IEC 63278-4

Edition 1.0 2026-09

INTERNATIONAL STANDARD

**Asset Administration Shell for industrial applications -
Part 4:Applications of Asset Administration Shell**

ICS 25.040.01; 35.240.50

ISBN 978-2-8327-1512-3

IEC 63278-4:2026-09(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Asset Administration Shell for industrial applications - Part 4: Applications of Asset Administration Shell

FOREWORD

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IEC 63278-4 has been prepared by IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

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

Draft	Report on voting
65/1206/FDIS	65/1246/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.

A list of all parts in the IEC 63278 series, published under the general title *Asset Administration Shell for industrial applications*, 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– withdrawn, or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

0.1 General

The Asset Administration Shell (AAS) is seen as one interoperable manifestation of a digital twin in manufacturing industries. IEC 63278-1 describes the conceptual framework for the AAS, the structure of the AAS and requirements associated with the AAS and related entities.

This document complements IEC 63278-1 by describing in a systematic way applications of the AAS.

0.2 Context of this document

The current work foresees parts covering the following topics:

– Asset Administration Shell structure (IEC 63278-1);
– Information meta model (IEC 63278-2[1] [1][2]);
– Security provisions for Asset Administration Shells (IEC 63278-3[3] [2]);
– Applications of AAS (this document);
– Interfaces (IEC 63278-5[4] [3]).

Figure 1 illustrates the relationships between the documents currently being worked on.

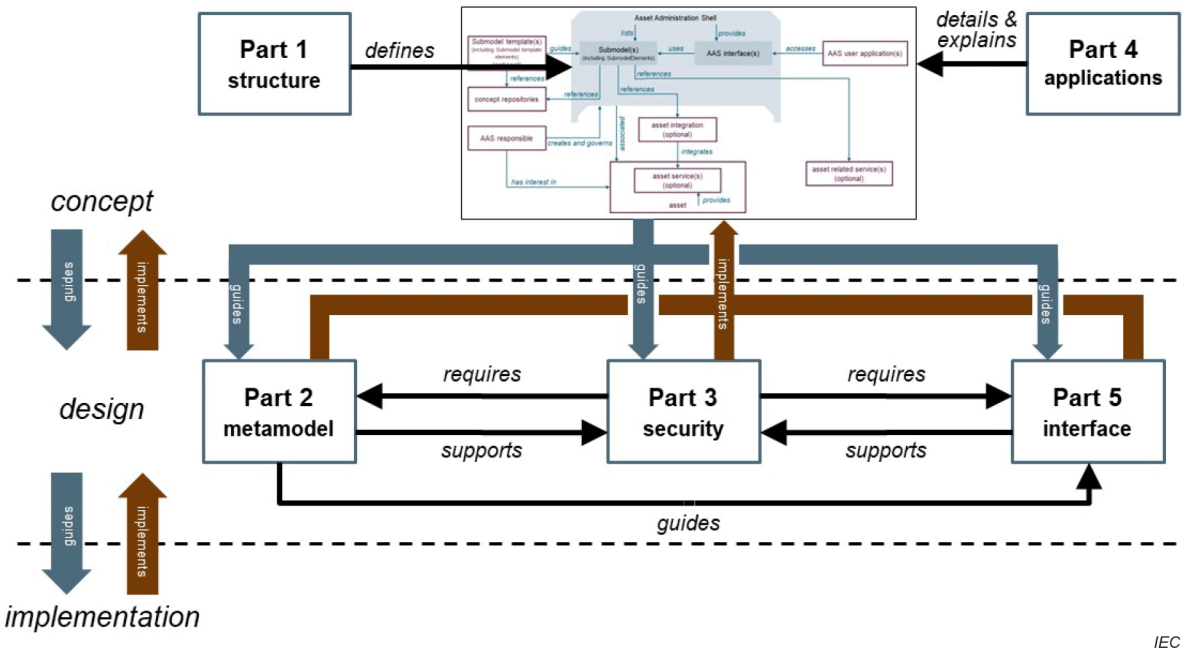


Figure 1 – Relationships between the documents

[1] Under preparation. Stage at the date of publication: IEC/CDV 63278-2:2026.

[2] Numbers in square brackets refer to the Bibliography.

[3] Under preparation. Stage at the date of publication: IEC/CD 63278-3:2026.

[4] Under preparation. Stage at the date of publication: IEC/CD 63278-5:2026.

IEC 63278-1 and IEC 63278-4 both address a concept view, whereas IEC 63278-2, IEC 63278-3, and IEC 63278-5 address a design view. An implementation is distinguished from the concept and design. Currently the implementation view is not addressed by the IEC 63278 series.

In this document, an application perspective is always taken. This document considers selected Smart Manufacturing use cases, see [4], and refines aspects of these use cases, but other input was also considered. However, the terms and concepts introduced in IEC 63278-1 are used. IEC 63278-4 does not introduce concepts which are not considered in IEC 63278-1.

NOTE IEC 63278-2 introduces concepts which are not introduced in IEC 63278-1 (e.g., qualifier, semanticID of Submodels), but such concepts are not in the scope of IEC 63278-4.

Nevertheless, IEC 63278-4 details and explains requirements, recommendations, and permissions that are not described precisely enough in IEC 63278-1. These requirements, recommendations, and permissions are not regarding the AAS itself, but the application of the AAS in the context of the related entities.

0.3 Structure of this document

Clause 4 of this document introduces additional actors in form of humans or organizations and describes how these actors interact with the AAS and the related entities by stating requirements, recommendations, and permissions. Clause 4 also describes examples about possible modelling and procedures using the AAS following the statements. This completes IEC 63278-1 regarding an application of the AAS. The claim is that these descriptions are complete regarding the level of detail considered.

Clause 5 describes – in addition to Clause 4 – selected examples about possible modelling and procedures using the AAS. It is the responsibility of a human or organization to determine how to apply the concepts provided by the AAS regarding their own objectives. In this respect, these examples neither claim to be complete nor to provide guidance about good practices. Clause 5 does not state any requirement.

0.4 Intended audience and purpose of the document

This document addresses humans or organizations that want to use the concepts provided by the AAS. This concerns how the AAS can be used in the context of the related entities and how to represent assets using the AAS.

Additionally, this document provides a framework to better understand the context of the AAS and thus lays a basis for further parts of the IEC 63278 series. This also concerns software developers, who want to provide software that supports AASs, be it to provide AASs or to use AASs.

1 Scope

The Asset Administration Shell is a standardized digital representation of an asset. The Asset Administration Shell gives uniform access to information of an asset and services of or related to an asset.

The purpose of the Asset Administration Shell is to enable two or more software applications to exchange information and to mutually use the information that has been exchanged in a trusted and secure manner.

This document assumes an application perspective of the Asset Administration Shell to develop a common understanding on how to use an Asset Administration Shell.

This document defines how the Asset Administration Shell can be used in the context of the related entities and how to represent assets using the Asset Administration Shell.

Due to the more detailed description compared to IEC 63278-1, additional requirements, recommendations, and permissions for the AAS are stated towards application of the AAS in selected scenarios.

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 63278-1:2023, *Asset Administration Shell for industrial applications - Part 1: Asset Administration Shell structure*

IEC 62832-1:2020, *Industrial-process measurement, control and automation - Digital factory framework - Part 1: General principles*

Bibliography

[1] IEC 63278-2:—, *Asset Administration Shell for Industrial Applications - Part 2: Information meta model*[5]

[2] IEC 63278-3:—, *Asset Administration Shell for Industrial Applications - Part 3: Security provisions for Asset Administration Shells*[6]

[3] IEC 63278-5:—, *Asset Administration Shell for industrial applications - Part 5: Interfaces*[7]

[4] IEC TS 63283-2:2025, *Industrial-process measurement, control and automation - Smart Manufacturing - Part 2: Use cases*

[5] IEC 60050-741:2020, *International Electrotechnical Vocabulary (IEV) - Part 741: Internet of Things (IoT)*

[6] IEC 61360-1:2017, *Standard data element types with associated classification scheme - Part 1: Definitions - Principles and methods*

[7] ISO/IEC 20924:2024, *Internet of Things (IoT) and digital twin - Vocabulary*

[8] IEC TR 62390:2005, *Common automation device - Profile guideline*

[9] IEC TR 63283-1, *Industrial-process measurement, control and automation - Smart manufacturing - Part 1: Terms and definitions*

[10] IEC PAS 63088:2017, *Smart manufacturing - Reference architecture model industry 4.0 (RAMI4.0)*[8]

[11] IEC 63365:2022, *Industrial process measurement, control and automation - Digital nameplate*

[12] TEKINERDOGAN, Bedir, VERDOUW, Cor: Systems Architecture Design Pattern Catalog for Developing Digital Twins, https://www.researchgate.net/publication/344201505 [viewed 2026-04-28]

[13] ZVEI White Paper - ZVEI-Show-Case PCF@Control Cabinet, https://www.zvei.org/fileadmin/user_upload/Presse_und_Medien/Publikationen/2022/Mai/Show-Case_PCF%40ControlCabin/22-05-25_Whitepaper_ZVEI-Show-Case-PCF-Control-Cabinet-HMI2022.pdf [viewed 2026-04-28]

[14] 802.1AR, https://1.ieee802.org/security/802-1ar/ [viewed 2026-04-28]

[15] ISO/TS 24520:2017, *Service activities relating to drinking water supply systems and wastewater systems - Crisis management - Good practice for technical aspects*

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5 Under preparation. Stage at the date of publication: IEC/CDV 63278-2:2026.

6 Under preparation. Stage at the date of publication: IEC/CD 63278-3:2026.

7 Under preparation. Stage at the date of publication: IEC/CD 63278-5:2026.

8 Withdrawn.

[16] ISO 690:2021, *Information and documentation - Guidelines for bibliographic references and citations to information resources*

[17] ISO 41014:2020, *Facility management - Development of a facility management strategy*

[18] ISO/TR 24464:2020, *Automation systems and integration - Industrial data - Visualization elements of digital twins*[9]

[19] ISO 10668:2010, *Brand valuation - Requirements for monetary brand valuation*

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9 This document was withdrawn and replaced by the 2025 edition, but the listed edition applies.