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

GB/T 47014.1-2026

**Industrial communication networks - Fieldbus specifications -
Type 2 elements: EtherNet/IP, ControlNet and DeviceNet
specifications - Part 1: Data-link layer service definition**

工业通信网络 现场总线规范 类型2元素：EtherNet/IP;ControlNet和DeviceNet
规范 第1部分：数据链路层服务定义

(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 based on GB/T 47014 "Industrial Communication Network Fieldbus Specification Type 2 Element. EtherNet/IP, ControlNet and..." Part 1 of the DeviceNet specification. GB/T 47014 has published the following parts.

---Part 1: Data Link Layer Service Definition;

---Part 2: Data Link Layer Protocol Specifications;

---Part 3: Application Layer Service Definition;

---Part 4: Application Layer Protocol Specifications.

This document is equivalent to IEC 61158-3-2:2023 "Industrial communication networks - Fieldbus specification - Part 3-2.Data link layer services".

Service definition type 2 element.

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

---To align with existing standards, the standard name has been changed to "Industrial Communication Network Fieldbus Specification Type 2 Element.

EtherNet/IP, ControlNet and DeviceNet Specifications Part 1: Data Link Layer Service Definitions.

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

The purpose of this document is to facilitate the interconnection of components in automation systems. It corresponds to the "three-layer" fieldbus parameters described in IEC 61158-1.

It is related to other standards in the series of standards defined by the test model.

In fieldbus standards, the term "service" refers to the abstract capabilities that a layer in the OSI basic reference model provides to the layer above it.

Therefore, the data link layer service defined in this document is a conceptual architecture service, independent of the management and implementation parts.

GB/T 47014 "Industrial Communication Network Fieldbus Specification Type 2 Elements. EtherNet/IP, ControlNet and DeviceNet" the standard is planned to consist of four parts.

---Part 1: Data Link Layer Service Definitions.

---Part 2: Data Link Layer Protocol Specifications.

---Part 3: Application Layer Service Definition.

---Part 4: Application Layer Protocol Specifications.

Industrial Communication Network Fieldbus Specification Type 2 Element.

EtherNet/IP, ControlNet, and DeviceNet Specifications Part 1: Data Link Layer Service Definition

1.1 Overview

This document provides general elements for basic time-strict message communication between devices in an automated environment. The term "time-strict" is used in tables.

There exists a time window within which one or more prescribed actions need to be performed with a defined level of determinism. If Failure to complete the specified action within this time window may cause the application requesting the action to fail, and may also damage the device, factory, and even the system.

Human life is at risk.

This document defines the externally visible services provided by the Type 2 fieldbus data link layer in the following abstract form.

- a) Primitive actions and events of the service;
- b) The parameters associated with each primitive action and event, and the forms they take;

c) The relationships between these actions and events, and their effective sequence.

The purpose of this document is to define the services provided to.

---Type 2 Fieldbus Application Layer, located at the boundary between the application layer and data link layer of the fieldbus reference model;

---System management is located at the intersection of the data link layer and system management in the fieldbus reference model.

Type 2DL services provide connected and unconnected subsets of the service set specified in ISO/IEC 8886.

1.2 Standards

The main purpose of this document is to define the characteristics of conceptual data link layer services applicable to time-strict communication, as a fundamental feature of the OSI model.

This supplements the reference model, guiding the development of time-sensitive communication data link protocols. A secondary objective is to provide a means of migrating from existing industrial communication protocols.

The way.

This document can serve as the basis for formal DL programming interfaces. However, it is not a formal compilation.

Program interfaces, and any such interfaces, need to address implementation issues not covered in this document, including.

- a) Size and byte order of various multi-byte service parameters;
- b) The relationship between paired request and confirmation, or instruction and response primitives.

1.3 Consistency

This document does not specifically specify the implementation or product, nor does it restrict the implementation of data link layer entities in industrial automation systems.

This document does not require consistency from the devices themselves, but rather achieves consistency through the implementation of the corresponding data link protocol, which satisfies the requirements of this document.

Type 2 data link layer service as defined in [the document/reference].