Industrial communication networks – Wireless communication networks*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

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<sup>1</sup> Under preparation. Stage at the time of publication: IEC/AFDIS 62890:2017.

## INTRODUCTION

The overall market for wireless network solutions spans a range of diverse applications, with differing performance and functional requirements. Within this overall market, the industrial automation domain could include:

- process automation, covering for example the following industry branches:
  - oil and gas, refining,
  - chemical,
  - pharmaceutical,
  - mining,
  - pulp & paper,
  - water & wastewater,
  - steel
- electric power such as:
  - power generation (for example wind turbine),
  - power transmission and distribution (grid),
- factory automation, covering for example the following industry branches:
  - food and beverage,
  - automotive,
  - machinery,
  - semiconductor.

Industrial automation requirements for wireless networks are different from those of, for example, the telecommunications, commercial and consumer markets. These industrial automation requirements are identified and provided in IEC 62657-1.

Industrial premises may contain a variety of wireless network technologies and other sources of radio frequency emissions.

This document is intended for designers and persons responsible for production and process plants, system integrators and mechanical engineers having to integrate and start up wireless systems in machines and plants, and producers of industrial wireless solutions. In particular, it is intended to motivate exchange of information between automation and radio engineers.

Many wireless industrial automation applications are also located in physical environments over which the operator/owner can exert control. That is, within a physical facility where the presence and operation of all radio frequency emitting devices are under the control of a single entity. This allows wireless management strategies to be employed which are not feasible for equipment installed in public or other unmanaged areas.

In industrial automation, many different wireless networks may operate in the same premises. Examples of these networks are IEC 62591 [8]<sup>2</sup> (WirelessHART<sup>®3</sup>), IEC 62601 [9] (WIA-PA) and IEC 62734 [10] (ISA100.11a); all these networks use IEEE 802.15.4 [19] for the process automation applications. Other examples of wireless networks are specified in IEC 61784-1 [4] and IEC 61784-2 [5] CPs that use IEEE 802.11 [17] and IEEE 802.15.1 [18] for factory automation applications. Different to wired fieldbuses, the wireless communication devices can interfere with others on the same premises or environment, disturbing each other. Other sources of radio frequency energy in these bands, often at high energy levels, include radio-frequency process heating, plastic welding, plasma lamps, and microwave irradiation devices.

Clearly, without a means to manage the coexistence of these varied emitters, it would be problematic to ensure that wireless networks meet the time-criticality and other performance requirements of industrial automation.

The IEC 62657 series has two parts:

- Part 1: Wireless communication requirements and spectrum considerations
- Part 2: Coexistence management

IEC 62657-1 provides general requirements for industrial automation and spectrum considerations that are the basis for industrial communication solutions. This document specifies the coexistence management of wireless devices to ensure predictable performance. It is intended to facilitate harmonization of future adjustments to international, national, and local regulations.

This document provides the coexistence management concept and process. Based on the coexistence management process, a predictable assuredness of coexistence can be achieved for a given spectrum with certain application requirements. This document describes mechanisms to manage the potential mutual interference that might occur due to the operation of multiple wireless devices in a plant.

This document provides guidance to the users of wireless networks on selection and proper use of wireless networks. To provide suitable wireless devices to the market, it also serves vendors in describing the behaviours of wireless devices to build wireless networks matching the application requirements.

This document is based on analyses of a number of International Standards, which focus on specific technologies. The intention of this standard is not to invent new parameters but to use already defined ones and to be technology independent.

---

<sup>2</sup> Numbers in square brackets refer to the bibliography.

<sup>3</sup> WirelessHART is the registered trade name of the FieldComm Group, see [www.fieldcommgroup.org](http://www.fieldcommgroup.org). This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

## **INDUSTRIAL COMMUNICATION NETWORKS – WIRELESS COMMUNICATION NETWORKS –**

### **Part 2: Coexistence management**

#### **1 Scope**

This document:

- specifies the fundamental assumptions, concepts, parameters, and procedures for wireless communication coexistence;
- specifies coexistence parameters and how they are used in an application requiring wireless coexistence;
- provides guidelines, requirements, and best practices for wireless communication's availability and performance in an industrial automation plant; it covers the life-cycle of wireless communication coexistence;
- helps the work of all persons involved with the relevant responsibilities to cope with the critical aspects at each phase of life-cycle of the wireless communication coexistence management in an industrial automation plant. Life-cycle aspects include: planning, design, installation, implementation, operation, maintenance, administration and training;
- provides a common point of reference for wireless communication coexistence for industrial automation sites as a homogeneous guideline to help the users assess and gauge their plant efforts;
- deals with the operational aspects of wireless communication coexistence regarding both the static human/tool-organization and the dynamic network self-organization.

This document provides a major contribution to national and regional regulations. It does not exempt devices from conforming to all requirements of national and regional regulations.

#### **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 62657-1:—<sup>4</sup>, *Industrial communication networks – Wireless communication networks – Wireless communication requirements and spectrum considerations*

IEC 62443 (all parts), *Industrial communication networks – Network and system security*

#### **3 Terms, definitions, abbreviated terms and conventions**

##### **3.1 Terms and definitions**

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

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

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<sup>4</sup> Under preparation. Stage at the time of publication: IEC/RFDIS 62657-1:2017.