

SLOVENSKI STANDARD

SIST EN 61987-11:2017

01-september-2017

Nadomešča:

SIST EN 61987-11:2012

Merjenje in nadzor industrijskega procesa - Strukture podatkov in elementi v katalogih procesne opreme - 11. del: Seznam lastnosti merilne opreme za elektronsko izmenjavo podatkov - Splošne strukture (IEC 61987-11:2016)

Industrial-process measurement and control - Data structures and elements in -process equipment catalogues - Part 11: Lists of properties (LOPs) of measuring equipment for electronic data exchange - Generic structures (IEC 61987-11:2016)

Industrielle Leittechnik - Datenstrukturen und -elemente in Katalogen der Prozessleittechnik - Teil 11: Merkmaleisten (ML) für Messgeräte für den elektronischen Datenaustausch - Allgemeine Strukturen (IEC 61987-11:2016)

Mesure et commande des processus industriels - Structures de données et éléments dans les catalogues d'équipement de processus - Partie 11: Listes des propriétés (LOP) d'équipements de mesure pour l'échange électronique de données - Structures génériques (IEC 61987-11:2016)

Ta slovenski standard je istoveten z: EN 61987-11:2017

ICS:

01.110	Tehnična dokumentacija za izdelke	Technical product documentation
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

SIST EN 61987-11:2017

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61987-11:2017

<https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-4fc1b9d2d09d/sist-en-61987-11-2017>

EUROPEAN STANDARD

EN 61987-11

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2017

ICS 25.040.40; 35.100.20

Supersedes EN 61987-11:2012

English Version

Industrial-process measurement and control - Data structures
and elements in -process equipment catalogues - Part 11: Lists
of properties (LOPs) of measuring equipment for electronic data
exchange - Generic structures
(IEC 61987-11:2016)

Mesure et commande des processus industriels -
Structures de données et éléments dans les catalogues
d'équipement de processus - Partie 11: Listes des
propriétés (LOP) d'équipements de mesure pour l'échange
électronique de données - Structures génériques
(IEC 61987-11:2016)

Industrielle Leittechnik - Datenstrukturen und -elemente in
Katalogen der Prozessleittechnik - Teil 11: Merkmalleisten
(ML) für Messgeräte für den elektronischen
Datenaustausch - Allgemeine Strukturen
(IEC 61987-11:2016)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This European Standard was approved by CENELEC on 2017-01-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member [SIST EN 61987-11:2017](http://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-)

<https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1->

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 61987-11:2017**European foreword**

The text of document 65E/467/CDV, future edition 2 of IEC 61987-11, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61987-11:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-10-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-21

This document supersedes EN 61987-11:2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61987-11:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

	<u>SIST EN 61987-11:2017</u>
	https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-4f0e2d094189/iec-61987-11
IEC 60770-1:2010	NOTE Harmonized as EN 60770-1:2011
IEC 61360-1:2009	NOTE Harmonized as EN 61360-1:2010
IEC 61360-2	NOTE Harmonized as EN 61360-2
IEC 61987-12	NOTE Harmonized as EN 61987-12
IEC 81346-1:2009	NOTE Harmonized as EN 81346-1:2009
ISO 10303 (Series)	NOTE Harmonized as ENV 10303 (Series)

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60947-5-6	-	Low-voltage switchgear and controlgear -- Part 5-6: Control circuit devices and switching elements - DC interface for proximity sensors and switching amplifiers (NAMUR)	EN 60947-5-6	-
IEC 61069-5	-	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 5: Assessment of system dependability	EN 61069-5	-
IEC 61508-6	-	Functional safety of electrical/electronic/programmable electronic safety-related systems -- Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3	EN 61508-6	-
IEC 61987-1	2006	Industrial-process measurement and control - Data structures and elements in process equipment catalogues -- Part 1: Measuring equipment with analogue and digital output	EN 61987-1	2007
IEC 61987-10	2009	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 10: Lists of Properties (LOPs) for Industrial-Process Measurement and Control for Electronic Data Exchange - Fundamentals	EN 61987-10	2009
-	-		+ AC	2011
IEC 61987-92	-		-	-
IEC 62424	-	Representation of process control engineering - Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools	EN 62424	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61987-11:2017

<https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-4fc1b9d2d09d/sist-en-61987-11-2017>



IEC 61987-11

Edition 2.0 2016-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Industrial-process measurement and control – Data structures and elements in process equipment catalogues –
Part 11: Lists of properties (LOPs) of measuring equipment for electronic data exchange – Generic structures**

[SIST EN 61987-11:2017](https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-11d6c789111100000000000000000000)

[https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-](https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-11d6c789111100000000000000000000)

**Mesure et commande des processus industriels – Structures de données et éléments dans les catalogues d'équipement de processus –
Partie 11: Listes des propriétés (LOP) d'équipements de mesure pour l'échange électronique de données – Structures génériques**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.040.40; 35.100.20

ISBN 978-2-8322-3692-5

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
3.1 Terms and definitions concerning measuring instruments	10
3.2 Terms and definitions concerning relationships	11
4 General	13
4.1 Characterization scheme.....	13
4.2 Aspects.....	13
4.3 Rules for the construction of LOPs with block structure.....	15
4.3.1 Block order	15
4.3.2 Position of cardinality properties	15
4.3.3 Naming of blocks created by cardinality.....	15
4.3.4 Characterizing property	15
4.3.5 Validity	15
4.4 OLOP and DLOP	15
4.5 Operating conditions.....	16
4.6 Measuring equipment configuration.....	17
5 Operating list of properties (OLOP).....	18
5.1 Generic block structure	18
5.2 Base conditions	19
5.3 Process case	19
5.3.1 General	19
5.3.2 Process case variables	19
5.3.3 Other process case variable	20
5.4 Operating conditions for device design.....	20
5.4.1 General	20
5.4.2 Installation design conditions.....	20
5.4.3 Environmental design conditions.....	20
5.4.4 Process design conditions	21
5.4.5 Pressure-temperature design conditions	21
5.5 Process equipment	22
5.5.1 General	22
5.5.2 Line or nozzle	22
5.6 Physical location.....	22
5.6.1 General	22
5.6.2 Available power supply	22
5.6.3 Process criticality classification	23
5.6.4 Area classification	23
6 Device list of properties (DLOP)	23
6.1 General.....	23
6.1.1 Generic block structure.....	23
6.1.2 Relationship to IEC 61987-1	25
6.1.3 Multivariable devices	25
6.2 Identification	26

6.3	Application	26
6.4	Function and system design	26
6.4.1	General	26
6.4.2	Dependability	26
6.5	Input	26
6.5.1	General	26
6.5.2	Measured variable	26
6.5.3	Auxiliary input	27
6.6	Output	28
6.6.1	General	28
6.6.2	<Signal> output	29
6.7	Digital communication	30
6.7.1	General	30
6.7.2	Digital communication interface	30
6.8	Performance	30
6.8.1	General	30
6.8.2	Reference conditions for the device	30
6.8.3	Performance variable	30
6.9	Rated operating conditions	32
6.9.1	General	32
6.9.2	Installation conditions	32
6.9.3	Environmental design ratings	33
6.9.4	Process design ratings	33
6.9.5	Pressure-temperature design ratings	34
6.10	Mechanical and electrical construction	34
6.10.1	General	34
6.10.2	Overall dimensions and weight	34
6.10.3	Structural design	35
6.10.4	Explosion protection design approval	35
6.10.5	Codes and standards approval	35
6.11	Operability	35
6.11.1	General	35
6.11.2	Basic configuration	35
6.11.3	Parametrization	35
6.11.4	Adjustment	35
6.11.5	Operation	35
6.11.6	Diagnosis	35
6.12	Power supply	36
6.13	Certificates and approvals	36
6.14	Component part identifications	36
7	Composite devices	36
7.1	Structure of composite devices	36
7.2	Aspects of components	38
8	Additional aspects	38
8.1	Administrative information	38
8.2	Calibration and test	39
8.3	Accessories	39
8.4	Device documents supplied	39
8.5	Packaging and shipping	39

8.6	Digital communication parametrization	39
8.7	Example of a composite device with aspects	39
Annex A (informative) Device type dictionary – Classification of process measuring equipment according to measuring characteristics		41
Bibliography		60
Figure 1 – Characterisation of measuring equipment		13
Figure 2 – Simplified UML scheme of device, LOPs and aspects		14
Figure 3 – Assignment of OLOPs and DLOPs for equipment used to measure one type of measured variable		16
Figure 4 – Structure of a composite device		37
Figure 5 – Example for the structure of an LOP for a composite device showing different aspects related to different sub-components		40
Table 1 – Structure of the block “Operating conditions for device design” in the OLOP		17
Table 2 – Structure of the block “Rated operating conditions” in the DLOP		17
Table 3 – Generic block structure of an OLOP		18
Table 4 – Generic block structure of a DLOP		24
Table 5 – DLOP structure for composite devices		37
Table A.1 – Classification scheme for process measuring equipment		41

iteh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61987-11:2017](https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-4fc1b9d2d09d/sist-en-61987-11-2017)

<https://standards.iteh.ai/catalog/standards/sist/c02c8370-2791-46b2-aec1-4fc1b9d2d09d/sist-en-61987-11-2017>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL –
DATA STRUCTURES AND ELEMENTS IN PROCESS
EQUIPMENT CATALOGUES –****Part 11: Lists of properties (LOPs) of measuring equipment
for electronic data exchange – Generic structures**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61987-11 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) The classification in Table A.1 has been amended to reflect the changes in the classification scheme of process measuring equipment in the CDD due to the development of IEC 61987-14, IEC 61987-15 and IEC 61987-16.
- b) Annex A has become “informative”.

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

CDV	Report on voting
65E/467/CDV	65E/509/RVC

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.

A list of all parts in the IEC 61987 series, published under the general title *Industrial-process measurement and control – Data structures and elements in process equipment catalogues*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The exchange of product data between companies, business systems, engineering tools, data systems within companies and, in the future, control systems (electrical, measuring and control technology) can run smoothly only when both the information to be exchanged and the use of this information has been clearly defined.

Prior to this document, requirements on process control devices and systems were specified by customers in various ways when suppliers or manufacturers were asked to quote for suitable equipment. The suppliers in their turn described the devices according to their own documentation schemes, often using different terms, structures and media (paper, databases, CDs, e-catalogues, etc.). The situation was similar in the planning and development process, with device information frequently being duplicated in a number of different information technology (IT) systems.

Any method that is capable of recording all existing information only once during the planning and ordering process and making it available for further processing, gives all parties involved an opportunity to concentrate on the essentials. A precondition for this is the standardization of both the descriptions of the objects and the exchange of information.

This standard series proposes a method for standardization which will help both suppliers and users of measuring equipment to optimize workflows both within their own companies and in their exchanges with other companies. Depending on their role in the process, engineering firms may be considered here to be either users or suppliers.

The method specifies measuring equipment by means of blocks of properties. These blocks are compiled into lists of properties (LOPs), each of which describes a specific equipment (device) type. This standard series covers both properties that may be used in an inquiry or a proposal and detailed properties required for integration of the equipment in computer systems for other tasks.

IEC 61987-10 defines structure elements for constructing lists of properties for electrical and process control equipment in order to facilitate automatic data exchange between any two computer systems in any possible workflow, for example engineering, maintenance or purchasing workflow and to allow both the customers and the suppliers of the equipment to optimize their processes and workflows. IEC 61987-10 also provides the data model for assembling the LOPs.

IEC 61987-11 specifies the generic structure for operating and device lists of properties (OLOPs and DLOPs). It lays down the framework for further parts of IEC 61987 in which complete LOPs for device types measuring a given physical variable and using a particular measuring principle will be specified. The generic structure may also serve as a basis for the specification of LOPs for other industrial-process control instrument types such as control valves and signal processing equipment.

Content of the lists of properties (LOPs)

The LOPs specified in this document describe at generic level:

- the operating conditions of the measuring equipment;
- the ambient conditions at the measuring point;
- the performance of the measuring equipment;
- the metrological, mechanical and electrical features of the measuring equipment;
- the compliance of the measuring instrument to specific industrial requirements.

The LOPs mirror constructive reality but do not represent an instrument model.

Measuring equipment configuration

The generic LOPs have been so constructed that they take account of integral equipment and separately mounted equipment.

Device type dictionary

Annex A describes a characterisation of measuring equipment based on the STEP library, ISO 10303. This is a tree of relationships between different device types. Starting at the root “equipment for industrial-process automation”, it first characterizes measuring equipment according to type, then according to process variable measured and finally according to the measuring method employed. This structure will be used in the IEC Common Data Dictionary (CDD) “Process automation (IEC 61987 series)” domain.

For the purpose of this document, the following types of measuring equipment have been identified, see Clause 3 for definitions:

- sight indicator (with direct indicating qualitative output),
- gauge (with quantitative output only in the form of a direct indicating display),
- transmitter (with quantitative analogue output or corresponding digital output signal),
- switch (with discrete output or corresponding digital output signal),
- measuring assembly (as a grouping of instrument components, which together form a gauge, transmitter or switch).

It should be noted that in the real world there is not such a clear demarcation between types of measuring equipment. In commercial literature, indicators are often called gauges, although the products offer no quantitative measurement. Similarly, direct indicating displays are often equipped with electrical trip switches which allow a gauge to act as a switch. Finally “transmitter” is by no means a universal term and in particular for flow measurement many manufacturers call this kind of equipment “meter”.

Composite devices

A structural scheme is given, defining how to build up LOPs for devices consisting of several components or assembled from different parts, that is, composite devices and measuring assemblies.

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

Part 11: Lists of properties (LOPs) of measuring equipment for electronic data exchange – Generic structures

1 Scope

This part of IEC 61987 provides:

- a characterisation of industrial process measuring equipment (device type dictionary) for integration in the Common Data Dictionary (CDD), and
- generic structures for operating lists of properties (OLOP) and device lists of properties (DLOP) of measuring equipment in conformance with IEC 61987-10.

The generic structures for the OLOP and DLOP contain the most important blocks for process measuring equipment. Blocks pertaining to a specific equipment type will be described in the corresponding part of the IEC 61987 standard series. Similarly, equipment properties are not part of IEC 61987-11. For instance, the OLOP and DLOP for flow transmitters with blocks and properties are to be found in IEC 61987-12.

(standards.iteh.ai)

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 60947-5-6, *Low-voltage switchgear and controlgear – Part 5-6: Control circuit devices and switching elements – DC interface for proximity sensors and switching amplifiers (NAMUR)*

IEC 61069-5, *Industrial-process measurement, control and automation – Evaluation of system properties for the purpose of system assessment – Part 5: Assessment of system dependability*

IEC 61508-6, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3*

IEC 61987-1:2006, *Industrial-process measurement and control – Data structures and elements in process equipment catalogues – Part 1: Measuring equipment with analogue and digital output*

IEC 61987-10:2009, *Industrial-process measurement and control – Data structures and elements in process equipment catalogues – Part 10: Lists of Properties (LOPs) for Industrial-Process Measurement and Control for Electronic Data Exchange – Fundamentals*