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Interested committees:

Title: Draft BS ISO 16400-5 Automation systems and integration - Equipment behaviour catalogues for virtual production system.
Part 5: Interfaces of an equipment behaviour catalogue with production systems engineering and manufacturing operations.

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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 16400-5

Automation systems and integration — Equipment behaviour catalogues for virtual production system —

Part 5: Interfaces of an equipment behaviour catalogue with production systems engineering and manufacturing operations

ICS: 25.040.01

ISO/TC 184/SC 5

Secretariat: **ANSI**

Voting begins on:
2024-12-30

Voting terminates on:
2025-03-24

This document is circulated as received from the committee secretariat.

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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.

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 5, *Interoperability, integration, and architectures for enterprise systems and automation applications*.

A list of all parts in the ISO 16400 series can be found on the ISO website.

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.

Introduction

The ISO 16400 series introduces a concept of an equipment behaviour catalogue (EBC), addresses the requirements of an EBC and proposes guidelines to generate an executable representing the dynamic behaviour of a nominal or physical instance of an equipment. Such executable plays a vital role when configuring virtual production systems used for simulation and verification of a future process as well as monitoring of a current process. Therefore, EBCs will constitute an important part of the evolution of smart manufacturing.

An EBC enables an efficient and standardized way for a provider of equipment to communicate its dynamic behaviour.

In this document, interfaces of an EBC with production systems engineering and manufacturing operations are defined. It addresses on the one hand the usability of the information contained within the EBC and on the other hand the enrichment and updating of this information using bi-directional interfaces. The interfaces and elements of the EBC are analysed and related to the main information objects of production companies, using a semantic information model introduced in [Annex A](#). The information model encompasses the production lifecycle, which contains production systems engineering and manufacturing operations. This standard embeds the EBC in application context in manufacturing.

Automation systems and integration — Equipment behaviour catalogues for virtual production system —

Part 5: Interfaces of an equipment behaviour catalogue with production systems engineering and manufacturing operations

1 Scope

This document specifies the interfaces of an equipment behaviour catalogue (EBC) with production systems engineering and manufacturing operations, facilitating their bi-directional integration by providing technical and contextual information.

NOTE In a virtual production system, integration of EBCs with other component models proceeds through the interfaces to obtain and exchange necessary information for equipment behaviour.

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 16400-1:2020, *Automation systems and integration — Equipment behaviour catalogues for virtual production system — Part 1: Overview*

ISO 16400-2, *Automation systems and integration — Equipment behaviour catalogues for virtual production systems — Part 2: Formal description of a catalogue template*

ISO 16400-3, *Automation systems and integration — Equipment behaviour catalogues for virtual production system — Part 3: Requirements and recommendations for construction of an equipment instance model*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16400-1, 16400-2, 16400-3 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 product structure

structure providing a functional classification of all items, parts, components, sub-assemblies and assemblies of a product

[SOURCE: ISO 18828-2]

3.2

consumption

act of using resources to satisfy current or future needs and wants.

Note 1 to entry: A resource according to IEC 62264-1:2003 is an enterprise entity that provides some or all of the capabilities required by the execution of an enterprise activity and/or business process (e.g. a collection of personnel, equipment, and/or material)

3.3

customer order

order from an in-house customer or a customer external to the company

[SOURCE: DIN EN 14943:2006]

3.4

production planning

process describing the phase between product design and production with the primary application domain in the planning of production systems

[SOURCE: ISO 18828-2]

3.5

equipment

physical assets of an enterprise involved in manufacturing

Note 1 to entry: Equipment may be a listing of sites, areas, production units, production lines, work cells, process cells or units.

Note 2 to entry: Equipment may be made up of other equipment. For example, a production line may be made up of work cells.

[SOURCE: IEC 62264-1]

3.6

cost

monetary value of resources consumed to perform activities

[SOURCE: ISO 14051]

3.7

asset

physical or logical object owned by or under the custodial duties of an organization, having either a perceived or actual value to the organization

[SOURCE: IEC 62443-1:2009, 3.2.6]

3.8

production systems engineering

engineering of production systems, following the reference planning process defined in ISO 18828-2

Note 1 to entry: The ISO 18828 series addresses standardized procedures for production systems engineering. Focusing the production planning, it provides a framework which approaches aspects such as production processes, information flows, key performance indicators (KPIs) and manufacturing changes.

3.9

reference planning process

process from the initial product definition to delivery of the last work plan in series planning

[SOURCE: ISO 18828-2]