

English Version

**Alarm systems - Alarm transmission systems and equipment -
Part 9: Requirements for common protocol for alarm
transmission using the Internet Protocol (IP)**

Systèmes d'alarmes - Systèmes et équipements de
transmission d'alarme - Partie 9 : Exigences pour le
protocole commun de transmission d'alarme utilisant le
protocole Internet (IP)

Alarmanlagen - Alarmübertragungsanlagen und -
einrichtungen - Teil 9: Anforderungen an standardisierte
Protokolle zur Alarmübertragung unter Nutzung des
Internetprotokolls (IP)

This Technical Specification was approved by CENELEC on 2020-09-28.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

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

Contents	Page
European foreword	5
1 Scope	6
2 Normative references	6
3 Terms, definitions and abbreviations	6
3.1 Terms and definitions	6
3.2 Abbreviations	6
4 Objective	7
5 Messaging	7
5.1 General	7
5.2 Message format overview	8
5.3 Padding and message length	12
5.4 Hashing	13
5.5 Encryption	13
5.6 Timeouts and retries	14
5.7 Version number	15
5.8 Reverse commands	15
5.9 Initial values	15
6 Message types	16
6.1 General	16
6.2 Path supervision	16
6.3 Event message format	17
6.4 Event response format	23
6.5 Configuration messages	23
7 Commissioning and connection setup	36
7.1 General	36
7.2 Commissioning	36
7.3 Connection setup	39
Annex A (normative) Result codes	41
Annex B (normative) Protocol identifiers	42
Annex C (normative) Shared secret	43
Annex D (informative) Examples of messaging sequences	44
Annex E (informative) Examples of application protocols	51
Annex F (informative) Design principles	53
Bibliography	54
Tables	
Table 1 — Backwards compatibility	8
Table 2 — Backwards compatibility result code	8

Table 3 — Identifiers	9
Table 4 — Basic unencrypted format of messages	9
Table 5 — Basic encrypted format of messages	10
Table 6 — Message ID overview	11
Table 7 — Flags	12
Table 8 — Hashing ID's	13
Table 9 — Encryption ID's.....	14
Table 10 — Reverse commands.....	15
Table 11 — Initial values	15
Table 12 — Poll message SPT ← → RCT	16
Table 13 — Poll response RCT ← → SPT	16
Table 14 — Poll response - result code	17
Table 15 — Event message format – SPT → RCT.....	17
Table 16 — Event message format – Fields	18
Table 17 — Event field	18
Table 18 — Time event field	19
Table 19 — Time message field.....	19
Table 20 — Link field – IP Address	19
Table 21 — Link field – Port number.....	20
Table 22 — Link field – URL	20
Table 23 — Link field – Filename.....	20
Table 24 — Alarm Text	20
Table 25 — Site Name	21
Table 26 — Building Name	21
Table 27 — Location	21
Table 28 — Room	21
Table 29 — Alarm Trigger.....	22
Table 30 — Longitude	22
Table 31 — Latitude	22
Table 32 — Altitude	22
Table 33 — Event response message format.....	23
Table 34 — Event response - result code.....	23
Table 35 — Connection handle request message format.....	24
Table 36 — Connection handle response message format.....	24
Table 37 — Connection handle response - result code.....	24
Table 38 — Device ID request message format	25
Table 39 — Device ID request flags	25
Table 40 — Device ID response message format	25
Table 41 — Encryption selection request message format	26
Table 42 — 'Master Encryption Selection request' flag	26

Table 43 — Encryption selection response message format.....	26
Table 44 — Encryption selection response - result code.....	26
Table 45 — Encryption key exchange request message format	27
Table 46 — 'Master Key request' flag	27
Table 47 — Encryption key exchange response message format.....	28
Table 48 — Encryption key - result code	28
Table 49 — Hash selection request message format	28
Table 50 — Hash selection response message format	29
Table 51 — Path supervision request message format	29
Table 52 — Path supervision response message format	30
Table 53 — Path supervision response - result code	30
Table 54 — Set time command message format.....	30
Table 55 — Set time response message format.....	31
Table 56 — Set time response - result code.....	31
Table 57 — Protocol version request message format.....	31
Table 58 — Protocol version response message format	32
Table 59 — Protocol version response - result code	32
Table 60 — Transparent message format	32
Table 61 — Transparent response format	33
Table 62 — Transparent response - result code.....	33
Table 63 — DTLS completed request message format.....	33
Table 64 — DTLS completed response message format.....	34
Table 65 — DTLS completed response - result code	34
Table 66 — RCT IP parameter request message format	34
Table 67 — RCT IP parameter response message format.....	35
Table 68 — RCT IP parameter response - result code.....	35
Table 69 — Message flow during the commissioning of a new SPT	37
Table 70 — Message flow during connection setup	40
Table A.1 — Result codes.....	41
Table B.1 — Protocol identifiers.....	42
Table D.1 — Example of the commissioning messaging sequence	45
Table D.2 — Example of the connection setup messaging sequence	48
Table E.1 — VdS2465 message example	52

European foreword

This document (CLC/TS 50136-9:2020) has been prepared by CLC/TC 79 “Alarm systems”.

This document supersedes CLC/TS 50136-9:2017.

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.

This document specifies a common IP transport protocol for alarm transmission. The published version (2017, second version) required solving both technical and security issues identified during the first actual implementations of the protocol. The working group was working closely with the early adopters of the protocol and has a very clear and complete list of issues and solutions. This revision supersedes the previous version.

EN 50136 consists of the following parts, under the general title *Alarm systems - Alarm transmission systems and equipment*:

- *Part 1: General requirements for alarm transmission systems*
- *Part 2: General requirements for Supervised Premises Transceiver (SPT)*
- *Part 3: Requirements for Receiving Centre Transceiver (RCT)*
- *Part 4: Annunciation equipment used in alarm receiving centres*
- *Part 5: (Free)*
- *Part 6: (Free)*
- *Part 7: Application guidelines*
- *Part 8: (Free)*
- *Part 9: Requirements for a common protocol for alarm transmission using the Internet Protocol (IP)*

1 Scope

This document specifies a protocol for point-to-point transmission of alarms and faults, as well as communications monitoring, between a Supervised Premises Transceiver and a Receiving Centre Transceiver using the Internet Protocol (IP).

The protocol is intended for use over any network that supports the transmission of IP data. These include Ethernet, xDSL, GPRS, WiFi, UMTS and WIMAX.

The system performance characteristics for alarm transmission are specified in EN 50136-1.

The requirements for the performance of the alarm transmission system, the SPT and the RCT are specified in the relevant parts of the EN 50136 series.

Compliance with this document is voluntary.

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.

EN 50136-1:2012, *Alarm systems - Alarm transmission systems and equipment - Part 1: General requirements for alarm transmission systems*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50136-1:2012 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

AES	Advanced Encryption Standard
ARC	Alarm Receiving Centre
ATP	Alarm Transmission Path
ATS	Alarm Transmission System
CA	X.509 Certificate Authority
CBC	Cipher Block Chaining
CRC	Cyclic redundancy check
DNS	Domain Name System
DTLS	Datagram Transport Layer Security
HL	Header Length
IP	Internet Protocol
IV	Initialization Vector