

ICS 25.040.40

CCS N 18



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

GB/T 15969.8-2025

Replacing GB/T 15969.8-2007

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

可编程序控制器 第8部分：编程语言的应用与实现导则

(English Translation)

Issued on: October 31, 2025

Implemented on: May 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Preface
Introduction
1 Scope
2 Normative References
3 Terms and Definitions
4 Abbreviations
5 Overview
6 Introduction to IEC 61131-3
7 Application Guidelines
8 Implementing Guideline
Appendix A (Informative) Relationship with Other Standards
References

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 8 of GB/T 15969 "Programmable Logic Controllers". GB/T 15969 has already published the following parts.

- Part 1: General Information;
- Part 2: Equipment Requirements and Testing;
- Part 3: Programming Languages;
- Part 4: User Guidelines;
- Part 5: Communication;
- Part 6: Functional Safety;
- Part 7: Fuzzy Control Programming;
- Part 8: Guidelines for the Application and Implementation of Programming Languages;
- Part 9: Single-Point Digital Communication Interface (SDCI) for Small Sensors and Actuators;

---Part 10: XML Open Interactive Format for PLCs.

This document supersedes GB/T 15969.8-2007 "Programmable Logic Controllers Part 8: Guidelines for the Application and Implementation of Programming Languages", and is consistent with...

Compared with GB/T 15969.8-2007, apart from structural adjustments and editorial changes, the main technical changes are as follows.

---Added new data types and functional conversions, references, namespaces, and object-oriented features for classes and functional blocks (see...).

List in Appendix B of GB/T 15969.3-2017 (see 7.1, 7.3, 7.5, 7.11, 8.5).

This document is equivalent to IEC TR61131-8:2017 "Industrial process measurement and control - Programmable controllers - Part 8: Programming languages".

The document type has been changed from an IEC technical report to a Chinese national standard.

The following minimal editorial changes have been made to this document.

---The standard name has been changed to "Programmable Logic Controllers Part 8: Application Implementation Guidelines for Programming Languages".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Industrial Process Measurement, Control and Automation (SAC/TC124).

Introduction

Since its invention, programmable logic controllers (PLCs) have been widely used in various fields of industrial automation and have become an important component of industrial automation systems.

It needs support. Programmable logic controller (PLC) technology is developing very rapidly. Its applications have expanded from logic control to motion control, process control, and batch processing.

Control, formula control, etc.; the control range has expanded from single machine to the entire workshop and even the entire plant, and includes remote radio control, thus covering a wide range of functions.

The application areas of programmable logic controllers (PLCs) include distributed control systems (DCS), numerical control systems (NC), and robot control systems. In short, PLCs

have been continuously...

Expanding towards vertical and horizontal integration.

GB/T 15969 "Programmable Logic Controllers" has been continuously modified and expanded with the development of programmable logic controller technology, and has made further modifications and expansions to the standard.

The controller's software, hardware, peripherals, and related guidelines have been systematically standardized and are proposed to consist of 10 parts.

---Part 1: General Information. The purpose is to establish the relevant definitions of programmable logic controllers (PLCs) and their peripheral devices, and to confirm their compatibility with programmable logic controllers (PLCs).

Key characteristics related to the selection and application of programmable controllers and their peripheral devices.

---Part 2: Equipment Requirements and Testing. This section outlines the equipment requirements and related testing procedures for programmable logic controllers (PLCs) and their peripherals.

The verification process is conducted in accordance with regulations.

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

---Part 4: User Guidelines. The purpose is to provide general information on GB/T 15969 for end users of programmable logic controllers (PLCs), and...

Help them select programmable logic controller (PLC) devices and technical specifications in accordance with GB/T 15969.

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

---Part 6: Functional Safety. This section specifies the functional safety requirements for programmable logic controllers (PLCs) and their related peripheral devices.

The focus is on establishing and describing the safety lifecycle elements of functionally safe programmable controllers, and aligning them with IEC 61508-1, the general safety lifecycle defined in IEC 61508-2 and IEC 61508-3 is consistent.

---Part 7: Fuzzy Control Programming. This section covers programming languages for fuzzy control and integrating fuzzy control applications into GB/T 15969.3 programming.

The basic methods in the language are specified in order to provide a means for the interoperability and portability of fuzzy control programs between different programming

systems.

Provide the foundation.

---Part 8: Guidelines for the Application and Implementation of Programming Languages.
The purpose is to help users utilize the programming languages defined in IEC 61131-3.

Software development is carried out using programming languages.

---Part 9: Single-Point Digital Communication Interface (SDCI) for Small Sensors and Actuators. For use with programmable controllers.

The communication services and protocols for single-point digital communication interfaces of stations and equipment have been standardized, with the aim of conforming to GB/T 15969.2.

The digital I/O interface is being extended to a single-point digital communication interface.

---Part 10: Open XML Interaction Format for PLCs. The aim is to define the XML interaction format according to IEC 61131-3.

This method enables the exchange of GB/T 15969.3 programs, or even the entire GB/T 15969.3 project, in different development environments.

Programmable Logic Controllers Part 8: Programming Languages Application and Implementation Guidelines

1 Scope

This document applies to programming programmable controller systems using the programming languages defined in IEC 61131-3.

The scope of IEC 61131-3 applies to this document.

This document provides.

- a) IEC 61131-3 Application Guidelines;
- b) IEC 61131-3 Language Implementation Guidelines for Programmable Logic Controller Systems;
- c) Recommendations for the use of Programming and Debugging Tools (PADT).

For more information, IEC TR61131-4 describes other aspects of programmable controller system applications, such as electromagnetic compatibility.

Or functional safety.

Note: Neither IEC 61131-3 nor this document explicitly addresses the security issues of programmable logic controller (PLC) systems and their related software. Refer to IEC 61508 (all...).