SVENSK STANDARD SS-EN 61131-2

Fastställd	Utgåva	Sida	Ingår i
2003-09-22	2	1 (1+116)	SEK Område 65

Svenska Elektriska Kommissionen, SEK

Programmerbara styrsystem – Del 2: Utrustning – Fordringar och provning

Programmable controllers – Part 2: Equipment requirements and tests

Som svensk standard gäller europastandarden EN 61131-2:2003[*)]. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61131-2:2003.

Nationellt förord

Europastandarden EN 61131-2:2003

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61131-2, Second edition, 2003 - Programmable controllers - Part 2: Equipment requirements and tests**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare utgiven svensk standard SS-EN 61131-2, utgåva 1, 1995, SS-EN 61131-2/A11, utgåva 1, 1997, SS-EN 61131-2 C1, utgåva 1, 1998 och SS-EN 61131-2/A12, utgåva 1, 2000, gäller ej fr o m 2006-05-01.

[*)] Corrigendum till EN 61131-2:2003 är inarbetat i texten.

ICS 35.240.50; 25.040.40

Denna standard är fastställd av Svenska Elektriska Kommissionen, SEK, som också kan lämna upplysningar om **sakinnehållet** i standarden.
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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.

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

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EUROPEAN STANDARD **EN 61131-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM August 2003

ICS 35.240.50; 25.040.40

Supersedes EN 61131-2:1994 + A11:1996 + A12:2000
Incorporates Corrigendum August 2003

English version

Programmable controllers
Part 2: Equipment requirements and tests
(IEC 61131-2:2003)

Automates programmables
Partie 2: Spécifications et essais des équipements
(CEI 61131-2:2003)

Speicherprogrammierbare Steuerungen
Teil 2: Betriebsmittelanforderungen und Prüfungen
(IEC 61131-2:2003)

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 61131-2:2003 E

Foreword

The text of document 65B/470A/FDIS, future edition 2 of IEC 61131-2, 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 61131-2 on 2003-05-01.

This European Standard supersedes EN 61131-2:1994 + A11:1996 + A12:2000.

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) 2004-02-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-05-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes C and ZA are normative and annexes A, B, D and E informative.
Annex ZA has been added by CENELEC.

The contents of the corrigendum of August 2003 have been included in this copy.

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Endorsement notice

The text of the International Standard IEC 61131-2:2003 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 standard indicated:

IEC 60038	NOTE	Harmonized as HD 472 S1:1989 (modified)
IEC 60112	NOTE	IEC 60112:2003 is harmonized as EN 60112:2003 (not modified)
IEC 60445	NOTE	Harmonized as EN 60445:2000 (not modified)
IEC 60947-5-2	NOTE	Harmonized as EN 60947-5-2:1998 (modified)
IEC 61140	NOTE	Harmonized as EN 61140:2002 (not modified)
IEC 62079	NOTE	Harmonized as EN 62079:2001 (not modified)

Corrigendum to IEC 61131-2:2003:

In Table 41, **replace** “Table 64” by “Table D.2”.

In Table 56, r**eplace** “Figure 13” by “Figure 12”.

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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.

Publication	Year	Title	EN/HD	Year
IEC 60068-2-1	1990	Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993
IEC 60068-2-2	1974	Part 2: Tests - Test B: Dry heat	EN 60068-2-2[1)]	1993
IEC 60068-2-6 + corr. March	1995 1995	Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995
IEC 60068-2-14	1984	Part 2: Tests - Test N: Change of temperature	EN 60068-2-14[2)]	1999
IEC 60068-2-27	1987	Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60068-2-30	1980	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)	EN 60068-2-30[3)]	1999
IEC 60068-2-31	1969	Part 2: Tests - Test Ec: Drop and topple, primarily for equipment-type specimens	EN 60068-2-31[4)]	1993
IEC 60068-2-32	1975	Part 2: Tests - Test Ed: Free fall	EN 60068-2-32[5)]	1991
IEC 60417	series	Graphical symbols for use on equipment	EN 60417	series
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr May	1991 1993

[1)] EN 60068-2-2 includes IEC 60068-2-2A:1976.

[2)] EN 60068-2-14 includes A1:1986 to IEC 60068-2-14.

[3)] EN 60068-2-30 includes A1:1985 to IEC 60068-2-30.

[4)] EN 60068-2-31 includes A1:1982 to IEC 60068-2-31.

[5)] EN 60068-2-32 includes A2:1990 to IEC 60068-2-32.

Publication	Year	Title	EN/HD	Year
IEC 60664-1	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1[6)]	2003
IEC 60664-3	1992	Part 3: Use of coatings to achieve insulation coordination of printed board assemblies	HD 625.3 S1[7)]	1997
IEC 60695-2-1/x	series	Fire hazard testing Part 2: Test methods – Section 1: Glow-wire test and methods	EN 60695-2-1/x[8)]	series
IEC 60707	1999	Flammability of solid non-metallic materials when exposed to flame sources - List of test methods	EN 60707	1999
IEC 60947-5-1	1997	Low-voltage switchgear and controlgear Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1 + A12	1997 1999
IEC 60947-7-1	2002	Part 7-1: Ancillary equipment - Terminal blocks for copper conductors	EN 60947-7-1	2002
IEC 60950-1 (mod)	2001	Information technology equipment - Safety Part 1: General requirements	EN 60950-1	2001
IEC 61000-4-2	1995	Electromagnetic compatibility (EMC) Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	1995
IEC 61000-4-3	2002	Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	2002
IEC 61000-4-4	1995	Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	1995
IEC 61000-4-5	1995	Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61000-4-6	1996	Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	1996

6) EN 60664-1 includes A1:2000 + A2:2002 to IEC 60664-1.

7) HD 625.3 S1 is superseded by EN 60664-3:2003, which is based on IEC 60664-3:2003.

8) EN 60695-2-1/x are superseded by EN 60695-2-10 to EN 60695-2-13:2001, Fire hazard testing, Part 2-1X: Glowing/hot-wire based test methods.

Publication	Year	Title	EN/HD	Year
IEC 61000-4-8	1993	Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	1993
IEC 61000-4-12	1995	Part 4-12: Testing and measurement techniques - Oscillatory waves immunity test	EN 61000-4-12	1995
IEC 61010-1	2001	Safety requirements for electrical equipment for measurement, control, and laboratory use Part 1: General requirements	EN 61010-1 + corr June	2001 2002
CISPR 11 (mod)	1997	Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55011	1998
A1	1999		A1	1999
CISPR 16-1	1999	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	-	-
CISPR 16-2	1996	Part 2: Methods of measurement of disturbances and immunity	-	-
A1	1999		-	-

CONTENTS

PROGRAMMABLE CONTROLLERS –

Part 2: Equipment requirements and tests

1 General

1.1 Scope and object

This Part of IEC 61131 specifies requirements and related tests for programmable controllers (PLC) and their associated peripherals (for example, programming and debugging tools (PADTs), human-machine interfaces (HMIs), etc.) which have as their intended use the control and command of machines and industrial processes.

PLCs and their associated peripherals are intended to be used in an industrial environment and may be provided as open or enclosed equipment. If a PLC or its associated peripherals are Intended for use in other environments, then the specific requirements, standards and installation practices for those other environments must be additionally applied to the PLC and its associated peripherals.

This standard also applies to any products performing the function of PLCs and/or their associated peripherals.

Equipment covered in this standard is intended for use in overvoltage category II (IEC 60664-1) in low-voltage installations, where the rated mains supply voltage does not exceed a.c. 1 000 V r.m.s. (50/60 Hz), or d.c. 1 500 V. (If PLCs or their associated peripherals are applied in overvoltage category III installations, then additional analysis will be required to determine the suitability of the equipment for those applications.)

This standard does not deal with the functional safety or other aspects of the overall automated system. PLCs, their application programme and their associated peripherals are considered as components of a control system.

Since PLCs are component devices, safety considerations for the overall automated system including installation and application are beyond the scope of this standard. However, PLC safety as related to electric shock and fire hazards, electrical interference immunity and error detecting of the PLC-system operation (such as the use of parity checking, self-testing diagnostics, etc.), are addressed. Refer to IEC 60364 or applicable national/local regulations for electrical installation and guidelines.

The object of this standard is

– to establish the definitions and identify the principal characteristics relevant to the selection and application of PLCs and their associated peripherals;
– to specify the minimum requirements for functional, electrical, mechanical, environmental and construction characteristics, service conditions, safety, EMC, user programming and tests applicable to PLCs and the associated peripherals.

This Part also specifies

a) service, storage and transportation requirements for PLCs and their associated peripherals (Clause 4);
b) functional requirements for PLCs and their associated peripherals (Clause 5);
c) EMC requirements for PLCs and their associated peripherals (Clause 8);
d) safety requirements for PLCs and their associated peripherals (Clause 11);

e) information that the manufacturer is required to supply (Clauses 7, 10 and 13);

f) test methods and procedures that are to be used for the verification of compliance of PLCs and their associated peripherals with the requirements (5.12, 8.5, 11.18 and Clause 13).

The tests are type tests or production routine tests, and not tests related to the ways PLC systems are applied.

1.2 Compliance with this standard

When compliance with this Part of IEC 61131 is indicated without qualification, compliance with all clauses, including all tests and verifications required in this part, must be verified. Moreover, the manufacturer's obligations expressed in this part are not waived if no type test is required, or if the test conditions are restricted for practical reasons.

When compliance with some portion of this Part of IEC 61131 is indicated, it is only necessary to verify compliance with those clauses against which the compliance claim is made. The manufacturer's obligations as indicated above are still applicable. The smallest unit of this part for compliance purposes shall be a clause, such as Clauses 5, 8 or 11.

Compliance with a portion of this Part of IEC 61131 is provided to facilitate efforts with respect to particular conformity assessment requirements (for example, Clause 8 as the compliance requirement for the EU electromagnetic compatibility directive or Clause 11 as the compliance requirement for the EU low-voltage directive).

Compliance with constructional requirements and with requirements for information to be provided by the manufacturer shall be verified by suitable examination, visual inspection and/or measurement.

All requirements not tested according to the clauses on tests and verifications shall be verifiable under a procedure to be agreed to by the manufacturer and the user.

The manufacturer shall provide, on request, compliance verification information for all requirements referenced in the claims of compliance with all or a portion of this Part of IEC 61131.

It is the manufacturer's responsibility to ensure that delivered PLC equipment and associated peripherals are equivalent to the sample(s) which have been type-tested according to this Part of IEC 61131 and therefore that they comply with all requirements of this part.

Significant modifications shall be indicated through the use of suitable revision level indexes and markings (see 5.11 and 11.15) and shall comply with this Part of IEC 61131.

NOTE A new type test may be required to confirm compliance.

Where the manufacturer is allowed to select among several options, he shall clearly specify in his catalogues and/or datasheets those to which any portion of the PLC-system equipment complies. This applies to severity classes of voltage drops (i.e. PS1 or PS2) and types of digital inputs (i.e. Type 1 or Type 3).

All relevant functions and parts of the EUT (i.e. units and modules) shall be functioning in such a way that the information paths to/from these functions and parts are exercised.

1.3 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 60068-2-1:1990, *Environmental testing – Part 2: Tests – Tests A: Cold*

IEC 60068-2-2:1974, *Environmental testing – Part 2: Tests – Tests B: Dry heat*

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14:1984, *Environmental testing – Part 2: Tests – Test N: Change of temperature*

IEC 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30:1980, *Environmental testing – Part 2: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)*

IEC 60068-2-31:1969, *Environmental testing – Part 2: Tests – Test Ec: Drop and topple, primarily for equipment-type specimens*

IEC 60068-2-32:1975, *Environmental testing – Part 2: Tests – Test Ed: Free fall (Procedure 1)*

IEC 60417 (all parts), *Graphical symbols for use on equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3:1992, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coatings to achieve insulation coordination of printed board assemblies*

IEC 60695-2-1 (all sheets), *Fire hazard testing – Part 2: Test methods – Section 1: Glow-wire test and methods*

IEC 60707:1999, *Flammability of solid non-metallic materials when exposed to flame sources – List of test methods*

IEC 60947-5-1:1997, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 60947-7-1:2002, *Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment – Terminal blocks for copper conductors*

IEC 60950-1:2001, *Information technology equipment—Safety – Part 1: General requirements*

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2002, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated radio-frequency electromagnetic field immunity test*

IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test*

IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:1996, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances induced by radio-frequency fields*

IEC 61000-4-8:1993, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-12:1995, *Electromagnetic compatibility (EMC) – Part 4-12: Testing and measurement techniques – Oscillatory waves immunity test*

IEC 61010-1:2001, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

CISPR 11:1999, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*

CISPR 16-1:1999, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus*

CISPR 16-2:1999, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2: Methods of measurement of disturbances and immunity*