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# **Enterprise-Control System Integration – Part 2: Objects and Attributes for Enterprise-Control System Integration**

**Approved 24 May 2018**

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Enterprise-Control System Integration – Part 2: Objects and Attributes for Enterprise-Control System Integration

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This standard was approved by the ISA Standards and Practices Board on 16 April 2018.

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## FOREWORD

This standard is Part 2 of a series of standards that defines the interfaces between enterprise activities and control activities. It follows ANSI/ISA-95.00.01-2010 (ISA-95.00.01 Mod), Enterprise-Control System Integration – Part 1: Models and Terminology.

The scope of this Part 2 standard is limited to defining the details of the interface content between manufacturing control functions and other enterprise functions. The scope of this Part 2 standard is limited to the definition of object models and attributes for the information defined in Part 1. The goal is to reduce the effort, cost, and errors associated with implementing these interfaces.

This standard may 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.

This standard has been prepared in accordance with the ISO/IEC Directives, Part 2. Therefore, the first three clauses present the scope of the standard, normative references, and definitions, in that order.

Clause 4 is informative. It describes the general information about the object models and examples defined in later clauses.

Clause 5 is normative. It defines the object models, relationships, and attributes of common information defined in Part 1.

Clause 6 is normative. It defines the object models, relationships, and attributes of operations management information defined in Part 1.

Clause 7 is informative. It defines the interrelationships between the object models.

Clause 8 is informative. It lists the objects defined in the standard as an aid to documenting conformance and compliance.

Clause 9 is normative. It defines completeness, conformance, and compliance criteria associated with the objects and attributes.

Annex A is informative. It defines implementation naming convention for object relationships.

Annex B is informative. It defines a value syntax best practice. The format for values in a value attribute of an object is not defined in the standard and are defined by implementations of the standard.

Annex C is informative. It provides examples to illustrate how the models, relationships, and attributes may be used.

Annex D is informative. It illustrates some example data sets for exchange.

Annex E is informative. It contains questions and answers on the use and reason for elements in the standard.

Annex F is informative. It discusses how the standard relates to logical information flows.

Annex G is informative. It discusses how the standard relates to abstract to implementation models.

Annex H is informative. It discusses how the standard relates to abstract to implementation examples.

## INTRODUCTION

This ISA-95 Part 2 standard further defines formal object models for exchange information described in Part 1 using UML object models, tables of attributes, and examples. The models and terminology defined in this standard:

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

Specifically, this standard 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

- a) reduce the user's time to reach full production levels for new products;
- b) enable vendors to supply appropriate tools for implementing integration of control systems to enterprise systems;
- c) enable users to better identify their needs;
- d) reduce the cost of automating manufacturing processes;
- e) optimize supply chains; and
- f) reduce life-cycle engineering efforts.

This standard may 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:

- a) suggest that there is only one way of implementing integration of control systems to enterprise systems;
- b) force users to abandon their current way of handling integration; or
- c) restrict development in the area of integration of control systems to enterprise systems.

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## 1 Scope

This standard specifies conceptual interface content exchanged between manufacturing control functions and other enterprise functions. The interface considered is between Level 3 manufacturing systems and Level 4 business systems in the hierarchical model defined in Part 1 of this standard. The goal is to reduce the risk, cost, and errors associated with implementing the interface.

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

The scope of this standard is limited to the definition of object models and attributes of the exchanged information defined in the Part 1 standard.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, latest edition of referenced document (including any amendments) applies.

ANSI/ISA-95.00.01-2010 (IEC 62264-1 Mod), *Enterprise-Control System Integration – Part 1: Models and terminology*

ANSI/ISA-95.00.03-2013, *Enterprise-Control System Integration – Part 3: Activity models of manufacturing operations management*

ANSI/ISA-95.00.04-2012, *Enterprise-Control System Integration – Part 4: Objects and attributes for manufacturing operations management integration*

ANSI/ISA-95.00.05-2013, *Enterprise-Control System Integration – Part 5: Business-to-manufacturing transactions*

ANSI/ISA-88.00.01-2010, *Batch Control – Part 1: Models and terminology*

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

IEC 61512-1, *Batch control – Part 1: Models and terminology*

ANSI/ISA-18.2-2009, *Management of alarm systems for the process industries*

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

ISO/IEC 19505-1, *Information technology – OMG Unified Modeling Language (OMG UML) Version 2.5 – Part 1: Infrastructure*