

SLOVENSKI STANDARD SIST EN 61987-11:2012

01-november-2012

Meritve in krmiljenje industrijskih procesov - Strukture podatkov in elementi v katalogih procesne opreme - 11. del: Seznam lastnosti merilne opreme za elektronsko izmenjavo podatkov - Rodovne strukture (IEC 61987-11:2012)

Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 11: Lists of properties (LOP) of measuring equipment for electronic data exchange - Generic structures (IEC 61987-11:2012)

iTeh STANDARD PREVIEW

Industrielle Leittechnik - Datenstrukturen und -elemente in Katalogen der Prozessleittechnik - Teil 11: Merkmalleisten für Messgeräte für elektronischen Datenaustausch – Allgemeine Strukturen (IEC 61987-11:2012)

SIST EN 61987-11:2012

https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff-

Mesure et contrôle des processus industriels en Structures de données et éléments dans les catalogues d'équipement de processus - Partie 11: Liste de propriétés (LOP) des équipements de mesure pour l'échange électronique de données - Structures génériques (CEI 61987-11:2012)

Ta slovenski standard je istoveten z: EN 61987-11:2012

ICS:

25.040.40 Merjenje in krmiljenje Industrial process industrijskih postopkov measurement and control

35.240.50 Uporabniške rešitve IT v IT applications in industry

industriji

SIST EN 61987-11:2012 en

SIST EN 61987-11:2012

iTeh STANDARD PREVIEW (standards.iteh.ai)

EUROPEAN STANDARD

EN 61987-11

NORME EUROPÉENNE EUROPÄISCHE NORM

September 2012

ICS 25.040.40; 35.100.20

English version

Industrial-process measurement and control Data structures and elements in process equipment catalogues Part 11: List of Properties (LOP) of measuring equipment for electronic
data exchange - Generic structures

(IEC 61987-11:2012)

Mesure et contrôle des processus industriels -

Structures de données et éléments dans les catalogues d'équipement de processus - Partie 11: Liste de propriétés (LOP)

des équipements de mesure pour l'échange électronique de données -

Structures génériques (CEI 61987-11:2012)

Industrielle Leittechnik Datenstrukturen und -elemente in
Katalogen der Prozessleittechnik Teil 11: Merkmalleisten (ML) für
Messgeräte für den elektronischen
Datenaustausch - Allgemeine Strukturen
(IEC 61987-11:2012)

SIST EN 61987-11:2012

(standards.iteh.ai)

https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff-b6abedd5fe04/sist-en-61987-11-2012

This European Standard was approved by CENELEC on 2012-08-28. 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.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 65E/245/FDIS, future edition 1 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 61987-11:2012.

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)	2013-05-28
•	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-08-28

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 61987-11:2012 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:

IEC 60770-1:2010	NOTE	Harmonised as EN 60770-1:2011 (not modified).
IEC 61346-1:1996ps://s		Harmonised as EN 61346-1:1996 (not modified).
IEC 61360-1:2009	NOTE b6abe	Harmonised as EN 61360-1:2010 (not modified).
IEC 61360-2	NOTE	Harmonised as EN 61360-2.
IEC 61360-5	NOTE	Harmonised as EN 61360-5.

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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 61069-5	-	Industrial-process measurement and control - 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	Series	Industrial-process measurement RFVIII and control - Data structures and elements in process equipment catalogues at	EN 61987	Series
IEC 61987-1	2006 https://st	Industrial-process measurement and control <u>s Data structures 2012</u> and elements in process equipment 1-de30-4 catalogues ad5 fe04/sist-en-61987-11-2012 Part 1: Measuring equipment with analogue and digital output	EN 61987-1 164e-85ff-	2007
IEC 61987-10 + corr. May	2009 2012	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		2009 2011
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	-

SIST EN 61987-11:2012

iTeh STANDARD PREVIEW (standards.iteh.ai)



IEC 61987-11

Edition 1.0 2012-07

INTERNATIONAL STANDARD

Industrial-process measurement and control P Data structures and elements in process equipment catalogues Tards.iteh.ai)

Part 11: List of Properties (LOP) of measuring equipment for electronic data exchange – Generic structures SIST EN 61987-11:2012

https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff-b6abedd5fe04/sist-en-61987-11-2012

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE XA

ICS 25.040.40; 35.100.20 ISBN 978-2-83220-283-8

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FΟ	REW	ORD		5
INT	RODI	JCTION	١	7
1	Scop	e		9
2	Norm	native re	eferences	9
3	Term	is and d	definitions	10
	3.1	Terms	and definitions concerning measuring instruments	10
	3.2		and definitions concerning relationships	
4	Gene		· · · · · · · · · · · · · · · · · · ·	
	4.1	Chara	cterization scheme	13
	4.2	Aspec	ts	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	
		4.3.3	Naming of blocks created by cardinality	
		4.3.4	Characterizing property	
		4.3.5	Validity en STANDARD PREVIEW and DLOP ting conditions (standards.iteh.ai)	15
	4.4	OLOP	and DLOP(standards itch ai)	15
	4.5			
F	4.6		rring equipment configuration	
5		ating Li	https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff-	18
	5.1	Gener	https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff- ic block structure b6abedd5ie04/sist-en-61987-11-2012	18
	5.2 5.3		conditionsss case	
	5.5	5.3.1	General	
		5.3.2	Process case variables	
		5.3.3	Other process case variable	
	5.4		ting conditions for device design	
		5.4.1	General	
		5.4.2	Installation design conditions	
		5.4.3	Environmental design conditions	
		5.4.4	Process design conditions	21
		5.4.5	Pressure-temperature design conditions	21
	5.5	Proces	ss equipment	22
		5.5.1	General	22
		5.5.2	Line or equipment nozzle	
	5.6	•	cal location	
		5.6.1	General	
		5.6.2	Available power supply	
		5.6.3	Process criticality classification	
_	David	5.6.4	Area classification	
6			f properties (DLOP)	
	6.1		al	
		6.1.1	Generic block structure	
		6.1.2	Relationship to IEC 61987-1	∠5

7

8

	6.1.3 Multivariable devices	25
6.2	Identification	25
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</signal>	28
6.7	Digital communication	
	6.7.1 General	
	6.7.2 Digital communication interface	
6.8	Performance	
	6.8.1 General	
	6.8.2 Reference conditions for the device	
	6.8.3 Performance variable	
6.9	Rated operating conditions .N.D.A.R.D. P.R.E.V.I.E.W.	
0.0		
	6.9.1 General (Standards.iteh.ai) 6.9.2 Installation conditions	32
	6.9.3 Environmental design ratings	33
	6.9.5 Pressure-temperature design ratings 11-2012	34
6.10	Mechanical and electrical construction	
0	6.10.1 General	
	6.10.2 Overall dimensions and weight	
	6.10.3 Structural design	
	6.10.4 Explosion protection design approval	
	6.10.5 Codes and standards approval	
6 11	Operability	
0.11	6.11.1 General	
	6.11.2 Basic configuration	
	6.11.3 Parametrization	
	6.11.4 Adjustment	
	6.11.5 Operation	
	6.11.6 Diagnosis	
6 12	Power supply	
	Certificates and approvals	
	Component part identifications	
	posite devicesposite devices	
7.1	Structure of composite devices	
7.2	Aspects of components	
	tional aspects	
8.1	Administrative information	
8.2	Calibration and test	
8.3	Accessories	38

-4-

61987-11	© IEC	:2012(E)
----------	-------	----------

8.4	Device documents supplied	38
8.5	Packaging and shipping	39
8.6	Digital communication parametrization	39
8.7	Example of a composite device with aspects	39
	normative) Device type dictionary – Classification of process measuring taccording to measuring characteristics	40
Bibliograp	hy	53
Figure 1 –	Characterisation of measuring equipment	13
	Simplified UML scheme of device, LOPs and aspects	
		17
	Assignment of OLOPs and DLOPs for equipment used to measure one type ed variable	16
	Structure of a composite device	
	Example for the structure of a LOP for a composite device showing different elated to different sub-components	39
Table 1 –	Structure of the "Operating conditions for device design" block in the OLOP	17
Table 2 –	Structure of the "rated operating conditions" block in the DLOP	17
Table 3 –	Generic block structure of an OLOP	18
Table 4 –	Generic block structure of a DLOPARD PREVIEW	24
Table 5 –	DLOP structure for composite devices	37
Table A.1	- Classification scheme for process measuring equipment	40

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 11: List of Properties (LOP) 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.
- https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff4) In order to promote international uniformity, EC 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.

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

FDIS	Report on voting
65E/245/FDIS	65E/270/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.

61987-11 © IEC:2012(E)

-6-

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

A list of all parts of 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 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 version of this publication may be issued at a later date.

iTeh STANDARD PREVIEW (standards.iteh.ai)

61987-11 © IEC:2012(E)

-7-

INTRODUCTION

0.1 General

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 standard, 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 within their own companies as well as 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), leach 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. Part 10 also provides the data model for assembling the LOPs.

This part of the IEC 61987 series 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.

0.2 Content of the lists of properties (LOPs)

The LOPs specified in this standard 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,

- 8 -

• the compliance of the measuring instrument to specific industrial requirements.

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

0.3 Measuring equipment configuration

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

0.4 Device type dictionary

Annex A of this part 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 "automation equipment", 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 Component Data Dictionary (CDD) "Automation equipment" Domain.

For the purpose of this standard the following types of measuring equipment have been identified and defined in Clause 3: sight indicator, gauge, transmitter, switch and measuring assembly.

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". 11:2012

https://standards.iteh.ai/catalog/standards/sist/9ac9b0c1-de30-464e-85ff-b6abedd5fe04/sist-en-61987-11-2012

0.5 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: List of Properties (LOP) 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 Component Data Dictionary (CDD), and
- generic structures for Operating Lists of Properties (OLOPs) and Device Lists of Properties (DLOPs) of measuring equipment in conformance with IEC 61987-10.

The generic structures for the OLOPs and DLOPs 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 series (for example IEC 61987-12, flow transmitters). Similarly, equipment properties are not dealt with in this part of the series For instance, the OLOPs and DLOPs for flow transmitters with blocks and properties will be found in future in IEC 61987-12.

SIST EN 61987-11:2012 Normative references SIST EN 61987-11:2012 Normative references SIST EN 61987-11:2012 b6abedd5fe04/sist-en-61987-11-2012

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.

IEC 61069-5, Industrial-process measurement and control – 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 (all parts), Industrial-process measurement and control – Data structures and elements in process equipment catalogues

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

IEC 62424, Representation of process control engineering – Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools