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Partie 1: Considérations générales – Section 3: Glossaire

Telecontrol equipment and systems –

Part 1: General considerations – Section 3: Glossary

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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TELECONTROL EQUIPMENT AND SYSTEMS –

Part 1: General considerations –
Section 3: Glossary

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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- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

Technical reports of types 1 and 2 are subject to review within three years of publication to decide whether they can be transformed into International Standards. Technical reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

IEC 60870-1-3, which is a technical report of type 3, has been prepared by IEC technical committee 57: Power system control and associated communications.

This second edition cancels and replaces the first edition published in 1990 and constitutes a technical revision.

The text of this technical report is based on the following documents:

Committee draft	Report on voting
57(Sec)171	57/297/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

INTRODUCTION

Standards and reports on telecontrol equipment and systems produced during the last few years by IEC technical committee 57 in different documents of series IEC 60870-5 and IEC 60870-6 use a certain number of terms with specific meanings in telecontrol applications that are not yet defined in IEC 60050(371): *International Electrotechnical Vocabulary (IEV) – Chapter 371: Telecontrol* (1984). In most of the documents of the 60870 series, glossaries related to the particular document already exist. Nevertheless, the collection of relevant terms in this document is useful for the reader of the above-mentioned documents.

This section of IEC 60870-1 presents in alphabetic order these terms and their definitions. It also presents a comprehensive means of referring to terms with particular meaning in telecontrol systems and equipment that should also be used in future telecontrol documentation.

TELECONTROL EQUIPMENT AND SYSTEMS –

Part 1: General considerations –
Section 3: Glossary

1 Scope and object

This technical report applies to telecontrol equipment and systems with coded bit serial data transmission for monitoring and control of geographically widespread processes.

This section of IEC 60870-1 covers those terms which are specifically relevant to telecontrol techniques as well as other terms which are necessary for the understanding of telecontrol standards.

This report also gives, where applicable, references to other dictionaries of electrical and electronic terms.

Terms which are considered to be well known by readers of telecontrol standards are not included in this report. This applies particularly in the field of communications where such terms as, for example, "information" and "bit" are commonplace and well understood.

2 Reference documents

The following standards contain provisions which, through reference in this text, constitute provisions of this section of the IEC 60870 series. At the time of publication, the editions of the reference documents indicated were valid. All standards are subject to revision, so readers 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 60050(191): 1990, *International Electrotechnical Vocabulary (IEV) – Chapter 191: Dependability and quality of service*

IEC 60050(351): 1997, *International Electrotechnical Vocabulary (IEV) – Chapter 351: Automatic control*

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

IEC 60050(721): 1992, *International Electrotechnical Vocabulary (IEV) – Chapter 721: Telegraphy, facsimile and data communication*

IEC 60870-1-4: 1994, *Telecontrol equipment and systems – Part 1: General considerations – Section 4: Basic aspects of telecontrol data transmission and organization of standards IEC 60870-5 and IEC 60870-6*

IEC 60870-2-1: 1995, *Telecontrol equipment and systems – Part 2: Operating conditions – Section 1: Power supply and electromagnetic compatibility*

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: 1995, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 101: Companion standard for basic telecontrol tasks*

IEC 60870-6-501: 1995, *Telecontrol equipment and systems – Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations – Section 501: TASE.1 Service definitions*

IEC 60870-6-502: 1995, *Telecontrol equipment and systems – Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations – Section 502: TASE.1 Protocol definitions*

ISO/IEC 2382-9: 1995, *Information technology – Vocabulary – Part 9: Data communication*

ISO/IEC 3309: 1993, *Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures – Frame structure*

ISO/IEC 4335: 1993, *Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures – Elements of procedures*

ISO 7498-1: 1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*

ISO 7498-2: 1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 2: Security Architecture*

ISO 8326: 1987, *Information processing systems – Open Systems Interconnection – Basic connection oriented session service definition*

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

ISO 8648: 1988, *Information processing systems – Open Systems Interconnection – Internal organization of the Network Layer*

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

ISO/IEC 9545: 1994, *Information technology – Open Systems Interconnection – Application Layer structure*

ISO/IEC 9646-1: 1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts*

ISO/IEC TR 10000-1: 1995, *Information technology – Framework and taxonomy of International Standarized Profiles – Part 1: General principles and documentation*

ISO/IEC TR 10000-2: 1995, *Information technology – Framework and taxonomy of International Standarized Profiles – Part 2: Principles and Taxonomy for OSI Profiles*

ITU-T X.15: 1984, *Definition of terms concerning public data networks*

3 Definitions

absolute chronology; time tagging: Method of transmission of changes-of-state so that transmitted information is accompanied by data giving the registered time at which the change occurred, within the time resolution. [IEV 371-05-02]

acknowledgement: See **positive acknowledgement; negative acknowledgement**

acquisition time: Minimum time for correct detection and processing of a change-of-state.

address: Part of a message identifying the source or its destination.

adjusting command: Command used to change the state of operational equipment having more than two states. [IEV 371-03-10]

alarm: Information for attracting attention to some abnormal state.

NOTE – A transition from a normal into an abnormal state causes a visual and/or audible warning which has to be acknowledged. A transition from an abnormal into a normal state usually causes a change of indication and, in some applications, also causes a visual and/or audible warning which has to be acknowledged.

analogue signal: Signal in the form of a continuously variable value.

application association: Co-operative relationship between two application-service-object-invocations which govern their bilateral use of the Presentation Service for communication of information and co-ordination of their joint operation. [ISO/IEC 9545]

application entity (AE): Aspects of an application-process pertinent to Open Systems Interconnection (OSI). [ISO 7498]

application functions: Functions covering the special needs of the process to which a telecontrol or SCADA system is applied.

The application functions are divided into basic functions and extended processing functions.

application functions (in the sense of the basic reference model): Part of application-processes which performs the remote communications procedures between application-processes. [ISO 7498]

application-process: Element within a real open system which performs the information processing for a particular application. [ISO 7498]

application profile: Profile defining the use of protocol standards from Open Systems Interconnection (OSI) layers 5 to 7, to provide for the structured transfer of information between systems.

application service element: That part of an application-entity which provides an Open Systems Interconnection (OSI) environment capability, using underlying services when appropriate. [ISO 7498]

association control service element: Application service element that provides the exclusive means for establishing and terminating all application-associations. [ISO/IEC 9545]

asynchronous telecontrol transmission: See **start-stop telecontrol transmission.**

asynchronous transmission: Data transmission in which the time of occurrence of the start of each character or block of characters is arbitrary; once started, the time of occurrence of each signal representing a bit within the character or block, has the same relationship to significant instants of a fixed time base. [ISO 2382-9]

automatic generation control (AGC): See **load-frequency control.**

auxiliary information: Information used in order to control the operation of a telecontrol system.

availability: Ability of a unit or system to perform its required function at any given moment.

average transfer time: Average of the transfer time for every case of input of the primary signal with respect to the telecontrol system. [IEV 371-08-18]

balanced circuit; balanced line; balanced signal pair: Transmission line consisting of two conductors in the presence of ground, capable of being operated in such a way that, when the voltages of the two conductors at all transverse planes are equal in magnitude and opposite in polarity with respect to ground, the currents in the two conductors are equal in magnitude and opposite in direction.

balanced transmission: Transmission method by which either Data Terminal Equipment (DTE) of two connected stations may initiate a message transmission at any time. [IEC 60870-1-4]

barrier device: Device for galvanic isolation of telecontrol equipment and the operational equipment (e.g. a relay, optocoupler or transformer).

base standard: Approved international standard, technical report or ITU-T Recommendation which is used in the definition of a Profile. [ISO/IEC TR 10000-1]

basic application function (in telecontrol): Transmission procedure that performs a supervisory or control function that is generally used in telecontrol systems. [IEC 60870-5-5]

Examples: command transmission, event transmission, cyclic transmission, etc.

basic functions: Functions dealing with all types of individual information from and to the operational equipment and the operator.

basic reference model: See **open system interconnection**

baud (Bd): Unit of modulation rate or unit of transfer rate of signal elements of constant duration in a discretely timed or digital signal; the number of baud is equal to the reciprocal of the duration in seconds of the shortest signal element or of the unit interval in such a signal. [IEV 721-03-27]

NOTE – For example, if the duration of the unit interval is 20 ms, the modulation rate is 50 Bd.

binary state information: Monitored information of the status of operational equipment which is characterized by one of two states, for example on/off. [IEV 371-02-03]

bit erasure probability: Probability that a received signal variable used to represent the value of a bit exceeds specified limits of tolerated signal quality.

bit erasure rate: Ratio of the number of bits received with signals exceeding specified limits of tolerated signal quality to the total number of bits sent.

bit error probability: Probability that a received bit will be inverted with respect to the corresponding bit sent. [IEV 371-08-02]

bit error rate: Ratio of the number of bits received inverted to the total number of bits sent. [IEV 371-08-01]

bit oriented data transmission: See **code transparent data transmission**

bit oriented code: See **transparent code**

bit rate: Speed at which bits are transmitted, usually expressed in bits per second (bits/s).

block: Sequence of bits transmitted as a unit, generally subdivided into fields for conveying information bits and error check bits.

block code: Sequence of information bits completed by bits used for error detection or error correction.

block error probability: Probability that a block will be incorrectly received. [IEV 371-08-04]

block error rate: Ratio of the number of blocks incorrectly received to the total number of blocks sent. [IEV 371-08-03]

blocked: When the value of the information object is blocked for transmission, the value remains in the state that was acquired before it was blocked. Blocking and deblocking may be initiated e.g. by a local lock or a local automation cause.

blocked spontaneous data transfer: Similar to "spontaneous data transfer", but the initiating application process waits a certain time for more spontaneous data before transmission to allow a more efficient data transfer in the case of bursts of spontaneous data.

blocking: Function performed by an (N)-entity to map multiple (N)-service-data-units into one (N)-protocol-data-unit. [ISO 7498]

Bose Chaudhuri Hocquenghem-code (BCH-code): Cyclic code that can be defined by a generator polynomial; every code word is a multiple of that polynomial.

breaking capability: Current that a device is capable of breaking at a stated recovery voltage under prescribed conditions of use and behaviour.

bridge: Relay node of a data network in which transmission paths with different protocol definitions of the physical layer are interconnected.

broadcast command: Command which is addressed to operational equipment at several or all outstations of a telecontrol network. [IEV 371-03-16]

brouter: Relay node of a data network which performs both the functionality of a bridge and of a router with one single unit. Used to interconnect data networks to create a single logical network.

byte: Ordered set of a specified number of binary digits operated upon as an entity. [IEV 721-02-11]

NOTE – The word "byte" without qualification may be used as a synonym for octet.

call control procedure: Implementation of a set of protocols necessary to establish and release a call. [ISO 2382-9]

call establishment: Sequence of events for the establishment of a data connection. [ITU-T X.15]

call release: Sequence of events for the release of a data connection. [IEC 60870-1-4]

calling: Process of transmitting selection signals in order to establish a connection between data stations. [ISO 2382-9]

centralized absolute chronology: Transmission of changes-of-state information with absolute chronology from different locations containing synchronized clocks. [IEV 371-05-04]

NOTE – The resulting accuracy specification considers separating capability, absolute chronology and clock synchronization errors.

change-of-state announcement: Announcement of a demand for the transmission of event information. [IEV 371-04-03]

channel: Single path for transmitting electric signals, usually in distinction from other parallel paths.

NOTE – The word "path" is to be interpreted in a broad sense to include separation by frequency division or time division. The term "channel" may signify either a one-way path, providing transmission in one direction only, or a two-way path, providing transmission in two directions.

channel selecting telecontrol system; common diagram telecontrol system: Telecontrol system in which the control centre or master station selects any one of a number of outstations by switching the receiver and, if necessary, the command sender from one circuit to another. [IEV 371-07-10]

check command: Command for the purpose of ensuring that the telecontrol equipment is functioning correctly. [IEV 371-04-08]

check sequence; check sum: Part of a message used for error checking or error correcting purposes.

ciphertext: Data product through the use of encipherment (encryption). The semantic content of the resulting data is not available without the knowledge of the encipherment used.

circuit switched data network (CSDN); circuit switched network: Arrangement of dedicated (time-division or space-division) switching facilities to provide telecommunication service based on circuit switching methods. These could be a circuit switched data network or switched telephone network. [IEC 60870-1-4]