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Function blocks –

**Part 4:
Rules for compliance profiles**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FUNCTION BLOCKS –

Part 4: Rules for compliance profiles

FOREWORD

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International Standard IEC 61499-4 has been prepared by IEC technical committee 65: Industrial-process measurement and control.

This standard cancels and replaces IEC/PAS 61499-4 published in 2002.

This first edition constitutes a technical revision.

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

CDV	Report on voting
65/349/CDV	65/363/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.

IEC 61499 consists of the following parts, under the general title *Function blocks*:

- Part 1: Architecture
- Part 2: Software tool requirements
- Part 3: Tutorial information
- Part 4: Rules for compliance profiles

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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- withdrawn,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 edition of this standard may be issued at a later date.

Withdrawn
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FUNCTION BLOCKS –

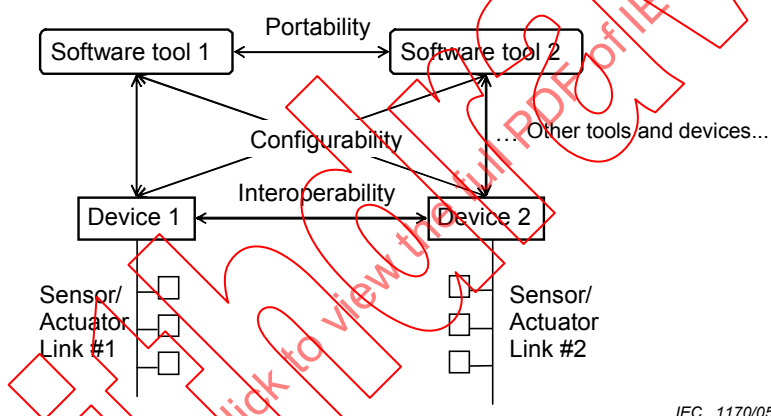
Part 4: Rules for compliance profiles

1 Scope

This part of IEC 61499 defines rules for the development of *compliance profiles* which specify the features of IEC 61499-1 and 61499-2 to be implemented in order to promote the following *attributes* of IEC 61499-based *systems*, *devices* and *software tools*:

- *interoperability* of *devices* from multiple suppliers;
- *portability* of *software* between *software tools* of multiple suppliers; and
- *configurability* of *devices* from multiple vendors by *software tools* of multiple suppliers.

These attributes are illustrated in Figure 1.



IEC 1170/05

Figure 1 – Topics addressed by compliance profiles

NOTE 1 The sensor/actuator links designated #1 and #2 in Figure 1 may be non-interoperable. However, it is intended that systems complying with a particular profile may show the transfer of *events* and *data* from sensors on one link to actuators on another link using appropriately configured and interconnected *service interface function blocks*.

NOTE 2 Compliance profiles may extend their scope beyond that shown in Figure 1 to include interoperability of sensors and actuators.

NOTE 3 Suppliers of *software tools* should assure that their products conform to the requirements of IEC 61499-2 as well as any specific requirements defined in compliance profiles applicable to their particular software tools.

The specification of provisions for the facilitation of device *interchangeability* is beyond the scope of this standard.

2 Normative references

The following referenced documents are indispensable for the application 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 61499-1, *Function blocks – Part 1: Architecture*

IEC 61499-2, *Function blocks – Part 2: Software tools requirements*

ISO/IEC Directives, *Part 2: Rules for the structure and drafting of International Standards*

3 Terms and definitions

NOTE 1 Terms defined in this clause are *italicized* where they appear in the bodies of definitions.

NOTE 2 The ISO/AFNOR *Dictionary of computer science* and the *International Electrotechnical Vocabulary* should be consulted for terms not defined or referenced in this part of IEC 61499.

For the purposes of this document, the terms and definitions given in IEC 61499-1 and IEC 61499-2, as well as the following, apply.

3.1

comply (with a specification)

meet all the requirements (of the specification)

3.2

compliance profile

specification *complying* with the rules given in this part of IEC 61499

3.3

configurability

ability (of a functional unit) to be *configured*

EXAMPLE The *configurability* of a *device* can be expressed by the extent to which it *conforms* to the configurability requirements of a *compliance profile*

3.4

conform (to a specification)

satisfy some, but not necessarily all, of the requirements (of the specification)

EXAMPLE A software tool or a device developed meeting some but not necessarily all of the requirements of a compliance profile is said to "conform to" or to be "conformant with" that compliance profile.

3.5

interoperable

able to operate together to perform a specified set of *functions*

EXAMPLE Two *devices* may be considered *interoperable* if they are able to operate together to perform the *functions* specified in a *system configuration*.

3.6

interchangeable (with a functional unit)

able to be substituted (for the *functional unit*)

EXAMPLE A device may be considered *interchangeable* with another device if it can be substituted for the device in such a way that any distributed *applications* will continue to operate as before the substitution, including identical dynamic responses of any distributed *applications* involving the device.

3.7

portable

able to be accepted and correctly interpreted by multiple software tools

EXAMPLE A software library element is *portable* between two *software tools* if it can be accepted and correctly interpreted by both software tools.

4 Contents of compliance profiles

4.1 Structure of compliance profiles

The contents of compliance profiles shall follow the general outline given in Table 1. Rules for the writing of specific clauses and subclauses of such profiles are given in the remainder of this clause.

The title of a compliance profile shall have the form "IEC 61499 Compliance Profile for <yyy>", where <yyy> is free text denoting the scope of the intended usage of the profile, for example "feasibility demonstrations". The title page or a foreword shall also denote the organization(s) or individual(s) responsible for the development and maintenance of the compliance profile.

Compliance profiles may define features not specified in IEC 61499-1 and 61499-2. Such features shall be described as "extensions to IEC 61499-1" or "extensions to IEC 61499-2" and the compliance profile shall specify their *mapping* to the elements described in IEC 61499-1 or 61499-2, respectively.

Table 1 – Contents of compliance profiles

0	Title
0.1	Foreword
1	Scope
2	Normative documents
3	Terms and definitions
4	Portability provisions
5	Interoperability provisions
6	Configurability provisions
7	Test requirements
8	Annexes

4.2 General provisions of a compliance profile

4.2.1 Scope

Clause 1 of a compliance profile shall address the following subjects:

- a) the intended usage of the compliance profile;
- b) the functional scope addressed by the compliance profile. This may be addressed by a suitably edited version of Figure 1 accompanied by appropriate text;
- c) any additional requirements or restrictions beyond those of IEC 61499-1 and IEC 61499-2 which must be met within the scope of the compliance profile;
- d) any requirements of IEC 61499-1 and IEC 61499-2 which need not be met within the scope of the compliance profile;
- e) provisions of the compliance profile which contradict the normative requirements of IEC 61499-1 and IEC 61499-2, and the technical reasons for such contradiction.

4.2.2 References to normative documents

Clause 2 of a compliance profile shall follow the rules for presentation of normative references given in Part 2 of the ISO/IEC Directives.

4.2.3 Terms and definitions

Clause 3 of a compliance profile shall follow the rules for presentation of terms and definitions given in 6.3.1 of Part 2 of the ISO/IEC Directives.

4.3 Portability provisions

Clause 4 of a compliance profile shall contain the following information.

- The extent to which conforming *software tools* shall be capable of producing library elements in the syntax and with the semantics defined in Annexes A and B of IEC 61499-2.
- The extent to which conforming software tools shall be capable of correctly parsing and interpreting library elements in the syntax and with the semantics defined in Annexes A and B of IEC 61499-2.
- The format of filenames (if any) to be used for the exchange of library elements, for instance, <LibraryElementName>.xml.

4.4 Interoperability provisions

Clause 5 of a compliance profile shall specify the means to be used to meet the requirements for communication among entities within the functional scope of the compliance profile, for instance, in terms of the **semantics** of the event and data inputs and outputs of *communication function blocks* defined in IEC 61499-1.

NOTE The **syntax** of the event and data inputs and outputs of communication function blocks may, but are not required to be, used to meet the requirements of this subclause.

4.5 Configurability provisions

Clause 6 of a compliance profile shall specify the means to be implemented by *devices* and *software tools* to achieve *configurability* of the former by the latter. This may include the definition of one or more configurability classes for devices.

NOTE An example of the definition of configurability classes is shown in Annex B.

4.6 Test requirements

Clause 7 of a compliance profile shall specify the tests (if any) to be performed to ensure compliance with the requirements of the profile.

4.7 Annexes

A compliance profile may contain normative or informative annexes. A normative annex contains provisions which must be satisfied by compliant implementations, while an informative annex shall not contain such provisions. The normative or informative nature of each annex shall be made clear by the way in which it is referred to in the text, by a statement to this effect in a foreword to the compliance profile, and by an indication in the profile's table of contents and under the heading of the annex.

Annex A

(informative)

Example compliance profile

An example document used to guide and record the results of an IEC 61499 feasibility demonstration project undertaken by the Holonic Manufacturing Systems (HMS) Consortium is available online at <http://www.holobloc.com/doc/ita/index.htm>. To save space, this document is not included here. Notices of updates to the referenced document will be posted at <http://www.holobloc.com/>.

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