EESTI STANDARD **EVS-EN 61970-404:2007**

Energy management system application program interface (EMS-API) -- Part 404: High Speed Data Access (HSDA)

Energy management system application program interface (EMS-API) -- Part 404: High Speed Data Access (HSDA)

EVS **EESTI STANDARDIKESKUS**

EESTI STANDARDI EESSÕNA   **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 61970-404:2007 sisaldab Euroopa standardi EN 61970-404:2007 ingliskeelset teksti.	This Estonian standard EVS-EN 61970-404:2007 consists of the English text of the European standard EN 61970-404:2007.
Käesolev dokument on jõustatud 23.11.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.	This document is endorsed on 23.11.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

Käsitlusala:	**Scope:**
The IEC 61970-404 High Speed Data Access (HSDA) specification specifies a generalized interface for efficient exchange of data. The specification takes into account the latencies caused by a Local Area Network (LAN) providing efficient data exchange also over Local Area Networks. IEC 61970-404 is derived from the Object Management Group (OMG) Data Acquisition from Industrial Systems section Data Access (DAIS DA) specification. OMG DAIS DA relies on the OMG Data Access Facility (DAF) and OPC Data Access (DA) specifications. OMG DAIS DA is a Platform Specific Model (PSM) with CORBA as the platform and OPC DA is a PSM with Microsoft COM as the platform. IEC 61970-404 describes the functionality of these PSMs in a technology independent way (i.e., as a Platform Independent Model (PIM)). Hence it explains the functionality to a level that can be used to create additional PSMs or act as an introduction to existing PSMs, i.e. DAIS DA and OPC DA. Implementers wanting an introduction to OMG DAIS DA and OPC DA shall read these documents.	The IEC 61970-404 High Speed Data Access (HSDA) specification specifies a generalized interface for efficient exchange of data. The specification takes into account the latencies caused by a Local Area Network (LAN) providing efficient data exchange also over Local Area Networks. IEC 61970-404 is derived from the Object Management Group (OMG) Data Acquisition from Industrial Systems section Data Access (DAIS DA) specification. OMG DAIS DA relies on the OMG Data Access Facility (DAF) and OPC Data Access (DA) specifications. OMG DAIS DA is a Platform Specific Model (PSM) with CORBA as the platform and OPC DA is a PSM with Microsoft COM as the platform. IEC 61970-404 describes the functionality of these PSMs in a technology independent way (i.e., as a Platform Independent Model (PIM)). Hence it explains the functionality to a level that can be used to create additional PSMs or act as an introduction to existing PSMs, i.e. DAIS DA and OPC DA. Implementers wanting an introduction to OMG DAIS DA and OPC DA shall read these documents.

ICS 33.200

Võtmesõnad:

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61970-404

September 2007

English version

Energy management system application program interface (EMS-API) - Part 404: High Speed Data Access (HSDA)
(IEC 61970-404:2007)

Interface de programmation d'application
pour système de gestion d'énergie
(EMS-API) -
Partie 404: Accès aux données
haute vitesse (HSDA)
(CEI 61970-404:2007)

Schnittstelle für Anwendungsprogramme
für Energiemanagementsysteme
(EMS-API) -
Teil 404: Hochgeschwindigkeitsdatenzugang
(HSDA)
(IEC 61970-404:2007)

This European Standard was approved by CENELEC on 2007-09-01. 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.

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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

Ref. No. EN 61970-404:2007 E

Foreword

The text of document 57/887/FDIS, future edition 1 of IEC 61970-404, 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 61970-404 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 61970-404:2007 was approved by CENELEC as a European Standard without any modification.

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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.

Publication	Year	Title	EN/HD	Year
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 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	– [1]	Energy management system application program interface (EMS-API) - Part 401: Component interface specification (CIS) framework	–	–
IEC 61970-402	– [3]	Energy management system application program interface (EMS-API) - Part 402: Component Interface Specification (CIS) - Common services	–	–
OMG DAIS DA	2005	Data Acquisition from Industrial Systems section Data Access (DAIS DA)	–	–
OMG DAF	2005	Utility Management System (UMS) Data Access Facility (DAF)	–	–
OPC DA	2000	OPC Data Access Custom Interface Specification	–	–

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[1] Undated reference.

[2] Valid edition at date of issue.

[3] At draft stage.

![IEC logo]

IEC 61970-404

INTERNATIONAL
STANDARD

**Energy management system application program interface (EMS-API) –
Part 404: High Speed Data Access (HSDA)**

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IEC 61970-404

INTERNATIONAL STANDARD

**Energy management system application program interface (EMS-API) –
Part 404: High Speed Data Access (HSDA)**

INTERNATIONAL
ELECTROTECHNICAL
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PRICE CODE **S**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION
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**ENERGY MANAGEMENT SYSTEM
APPLICATION PROGRAM INTERFACE (EMS-API) –**

Part 404: High Speed Data Access (HSDA)

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 61970-404 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
57/887/FDIS	57/906/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 61970-404 specifies an interface for the efficient transfer of data in a distributed environment. Small amounts of data are transferred with short delay but also large amounts of data 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 HSDA. When short delay times as well as bulk data transfer is required, HSDA is a good fit.

These 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 404: High Speed Data Access (HSDA)

1 Scope

The IEC 61970-404 High Speed Data Access (HSDA) specification specifies a generalized interface for efficient exchange of data. The specification takes into account the latencies caused by a Local Area Network (LAN) providing efficient data exchange also over Local Area Networks.

IEC 61970-404 is derived from the Object Management Group (OMG) Data Acquisition from Industrial Systems section Data Access (DAIS DA) specification. OMG DAIS DA relies on the OMG Data Access Facility (DAF) and OPC Data Access (DA) specifications. OMG DAIS DA is a Platform Specific Model (PSM) with CORBA as the platform and OPC DA is a PSM with Microsoft COM as the platform. IEC 61970-404 describes the functionality of these PSMs in a technology independent way (i.e., as a Platform Independent Model (PIM)). Hence it explains the functionality to a level that can be used to create additional PSMs or act as an introduction to existing PSMs, i.e. DAIS DA and OPC DA. Implementers wanting an introduction to OMG DAIS DA and OPC DA shall read these documents.

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

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

Subclause 4.6 provides a generic mapping for the CIM classes and attributes.

The way data is organized in a server implementing the HSDA 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 61970-403 interface. Information on what classes and attributes are available will be described in IEC 61970-45X documents, for example SCADA data, State Estimator results etc.

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.

The mapping of IEC 61970-404 to implementation specific technologies or 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 DA, OMG DAF or OPC DA 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, *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 Data Access (DAIS DA), OMG Adopted Specification Version 1.1, formal/05-06-01 June 2005 (Referred herein as 'OMG DAIS DA')

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 Data Access Custom Interface Specification, Version 2.05, OPC file: opcda205_cust.doc, OPC Foundation, December 17, 2000 (Referred to herein as 'OPC DA')

3 Terms, definitions and identification conventions

3.1 Terms and definitions

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

3.2 Conventions

A convention used in this document to uniquely identify a UML attribute is to concatenate the class name and the attribute name with a period in between, for example, the attribute "id" in the class "Node" will then be named "Node.id". For attributes in sub structures multiple attribute names may be used, for example "Item.id.node_id" where the "node_id" is a part in the structure "Item.id".

4 CIS Specification

4.1 Background (informative)

For historical reasons, control systems for different industrial processes have evolved along different lines. Control systems for power systems have evolved on a UNIX base and control systems for most other industrial processes have evolved on a Windows base. For Windows based control systems, OPC has become the dominating standard. For UNIX based systems, the DAIS API defined in Common Object Request Broker Architecture (CORBA) Interface Definition Language (IDL) has been developed. DAIS is based on OPC to benefit from the success of OPC and enable easy bridging to OPC. With this intent Object Management Group (OMG) started in 1997 to develop a CORBA based interface with the same functionality as