

INTERNATIONAL STANDARD

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**Industrial communication networks – Wireless communication networks –
Part 1: Wireless communication requirements and spectrum considerations**

**Réseaux de communication industriels – Réseaux de communication sans fil –
Partie 1: Exigences de communication sans fil et considérations relatives au
spectre**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
WIRELESS COMMUNICATION NETWORKS –****Part 1: Wireless communication requirements
and spectrum considerations**

FOREWORD

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International Standard IEC 62657-1 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This first edition cancels and replaces the first edition of IEC TS 62657-1 published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC TS 62657-1:2014:

- a) update of requirements for wireless industrial applications;
- b) addition of performance indicators and their measurement.

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

FDIS	Report on voting
65C/874/FDIS	65C/878/RVD

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

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

A list of all 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 document will remain unchanged until the stability date indicated on the IEC website under "<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- withdrawn,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.

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INTRODUCTION

This document provides general requirements of industrial automation and spectrum considerations that are the basis for industrial communication solutions. This document is intended to facilitate harmonization of future adjustments to international, national, regional and local regulations.

IEC 62657-2 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.

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INDUSTRIAL COMMUNICATION NETWORKS – WIRELESS COMMUNICATION NETWORKS –

Part 1: Wireless communication requirements and spectrum considerations

1 Scope

This part of IEC 62657 provides the wireless communication requirements dictated by the applications of wireless communication systems in industrial automation, and requirements of related context. The requirements are specified in a way that is independent of the wireless technology employed. The requirements are described in detail and in such a way as to be understood by a large audience, including readers who are not familiar with the industry applications.

Social aspects, environmental aspects, health aspects and market requirements for wireless communication systems in industrial automation are described to justify the wireless communication requirements.

This document also provides a rationale to successfully articulate the solutions of the wireless communication requirements proposed for the short-term and long-term. Coexistence management according to IEC 62657-2 is already applied in the short-term.

This document describes requirements of the industrial automation applications that can be used to ask for additional dedicated, worldwide unique spectrum. This additional spectrum is intended to be used for additional wireless applications while continuing using the current industrial, scientific and medical (ISM) bands.

This document provides useful information for the automation field professionals who are not familiar with the spectrum and wireless technologies.

Building automation is excluded from the scope because of the different usage constraints (for most non-industrial buildings it is normally difficult for the owner/operator to impose control over the presence and operation of radio equipment).

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 60079-10-1, *Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres*

IEC 60079-10-2, *Explosive atmospheres – Part 10-2: Classification of areas – Explosive dust atmospheres*

IEC 61511 (all parts), *Functional safety – Safety instrumented systems for the process industry sector*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

IEC 61784-3, *Industrial communication networks – Profiles – Part 3: Functional safety fieldbuses – General rules and profile definitions*

IEC 62657-2:—1, *Industrial communication networks – Wireless communication networks – Part 2: Coexistence management*

ETSI TR 102 889-2 V.1.1.1 (2011), *Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference Document; Short Range Devices (SRD); Part 2: Technical characteristics for SRD equipment for wireless industrial applications using technologies different from Ultra-Wide Band (UWB)*

ETSI EN 300 328 V2.1.1 (2016), *Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU*

3 Terms, definitions abbreviated terms and acronyms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62657-2:— and the following apply.

3.1.1 automation application

application of measurement and automatic control in the industrial automation domains

3.1.2 availability, <performance>

ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided

Note 1 to entry This ability depends on the combined aspects of the reliability performance, the maintainability performance, and the maintenance support performance.

Note 2 to entry Required external resources, other than maintenance resources, do not affect the availability performance of the item.

[SOURCE: IEC 60050-191:1990, 191-02-05]

3.1.3 coexistence

wireless communication coexistence

state in which all wireless communication solutions of a plant using shared medium fulfil all their application communication requirements

Note 1 to entry: In IEEE 802.15.2-2003 [17]² the coexistence is defined as a characteristic of a device.

[SOURCE: IEC 62657-2:—, 3.1.13]

3.1.4 coexistence management

process to establish and to maintain coexistence that includes technical and organizational measures

¹ Under preparation. Stage at the time of publication: IEC FDIS 62657-2:2017.

² Numbers in square brackets refer to the Bibliography.