

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Industrial- process measurement and control – Data structures and elements in process equipment catalogues –  
Part 32: Lists of properties (LOP) for I/O modules for electronic data exchange**

**Mesure et commande des processus industriels – Structures de données et éléments dans les catalogues d'équipement de processus –  
Partie 32: Listes des propriétés (LOP) pour les modules d'E/S pour l'échange électronique des données**

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**INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL –  
DATA STRUCTURES AND ELEMENTS  
IN PROCESS EQUIPMENT CATALOGUES –****Part 32: Lists of properties (LOP) for I/O modules  
for electronic data exchange**

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IEC 61987-32 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65E/934/CDV	65E/994/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

The List of Properties (LOPs) given in this standard are published in the Common Data Dictionary of IEC as stated in the appendices A to D. In the event that the LOPs are not yet available in the CDD, they can be found temporarily in the CDD maintenance area (<https://std.iec.ch/cdd/iec61987/cdddev.nsf/TreeFrameset?OpenFrameSet>).

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 document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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## 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 can 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 can 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 can 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.

IEC 61987-31 concerns infrastructure devices, i.e. devices mostly to be found in the switching room and the control room. It provides a classification, a generic DLOP and an OLOP for a range of device types of this device group.

IEC 61987-32 concerns I/O modules. It provides an OLOP for I/O modules that can also be used for other infrastructure devices and a DLOP for I/O modules that can be used for input modules, output modules and combined input/output modules of various types.

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

## Part 32: Lists of properties (LOP) for I/O modules for electronic data exchange

### 1 Scope

This part of IEC 61987 provides

- an operating list of properties (OLOP) for the description of the operating parameters and the collection of requirements for I/O modules and
- a device list of properties (DLOP) for the description of a range of I/O module types

The structures of the OLOP and the DLOPs correspond to the general structures defined in IEC 61987-11 and agree with the fundamentals for the construction of LOPs defined in IEC 61987-10.

Aspects other than the OLOP, needed in different electronic data exchange processes and described in IEC 61987-10 and IEC 61987-11, are published in IEC 61987-92.

The locations of the libraries of properties and of blocks used in the LOPs concerned are listed in Annex C and Annex D.

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

IEC 61987-11, *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*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61987-10 and IEC 61987-11 apply.

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

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

NOTE Definitions for device types of I/O modules can be found in Table A.1, in Annex A of IEC 61987-31.



## 4 General

### 4.1 Overview

The LOPs provided by this document are intended for use in electronic data exchange processes performed between any two computer systems. The two computer systems can both belong to the same company or they can belong to different companies as described in Annex C of IEC 61987-10:2009.

The OLOP for the family of infrastructure devices is to be found in Annex A while the DLOPs of the individual I/O modules types are to be found in Annex B.

Structural elements such as LOP type, block and property defined in this document are available in electronic form in the "Process automation" domain of the IEC Component Data Dictionary (CDD).

### 4.2 Examples of DLOP block usage

#### 4.2.1 DLOP for I/O modules

In Table 1, an excerpt of the DLOP for I/O modules with values and units of measure assigned to the properties is shown. This is a possible configuration for a four-channel binary input module (see also Figure 1). Not all properties of an LOP have to be used. Thus, in Table 1 there are empty properties. "..." indicates there a property area that has not been used in the example.

**Table 1 – DLOP Example of I/O module with binary inputs**

Name of LOP type, block or property <sup>1</sup>		Assigned value	Unit
...			
	number of inputs [I/O module]	1	
	<b>Input [I/O module]</b>		
	quantity of identical channels	4	
	quantity of channels per common/ground	4	
	number of galvanic isolations	1	
	<b>Galvanic isolation</b>		
	first test point	input signal	
	second test point	system	
	type of voltage	AC	
	withstand voltage	1,5	kV
	test criterium	not to cause electric breakdown	
	maximum limit of current		mA
	duration of test	1	min
	method of galvanic isolation	photocoupler	
	<b>Insulation resistance</b>		
	type of voltage	DC	
	test voltage	500	V
	minimum insulation resistance	1	MΩ
	duration of test	60	s

<sup>1</sup> In the CDD, block names start with a capital letter, property names with a lower case letter.

Name of LOP type, block or property <sup>1</sup>		Assigned value	Unit
<b>Resistance to earth</b>			
	type of current	DC	
	test current	25	A
	maximum measured voltage	10	V
	maximum measured resistance	0,1	Ω
	duration of test	60	s
<b>Protective conductor current</b>			
	type of voltage	AC	
	test voltage	132	V
	maximum measured current	3,5	mA
<b>Touch current</b>			
	type of voltage	AC	
	test voltage	120	V
	maximum measured current	2	mA
<b>Binary input [I/O module]</b>			
	type of binary input	DC	
	...		
	number of signal levels	1	
<b>Signal levels</b>			
	...		
	maximum signal voltage level for signal "0"	5,8	V
	minimum signal voltage level for signal "1"	16	V
	maximum signal current level for signal "0"	0,9	mA
	minimum signal current level for signal "1"	3,2	mA
	...		
	number of DC ratings for external power	1	
<b>DC rating for external power</b>			
	rated voltage	24	V
	minimum voltage	20,4	V
	maximum voltage	26,4	V
	maximum current	4,1	mA
	...		
<b>Electrical data for passive behaviour</b>			
	...		
	input resistance/impedance	5,9	kΩ
	...		

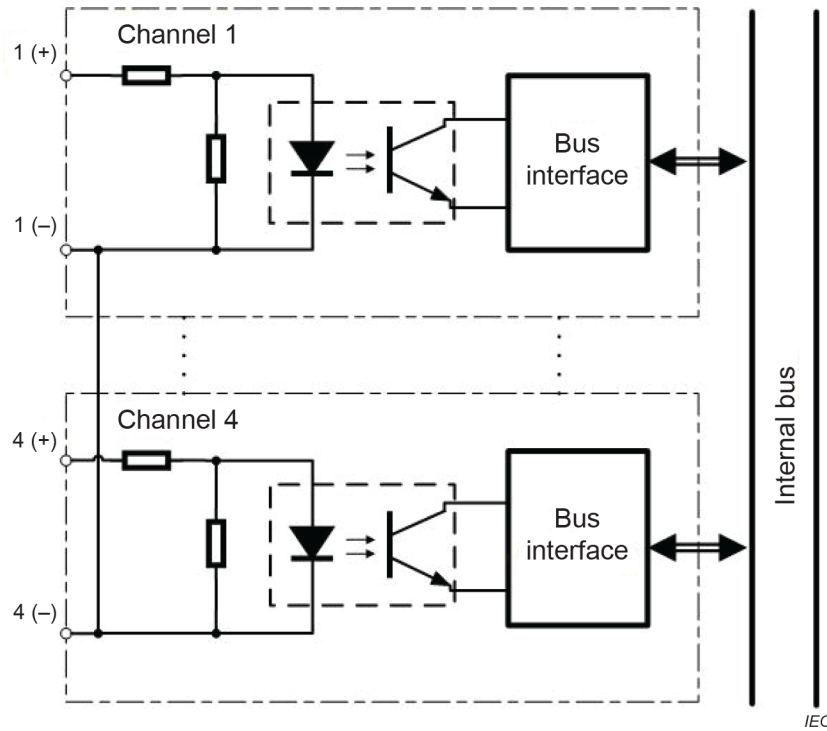


Figure 1 – Four-channel binary input module

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