IEC 61499-4

Edition 2.0 2013-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Function blocks – Part 4: Rules for compliance profiles

Blocs fonctionnels – Partie 4: Règles pour les profils de conformité

IEC 61499-4:2013

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61499-4 has been prepared by subcommittee 65B: Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2005. This edition constitutes a technical revision.

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

Table B.1 has been updated for consistency with Table 8 of IEC 61499-1:2013.

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

FDIS	Report on voting
65B/854/FDIS	65B/862/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.

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

A list of all parts of the IEC 61499 series, published under the general title *Function blocks*, can be found on the IEC website.

Terms defined in IEC 61499-1, IEC 61499-2 and this standard are *italicized*.

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- withdrawn,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.

FUNCTION BLOCKS –

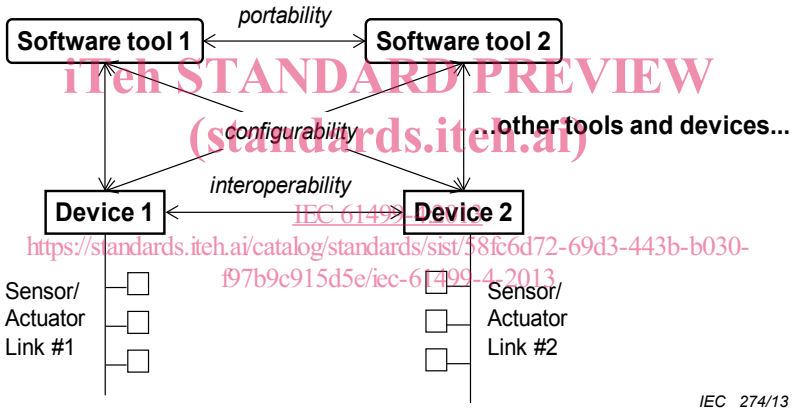
Part 4: Rules for compliance profiles

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.



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* ensure 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.

Figure 1 – Topics addressed by compliance profiles

The specification of provisions for the facilitation of device *interchangeability* is beyond the scope of this part of IEC 61499.

2 Normative references

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 61499-1,— *Function blocks – Part 1: Architecture*[1]

IEC 61499-2,— *Function blocks – Part 2: Software tool requirements*[1]

ISO/IEC Directives, Part 2:2011, *Rules for the structure and drafting of International Standards*

3 Terms and definitions

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.

NOTE 1 Terms defined in this clause are *italicized* where they appear.

NOTE 2 See also the ISO/AFNOR *Dictionary of computer science*[2] and the *International Electrotechnical Vocabulary*[3] for terms not defined or referenced in this part of IEC 61499.

3.1
comply
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
conform to a specification
satisfy some, but not necessarily all, of the requirements (of the specification)

EXAMPLE A *software tool* or a device developed to meet 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
interchangeable with a *functional unit*
able to be substituted (for the functional unit)

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1 To be published. Expected publication date: 2013.

2 See Bibliography.

3 See Bibliography.

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 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 shall be met within the scope of the compliance profile;

d) any requirements of IEC 61499-1 and IEC 61499-2 that need not be met within the scope of the compliance profile;

e) provisions of the compliance profile that contradict the normative requirements of IEC 61499-1 and IEC 61499-2, and the technical reasons for such contradictions.

4.2.2 References to normative documents

Clause 2 of a compliance profile shall follow the rules for 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 terms and definitions given in 6.3.1 and Annex D 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 61499-2:2013.
- 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 61499-2:2013.
- 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.

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 shall 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 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/.