

**SLOVENSKI
STANDARD**

**SIST EN 61131-
2:1998/A12:2001**

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julij 2001

Amendment A12:2000 to EN 61131-2:1994

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English version

Programmable controllers — Part 2: Equipment requirements and test

(includes amendments A11:1996 and A12:2000)
(IEC 601131-2:1992, modified)

Automates programmables —
Partie 2: Spécifications et essais des
équipements

(inclut les amendements A11:1996 et A12:2000)
(CEI 601131-2:1992, modifié)

Speicherprogrammierbare Steuerungen —
Teil 2: Betriebsmittelanforderungen
Prüfungen

(enthält Änderungen A11:1996 und A12:2000)
(IEC 601131-2:1992, modifiziert)

This European Standard was approved by CENELEC on 1994-03-08. Amendment A11 was approved by CENELEC on 1995-11-28; amendment A12 was approved on 2000-04-01. 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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, 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 CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 1131-2:1992 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 61131-2 on 8 March 1994.

NOTE Finland has no obligation to implement this European Standard.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1995-03-15
- latest date of withdrawal of conflicting national standards (dow) 1995-03-15

For products which have complied with the relevant national standard before 1995-03-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-03-15.

Annexes designated “normative” are part of the body of the standard. Annexes designated “informative” are given only for information. In this standard, Annex A, Annex B, Annex D and Annex ZA are normative and Annex C and Annex E are informative.

Foreword to amendment A11

This amendment was prepared by CENELEC Reporting Secretariat SR 65B.

The text of the draft was submitted to the formal vote and was approved by CENELEC as amendment A11 to EN 61131-2:1994 on 1995-11-28.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1996-12-01

For products which have complied with EN 61131-2:1994 before 1996-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2001-12-01.

Foreword to amendment A12

This amendment to the European Standard EN 61131-2:1994 was prepared by CENELEC Reporting Secretariat SR 65B.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A12 to EN 61131-2:1994 on 2000-04-01.

The following dates were fixed:

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- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2003-01-01

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1 General

1.1 Scope

This International Standard applies to programmable controllers and their associated peripherals such as programming and debugging tools (PADTs), test equipment (TE) and man-machine interfaces (MMIs), etc. Equipment covered in this standard is intended for use in overvoltage category II (see IEC 364-4-443), in low voltage installations, where the rated mains supply voltage does not exceed 1 000 V a.c. (50/60 Hz), or 1 500 V d.c., for the control and command of machines and industrial processes.

Programmable controllers and the associated peripherals are considered as components of a control system and may be provided as enclosed or open equipment. Therefore, *this standard does not deal with the automated system* in which the programmable controller system is but one basic component among many others including its application program.

Since programmable controllers are component devices, overall automated system safety including installation and application is beyond the scope of this standard. For further information, refer to IEC 1131-4 which is intended to help users in reducing the risks. However, electrical noise immunity and error detecting of the PC-system operation such as the use of parity checking, self-testing diagnostics, etc., are addressed.

1.2 Object of the standard

The purposes of this standard are:

- to establish the definitions and identify the principal characteristics relevant to the selection and application of programmable controllers and their associated peripherals;
- to specify the minimum requirements for the functional characteristics, service conditions, construction characteristics, general safety, and tests applicable to programmable controllers and the associated peripherals;
- to define, for each of the most commonly used programming languages: major field of application, syntactic and semantic rules, simple but complete basic sets of programming elements, applicable tests and means by which manufacturers may expand or adapt those basic sets to their own programmable controller implementations;
- to give general tutorial information and application guidelines to the user;
- to define the communication between programmable controllers and other electronic systems using the Manufacturing Message Specification (MMS) defined in ISO/IEC 9506.

1.3 Object of this part

This part specifies

- the electrical, mechanical and functional²⁾ requirements for programmable controllers and the associated peripherals and the service, storage and transportation conditions that apply;
- the information that the manufacturer is required to supply;
- the test methods³⁾ and procedures that are to be used for the verification of compliance of programmable controllers and their associated peripherals with the requirements.

Concerning the electromagnetic compatibility, only the immunity aspect is covered in this part 2.

1.4 Definitions

NOTE This clause contains the definitions of terms which are more specific to the object of this part in order to make it more self-contained. Terms of general use are defined in part 1.

1.4.1

accessible part

- 1) a part which can be touched by the standard jointed test finger (see IEC 529)
- 2) a conductive part which can readily be touched and which is not normally live, but which may become live under fault conditions
[IEV 441-11-10 modified]

²⁾Functional requirements are contained in both the electrical and mechanical clauses.

³⁾The tests are type tests or production routine tests, and not tests related to the ways programmable controller systems are applied.

1.4.2
basic PC-system(s)

representative configuration(s) used for type test. See Figure 1, in 3.1 and 6.3.1

1.4.3
battery

an electrochemical energy source which may be rechargeable or non-rechargeable

1.4.4
circuit, class I, class II, class III

see equipment (1.4.16)

1.4.5
clearance

the shortest distance between two conductive parts, or between a conductive part and the bounding surface of the equipment, measured through air. The bounding surface is the outer surface of the enclosure considered as though metal foil is pressed into contact with accessible surfaces of insulating material

1.4.6
coating, protective

a coating of suitable insulating material that covers the clearance and/or creepage distance of the printed board and conforms to the surface of the board in such a manner that the environment is excluded and the clearance and/or creepage distance can withstand the required impulse and continuous potential

NOTE Coating is normally applied to exclude the effects of atmosphere and to increase the dielectric properties of the clearance and/or creepage distances which would not normally be adequate without coating. Less effective coating may exclude the atmosphere but cannot be relied on to enhance the dielectric properties.

1.4.7
comparative tracking index (CTI)

the numerical value of the maximum voltage at which a material withstands 50 drops of NH_4Cl solution (ammonia chloride) without tracking (see IEC 112)

1.4.8
coverage factor (for modules, units, external wiring, internal wiring, removable cables, interconnections and functions)

the percentage of modules, units, external wirings, internal wirings, removable cables, interconnections, functions, whose removal, absence or failure is detected by built-in test functions or by a suitable test program along with a proper functioning verification procedure. See 6.3.2

1.4.9
creepage distance

the shortest path between two conductive parts, or between a conductive part and bounding conducting surface of the equipment, measured along the surface of the insulation

1.4.10
current sinking

the act of receiving current

1.4.11
current sourcing

the act of supplying current

1.4.12
diversity factor (of an output module)

ratio of the permissible total current (total output current) to the sum of all maximum rated currents of multi-channel output module operating at the most adverse combination of normal service conditions

1.4.13
earth

the conducting mass of the Earth, whose electric potential at any point is conventionally taken as zero [IEV 151-01-07] (synonymous with protective earth)

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Programmable controllers –

**Part 2:
Equipment requirements and tests**

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Révision de la présente publication

Le contenu technique des publications de la C E I est constamment revu par la Commission afin d'assurer qu'il reflète bien l'état actuel de la technique.

Les renseignements relatifs à ce travail de révision, à l'établissement des éditions révisées et aux mises à jour peuvent être obtenus auprès des Comités nationaux de la C E I et en consultant les documents ci-dessous:

- **Bulletin de la C E I**
- **Annuaire de la C E I**
- **Catalogue des publications de la C E I**
Publié annuellement

Terminologie

En ce qui concerne la terminologie générale, le lecteur se reportera à la Publication 50 de la C E I: Vocabulaire Electrotechnique International (VEI), qui est établie sous forme de chapitres séparés traitant chacun d'un sujet défini, l'Index général étant publié séparément. Des détails complets sur le VEI peuvent être obtenus sur demande.

Les termes et définitions figurant dans la présente publication ont été soit repris du VEI, soit spécifiquement approuvés aux fins de cette publication.

Symboles graphiques et littéraux

Pour les symboles graphiques, symboles littéraux et signes d'usage général approuvés par la C E I, le lecteur consultera:

- la Publication 27 de la C E I: Symboles littéraux à utiliser en électrotechnique;
- la Publication 617 de la C E I: Symboles graphiques pour schémas.

Les symboles et signes contenus dans la présente publication ont été soit repris des Publications 27 ou 617 de la C E I, soit spécifiquement approuvés aux fins de cette publication.

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L'attention du lecteur est attirée sur le deuxième feuillet de la couverture, qui énumère les publications de la C E I préparées par le Comité d'Etudes qui a établi la présente publication.

Revision of this publication

The technical content of I E C publications is kept under constant review by the I E C, thus ensuring that the content reflects current technology.

Information on the work of revision, the issue of revised editions and amendment sheets may be obtained from I E C National Committees and from the following I E C sources:

- **I E C Bulletin**
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Terminology

For general terminology, readers are referred to I E C Publication 50: International Electrotechnical Vocabulary (IEV), which is issued in the form of separate chapters each dealing with a specific field, the General Index being published as a separate booklet. Full details of the IEV will be supplied on request.

The terms and definitions contained in the present publication have either been taken from the IEV or have been specifically approved for the purpose of this publication.

Graphical and letter symbols

For graphical symbols, and letter symbols and signs approved by the I E C for general use, readers are referred to:

- I E C Publication 27: Letter symbols to be used in electrical technology;
- I E C Publication 617: Graphical symbols for diagrams.

The symbols and signs contained in the present publication have either been taken from I E C Publications 27 or 617, or have been specifically approved for the purpose of this publication.

I E C publications prepared by the same Technical Committee

The attention of readers is drawn to the back cover, which lists I E C publications issued by the Technical Committee which has prepared the present publication.



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Part 2: Equipment requirements and tests

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Partie 2:

Spécifications et essais des équipements

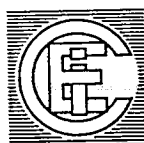
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