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I.S. EN 61158-3-22:2014

Industrial communication networks - Fieldbus specifications - Part 3-22: Data-link layer service definition - Type 22 elements

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61158-3-22

October 2014

ICS 25.040.40; 35.100.20; 35.110

Supersedes EN 61158-3-22:2012

English Version

Industrial communication networks - Fieldbus specifications - Part 3-22: Data-link layer service definition - Type 22 elements (IEC 61158-3-22:2014)

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 3-22: Définition des services de la couche liaison de données - Eléments de type 22 (CEI 61158-3-22:2014)

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Foreword

The text of document 65C/759/FDIS, future edition 2 of IEC 61158-3-22, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61158-3-22:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-06-17
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-09-17

This document supersedes EN 61158-3-22:2012.

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61158-4-22	NOTE	Harmonized as EN 61158-4-22.
IEC 61784-1	NOTE	Harmonized as EN 61784-1.
IEC 61784-2	NOTE	Harmonized as EN 61784-2.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
ISO/IEC 7498-1	-	Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model	-	-
ISO/IEC 7498-3	-	Information technology - Open Systems Interconnection - Basic Reference Model: Naming and addressing	-	-
ISO/IEC 8802-3	2000	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	-	-
ISO/IEC 10731	-	Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services	-	-
IEEE 802.1D	2004	IEEE Standard for local and metropolitan area networks - Media Access Control (MAC) Bridges	-	-
IETF RFC 791	-	Internet Protocol	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Réseaux de communication industriels – Spécifications des bus de terrain – Partie 3-22: Définition des services de la couche liaison de données – Éléments de type 22

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Réseaux de communication industriels – Spécifications des bus de terrain – Partie 3-22: Définition des services de la couche liaison de données – Éléments de type 22

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 3-22: Data-link layer service definition – Type 22 elements

FOREWORD

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NOTE Combinations of protocol types are specified in IEC 61784-1 and IEC 61784-2.

International Standard IEC 61158-3-22 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision. This edition includes the following technical changes with respect to the previous edition.

- Introduction of two new topology scan services.
- Marking old topology scan services as to be discontinued.

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The text of this standard is based on the following documents:

FDIS	Report on voting
65C/759/FDIS	65C/769/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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INTRODUCTION

This part of IEC 61158 is one of a series produced to facilitate the interconnection of automation system components. It is related to other standards in the set as defined by the “three-layer” fieldbus reference model described in IEC 61158-1.

Throughout the set of fieldbus standards, the term “service” refers to the abstract capability provided by one layer of the OSI Basic Reference Model to the layer immediately above. Thus, the data-link layer service defined in this standard is a conceptual architectural service, independent of administrative and implementation divisions.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning Type 22 elements and possibly other types:

WO-2006/069691 A1	[PI]	Control system with a plurality of spatially distributed stations and method for transmitting data in said control system
DE-10 2004 063 213 B4	[PI]	Steuerungssystem mit einer Vielzahl von räumlich verteilten Stationen sowie Verfahren zum Übertragen von Daten in einem solchen Steuerungssystem
EP-1 828 858 A1	[PI]	Control system with a plurality of spatially distributed stations and method for transmitting data in said control system
JP-4 848 469 B2	[PI]	Control system with a plurality of spatially distributed stations and method for transmitting data in said control system
CN-101 111 807	[PI]	Control system with a plurality of spatially distributed stations and method for transmitting data in said control system
US-8 144 718 B2	[PI]	Control system having a plurality of spatially distributed stations, and method for transmitting data in such a control system

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 3-22: Data-link layer service definition – Type 22 elements

1 Scope

1.1 General

This part of IEC 61158 provides common elements for basic time-critical messaging communications between devices in an automation environment. The term “time-critical” is used to represent the presence of a time-window, within which one or more specified actions are required to be completed with some defined level of certainty. Failure to complete specified actions within the time window risks failure of the applications requesting the actions, with attendant risk to equipment, plant and possibly human life.

This standard defines in an abstract way the externally visible service provided by the Type 22 fieldbus data-link layer in terms of:

a) the primitive actions and events of the service;

b) the parameters associated with each primitive action and event, and the form which they take; and

c) the interrelationship between these actions and events, and their valid sequences.

The purpose of this standard is to define the services provided to:

- the Type 22 fieldbus application layer at the boundary between the application and data-link layers of the fieldbus reference model; and
- systems management at the boundary between the data-link layer and systems management of the fieldbus reference model.

1.2 Specifications

The principal objective of this standard is to specify the characteristics of conceptual data-link layer services suitable for time-critical communications, and thus supplement the OSI Basic Reference Model in guiding the development of data-link protocols for time-critical communications. A secondary objective is to provide migration paths from previously-existing industrial communications protocols.

This specification may be used as the basis for formal DL-Programming-Interfaces. Nevertheless, it is not a formal programming interface, and any such interface will need to address implementation issues not covered by this specification, including:

a) the sizes and octet ordering of various multi-octet service parameters; and

b) the correlation of paired request and confirm, or indication and response, primitives.

1.3 Conformance

This standard does not specify individual implementations or products, nor do they constrain the implementations of data-link entities within industrial automation systems.

There is no conformance of equipment to this data-link layer service definition standard. Instead, conformance is achieved through implementation of the corresponding data-link protocol that fulfils the Type 22 data-link layer services defined in this standard.

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