

INTERNATIONAL STANDARD



**Telecontrol equipment and systems –
Part 5-101: Transmission protocols – Companion standard for basic telecontrol
tasks**

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IEC 60870-5-101

Edition 2.1 2015-11
CONSOLIDATED VERSION

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[IEC 60870-5-101:2003](https://standards.iteh.ai/catalog/standards/iec/fl579eb6-083a-44bc-8a3d-cf37d2ec47b2/iec-60870-5-101-2003)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.200

ISBN 978-2-8322-3051-0

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**Telecontrol equipment and systems –
Part 5-101: Transmission protocols – Companion standard for basic telecontrol
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TELECONTROL EQUIPMENT AND SYSTEMS –

**Part 5-101: Transmission protocols –
Companion standard for basic telecontrol tasks**

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IEC 60870-5-101 edition 2.1 contains the second edition (2003-02) [documents 57/605/FDIS and 57/623/RVD] and its amendment 1 (2015-11) [documents 57/1530/CDV and 57/1592/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60870-5-101 has been prepared by IEC technical committee 57: Power system control and associated communications.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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TELECONTROL EQUIPMENT AND SYSTEMS –

Part 5-101: Transmission protocols – Companion standard for basic telecontrol tasks

1 Scope and object

This part of IEC 60870-5 applies to telecontrol equipment and systems with coded bit serial data transmission for monitoring and controlling geographically widespread processes. It defines a telecontrol companion standard that enables interoperability among compatible telecontrol equipment. The defined telecontrol companion standard utilizes standards of the IEC 60870-5 series of documents. The specifications of this standard present a functional profile for basic telecontrol tasks. Further companion standards, based on the IEC 60870-5 series are under consideration.

This standard defines ASDUs with time tags CP24Time2a which includes three octets binary time from milliseconds to minutes. In addition to these specifications, ASDUs with time tags CP56Time2a, which includes seven octets binary time from milliseconds to years, are defined in this standard (see 6.8 of IEC 60870-5-4 and 7.2.6.18 of this standard).

ASDUs with time tags CP56Time2a are used when the controlling station is not able to add the time from hours to years unambiguously to the received ASDUs which are tagged from milliseconds to minutes. This may happen when using networks with uncertain transmission delays or if temporary failure of a network occurs.

Although this companion standard defines the most important user functions, other than the actual communication functions, it cannot guarantee complete compatibility and interoperability between equipment of different vendors. An additional mutual agreement is normally required between concerned parties regarding the methods of use of the defined communication functions, taking into account the operation of the entire telecontrol equipment.

Standards specified in this standard are compatible with standards defined in IEC 60870-5-1 to IEC 60870-5-5 (see Clause 2).

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60050(371):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 371: Telecontrol*

IEC 60870-1-1:1988, *Telecontrol equipment and systems – Part 1: General considerations – Section 1: General principles*

IEC 60870-5-1:1990, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 1: Transmission frame formats*

IEC 60870-5-2:1992, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 2: Link transmission procedures*

IEC 60870-5-3:1992, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 3: General structure of application data*

IEC 60870-5-4:1993, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 4: Definition and coding of application information elements*

IEC 60870-5-5:1995, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 5: Basic application functions*

IEC 60870-5-103:1997, *Telecontrol equipment and systems – Part 5-103: Transmission protocols – Companion standard for the informative interface of protection equipment*

ISO/IEC 8824-1:2000, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ITU-T V.24:2000, *List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)*

ITU-T V.28:1993, *Electrical characteristics for unbalanced double-current interchange circuits*

ITU-T X.24:1988, *List of definitions for interchange circuits between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) on public data networks*

ITU-T X.27:1996, *Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s*

IEEE 754:1985, *Binary floating-point arithmetic*

3 Terms and definitions

For the purpose of this part of IEC 60870-5, the following definitions apply.

3.1

companion standard

a companion standard adds semantics to the definitions of the basic standard or a functional profile. This may be expressed by defining particular uses for information objects or by defining additional information objects, service procedures and parameters of the basic standard

NOTE Companion standards do not alter the standards to which they refer, but make explicit the relationship between those used together for a specific domain of activity.

3.2

group (of information objects)

selection of COMMON ADDRESSES or INFORMATION ADDRESSES which is specifically defined for a particular system

3.3

control direction

direction of transmission from the controlling station to a controlled station

3.4

monitor direction

direction of transmission from a controlled station to the controlling station