IEC 60839-5-1

Edition 2.0   2014-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Alarm and electronic security systems –
Part 5-1: Alarm transmission systems – General requirements

Systèmes d'alarme et de sécurité électroniques –
Partie 5-1: Systèmes de transmission d'alarme – Exigences générales

IEC 60839-5-1:2014-07(en-fr)

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue
Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org
Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

IEC 60839-5-1

Edition 2.0 2014-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Alarm and electronic security systems –
Part 5-1: Alarm transmission systems – General requirements

Systèmes d'alarme et de sécurité électroniques –
Partie 5-1: Systèmes de transmission d'alarme – Exigences générales

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

W

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ALARM AND ELECTRONIC SECURITY SYSTEMS –

Part 5-1: Alarm transmission systems – General requirements

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.

International Standard IEC 60839-5-1 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This international standard is based on EN 50136-1:2012.

This second edition cancels and replaces the first edition published 1991. This edition constitutes a technical revision.

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

a) The previous version was published 24 years ago, techniques and constraints have been widely changed since that time. Although covering the same subject the contents of the new IEC 60839-5-1 are widely different and there is no constructive issues in trying to find similarities and differences between both versions.

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

FDIS	Report on voting
79/479/FDIS	79/490/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 parts in the IEC 60839 series, published under the general title *Alarm and electronic security systems*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

IEC 60839-5-1:2014
https://standards.iteh.ai/catalog/standards/sist/68077c98-539c-430c-85ad-
eaeb7262de9c/iec-60839-5-1-2014

INTRODUCTION

The object of this part of IEC 60839 is to specify the general requirements for the performance, reliability, resilience and security of alarm transmission systems and to ensure their suitability for use with different types of alarm systems and annunciation equipment.

An alarm transmission system may use any type of transmission network.

When the ATS functions are integrated into an alarm system or annunciation equipment the requirements of this standard apply.

The intended users of this standard include alarm transmission service providers, alarm receiving centre operators, fire departments, insurance companies, telecommunication network operators, internet service providers, equipment manufacturers, alarm companies, end users and others.

The IEC 60839-5 series consists of the following parts, under the general title *Alarm and electronic security systems*:

– Part 5-1: Alarm transmission systems – General requirements;

– Part 5-2: Alarm transmission systems – Requirements for supervised premises transceiver (SPT);

– Part 5-3: Alarm transmission systems – Requirements for receiving centre transceiver (RCT);

– Part 5-4[1]: (under evaluation);

– Part 5-5[1]: (under evaluation);

– Part 5-6[1]: (under evaluation);

– Part 5-7: (place holder).

_____

1 The former IEC 60839-5 series (1991) is being reviewed by an ad-hoc group set-up at the TC 79 meeting in Milano in October 2013. This ad-hoc group is in charge of evaluating the relevance / obsolescence of all parts of IEC 60839-5 series. The result of this analysis can be found in 79/462/DC and 79/477/INF that recommend to:

– keep IEC 60839-5-1 and IEC 60839-5-2 to receive, under identical titles, updated contents, such as the present document;

– withdraw IEC 60839-5-4, IEC 60839-5-5 and IEC 60839-5-6 developed in 1991 that have now no relevance.

ALARM AND ELECTRONIC SECURITY SYSTEMS –

Part 5-1: Alarm transmission systems –
General requirements

1 Scope

This part of IEC 60839 specifies the requirements for the performance, reliability, resilience and security of alarm transmission systems and ensures their suitability for use with different types of alarm systems and annunciation equipment.

An alarm transmission system may use any type of transmission network. When the ATS functions are integrated into an alarm system or annunciation equipment the requirements of this standard apply.

This standard specifies the requirements for alarm transmission systems providing alarm transmission between an alarm system at supervised premises and annunciation equipment at an alarm receiving centre.

This standard applies to transmission systems for all types of alarm messages such as fire, intrusion, access control, social alarm, etc. Different types of alarm systems may in addition to alarm messages also send other types of messages, e.g. fault messages and status messages. These messages are also considered to be alarm messages in the context of this standard. The term alarm is used in this broad sense throughout the document.

Additional alarm transmission requirements of specific types of alarm systems are given in the relevant standards. The intended users of this standard include alarm transmission service providers, alarm receiving centre operators, fire departments, insurance companies, telecommunication network operators, internet service providers, equipment manufacturers, alarm companies, end users and others.

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.

None.

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

NOTE   The definitions below are read in conjunction with Figure 1.

3.1.1
alarm condition
condition of an alarm system (AS), or part thereof, which results from the response of the system, or part thereof, to the presence of a hazard

3.1.2
alarm receiving centre
ARC
continuously manned centre to which information concerning the status of one or more alarm systems (ASs) is reported

Note 1 to entry: This note applies to the French language only.

3.1.3
alarm system
AS
electrical installation, which responds to the manual or automatic detection of the presence of a hazard

Note 1 to entry: The AS is not part of the alarm transmission system (ATS).

Note 2 to entry: This note applies to the French language only.

3.1.4
alarm transmission equipment
ATE
collective term to describe a supervised premises transceiver (SPT), a monitoring centre transceiver (MCT) and a receiving centre transceiver (RCT)

Note 1 to entry: This note applies to the French language only.

3.1.5
alarm transmission path
ATP
route an alarm message travels between an individual AS and its associated AE

Note 1 to entry: The ATP starts at the interface between the AS and the supervised premises transceiver (SPT) and ends at the interface between the receiving centre transceiver (RCT) and the AE. For notification and surveillance purposes the reverse direction may also be used.

Note 2 to entry: This note applies to the French language only.

3.1.6
alarm transmission service network
ATSN
group of alarm transmission systems (ATSs) of the same category

Note 1 to entry: An ATSN consists of one or more ATSs of the same category, functioning under supervision of the same management and monitoring centre.

Note 2 to entry: This note applies to the French language only.

3.1.7
alarm transmission service provider
ATSP
person or entity that is responsible for design, operation and the verification of the performance of one or more alarm transmission service networks (ATSNs)

Note 1 to entry: The ATSP may take responsibility for the ATS provision and performance monitoring of one or more ATSN as the design authority, through contracts with customers, ARCs, transmission network operators, etc.

Note 2 to entry: This note applies to the French language only.

3.1.8
alarm transmission system
ATS
alarm transmission equipment (ATE) and networks used to transfer information concerned with the state of one or more alarm systems (ASs) at supervised premises to one or more annunciation equipments (AEs) of one or more alarm receiving centres (ARCs)

Note 1 to entry: An ATS may consist of more than one alarm transmission path (ATP).

Note 2 to entry: This note applies to the French language only.

3.1.9
alarm transmission system category
ATS category
set of parameters that define the performance requirements of an alarm transmission system

Note 1 to entry: A category defines minimum ATS requirements.

Note 2 to entry: The alarm system application should specify the appropriate ATS category.

Note 3 to entry: Where resilience and reliability are considered important for the alarm system application, the use of a dual path ATS is recommended.

3.1.10
alarm transmission system management system
ATS management system
part of the ATS that is used to manage alarm transmission equipment, supervise alarm transmission equipment and networks and may help to keep the ATS in operation

Note 1 to entry: The management system may also be used to collect data about the ATS availability.

3.1.11
alarm transmission system monitoring centre
ATS monitoring centre
centre in which the status and performance of one or more ATS is monitored

Note 1 to entry: A monitoring centre may be a separate centre or part of an ARC.

Note 2 to entry: A monitoring centre may be the place where monitoring centre transceivers (MCTs) are located.

Note 3 to entry: A monitoring centre may be the place where a management system is located.

3.1.12
annunciation equipment
AE
equipment located at an alarm receiving centre (ARC) which secures and displays the alarm status, or the changed alarm status of alarm systems (ASs) in response to the receipt of incoming alarms before sending a confirmation

Note 1 to entry: The AE is not part of the alarm transmission system (ATS).

Note 2 to entry: This note applies to the French language only.

3.1.13
authentication
exchange of a code to identify that a supervised premises transceiver (SPT) has not been substituted by a similar equipment without this code, or that the information message transmitted has not been modified

3.1.14
availability, general
percentage of time a system or parts of a system are functioning in accordance with the requirements of this standard

3.1.15
diverse technology
technology used in transmission paths in such a way that a single point of failure, or tampering of a single point, cannot cause both alarm transmission paths (ATPs) of a dual path system to fail simultaneously

3.1.16
dual path ATS
dual path alarm transmission system
ATS consisting of one primary alarm transmission path (ATP) and one secondary ATP using diverse technology, having two transmission network interfaces at the supervised premises transceiver (SPT), to connect one or more alarm systems (ASs) of one supervised premises to one or more annunciation equipments (AEs) of one or more alarm receiving centres (ARCs)

3.1.17
encryption
systematic encoding of a bit stream before transmission, so that the information contained in the bit stream cannot be deciphered by an unauthorised party

3.1.18
fault condition
condition of a system which prevents a system or part thereof from functioning normally

3.1.19
fault message
fault signal
message or signal generated as a result of a fault condition

3.1.20
hashing technique
use of a mathematical transformation that takes an input and returns a fixed-size string, which is called the hash value

Note 1 to entry: The hash value is used to detect any alteration of the input and therefore verify the contents in an easy way.

3.1.21
message
series of transmitted signals which include identification, function data and the various means for providing their own integrity, immunity and proper reception

3.1.22
monitoring centre
centre in which the status of one or more alarm transmission service networks (ATSNs) is monitored

3.1.23
monitoring centre transceiver
MCT
alarm transmission equipment (ATE) within the alarm transmission system (ATS) that enables monitoring and management information regarding the status of alarm transmission equipment and networks

Note 1 to entry: The monitoring centre transceiver may be located at the alarm receiving centre or at a separate centre.

Note 2 to entry: This note applies to the French language only.

3.1.24
multiple path alarm transmission system
multiple path ATS
ATS where more than one independent alarm transmission paths (ATPs) are combined to connect one or more alarm systems (ASs) of one supervised premises to one or more annunciation equipments (AEs) of one or more alarm receiving centres (ARCs)

3.1.25
network equipment on site
equipment that is part of the alarm transmission path (ATP), but is not considered to be alarm transmission equipment (ATE)

3.1.26
packet switched network
PSN
transmission network that uses packet switching

Note 1 to entry: Messages are broken into packets, which are addressed individually and routed through the network, possibly using different routes. At the end node the packets are re-assembled to be converted back to the original message.

Note 2 to entry: The most prominent example of a packet switched data network is the Internet, making use of the Internet protocol suite, which is specified by the Internet Engineering Task Force (IETF) in so called requests for comments (RFCs).

Note 3 to entry: This note applies to the French language only.

3.1.27
peer review
evaluation of work by one or more people of similar competence to the producers of the work (peers).

Note 1 to entry: In this standard the definition applies to cryptographic algorithms, it means there is published evidence that the cryptographic community has confirmed the robustness of the algorithm against attack.

3.1.28
receiving centre transceiver
RCT
alarm transmission equipment (ATE) at the alarm receiving centre (ARC) including the interface to one or more annunciation equipments (AEs) and the interface to one or more transmission networks and which is part of one or more alarm transmission paths (ATPs)

Note 1 to entry: In some systems this transceiver may be able to indicate changes of the status of an alarm system (AS) and to store log-files. This may be needed to increase the alarm transmission system (ATS) availability in case of AE failure.

Note 2 to entry: This note applies to the French language only.

3.1.29
reporting time
period from the time a fault occurs in the alarm transmission system (ATS) until the fault information is reported to the receiving centre transceiver (RCT), the alarm system (AS) at the supervised premises and the monitoring centre transceiver (MCT) (if provided)

3.1.30
secured message
message which cannot be lost (e.g. in the case of power failure) and which can be retrieved

3.1.31
signalling security
method(s) used to prevent or detect deliberate attempts to interfere with the transmission of an alarm by blocking or substitution

3.1.32
single path alarm transmission system
single path ATS
ATS that consists of one alarm transmission path (ATP) to connect one or more alarm systems (ASs) of one supervised premises to one or more annunciation equipments (AEs) of one or more alarm receiving centre (ARCs)

3.1.33
supervised premises transceiver
SPT
alarm transmission equipment (ATE) at the supervised premises including the interface to the alarm system (AS) and the interface to one or more transmission networks and which is part of one or more alarm transmission paths (ATPs)

Note 1 to entry: This note applies to the French language only.

3.1.34
system capacity
maximum number of alarm systems (ASs) that can be connected to an alarm transmission service network (ATSN)

3.1.35
transmission link
part of a transmission network used to carry one or more alarm transmission paths (ATPs)

Note 1 to entry: An ATP can be established by switching together transmission links in several ways (in parallel, in series and in combinations thereof).

Note 2 to entry: A transmission link can carry several ATPs or sections of ATPs.

3.1.36
transmission network
network between two or more items of alarm transmission equipment (ATE)

Note 1 to entry: Where the network is provided by a common carrier (e.g. a public telephone network operator) the network may include items of general transmission equipment, which may not be covered by the requirements of IEC 60839-5-2, e.g. public telephone network operator equipment, mobile telephone operator equipment, ADSL modems, SDSL modems, Routers, Ethernet switches, Ethernet hubs, Firewalls and network wiring.

3.1.37
transmission time
time from when a change of state occurs or an alarm message is presented for transmission at the supervised premises transceiver (SPT) interface to the alarm system (AS) until the time that the new state or message is reported at the receiving centre transceiver (RCT) interface to the annunciation equipment (AE)

3.2   Abbreviations

For the purposes of this document, the following abbreviations apply. The following abbreviations apply to the entire IEC 60839 series.

ADSL	Asymmetric digital subscriber line
AE	Annunciation equipment
ARC	Alarm receiving centre
AS	Alarm system
ATE	Alarm transmission equipment
ATP	Alarm transmission path
ATS	Alarm transmission system
ATSN	Alarm transmission service network
ATSP	Alarm transmission service provider
DSL	Digital subscriber line
DTMF	Dual tone multi frequency
GSM	Global system mobile
ISO	International Standardisation Organisation

ISDN   Integrated service digital network

MCT   Monitoring centre transceiver

OSI   Open systems interconnection

PSN   Packet switched network

PSTN   Public switched telephone network

RCT   Receiving centre transceiver

SPT   Supervised premises transceiver

SDSL   Symmetric digital subscriber line

4   General

(void)

5   General requirements

5.1   ATS configuration

The logical configuration of an ATS shall be as shown in Figure 1. The main function of an ATS is to provide a reliable and secure transmission network from the interface of the AS to the SPT to the interface of the RCT to the AE for the transmission of alarms.

Depending upon the required reliability and resilience of the ATS and the operational features of the ARC, various ATS configurations may be used, including the use of more than one ATP between an AS and one or more RCTs connected to one or more AEs. Each ATP shall have its own transmission network interface at the SPT.

NOTE 1   For example an SPT can use a fixed line network and a radio network.

Selection of the category of ATS used for an AS shall be determined by the required reliability and security for the associated application. Reference should be made to the category of ATS required and the options that may be selected.

NOTE 2 Examples of different ATS configurations are indicated in Annex A, Figures A.1 to A.3.

5.2   ATS categories

5.2.1   General

An alarm transmission system shall be selected from one of ten categories described by this standard. An ATS shall be allocated a category which will determine its performance and resilience.

Categories SP1 to SP6 are based on single ATP ATSs.

Categories DP1 to DP4 add resilience by requiring alternate ATPs.