

IEC 61131 – Programmable Controllers

Summary of updated versions (as of 2020-10)

Reference: <https://webstore.iec.ch>

IEC 61131-1 Edition 2.0 2003-05 Part 1: **General information**

IEC 61131-1:2003 applies to **programmable controllers (PLC) and their associated peripherals** such as 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**.

It gives the **definitions of terms** used in this standard. It identifies the **principal functional characteristics** of programmable controller systems.

This second edition cancels and replaces the first edition published in 1992 and constitutes a technical revision. This bilingual version (2012-05) corresponds to the monolingual English version, published in 2003-05. **Stability date: 2020.**

IEC 61131-2 Edition 4.0 2017-08 Part 2: **Equipment requirements and tests**

IEC 61131-2:2017 specifies **functional and electromagnetic compatibility requirements and related verification tests** for any product where the primary purpose is performing the function of industrial control equipment, including PLC and/or PAC, and/or their associated peripherals which have as their intended use the control and command of machines, automated manufacturing and industrial processes, e.g. discrete, batch and continuous control.

This fourth edition cancels and replaces the third edition published in 2007. This edition constitutes a technical revision. **Stability date: 2020.**

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

- a) removal of safety requirements and instead pointing to IEC 61010-2-201;
- b) addition of negative logic digital inputs and outputs;
- c) addition of Type 3-d digital input;

- d) addition of 2,7 GHz to 6 GHz requirement for Radio-frequency electro-magnetic amplitude modulated immunity;
- e) clarification of temperature testing;
- f) clarification of type testing;
- g) deprecation of certain technologies;
- h) general update of multiple aspects of functionality and EMC;
- i) reorganization of clauses to associate requirements and verifications more closely.

IEC 61131-3

Edition 3.0

2013-02

Part 3: Programming languages

IEC 61131-3:2013 specifies the **syntax and semantics** of a **unified suite of programming languages** for programmable controllers (PCs).

This suite consists of two **textual languages**, Instruction List (**IL**) and Structured Text (**ST**), and two **graphical languages**, Ladder Diagram (**LD**) and Function Block Diagram (**FBD**).

This third edition cancels and replaces the second edition, published in 2003 and constitutes a technical revision. It includes the following significant technical changes: It is a **compatible extension of the second edition**. The main extensions are **new data types and conversion functions**, references, name spaces and the **object oriented features** of classes and function blocks. **Stability date: 2020.**

IEC TR 61131-4

Edition 2.0

2004-07

Part 4: User guidelines

IEC TR 61131-4:2004 introduces the **end-users** of Programmable Controller (PLC) to the IEC 61131 series, and assists the end-users in their **selection and specification of their PLC equipment** according to the IEC 61131 series. This user guideline has as its main audience PLC end-users.

Stability date: 2020.

IEC 61131-5

Edition 1.0

2000-11

Part 5: Communications

IEC 61131-5:2000 specifies **communication aspects** of a programmable controller. It specifies **from the viewpoint of a PC** (programmable controller) how any device can communicate with a PC as a server and how a PC can communicate with any device.

In particular, it specifies the behavior of the PC as it provides services on behalf of other devices and the services the PC application program can request from other devices.

This bilingual version (2012-08) corresponds to the monolingual English version, published in 2000-11. **Stability date: 2020.**

IEC 61131-6 Edition 1.0 2012-10

Part 6: **Functional safety**

IEC 61131-6:2012 specifies **requirements** for programmable controllers (**PLCs**) and their associated peripherals, as defined in Part 1, which are **intended to be used as the logic subsystem of** an electrical/electronic/programmable electronic (**E/E/PE**) **safety-related system**.

A programmable controller and its associated peripherals complying with the requirements of this part is considered suitable for use in an E/E/PE safety-related system and is identified as a **functional safety programmable logic controller (FS-PLC)**. An FS-PLC is generally a **hardware (HW) / software (SW) subsystem**. An FS-PLC may also include software elements, for example predefined function blocks.

Stability date: 2020.

IEC 61131-7 Edition 1.0 2000-08

Part 7: **Fuzzy control programming**

IEC 61131-7:2000 defines a **language** used by programmable controllers for the programming of **Fuzzy Control applications**.

Stability date: 2020.

IEC TR 61131-8 Edition 3.0 2017-11

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

IEC TR 61131-8:2017(E) applies to the **programming** of programmable controller systems using the programming languages defined in IEC 61131-3. The scope of IEC 61131-3 is applicable to this part.

This document provides

- a) **guidelines for the application of IEC 61131-3**,
- b) guidelines for the **implementation** of IEC 61131-3 languages for programmable controller systems,
- c) **programming and debugging tool (PADT)** recommendations.

For further information see IEC 61131-4 which describes other aspects of the application of programmable controller systems, e.g. electromagnetic compatibility or functional safety.

This third edition cancels and replaces the second edition published in 2003. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition: This third edition is a **compatible extension of the second edition**. The main extensions are **new data types and conversion functions**, references, name spaces and the **object oriented features of classes and function blocks** (see listing in Annex B of IEC 61131-3:2013). **Stability date: 2020**.

IEC 61131-9 Edition 1.0 2013-09

Part 9: **Single-drop digital communication interface for small sensors and actuators (SDCI)**

IEC 61131-9:2013 specifies a **single-drop digital communication interface (SDCI) technology** for **small sensors and actuators** (commonly known as **IO-Link**), which extends the traditional digital input and digital output interfaces as defined in IEC 61131-2 towards a **point-to-point communication link**. This technology enables the **transfer of parameters to Devices** and the **delivery of diagnostic information from the Devices** to the automation system.

Stability date: 2020.

IEC 61131-10 Edition 1.0 2019-04

Part 10: **PLC open XML exchange format**

IEC 61131-10:2019 specifies an **XML-based exchange format** for the **export and import of IEC 61131-3 projects**. A complete IEC 61131-3 project implemented in an IEC 61131-3 environment can be transferred **between different programming environments**. It allows for the **exchange of configuration elements, data types, and POU**s written in:

- the textual language, instruction list (**IL**),
- the textual language, structured text (**ST**),
- the graphical language, ladder diagram (**LD**),
- the graphical language, function block diagram (**FBD**), and
- sequential function chart (**SFC**).

The **exchange format** is specified as a corresponding XML schema. The **XML schema** is an independent file with the .xsd extension and as such part of this specification. The specification of this schema is contained in Annex A. Annex B provides recommended schemata for extensions. An example XML document is given in Annex C. It is assumed that the reader of this document is familiar with XML technology.

Stability date: 2021.