
Aplikacijski programski vmesnik za sistem upravljanja z energijo (EMS-API) - 402.
del: Skupne storitve (IEC 61970-402:2008)

Energy management system application program interface (EMS-API) -- Part 402:
Common services

Schnittstelle für Anwendungsprogramme für Netzführungssysteme (EMS-API) - Teil 402:
Allgemeine Dienste

Interface de programmation d'application pour systèmes de gestion d'énergie (EMS-API)
- Partie 402: Services communs

iTeh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>

Ta slovenski standard je istoveten z: EN 61970-402:2008

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST EN 61970-402:2008

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61970-402:2008

<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61970-402

August 2008

ICS 33.200

English version

**Energy management system application program interface (EMS-API) -
Part 402: Common services
(IEC 61970-402:2008)**

Interface de programmation d'application
pour systèmes de gestion d'énergie
(EMS-API) -
Partie 402: Services communs
(CEI 61970-402:2008)

Schnittstelle für Anwendungsprogramme
für Netzführungssysteme (EMS-API) -
Teil 402: Allgemeine Dienste
(IEC 61970-402:2008)

iTeh STANDARD PREVIEW

This European Standard was approved by CENELEC on 2008-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 57/928/FDIS, future edition 1 of IEC 61970-402, prepared by IEC TC 57, Power systems management and associated information exchange, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61970-402 on 2008-07-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2009-04-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-07-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61970-402:2008 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 61850-7-2	NOTE Harmonized as EN 61850-7-2:2003 (not modified).
IEC 61968	NOTE Harmonized in EN 61968 series (not modified).
IEC 61968-1	NOTE Harmonized as EN 61968-1:2004 (not modified).
IEC 61968-3	NOTE Harmonized as EN 61968-3:2004 (not modified).
IEC 61970-301	NOTE Harmonized as EN 61970-301:2004 (not modified).

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61970-1	- ¹⁾	Energy management system application program interface (EMS-API) - Part 1: Guidelines and general requirements	EN 61970-1	2006 ²⁾
IEC/TS 61970-2	- ¹⁾	Energy management system application program interface (EMS-API) - Part 2: Glossary	CLC/TS 61970-2	2005 ²⁾
IEC/TS 61970-401	- ¹⁾	Energy management system application program interface (EMS-API) - Part 401: Component interface specification (CIS) framework	-	-
IEC 61970-403	- ¹⁾	Energy management system application program interface (EMS-API) - Part 403: Generic data access	EN 61970-403	2008 ²⁾
IEC 61970-404	- ¹⁾	Energy management system application program interface (EMS-API) - Part 404: High Speed Data Access (HSDA)	EN 61970-404	2007 ²⁾
IEC 61970-405	- ¹⁾	Energy management system application program interface (EMS-API) - Part 405: Generic Eventing and Subscription (GES)	EN 61970-405	2007 ²⁾
IEC 61970-407	- ¹⁾	Energy management system application program interface (EMS-API) - Part 407: Time Series Data Access (TSDA)	EN 61970-407	2007 ²⁾
OMG DAF	2002	Utility Management System (UMS) Data Access Facility (DAF)	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61970-402:2008

<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>



IEC 61970-402

Edition 1.0 2008-06

INTERNATIONAL STANDARD

**Energy management system application program interface (EMS-API) –
Part 402: Common services**

STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 61970-402:2008
<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

W

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	8
3 Terms and definitions	8
4 Background	8
5 Common services identifiers (normative).....	9
5.1 DAF resource identifiers interface	9
5.2 Extended resource ID service	10
5.2.1 General	10
5.2.2 get_uris().....	11
5.2.3 set_uris().....	11
5.2.4 create_resource_ids().....	12
6 Common services descriptions (normative)	12
7 IECTC 57Views (normative).....	14
7.1 General	14
7.2 IECTC 57View motivations (informative)	14
7.2.1 General	14
7.2.2 Problem example (informative).....	15
7.2.3 IECTC 57View description (normative).....	16
7.2.4 IECTC 57View examples (informative).....	16
7.2.5 Node properties (normative).....	18
7.3 The IECTC 57Physical view (normative).....	18
7.3.1 General	18
7.3.2 IECTC 57Physical view hierarchy	19
7.4 The IECTC 57Eventing View (normative)	21
7.4.1 General	21
7.4.2 IECTC 57EventingView properties.....	21
8 Context support (normative).....	22
Annex A (informative) TC 57 Views discussion	23
Annex B (informative) Proxy architecture	28
Annex C (informative) The IEC 61970 services and mapping IEC 61968 verbs.....	29
Bibliography	36
Figure 1 – DAF resource identifiers model.....	9
Figure 2 – GDA extended resource identifiers model	11
Figure 3 – Resource descriptions	12
Figure 4 – Resource descriptions:SimpleValue	13
Figure 5 – Fictitious information model	15
Figure 6 – Fictitious populated model displayed in tree	15
Figure 7 – IECTC 57Views	16
Figure 8 – Example TC 57 PhysicalView (informative)	17
Figure 9 – Example IECTC 57EventingView (informative)	17

Figure A.1 – Non-CIM-compliant example of a full mesh network of object classes and instances	23
Figure A.2 – Non-CIM-compliant example of traditional view of utility data	24
Figure A.3 – Non-CIM-compliant example of customer data within a network view	24
Figure A.4 – Non-CIM-compliant example of a full mesh view	25
Figure A.5 – Subscribing to data using share path information	26
Figure A.6 – TC 57 View used as a subscription topic tree	27
Table 1 – DAF resource identifiers operations	10
Table 2 – GDA extended resource identifiers operations	11
Table 3 – DAF resource description iterator	13
Table 4 – Format of view version	18
Table 5 – First level associations used in the TC 57PhysicalView	19
Table 6 – Second level associations used in the TC 57PhysicalView	19
Table 7 – Third level associations used in the TC 57PhysicalView	20
Table 8 – Fourth level associations used in the TC 57PhysicalView	20
Table 9 – Fifth level associations used in the TC 57PhysicalView	20
Table 10 – Format of TC 57PhysicalView properties	21
Table 11 – Format of TC 57EventingView properties	22
Table C.1 – Mapping IEC 61968 verbs to IEC 61970 services	31

SIST EN 61970-402:2008

<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 402: Common services

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
<https://standards.iteh.ai/catalog/standards/sist/091eda8-9078-4ff7-a715-6b49110c281c/sist-en-61970-402-2008>
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61970-402 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

FDIS	Report on voting
57/928/FDIS	57/947/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.

A list of all parts of the IEC 61970 series, under the general title *Energy management system application program interface (EMS-API)*, can be found on the IEC website.

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

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

A bilingual version of this publication may be issued at a later date.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN 61970-402:2008

<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>

INTRODUCTION

This standard is one of the IEC 61970 series parts that define an application program interface (API) for utility operational systems. This standard is based upon the work of the Electric Power Research Institute (EPRI) Control Center API (CCAPI) research project (RP-3654-1).

The IEC 61970-4xx series specifies a set of interfaces that a component (or application) should implement to be able to exchange information with other components and/or access publicly available data in a standard way. The IEC 61970-4xx series component interfaces describe the specific event types and message contents that can be used by applications independent of any particular component technology. The implementation of these messages using a particular component technology is described in the IEC 61970-5xx series of documents. Thus, IEC 61970-4xx documents describe a Platform Independent Model (PIM), while IEC 61970-5xx documents describe a Platform Specific Model (PSM).

IEC 61970-402 contains API services that are considered to be foundational. As such, all the other parts in the IEC 61970-4xx series assume their existence. As a result, the services described in IEC 61970-402 are required for any component that complies with the IEC 61970-4xx series.

The component interface specifications refer to entity objects for the power system domain that are defined in the IEC 61970-3xx series: Common Information Model (CIM).

This standard contains normative and informative text. Clauses are marked as normative or informative. A subclause inherits its parent clause's label unless overridden by the lower level subclause label.

(standards.iteh.ai)

SIST EN 61970-402:2008

<https://standards.iteh.ai/catalog/standards/sist/0f91eda8-9078-4ff7-a715-fcb49d278d2f/sist-en-61970-402-2008>

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

Part 402: Common services

1 Scope

This International Standard provides the base functionality considered necessary and common that is provided by neither the normative standards incorporated by reference nor the new APIs specified in the IEC 61970-403 to IEC 61970-449 ¹⁾ generic interface standards. An application is expected to use the Common Services in conjunction with the generic interfaces. These application category independent interfaces include:

- IEC 61970-403: Generic Data Access (GDA)
- IEC 61970-404: High Speed Data Access (HSDA)
- IEC 61970-405: Generic Eventing and Subscription (GES)
- IEC 61970-407: Time Series Data Access (TSDA)

To support these objectives, the Common Services are divided into three categories:

- a) Resource Identifiers – A common way of identifying classes, class attributes, and object instances.
- b) Resource Description – A common way of encoding values associated with classes, class attributes, and object instances.
- c) Views – A common way of presenting classes, class attributes, and object instances via hierarchies.

IEC 61970-402 contains API services that are considered to be foundational. As such, all the other parts in the IEC 61970-4xx series assume their existence. As a result, the services described in IEC 61970-402 are required for any component that complies with the IEC 61970-4xx series of standards.

Though the target of this IEC standard includes the control center technical domain, common services encompass a general set of concepts that can be applied to many types of systems. Examples of these systems include:

- Distribution management systems
- Work or asset management systems
- Geographic information systems
- Outage management systems
- Other types of operational business systems.

In recognition that the integration between applications in two or more of these systems is often necessary, the intent of this specification is to address general common service requirements to the extent that they are common to different types of systems while effectively addressing the control center needs.

¹⁾ At this time, only parts 402 to 408 exist. Additional generic services beyond are not yet under consideration.