

SLOVENSKI STANDARD

SIST EN 50131-5-3:2017

01-junij-2017

Nadomešča:

SIST EN 50131-5-3:2005

SIST EN 50131-5-3:2005/A1:2009

Alarmni sistemi - Sistemi za javljanje vloma in ropa - 5-3. del: Zahteve za povezovalno opremo, ki uporablja radiofrekvenčno tehniko

Alarm systems - Intrusion and hold-up systems - Part 5-3: Requirements for interconnections equipment using radio frequency techniques

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Alarmanlagen - Einbruch- und Überfallmeldeanlagen - Teil 5-3: Anforderungen an Übertragungsgeräte, die Funkfrequenz-Techniken verwenden

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Systèmes d'alarme - Systèmes d'alarme contre l'intrusion et les hold-up - Partie 5-3: Exigences pour les équipements d'alarme intrusion utilisant des techniques radio

Ta slovenski standard je istoveten z: EN 50131-5-3:2017

ICS:

13.310	Varstvo pred kriminalom	Protection against crime
13.320	Alarmni in opozorilni sistemi	Alarm and warning systems

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en,fr

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EUROPEAN STANDARD

EN 50131-5-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2017

ICS 13.310

Supersedes EN 50131-5-3:2005

English Version

Alarm systems - Intrusion systems - Part 5-3: Requirements for interconnections equipment using radio frequency techniques

Systèmes d'alarme - Systèmes d'alarme contre l'intrusion -
Partie 5-3: Exigences pour les équipements
d'interconnexion utilisant des techniques radio

Alarmanlagen - Einbruch- und Überfallmeldeanlagen - Teil
5-3: Anforderungen an Übertragungsgeräte, die
Funkfrequenz-Techniken verwenden

This European Standard was approved by CENELEC on 2016-11-14. 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.

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

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EN 50131-5-3:2017**European foreword**

This document (EN 50131-5-3:2017) has been prepared by CLC/TC 79 "Alarm systems".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-09-17
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-03-17

This document supersedes EN 50131-5-3:2005.

This document is bound to be used in conjunction with the other parts of the EN 50131 series that define the functional requirements of the equipment regardless of the type of interconnections used.

EN 50131-5 is currently composed with the following parts:

- CLC/FprTS 50131-5-1 *Alarm systems — Intrusion systems — Part 5-1: Interconnections — Requirements for wired Interconnection for I&HAS equipments located in supervised premises;*
- EN 50131-5-3, *Alarm systems — Intrusion systems — Part 5-3: Requirements for interconnections equipment using radio frequency techniques;*
- CLC/TS 50131-5-4, *Alarm systems — Intrusion and hold-up systems — Part 5-4: System compatibility testing for I&HAS equipments located in supervised premises.*

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1 Scope

This European Standard applies to intrusion alarm equipment using radio frequency (RF) links and located on protected premises. It does not cover long-range radio transmissions.

This European Standard defines the terms used in the field of intrusion alarm equipment using radio frequency links as well as the requirements relevant to the equipment.

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.

EN 50131-1:2006, *Alarm systems - Intrusion and hold-up systems - Part 1: System requirements*

EN 50131-3, *Alarm systems - Intrusion and hold-up systems - Part 3: Control and indicating equipment*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1

alarm message

message conveying information regarding intruder, tamper or fault alarms

3.1.2

assigned band

frequency band within which the equipment is authorized to operate

3.1.3

attenuation

degradation of the RF signal due to a change in the passive environment of the system after its installation

EXAMPLE Creation, relocation or reflection or absorption materials.

3.1.4

collision

simultaneous transmissions from two or more RF communication devices belonging to the same system, of sufficient signal strength to cause corruption or obliteration of the RF signals

3.1.5

collision probability

likelihood of two or more messages having part or all of their information coincident on the RF link leading to a collision

3.1.6

communication link

all local RF equipment, media and protocols used to route alarm system messages

EN 50131-5-3:2017**3.1.7****disturbance**

event originating internally or externally to the system and liable to impair transmission and/or processing of data in the system

Note 1 to entry: It can be unintentionally or intentionally harmful.

Note 2 to entry: Causes of disturbance are attenuation, collision, unintentional or intentional message substitution and other RF interference.

Note 3 to entry: The different effects that disturbances may have on the signals are:

- corruption of the RF signal with no message corruption,
- corruption of the RF signal with partial message corruption,
- total obliteration of the RF signal (inability to receive).

3.1.8**failure of communication**

inability to pass a message on an RF link

3.1.9**identification code**

part of a message used to identify a RF communication device belonging to the system

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3.1.10**intentional message substitution (standards.iteh.ai)**

deliberate transmissions from an RF communication device using the correct protocol with the intention of reducing the security of the system

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3.1.11**RF interference**

RF emissions from any other source, that may cause corruption or obliteration of wanted signals and do not conform to the definition of collision or message substitution

3.1.12**RF communication device**

device using RF transmission links

3.1.13**relaying equipment**

device that receives RF messages from one or more devices and transmits them to another receiving device of the alarm system either directly or through other relaying equipment

3.1.14**throughput ratio**

ratio of the total number of messages correctly interpreted by the receiving device to the total number of messages sent by the transmitting device

3.1.15**unintentional message substitution**

non-deliberate transmissions from an RF communication device using the correct protocol originating from another system with no intention of reducing the security

EXAMPLE Alarm system of same manufacturer and type installed in the neighbourhood, which could negatively interfere by its normal operation

3.2 Abbreviated terms

For the purpose of this document, the following abbreviated terms apply:

ACE	ancillary control equipment
CIE	control and indicating equipment
EUT Rx	receiving equipment under test
EUT Tx	transmitting equipment under test
RE	relaying equipment
RF	radio frequency
RL	reference level
SPT	Supervised premises transceiver
WD	warning device

4 Requirements

4.1 General

Components of IAS with usage of RF links shall comply with the following requirements.

4.2 Immunity to attenuation

4.2.1 General

Due to the fact that there may be changes in the passive environment after installation, it shall be possible to temporarily reduce or simulate the reduction of the RF link budget during installation or maintenance.

4.2.2 Requirement for immunity to attenuation

The manufacturer shall specify in the installation and maintenance documentation the means used on its equipment to fulfil this requirement.

This function shall be automatically activated by the system itself when the system is in maintenance or installation mode.

In this installation condition, the reduction shall be according to the values given in Table 1. This applies to all links e.g. to CIE, RE, SPT and WD.

Table 1 — Immunity to attenuation

	Reduction of the RF link budget
Grade 1	≥ 8 dB
Grade 2	≥ 8 dB
Grade 3	≥ 15 dB
Grade 4	≥ 15 dB
NOTE The requirements given in Table 1 do not apply to portable devices (e.g. key fob)	

EN 50131-5-3:2017**4.3 Immunity to collision****4.3.1 General**

The objective of the requirement and the process of decoding is to ensure a high level of confidence in the transmissions of alarm and monitoring messages thus reducing the probability of equipment on the same system causing interference by design and possibly leading to loss or corruption of information.

4.3.2 Requirement for occupation rate

To keep the occupation rate as small as possible, the following requirements given in Table 2 shall be fulfilled. This rate shall be calculated by assuming the system is at its full capacity.

Table 2 — System occupation of the medium

	Maximum occupation (percentage)	In a period of time of
Grade 1	10 %	240 min
Grade 2	10 %	120 min
Grade 3	10 %	100 s
Grade 4	10 %	10 s

To ensure successful transmissions for grade 3 and grade 4 equipment, all types of messages (e.g. alarm, monitoring) shall be acknowledged by the receiving equipment to the transmitting equipment.

4.3.3 Requirement for throughput ratio

The objective of this requirement is to measure the ability of all receiving equipment to interpret and decode radio messages accurately.

Receiving equipment shall comply with the requirements of Table 3.

Table 3 — Throughput ratio

	Minimum number of correctly interpreted messages
All grades	999 out of 1 000

4.4 Immunity to substitution**4.4.1 General**

Intentional message or component substitution generally attempts to reduce the security of the system. Unintentional message or component substitution generally causes false alarms or tamper alarms and has a nuisance value.

4.4.2 Immunity to unintentional message and component substitution

In order to prevent unintentional message and component substitution, each transmitting device shall be identified as belonging to the system by an identification code. The number of identification code possibilities shall be at least equal to those shown in Table 4.

Table 4 — Identification codes

	Identification codes
Grade 1	100 000
Grade 2	1 000 000
Grade 3	10 000 000
Grade 4	100 000 000

Alternatively the manufacturer shall provide means to the installer on site to choose identification code with the minimum of 256 codes to ensure that an alarm shall not interfere with other nearby systems.

4.4.3 Immunity to intentional messages and components substitution

In accordance with EN 50131-3 for grade 4 equipment, means to monitor and to detect messages and components substitution are required.

4.5 Immunity to interference

4.5.1 General

The purpose of this requirement is to check the ability of the receiving equipment to discriminate between the desired signal and the interfering RF signals.

This immunity to interference requirement applies to the receiving equipment as listed below:

- CIE;
- WD;
- RE;
- SPT.

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Each of the interference signals defined below shall be applied and shall not cause false alarm, indications of a failure of periodic communication and shall not compromise the correct reception and processing of the messages.

During continuous application of the interfering signals whose levels are defined in the subsequent subclauses, all of the 20 system relevant messages (sent by the transmitting equipment used for test purposes) shall be correctly received and processed by the receiving equipment.

In the event of the receiving equipment operating in more than one assigned band, the requirement shall be fulfilled for each individual assigned band.

4.5.2 Interference outside the assigned band for equipment of all grades

The receiving equipment shall be fully functional during the application of the interference signal at a level of 10 V/m at frequency F_1 and subsequently at frequency F_2 (F_1 and F_2 are defined in 5.5.1).

4.5.3 Interference within the assigned band for equipment of all grades

The receiving equipment shall be fully functional during the application of the interference signal at a level of $RL + 8$ dB (RL is defined in 5.1) at frequency F_t (F_t is defined in 5.5.1).

4.5.4 Interference within the assigned band for grade 3 and grade 4 equipment

Additionally, the receiving equipment shall be fully functional when an interference signal is applied to each assigned band sequentially at a level, $IL + 3$ dB (IL is defined in 5.5.4) with a frequency modulated signal as defined in 5.5.4.