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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32235.1-2024

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

工业过程测量、控制和自动化 数字工厂框架 第1部分：通用要求

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 1 of GB/T 32235. GB/T 32235 has been published in the following parts.

--- Part 1: General requirements;

--- Part 2: Model elements.

This document replaces GB/Z 32235-2015 "Reference model for the representation of industrial process measurement, control and automation production facilities (Digital Process Compared with GB/Z 32235-2015, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

--- Added the use of DF reference model and digital factory (see 4.2 and 4.3);

--- Changed the reference model concepts and reference model activities, concept identifiers, concept dictionary entries, concept dictionaries, data elements, the contents of data element collection, DF asset class, view element, library, etc. are refined (see 5.2, 5.3, 5.4, 5.5, 5.6, 5.7 and 5.8, 5.1, 5.2 and 5.3 of the 2015 edition).

This document is equivalent to IEC 62832-1:2020 "Industrial process measurement, control and automation digital factory framework Part 1: Communication "Requirements for Use".

0.1 Market demand and environment

High performance, flexible dynamic processes and agile equipment and production systems are important to meet product quality, delivery and cost requirements.

These requirements will increase the complexity of factory life cycle management. In addition, all product and production system information is transmitted through the the entire life cycle of products and production systems is described and modified, for example during the planning, development or operation of products and production systems.

This situation has prompted companies to adopt electronic data to exchange data about products and production systems.

However, each enterprise and each department within each enterprise often uses different terminology, structure, and and media to describe products and production systems.

Examples. Examples of data management solutions include paper-based, database-based, disk-based, electronic directory, and cloud-based.

Therefore, it is impossible to find (establish) a seamless information exchange between all

units involved in the life cycle of products and production systems.

Efficient data exchange between and within enterprises can only be achieved when the syntax (format) and semantics (meaning) of the relevant information are unified.

1.Sharing can only be realized after the method is stipulated.

0.2 History of standardization in this field

The basic purpose of early work on electronic product data was to replace paper with electronic descriptions of electronic components in products.

Data list, also used in software tools to describe electronic circuits and components (for example, when designing electronic circuit boards).

In addition, this concept is further used in the equipment configuration of production systems, with the aim of better describing the relevant parameters and the impact of behavior.

factors to facilitate integration and reduce engineering costs, and provide guidance for standard developers.

Note 1: See Equipment Configuration Guide (GB/T 34064-2017).

GB/T 20818.10-2017 specifies the basic principles by creating a list of properties (LOPs).

These properties are compiled into a modular form.

Subsequent parts of GB/T 20818 and other relevant standards (such as GB/T 35743-2017) Defines a list of reference properties for electronic/electrical components and materials in electrotechnical equipment and systems, such as for measuring flow, pressure, temperature, potential and density equipment.

Note 2: Although the name of GB/T 35743 is "Product data and characteristics for information exchange of low-voltage switchgear and controlgear", GB/T 35743 the purpose of this specification is to enable coordination between devices through the exchange of information when describing the devices used in the production system.

GB/T 38984.1-2020, IEC 61360-2 and ISO 13584-42 clearly define the basic principles of component type characteristics and their attributes.

The database developed on this basis is named IEC Common Data Dictionary (IEC CDD), which is a database of various types of components and their attributes.

A reference collection of documents. ISO 22745 (all parts) specifies Open Technical Dictionaries (OTDs) and their use in master data. ISO/IEC Guide 77 provides recommendations for describing products and their characteristics for use in creating these classifications, catalogues, and reference dictionaries.

Note 3: The term "product" used in ISO/IEC Guide No. 77 includes equipment, process, system and

facility.

ISO 15704 specifies requirements for enterprise reference architectures and methods to support collaborative and integrated applications, as well as the requirements for supporting system Requirements for enterprise architecture applied across the entire lifecycle and supply chain.

A series of efforts in the development of business and manufacturing enterprise models are aimed at helping companies better understand the role of enterprises in improving their own operations.

In addition, enterprise and control system models for production systems have also been developed, but further development is needed to improve There is still a gap in model development from the production system design environment to the production operation environment, especially for the sharing of process, instrument and equipment information.

In terms of.

Note 4: GB/T 20720 (all parts) specifies the functional models of the production domain and the control domain and the information exchanged with the enterprise domain.

0.3 Purpose and significance of GB/T 32235 (all parts)

The above standards provide a method for describing the characteristic attributes of a given device, while GB/T 32235 (all parts) provides a method for describing the characteristic attributes of a given device by providing a typical this approach is extended by defining a reference model of the production system (including related equipment).

In order to effectively manage the entire life cycle of the production system, it is necessary to have a digital representation and adaptively combine the evolution of the life cycle it is very important to maintain the relevant content. Production system related activities access, update and use these digital representations of the content.

These digital representations provide continuous communication between the relevant processes and components of the production system.

Information interaction, and making this information understandable, reusable and modifiable throughout the entire life cycle.

Dictionaries and models help create digital representations by describing elements of production systems, such as equipment and instruments.

Obtaining the expected digital representation of the production system requires more additional information, such as a description of the relationships between elements.

GB/T 32235 provides a framework for establishing and maintaining a digital representation of a production system, including elements, relationships between elements, the framework aims to reduce the interoperability barriers between the different activities of the production