



SLOVENSKI STANDARD

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Telecontrol equipment and systems - Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations - Section 501: TASE.1 service definitions (IEC 870-6-501:1995)

Telecontrol equipment and systems -- Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations -- Section 501: TASE.1 Service definitions

Fernwirkeinrichtungen und -systeme -- Teil 6: Fernwirkprotokolle, die mit ISO-Normen und ITU-T-Empfehlungen kompatibel sind -- Hauptabschnitt 501: Beschreibung des TASE.1-Dienstes

Matériels et systèmes de téléconduite -- Partie 6: Protocoles de téléconduite compatibles avec les normes ISO et les recommandations de l'UIT-T -- Section 501: Définitions des services TASE.1

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Part 6: Telecontrol protocols compatible with ISO standards
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Section 501: TASE.1 Service definitions
(IEC 870-6-501:1995)

Matériels et systèmes de téléconduite

Partie 6: Protocoles de téléconduite compatibles avec les normes ISO et les recommandations de l'UIT-T

Section 501: Définitions des services

TASE.1

(CEI 870-6-501:1995)

Fernwirkleinrichtungen und -systeme

Teil 6: Fernwirkprotokolle, die mit ISO-Normen und ITU-T-Empfehlungen kompatibel sind

Hauptabschnitt 501: Beschreibung

des TASE.1-Dienstes

(IEC 870-6-501:1995)

This European Standard was approved by CENELEC on 1996-03-05. 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, 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 57/222/FDIS, future edition 1 of IEC 870-6-501, 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 60870-6-501 on 1996-03-05.

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) 1996-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-12-01

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 and B are informative.
Annex ZA has been added by CENELEC.

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Endorsement notice
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The text of the International Standard IEC 870-6-501:1995 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 870-6-502	1995	Telecontrol equipment and systems Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations Section 502: TASE.1 Protocol definitions	EN 60870-6-502	1996
ISO 7498	1984	Information processing systems - Open Systems Interconnection - Basic Reference Model	EN 27498	1989
ISO 7498-3	1989	Part 3: Naming and addressing	-	-
ISO TR 8509	1987	Information processing systems - Open Systems Interconnection - Service conventions	-	-
ISO 8649	1988	Information processing systems - Open Systems Interconnection - Service definition for the Association Control Service Element	-	-
ISO 8650	1988	Information processing systems - Open Systems Interconnection - Protocol specification for the Association Control Service Element	-	-
ISO 8822	1994	Information technology - Open Systems Interconnection - Presentation service definition	-	-
ISO/IEC 8824	1990	Information technologie - Open Systems Interconnection - Specification of the Abstract Syntax Notation One (ASN.1)	-	-
ISO/IEC 9072-1	1989	Information processing systems - Text communication - Remote Operations Part 1: Model notation and service definition	-	-
ISO/IEC 9072-2	1989	Part 2: Protocol specification	-	-

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les normes ISO et les recommandations de l'UIT-T –
Section 501: Définitions des services TASE.1

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Telecontrol equipment and systems –

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Section 501: TASE.1 Service definitions

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TELECONTROL EQUIPMENT AND SYSTEMS -

**Part 6: Telecontrol protocols compatible with ISO standards
and ITU-T recommendations -
Section 501: TASE.1 Service definitions**

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.
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International Standard IEC 870-6-501 has been prepared by IEC technical committee 57: Power system control and associated communications.

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

FDIS	Report on voting
57/222/FDIS	57/258/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.

Annexes A and B are for information only.

INTRODUCTION

The TASE.1 (Telecontrol Application Service Element No. 1) specification has been developed as a result of the TC57 strategy expressed in annex C of the technical report IEC 870-6-1 [1]*. This strategy defines the requirement to standardize only ISO/OSI compliant protocols, and to base the work on proven technology.

The TASE.1 is aimed for use where utilities have a need for exchange of process data, e.g. real-time measurements, breaker status, or energy counter values. The exchange can be on any level within the utility or between utilities using a data network. The network can be local or wide, public or private, but must be able to support standard ISO protocols.

The TASE.1 is an application layer protocol and the corresponding service specifications are based on the ELCOM 90 de facto standard protocol. The services of the proved ELCOM 90 protocol have been moved into a full ISO stack of protocols where standard ISO protocols are used on all levels including layer 7. Some of the services of ELCOM 90 have been mapped directly on the services of the ISO standards ACSE and ROSE while the remaining are included in the TASE.1 services. This solution will ensure a high degree of common software between different communication functions within a system and keep the cost of implementation at a minimum. Please refer to annex C of the technical report IEC 870-6-1 [1]*, for a description of how this TASE.1 fits into the overall architecture.

The TASE.1 protocol will make it possible to exchange data values of different type between telecontrol systems at different levels, for example:

- real-time data values; (standards.iteh.ai)
- historical data set values;
- supervisory control data values; [SIST EN 60870-6-501:1997](https://standards.iteh.ai/catalog/standards/sist/5e9dcbc3-4b7d-4942-b7f2-06c1d98c455a/sist-en-60870-6-501-1997)
- short text messages. <https://standards.iteh.ai/catalog/standards/sist/5e9dcbc3-4b7d-4942-b7f2-06c1d98c455a/sist-en-60870-6-501-1997>

Data transfer can be initiated and controlled in various ways, for example:

- periodic transfer;
- unsolicited transfer, event driven;
- requested transfer.

The data transmission can be done on an individual data item value basis, or data values can be grouped together for more efficient transmission.

The protocol definition is prepared for introduction of new data types. If additional data types are required, these may be defined in an amendment by extension of the ASN.1 syntax of the protocol.

The TASE.1 is designed to operate together with other standard protocols and does therefore not provide functionality already available in other standards in use, for example FTAM for file transfer and X.400 for message transfer.

* Numbers in brackets refer to annex B, Bibliography.

TELECONTROL EQUIPMENT AND SYSTEMS –

Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations – Section 501: TASE.1 Service definitions

1 Scope and object

This section of IEC 870-6 defines the services provided by a telecontrol specific application-service-element – the Telecontrol Application Service Element No. 1 (TASE.1) – for the exchange of process data in telecontrol systems.

The main goals for the design of these services are:

- simplicity;
- adaptability;
- independence of lower layer architecture;
- extensibility;
- efficiency;
- performance;
- maintainability.

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The services of TASE.1 are: <https://standards.iteh.ai/catalog/standards/sist/5e9dcbc3-4b7d-4942-b7f2-06c1d98c455a/sist-en-60870-6-501-1997>

- services for defining, changing, deleting and inspecting information groups;
- services for managing the transfer of information groups and blocks of information from different groups;
- services for supervisory control.

The TASE.1 services are provided by the use of the TASE.1 protocol (IEC 870-6-502) in conjunction with the Remote Operations Service Element (ROSE) services (ISO/IEC 9072-1), the ROSE protocol (ISO/IEC 9072-2), and the Association Control Service Element (ACSE) services (ISO 8649) and the ACSE protocol (ISO 8650).

The services defined in this standard allow communication between telecontrol end systems. The primitives comprise a minimum set able to fulfil the following requirements:

- allowing the inclusion of OSI standard protocols for all layers;
- allowing extensions of the services to cope with future OSI requirements.

The services can be applied for the exchange of realtime data, as well as historical and planning data.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this section of IEC 870-6. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this section of IEC 870-6 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 870-6-502: 1995, *Telecontrol equipment and systems – Part 6: Telecontrol protocols compatible with ISO standards and IUT-T recommendations – Section 502: TASE.1 Protocol definitions*

ISO 7498: 1984, *Information processing systems – Open Systems Interconnection – Basic Reference Model*

ISO 7498-3: 1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 3: Naming and addressing*

ISO/TR 8509: 1987, *Information processing systems – Open Systems Interconnection – Service conventions*

ISO 8649: 1988, *Information processing systems – Open Systems Interconnection – Service definition for the Association Control Service Element*

ISO 8650: 1988, *Information processing systems – Open Systems Interconnection – Protocol specification for the Association Control Service Element*

ISO 8822: 1994, *Information technology – Open Systems Interconnection – Presentation service definition*

ISO/IEC 8824: 1990, *Information technology – Open Systems Interconnection – Specification of the Abstract Syntax Notation One (ASN.1)*

ISO/IEC 9072-1: 1989, *Information processing systems – Text communication – Remote Operations – Part 1: Model notation and service definition*

ISO/IEC 9072-2: 1989, *Information processing systems – Text communication – Remote Operations – Part 2: Protocol specification*

3 Definitions

For the purpose of this section of IEC 870-6, the following definitions apply.

3.1 Reference model definitions (terms defined in ISO 7498)

- a) Application-process
- b) Application-protocol-control-information
- c) Application entity

- d) Application-service-element
- e) Service-element
- f) User-element

3.2 *Naming and addressing definitions* (terms defined in ISO 7498-3)

- a) Application-entity-title
- b) Application-association-identifier

3.3 *Service conventions definitions* (terms defined in ISO/TR 8509)

- a) Service-provider
- b) Service-user
- c) Confirmed service
- d) Non-confirmed service
- e) Provider-initiated service
- f) Primitive
- g) Request
- h) Indication
- i) Response
- j) Confirm

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3.4 *Presentation service definition* (term defined in ISO 8822)

- a) Abstract syntax

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3.5 *Association control definition* (term defined in ISO 8649)

- a) Application-association; association

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3.6 *Remote operations definitions* (terms defined in ISO 9072)

- a) ACSE-user
- b) ROSE-user
- c) BIND
- d) UNBIND

3.7 *TASE.1 definitions*

3.7.1 analog setpoint group: Group containing object identifiers for floating-point command values. Analog setpoints are typically used as input parameters for regulators.

3.7.2 application-association-identifier: An identifier returned by the ACSE service provider that uniquely identifies a successfully established application association within the TASE.1 environment.

3.7.3 binary command group: Group containing object identifiers for two-state (on/off) commands. Binary commands are used to control the state of breakers.

3.7.4 digital setpoint group: Group containing object identifiers for two's-complement integer command values. Digital setpoints are typically used as input parameters for regulators.

3.7.5 discrete group: Group containing object identifiers for two's-complement integer values. The position of a transformer tap changer is an example for a discrete group.

3.7.6 logical breaker status group: Group containing object identifiers for composite three-state status information regarding busbar connection of a feeder and of connections between busbars. Normally the values are calculated locally from the breaker's status values.

3.7.7 group: Set of named data objects of same type, implicitly numbered by their indexes.

3.7.8 group management: Creating groups, changing groups by means of their group descriptor, and deleting groups.

3.7.9 group definition: Unique definition of data objects within one specific group.

3.7.10 group descriptor: Set of attributes describing the properties of a group.

3.7.11 group descriptor attributes: Parameters describing specific characteristics of a group.

3.7.12 group incarnation: Set of simultaneous values from a given group.

3.7.13 group number: Unique identifier for one group.

3.7.14 group type: Description of the type of objects represented in the group.

3.7.15 initiator: TASE.1 service-user that issues the association establishment request service primitive.

3.7.16 measurand group: Group containing floating-point values.

3.7.17 object: Abstract model of a real device. A specific type and data value is attached to the object. Objects may change their value in course of time. Data objects are named by means of object-identifiers in the local data acquisition environment and by group number and index in the TASE.1 environment.

3.7.18 object identifier: Unique object name used in the local data acquisition environment. The object-identifier is used to identify which local data value is to be logically associated with a given combination of group-number and index number.

3.7.19 responder: TASE.1 service-user that issues the association establishment response service primitive. A service-user may act as initiator and responder at the same time.

3.7.20 status group: Group containing object identifiers for three-state (on/off/between) status values.

3.7.21 text message group: Group containing object identifiers for 8-bit character strings.

4 Abbreviations

A-PCI Application Protocol Control Information

AA Application Association

ACEP Application Connection End-Point

ACSE Association Control Service Element

AE Application Entity

AS Application Service

OSI Open Systems Interconnection

OSIE Open Systems Interconnection Environment

P-ACEP ACEP identifier for service-provider

PSAP Presentation Service Access Point

ROSE Remote Operations Service Element

SAP Service Access Point

TASE Telecontrol Application Service Element

U-ACEP ACEP identifier for user-element