



# SLOVENSKI STANDARD SIST EN IEC 62657-2:2022

01-oktober-2022

Nadomešča:

SIST EN 62657-2:2017

SIST EN 62657-2:2017/A1:2020

---

**Industrijska omrežja - Soobstoj brezžičnih sistemov - 2. del: Upravljanje soobstoja (IEC 62657-2:2022)**

Industrial networks - Coexistence of wireless systems - Part 2: Coexistence management (IEC 62657-2:2022)

Industrielle Kommunikationsnetze – Koexistenz von Funksystemen - Teil 2: Koexistenz-Management (IEC 62657-2:2022)

Réseaux industriels - Coexistence des systèmes sans fil - Partie 2: Gestion de coexistence (IEC 62657-2:2022)

**Ta slovenski standard je istoveten z: EN IEC 62657-2:2022**

---

**ICS:**

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.110	Omreževanje	Networking

**SIST EN IEC 62657-2:2022**

**en,fr,de**



EUROPEAN STANDARD

**EN IEC 62657-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2022

ICS 25.040.40; 33.040; 35.100

Supersedes EN 62657-2:2017; EN 62657-2:2017/A1:2019

English Version

**Industrial networks - Coexistence of wireless systems - Part 2:  
Coexistence management  
(IEC 62657-2:2022)**

Réseaux industriels - Coexistence des systèmes sans fil -  
Partie 2: Gestion de coexistence  
(IEC 62657-2:2022)

Industrielle Kommunikationsnetze – Koexistenz von  
Funksystemen - Teil 2: Koexistenz-Management  
(IEC 62657-2:2022)

This European Standard was approved by CENELEC on 2022-07-14. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 62657-2:2022 (E)****European foreword**

The text of document 65C/1163/FDIS, future edition 3 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 IEC 62657-2:2022.

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) 2023-04-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-07-14

This document supersedes EN 62657-2:2017 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

**iTeh STANDARD PREVIEW**  
**Endorsement notice**  
 (standards.itih.ai)

The text of the International Standard IEC 62657-2:2022 was approved by CENELEC as a European Standard without any modification.

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 61158-2:2014 NOTE Harmonized as EN 61158-2:2014 (not modified)

IEC 61360 (series) NOTE Harmonized as EN 61360 (series)

IEC 61784-1 NOTE Harmonized as EN IEC 61784-1

IEC 61784-2 NOTE Harmonized as EN IEC 61784-2

IEC 61918:2018 NOTE Harmonized as EN IEC 61918:2018 (not modified) +A11:2019

IEC 62591:2016 NOTE Harmonized as EN 62591:2016 (not modified)

IEC 62601 NOTE Harmonized as EN 62601

IEC 62657 (series) NOTE Harmonized as EN 62657 (series)

IEC 62657-3 NOTE Harmonized as EN IEC 62657-3

IEC 62734:2014 NOTE Harmonized as EN 62734:2015 (not modified)

IEC 62890:2020 NOTE Harmonized as EN IEC 62890:2020 (not modified)

## Annex ZA (normative)

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

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.

NOTE 1 Where 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	2017
IEC 62657-4	-	Industrial communication networks - Coexistence of wireless systems - Part 4: Coexistence management with central coordination of wireless applications	EN IEC 62657-4	-
IEC 62443	series	Industrial communication networks - Network and system security	EN IEC 62443	series

<https://standards.iteh.ai/catalog/standards/sist/8882982f-01e8-4b0f-bd8a-c781357bdb8f/sist-en-iec-62657-2-2022>





IEC 62657-2

Edition 3.0 2022-06

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Industrial networks – Coexistence of wireless systems –  
Part 2: Coexistence management**

**Réseaux industriels – Coexistence des systèmes sans fil –  
Partie 2: Gestion de coexistence**

<https://standards.iteh.ai/catalog/standards/sist/8882982f-01e8-4b0f-bd8a-c781357bdb8f/sist-en-iec-62657-2-2022>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 25.040.40; 33.040; 35.100

ISBN 978-2-8322-0973-8

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	11
2 Normative references .....	11
3 Terms, definitions, abbreviated terms and conventions.....	12
3.1 Terms and definitions.....	12
3.2 Abbreviated terms.....	27
3.3 Conventions.....	28
4 Coexistence concept in industrial automation .....	28
4.1 Overview.....	28
4.2 Objective .....	30
4.3 Necessity to implement a coexistence management.....	32
4.4 Interference potential.....	33
4.5 Ancillary conditions.....	35
4.6 Requirements to wireless devices for support of coexistence management.....	36
4.7 Concepts .....	36
4.7.1 Manual coexistence management.....	36
4.7.2 Automated non-collaborative coexistence management.....	37
4.7.3 Automated collaborative coexistence management.....	37
4.8 Best practices to achieve coexistence.....	38
4.9 Coexistence conceptual model.....	40
4.10 Coexistence management and selection of a wireless solution.....	42
4.11 Coexistence management system.....	44
5 Coexistence management parameters.....	44
5.1 General.....	44
5.1.1 Definition and usage of parameters .....	44
5.1.2 Physical link .....	44
5.2 Adjacent channel selectivity.....	45
5.3 Antenna gain .....	45
5.4 Antenna radiation pattern.....	45
5.5 Antenna type .....	45
5.6 Communication availability.....	46
5.7 Communication reliability .....	46
5.8 Bit rate of physical link.....	46
5.9 Blocked frequency list.....	46
5.10 Centre frequency .....	46
5.11 Area of operation .....	47
5.12 Communication load .....	47
5.13 Cut-off frequency .....	49
5.14 Data throughput.....	50
5.15 Distance between wireless devices.....	50
5.16 Duty cycle.....	51
5.17 Dwell time.....	53
5.18 Equivalent isotropic radiated power.....	54
5.19 Equivalent radiated power.....	54
5.20 Frequency band.....	54



5.21	Frequency bandwidth .....	54
5.22	Frequency channel .....	55
5.23	Frequency hopping sequence .....	55
5.24	Future expansion plan .....	56
5.25	Geographical dimension of the plant .....	56
5.26	Infrastructure device .....	56
5.27	Initiation of data transmission .....	56
5.28	Interference type .....	56
5.29	Intervisibility .....	57
5.30	ISM application .....	57
5.31	Length of user data per transfer interval .....	57
5.32	Limitation from neighbours of the plant .....	57
5.33	Maximum number of retransmissions .....	57
5.34	Mechanism for adaptivity .....	58
5.35	Medium access control mechanism .....	58
5.36	Medium utilization factor .....	58
5.37	Message .....	59
5.38	Modulation .....	59
5.39	Natural environmental condition .....	59
5.40	Network topology .....	59
5.41	Number of consecutive lost messages .....	60
5.42	Object movement .....	60
5.43	Operating time between failures .....	60
5.44	Message loss ratio .....	60
5.45	Position of wireless devices .....	61
5.46	Power spectral density .....	61
5.47	Purpose of the automation application .....	62
5.48	Receiver blocking .....	62
5.49	Receiver maximum input level .....	62
5.50	Receiver sensitivity .....	62
5.51	Regional radio regulations .....	62
5.52	Relative movement .....	63
5.53	Response time .....	63
5.54	Security level .....	63
5.55	Spatial coverage of the wireless communication system .....	64
5.56	Spatial extent of the application .....	64
5.57	Spurious response .....	64
5.58	Survival time .....	64
5.59	Total radiated power .....	64
5.60	Transfer interval .....	64
5.61	Transmission gap .....	65
5.62	Transmission time .....	66
5.63	Transmitter output power .....	69
5.64	Transmitter sequence .....	69
5.65	Transmitter spectral mask .....	71
5.66	Update time .....	71
5.67	Wireless device density .....	72
5.68	Wireless device type information .....	72
5.69	Wireless communication solution density .....	73

5.70	Wireless technology or standard .....	73
6	Coexistence management information structures .....	73
6.1	General.....	73
6.2	General plant characteristic .....	75
6.2.1	General .....	75
6.2.2	General plant characteristic .....	75
6.2.3	Passive environmental influences .....	76
6.2.4	Active environmental influences.....	76
6.3	Application communication requirements .....	77
6.3.1	Overview .....	77
6.3.2	Requirements influencing the characteristic of wireless solutions .....	78
6.3.3	Performance requirements.....	79
6.4	Wireless system type and wireless device type .....	79
6.4.1	Overview .....	79
6.4.2	Wireless system type.....	80
6.4.3	Wireless device type.....	80
6.5	Wireless solution .....	83
6.5.1	Overview .....	83
6.5.2	Wireless system solution .....	83
6.5.3	Wireless device solution .....	84
6.6	Application related characteristic parameters .....	85
7	Coexistence management process .....	87
7.1	General.....	87
7.1.1	Overview .....	87
7.1.2	Documentation .....	87
7.1.3	Suitable documentation method .....	89
7.1.4	Application of tools .....	89
7.2	Establishment of a coexistence management system .....	89
7.2.1	Nomination of a coexistence manager .....	89
7.2.2	Responsibility of a coexistence manager .....	90
7.2.3	Support by wireless experts.....	90
7.2.4	Training .....	91
7.3	Maintaining coexistence management system.....	91
7.4	Phases of a coexistence management process .....	91
7.4.1	Investigation phase.....	91
7.4.2	Planning phase.....	94
7.4.3	Implementation phase.....	96
7.4.4	Operation phase .....	97
8	Coexistence parameter templates.....	99
	Bibliography.....	106
	Figure 1 – Issues of consideration .....	31
	Figure 2 – Applications using frequency spectrum .....	31
	Figure 3 – Progression of expense to achieve coexistence corresponding to the application classes .....	36
	Figure 4 – Separation of wireless systems according to frequency and time .....	39
	Figure 5 – Coexistence conceptual model.....	41
	Figure 6 – Flow chart of the coexistence conceptual model.....	42

Figure 7 – Selection of a wireless system in the coexistence management process .....	43
Figure 8 – Communication load in case of two wireless devices .....	48
Figure 9 – Communication load in the case of several wireless devices .....	49
Figure 10 – Cut-off frequencies derived from maximum power level .....	50
Figure 11 – Distance of the wireless devices .....	51
Figure 12 – Duty cycle .....	52
Figure 13 – Maximum dwell time .....	53
Figure 14 – Power spectral density of an IEEE 802.15.4 system .....	61
Figure 15 – Communication cycle, application event interval and machine cycle .....	65
Figure 16 – Transmission gap .....	66
Figure 17 – Example of the density functions of transmission time .....	67
Figure 18 – Example of the distribution functions of transmission time .....	68
Figure 19 – Transmitter sequence .....	70
Figure 20 – Transmitter spectral mask of an IEEE 802.15.4 system .....	71
Figure 21 – Example of distribution functions of the update time .....	72
Figure 22 – Principle for use of coexistence parameters .....	75
Figure 23 – Parameters to describe the general plant characteristic .....	75
Figure 24 – Parameters to describe application communication requirements .....	78
Figure 25 – Parameters to describe wireless system type and device type .....	79
Figure 26 – Example of power spectral density and transmitter spectral mask .....	81
Figure 27 – Example of medium utilization in time and frequency .....	82
Figure 28 – Parameters to describe a wireless communication solution .....	83
Figure 29 – Planning of a wireless system in the coexistence management process .....	95
Figure 30 – Implementation and operation of a wireless system in the coexistence management process .....	98
Table 1 – Example of a classification of application communication requirements .....	30
Table 2 – Application profile dependent observation time values .....	52
Table 3 – Parameter options for frequency channel .....	55
Table 4 – Hierarchy of the characteristics .....	74
Table 5 – List of parameters used to describe the general plant characteristic .....	76
Table 6 – List of parameters used to describe the passive environmental influences .....	76
Table 7 – List of parameters used to describe the active environmental influences .....	76
Table 8 – List of parameters used to describe the interference type .....	77
Table 9 – List of parameters used to describe the requirements influencing the characteristic of wireless solutions .....	78
Table 10 – List of characteristic parameters .....	79
Table 11 – List of parameters used to describe the wireless system type .....	80
Table 12 – List of parameters used to describe the transmitter of a wireless device type .....	82
Table 13 – List of parameters used to describe the receiver of a wireless device type .....	83
Table 14 – List of parameters used to describe a wireless solution .....	84
Table 15 – List of general parameters used to describe the wireless device solution .....	84
Table 16 – List of parameters used to describe the transmitter of a wireless device solution .....	85

Table 17 – List of parameters used to describe the receiver of a wireless device solution.....	85
Table 18 – List of relevant characteristic parameters of wireless solutions.....	86
Table 19 – List of relevant statistical values of characteristic parameters.....	86
Table 20 – Template used to describe the general plant characteristic.....	100
Table 21 – Template used to describe the application communication requirements.....	101
Table 22 – Template used to describe the wireless system type.....	102
Table 23 – Template used to describe a wireless device type.....	102
Table 24 – Template used to describe the wireless system solution.....	103
Table 25 – Template used to describe a wireless device solution.....	104
Table 26 – Template used to describe the relevant characteristic parameters of wireless solutions.....	104
Table 27 – Template used to describe the relevant statistical values of characteristic parameters.....	105
Table 28 – Template used to describe an interference type.....	105

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN IEC 62657-2:2022](https://standards.iteh.ai/catalog/standards/sist/8882982f-01e8-4b0f-bd8a-c781357bdb8f/sist-en-iec-62657-2-2022)

<https://standards.iteh.ai/catalog/standards/sist/8882982f-01e8-4b0f-bd8a-c781357bdb8f/sist-en-iec-62657-2-2022>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL NETWORKS –  
COEXISTENCE OF WIRELESS SYSTEMS –****Part 2: Coexistence management**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This third edition cancels and replaces the second edition published in 2017 and Amendment 1: 2019. This edition constitutes a technical revision.

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

- a) change the main part of the title from:  
Industrial communication networks – Wireless communication networks  
to  
Industrial networks – Coexistence of wireless systems
- b) 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;

- c) alignment of some definitions and specifications to be consistent to the new Part 3 and Part 4.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65C/XX/FDIS	65C/XX/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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

**IMPORTANT – The "colour inside" logo on the cover page of this document 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.**

## INTRODUCTION

The overall market for wireless communication 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 communication systems 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 can contain a variety of wireless communication technologies and other sources of radio 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 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.