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NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 25105.2-2025

Replacing GB/T 25105.2-2014

Industrial communication networks - Fieldbus specifications - Type 10: PROFINET IO specifications - Part 2: Application layer protocol specification

工业通信网络 现场总线规范 类型10： PROFINET IO 规范 第2部分：应用层协议规范

(English Translation)

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Preface XLIX

Foreword

This document is in accordance with GB/T 1.1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" Drafting.

This document is GB/T

25105 Industrial Communication Network Fieldbus Specification Type 10.PROFINET Part 2 of the IO Specification GB/T 25105 has released the following parts.

--- Part 1: Application layer service definition;

--- Part 2: Application layer protocol specification;

--- Part 3: PROFINET IO communication profile.

This document replaces GB/T 25105.2-2014 Industrial Communication Network Fieldbus Specification Type 10.PROFINET IO Specifications Part 2: Application layer protocol specification, in line with GB/T Compared with 25105.2-2014, in addition to structural adjustments and editorial changes, the main technical the technical changes are as follows.

--- Added segmentation (see 4.9);

--- Added remote service interface RSI (see 4.8.1.3, 4.8.2, 4.10.3, 5.6.3.15);

--- Added time perception (see 4.12, Appendix J);

--- Added dynamic frame packaging (see 4.12.11.5, 5.2.17);

---Added network configuration (see 4.17);

---Added network management engine (see 5.2, 5.6);

--- Added dynamic reconfiguration (see 5.6.3.12, 5.6.3.13);

---Information security has been added (Table 535, Table 538, Table 543).

This document is equivalent to IEC 61158-6-10:2023 "Industrial Communication Network Fieldbus Specification Part 6-10.Application Layer Protocol Specification Type Part 10.

The following minimal editorial changes were made to this document.

--- In order to coordinate with the existing standards, the name of the standard is changed to "Industrial Communication Network Fieldbus Specification Type 10.

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IO Specification Part 2: Application Layer Protocol Specification".

Introduction

GB/T

25105 is proposed to consist of the following parts.

--- Part 1: Application layer service definition. The purpose is to provide a time-sensitive and non-critical communication platform for applications in an automation environment.

Time-critical message communication provides common elements and PROFINET IO fieldbus-specific data, defined in an abstract way PROFINET the externally visible services provided by the IO fieldbus application layer. Including the abstract model of application resources (objects), service the primitive actions and events of the service, and the parameters associated with each primitive action and event.

--- Part 2: Application layer protocol specification. The purpose is to define PROFINET in an abstract way IO fieldbus application layer provides the externally visible behavior of the application layer protocol data unit transmitted between communication application entities.

The input syntax, the application context state machine of the application service behavior, and the application relationship state machine of the communication behavior.

--- Part 3: PROFINET IO communication profile. The purpose is to define a family of communication profiles for real-time Ethernet (RTE) (CPF3) is an extension of CPF3.CPF3 specifies a set of real-time Ethernet communication profiles and

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10) ISO/IEC/IEEE

8802-3 and other standard related network components. For RTE communication rules, relevant RTE performance indicators and the relationship between performance indicators.

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Fieldbus Specifications for Industrial Communication Networks Type 10.PROFINET IO Specifications Part 2: Application layer protocol specification

1.1 Overview

The Fieldbus Application Layer (FAL) provides a means for user programs to access the Fieldbus communication environment.

The FAL is considered as a "window between corresponding applications".

This document provides basic time-critical and non-time-critical message communication

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between applications in an automation environment.

Provides common elements and PROFINET IO fieldbus-specific information. The term "strict time requirement" is used to indicate that there is a time requirement.

A time window is a time window during which one or more specified actions are required to be completed with a clear level of certainty.

The specified actions may lead to the risk of failure of the application requesting these actions, and even cause danger to instruments, equipment and possible personal injury.

This document defines PROFINET in an abstract way from the following aspects the externally visible behavior provided by the IO fieldbus application layer.

a) defines the abstract syntax of application layer protocol data units transmitted between communicating application entities;

b) defines the transfer syntax of application layer protocol data units transmitted between communicating application entities;

c) an application context state machine that defines the visible application service behaviors between communicating application entities;

d) An application relationship state machine that defines the visible communication behavior between communicating application entities.

The purpose of this document is to define protocols for.

a) Defined in GB/T

The byte transmission order (wire-representation) of the service primitives defined in 25105.1-2025;

b) define the externally visible behavior associated with its transmission.

This document is based on the OSI Basic Reference Model (ISO/IEC 7498-1) and application layer structure (ISO/IEC

9545)

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IO fieldbus application layer protocol.

1.2 Specifications

The primary objective of this document is to specify the syntax and behavior of the application layer protocol that is transmitted over GB/T Defined in 25105.1-2025 Application layer services.

The second goal is to provide an upgrade path to existing industrial communication

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protocols. It is this goal that formed the IEC 61158-6 China Association for Standardization Diversity of discussion.

1.3 Consistency

This document does not specify individual implementations or products, nor does it restrict the implementation of application layer entities within industrial automation systems.

Application layer protocol specifications to achieve consistency.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

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