SVENSK STANDARD SS-EN 61499-1

| Fastställd | Utgåva | Sida | Ansvarig kommitté |
|---|---|---|---|
| 2005-10-24 | 1 | 1 (1+111) | SEK TK 65 |



# Funktionsblock – Del 1: Arkitektur

*Function blocks – Part 1: Architecture*

Som svensk standard gäller europastandarden EN 61499-1:2005. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61499-1:2005.

## Nationellt förord

Europastandarden EN 61499-1:2005[*)]

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61499-1, First edition, 2005 - Function blocks - Part 1: Architecture**

utarbetad inom International Electrotechnical Commission, IEC.

[*)] EN 61499-1:2005 ikraftsattes 2005-10-24 som SS-EN 61499-1 genom offentliggörande, d v s utan utgivning av något svenskt dokument.

ICS 25.040.40; 35.240.50

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: SEK, Box 1284, 164 29 KISTA
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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

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Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

## *Var med och påverka!*

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD **EN 61499-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM August 2005

ICS 25.040.40; 35.240.50

English version

# Function blocks
# Part 1: Architecture
(IEC 61499-1:2005)

Blocs fonctionnels
Partie 1: Architecture
(CEI 61499-1:2005)

Funktionsbausteine für industrielle Leitsysteme
Teil 1: Architektur
(IEC 61499-1:2005)

This European Standard was approved by CENELEC on 2005-06-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**



Ref. No. EN 61499-1:2005 E

SEK Svensk Elstandard

## Foreword

The text of the International Standard IEC 61499-1:2005, prepared by IEC TC 65, Industrial-process measurement and control, was submitted to the formal vote and was approved by CENELEC as EN 61499-1 on 2005-06-01 without any modification.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2006-06-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2008-06-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 61499-1:2005 was approved by CENELEC as a European Standard without any modification.

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# Annex ZA
(normative)

## Normative references to international publications with their corresponding European publications

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.

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

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 60050-351 | 1998 | International Electrotechnical Vocabulary Part 351: Automatic control | - | - |
| IEC 61131-3 | 2003 | Programmable controllers Part 3: Programming languages | EN 61131-3 | 2003 |
| ISO/IEC 7498-1 | 1994 | Information technology - Open systems interconnection - Basic reference model Part 1: The basic model | EN ISO/IEC 7498-1 | 1995 |
| ISO/IEC 8824-1 | 2000 | Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation | - | - |
| ISO/IEC 8825-1 | 2000 | Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER) | - | - |
| ISO/IEC 10646 | 2003 | Information technology - Universal multiple-octet coded character set (UCS) | - | - |
| ISO/IEC 10731 | 1994 | Information technology - Open Systems Interconnection Basic reference model - Conventions for the definition of OSI services | - | - |
| ISO/AFNOR ISBN 2-12-4869111-6 | 1989 | Dictionary of computer science - The standardised vocabulary | - | - |

# CONTENTS

# INTRODUCTION

The IEC 61499 series consists of four Parts:

d) Part 1 (this part of IEC 61499) contains:

- general requirements, including scope, normative references, definitions, and reference models;
- rules for the declaration of *function block types*, and rules for the behavior of *instances* of the types so declared;
- rules for the use of function blocks in the *configuration* of distributed Industrial-Process Measurement and Control *Systems* (IPMCSs);
- rules for the use of function blocks in meeting the communication requirements of distributed IPMCSs;
- rules for the use of function blocks in the management of *applications, resources* and *devices* in distributed IPMCSs.

e) Part 2 defines requirements for *software tools* to support the following systems engineering tasks enumerated in Clause 1 of this part of IEC 61499:

- the specification of function block types;
- the functional specification of resource types and device types;
- the specification, analysis, and validation of distributed IPMCSs;
- the *configuration*, *implementation*, operation, and maintenance of distributed IPMCSs;
- the exchange of *information* among *software tools*.

f) Part 3 has the purpose of increasing the understanding, acceptance, and both generic and domain-specific applicability of IPMCS architectures and software tools meeting the requirements of the other Parts, by providing:

- answers to Frequently Asked Questions (FAQs) regarding the IEC 61499 series;
- examples of the use of IEC 61499 constructs to solve frequently encountered problems in control and automation engineering.

g) Part 4 defines rules for the development of *compliance profiles* which specify the features of IEC 61499-1 and IEC 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.

# FUNCTION BLOCKS –

# Part 1: Architecture

## 1 Scope

This part of IEC 61499 defines a generic architecture and presents guidelines for the use of *function blocks* in distributed Industrial-Process Measurement and Control Systems (IPMCSs). This architecture is presented in terms of implementable reference *models*, textual syntax and graphical representations. These models, representations and syntax can be used for:

- the specification and standardization of *function block types*;
- the functional specification and standardization of system elements;
- the implementation independent specification, analysis, and validation of distributed IPMCSs;
- the *configuration*, *implementation*, operation, and maintenance of distributed IPMCSs;
- the exchange of *information* among *software tools* for the performance of the above *functions*.

NOTE 1 This part of IEC 61499 does not restrict or specify the functional capabilities of IPMCSs or their system elements, except as such capabilities are represented using the elements defined herein. IEC 61499-4 addresses the extent to which the elements defined in this part of IEC 61499 may be restricted by the functional capabilities of compliant systems, subsystems, and devices.

Part of the purpose of this part of IEC 61499 is to provide reference models for the use of function blocks in other standards dealing with the support of the system life cycle, including system planning, design, implementation, validation, operation and maintenance. The models given in this part of IEC 61499 are intended to be generic, domain independent and extensible to the definition and use of function blocks in other standards or for particular applications or application domains. It is intended that specifications written according to the rules given in this part of IEC 61499 be concise, implementable, complete, unambiguous, and consistent.

NOTE 2 The provisions of this part of IEC 61499 alone are not sufficient to ensure interoperability among devices of different vendors. Standards complying with this part of IEC 61499 may specify additional provisions to ensure such interoperability.

NOTE 3 Standards complying with this part of IEC 61499 may specify additional provisions to enable the performance of *system*, *device*, *resource* and *application* management *functions*.

## 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 60050-351:1998, *International Electrotechnical Vocabulary (IEV) – Part 351: Automatic Control*

IEC 61131-3:2003, *Programmable controllers – Part 3: Programming languages*

ISO/IEC 7498-1:1994, *Information Technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*

ISO/IEC 8824-1, *Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation)*

ISO/IEC 8825-1, *Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 10646, *Information technology - Universal Multiple-Octet Coded Character Set (UCS)*

ISO/IEC 10731, *Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services*

ISO/AFNOR, *Dictionary of Computer Science*, 1989, ISBN 2-12-4869111-6