

ICS 25.040
CCS N 10



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

GB/Z 26157.4-2010

**Digital data communication for measurement and control -- Fieldbus for
use in industrial control systems -- Type 2: ControlNet and EtherNet/IP
specification -- Part 4: Network and transport layer**

公告：国家标准公告 2026年第10号

(English Translation)

Issued on: January 14, 2011

Implemented on: June 1, 2011

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of People's Republic of China, China National Standardization
Administration**

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Foreword

IEC 61158:2003 "Fieldbus for the Measurement and Control of Digital Data Communications Industrial Control Systems" includes 10 fieldbus Types of.

- Type 1.IEC technical report;
- Type 2.ControlNet and Ethernet/IP;
- Type 3.PROFIBUS;
- Type 4.P-Net;
- Type 5.FFHSE;
- Type 6.SwiftNet;
- Type 7.WorldFIP;
- Type 8.Interbus;
- Type 9.FFAL;
- Type 10.PROFINET.

The standardization of the guidance of technical documents to amend the use of IEC 61158:2003 "Measurement and Control Digital Data Communications Industrial Control System Fieldbus Type 2. ControlNet and EtherNet/IP Specification Part 4. Network and Transport Layers. " IEC 61158 series of standards will be 10 kinds of fieldbus technology mixed together to write, not easy to domestic engineering and technology Off personnel on a variety of bus technology reading and understanding of the National Industrial Process Measurement and Control Standardization Technical Committee in the use of international standards on time, only used in the country has a wide range of applications 2.ControlNet and EtherNet/IP specification of the relevant technical content, and According to the habits of technology developers will be divided into 10 parts to prepare. In technical content and international standards no difference, for the convenience of me National users, in the text of the structure of the layout of the appropriate adjustments, and according to GB/T 1.1 requirements for the preparation.

GB/Z 26157 "Measurement and Control Digital Data Communication Fieldbus Type for Industrial Control Systems 2.ControlNet and Ether-Net/IP specification "is divided into the following 10 sections.

- GB/Z 26157.1 General Description;
- GB/Z 26157.2 physical layer and media;
- GB/Z 26157.3 data link layer;
- GB/Z 26157.4 network layer and transport layer;

GB/Z 26157.5 Data Management;

GB/Z 26157.6 object model;

GB/Z 26157.7 equipment rules;

GB/Z 26157.8 electronic data sheet;

GB/Z 26157.9 station management;

GB/Z 26157.10 object library.

This guidance document is Part 4.

This guidance document is proposed by China Machinery Industry Federation.

This Guidance Document is governed by the National Technical Committee for Measurement and Control of Industrial Processes (SAC/TC124).

The drafting of the guidance of technical documents. Machinery Industry Instrumentation Technology and Economy Institute, Tsinghua University, Southwest University, Beijing Iron and Steel Design and Research Institute, China Instrument Association, China Mechatronics Technology Association, Shanghai Automation Instrumentation Co., Ltd., Shanghai Engineering Automation Instrumentation Institute, Shanghai Electric Institute of Science (Group) Co., Ltd., Rockwell Automation Research (Shanghai) Co., Ltd.

Introduction

The task of the network and transport layer is to establish and maintain the connection. You can compare a connection to a telephone line. Phone system root when calling is required According to your dial select the path and set the path of each switching station. This virtual channel remains open as the call continues Realize data or voice transmission. In a telephone system, a call can go through several different types of links and the format of the data Different links change, but the same appearance appears before the conversant and the receiving caller. One end of the voice immediately output the other end the sound of.

A connected message has previously agreed on resources and parameters for the source, destination, and all intermediate delivery points. These resources are associated with the only identifier related, does not need to be included in each message, only need to identify the connection ID in the message can indicate the relevant parameters, this leads to a marked improvement in the efficiency of the message.

Unconnected messages provide a way to communicate with a target object that was previously un-agreed resources, so messages should carry all the details of the target ID Emotions, internal data description, details of source ID if needed. No message is used to establish the connection.

The standard and this part of the connection established by the agreement and unconnected together referred to as Control and Information Protocol (CIP).

Measure and control digital data communications Industrial control system with fieldbus
Type 2. ControlNet and EtherNet/IP specifications Part 4. Network layer and transport layer

1 Scope

This guidance document defines the network and transport layer requirements for a node on a defined control network.

The guidance and technical documents applicable to determine the network and transmission control layer corresponds to GB/T 9387 in accordance with the seven ISO model Type 3 and 4. Figure 1 shows the location of the network and transport layer within the OSI model.

Note Most of the terms and models for the network and transport layers come from ISO/IEC 8802-4:1990 or GB/T 15629.3-1995. The type of data used Part 5 data management instructions.

Figure 1 and the ISO/OSI model of the relationship

2.1 Overview

UCMM shall provide unconnected request/response packet service, this service is only used to support multiple unfinished packet processing a single chain road. The number of pending unprocessed messages is implementation-specific. All nodes should have UCMM and support at least one incomplete