SLOVENSKI STANDARD
SIST EN 60870-5-2:1997

01-avgust-1997

Telecontrol equipment and systems - Part 5: Transmission protocols - Section 2: Link transmission procedures (IEC 870-5-2:1992)

Telecontrol equipment and systems -- Part 5: Transmission protocols - Section 2: Link transmission procedures

Fernwirkeinrichtungen und -systeme -- Teil 5: Übertragungsprotokolle - Hauptabschnitt 2: Übertragungsprozeduren der Verbindungsschicht

Matériels et systèmes de téléconduite -- Partie 5: Protocoles de transmission - Section 2: Procédures de transmission de liaison de données

Ta slovenski standard je istoveten z: **EN 60870-5-2:1993**

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33.200	Daljinsko krmiljenje, daljinske meritve (telemetrija)
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EUROPEAN STANDARD

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Descriptors: Teleprocessing, control processes, telecontrol, data transmission, open system interconnection, data transmission procedure, data multilink procedure, protocol, data structure, frame

ENGLISH VERSION

Telecontrol equipment and systems
Part 5: Transmission protocols
Section 2: Link transmission procedures
(IEC 870-5-2:1992)

Matériels et systèmes de téléconduite
Partie 5: Protocoles de transmission
Section 2: Procédures de transmission de liaison de données
(CEI 870-5-2:1992)

Fernwirkeinrichtungen und Fernwirksysteme
Teil 5: Übertragungsprotokolle
Hauptabschnitt 2: Übertragungsprozeduren der Verbindungsschicht
(IEC 870-5-2:1992)

This European Standard was approved by CENELEC on 1993-07-06. 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 CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 870-5-2:1992 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60870-5-2 on 6 July 1993.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1994-08-01
- latest date of withdrawal of conflicting national standards	(dow)	1994-08-01

Annexes designated "normative" are part of the body of the standard. In this standard, annexes A and ZA are normative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 870-5-2:1992 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT 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.

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

IEC Publication	Date	Title	EN/HD	Date
50(371)	1984	International Electrotechnical Vocabulary (IEV) Chapter 371: Telecontrol	-	-
870-1-1	1988	Telecontrol equipment and systems Part 1: General considerations Section One: General principles	-	-
870-5-1	1990	Part 5: Transmission protocols Section One: Transmission frame formats	EN 60870-5-1	1993

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Matériels et systèmes de téléconduite

Partie 5:
Protocoles de transmission
Section 2: Procédures de transmission de liaison de données

Telecontrol equipment and systems

Part 5:
Transmission protocols
Section 2: Link transmission procedures

Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève, Suisse

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TELECONTROL EQUIPMENT AND SYSTEMS

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FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

This section of International Standard IEC 870-5 has been prepared by IEC Technical Committee No. 57: Telecontrol, teleprotection and associated telecommunications for electric power systems.

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

DIS	Report on Voting
57(CO)57	57(CO)60

Full information on the voting for the approval of this section can be found in the Voting Report indicated in the above table.

Annex A is an integral part of this section.

INTRODUCTION

This section of IEC 870-5 is part of a series which highlights specific requirements and conditions for data transmission in telecontrol systems and describes ways to meet those requirements.

In terms of the OSI (Open System Interconnection) reference model of ISO-CCITT, which subdivides communication into seven layers, this section is concerned with the procedures required by the second layer: the link layer.

Section 1 covers the two bottom layers: the physical layer and the link layer, the latter being explained in terms of admissible frame formats and rules for frame synchronization. This section specifies standard link transmission procedures which operate on the link layer.

TELECONTROL EQUIPMENT AND SYSTEMS

Part 5: Transmission protocols

Section 2: Link transmission procedures

1 Scope and object

1.1 *Scope*

This section of IEC 870-5 applies to telecontrol equipment and systems with coded bit serial data transmission for monitoring and controlling geographically widespread processes.

The defined link procedures are restricted to message transmission sequences operating with size 1 windows. This means that the link layer of the primary station (station that initiates a message transfer) accepts a request for a new message transfer only when a previously accepted request for a message transfer is terminated either successfully or with an error indication. The procedures are applicable to balanced and unbalanced transmission in telecontrol systems using half duplex or duplex transmission channels.

1.2 *Object*

The standard transmission procedures defined by this section are applicable to point-to-point, multiple point-to-point, multipoint-star, multipoint-partyline and multipoint-ring configurations as described in 4.4 of IEC 870-1-1.

The data transmission functions in these systems are composed of three basic types of link transmission services, namely:

1. SEND/NO REPLY 2. SEND/CONFIRM 3. REQUEST/RESPOND

The two services SEND/CONFIRM and REQUEST/RESPOND consist of a sequence of non-separable dialogue elements between requesting stations and responding stations.

The protocol defined in this section accepts and processes only a single link transmission service at a time in each direction of a bidirectional communication system. Each transmission service is terminated either successfully or with error reports before the next transmission service begins. This means that the window size for successive packet transfers is 1 and the specified error recovery for the transmission services SEND/CONFIRM and REQUEST/RESPOND utilize the stop-and-wait method for automatic repeat requests (ARQ).

In point-to-point configurations equipped with duplex channel operation, the defined protocol supports balanced transmission procedures, that is simultaneous data transmission services in both directions of the communication link. This enables outstations to report spontaneous events to the control station as they occur, without having to be polled. This reduces reporting delays and leads to faster data acquisition. However, the use of an individual duplex communications channel to each outstation leads to increased equipment costs.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this section of IEC 870-5. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this section of IEC 870-5 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(371): 1984, *International Electrotechnical Vocabulary (IEV) – Chapter 371: Telecontrol.*

IEC 870-1-1: 1988, *Telecontrol equipment and systems – Part 1: General considerations – Section one: General principles.*

IEC 870-5-1: 1990, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section One: Transmission frame formats.*

3 Formats and structures of standard transmission frames

The transmission procedures defined in this section provide protection against residual (i.e. undetected) transmission errors in the range of integrity class I1, specified in IEC 870-5-1, if the transmission frame format FT 1.1 is used and if the transmission rules specified by that section are observed. Residual transmission errors in the range of integrity class I2 are achieved if one of the transmission frame formats FT 1.2, FT 2 or FT 3, specified by that section, are utilized and if the corresponding transmission rules are observed. Only one chosen transmission frame format may be used on any given physical communications channel in a system. The order of fields in the frames is generally as follows:

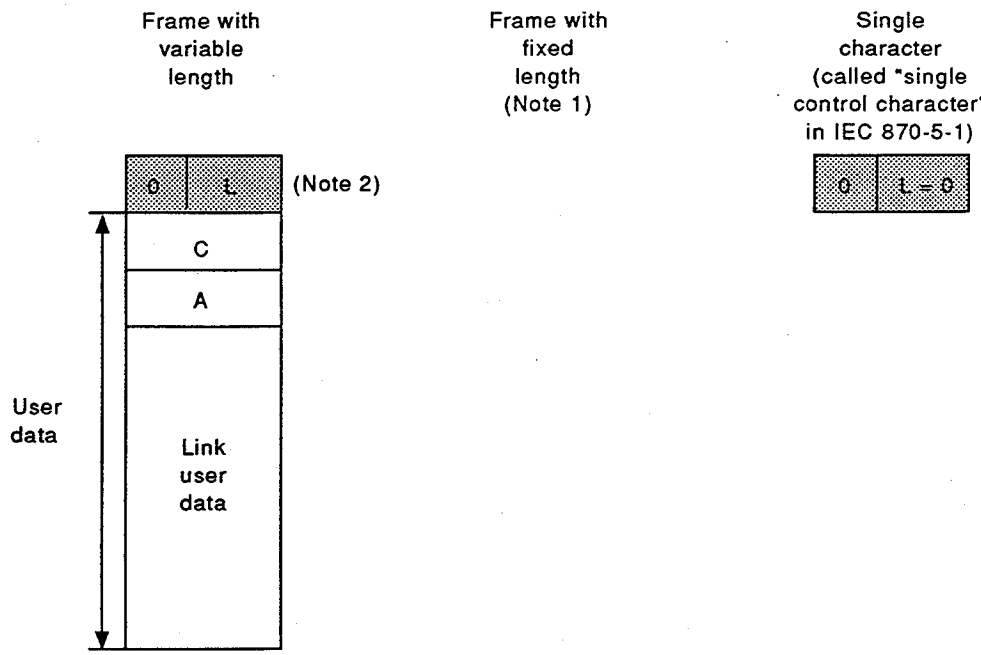
Length (one octet)

Control (one octet)

Address (one or more octets, by agreement)

Link user data (n octets)

3.1 *Format FT 1.1*



L: length field range: 0...127
L specifies the number of subsequent user data octets including the control and address fields

C: control field
A: address field, optional

NOTES

1 There is no special frame with a fixed length; the variable length frame is used in all cases.

2 The shaded fields have already been defined in IEC 870-5-1.
The unshaded fields are the "user data" of the frame as indicated in IEC 870-5-1.