AS IEC 61131.2:2014
IEC 61131-2, Ed. 3.0 (2007)

AS IEC 61131.2:2014

Programmable controllers

Part 2: Equipment requirements and tests

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- Australian Computer Society
- Australian Industry Group
- Australian Petroleum Production and Exploration Association
- Australian Safety Critical Systems Association
- Consult Australia
- Engineers Australia
- Institute of Chemical Engineers Australia
- Institute of Instrumentation, Control and Automation Australia
- ISACA
- Process Control Society
- University of Queensland
- Workplace Health and Safety Queensland

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Australian Standard®

Programmable controllers

Part 2: Equipment requirements and tests

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PREFACE

This Standard was prepared by the Standards Australia Committee IT-006, Industrial Process Measurement, Control and Automation, to supersede AS IEC 61131.2—2004.

The objective of this Standard is to specify requirements and related tests for programmable controllers (PLCs) and their assorted 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.

This Standard should be read in conjunction with the other parts of the AS IEC 61131 series.

This Standard is identical with, and has been reproduced from, IEC 61131-2, Ed. 3.0 (2007), *Programmable controllers*—Part 2*: Equipment requirements and tests.*

The principal differences between this and the previous edition are given in the Foreword.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this part of IEC 61131' should read 'this Australian Standard'.

(b) A full point substitutes for a comma when referring to a decimal number.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
IEC		AS	
60060	High-voltage test techniques	1931	High-voltage test techniques
60060-1	Part 1: General definitions and test requirements	1931.1	Part 1: General definitions and test requirements
60068	Environmental testing	60068	Environmental testing
60068-2-2	Part 2-2: Tests—Tests B: Dry heat	60068.2.2	Part 2.2: Tests—Tests B: Dry heat
60068-2-6	Part 2-6: Tests—Test Fc: Vibration (sinusoidal)	60068.2.6	Part 2.6: Tests—Test Fc: Vibration (sinusoidal)
60068-2-14	Part 2-14: Tests—Test N: Change of temperature	60068.2.14	Part 2.14: Tests—Test N: Change of temperature
60068-2-27	Part 2-27: Tests—Test Ea and guidance: Shock	60068.2.27	Part 2.27: Tests—Test Ea and guidance: Shock
60068-2-31	Part 2-31: Tests—Test Ec: Drop and topple, primarily for equipment-type specimens	60068.2.31	Part 2.31: Tests—Test Ec: Drop and topple, primarily for equipment-type specimens
60068-2-32	Part 2-32: Tests—Test Ed: Free fall	60068.2.32	Part 2.32: Tests—Test Ed: Free fall
60417	Graphical symbols for use on equipment (series)	60417	Graphical symbols for use on equipment (series)
60529	Degrees of protection provided by enclosures (IP Code)	60529	Degrees of protection provided by enclosures (IP Code)
60947	Low-voltage switchgear and controlgear	60947	Low-voltage switchgear and controlgear
60947-5-1	Part 5-1: Control circuit devices and switching elements—Electromechanical control circuit devices	60947.5.1	Part 5.1: Control circuit devices and switching elements—Electromechanical control circuit devices

Reference to International Standard		*Australian Standard*	
IEC		AS	
60947-5-2	Part 5-2: Control circuit devices and switching elements—Proximity switches	60947.5.2	Part 5.2: Control circuit devices and switching elements—Proximity switches
60947-7-1	Part 7-1: Ancillary equipment—Terminal blocks for copper conductors	60947.7.1	Part 7.1: Ancillary equipment—Terminal blocks for copper conductors
		AS/NZS	
60695	Fire hazard testing	60695	Fire hazard testing
60695-11-10	Part 11-10: Test flames—50 W horizontal and vertical flame test methods	60695.11.10	Part 11.10: Test flames—50 W horizontal and vertical flame test methods
61000	Electromagnetic compatibility (EMC)	61000	Electromagnetic compatibility (EMC)
61000-4-3	Part 4-3: Testing and measurement techniques—Radiated radio-frequency electromagnetic field immunity test	61000.4.3	Part 4.3: Testing and measurement techniques—Radiated radio-frequency electromagnetic field immunity test
61000-4-4	Part 4-4: Testing and measurement techniques—Electrical fast transient/burst immunity test	61000.4.4	Part 4.4: Testing and measurement techniques—Electrical fast transient/burst immunity test
61000-4-5	Part 4-5: Testing and measurement techniques—Surge immunity test	61000.4.5	Part 4.5: Testing and measurement techniques—Surge immunity test
61000-6-1	Part 6-1: Generic standards—Immunity for residential, commercial and light-industrial environments	61000.6.1	Part 6.1: Generic standards—Immunity for residential, commercial and light-industrial environments
61000-6-2	Part 6-2: Generic standards—Immunity for industrial environments	61000.6.2	Part 6.2: General standards—Immunity for industrial environments
61000-6-4	Part 6-4: Generic standards—Emission standard for industrial environments	61000.6.4	Part 6.4: Generic standards—Emission standard for industrial environments
		AS IEC	
61131	Programmable controllers	61131	Programmable controllers
61131-1	Part 1: General information	61131.1	Part 1: General information
61131-3	Part 3: Programming languages	61131.3	Part 3: Programming languages
61131-4	Part 4: User guidelines	61131.4	Part 4: User guidelines
CISPR		AS/NZS CISPR	
16	Specification for radio disturbance and immunity measuring apparatus and methods	16	Specification for radio disturbance and immunity measuring apparatus and methods
16-1-2	Part 1-2: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Conducted disturbances	16.1.2	Part 1.2: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Conducted disturbances
16-1-4	Part 1-4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances	16.1.4	Part 1.4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances

Reference to International Standard		*Australian Standard*	
CISPR 16-2-1	Part 2-1: Methods of measurement of disturbances and immunity—Conducted disturbance measurements	AS/NZS CISPR 16.2.1	Part 2.1: Methods of measurement of disturbances and immunity—Conducted disturbance measurements

Only normative references that have been adopted as Australian or Australian/New Zealand Standard have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

CONTENTS

FOREWORD

This third edition includes the following significant technical changes with respect to the previous edition.

a) DC power port requirements have been moved from Clause 8 to Clause 5.

b) Correction of the following tests of Clause 6:

- voltage range test;
- fast supply voltage variation test;
- slow supply voltage variation test;
- gradual shut-down/start-up test.

c) Change of EMC requirements in Clause 8:

- requirements for radiofrequency interference in Table 33 changed from 3 V to 10 V for Zone B equipment;
- reference to EMC basic standards with the last version;
- reference to generic standards 61000-6-x;
- cable length aligned to generic standards.

d) Correction of the following tests in Clause 9:

- voltage dips and interruptions – power port type tests and verifications.

e) New organization of Clause 11:

- equipment types and protection;
- open PLC-system equipment;
- enclosed PLC-system equipment:
  - Class I equipment;
  - Class II equipment;
  - Class III equipment;
- protection against electric shock;
- definition of secondary circuits which do not pose a risk of electric shock:
  - Class 2 circuit;
  - limited voltage/current circuit;
  - limited voltage circuit;
  - limited energy circuit ≤30 V a.c. or 42,2 V peak;
  - limited impedance circuit;
- protection against the spread of fire within limited power circuits;
- potective earthing requirements for enclosed equipment;
- minor improvements in different subclauses;
- impulse test only for verification of clearances.

INTRODUCTION

IEC 61131-2 is part of a series of standards on programmable controllers and the associated peripherals and should be read in conjunction with the other parts of the series.

Where a conflict exists between this and other IEC standards (except basic safety standards), the provisions of this standard should be considered to govern in the area of programmable controllers and their associated peripherals.

Compliance with IEC 61131-2 cannot be claimed unless the requirements of 7.2 are met.

Service and physical environment requirements are specified in Clause 4. Functional requirements are specified in Clause 5. Electromagnetic compatibility requirements are specified in Clause 8. Safety requirements are specified in Clause 11.

Terms of general use are defined in IEC 61131-1. More specific terms are defined in each part.

AUSTRALIAN STANDARD

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 (PLCs) 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 (light industrial, commercial, residential), then the specific requirements, standards and installation practices for those other environments should 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 equipment 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. Refer to IEC 60364-1 or applicable national/local regulations for electrical installation and guidelines.

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.

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 standard 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);

