

INTERNATIONAL STANDARD

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ITU STANDARD PREVIEW
Telecontrol equipment and systems –
Part 6-702: Telecontrol protocols compatible with ISO standards and ITU-T
recommendations – Functional profile for providing the TASE.2 application
service in end systems

[IEC 60870-6-702:2014](#)

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Matériels et systèmes de téléconduite –
Partie 6-702: Protocoles de téléconduite compatibles avec les normes ISO
et les recommandations de l'UIT-T – Profil fonctionnel pour fournir le service
d'application TASE.2 dans les systèmes finals





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TELECONTROL EQUIPMENT AND SYSTEMS –

**Part 6-702: Telecontrol protocols compatible with
ISO standards and ITU-T recommendations –
Functional profile for providing the TASE.2
application service in end systems**

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International Standard 60870-6-702 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition published in 1998 and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- Accounts, Programs, Event Enrollment, and Event Condition objects were moved from being normative to informative. As a result, the conformance tables have been updated.
- The services associated with Accounts, Programs, Event Enrollment, and Event Conditions are now out-of-scope.
- The TASE.2 conformance blocks 6, 7, 8, and 9 have been made out-of-scope.

These changes were made in order to remove TASE.2 blocks that were seldom used and whose capabilities are typically implemented by some other means besides TASE.2. This was done to promote interoperability of implementations from an application perspective.

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

FDIS	Report on voting
57/1454/FDIS	57/1478/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.

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

A list of all parts in the IEC 60870 series, published under the general title *Telecontrol equipment and systems*, can be found on the IEC website.

The committee has decided that the contents of this publication 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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- replaced by a revised edition, or
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INTRODUCTION

This part of IEC 60870 is one of the IEC 60870-6 series defining functional profiles to be used in telecommunication networks for electric power systems. It is largely based on existing ISO/IEC International Standards and International Standardized Profiles (ISP).

The notion of functional profiles is fundamental in the organization of the IEC 60870-6 series. A description of functional profiles, their classification scheme and the manner of defining them are laid down in IEC 60870-6-1.

This profile for telecontrol application service element (TASE.2, also known as inter-control centre communications protocol, ICCP) is an application-class profile (A-profile) providing communications capabilities to control centre applications. The TASE.2 in the application layer is specified in IEC 60870-6-503. The present standard refines the application layer protocol to meet interoperability requirements and specifies requirements on the presentation and session layers support for TASE.2. TASE.2 operates in a connection mode, so this A-profile needs to interface to a transport-class profile of the T-profile variety.

Since the TASE.2 is an MMS-based protocol, this functional profile (FP) is based on MMS profiles. In the OSI international standardized profile taxonomy there is a category for MMS A-profiles. The present standard makes frequent use of the AMM11 profile.

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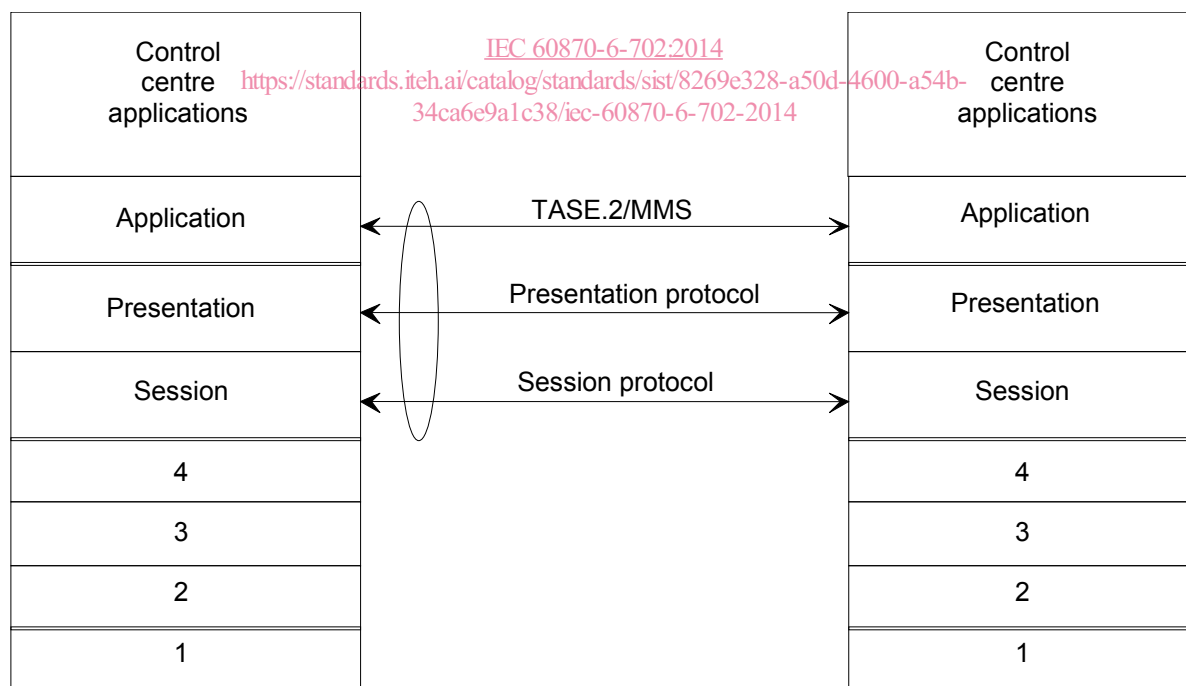
Part 6-702: Telecontrol protocols compatible with ISO standards and ITU-T recommendations – Functional profile for providing the TASE.2 application service in end systems

1 Scope

This part of IEC 60870 is a functional profile (FP) and defines the provision of the TASE.2 communications services between two control centre end systems. It is supported by the transport services implemented in accordance with transport-profiles defined for the type of network that interconnects the control centre end systems. This is demonstrated in Figure 1.

This FP also defines the provision of the OSI connection-mode presentation and session services between the end systems.

ISO/ISP 14226 specifies the AMM11 profiles for MMS. The parts of ISO/ISP 14226 that cover the profile that are used as a basis for this FP are ISO/ISP 14226-1 and ISO/ISP 14226-2. This FP is in alignment with ISO/ISP 14226, as far as possible, and maintains this compatibility by reference. There are TASE.2 requirements in addition to ISO/ISP 14226. These requirements are specified in this FP.



IEC 2021/14

Figure 1 – Applicability of functional profile

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For

undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60870-6-503, *Telecontrol equipment and systems – Part 6-503: Telecontrol protocols compatible with ISO standards and ITU-T recommendations – TASE.2 Services and protocol*

IEC/TS 62351-4, *Power systems management and associated information exchange – Data and communications security – Part 4: Profiles including MMS*

ISO/IEC 8327-2, *Information technology – Open Systems Interconnection – Connection-oriented Session protocol: Protocol Implementation Conformance Statement (PICS) proforma*

ISO/IEC 8650-2, *Information technology – Open Systems Interconnection – Protocol specification for the Association Control Service Element: Protocol Implementation Conformance Statement (PICS) proforma*

ISO/IEC 8823-2, *Information technology – Open Systems Interconnection – Connection-oriented presentation protocol: Protocol Implementation Conformance Statement (PICS) proforma*

ISO 9506-1:2003, *Industrial automation systems – Manufacturing Message Specification – Part 1: Service definition*

ISO 9506-2:2003, *Industrial automation systems – Manufacturing Message Specification – Part 2: Protocol specification*

ISO/ISP 14226-1:1996, *Industrial automation systems – International Standardized Profile AMM11: MMS General Applications Base Profile – Part 1: Specification of ACSE, Presentation and Session protocols for the use by MMS¹*

ISO/ISP 14226-2:1996, *Industrial automation systems – International Standardized Profile AMM11: MMS General Applications Base Profile – Part 2: Common MMS requirements¹*

RFC 2126, *ISO Transport Service on top of TCP (ITOT)*

3 Terms and definitions

All the terms used in this standard are as defined in the normative references.

4 Abbreviations

All the abbreviations used in this standard are as defined in the normative references.

5 Profile protocol stacks

As shown in Figure 1, the TASE.2 profile includes the TASE.2, MMS and ACSE elements in the TASE.2 protocol, the connection-mode presentation protocol, and the connection-mode session protocol.

¹ This publication has been withdrawn from circulation.

6 Conformance requirements

6.1 General

The TASE.2 application profile can be referred to as a TASE.2 MMS application profile. It shall follow the same rules and regulations governing MMS ISPs. Requirements of the TASE.2 MMS application profile to support TASE.2 are separated into upper layer requirements, MMS requirements, and TASE.2 requirements.

The ISPICS requirements lists for TASE.2, MMS, ACSE, presentation and session are given in Annex A. Annex A makes mandatory some features that were optional in ISO/ISP 14226-1 and ISO/ISP 14226-2.

For each implementation claiming conformance to this part of IEC 60870 an appropriate set of PICSSs shall be made available stating support or non-support of each option identified in this part.

6.2 TASE.2 requirements

The TASE.2 conformance requirements can be found in A.3.

6.3 MMS requirements

The MMS conformance requirements can be found in A.4. A data structure nesting level parameter value of greater than 1 shall be supported.

6.4 Upper layers requirements

Upper layer requirements for TASE.2 shall be as defined by ISO/ISP 14226-1 for the AMM11 profile. In addition, the presentation protocol shall be able to support the default context negotiation, default context name and simply encoded data options.

The TASE.2 MMS application profile requires that there be a mechanism for the application association performance/quality attributes to be conveyed to the transport (and thus network) service. The mechanism employed is implementation-defined, but the TASE.2 and transport profile implementations must be compatible.

When an association is requested, if there is a priority class agreed for it, the value agreed between the control centres is given to the transport layer. Every data unit that is sent on this association is treated according to the priority class in the transport service. If no priority value is agreed, then none is expressed and a default value is assumed.

6.5 Lower Layer requirements

The lower layers shall be based upon TCP/IP and include RFC-2126.

The implementation of IPv4 is mandatory.

Annex A (normative)

ISPICS requirements lists

A.1 General

This annex describes the TASE.2, ACSE, presentation and session requirements in terms of tables which reference the base standard PICS proforma. The MMS requirements are also described in terms of tables which were derived from the base standard. The tables are intended to give a precise specification of requirements. In case of arbitration or dispute, this annex takes precedence over Clause 6.

In the PICS proforma reference column of Tables A.1 to A.16 and A.43 to A.61, and in the lists of conditional expressions underneath the tables, tables within the base standard PICS proformas are referenced. The first letter identifies the specific PICS proforma:

I – TASE.2 – IEC 60870-6-503;

A – ACSE – ISO/IEC 8650-2;

P – Presentation – ISO/IEC 8823-2;

S – Session – ISO/IEC 8327-2.

The characters from the second character to the solidus (/) form a reference to the specific subclause in annex A of that PICS proforma which contains the table in question. The number after the solidus references the row number in the table.

Coupling between layers is accounted for in this standard. Optional "o" items can be chosen without regard to the affect on another layer.

A.2 Classification of requirements

A.2.1 General

Throughout this annex, to specify the level of support for each feature, the following classification is used.

Client-CR: Client conformance requirement

Server-CR: Server conformance requirement

A.2.2 Base column

The "Base" column reflects the definitions and specifications in the appropriate base standard. Each entry in this column is chosen from the following list:

mandatory; m: this feature shall be supported, i.e. its syntax and procedures shall be implemented as specified in the base standard. However, it is not a requirement that the feature shall be used in all instances of communication, unless mandated by the base standard;

optional; o: any feature denoted by "o" is left to the implementation as to whether that feature is implemented or not. If a parameter is optionally supported, then the syntax shall be implemented, but it is left to each implementation whether the procedures are implemented or not.

Where the base entry contains two classifications separated by a comma, these reference the sending and receiving capabilities, respectively.

A.2.3 F/S column

The "F/S" column reflects the requirements of this Functional Standard. Each entry in this column is chosen from the following terminology:

supported; m: any feature denoted by "m" is mandatory or optional in the base standard. This feature shall be supported, i.e. its syntax and procedures shall be implemented as specified in the base standard or in this ISP by all implementations claiming conformance to this standard. However, it is not a requirement that the feature shall be used in all instances of communication, unless mandated by the base standard or stated otherwise in this profile;

optionally supported; o: any feature denoted by "o" is left to the implementation as to whether that feature is implemented or not. If a parameter is optionally supported, then the syntax shall be implemented, but it is left to each implementation whether the procedures are implemented or not;

conditionally supported; c: any feature denoted by "c" shall be supported under the conditions specified in this standard. If these conditions are not met, the feature is outside the scope of this standard;

excluded; x: any feature denoted by "x" is excluded in this profile, i.e. an implementation shall behave as if the feature were not implemented;

outside of scope; i: any feature denoted by "i" is outside the scope of this standard, i.e. it may be ignored, and will therefore not be subject to a profile conformance test. However, the syntax of all parameters of supported PDUs shall be implemented, even if the procedures are not (i.e. the receiver shall be able to decode the PDU);

not applicable; –: any feature denoted by "–" is not defined in the context where it is mentioned, e.g. a parameter which is not part of the respective PDU. The occurrence of "not applicable" features is mainly due to the format of the tables in the ISPICS requirements list.

Where the F/S entry contains two classifications separated by a comma, these reference the sending and receiving capabilities, respectively.

A.2.4 Status column

The status column reflects the classification to be found in the base standard PICS proforma:

- o: optional;
- c: conditional;
- o.n: optional with at least one of the marked items being selected.

The definitions of conditional items may be found in the respective PICS proformas.

Where the status entry contains two classifications separated by a comma, these reference the sending and receiving capabilities, respectively.

A.2.5 Profile column

The profile column reflects the requirement of this profile. Each entry in this column is chosen from the following list:

- m: mandatory support;
- c: conditional support;

- o.n: optional with at least one of the marked items being selected;
 i: outside the scope;
 x: exclude from use. Shall not be supported/implemented².
 –: not applicable.

Where the profile entry contains two classifications, separated by a comma, these reference the sending and receiving capabilities, respectively.

A.3 TASE.2

Throughout this clause, the entry mn denotes that the item is mandatory for conformance to block n.

Table A.1 – Client/Server capability

PICS proforma reference	Capability	Base	F/S
I. /1	Client control centre		o.1
I. /2	Server control centre		o.1

iTeh STANDARD PREVIEW Table A.2 – TASE.2 CBBS (standards.iteh.ai)

PICS proforma reference	Conformance building block	Base	F/S	
			Client-CR	Server-CR
I. /1	Basic Services	m	m	m
I. /2	Extended Conditions	o	o	o
I. /3	Blocked Transfers	o	o	o
I. /4	Information Message	o	o	o
I. /5	SBO Device Control	o	o	o
I. /6	Programs	i	i	i
I. /7	Events	i	i	i
I. /8	Accounts	i	i	i
I. /9	Time Series	i	i	i

² The exclusion of certain services is used to improve the overall security aspects of TASE.2. There have been several assessments that indicated since ISO 9506 has 86+ services, that represents a potential security issue. Therefore, the use of an “x” is intended to mandate that services not required to support TASE.2 shall be disabled.