SVENSK STANDARD SS-EN 61131-3

Fastställd	Utgåva	Sida	Ansvarig kommitté
2013-07-03	3	1 (1+229)	SEK TK 65

Programmerbara styrsystem – Del 3: Programspråk

Programmable controllers – Part 3: Programming languages

Som svensk standard gäller europastandarden EN 61131-3:2013. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61131-3:2013.

Nationellt förord

Europastandarden EN 61131-3:2013

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61131-3, Third edition, 2013 - Programmable controllers - Part 3: Programming languages**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61131-3, utgåva 2, 2003 gäller ej fr o m 2016-03-27.

ICS 25.040.00; 35.240.50

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

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.

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SEK är Sveriges röst i standardiseringsarbetet inom elområdet

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Stora delar av arbetet sker internationellt

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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

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61131-3

May 2013

ICS 25.040; 35.240.50

Supersedes EN 61131-3:2003

English version

Programmable controllers - Part 3: Programming languages

(IEC 61131-3:2013)

Automates programmables - Partie 3: Langages de programmation (CEI 61131-3:2013)

Speicherprogrammierbare Steuerungen - Teil 3: Programmiersprachen (IEC 61131-3:2013)

This European Standard was approved by CENELEC on 2013-03-27. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61131-3:2013 E

SEK Svensk Elstandard

Foreword

The text of document 65B/858/FDIS, future edition 3 of IEC 61131-3, prepared by IEC TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61131-3:2013.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-12-27
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-03-27

This document supersedes EN 61131-3:2003.

EN 61131-3:2013 includes the following significant technical changes with respect to EN 61131-3:2003:

EN 61131-3:2013 is a compatible extension of EN 61131-3:2003. The main extensions are new data types and conversion functions, references, name spaces and the object oriented features of classes abd function blocks. See Annex B.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61131-3:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60848	NOTE	Harmonised as EN 60848.
IEC 61499 series	NOTE	Harmonised in EN 61499 series.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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

Publication	Year	Title	EN/HD	Year
IEC 61131-1	-	Programmable controllers - Part 1: General information	EN 61131-1	-
IEC 61131-5	-	Programmable controllers - Part 5: Communications	EN 61131-5	-
ISO/IEC 10646	2012	Information technology - Universal Coded Character Set (UCS)	-	-
ISO/IEC/IEEE 60559	-	Information technology - Microprocessor Systems - Floating-Point arithmetic	-	-

CONTENTS

PROGRAMMABLE CONTROLLERS –

Part 3: Programming languages

1 Scope

This part of IEC 61131 specifies syntax and semantics of programming languages for programmable controllers as defined in Part 1 of IEC 61131.

The functions of program entry, testing, monitoring, operating system, etc., are specified in Part 1 of IEC 61131.

This part of IEC 61131 specifies the syntax and semantics of a unified suite of programming languages for programmable controllers (PCs). This suite consists of two textual languages, Instruction List (IL) and Structured Text (ST), and two graphical languages, Ladder Diagram (LD) and Function Block Diagram (FBD).

An additional set of graphical and equivalent textual elements named Sequential Function Chart (SFC) is defined for structuring the internal organization of programmable controller programs and function blocks. Also, configuration elements are defined which support the installation of programmable controller programs into programmable controller systems.

In addition, features are defined which facilitate communication among programmable controllers and other components of automated systems.

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 61131-1, *Programmable controllers – Part 1: General information*

IEC 61131-5, *Programmable controllers – Part 5: Communications*

ISO/IEC 10646:2012, *Information technology – Universal Coded Character Set (UCS)*

ISO/IEC/IEEE 60559, *Information technology – Microprocessor Systems – Floating-Point arithmetic*

Annex B
(informative)

List of major changes and extensions of the third edition

This standard is fully compatible with IEC 61131-3:2003. The following list shows the major changes and extensions:

Editorial improvements: Structure, numbering, order, wording, examples, feature tables

Terms and definitions like class, method, reference, signature

Compliance table format

New major features

- Data types with explicit layout
- Type with named values
- Elementary data types
- Reference, functions and operations with reference; Validate
- Partial access to `ANY_BIT`
- Variable-length `ARRAY`
- Initial value assignment
- Type conversion rules: Implicit – explicit
- Function – call rules, without function result
- Type conversion functions of numerical, bitwise Data, etc.
- Functions of concatenate and split of time and date
- Class, including method, interface, etc.
- Object-oriented FB, including method, interface, etc.
- Namespaces
- Structured Text: `CONTINUE`, etc.
- Ladder Diagram: Contacts for compare (typed and overloaded)
- ANNEX A - Formal specification of language elements

Deletions (of informative parts)

- ANNEX - Examples
- ANNEX - Interoperability with IEC 61499

Deprecations

- Octal literal
- Use of directly represented variables in the body of POUs and methods
- Overloaded truncation `TRUNC`
- Instruction list (IL)
- “Indicator” variable of action block