NEMA IA 2.8-2005

PROGRAMMABLE CONTROLLERS—

PART 8: GUIDELINES FOR THE APPLICATION AND IMPLEMENTATION OF PROGRAMMING LANGUAGES
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Foreword

This Standards Publication is a NEMA Authorized Engineering Information adopted from IEC TR 61131-8, Programmable Controllers—Part 8: Guidelines for the Application and Implementation of Programming Languages. IEC TR 61131-8 has been published by the International Electrotechnical Commission as a Type 3 Technical Report.

This NEMA Standards Publication was supported and reviewed by the Programmable Controller Technical Committee of the NEMA Automation Products and Systems Section. It was approved in accordance with the bylaws of NEMA and supersedes applicable portions of NEMA Standards Publication ICS 3-1988, Part 3-304.

This Standards Publication represents many years of direct NEMA member participation in IEC Subcommittee 65B/Working Group 7, and reflects the input provided to the IEC from the Programmable Controller Technical Committee.

NEMA Standards Publications are subject to periodic review. They are revised frequently to reflect user input and to meet changing conditions and technical progress. Users should secure the latest editions.

Proposed revisions to this Standards Publication should be submitted to:

Vice President, Technical Services
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752
Rosslyn, Virginia 22209
Referenced Standards

This NEMA Standards Publication references standards published by the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO), and the National Fire Protection Association (NFPA). Copies of these standards are available from:

American National Standards Institute
11 West 42nd Street
New York, NY 10036
Amendments

IEC TR 61131-8, *Programmable Controllers—Part 8: Guidelines for the Application and Implementation of Programming Languages*, is adopted in its entirety.

Authorized Engineering Information

When the phrase “national code” or the like is used in IEC TR 61131-8, reference to ANSI/NFPA 70, *National Electrical Code*, and other applicable codes is to be understood.

Authorized Engineering Information

Where a conflict exists between the provisions of IA 2.8 and other NEMA Standards Publications, the provisions of IA 2.8 should take precedence in the area of programmable controllers and their associated peripherals.

Authorized Engineering Information
Programmable controllers –

Part 8:
Guidelines for the application and implementation of programming languages

Automates programmables –

Partie 8:
Lignes directrices pour l'application et la mise en oeuvre des langages de programmation
Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

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Programmable controllers –

Part 8:
Guidelines for the application and implementation of programming languages

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROGRAMMABLE CONTROLLERS –

Part 8: Guidelines for the application and implementation of programming languages

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, and Guides (hereafter referred to as “IEC Publication(s)”). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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IEC 61131-8, which is a technical report, has been prepared by subcommittee 65B: Devices, of IEC technical committee 65: Industrial-process measurement and control.

This second edition cancels and replaces the first edition, published in 2000, and constitutes a technical revision.

The main changes with respect to the previous edition are to make IEC 61131-8 consistent with IEC 61131-3, 2nd edition.
The text of this technical report is based on the following documents:

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Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.
INTRODUCTION

This part of IEC 61131 is being issued as a technical report in order to provide guidelines for the implementation and application of the programming languages defined in IEC 61131-3: 2003, second edition.

Its contents answer a number of frequently asked questions about the intended application and implementation of the normative provisions of IEC 61131-3, second edition and about its differences from IEC 61131-3:1993, first edition.
1 General

1.1 Scope

This part of IEC 61131, which is a technical report, applies to the programming of programmable controller systems using the programming languages defined in IEC 61131-3. It also provides guidelines for the implementation of these languages in programmable controller systems and their programming support environments (PSEs).

IEC 61131-4 should be consulted for other aspects of the application of programmable controller systems.

NOTE Neither IEC 61131-3 nor this technical report explicitly addresses safety issues of programmable controller systems or their associated software. The various parts of IEC 61508 should be consulted for such considerations.

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 61131-1:1992, Programmable controllers – Part 1: General information

IEC 61131-2:2003, Programmable controllers – Part 2: Equipment requirements and tests


IEC 61131-5:2000, Programmable controllers – Part 5: Communications

1.3 Abbreviated terms

FB Function Block
FBD Function Block Diagram
LD Ladder Diagram
IL Instruction List
POU Program Organization Unit
PSE Programming Support Environment
SFC Sequential Function Chart
ST Structured Text