

# **Energy management system application program interface (EMS-API) -- Part 405: Generic Eventing and Subscription (GES)**

Energy management system application program  
interface (EMS-API) -- Part 405: Generic Eventing  
and Subscription (GES)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 61970-405:2007 sisaldab Euroopa standardi EN 61970-405:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 61970-405:2007 consists of the English text of the European standard EN 61970-405:2007.</p> <p>This document is endorsed on 23.11.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>The IEC 61970-405 Generic Eventing and Subscription (GES) specification specifies a generalized interface for efficient exchange of messages. The specification takes into account the latencies caused by a Local Area Network (LAN) providing efficient data exchange also over Local Area Networks. The Generic Eventing and Subscription (GES) API is expected to provide one of the primary means for accomplishing application integration. Beyond the scope of the GES API, other APIs address the high performance, real-time interactive needs of an application within a running system as well as request/reply oriented generic data access. IEC 61970-405 is derived from the Object Management Group (OMG) Data Acquisition from Industrial Systems section Alarms and Events (DAIS A&amp;E) specification. OMG DAIS A&amp;E relies on the OMG Data Access Facility (DAF) and OPC Alarms and Events (A&amp;E) specifications. OMG DAIS A&amp;E is a Platform Specific Model (PSM) with CORBA as the platform and OPC A&amp;E is a PSM with Microsoft COM as the platform. Implementers wanting an introduction to OMG DAIS A&amp;E and OPC A&amp;E shall read these documents.</p>	<p><b>Scope:</b></p> <p>The IEC 61970-405 Generic Eventing and Subscription (GES) specification specifies a generalized interface for efficient exchange of messages. The specification takes into account the latencies caused by a Local Area Network (LAN) providing efficient data exchange also over Local Area Networks. The Generic Eventing and Subscription (GES) API is expected to provide one of the primary means for accomplishing application integration. Beyond the scope of the GES API, other APIs address the high performance, real-time interactive needs of an application within a running system as well as request/reply oriented generic data access. IEC 61970-405 is derived from the Object Management Group (OMG) Data Acquisition from Industrial Systems section Alarms and Events (DAIS A&amp;E) specification. OMG DAIS A&amp;E relies on the OMG Data Access Facility (DAF) and OPC Alarms and Events (A&amp;E) specifications. OMG DAIS A&amp;E is a Platform Specific Model (PSM) with CORBA as the platform and OPC A&amp;E is a PSM with Microsoft COM as the platform. Implementers wanting an introduction to OMG DAIS A&amp;E and OPC A&amp;E shall read these documents.</p>
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**Energy management system application program interface (EMS-API) -  
Part 405: Generic Eventing and Subscription (GES)**  
(IEC 61970-405:2007)

Interface de programmation d'application  
pour système de gestion d'énergie  
(EMS-API) -  
Partie 405: Événements génériques  
et souscriptions (GES)  
(CEI 61970-405:2007)

Schnittstelle für Anwendungsprogramme  
für Energiemanagementsysteme  
(EMS-API) -  
Teil 405: Übermitteln  
von Ereignismeldungen (GES)  
(IEC 61970-405:2007)

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

## Foreword

The text of document 57/888/FDIS, future edition 1 of IEC 61970-405, 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 61970-405 on 2007-09-01.

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) 2008-06-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2010-09-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 61970-405:2007 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 61968-1	NOTE	Harmonized as EN 61968-1:2004 (not modified).
IEC 61968-3	NOTE	Harmonized as EN 61968-3:2004 (not modified).

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## 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	2005	Energy management system application program interface (EMS-API) - Part 1: Guidelines and general requirements	EN 61970-1	2006
IEC/TS 61970-2	– <sup>1)</sup>	Energy management system application program interface (EMS-API) - Part 2: Glossary	CLC/TS 61970-2	2005 <sup>2)</sup>
IEC 61970-301	2003	Energy management system application program interface (EMS-API) - Part 301: Common Information Model (CIM) Base	EN 61970-301	2004
IEC/TS 61970-401	– <sup>1)</sup>	Energy management system application program interface (EMS-API) - Part 401: Component interface specification (CIS) framework	–	–
IEC 61970-402	– <sup>3)</sup>	Energy management system application program interface (EMS-API) - Part 402: Component Interface Specification (CIS) - Common services	–	–
OMG DAIS A&E	2005	Data Acquisition from Industrial Systems section Alarms and Events (DAIS A&E)	–	–
OMG DAF	2005	Utility Management System (UMS) Data Access Facility (DAF)	–	–
OPC A&E	2002	OPC Alarms and Events Specification	–	–

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

<sup>3)</sup> At draft stage.

# INTERNATIONAL STANDARD

**Energy management system application program interface (EMS-API) –  
Part 405: Generic Eventing and Subscription (GES)**



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IEC 61970-405

Edition 1.0 2007-08

# INTERNATIONAL STANDARD

**Energy management system application program interface (EMS-API) –  
Part 405: Generic Eventing and Subscription (GES)**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE

U

ICS 33.200

ISBN 2-8318-9252-X



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

### Part 405: Generic Eventing and Subscription (GES)

#### 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.
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International Standard IEC 61970-405 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
57/888/FDIS	57/907/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.

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.

## INTRODUCTION

This part of IEC 61970 is part of the IEC 61970 series that defines Application Program Interfaces (APIs) for an Energy Management System (EMS). The IEC 61970-4XX and IEC 61970-5XX series documents comprise Component Interface Specifications (CISs). The IEC 61970-4XX series CIS are specified as Platform Independent Models (PIMs), which means they are independent of the underlying technology used to implement them. PIM specifications are also referred to as Level 1 specifications. The IEC 61970-5XX series CIS, on the other hand, are specified as Platform Specific Models (PSMs). PSM specifications are also referred to as Level 2 specifications.

IEC 61970-4XX CISs specify the functional requirements for interfaces that a component (or application) should implement to exchange information with other components (or applications) and/or to access publicly available data in a standard way. The component interfaces describe the specific event types and message contents that can be used by applications for this purpose.

IEC 61970-405 specifies an interface for the efficient transfer of event messages and alarm acknowledge messages in a distributed environment. Small numbers of messages are transferred with short delay but also large amounts are transferred in short time but with possibly longer delay. This is a typical requirement for a SCADA system that acts as a real time data provider to other sub-systems. Other systems than SCADA may also benefit from the characteristics of Generic Eventing and Subscription (GES) interface. When short delay times as well as bulk message transfer is required, GES is a good fit.

The component interface specifications refer to entity objects for the power system domain that is defined in the IEC 61970-3XX series, including IEC 61970-301.

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

### Part 405: Generic Eventing and Subscription (GES)

#### 1 Scope

The IEC 61970-405 Generic Eventing and Subscription (GES) specification specifies a generalized interface for efficient exchange of messages. The specification takes into account the latencies caused by a Local Area Network (LAN) providing efficient data exchange also over Local Area Networks. The Generic Eventing and Subscription (GES) API is expected to provide one of the primary means for accomplishing application integration. Beyond the scope of the GES API, other APIs address the high performance, real-time interactive needs of an application within a running system as well as request/reply oriented generic data access.

IEC 61970-405 is derived from the Object Management Group (OMG) Data Acquisition from Industrial Systems section Alarms and Events (DAIS A&E) specification. OMG DAIS A&E relies on the OMG Data Access Facility (DAF) and OPC Alarms and Events (A&E) specifications. OMG DAIS A&E is a Platform Specific Model (PSM) with CORBA as the platform and OPC A&E is a PSM with Microsoft COM as the platform. Implementers wanting an introduction to OMG DAIS A&E and OPC A&E shall read these documents.

The GES interface is intended to interoperate with other IEC 61970 based interfaces. Hence it is possible to use information retrieved from other interface to access the same information using this interface, for example:

- object identifiers,
- attribute names or identifiers,
- class names or identifiers.

The way data is organized in a server implementing the GES interface can be seen by using the browse interfaces for data and meta data. It is also possible to use the data access interface directly without using the browse interfaces if the client has an *a priori* knowledge of object, class and attribute identifiers. Object identifiers may be retrieved using data from other interfaces, for example a CIMXML file or the IEC 61970-404 interface. Information on what classes and attributes are available will be described in IEC 61970-45X documents.

IEC 61970-405 describes the functionality in a technology independent way, it is a Platform Independent Specification (PIM). Hence, it explains the functionality to a level that can be used to create PSMs or be an introduction to existing PSMs, i.e. DAIS A&E and OPC A&E. Implementers wanting an introduction to OMG DAIS A&E and OPC A&E should read these documents.

IEC 61970-405 consists of two parts:

- SCADA alarms and events that is the Platform Independent Specification (PIM) derived from DAIS A&E and OPC A&E. This part is called “Generic Eventing and Subscription Alarms and Events” (GES A&E).
- Generic messaging that is a generalization of the SCADA alarms and events. This part is just called “Generic Eventing and Subscription” (GES).

IEC 61970-1 provides the EMS-API reference model upon which this standard is based. In that reference model, the terminology used in this part of IEC 61970 is introduced and the role of the CIS is explained.

IEC 61970-401 provides an overview and framework for the CIS (IEC 61970-4XX) standards. IEC 61970-402 provides the base services to be used in conjunction with other IEC 61970-4XX documents. This specification extends the Common Services to provide an event subscription oriented mechanism for applications to exchange CIM data.

The mapping of IEC 61970-405 to implementation specific technologies or Platform Specific Models (PSMs) is further described in a separate series of documents, i.e. the future IEC 61970-5XX. For actual implementations, the future IEC 61970-5XX, OMG DAIS A&E, OMG DAF or OPC A&E are used.

## 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 61970-1:2005, *Energy management system application program interface (EMS-API) – Part 1: Guidelines and general requirements*

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

IEC 61970-301:2005, *Energy management system application program interface (EMS-API) – Part 301: Common Information Model (CIM) base*

IEC 61970-401, *Energy management system application program interface (EMS-API) – Part 401: Component Interface Specification (CIS) Framework*

IEC 61970-402, *Energy management system application program interface (EMS-API) – Part 402: Component Interface Specification (CIS) – Common Services*

*Data Acquisition from Industrial Systems section Alarms and Events (DAIS A&E)*, OMG Adopted Specification Version 1.1, formal/2005-06-01 June 2005 (Referred herein as 'OMG DAIS A&E')

*Utility Management System (UMS) Data Access Facility (DAF)*, OMG Adopted Specification, Version 2.0.1, formal/05-06-03, July 2005 (Referred to herein as 'OMG DAF')

*OPC Alarms and Events Specification*, Version 1.10, OPC Foundation, October 2002 (Referred to herein as 'OPC A&E')

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC/TS 61970-2 apply.

NOTE Refer to International Electrotechnical Vocabulary, IEC 60050, for general glossary definitions.

## 4 Generic Eventing and Subscription (Normative)

### 4.1 Overview

#### 4.1.1 General

Figure 1 illustrates the interaction between a Generic Eventing and Subscription Alarms and Events (GES A&E) client and server. A subscription means that the server has no *a priori*