



BSI Standards Publication

Industrial automation systems and integration — Integration of industrial data for exchange, access and sharing

Part 1: Architecture overview and description

National foreword

This Published Document is the UK implementation of [ISO/TS 18876-1:2003](#).

The UK participation in its preparation was entrusted to Technical Committee AMT/4, Industrial data and manufacturing interfaces.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 22160 2

ICS 25.040.40; 35.240.50

Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 April 2023.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL SPECIFICATION

ISO/TS 18876-1

First edition
2003-11-01

Industrial automation systems and integration — Integration of industrial data for exchange, access and sharing —

Part 1: Architecture overview and description

*Systèmes d'automatisation industrielle et intégration — Intégration
des données industrielles pour l'échange, l'accès et le partage —*

Partie 1: Vue d'ensemble et description de l'architecture



Reference number
ISO/TS 18876-1:2003(E)

AVA Documents
Document Sharing Hub
© ISO 2003



COPYRIGHT PROTECTED DOCUMENT

© ISO 2003, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
0.1 Overview of ISO 18876	v
0.2 Organization of this part of ISO 18876	v
0.3 Target audiences	v
1 Scope	1
2 Normative references	2
3 Terms, definitions, and abbreviations	2
3.1 Terms and definitions	2
3.2 Abbreviations	5
4 Organization of ISO 18876	5
5 Fundamental concepts and assumptions	5
5.1 Integration models	5
5.1.1 Principles	5
5.1.2 Scope and context	7
5.1.3 Integration model concepts	10
5.1.4 A full integration model	10
5.2 Mapping specifications	11
6 Overview of the model integration process	12
7 Integration architecture components	17
8 Data mapping and consolidation	18
9 Relationship to other standards	18
Annex A (normative) Information object registration	19
Bibliography	20

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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 18876-1](#) was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

This International Standard is organized as a series of parts, each published separately. The structure of this International Standard is described in this part of ISO 18876.

Introduction

0.1 Overview of ISO 18876

This International Standard establishes an architecture, a methodology, and other specifications for integrating industrial data for exchange, access, and sharing. It supports:

- data sharing and data integration;
- specification of mappings between models; and
- data transformation.

0.2 Organization of this part of ISO 18876

This part of ISO 18876 is organized as follows:

- [Clause 1](#) specifies the scope and field of application of the International Standard and of this part of ISO 18876;
- [Clause 2](#) identifies additional standards that, through references in this part of ISO 18876, constitute provisions of this part of ISO 18876;
- [Clause 3](#) defines terms and abbreviations used in this part of ISO 18876;
- [Clause 4](#) describes the organization of this International Standard;
- [Clause 5](#) describes the fundamental concepts and assumptions on which this International Standard is based;
- [Clause 6](#) provides an overview of the model integration process;
- [Clause 7](#) identifies some components of the integration architecture;
- [Clause 8](#) provides an overview of the processes of data mapping and consolidation;
- [Clause 9](#) summarizes the relationships with other standards.

0.3 Target audiences

The target audiences for this part of ISO 18876 are as follows:

- technical managers wishing to determine whether ISO 18876 is appropriate for their business needs;
- implementers wishing to obtain an overview of its contents.

This page deliberately left blank

Industrial automation systems and integration — Integration of industrial data for exchange, access and sharing —

Part 1: Architecture overview and description

1 Scope

This Technical Specification establishes an architecture, a methodology, and other specifications for integrating industrial data for exchange, access, and sharing. The following activities are supported:

- integrating data which may be:
 - from different sources or different contexts,
 - described by different models, or
 - defined in different modelling languages;
- sharing data among applications through systems integration architectures;
- resolving conflict between models developed with different objectives;
- translating data between different encodings;
- translating models between different modelling languages.

The following are within the scope of ISO 18876:

- integration models;
- methods for creating, extending, and updating integration models;
- methods for creating a mapping specification to map data instances between an integration model and an application model that falls within its scope;
- encoding and decoding of data and models with different formats, such as SGML [\[1\]](#), XML [\[7\]](#), EXPRESS [\[3\]](#), UML [\[6\]](#) and [ISO 10303-21 \[4\]](#);
- methods for consolidating data sets from different sources and different models;
- modelling and mapping specification languages.

The following is within the scope of this part of ISO 18876:

- the architecture and an outline of the methodology.

The following are outside the scope of this part of ISO 18876:

- integration models;
- detailed specifications of the methodology;

NOTE Such specifications can be found in other parts of ISO 18876 or in other standards.

- translating data between different encodings;