IEC 62714-2

Edition 2.0 2022-10

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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

IEC 62714-2:2022-10(en-fr)

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

Part 2: Semantics libraries

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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.

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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.

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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.

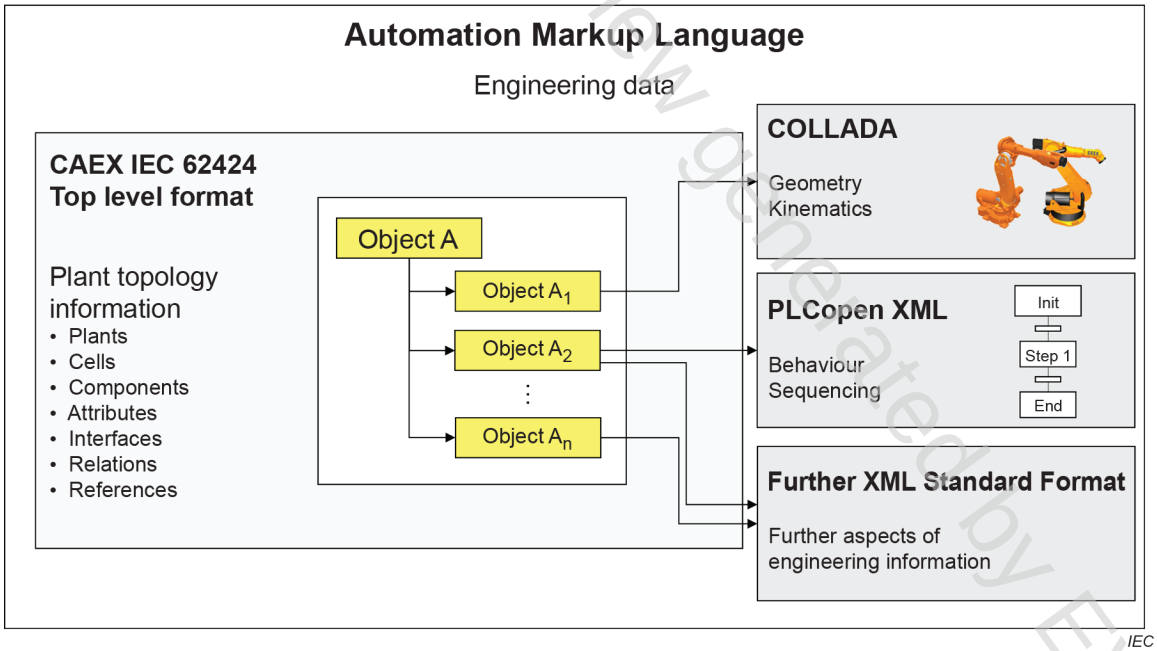

Figure 1 – Overview of the engineering data exchange format (AML)

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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.

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

Part 2: Semantics libraries

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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/

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62714-1:2018 and the following apply.