SVENSK STANDARD

SS-EN IEC 62714-2, utg 2:2023

Fastställd	Sida	Ansvarig kommitté
2023-06-29	1 (61)	SEK TK 65

Dataformat för utbyte av konfigurationsdata för industriella automationssystem (AutomationML) – Del 2: Semantiska bibliotek

Engineering data exchange format for use in industrial automation systems engineering – Automation markup language – Part 2: Semantics libraries

Som svensk standard gäller europastandarden EN IEC 62714-2:2022. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62714-2:2022.

Nationellt förord

Europastandarden EN IEC 62714-2:2022

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62714-2, Second edition, 2022 - Engineering data exchange format for use in industrial automation systems engineering – Automation markup language – Part 2: Semantics libraries**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 62714-2, utg 1:2015, gäller ej fr o m 2025-11-24.

ICS 25.040.40; 35.060.00; 35.240.50

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62714-2

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English Version

Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 2: Semantics libraries (IEC 62714-2:2022)

Format d'échange de données technique pour une utilisation dans l'ingénierie des systèmes d'automatisation industrielle - Automation markup language - Partie 2: Bibliothèques de sémantique (IEC 62714-2:2022)

Datenaustauschformat für Planungsdaten industrieller Automatisierungssysteme - Automation markup language - Teil 2: Semantikbibliotheken (IEC 62714-2:2022)

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

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SS-EN IEC 62714-2, utg 2:2023

European foreword

The text of document 65E/871/FDIS, future edition 2 of IEC 62714-2, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62714-2:2022.

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)	2023-08-24
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2025-11-24

This document supersedes EN 62714-2:2015 and all of its amendments and corrigenda (if any).

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

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Endorsement notice

The text of the International Standard IEC 62714-2:2022 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 standard indicated:

IEC 61512-1:1997 NOTE Harmonized as EN 61512-1:1999 (not modified)

IEC 62264-1:2013 NOTE Harmonized as EN 62264-1:2013 (not modified)

IEC 62714-3 NOTE Harmonized as EN 62714-3

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62714-1	2018	Engineering data exchange format for use in industrial automation systems engineering - Automation Markup Language - Part 1: Architecture and general requirements	EN IEC 62714-1	2018
IEC 61360	-	IEC Common Data Dictionary	-	-
IEC 62424	2016	Representation of process control engineering - Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools	EN 62424	2016
Extensible Markup Language (XML) 1.2	2008	W3C Recommendation	-	-

IEC 62714-2

Edition 2.0 2022-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Engineering data exchange format for use in industrial automation systems engineering – Automation markup language – Part 2: Semantics libraries

Format d'échange de données technique pour une utilisation dans l'ingénierie des systèmes d'automatisation industrielle – Automation markup language – Partie 2: Bibliothèques de sémantique

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ENGINEERING DATA EXCHANGE FORMAT FOR USE IN INDUSTRIAL AUTOMATION SYSTEMS ENGINEERING – AUTOMATION MARKUP LANGUAGE –

Part 2: Semantics libraries

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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IEC 62714-2 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This second edition cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) additional explanation about usage of external semantics in AML Attributes;
b) adaption to CAEX V3.0;
c) additional new RoleClasses e.g. for Industrie 4.0.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65E/871/FDIS	65E/889/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62714 series, published under the general title *Engineering data exchange format for use in industrial automation systems engineering – Automation Markup Language*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The data exchange format defined in IEC 62714 (Automation Markup Language, AML) is an XML schema based data format and has been developed in order to support the data exchange between engineering tools in a heterogeneous engineering tool landscape. IEC 62714-1 gives an overview about the format.

The goal of AML is to interconnect engineering tools from the existing heterogeneous tool landscape in their different disciplines, e.g. mechanical plant engineering, electrical design, process engineering, process control engineering, HMI development, PLC programming, robot programming, etc.

AML stores engineering information following the object oriented paradigm and allows modelling of physical and logical plant components as data objects encapsulating different aspects. An object may consist of other sub-objects and may itself be part of a larger composition or aggregation. Typical objects in plant automation comprise information on topology, geometry, kinematics and logic, whereas logic comprises sequencing, behaviour and control.

AML combines existing industry data formats that are designed for the storage and exchange of different aspects of engineering information. These data formats are used on an "as-is" basis within their own specifications and are not branched for AML needs.

The core of AML is the top-level data format CAEX that connects the different data formats. Therefore, AML has an inherent distributed document architecture.

Figure 1 illustrates the basic AML architecture and the distribution of topology, geometry, kinematic and logic information.

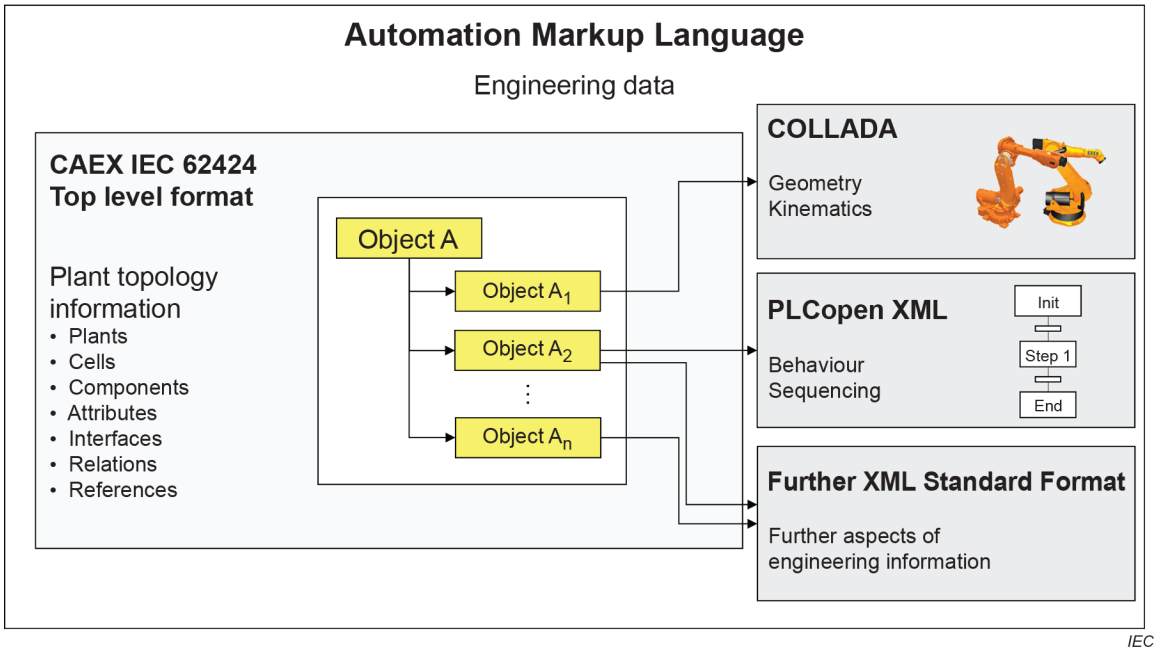

Figure 1 – Overview of the engineering data exchange format (AML)

Due to the different aspects of AML, IEC 62714 (all parts) consists of different parts focusing on different aspects.

- IEC 62714-1: Architecture and general requirements

  This part specifies the general AML architecture, the modelling of engineering data, classes, instances, relations, references, hierarchies, basic AML libraries and extended AML concepts.

- IEC 62714-2: Semantics libraries

  This part specifies AML role class libraries and the usage of AML attributes to represent semantics.

- IEC 62714-3: Geometry and kinematics

  This part specifies the modelling of geometry and kinematics information.

- IEC 62714-4: Logic

  This part specifies the modelling and referencing of logic information.

Further parts may be added in the future in order to interconnect further data standards to AML.

Clause 5 describes normative role class libraries within AML.

Annex A describes the informative AML extended role class library.

Annex B gives an informative example for the usage of AML role classes.

Annex C shows some user-defined role class libraries of different origins.

Annex D gives an informative XML representation of the libraries defined in this part of IEC 62714.

ENGINEERING DATA EXCHANGE FORMAT FOR USE IN INDUSTRIAL AUTOMATION SYSTEMS ENGINEERING – AUTOMATION MARKUP LANGUAGE –

Part 2: Semantics libraries

1 Scope

IEC 62714 (all parts) specifies an engineering data exchange format for use in industrial automation systems.

This part of IEC 62714 specifies normative as well as informative AML libraries for the modelling of engineering information for the exchange between engineering tools in the plant automation area by means of AML. Moreover, it presents additional user-defined libraries as an example. Its provisions apply to the export/import applications of related tools.

This part of IEC 62714 specifies AML role class libraries and the usage of AML attributes to represent semantics. Role classes provide semantics to AML objects, attribute types provide semantics to AML attributes. The association of role classes to AML objects or attribute types to AML attributes represent the possibility to add (also external) semantic information to it. By associating a role class to an AML object or an attribute type to an AML attribute, it gets semantic information. This part of IEC 62714 does not define details of the data exchange procedure or implementation requirements for the import/export tools.

NOTE In the future, it is possible to include AML attribute type libraries in this part of IEC 62714.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 62714-1:2018, *Engineering data exchange format for use in industrial automation systems engineering – Automation Markup Language – Part 1: Architecture and general requirements*

IEC 61360, *IEC Common Data Dictionary* (available at https://cdd.iec.ch/)

IEC 62424:2016 *Representation of process control engineering – Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools*

Extensible Markup Language (XML) 1.0:2008, *W3C Recommendation* (available at http://www.w3.org/TR/2008/REC-xml-20081126/