
Programmable controllers - Part 3: Programming languages

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NORME EUROPÉENNE

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English version

Programmable controllers
Part 3: Programming languages
(IEC 61131-3:2003)

Automates programmables
Partie 3: Langues de programmation
(CEI 61131-3:2003)

Speicherprogrammierbare Steuerungen
Teil 3: Programmiersprachen
(IEC 61131-3:2003)

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This European Standard was approved by CENELEC on 2002-12-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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

Foreword

The text of document 65B/456/FDIS, future edition 2 of IEC 61131-3, prepared by SC 65B, Devices, of IEC TC 65, Industrial-process measurement and control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61131-3 on 2002-12-01.

This European Standard supersedes EN 61131-3:1993.

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) 2003-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-12-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A, B, C, D, E and ZA are normative and annexes F and G are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61131-3:2003 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

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-----------------|---|--------------|--------------------|
| IEC 60050 | Series | International Electrotechnical Vocabulary | - | - |
| IEC 60559 | 1989 | Binary floating-point arithmetic for microprocessor systems | HD 592 S1 | 1991 |
| IEC 60617-12 | 1997 | Graphical symbols for diagrams Part 12: Binary logic elements | EN 60617-12 | 1998 |
| IEC 60617-13 | 1993 | Part 13: Analogue elements | EN 60617-13 | 1993 |
| IEC 60848 | 2002 | GRAFCET specification language for sequential function charts | EN 60848 | 2002 |
| IEC 61131-1 | - ¹⁾ | Programmable controllers Part 1: General information | EN 61131-1 | 1994 ²⁾ |
| IEC 61131-5 | - ¹⁾ | Part 5: Communications | EN 61131-5 | 2001 ²⁾ |
| ISO/AFNOR | 1989 | Dictionary of computer science - The standardised vocabulary | - | - |
| ISO/IEC 10646-1 | 1993 | Information technology - Universal Multiple-Octet Coded Character set (UCS) - Part 1: Architecture and Basic Multilingual Plane | - | - |

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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CONTENTS

| | |
|--|----|
| FOREWORD | 8 |
| 1 General | 9 |
| 1.1 Scope | 9 |
| 1.2 Normative references | 9 |
| 1.3 Definitions | 9 |
| 1.4 Overview and general requirements | 14 |
| 1.4.1 Software model | 14 |
| 1.4.2 Communication model | 16 |
| 1.4.3 Programming model | 18 |
| 1.5 Compliance | 19 |
| 1.5.1 System compliance | 20 |
| 1.5.2 Program compliance | 22 |
| 2 Common elements | 23 |
| 2.1 Use of printed characters | 23 |
| 2.1.1 Character set | 23 |
| 2.1.2 Identifiers | 23 |
| 2.1.3 Keywords | 24 |
| 2.1.4 Use of white space | 24 |
| 2.1.5 Comments | 24 |
| 2.1.6 Pragmas | 25 |
| 2.2 External representation of data | 25 |
| 2.2.1 Numeric literals | 25 |
| 2.2.2 Character string literals | 26 |
| 2.2.3 Time literals | 28 |
| 2.2.3.1 Duration | 28 |
| 2.2.3.2 Time of day and date | 29 |
| 2.3 Data types | 29 |
| 2.3.1 Elementary data types | 30 |
| 2.3.2 Generic data types | 31 |
| 2.3.3 Derived data types | 32 |
| 2.3.3.1 Declaration | 32 |
| 2.3.3.2 Initialization | 33 |
| 2.3.3.3 Usage | 35 |
| 2.4 Variables | 36 |
| 2.4.1 Representation | 36 |
| 2.4.1.1 Single-element variables | 36 |
| 2.4.1.2 Multi-element variables | 38 |
| 2.4.2 Initialization | 38 |
| 2.4.3 Declaration | 39 |
| 2.4.3.1 Type assignment | 41 |
| 2.4.3.2 Initial value assignment | 42 |
| 2.5 Program organization units | 45 |
| 2.5.1 Functions | 45 |
| 2.5.1.1 Representation | 46 |
| 2.5.1.2 Execution control | 49 |
| 2.5.1.3 Declaration | 50 |
| 2.5.1.4 Typing, overloading, and type conversion | 52 |
| 2.5.1.5 Standard functions | 55 |
| 2.5.1.5.1 Type conversion functions | 55 |
| 2.5.1.5.2 Numerical functions | 56 |
| 2.5.1.5.3 Bit string functions | 59 |
| 2.5.1.5.4 Selection and comparison functions | 59 |
| 2.5.1.5.5 Character string functions | 62 |
| 2.5.1.5.6 Functions of time data types | 64 |
| 2.5.1.5.7 Functions of enumerated data types | 66 |

| | | |
|-----------|--|-----|
| 2.5.2 | Function blocks..... | 66 |
| 2.5.2.1 | Representation | 67 |
| 2.5.2.1a) | Use of EN and ENO in function blocks | 68 |
| 2.5.2.2 | Declaration | 69 |
| 2.5.2.3 | Standard function blocks | 77 |
| 2.5.2.3.1 | Bistable elements | 77 |
| 2.5.2.3.2 | Edge detection..... | 78 |
| 2.5.2.3.3 | Counters | 78 |
| 2.5.2.3.4 | Timers..... | 81 |
| 2.5.2.3.5 | Communication function blocks..... | 83 |
| 2.5.3 | Programs | 83 |
| 2.6 | Sequential Function Chart (SFC) elements..... | 84 |
| 2.6.1 | General..... | 84 |
| 2.6.2 | Steps..... | 84 |
| 2.6.3 | Transitions | 86 |
| 2.6.4 | Actions | 89 |
| 2.6.4.1 | Declaration | 89 |
| 2.6.4.2 | Association with steps | 91 |
| 2.6.4.3 | Action blocks | 92 |
| 2.6.4.4 | Action qualifiers | 93 |
| 2.6.4.5 | Action control..... | 94 |
| 2.6.5 | Rules of evolution | 99 |
| 2.6.6 | Compatibility of SFC elements | 107 |
| 2.6.7 | SFC Compliance requirements | 108 |
| 2.7 | Configuration elements..... | 108 |
| 2.7.1 | Configurations, resources, and access paths | 110 |
| 2.7.2 | Tasks | 114 |
| 3 | Textual languages | 123 |
| 3.1 | Common elements | 123 |
| 3.2 | Instruction list (IL) | 123 |
| 3.2.1 | Instructions | 123 |
| 3.2.2 | Operators, modifiers and operands..... | 124 |
| 3.2.3 | Functions and function blocks | 126 |
| 3.3 | Structured Text (ST)..... | 129 |
| 3.3.1 | Expressions | 129 |
| 3.3.2 | Statements | 131 |
| 3.3.2.1 | Assignment statements | 133 |
| 3.3.2.2 | Function and function block control statements | 133 |
| 3.3.2.3 | Selection statements | 133 |
| 3.3.2.4 | Iteration statements | 134 |
| 4 | Graphic languages | 135 |
| 4.1 | Common elements | 135 |
| 4.1.1 | Representation of lines and blocks | 135 |
| 4.1.2 | Direction of flow in networks..... | 135 |
| 4.1.3 | Evaluation of networks | 136 |
| 4.1.4 | Execution control elements | 138 |
| 4.2 | Ladder diagram (LD) | 139 |
| 4.2.1 | Power rails..... | 139 |
| 4.2.2 | Link elements and states..... | 139 |
| 4.2.3 | Contacts | 140 |
| 4.2.4 | Coils..... | 140 |
| 4.2.5 | Functions and function blocks..... | 140 |
| 4.2.6 | Order of network evaluation | 141 |
| 4.3 | Function Block Diagram (FBD)..... | 143 |
| 4.3.1 | General..... | 143 |
| 4.3.2 | Combination of elements..... | 143 |
| 4.3.3 | Order of network evaluation | 143 |

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ANNEX A (normative) Specification method for textual languages 144

A.1 Syntax 144

A.1.1 Terminal symbols 144

A.1.2 Non-terminal symbols 144

A.1.3 Production rules 145

A.2 Semantics 145

ANNEX B (normative) Formal specifications of language elements 146

B.0 Programming model 146

B.1 Common elements 146

B.1.1 Letters, digits and identifiers 146

B.1.2 Constants 147

B.1.2.1 Numeric literals 147

B.1.2.2 Character strings 147

B.1.2.3 Time literals 148

B.1.2.3.1 Duration 148

B.1.2.3.2 Time of day and date 148

B.1.3 Data types 149

B.1.3.1 Elementary data types 149

B.1.3.2 Generic data types 149

B.1.3.3 Derived data types 149

B.1.4 Variables 151

B.1.4.1 Directly represented variables 151

B.1.4.2 Multi-element variables 151

B.1.4.3 Declaration and initialization 152

B.1.5 Program organization units 154

B.1.5.1 Functions 154

B.1.5.2 Function blocks 155

B.1.5.3 Programs 156

B.1.6 Sequential function chart elements 156

B.1.7 Configuration elements 157

B.2 Language IL (Instruction List) 159

B.2.1 Instructions and operands 159

B.2.2 Operators 159

B.3 Language ST (Structured Text) 160

B.3.1 Expressions 160

B.3.2 Statements 160

B.3.2.1 Assignment statements 161

B.3.2.2 Subprogram control statements 161

B.3.2.3 Selection statements 161

B.3.2.4 Iteration statements 161

ANNEX C (normative) Delimiters and keywords 162

ANNEX D (normative) Implementation-dependent parameters 165

ANNEX E (normative) Error conditions 167

ANNEX F (informative) Examples 169

F.1 Function WEIGH 169

F.2 Function block CMD_MONITOR 170

F.3 Function block FWD_REV_MON 173

F.4 Function block STACK_INT 178

F.5 Function block MIX_2_BRIX 183

F.6 Analog signal processing 186

F.6.1 Function block LAG1 187

F.6.2 Function block DELAY 187

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SIST EN 61131-3:2004

<https://standards.iteh.ai/catalog/standards/sist/a6b0592e-74c3-470b-9a5e-84d95925d445/sist-en-61131-3-2004>

| | |
|---|-----|
| F.6.3 Function block AVERAGE | 188 |
| F.6.4 Function block INTEGRAL..... | 188 |
| F.6.5 Function block DERIVATIVE | 189 |
| F.6.6 Function block HYSTERESIS | 189 |
| F.6.7 Function block LIMITS_ALARM..... | 190 |
| F.6.8 Structure ANALOG_LIMITS..... | 190 |
| F.6.9 Function block ANALOG_MONITOR..... | 191 |
| F.6.10 Function block PID..... | 192 |
| F.6.11 Function block DIFFEQ | 193 |
| F.6.12 Function block RAMP | 194 |
| F.6.13 Function block TRANSFER..... | 195 |
| F.7 Program GRAVEL..... | 195 |
| F.8 Program AGV | 203 |
| F.9 Use of enumerated data types | 206 |
| F.10 Function block RTC (Real Time Clock)..... | 206 |
| F.11 Function block ALRM_INT..... | 206 |
| | |
| ANNEX G (informative) Reference character set..... | 208 |
| | |
| Index | 210 |
| | |
| Table 1 - Character set features..... | 23 |
| Table 2 - Identifier features..... | 24 |
| Table 3 - Comment feature..... | 25 |
| Table 3a - Pragma feature..... | 25 |
| Table 4 - Numeric literals..... | 26 |
| Table 5 - Character string literal features..... | 27 |
| Table 6 - Two-character combinations in character strings..... | 28 |
| Table 7 - Duration literal features | 29 |
| Table 8 - Date and time of day literals..... | 29 |
| Table 9 - Examples of date and time of day literals | 29 |
| Table 10 - Elementary data types | 30 |
| Table 11 - Hierarchy of generic data types | 32 |
| Table 12 - Data type declaration features | 33 |
| Table 13 - Default initial values of elementary data types..... | 34 |
| Table 14 - Data type initial value declaration features | 35 |
| Table 15 - Location and size prefix features for directly represented variables..... | 37 |
| Table 16a - Variable declaration keywords | 39 |
| Table 16b - Usages of VAR_GLOBAL, VAR_EXTERNAL and CONSTANT declarations | 41 |
| Table 17 - Variable type assignment features..... | 41 |
| Table 18 - Variable initial value assignment features..... | 43 |
| Table 19 - Graphical negation of Boolean signals | 47 |
| Table 19a - Textual invocation of functions for formal and non-formal argument list | 49 |
| Table 20 - Use of EN input and ENO output | 50 |
| Table 20a - Function features..... | 51 |
| Table 21 - Typed and overloaded functions | 53 |
| Table 22 - Type conversion function features | 55 |
| Table 23 - Standard functions of one numeric variable..... | 57 |
| Table 24 - Standard arithmetic functions..... | 58 |

| | |
|---|-----|
| Table 25 - Standard bit shift functions | 59 |
| Table 26 - Standard bitwise Boolean functions | 60 |
| Table 27 - Standard selection functions ^d | 61 |
| Table 28 - Standard comparison functions | 62 |
| Table 29 - Standard character string functions | 63 |
| Table 30 - Functions of time data types | 64 |
| Table 31 - Functions of enumerated data types | 66 |
| Table 32 - Examples of function block I/O variable usage | 68 |
| Table 33 - Function block declaration and usage features | 71 |
| Table 34 - Standard bistable function blocks ^a | 77 |
| Table 35 - Standard edge detection function blocks | 78 |
| Table 36 - Standard counter function blocks | 79 |
| Table 37 - Standard timer function blocks | 81 |
| Table 38 - Standard timer function blocks - timing diagrams | 82 |
| Table 39 - Program declaration features | 83 |
| Table 40 - Step features | 85 |
| Table 41 - Transitions and transition conditions | 87 |
| Table 42 - Declaration of actions ^{a,b} | 90 |
| Table 43 - Step/action association | 92 |
| Table 44 - Action block features | 93 |
| Table 45 - Action qualifiers | 94 |
| Table 45a - Action control features | 98 |
| Table 46 - Sequence evolution | 101 |
| Table 47 - Compatible SFC features | 108 |
| Table 48 - SFC minimal compliance requirements | 108 |
| Table 49 - Configuration and resource declaration features | 112 |
| Table 50 - Task features | 116 |
| Table 51a - Examples of instruction fields | 124 |
| Table 51b - Parenthesized expression features for IL language | 125 |
| Table 52 - Instruction List operators | 125 |
| Table 53 - Function Block invocation and Function invocation features for IL language | 127 |
| Table 54 - Standard Function Block input operators for IL language | 129 |
| Table 55 - Operators of the ST language | 131 |
| Table 56 - ST language statements | 132 |
| Table 57 - Representation of lines and blocks | 136 |
| Table 58 - Graphic execution control elements | 138 |
| Table 59 - Power rails | 139 |
| Table 60 - Link elements | 140 |
| Table 61 - Contacts ^a | 141 |
| Table 62 - Coils | 142 |
| Table C.1 - Delimiters | 162 |
| Table C.2 - Keywords | 163 |
| Table D.1 - Implementation-dependent parameters | 165 |
| Table E.1 - Error conditions | 167 |

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8495923d45/sist-en-61131-3-2004

| | |
|---|-----|
| Table G.1 - Character representations | 208 |
| Table G.2 - Character encodings | 209 |
| Figure 1 - Software model | 15 |
| Figure 2 a) - Data flow connection within a program..... | 16 |
| Figure 2 b) - Communication via GLOBAL variables..... | 16 |
| Figure 2 c) - Communication function blocks | 17 |
| Figure 2 d) - Communication via access paths | 17 |
| Figure 3 - Combination of programmable controller language elements | 19 |
| Figure 4 - Examples of function usage..... | 45 |
| Figure 5 - Use of formal argument names..... | 48 |
| Figure 6 - Examples of function declarations and usage | 52 |
| Figure 7 - Examples of explicit type conversion with overloaded functions | 54 |
| Figure 8 - Examples of explicit type conversion with typed functions | 54 |
| Figure 9 - Function block instantiation examples | 67 |
| Figure 10 - Examples of function block declarations..... | 70 |
| Figure 11 a) - Graphical use of a function block name as an input variable | 73 |
| Figure 11 b) - Graphical use of a function block name as an in-out variable | 74 |
| Figure 11 c) - Graphical use of a function block name as an external variable | 75 |
| Figure 12 - Declaration and usage of in-out variables in function blocks..... | 76 |
| Figure 14 - ACTION_CONTROL function block - External interface (Not visible to the user) | 95 |
| Figure 15 a) - ACTION_CONTROL function block body with "final scan" logic..... | 96 |
| Figure 15 b) - ACTION_CONTROL function block body without "final scan" logic..... | 97 |
| Figure 16 a) - Action control example - SFC representation..... | 98 |
| Figure 16 b) - Action control example - functional equivalent | 99 |
| Figure 17 - Examples of SFC evolution rules..... | 105 |
| Figure 18 a) - Examples of SFC errors: an "unsafe" SFC..... | 106 |
| Figure 18 b) - Examples of SFC errors: an "unreachable" SFC..... | 107 |
| Figure 19 a) - Graphical example of a configuration | 109 |
| Figure 19 b) - Skeleton function block and program declarations for configuration example | 110 |
| Figure 20 - Examples of CONFIGURATION and RESOURCE declaration features..... | 113 |
| Figure 21 a) - Synchronization of function blocks with explicit task associations | 120 |
| Figure 21 b) - Synchronization of function blocks with implicit task associations | 121 |
| Figure 21 c) - Explicit task associations equivalent to figure 21 b) | 122 |
| Figure 22 - EXIT statement example | 134 |
| Figure 23 - Feedback path example..... | 137 |
| Figure 24 - Boolean OR examples | 143 |

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROGRAMMABLE CONTROLLERS –

Part 3: Programming languages

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61131-3 has been prepared by subcommittee 65B: Devices, of IEC technical committee 65: Industrial-process measurement and control.

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

| FDIS | Report on voting |
|--------------|------------------|
| 65B/456/FDIS | 65B/465/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 second edition of IEC 61131-3 cancels and replaces the first edition, published in 1993, and constitutes a technical revision.

This International Standard has been reproduced without significant modification to its original contents or drafting.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

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

PROGRAMMABLE CONTROLLERS –

Part 3: Programming languages

1 General

1.1 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.

1.2 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 (all parts): *International Electrotechnical Vocabulary (IEV)*

IEC 60559:1989, *Binary floating-point arithmetic for microprocessors systems*

IEC 60617-12:1997, *Graphical symbols for diagrams – Part 12: Binary logic elements*

IEC 60617-13:1993, *Graphical symbols for diagrams – Part 13: Analogue elements*

IEC 60848:2002, *GRAFNET specification language for sequential function charts*

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

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

ISO/AFNOR: 1989, *Dictionary of computer science – The standardised vocabulary*

ISO/IEC 10646-1:1993, *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*

1.3 Definitions

For the purposes of this part of IEC 61131, the following definitions apply. Definitions applying to all parts of IEC 61131 are given in part 1.

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

NOTE 2 The notation “(ISO)” following a definition indicates that the definition is taken from the ISO/AFNOR Dictionary of computer science.

NOTE 3 The ISO/AFNOR Dictionary of computer science and the IEC 60050 should be consulted for terms not defined in this standard.