SLOVENSKI STANDARD
oSIST prEN IEC 61987-1:2024

01-marec-2024

Merjenje in nadzor v industrijskih procesih – Strukture podatkov in elementov v katalogih procesne opreme – 1. del: Merilna oprema z analognim in digitalnim izhodom

Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 1: Measuring equipment with analogue and digital output

Industrielle Leittechnik - Datenstrukturen und -elemente in Katalogen der Prozessleittechnik - Teil 1: Messeinrichtungen mit analogen und digitalen Ausgängen

Mesure et commande dans les processus industriels - Eléments et structures de données dans les catalogues d'équipements de processus - Partie 1: Equipement de mesure avec sortie analogique et numérique

Ta slovenski standard je istoveten z: **prEN IEC 61987-1:2024**

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.240.50	Uporabniške rešitve IT v industriji	IT applications in industry

oSIST prEN IEC 61987-1:2024 **en,fr,de**

65E/1037/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61987-1 ED2**	
DATE OF CIRCULATION: **2024-01-12**	CLOSING DATE FOR VOTING: **2024-04-05**
SUPERSEDES DOCUMENTS: **65E/1025/CD, 65E/1033/CC**	

IEC SC 65E : DEVICES AND INTEGRATION IN ENTERPRISE SYSTEMS

SECRETARIAT: United States of America	SECRETARY: Mr Donald (Bob) Lattimer
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☒ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

Attention IEC-CENELEC parallel voting

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant “In Some Countries” clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 1: Measuring equipment with analogue and digital output

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL: DATA STRUCTURES AND ELEMENTS IN PROCESS EQUIPMENT CATALOGUES –

Part 1: Generic structures for measuring equipment

FOREWORD

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International Standard IEC 61987-1 Ed 2. has been prepared by subcommittee 65B65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement and control.

The text of this standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 2028 indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual edition of this standard may be issued at a later date.

INTRODUCTION

In recent years, industry has become alert to the fact that a great deal of time and effort is wasted in the transposition of measuring equipment data from one form to another. The technical data of an instrument, for example, may exist at the manufacturer's facility as two separate data sets for paper and electronic presentation: the end-user requires much the same data for works standards, engineering data bases or commercial data bases. In most cases, however, the data cannot be automatically re-used because each application has its own particular data storage format.

A second problem that belies the re-use of technical data is the content of the product descriptions themselves. There is little agreement between manufacturers on what information a technical data sheet should contain, how it should be arranged, or how the results, for example of particular performance tests, should be presented. When transferring this information into a data base, an end-user will always find gaps and proprietary interpretations that make the task more difficult.

This part of IEC 61987 aims to solve these problems by defining a generic structure and its content for industrial process measuring and control equipment. It builds upon the assumption that, for a given class of measuring equipment, for example, pressure measuring equipment, temperature measuring equipment or electromagnetic flow-measuring equipment, a set of non-proprietary structures and product features can be specified. The resulting documents can not only be exchanged electronically, they can also be presented to humans in an easily understandable form.

This part of IEC 61987 is applicable to electronic catalogues of process measuring equipment with analogue and digital output. The structure also contains a great many product features that are common to measuring equipment with binary output. Similarly, Annex B has been prepared with a view to future standardisation.

This part of IEC 61987 is not intended as a replacement for existing standards, but rather as a guiding document for all future standards which are concerned with the specifications of process measuring equipment. Every revision of an existing standard should take into account the structures and product features defined in Clause 5 of this part of IEC 61987 or work towards a harmonisation.

Annex A contains a tabular overview of the classification and catalogue structure of process measuring equipment. Annex B contains tables with a further sub-classification for specific measured variables.

Wherever possible, existing terms from international standards have been used to name the product features within the structures. In accordance with ISO 10241, Clause 3 of this part of IEC 61987 contains a list of terms, definitions and sources.

Documents created according to the standard are structured. A possible means of exchanging structured information free of layout information is given by SGML (Standard Generalised Mark-Up Language, ISO 8879) or XML (Extensible Mark-Up Language), which is derived from it.

This part of IEC 61987 could also provide the basis for arranging of properties (data element types) that conform to IEC 61360 or ISO 13584. This would require that the features, which in this part of IEC 61987 can be textual units, graphical and tabular representations etc., be broken down into properties (data element types) conformant to the said standards. For example, a range would be expressed as a lower range-limit (LRL) and upper range-limit (URL) with unit of measure; dimensions (L x B x H) as three separate elements, length, breadth and height with unit of measure; or a derating curve as an appropriate series of data element pairs.

This part of IEC 61987 conforms to ISO 15926 Part 1 and Part 2 with respect to the data model and associated reference data library (Part 4), for example, as used for the limited classification

structure. At the same time, it is also aligned to STEP: Standard for the Exchange of Product Model Data. The data model and definitions of ISO 10303 Part 221 uses the ISO 15926 Part 4 TS Reference Data Library as “library”. The current standard can reproduce the data fields as per this standard, including, for example, product structure data, dimensional data, electrical connection data and product properties such as measuring range or power supply.

Since the publication of Edition 1 of this standard a great deal of work has been done in the development of the IEC Common Data Dictionary for equipment for industrial-process automation. This, published as further parts of IEC 61987, covers not only measuring instruments with a variety of inputs and outputs, but also final control elements, infrastructure devices and in future process analysers.

For this reason, the title has been adjusted and the scope has been revised to reflect the current content of the whole IEC 61987 standard series.

During the development of the IEC CCD a number of questions arose regarding the structure proposed in Part 1, in particular the assignment of any digital communication interface to the output. Although this is not strictly incorrect, it was thought that the properties of such an interface could be better described separately. For this reason, a clause “Digital communication” has been added to Edition 2. In addition, the clause “Mechanical construction” has been renamed “Mechanical and electrical construction” to reflect its true content.

“Ordering information” is not found as a separate block in the IEC CDD, as it is assumed that the properties there describe the type and particular instance of an already purchased device. For an ordering process using IEC CDD properties, the necessary information is retrieved from the “Identification” which also includes the ordering information.

“Certificates and approvals” can be found both in the device list of properties (0112/2///61987#ABC156) and as a device aspect within the “device documents supplied” (0112/2///61987#ABH517). This is also the location of the information contained in “Documentation”.

In preparing Edition 2 of this standard all terms and definitions have been checked and where necessary the references updated. Since the publication of Edition 1 in 2006 a number of standards have been withdrawn. Where no suitable alternative source has been found, a note to this effect has been added, but the original term and definition have been left unchanged.

INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL: DATA STRUCTURES AND ELEMENTS IN PROCESS EQUIPMENT CATALOGUES –

Part 1: Generic structures for measuring devices

1 Scope

IEC 61987-1 defines a generic structure in which product features of industrial process measurement devices shall be arranged, in order to facilitate the understanding of product descriptions when they are transferred from one party to another. It applies to the production of catalogues supplied by the manufacturer of such devices and helps the user to formulate his requirements.

IEC 61987-1 shall also serve as a reference document for all future standards which are concerned with process measuring equipment.

In addition, IEC 61987-1 also provides a basic structure for the production of further standards listing the properties of process control equipment, for example, for actuators and infrastructure devices.

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.

IEC 60050-151:2001, *International Electrotechnical Vocabulary – Part 151: Electrical and magnetic devices*

IEC 60050-311:2001, *International Electrotechnical Vocabulary – Part 311: General terms relating to measurements*

IEC 60050-351:19982013: *International Electrotechnical Vocabulary – Part 351: Automatic control*

IEC 60050-426: 2020: *International Electrotechnical Vocabulary – Part 426: Equipment for explosive atmospheres*

IEC 60068 (all parts), *Environmental testing*

IEC 60529:1989+A1:1999+A2:2013, *Degrees of protection provided by enclosures (IP Code)*

IEC 60559:19892020, *Floating-point arithmetic*

IEC 60654-1:1993: *Industrial-process measurement and control equipment - Operating conditions - Part 1: Climatic conditions*

IEC 60721-3 (all parts): *Classification of environmental conditions - Classification of groups of environmental parameters and their severities*

IEC 60751: 2022, *Industrial platinum resistance thermometer sensors*

IEC 61000-1-1:1992, *Electromagnetic compatibility (EMC) - Part 1: General - Section 1: Application and interpretation of fundamental definitions and terms*

IEC 61069: (all parts), *Industrial-process measurement and control – Evaluation of system properties for the purpose of system assessment*

IEC 61082-1:2014, *Preparation of documents used in electrotechnology – Part 1 Rules*

IEC 61298 (all parts), *Process measurement and control devices - General methods and procedures for evaluating performance*

IEC 61326 (all parts): *Electrical equipment for measurement, control and laboratory use – EMC requirements*

IEC 61508 (all parts): *Functional safety of electrical/electronic/programmable electronic safety related systems*

IEC 61987-11: *Data structures and elements in process equipment catalogues - List of properties (LOPs) of measuring equipment for electronic data exchange - Generic structures*

IEC 62828 (all parts): *Reference conditions and procedures for testing industrial and process measurement transmitters*

IEC 82045-1:2001, *Document management – Part 1: Principles and methods*

International Vocabulary of Metrology (VIM), 3rd Edition: *Basic and general concepts and associated terms (VIM) – ISO/IEC Guideline 99/2007*

ISO 3511-1:1977, *Process measurement control functions and instrumentation – Symbolic representation – Part 1: Basic requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1
accuracy (of a measuring instrument)
inaccuracy
quality which characterizes the ability of a measuring instrument to provide an indicated value close to a true value of the measured value under reference conditions

NOTE 1 to entry: This term is used in the "true value" approach.

NOTE 2 to entry: Accuracy is all the better when the indicated value is closer to the corresponding true value.

NOTE 3 to entry: Inaccuracy as defined in IEC 61298-2 includes the errors of non-linearity, non-repeatability and hysteresis.

NOTE 4 to entry: Accuracy can be expressed as percentage of reading, span or full range etc. or as an absolute value

[SOURCE IEC 60050 311-06-08 modified, measured value instead of measurand, under reference conditions added, Notes 3 and 4 added]

3.2
accuracy class
category of instruments or components thereof, all of which are intended to comply with a set of specifications regarding uncertainty

[SOURCE IEC 60050 311-06-09 modified, “or components” added]

3.3
ambient condition,
environmental condition
characteristics of the environment which may affect the performance of the device or system

NOTE Examples of ambient conditions are pressure, temperature, humidity, vibration, radiation.

[SOURCE: IEC 60050, 151-16-03]

3.4
ambient temperature
temperature measured at a representative point within the local environment, including adjacent heat generating equipment, in which the measurement and control equipment will normally operate, be stored or transported.

See 3.3

3.5
ambient temperature limits
extreme values of ambient temperature to which a device may be subjected without permanent impairment of operating characteristics.

NOTE The performance characteristics may be exceeded in the range between the limits of normal operation and the operating temperature limits.

See 3.21, 3.22

3.6
ambient temperature range
range of ambient temperatures within which a device is designed to operate within specified accuracy limits.

See 3.32, 3.34

3.7
analog signal
signal each information parameter of which directly represents the respective variable quantity

NOTE: An analog signal may be a continuous-value signal or a discrete-value signal as well as a continuous-time or a discrete-time signal. Examples may be the pressure in a pneumatic final controlling element with continuous-value and continuous-time information parameter (value of the pressure) as well as a position-modulated pulse signal as an output signal of a computer based controller.

[SOURCE: IEC 60050, 351-41-24]