
**Industrial automation systems and
integration — Parts library —**

Part 102:

**View exchange protocol by ISO 10303
conforming specification**

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ISO 10303-13584-102:2006*

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 13584-102 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC4, *Industrial data*.

ISO 13584 consists of the following parts under the general title *Industrial automation systems and integration* — *Parts library*:

- Part 1: Overview and fundamental principles;
- Part 20: Logical resource: Logical model of expressions; 2:2006
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- Part 24: Logical resource: Logical model of supplier library; 4-102-2006
- Part 25: Logical resource: Logical model of supplier library with aggregate values and explicit content;
- Part 26: Logical resource: Information supplier identification;
- Part 31: Implementation resources: Geometric programming interface;
- Part 42: Description methodology: Methodology for structuring part families;
- Part 101: Geometrical view exchange protocol by parametric program;
- Part 102: View exchange protocol by ISO 10303 conforming specification;
- Part 501: Reference dictionary for measuring instruments — Registration procedure;
- Part 511: Mechanical systems and components for general use — Reference dictionary for fasteners.

The structure of the ISO 13584 series is described in ISO 13584-1. The numbering of the parts of ISO 13584 reflects its structure:

- Parts 10 to 19 specify the conceptual descriptions,
- Parts 20 to 29 specify the logical resources,

- Parts 30 to 39 specify the implementation resources,
- Parts 40 to 49 specify the description methodology,
- Parts 100 to 199 specify the view exchange protocols,
- Parts 500 to 599 specify reference dictionaries for specific application domains.

Should further parts of ISO 13584 be published, they will follow the same numbering pattern.

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Introduction

ISO 13584 is an International Standard for the computer-interpretable representation and exchange of part library data. The objective is to provide a neutral mechanism capable of transferring parts library data, independent of any application that is using a parts library data system. The nature of this description makes it suitable not only for the exchange of files containing parts, but also as a basis for implementing and sharing databases of parts library data.

ISO 13584 is organized as a series of parts, each published separately. The parts of ISO 13584 fall into one of the following series: conceptual descriptions, logical resources, implementation resources, description methodology, view exchange protocol, and standardized content. The series are described in ISO 13584-1. This part of ISO 13584 is a member of the view exchange protocol series.

A view exchange protocol specifies how a particular representation category of the items described in a parts library may be exchanged in a library exchange context. It defines the identification of the representation category, the means to be used to exchange representations that belong to this representation category, the implementation resources that shall be available on any implementation that claims conformance to this view exchange protocol, and the standard data that shall be recognized by any implementation that claims conformance to this view exchange protocol.

This part of ISO 13584 specifies how representations of the items described in a parts library may be exchanged by means of a representation conforming to one application protocol of ISO 10303 (ISO 10303 parts numbered between 200 and 299).

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Industrial automation systems and integration — Parts library —

Part 102:

View exchange protocol by ISO 10303 conforming specification

1 Scope

This part of ISO 13584 specifies a representation category, called *ISO10303_rep*. This representation category captures the generic concepts used to describe the representation of a product in ISO 10303 application protocols. This representation category may be associated with any of the items defined in a parts library. This part of ISO 13584 also defines how representations that belong to this representation category may be exchanged within a library exchange context by means of ISO 10303 compliant data repositories.

The following are within the scope of this part of ISO 13584:

- the definition of the *ISO10303_rep* representation category, and the mechanisms that are to be used to reference it;
- the properties used to characterize a particular representation within the *ISO10303_rep* representation category;
- the implementation resources to be supported by any implementation that claims conformance to this part of ISO 13584;
- the dictionary entries to be supported by any implementation that claims conformance to this part of ISO 13584;
- the standard data to be recognized by any implementation that claims conformance to this part of ISO 13584.

The following are outside the scope of this part of ISO 13584:

- the structure and exchange format of library delivery files;
- the structure and exchange format of library external files that conform to ISO 10303 application protocols.

NOTE 1 The structure of a library delivery file is defined by a library integrated information model specified in one of the logical resource series parts of ISO 13584.

NOTE 2 The **ISO13584_f_m_iim_schema**, documented in ISO 13584-24:2003, is a library integrated information model that defines the structure of a library delivery file. Such a library delivery file may contain instance values that reference the representation category and/or the library external files defined in this part of ISO 13584.

Annex A, which provides information on document identification, forms an integral part of this part of ISO 13584.

2 Normative references

The following referenced documents are indispensable for the application 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 10303-11:1994, *Industrial automation systems: and integration — Product data representation and exchange — Part 11: Description methods: The EXPRESS language reference manual.*

ISO 10303-21:1994, *Industrial automation systems and integration — Product data representation and exchange — Part 21: Implementation methods: Clear text encoding of the exchange structure .*

ISO 10303-41:2000, *Industrial automation systems and integration — Product data representation and exchange — Part 41: Integrated generic resource: Fundamentals of product description and support.*

ISO 10303-43:2000, *Industrial automation systems and integration — Product data representation and exchange — Part 43. Integrated generic resource: Representation structures.*

ISO 13584-24:2003, *Industrial automation systems and integration — Parts Library — Part 24: Logical resource: Logical model of supplier library*

ISO 13584-42:1998, *Industrial automation systems and integration — Parts Library — Part 42: Description methodology: Methodology for structuring part families*

ISO/IEC 8824-1:2002, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation.*

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3 Terms, definitions, and abbreviations

For the purposes of this document, the following terms and definitions apply. Some of these terms and definitions are repeated for convenience from:

- ISO 10303-1:1994;
- ISO 10303-11:1994;
- ISO 10303-31:1994;
- ISO 13584-1:2001;
- ISO 13584-24:2003;
- ISO 13584-42:1998.

3.1

AP conformance class

subset of an application protocol for which conformance may be claimed
[ISO 10303-1:1994]

3.2**application**

group of one or more processes creating or using product data
[ISO 10303-1:1994]

3.3**application context**

conditions that define the intended use of product data within an application
[ISO 10303-1:1994]

3.4**application programming interface****API**

set of functions that may be triggered by a program
[ISO 13584-24:2003]

3.5**application protocol****AP**

part of ISO 10303 that describes the use of (ISO 10303) integrated resources satisfying the scope and information requirements for a specific application context
[ISO 10303-1:1994]

3.6**basic semantic unit****BSU**

entity that provides an absolute and universally unique identification of certain objects of the application domain (e.g. classes, data element types)
[ISO 13584-42]

3.7**conformance class**

subset of a standard for which conformance may be claimed

[ISO 13584-24:2003]

ISO 13584-102:2006

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3.8**conformance requirement**

precise, text definition of a characteristic required to be present in a conforming implementation
[ISO 10303-1:1994]

3.9**conforming implementation**

implementation which satisfies the conformance requirements defined by one or several conformance classes of a standard
[ISO 13584-24:2003]

3.10**conformity****conformance**

fulfilment by the implementation of all specified requirements
[ISO 10303-31:1994]

3.11**entity (data type) instance**

named unit of data that represents a unit of information within the class defined by an entity, and which is a member of the domain established by an entity data type
[ISO 10303-11:1994]

3.12

functional model of a part

information model of one representation category of a part in an integrated library
[ISO 13584-1:2001]

3.13

functional view of a part

information model of one representation category of a part in product data
[ISO 13584-1:2001]

NOTE The structure of a functional view does not depend on the part it represents.

3.14

implementation method

technique used by computers to exchange data that is described using the EXPRESS data specification language
[ISO 13584-24:2003]

3.15

implementation resources

capabilities of a software system that shall be available to claim conformance to a particular conformance class of a view exchange protocol or both view exchange protocol and library integrated information model
[ISO 13584-24:2003]

3.16

information model

formal model of a set of facts, concepts or instructions to meet a specific requirement
[ISO 10303-1:1994]

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3.17

integrated library

operational system consisting of a library management system and a user library
[ISO 13584-24:2003]

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3.18

library

see: **parts library** (3.25), **supplier library** (3.31), and **user library** (3.32)
[ISO 13584-1:2001]

3.19

library data supplier

organisation that delivers a supplier library in the standard format defined in ISO 13584 and is responsible for its content
[ISO 13584-1:2001]

3.20

library delivery file

population of EXPRESS entity instances conforming to a library integrated information model and represented according to one of the implementation methods specified in ISO 10303
[ISO 13584-24:2003]

NOTE A library delivery file specifies the structure and the content of a supplier library. It can reference library external files.

3.21

library end-user

user of an integrated library.
[ISO 13584-1:2001]

- NOTE The library end-user:
- consults the data contained in the library;
 - selects a given part;
 - requests the transmission of a selected view of this part from the library system

3.22

library exchange context

set of one library delivery file and zero, one or several library external files that represent together a supplier library
[ISO 13584-24:2003]

3.23

library external file

file, referenced from a library delivery file, that contributes to the definition of a supplier library
[ISO 13584-24:2003]

NOTE The structure and the format of a library external file is specified in the library delivery file that references it.

3.24

library integrated information model

LIIM

EXPRESS schema that integrates resource constructs from different EXPRESS schemas in order to represent supplier libraries for the purpose of exchange, and which is associated with conformance requirements
[ISO 13584-24:2003]

NOTE Three library integrated information models are defined in ISO 13584-24 for representing different kinds of supplier libraries.

3.25

parts library

identified set of data, and possibly programs, which can generate information about a set of parts
[ISO 13584-1:2001] <https://standards.iteh.ai/catalog/standards/sist/511b11d1-f520-413a-8397-836b8c28303a/iso-13584-102-2006>

3.26

product

facts, concepts or instructions
[ISO 10303-1:1994]

3.27

reference coordinate system

underlying global rectangular Cartesian coordinate system to which all geometry refers
[ISO 13584-101:2003]

3.28

representation category

abstraction used to distinguish between different user perspectives of a part
[ISO 13584-1:2001]

NOTE In the model defined in this International Standard, this distinction is formally expressed in terms of a view logical name and in terms of the view control variables.

3.29

standard data

requirement on a software system defined by means of EXPRESS entity (data type) instances that are supposed to be recognised by this software system
[ISO 13584-24:2003]

3.30

**Standard for the Exchange of Product model data
STEP**

ISO 10303

3.31

supplier library

set of data, and possibly of programs, for which the supplier is defined and which describes in the standard format defined in ISO 13584 a set of parts and/or a set of representations of parts
[ISO 13584-24:2003]

3.32

user library

information that results from the integration of one or more supplier libraries by the library management system and possibly from a later adaptation performed by the user
[ISO 13584-1:2001]

3.33

view control variable

variable of enumerated type, which can be associated with a view logical name and is intended to further specify the perspective adopted by the user regarding a part (e.g. for geometry: 2D, wire frame, solid)
[ISO 13584-1:2001]

3.34

**view exchange protocol
VEP**

part of ISO 13584 that describes the use of resource constructs and of representation transmission interfaces which satisfy the information requirement for the exchange of one representation category of parts
[ISO 13584-24:2003]

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3.35

view logical name

identifier of a representation category corresponding to a perspective that can be adopted by a user regarding a part (e.g. geometry, inertia, kinematics)
[ISO 13584-1:2001]

4 Identification of the *ISO10303_rep* representation category

4.1 Concepts

When a library item is selected, it is often useful to access the shape of this item. Such a shape is a generic concept that may be captured at various levels of completeness and detail. These levels may be defined independently of the library items by the requirements that are intended to be met by each level.

To address this requirement, this part of ISO 13584 defines:

- the *ISO10303_rep* representation category that enables a product representation defined by ISO 10303 to represent a library item;
- five view control variables that allow ISO 10303 **representation** entities to be referenced.