SVENSK STANDARD SS-EN 61970-301

Fastställd	Utgåva	Sida	Ansvarig kommitté
2012-02-15	2	1 (1+261)	SEK TK 57

Gränssnitt för EMS (EMS-API) – Del 301: Grund för gemensam informationsmodell (CIM)

Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base

Som svensk standard gäller europastandarden EN 61970-301:2011. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61970-301:2011.

Nationellt förord

Europastandarden EN 61970-301:2011

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61970-301, Third edition, 2011 - Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61970-301, utgåva 1, 2009, gäller ej fr o m 2014-09-30.

ICS 33.200

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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61970-301

November 2011

ICS 33.200

Supersedes EN 61970-301:2004

English version

Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base

(IEC 61970-301:2011)

Interface de programmation d'application pour système de gestion d'énergie (EMS-API) -
Part 301: Base de modèle d'information commun (CIM)
(CEI 61970-301:2011)

Schnittstelle für Anwendungsprogramme für Netzführungssysteme (EMS-API) -
Teil 301: Allgemeines Informationsmodell (CIM), Basismodell
(IEC 61970-301:2011)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61970-301:2011 E

SEK Svensk Elstandard

Foreword

The text of document 57/1136/FDIS, future edition 3 of IEC 61970-301, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61970-301:2011.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-06-30
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2014-09-30

This document supersedes EN 61970-301:2004.

EN 61970-301:2011 includes the following significant technical changes with respect to EN 61970-301:2004:

— regulation control models were added with a new RegulatingControl class which provides the capability to model multiple equipments participating in a regulation scheme;

— new “OperationalLimits” package for equipment ratings;

— partial ownership specification added;

— LoadResponseCharacteristic class was enhanced to better model the characteristic response of the load demand due to changes in system conditions such as voltage and frequency;

— new ControlArea package added with load forecast and area interchange specifications;

— EPRI CIM for Planning project proposals to support the exchange of planning models were incorporated;

— branch group “interface” monitoring specification was added;

— composite switch model was changed to better model distribution use cases;

— extensions were added to support powerflow “case input” so that profiles are not required to use time based schedules and detailed connectivity (via new bus-branch model);

— new Equivalents package added to model equivalent networks;

— new Contingency package added to handle contingencies;

— various editorial changes to cleanup UML model;

— non-SI units have been changed to SI units.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61970-301:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61850-7-3	NOTE	Harmonized as EN 61850-7-3.
IEC 61968-11:2010	NOTE	Harmonized as EN 61968-11:2010 (not modified).
IEC 61970-501	NOTE	Harmonized as EN 61970-501.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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

Publication	Year	Title	EN/HD	Year
IEC 61850	Series	Communication networks and systems in substations	EN 61850	Series
IEC 61850-7-4	2010	Communication networks and systems for power utility automation - Part 7-4: Basic communication structure - Compatible logical node classes and data object classes	EN 61850-7-4	2010
IEC 61968	Series	Application integration at electric utilities - System interfaces for distribution management	EN 61968	Series
IEC/TS 61970-2	-	Energy management system application program interface (EMS-API) - Part 2: Glossary	CLC/TS 61970-2	-
ISO 8601	2004	Data elements and interchange formats - Information interchange - Representation of dates and times	-	-

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INTRODUCTION

This standard is one of several parts of the IEC 61970 series which define an application program interface (API) for an energy management system (EMS). This standard was originally based upon the work of the EPRI control center API (CCAPI) research project (RP-3654-1). The principle objectives of the EPRI CCAPI project were to

- reduce the cost and time needed to add new applications to an EMS;
- protect the investment of existing applications or systems that are working effectively with an EMS.

The principal objective of the IEC 61970 series of standards is to produce standards which facilitate the integration of EMS applications developed independently by different vendors, between entire EMS systems developed independently, or between an EMS system and other systems concerned with different aspects of power system operations, such as generation or distribution management systems (DMS). This is accomplished by defining application program interfaces to enable these applications or systems access to public data and exchange information independent of how such information is represented internally.

The common information model (CIM) specifies the semantics for this API. The component interface specifications (CIS), which are contained in other parts of the IEC 61970 standards, specify the content of the messages exchanged.

The CIM is an abstract model that represents all the major objects in an electric utility enterprise typically needed to model the operational aspects of a utility. This model includes public classes and attributes for these objects, as well as the relationships between them.

The objects represented in the CIM are abstract in nature and may be used in a wide variety of applications. The use of the CIM goes far beyond its application in an EMS. This standard should be understood as a tool to enable integration in any domain where a common power system model is needed to facilitate interoperability and plug compatibility between applications and systems independent of any particular implementation.

This standard defines the CIM base set of packages which provide a logical view of the functional aspects of an energy management system including SCADA. Other functional areas are standardized in separate IEC documents that augment and reference this base CIM standard. For example, IEC 61968-11 addresses distribution models and references this base CIM standard. While there are multiple IEC standards dealing with different parts of the CIM, there is a single, unified normalized information model comprising the CIM behind all these individual standard documents.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning a computer-based implementation of an object-oriented power system model in a relational database. As such, it does not conflict with the development of any logical power system model including the common information model (CIM), where implementation of the model is not defined.

The IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences free of charge with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

ICL
Wenlock Way
West Gorton
Manchester
M12 5DR
Royaume-Uni (U.K.)

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

ISO (www.iso.org/patents) and IEC (http://www.iec.ch/tctools/patent_decl.htm) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

ENERGY MANAGEMENT SYSTEM APPLICATION PROGRAM INTERFACE (EMS-API) –

Part 301: Common information model (CIM) base

1 Scope

This part of IEC 61970 deals with the common information model (CIM), an abstract model that represents all the major objects in an electric utility enterprise typically involved in utility operations.

The object classes represented in the CIM are abstract in nature and may be used in a wide variety of applications. The use of the CIM goes far beyond its application in an EMS. This standard should be understood as a tool to enable integration in any domain where a common power system model is needed to facilitate interoperability and plug compatibility between applications and systems independent of any particular implementation.

By providing a standard way of representing power system resources as object classes and attributes, along with their relationships, the CIM facilitates the integration of energy management system (EMS) applications developed independently by different vendors, between entire EMS systems developed independently, or between an EMS system and other systems concerned with different aspects of power system operations, such as generation or distribution management. SCADA (supervisory control and data acquisition) is modeled to the extent necessary to support power system simulation and inter-control center communication. The CIM facilitates integration by defining a common language (i.e., semantics and syntax) based on the CIM to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

Due to the size of the complete CIM, the object classes contained in the CIM are grouped into a number of logical packages, each of which represents a certain part of the overall power system being modeled. Collections of these packages are progressed as separate International Standards. This particular International Standard specifies a base set of packages which provide a logical view of the functional aspects of energy management system (EMS) information within the electric utility enterprise that is shared between all applications. Other standards specify more specific parts of the model that are needed by only certain applications. Subclause 4.2 provides the current grouping of packages into standard documents.

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 61850 (all parts), *Communication networks and systems in substations*

IEC 61850-7-4:2010, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

IEC 61968 (all parts), *Application integration at electric utilities – System interfaces for distribution management*

IEC 61970-2, *Energy management system application program interface (EMS-API) – Glossary*

ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times*