

INTERNATIONAL STANDARD

IEC
60839-7-1

First edition
2001-03

Alarm systems –

Part 7-1: Message formats and protocols for serial data interfaces in alarm transmission systems – General

Systèmes d'alarme –

Partie 7-1:

*Formats de message et protocoles pour les interfaces de
données série dans les systèmes de transmission d'alarme –
Généralités*



Reference number
IEC 60839-7-1:2001(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** (www.iec.ch)

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site (www.iec.ch/catlg-e.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications (www.iec.ch/JP.htm) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: custserv@iec.ch
Tel: +41 22 919 02 11
Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

IEC 60839-7-1

First edition
2001-03

Alarm systems –

Part 7-1: Message formats and protocols for serial data interfaces in alarm transmission systems – General

Systèmes d'alarme –

Partie 7-1:

Formats de message et protocoles pour les interfaces de données série dans les systèmes de transmission d'alarme – Généralités

© IEC 2001 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission
Telefax: +41 22 919 0300

3, rue de Varembe Geneva, Switzerland
e-mail: inmail@iec.ch

IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

R

For price, see current catalogue

CONTENTS

	Page
FOREWORD	3
Clause	
1 Scope	5
2 Normative references	5
3 Definitions	6
4 Abbreviations	8
5 OSI reference model	8
5.1 OSI layers	9
5.2 Definition of each layer	10
6 General considerations	10
7 Types of interface	10
7.1 Alarm system interface	11
7.2 Intermediate interface	11
7.3 Terminal interface	11
Annex A (informative) Message structure	12
Annex B (informative) Examples	13
Figure A.1 – Basic protocol structure	12
Figure B.1 – Digital communicator with a simple parallel interface to the CIE and an advanced serial interface to the PSTN	13
Figure B.2 – System employing digital communicators with a serial interface to the CIE	14
Figure B.3a – Dedicated communication employing ITU-T Recommendation V.23 signalling on a direct line	15
Figure B.3b – Dedicated communication employing protocol signalling on a power line	16
Figure B.4 – Alarm transmission equipment using ITU-T V.24/V.28 interface	17
Figure B.5 – Configuration of a system with multiple transmission options	18

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ALARM SYSTEMS –**Part 7-1: Message formats and protocols for serial data interfaces
in alarm transmission systems – General**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60839-7-1 has been prepared by IEC technical committee 79: Alarm systems.

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

FDIS	Report on voting
79/198/FDIS	79/208/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 3.

Annexes A and B are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

A bilingual version of this standard may be issued at a later date.

IEC 60839-7-1 forms one of a number of related parts presented under the general title: Alarm systems – Part 7: Message formats and protocols for serial data interfaces in alarm transmission systems:

- IEC 60839-7-1: General
- IEC 60839-7-2: Common application layer protocol
- IEC 60839-7-3: Common data link layer protocol
- IEC 60839-7-4: Common transport layer protocol
- IEC 60839-7-5: Alarm system interfaces employing a two-wire configuration in accordance with ISO/IEC 8482
- IEC 60839-7-6: Alarm system interfaces employing ITU-T Recommendation V.24/V.28 signalling
- IEC 60839-7-7: Alarm system interfaces for plug-in alarm system transceivers
- IEC 60839-7-11: Serial protocol for use by digital communicator systems using ITU-T Recommendation V.23 signalling at interfaces with the PSTN
- IEC 60839-7-12: PTT interfaces for dedicated communications channels using ITU-T Recommendation V.23 signalling
- IEC 60839-7-20: Terminal interfaces employing ITU-T Recommendation V.24/V.28 signalling

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

<https://standards.iteh.ai/standards/iec/9750/7431-2d1c-494e-94ee-c3ae2b923390/iec-60839-7-1-2001>

<https://standards.iteh.ai/standards/iec/9750/7431-2d1c-494e-94ee-c3ae2b923390/iec-60839-7-1-2001>

ALARM SYSTEMS –

Part 7-1: Message formats and protocols for serial data interfaces in alarm transmission systems – General

1 Scope

This part of IEC 60839 describes the requirements for standard serial data interfaces in alarm transmission systems. It gives an outline of how alarm transmission systems are connected and the various types of serial data interfaces that might be employed. This part includes a range of examples.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60839. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60839 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60839-7-2, *Alarm systems – Part 7-2: Message formats and protocols for serial data interfaces in alarm transmission systems – Common application layer protocol*

IEC 60839-7-5, *Alarm systems – Part 7-5: Message formats and protocols for serial data interfaces in alarm transmission systems – Alarm system interface employing a two-wire configuration in accordance with ISO/IEC 8482*

IEC 60839-7-7, *Alarm systems – Part 7-7: Message formats and protocols for serial data interfaces in alarm transmission systems – Alarm system interface for plug-in alarm system transceivers*

IEC 60839-7-11, *Alarm systems – Part 7-11: Message formats and protocols for serial data interfaces in alarm transmission systems – Serial protocol for use by digital communicator systems using ITU-T Recommendation V.23 signalling at interfaces with the PSTN*

IEC 60839-7-12, *Alarm systems – Part 7-12: Message formats and protocols for serial data interfaces in alarm transmission systems – PTT Interfaces for dedicated communications using ITU-T Recommendation V.23 signalling*

IEC 60839-7-20, *Alarm systems – Part 7-20: Message formats and protocols for serial data interfaces in alarm transmission systems – Terminal interfaces employing ITU-T Recommendation V.24/V.28 signalling*

ISO/IEC 8482, *Information technology – Telecommunications and information exchange between systems – Twisted pair multipoint interconnections*

ITU-T Recommendation V.23, *600/1200-baud modem standardized for use in the general switched telephone network*

ITU-T Recommendation V.24, *List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)* ¹⁾

ITU-T Recommendation V.28, *Electrical characteristics for unbalanced double-current interchange circuits*

3 Definitions

For the purpose of this part of IEC 60839, the following definitions apply.

3.1

alarm system messages

messages that convey information about the status of an alarm system

These may comprise:

3.1.1

alarm messages

messages that convey the presence of a hazard or a potential hazard to life or property, or the removal of such a hazard, including messages that convey the status of an alarm since the alarm transmission system is only responsible for decoding the type of the transmitted message

3.1.2

commands

messages that give instructions to an alarm system or to part of the alarm transmission system

3.1.3

informative messages

messages that give information about the status of functions of an alarm system

3.1.4

transmission system messages

messages that convey the status of parts of the alarm transmission system, including messages which report the status of the alarm system transceiver

NOTE The format and treatment of such messages may be the same as for alarm system messages.

3.2

alarm channel

part of the logical alarm transmission path across which information about the status of separately identifiable logical functional parts of the connected alarm system are passed

3.3

functional part

logical function which may include individual detectors, groups of detectors and sections of the common parts of the system (e.g. power supply unit (PSU), warning device, etc.)

NOTE Such a functional part may be in one or more of the following states as shown below.

3.3.1

normal condition

status of a functional part when it is fully operational and not in any other condition

¹⁾ To be published.

3.3.2**alarm condition**

status of a functional part which results from the response of that functional part to the presence of an abnormal condition indicating the presence of a hazard (or a potential hazard) which has not been acknowledged by either its successful transmission or by a local manual action

3.3.3**outstanding alarm**

status of a functional part which results from the response of that functional part to the presence of an abnormal condition indicating the presence of a hazard (or a potential hazard) which has been acknowledged by either its successful transmission or by a local manual action

3.3.4**tamper**

status of a functional part which results from the operation of a tamper device within that functional part

3.3.5**test condition**

status of the functional part which results from changing the status out of normal condition for test purposes

3.3.6**disabled**

status of the functional part in which the normal functions have been taken out of service

3.4**alarm system transceiver**

alarm transmission equipment, which is located at the supervised premises or at a satellite station

3.5**master**

item of equipment which controls the messages on the link and to which messages are either sent or received

3.6**slave**

item of equipment on the link which is not in control and which can only transmit a message in response to the master, in response to a request from it

3.7**data link data**

information element, a data link message or a message originating from LAYER 4 - TRANSPORT

3.8**originator**

item of equipment which initiates the data communications on a link

NOTE This need not be the item which initiates the physical/logical connection.

3.9**receiver**

item of equipment on a link which accepts data communication initiated on a link by another item of equipment (an ORIGINATOR)

3.10

message authentication code (MAC)

code ensuring that the message arrives from the correct source

3.11

window size

maximum number of messages which may be transmitted without receiving ACK.

4 Abbreviations

ACK	acknowledgement
CCTV	closed circuit television
ITU-T	International Telecommunication Union – Telecommunications
CIE	control and indicating equipment
CR	carriage return
CRC	cyclic redundancy check
DLLA	data link layer authentication
HEX	hexadecimal
ID	identity
INIT	initiated
ISO	International Standards Organization
ISDN	Integrated System Digital Network
Ki	secondary key
MAC	message authentication code
Mk	master key
LSB	least significant (byte) octet
OSI	open interconnection
PSTN	Public Switched Telephone Network
PTT	Post, Telegraph and Telephone
R1	random number
Rs	random seed
STX	start of text
TTL	transistor transistor logic

5 OSI reference model

The open system interconnection (OSI) reference model was developed by the International Standards Organization (ISO) both to provide a commonly agreed way of describing, understanding and analyzing the various functions of complex communications systems. It also provides a framework for drafting international standards.

The reference model views the functions of a system as being divided into a number of layers. There are formally 7 LAYERS (1-7), though layers 0 and 8 are now commonly added as described below.

The layered structure enables changes to be made to the different functions without affecting the other layers. In actual systems, some layers may be omitted. Designers are free to implement the layers individually or to combine them.