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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Industrial-process measurement and control – Data structures and elements in process equipment catalogues – Part 31: Lists of Properties (LOPs) of infrastructure devices for electronic data exchange – Generic structures

Mesure et commande des processus industriels – Structures de données et éléments dans les catalogues d'équipement de processus – Partie 31: Listes des propriétés (LOP) d'appareils d'infrastructure pour l'échange électronique de données – Structures génériques



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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 8
4 General 8
4.1 Characterization scheme 8
4.2 OLOP and DLOP 8
4.3 Cardinality and polymorphism 9
5 Operating List of Properties (OLOP) 9
5.1 Generic block structure 9
5.2 Operating conditions for device design 10
5.2.1 General 10
5.2.2 Installation design conditions 10
5.2.3 Environmental design conditions 10
5.3 Physical location 11
5.3.1 General 11
5.3.2 Available power supply 11
5.3.3 Process criticality classification 11
5.3.4 Area classification 11
6 Device List of Properties (DLOP) 12
6.1 Basic structure 12
6.1.1 General 12
6.1.2 Generic block structure 12
6.1.3 Relationship to IEC 61987-1 13
6.2 Identification 14
6.3 Application 14
6.4 Function and system design 14
6.4.1 General 14
6.4.2 Dependability 14
6.5 Input 14
6.6 Output 14
6.7 Digital communication 15
6.7.1 General 15
6.7.2 Digital communication interface 15
6.8 Performance 15
6.8.1 General 15
6.8.2 Reference conditions for the device 15
6.8.3 Performance variable 15
6.9 Rated operating conditions 16
6.9.1 General 16
6.9.2 Installation conditions 16
6.9.3 Environmental design ratings 16
6.10 Mechanical and electrical construction 17
6.10.1 General 17
6.10.2 Overall dimensions and weight 17

6.10.3 Structural design 17
6.10.4 Explosion protection design approval 17
6.11 Operability 17
6.11.1 General 17
6.11.2 Basic configuration 17
6.11.3 Parametrization 17
6.11.4 Operation 17
6.11.5 Diagnosis 18
6.12 Power supply 18
6.13 Certificates and approvals 18
6.14 Component part identifications 18
7 Composite devices 18
8 Additional aspects 18
Annex A (informative) Device Type Dictionary – Classification of infrastructure devices 19
Bibliography 24

Figure 1 – Characterization of infrastructure devices 8
Figure 2 – Assignment of OLOP and DLOPs for infrastructure devices 9

Table 1 – Generic block structure of an OLOP 10
Table 2 – Generic block structure of a DLOP 13
Table A.1 – Classification scheme for infrastructure devices 19

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

Part 31: Lists of Properties (LOPs) of infrastructure devices for electronic data exchange – Generic structures

FOREWORD

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IEC 61987-31 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/802/CDV	65E/895/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. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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 in the data related to the specific document. At this date, the document will be

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

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 have 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.

The IEC 61987 series proposes a method for standardization which will help both suppliers and users of process control 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 process control 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. The IEC 61987 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 while specifying a generic structure for measuring equipment provides several important detail descriptions, such as the handling of composite devices, that are also required for LOPs describing automated industrial valves.

IEC 61987-31 specifies the generic structure for operating (OLOPs) and device lists of properties (DLOPs) for infrastructure devices. Infrastructure devices are devices installed, for example, in network equipment and control rooms. It lays down the framework for further parts of IEC 61987-3x series in which complete LOPs for infrastructure devices of different construction and functional principle will be specified. The generic structure can also serve as a basis for the specification of LOPs for other industrial-process control device types.

Annex A contains a characterisation of infrastructure devices. This is a tree of relationships between different device types. Starting at the root "equipment for industrial-process automation", it introduces the infrastructure devices. This characterisation is used in the Process Automation Domain of the IEC Common Data Dictionary (CDD).

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

Part 31: Lists of Properties (LOPs) of infrastructure devices for electronic data exchange – Generic structures

1 Scope

This part of IEC 61987 provides

- a characterization for the integration of infrastructure devices in the Common Data Dictionary (CDD);
- generic structures in conformance with IEC 61987-10 for Operating Lists of Properties (OLOPs) and Device Lists of Properties (DLOPs) of infrastructure devices.

The generic structures for the OLOP and DLOP contain the most important blocks for infrastructure devices. Blocks pertaining to a specific equipment type will be described in the corresponding part of the IEC 61987 series. Similarly, equipment properties are not part of this part of IEC 61987. For instance, the OLOP and DLOP for I/O-modules are to be found in IEC 61987-32.

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 60534-1, *Industrial-process control valves – Part 1: Control valve terminology and general considerations*

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, *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: List 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, IEC 61987-11 and IEC 60534-1 apply.

ISO and IEC maintain terminological 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/ui

4 General

4.1 Characterization scheme

IEC 61987-1 describes a general classification scheme for industrial process measuring equipment based on measured variables. The introduction of the LOPs of any area of technology into the IEC Common Data Dictionary (CDD) requires the creation of a characterization scheme for the device types of this technology area.

The area of technology considered in this standard concerns infrastructure devices. The characterisation of the area for the CDD is provided in Table A.1.

The enhanced characterization scheme is used for the IEC Component Data Dictionary (CDD). The area of infrastructure devices belongs to the domain of "Process automation" in the CDD.

The area of infrastructure devices is divided into a range of sub-areas. The names of the sub-areas are shown in Figure 1.

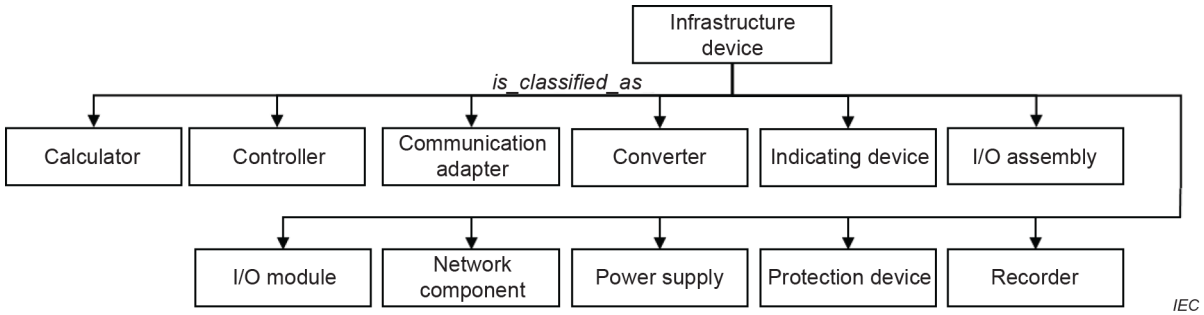


Figure 1 – Characterization of infrastructure devices

4.2 OLOP and DLOP

An Operating List of Properties (OLOP) describes an aspect relating to a device type, for example, the operational environment of the device, the device design requirements as well as all the boundary conditions applicable to the point of operation. The structure element "aspect" is described in IEC 61987-11. Among a range of possible aspects, the operating aspect represented by the OLOP is the most important.

The Device List of Properties (DLOP) is used to describe a given device type, for example an I/O-module, a calculator or a controller. The DLOP describes, for example, the mechanical construction and the electrical construction of a device. Each DLOP describes a particular device type.

Figure 2 shows the relationship between the OLOP and DLOPs for infrastructure devices. The OLOP is valid for the generic DLOP as well as for the DLOPs for the various device types, for example I/O-module, controller, etc.