

Distribution automation using distribution line carrier systems —

Part 4-511: Data communication protocols — Systems management — CIASE protocol

The European Standard EN 61334-4-511:2000 has the status of a British Standard

ICS 33.040.40; 35.100.70

National foreword

This British Standard is the official English language version of EN 61334-4-511: 2000. It is identical with IEC 61334-4-511: 2000.

The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power system control and associated communications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been renumbered as IEC 60027-1. For a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

Cross-references

Attention is drawn to the fact that CEN and CENLEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

This British Standard, having been prepared under the direction of the Electrotechnical Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 June 2001

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 35, and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

© BSI 06-2001

ISBN 0 580 37360 6

Distribution automation using distribution line carrier systems
Part 4-511: Data communication protocols -
Systems management - CIASE protocol
(IEC 61334-4-511:2000)

Automatisation de la distribution
à l'aide de systèmes de communication
à courants porteurs
Partie 4-511: Protocoles de
communication de données -
Administration de systèmes -
Protocole CIASE
(CEI 61334-4-511:2000)

Verteilungsautomatisierung
mit Hilfe von Trägersystemen
auf Verteilungsleitungen
Teil 4-511:
Datenkommunikationsprotokolle -
Systemverwaltung -
CIASE Protokoll
(IEC 61334-4-511:2000)

This European Standard was approved by CENELEC on 2000-08-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 57/446/FDIS, future edition 1 of IEC 61334-4-511, prepared by IEC TC 57, Power system control and associated communications, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61334-4-511 on 2000-08-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2001-05-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-08-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B and C are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61334-4-511:2000 was approved by CENELEC as a European Standard without any modification.

CONTENTS

	Page
INTRODUCTION	5
Clause	
1 Scope	6
2 Normative references	6
3 Definitions	7
4 Abbreviations	9
5 Service argument description	10
6 Systems management overview	11
6.1 OSI standards	11
6.2 DCP systems management concepts	11
6.2.1 MIB	12
6.2.2 Alarm	12
6.2.3 Client SMAE	12
6.3 Use of DLMS services in management services	12
6.4 Management VDE	12
6.4.1 Service Conformance Block	13
6.4.2 Mandatory DLMS Objects	13
6.5 Specifications of types	14
7 Configuration Initiation Application Service Element	14
7.1 Discover service	14
7.1.1 Purpose	14
7.1.2 Structure	15
7.1.3 Arguments	15
7.1.4 Service procedure	16
7.2 Register service	19
7.2.1 Purpose	19
7.2.2 Structure	19
7.2.3 Arguments	19
7.2.4 Service Procedure	20
7.3 CIASE protocol	20
7.3.1 Abstract and transfer syntax	20
7.3.2 Mapping to underlying services	20
7.3.3 CI-PDU description	21
7.4 CIASE state tables	22
7.4.1 Notations used in state tables	22
7.4.2 States description	25
7.4.3 Local state variables	25
7.4.4 Event functions description	26
7.4.5 Actions description	27

	Page
Annex A (informative) Vocabulary and operating rules	30
Annex B (informative) Examples of CIASE protocol use	32
Annex C (informative) Example of CIASE Td calculation	33
Annex ZA (normative) Normative references to international publications with their corresponding European publications	34
 Figure 1 – The Systems Management Application Process.....	 11
 Table 1 – The Discover service.....	 15
Table 2 – The Register service	19
Table 3 – The Client CIASE state table	23
Table 4 – The Server CIASE state table.....	24

INTRODUCTION

The description of the DCP systems management given in this part of IEC 61334 is developed in the following clauses:

Clause 1 defines the scope of this International Standard.

Clause 2 lists related ISO/IEC standards.

Clause 3 defines the terms used in this standard.

Clause 4 defines the abbreviations used in this standard.

Clause 5 specifies the conventions taken for the description of the primitives.

Clause 6 introduces general concepts related to DCP systems management.

Clause 7 specifies the Configuration Initiation Application Service Element (CIASE).

DISTRIBUTION AUTOMATION USING DISTRIBUTION LINE CARRIER SYSTEMS –

Part 4-511: Data communication protocols – Systems management – CIASE protocol

1 Scope

This part of IEC 61334 specifies the DCP management requirements. It describes the management services in an abstract way as well as the underlying protocol.

It defines terminology and describes concepts for DCP systems management, describes DCP systems management activities and facilities, and specifies DCP services and protocol.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61334. 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 61334 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 61334-4-1:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 1: Reference model of the communication system*

IEC 61334-4-32:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 32: Data link layer – Logical link control (LLC)*

IEC 61334-4-41:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 41: Application protocols – Distribution line message specification*

IEC 61334-4-42:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 42: Application protocols – Application layer*

IEC 61334-4-512, — *Distribution automation using distribution line carrier systems – Part 4-512: Data communication protocols – Systems management using profile 61334-5-1-MIB*¹⁾

IEC 61334-5-1:1996, *Distribution automation using distribution line carrier systems – Part 5: Lower layer profiles – Section 1: The spread frequency shift keying (S-FSK) profile*

1) Under consideration.

ISO/IEC 7498 (all parts), *Information technology – Open systems interconnection – Basic reference model*

ISO/IEC 7498-1:1994, *Information technology – Open systems interconnection – Basic reference models – The basic model*

ISO/IEC 7498-3:1997, *Information technology – Open systems interconnection – Basic reference model – Part 3: Naming and addressing*

ISO/IEC 7498-4:1989, *Information processing systems – Open systems interconnection – Basic reference model – Part 4: Management framework*

ISO/IEC/TR 8509:1987, *Information processing systems – Open systems interconnection – Service conventions*

ISO/IEC 9545:1994, *Information technology – Open systems interconnection – Application layer structure*

3 Definitions

3.1 For the purposes of this part of IEC 61334, the following terms as defined in ISO/IEC 7498 apply:

- a) open system,
- b) application-process,
- c) (N)-layer,
- d) (N)-sublayer,
- e) (N)-service,
- f) (N)-service-access-point,
- g) (N)-protocol,
- h) (N)-protocol-data-unit,
- i) (N)-service-data-unit,
- j) systems-management,
- k) application-entity,
- l) application-service-element,
- m) user-element.

3.2 For the purposes of this part of IEC 61334, the following terms as defined in ISO/IEC 7498-3 apply:

- a) (N)-address,
- b) (N)-selector,
- c) (N)-association,
- d) (N)-directory-function,
- e) (N)-entity,
- f) (N)-entity-title,
- g) system-title.

3.3 For the purposes of this part of IEC 61334, the following terms as defined in ISO/IEC 7498-4 apply:

- a) Systems management application-entity,
- b) OSI Management,
- c) Managed Object,
- d) Management Information Base.

3.4 For the purposes of this part of IEC 61334, the following terms as defined in ISO/IEC/ TR 8509 apply:

- a) primitive,
- b) request,
- c) indication,
- d) response,
- e) confirm,
- f) service provider,
- g) service user.

3.5 For the purposes of this part of IEC 61334, the following term as defined in ISO/IEC 9545 applies:

- a) application-context.

3.6 For the purposes of this part of IEC 61334, the following terms as defined in IEC 61334-4-1 apply:

- a) NEW-address,
- b) AllNew-Title,
- c) Source-Title,
- d) AllSMAE-Title,
- e) AllCIASE-Title.

3.7 For the purposes of this part of IEC 61334, the following terms as defined in IEC 61334-4-41 apply:

- a) client,
- b) server,
- c) Virtual Distributing Equipment (VDE),
- d) Task Invocation,
- e) Data Set,
- f) conformance.

3.8 For the purposes of this part of IEC 61334, the term "initiator" is not used as defined in ISO/IEC 7498-3. It is redefined thus:

3.8.1
initiator

user-element of a client SMAE (it uses the CIASE and DLMS ASE and is identified by its system title)

3.9 For the purposes of this part of IEC 61334, the following definitions apply.

3.9.1

active initiator

initiator which issues or has last issued a CIASE Register request when the server is in the unconfigured state

3.9.2

manager

user-element of the CIASE and DLMS ASEs that belongs to the sole SMAE of each server system

3.9.3

new system

server system which is in the unconfigured state: its MAC address equals "NEW-address"

3.9.4

new system title

system-title of a new system

3.9.5

registered system

server system which has an individual valid MAC address (therefore, different from "NEW-Address", see IEC 61334-5-1: Medium Access Control)

3.9.6

reporting system

server system which issues a DiscoverReport request

3.9.7

system

synonymous for real open system

4 Abbreviations

ACSE	Association Control Service Element
APDU	Application Protocol Data Unit
ASE	Application Service Element
CIASE	Configuration Initiation ASE
Conf	Confirm
CRC	Cyclic Redundancy Code (see IEC 61334-5-1)
DASE	DLMS Application Service Element
DCP	Data Communication Protocols
DLMS	Distribution Line Message Specification
Ind	Indication
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LLC	Logical Link Control
L-SAP	Link Service Access Point
MAC	Medium Access Control

MIB	Management Information Base
OSI	Open Systems Interconnection
OSIE	Open Systems Interconnection Environment
PDU	Protocol Data Unit
Req	Request
SAP	Service Access Point
SDU	Service Data Unit
SMAE	Systems Management Application Entity
SMAP	Systems Management Application Process
VAA	Virtual Application Association
VDE	Virtual Distribution Equipment

The following initials are used to specify the layers or sublayers:

- a) PHY – Physical layer,
- b) DL – Data_Link layer,
- c) MA – MAC sublayer,
- d) L – LLC sublayer,
- e) CI – CIASE sublayer (application layer).

5 Service argument description

This standard uses a tabular format to describe the component arguments of the CIASE service primitives. Each table consists of one to two columns describing the service arguments and the request ("Req"), and confirm ("Conf") primitives. The "Conf" column is absent when the service is not a confirmed service. The initiator (which is a CIASE-user) uses the CIASE services.

In each table, one argument (or a part of it) is listed on each horizontal line. Under the appropriate service primitive columns, a code is used to specify the type of usage of the argument.

The codes used are listed below:

- a) M – the argument is Mandatory for the primitive;
- b) U – the argument is a User option, and may or may not be provided depending on dynamic usage by the CIASE user;
- c) S – the argument is Selected among other S-arguments;
- d) C – the argument is Conditional upon other arguments or the environment of the CIASE user;
- e) (blank) – the argument is never present.

The "(=)" code following one of the M, U, C or S codes indicates that the argument is semantically equivalent to the argument in the service primitive to its immediate left in the table. (For instance, an "M(=)" code in the indication service primitive column and an "M" in the request service primitive column means that the argument in the indication primitive is semantically equivalent to the one in the request primitive.)