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Industrial automation systems and integration — Product data representation and exchange —

Part 1: Overview and fundamental principles

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits —

Partie 1: Aperçu et principes fondamentaux

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

This second edition cancels and replaces the first edition (ISO 10303-1:1994), which has been technically revised.

The main changes compared to the previous edition are as follows:

— inclusion of application interpreted constructs;

— inclusion of application modules;

— inclusion of business object models;

— inclusion of additional implementation methods;

— inclusion of modular architecture as a preferred alternative to the initial architecture of ISO 10303-1:1994;

— permission for integrated resources to reference constructs written using EXPRESS from other International Standards;

— corrections to part numbering scheme;

— extension of information object registration to be usable on other standards;

— inclusion of usage guides;

— additional definitions.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

A list of all parts in the ISO 10303 series can be found on the ISO website.

Introduction

ISO 10303 is an International Standard for the computer-interpretable representation of product information and for the exchange of product data. The objective is to provide a neutral mechanism capable of describing products throughout their life cycle. This mechanism is suitable not only for neutral file exchange, but also as a basis for implementing and sharing product databases, and as a basis for archiving. The information generated about a product during its design, manufacture, use, maintenance, and disposal is used for many purposes. The use can involve many computer systems, including some that can be located in different organizations. In order to support such uses, organizations need to be able to represent their product information in a common computer-interpretable form that is required to remain complete and consistent when exchanged among different computer systems.

This document is an overview of ISO 10303. It specifies the overall scope of ISO 10303 and describes the ISO 10303 architectures and structure. It describes the various series of parts of ISO 10303 and the relationships among them.

ISO 10303 is organized as a series of parts, each published separately. The structure of ISO 10303 is described in this document.

Each part of ISO 10303 is a member of one of the following series: description methods, implementation methods, conformance testing methodology and framework, integrated generic resources, integrated application resources, application protocols, abstract test suites, application interpreted constructs, application modules and business object models.

A list of all parts in the ISO 10303 series is available from the following URL:

http://standards.iso.org/iso/10303/tech/step_titles.htm.

Industrial automation systems and integration — Product data representation and exchange —

Part 1: Overview and fundamental principles

1 Scope

This document provides an overview of ISO 10303.

ISO 10303 provides a representation of product information along with the necessary mechanisms and definitions to enable product data to be exchanged. The exchange is among different computer systems and environments associated with the complete product lifecycle, including product design, manufacture, use, maintenance, and final disposition of the product.

This document defines the basic principles of product information representation and exchange used in ISO 10303. It specifies the characteristics of the various series of parts of ISO 10303 and the relationships among them.

The following are within the scope of this document:

— scope statement for ISO 10303 as a whole;

— overview of ISO 10303;

— architectures of ISO 10303;

— structure of ISO 10303;

— terms and definitions used throughout ISO 10303;

— overview of data specification methods used in ISO 10303;

NOTE This includes the EXPRESS data specification language and graphical presentation of product information models.

— introduction to the series of parts of ISO 10303:

  — integrated resources;

  — application interpreted constructs;

  — application modules;

  — business object models;

  — application protocols;

  — implementation methods;

  — usage guides;

  — conformance testing methodology and framework;

— abstract test suites;

— scheme for identification of schemas and other information objects defined within parts of ISO 10303.

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.

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
abstract test case
ATC
specification, encapsulating at least one test purpose, that provides the formal basis from which executable test cases are derived and that is independent of both the implementation and the values

3.1.2
abstract test method
ATM
description of how an implementation is tested, given at the appropriate level of abstraction to make the description independent of any specific implementation of testing tools or procedures, but with sufficient detail to enable these tools and procedures to be produced

3.1.3
abstract test suite
ATS
part of ISO 10303 that contains the set of abstract test cases necessary for conformance testing of an implementation of an application protocol

3.1.4
agreement of common understanding
result of discussions between the partners of product data exchange or sharing, that ensures that all of them have the same understanding of the transferred or shared information

3.1.5
application
one or more processes creating or using product data

3.1.6
application activity model
AAM
model that describes an application in terms of its processes and information flows

3.1.7
application construct
collection of EXPRESS language entities, types, functions, rules and references that are based on resource constructs and that specialize those resource constructs as necessary to define a valid description of an aspect of product data for specific application areas