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Part 2: Object models and relationships for interfaces between manufacturing operations and business functions

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FOREWORD

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International Standard IEC 62264-2 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control, and automation, and by ISO technical committee 184/SC5: Interoperability, integration and architectures for enterprise systems and automation applications. It is published as a double logo standard.

This document is based upon IEC CD 62264-2 and ANSI/ISA 95.00.02-2018 (ED3), Enterprise-Control System Integration, Part 2: Objects and Attributes for Enterprise-Control System Integration. It is used with the permission of the copyright holder, the Instrumentation, Systems and Automation Society (ISA).

This third edition cancels and replaces the second edition published in 2013. This edition constitutes a technical revision. Due to the extent of the changes and updates, this document cannot ensure backward compatibility to implementations based on older editions. This edition includes the following significant technical changes with respect to the previous edition and ANSI/ISA 95.00.02-2018 (ED3):

a) object models are added for the use of interactive communications to notify subscribers about the occurrence of events and to provide context information about the event, making the information exchange more efficient and consistent. The added object models were the operations event model and operations record model.

b) operations location model and spatial definition attribute added to allow the description of operation locations.

c) operations test model added to define how test specifications and test results are related to testable objects, operations test requirements, actual resource, and work definitions.

d) definition of possible measurement uncertainty sub-attributes for all value, quantity and duration attributes defined in this document.

e) updated hierarchy scope model.

f) removed as separate models in this edition were the models for product definition, production schedule, production performance, and production capability. Their content is covered for all manufacturing operations management categories under operations models.

g) object model was added for the operations segment capability as a collection of resources related to other operations models.

h) updated relationship name and role name conventions established in 3.3.4 and implemented across all models and associated tables.

i) updated all objects' relationship role table with explicit source and target names.

j) updated common header attributes for objects and property objects established in 4.5 and implemented across all models and associated tables.

k) updated explanation of the 'relationships between resource reference objects in operations management information models and resource models. These additional resource relationships are added to all operations management models.

l) added an annex explanation for implementation options for specifying values in unit of measurement attribute.

m) added an annex explanation for implementation considerations for inheritance and persistence of data exchange object models.

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

Draft	Report on voting
65E/1192/FDIS	65E/1200A/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/publications.

The list of all the parts of the IEC 62264 series, under the general title *Enterprise-Control system integration*, 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, or
– revised.

INTRODUCTION

IEC 62264 is a multi-part standard that defines the interface content between enterprise activities and control activities. This part of IEC 62264 further defines formal object models for exchange information described in IEC 62264-1 using UML object models, tables of attributes, and examples. The models and terminology defined in this document:

a) emphasize good integration practices of control systems with enterprise systems during the entire life cycle of the systems;

b) can be used to improve existing integration capability of manufacturing control systems with enterprise systems;

c) can be applied regardless of the degree of automation; and

d) can be used as a basis for new developments in Smart Manufacturing and Industrie 4.0 initiatives.

Specifically, this document provides a standard terminology and a consistent set of concepts and models for integrating control systems with enterprise systems that will improve communications between all parties involved. Benefits produced will:

e) reduce the user’s time to reach full production levels for new products;

f) enable vendors to supply appropriate tools for implementing integration of control systems to enterprise systems;

g) enable users to better identify their needs;

h) reduce the cost of automating manufacturing processes;

i) optimize supply chains; and

j) reduce life-cycle engineering efforts.

This document can be used to reduce the effort associated with implementing new product offerings. The goal is to have enterprise systems and control systems that interoperate and easily integrate.

It is not the intent of the standard to:

k) suggest that there is only one way of implementing integration of control systems to enterprise systems;

l) force users to abandon their current way of handling integration; or

m) restrict development in the area of integration of control systems to enterprise systems.

1 Scope

This part of IEC 62264 specifies interface content exchanged between manufacturing control functions and other enterprise functions as interrelated information models. The information models are represented as an interrelated collection of conceptual object models which can be used for the implementation of applications with logical data and physical data models. The data exchanges in interfaces are scoped as between Level 3 manufacturing operations and Level 4 business systems in the hierarchical model defined in IEC 62264-1. The purpose of this document is to reduce the risk, cost, and errors associated with interface implementation.

Since this document covers many manufacturing operations and enterprise domains and there are many different standards for those domains, the semantics of this data exchange standard are described at a conceptual level intended to enable the other standards to be mapped to these semantics. To this end, this document defines a set of elements contained in the generic interface, together with a mechanism for extending the interface content for implementations.

The scope is limited to the definition of object models and attributes of the exchanged information defined in the IEC 62264-1.

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 62264-1:2013, *Enterprise-control system integration - Part 1: Models and terminology*

IEC 62474, *Material declaration for products of and for the electrotechnical industry*

ISO/IEC 19501, *Information technology - Open Distributed Processing - Unified Modeling Language (UML) Version 1.4.2*

ISO/IEC 19505-1, *Information technology - Object Management Group Unified Modeling Language (OMG UML) - Part 1: Infrastructure*

ISO/IEC 19505-2, *Information technology - Object Management Group Unified Modeling Language (OMG UML) - Part 2: Superstructure*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO/IEC Guide 99:2007, *International vocabulary of metrology - Basic and general concepts and associated terms (VIM)*

ISO 10303-1, *Industrial automation systems and integration - Product data representation and exchange - Part 1: Overview and fundamental principles*

ISO 15000-5, *Electronic Business Extensible Markup Language (ebXML) - Part 5: Core Components Specification (CCS)*

Bibliography

[1] Ambler, Scott W., *The Design of a Robust Persistence Layer For Relational Databases*, June 2005, http://www.ambysoft.com/downloads/persistenceLayer.pdf

[2] American National Standards Institute. 1975. *ANSI/X3/SPARC Study Group on Data Base Management Systems; Interim Report. FDT (Bulletin of ACM SIGMOD) 7:2*

[3] *GPX (GPS Exchange Format) GPX 1.1 schema*, 2004

[4] *GeoJSON 1.0*, 2016

[5] IEC 61512 (all parts), *Batch control*

[6] IEC 62682, *Management of alarm systems for the process industries*

[7] IEC TS 62720, *Identification of units of measurement for computer-based processing*

[8] ISO/IEC 13249-3, *Information technology - Database languages - SQL multimedia and application packages - Part 3: Spatial*

[9] ISO/IEC 14977, *Information technology - Syntactic metalanguage - Extended BNF*

[10] ISO 8601-1, *Date and time - Representations for information interchange - Part 1: Basic rules*

[11] ISO 19136-1, *Geographic information - Geography Markup Language (GML) - Part 1: Fundamentals*

[12] *MIMOSA OSA-EAI CCOM V3.2.3a*, www.mimosa.org

[13] NIST. *Uncertainty of Measurement Results*, http://physics.nist.gov/cuu/Uncertainty/index.html

[14] NIST Technical Note 1297. *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results* (1994), https://www.nist.gov/pml/nist-technical-note-1297

[15] NIST. 1999. *Information Modeling: From Design to Implementation*, Y. Tina Lee (1999), NIST Manufacturing Systems Integration Division

[16] *Open Geospatial Consortium (OGC) KML (formerly Keyhole Markup Language)* Version 2.3, 2015

[17] *SVG (Scalable Vector Graphics) 1.1* (Second Edition) 2011

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