IEC 60870-5-104

Edition 2.1 2016-06
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

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Telecontrol equipment and systems – Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles

Matériels et systèmes de téléconduite – Partie 5-104: Protocoles de transmission – Accès aux réseaux utilisant des profils de transport normalisés pour l'IEC 60870-5-101

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REDLINE VERSION

VERSION REDLINE

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TELECONTROL EQUIPMENT AND SYSTEMS –

Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles

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FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60870-5-104 edition 2.1 contains the second edition (2006-06) [documents 57/812/FDIS and 57/819/RVD] and its amendment 1 (2016-06) [documents 57/1613/CDV and 57/1667/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 60870-5-104 Ed.2 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

IEC 60870-5 consists of the following parts, under the general title *Telecontrol equipment and systems – Part 5: Transmission protocols*

Part 5: Transmission protocols – Section One: Transmission frame formats

Part 5: Transmission protocols – Section 2: Link transmission procedures

Part 5: Transmission protocols – Section 3: General structure of application data

Part 5: Transmission protocols – Section 4: Definition and coding of application information elements

Part 5: Transmission protocols – Section 5: Basic application functions

Part 5-6: Guidelines for conformance testing for the IEC 60870-5 companion standards

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

Part 5: Transmission protocols – Section 102: Companion standard for the transmission of integrated totals in electric power systems

Part 5-103: Transmission protocols – Companion standard for the informative interface of protection equipment

Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles

Part 5-601: Conformance test cases for the IEC 60870-5-101 companion standard

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

IEC 60870-5-101 provides a communication profile for sending basic telecontrol messages between a central telecontrol station and telecontrol outstations, which uses permanent directly connected data circuits between the central station and individual outstations.

In some applications, it may be required to send the same types of application messages between telecontrol stations using a data network containing relay stations which store and forward the messages and provide only a virtual circuit between the telecontrol stations. This type of network delays messages by varying amounts of time depending on the network traffic load.

In general, the variable message delay times mean that it is not possible to use the link layer as defined in IEC 60870-5-101 between telecontrol stations. However, in some cases it is possible to connect telecontrol stations having all three layers of the companion standard IEC 60870-5-101 to suitable data networks using Packet Assembler Disassembler (PAD) type stations to provide access for balanced communication.

In all other cases this companion standard, which does not use the link functions of IEC 60870-5-101, may be used to provide balanced access via a suitable transport profile.

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TELECONTROL EQUIPMENT AND SYSTEMS –

Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles

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1 Scope and object

This part of IEC 60870 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. The specifications of this part present a combination of the application layer of IEC 60870-5-101 and the transport functions provided by a TCP/IP (Transmission Control Protocol/Internet Protocol). Within TCP/IP, various network types can be utilized, including X.25, FR (Frame Relay), ATM (Asynchronous Transfer Mode) and ISDN (Integrated Service Data Network). Using the same definitions, alternative ASDUs (Application Service Data Unit) as specified in other IEC 60870-5 companion standards (for example, IEC 60870-5-102) may be combined with TCP/IP, but this is not described further in this part.

NOTE Security mechanisms are outside the scope of this standard.

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 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 60870-5-101:2003, *Telecontrol equipment and systems – Part 5-101: Transmission protocols – Companion standard for basic telecontrol tasks*

IEC 60870-5-102:1996, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 102: Companion standard for the transmission of integrated totals in electric power systems*

ITU-T Recommendation X.25:1996, *Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit*

IEEE 802.3:1998, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

RFC 791, *Internet Protocol, Request for Comments 791 (MILSTD 1777) (September, 1981)*

RFC 793, *Transmission Control Protocol, Request for Comments 793 (MILSTD 1778) (September, 1981)*

RFC 894, *Internet Protocol on Ethernet Networks*

RFC 1661, *Point-to-Point Protocol (PPP)*

RFC 1662, *PPP in HDLC Framing*

RFC 1700, *Assigned Numbers, Request for Comments 1700 (STD 2) (October, 1994)*

RFC 2200, *Internet Official Protocol Standards, Request for Comments 2200 (June, 1997)*

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