



SLOVENSKI STANDARD
oSIST prEN IEC 61987-1:2024
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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 - Éléments et structures de données dans les catalogues d'équipements de processus - Partie 1: Equipement de mesure avec sortie analogique et numérique

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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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 1: Generic structures for measuring equipment

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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.

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

- 216 • reconfirmed,
- 217 • withdrawn,
- 218 • replaced by a revised edition, or
- 219 • amended.

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

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INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

293 “Certificates and approvals” can be found both in the device list of properties
294 (0112/2///61987#ABC156) and as a device aspect within the “device documents supplied”
295 (0112/2///61987#ABH517). This is also the location of the information contained in
296 “Documentation”.

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

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

Part 1: Generic structures for measuring devices

310 1 Scope

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

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

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

321 2 Normative references

322 The following referenced documents are indispensable for the application of this document. For
323 dated references, only the edition cited applies. For undated references, the latest edition of
324 the referenced document (including any amendments) applies.

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

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

329 IEC 60050-351:1998/2013: *International Electrotechnical Vocabulary – Part 351: Automatic
330 control*

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

333 IEC 60068 (all parts), *Environmental testing*

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

335 IEC 60559:1989/2020, *Floating-point arithmetic*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

361 **3 Terms and definitions** [oSIST prEN IEC 61987-1:2024](https://standards.iteh.ai/catalog/standards/sist/166f00bc-8423-4613-8dec-e8bf3369f8d7/osist-pren-iec-61987-1-2024)

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

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

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

367 **3.1**

368 **accuracy (of a measuring instrument)**

369 **inaccuracy**

370 quality which characterizes the ability of a measuring instrument to provide an indicated value
 371 close to a true value of the measured value under reference conditions

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

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

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

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

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

380 **3.2**

381 **accuracy class**

382 category of instruments or components thereof, all of which are intended to comply with a set
383 of specifications regarding uncertainty

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

385 **3.3**

386 **ambient condition,**

387 **environmental condition**

388 characteristics of the environment which may affect the performance of the device or system

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

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

391 **3.4**

392 **ambient temperature**

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

396 See 3.3

397 **3.5**

398 **ambient temperature limits**

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

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

403 See 3.21, 3.22

404 **3.6**

405 **ambient temperature range**

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

408 See 3.32, 3.34

409 **3.7**

410 **analog signal**

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

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

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

417