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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 15969.10-2023

**Programmable Controllers - Part 10: PLC open XML exchange
format**

可编程序控制器 第10部分：PLC的XML开放交互格式 可编程序控制器 第10部分：
PLC的XML开放交互格式

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting.

This document is Part 10 of GB/T 15969 "Programmable Controller". GB/T 15969 has published the following parts.

---Part 1: General information;

---Part 2: Equipment requirements and testing;

---Part 3: Programming languages;

- Part 4: User Guide;
- Part 5: Communication;
- Part 6: Functional safety;
- Part 7: Fuzzy control programming;
- Part 8: Application and implementation guidelines for programming languages;
- Part 9: Single-point digital communication interface (SDCI) for small sensors and actuators;
- Part 10: PLC's XML open interaction format.

This document is equivalent to IEC 61131-10:2019 "Programmable Controller Part 10: XML Open Interaction Format for PLC".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Since its advent in 1969, programmable controllers have been widely used in various fields of industrial automation and have become an important pillar of the system. Programmable controller technology is developing very rapidly. First of all, it has developed from a single model to a complete series (micro, small, medium, large, extra large), and functions such as communication, networking, computing, and adaptive control are greatly enhanced; secondly, the application scope is also controlled by logic the control is extended to motion control, process control, batch control, formula control, etc.; thirdly, the control scope is also extended from a single machine to the entire workshop and even the entire Factory-wide and radio remote control, thus covering part of the distributed control system (DCS), numerical control system (NC), robot control system application areas. In short, programmable controllers have continued to expand toward vertical and horizontal integration.

GB/T 15969 has also been continuously modified and expanded with the development of programmable controller technology, and the software, hardware, and peripherals of PLC the equipment and related guidelines have been systematically standardized and are planned to be composed of 10 parts.

---Part 1: General information. The purpose is to establish relevant definitions of programmable controllers and their related peripheral devices, and confirm their Key features relevant to the selection and application of programmable controllers and their peripherals.

---Part 2: Equipment requirements and testing. The purpose is to specify the equipment

requirements and Relevant tests are specified.

---Part 3: Programming languages. The purpose is to define the semantics and syntax of the most commonly used programming languages for programmable controllers.

---Part 4: User Guide. The purpose is to provide PLC end users with general information on GB/T 15969 and help them Select PLC devices and technical specifications according to GB/T 15969 series standards.

---Part 5: Communication. The purpose is to define communication between programmable controllers and other electronic systems.

---Part 6: Functional safety. Specifies the functional safety requirements for programmable controllers and related peripheral equipment. The purpose it consists in establishing and describing the safety life cycle elements of functional safety programmable controllers, and is consistent with those determined in IEC 61508-1~3 be consistent with the general security lifecycle.

---Part 7: Fuzzy control programming. Programming language for fuzzy control and integrating fuzzy control applications into GB/T 15969.3 the basic methods in programming languages are stipulated, with the purpose of realizing the interactive transplantation of fuzzy control programs between different programming systems.

sequence provides the basis.

---Part 8: Application and implementation guidelines for programming languages. The purpose is to help users use the Programming languages for software development.

---Part 9: Single-point digital communication interface (SDCI) for small sensors and actuators. For PLC master stations and equipment the communication services and protocols of the Single Point Digital Communication Interface (SDCI) are standardized with the purpose of integrating the data in GB/T 15969.2 the word IO interface is extended to SDCI.

---Part 10: PLC's XML open interaction format. The purpose is to define the XML interaction format of IEC 61131-3 this method enables the exchange of IEC 61131-3 programs or even the entire IEC 61131-3 project in different development environments.

IEC 61131-3 defines a programming language, but it is only part of the overall solution. Other parts include applications for simulation, debugging, versioning, etc.

Tools for this control, documentation, networking, etc. In order to solve the communication between IEC 61131-3 programs or the entire project between different software platforms XML) interchange format. In addition to textual and program logic information, it also provides the ability to graphically represent information such as the location of function blocks.

and size and how they are connected. If an IEC 61131-3 project is stored in this standard

XML interchange format, it can be reused independent of a particular development environment. Therefore, it can be used by any other development environment that supports this standard XML exchange format environment modification and maintenance.

programmable control Part 10: XML open interaction format for PLC

1.1 Overview

This document specifies the XML interaction format when importing and exporting IEC 61131-3 projects, so that in the development environment that complies with IEC 61131-3 A complete IEC 61131-3 project developed in the environment can be transferred between different development environments. The transferred content can include configuration - Text language, instruction list (InstructionList, IL), - Text language, structured text (StructuredText, ST), - Graphical language, ladder diagram (LadderDiagram, LD), the interaction format is specified by the corresponding XML schema. XML schema is an independent file and become part of this document. The specification of this mode is included in Appendix A. Appendix B gives extended recommendations. appendix C gives an example of an XML document. It is assumed that the reader of this document is familiar with XML technology.

Figure 1 provides an example of the usage of the XML interactive format. Different tools can generate or apply XML-based IEC 61131-3

information.

Figure 1 Overview of XML interactive format usage (example)

The application of XML interactive format not only supports the simple export and import of projects between development environments, but also supports all related information of the project.

Information can be exported, for example, it may need to include coordinate information of graphic controls. The import tool should have a filtering function, that is, it can select part of the information Import the information into the target environment. Supplier related information and attributes may need to be included in the export file and optionally imported where applicable