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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 39003.2-2023

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

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 2 of GB/T 39003 "Engineering Data Exchange Format Automation Markup Language for Industrial Automation System Engineering".

GB/T 39003 has released the following parts.

---Part 1. Architecture and general requirements;

---Part 2. Semantic library;

---Part 3. Geometry and Kinematics.

This document is equivalent to IEC 62714-2:2022 "Engineering Data Exchange Format Automation Markup Language for Industrial Automation System Engineering"

Part 2. Semantics Library".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

GB/T 39003 "Engineering Data Exchange Format Automation Markup Language for Industrial Automation System Engineering" is aimed at the field of automation engineering.

Domain data exchange solution.

The data exchange format (Automated Markup Language, AML) defined in GB/T 39003 (all parts) is an extensible markup-based

Language (XML) schema data format, which is used to support data exchange between heterogeneous engineering tools.

AML aims to establish connections between engineering tools in different fields, such as mechanical equipment engineering, electrical design, process engineering, and process control.

Manufacturing engineering, human-machine interface development, PLC programming and robot programming, etc.

AML follows an object-oriented approach to store engineering information, and allows the use of data objects encapsulating different aspects of content to control the factory.

Physical and logical components are modeled. An object can contain other sub-objects or belong to a larger combination or aggregation. work

A typical object in a factory automation project contains information including topology, geometry, kinematics and logic, and logic covers sequence, behavior and control.

AML integrates existing industrial data formats used to store and exchange engineering signals in different fields. These data formats are based on their respective

The specification is implemented independently and is not a branch of AML.

Since the core of AML is the top-level data format CAEX that connects different data formats, AML has its own distributed file system.

file structure.

Figure 1 describes the basic architecture of AML and the distribution of topological, geometric, kinematic and logical information.

Figure 1 Overview of engineering data exchange format AML

Since AML contains different aspects, GB/T 39003 is planned to be composed of 4 parts focusing on different aspects.

---Part 1.Architecture and general requirements. It is the basis for all other existing and future parts and provides a way to reference other subformats.

Provides a mechanism.

---Part 2.Semantics library. It is intended to give other user-defined libraries, rules based on the architecture and modeling normativeness of Part 1.

Defines the AML role class library for expressing semantics and the usage of AML. Role classes provide semantics, attribute types for AML objects

Provides semantics for AML attributes. The association of a role class with an AML object or an attribute type with an AML attribute represents

Possibility to add (including external) semantic information to it. Semantic information is

obtained by associating role classes with AML object or attribute types

Obtained with AML attributes, an extension of the application in Part 1.

---Part 3.Geometry and Kinematics. AML is intended to be used to exchange engineering within the factory automation area.

Integration of geometric and kinematic information of tools. The standard AML role classes and interface classes defined in this section are from Part 2

Extensions, also part of the AML standard library, are part 1-specific extensions.

---Part 4.Logic. Aims to define 6 sequencing and behavioral logic models (covering different stages of the production system engineering process) to

and how they are integrated into AML. This part, like Part 2 and Part 3, is an extension of the application of Part 1.

Extension.

To tie more data standards to AML, more sections may be added in the future.

Engineering data exchange format for industrial automation system engineering

Automated Markup Language Part 2.Semantics Library

1 Scope

This document specifies a normative and informative AML library for engineering information modeling to be used between engineering tools in the automation area.

AML method for information exchange. Additionally, other user-defined libraries are given in this document as examples. Its terms apply to related work

Tool export/import application.

This document specifies the AML role class library for expressing semantics and the usage of AML. Role classes provide semantics for AML objects, attributes

Sexual types provide semantics for AML attributes. The association of a role class with an AML object or an attribute type with an AML attribute represents the

Its possibility to add (including external) semantic information. Semantic information is obtained by associating role classes with AML objects or attribute types with AML attributes.

Sex to obtain. This document does not define the details of the data exchange process and the requirements for the use of export/import tools.

Note. AML attribute type libraries may be included in this document in the future.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

GB/T 39003.1-2020 Engineering data exchange format automation markup language for industrial automation system engineering Part 1.

Architecture and general requirements (IEC 62714-1.2018, IDT)

IEC 62714-1 Engineering data exchange format automation markup language for industrial automation systems engineering Part 1. Architecture and general requirements

3.1 Terms and definitions

The terms and definitions defined in GB/T 39003.1-2020 and the following apply to this document.

3.1.1

robot robot

Industrial robot

It has automatic control and reprogramming functions, can be programmed on 3 or more axes, can be fixed or mobile, and is used for industrial automation.