

Edition 1.0 2010-08

INTERNATIONAL STANDARD





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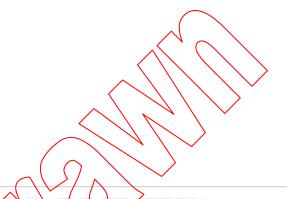
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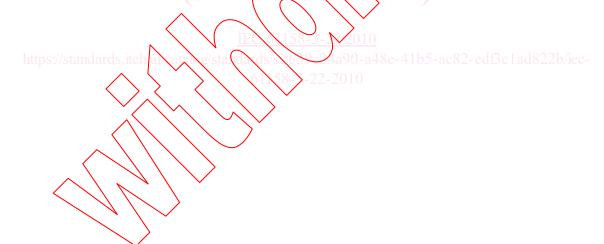


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Industrial communication networks - Fieldbus specifications - Part 3-22: Data-link layer service definition - Type 22 elements



INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE

V

ICS 25.04.40; 35.100.20; 35.110

ISBN 978-2-88912-080-2

CONTENTS

FΟ	REW	ORD	4	
INT	ROD	UCTION	6	
1	Scop	De	7	
	1.1	Overview	7	
	1.2	Specifications	7	
	1.3	Conformance	7	
2	Norr	native References	8	
3	Terms, definitions, symbols, abbreviations and conventions			
	3.1	Reference model terms and definitions	8	
	3.2	Service convention terms and definitions	10	
	3.3		11	
	3.4	Symbols and abbreviations	13	
	3.5	Common conventions	15	
4	Data	I-link layer services and concepts	16	
	4.1	Operating principle	16	
	4.2	Communication models	16	
	4.3	Topology	18	
	4.4	Topology Addressing	19	
	4.5	Gateway	20	
	4.6	Gateway Interaction models	20	
	4.7	Synchronization concept	20	
5	Com	munication services	21	
	5.1	Overview	21	
	5.2	Communication management services		
	5.3	Cyclic data channel service (CDC)		
	5.4	Message channel services (MSC)		
	5.5	Time synchronization		
	5.6	Media independent interface (MII) management services	32	
Bib	liogra			
	<			
Fig	ure 1	- RTFL device reference model	17	
Fig	ure 2	- RTFN device reference model	18	
Fig	ure 3	- Logical double line in a physical tree topology	18	
Fig	ure 4	- Logical double line in a physical line topology	19	
		- Addressing modes		
		- Time sequence diagram for time SYNC_START service		
_		- Synchronized timing signals without offset		
		- Synchronized timing signals with offset		
гıg	uie 6	- Synchronized tilling signals with onset	∠ I	
Tab	ole 1 -	- Summary of DL-services and primitives	22	
Tab	ole 2 -	- DL-Network verification service (NV)	23	
Tab	ole 3 -	- DL-RTFN scan network read service (RTFNSNR)	23	
Tab	ole 4 -	- DL-RTFN connection establishment DLL service (RTFNCE)	24	

Table 5 – DL-RTFN connection release service (RTFNCR)	24
Table 6 – DL-RTFL control service (RTFLCTL)	25
Table 7 – DL-RTFL configuration service (RTFLCFG)	25
Table 8 – DL-Read configuration data service (RDCD)	26
Table 9 – CDC send service (CDCS)	27
Table 10 – MSC send service (MSCS)	28
Table 11 – MSC send broadcast service (MSCSB)	29
Table 12 – MSC read service (MSCR)	
Table 13 – DL-DelayMeasurement start service (DMS)	29
Table 13 – DL-DelayMeasurement start service (DMS)	30
Table 15 – DL-PCS configuration service (PCSC)	30
Table 16 – DL-Sync master configuration service (SYNC_MC)	31
Table 17 – DL-Sync start service (SYNC_START)	31
Table 18 – DL-Sync stop service (SYNC_STOP)	32
Table 19 – DL-MII read service (MIIR)	32
Table 20 – DL-MII write service (MIIW)	33
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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 1 Use of some of the associated protocol types is restricted by their intellectual-property-right holders. In all cases, the commitment to limited release of intellectual-property-rights made by the holders of those rights permits a particular data-link layer protocol type to be used with physical layer and application layer protocols in type combinations as specified explicitly in the profile parts. Use of the various protocol types in other combinations may require permission of their respective intellectual-property-right holders.

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 standard cancels and replaces IEC/PAS 61158-3-22 published in 2009. This first edition constitutes a technical revision.

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

FDIS	Report on voting
65C/604/FDIS	65C/618/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.

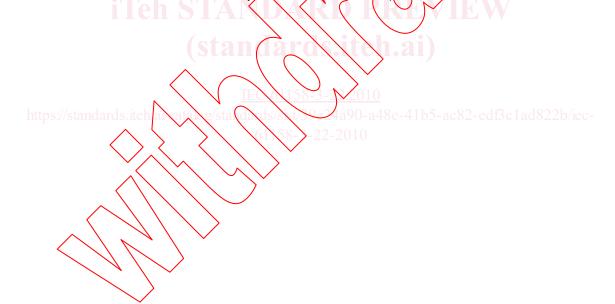
This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61158 series, published under the general title *Industrial* communication networks – Fieldbus specifications, can be found on the IEC web site.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be.

- · reconfirmed.
- withdrawn,
- · replaced by a revised edition, or
- amended.

NOTE The revision of this standard will be sypchronized with the other parts of the IEC 61158 series.



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/TR 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.



INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

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

1 Scope

1.1 Overview

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 datalink 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.

2 Normative References

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

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 10731, Information technology – Open Systems Interconnection – Basic Reference Model – Conventions for the definition of OSI services

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.

3 Terms, definitions, symbols, abbreviations and conventions

For the purposes of this document, the following terms, definitions, symbols, abbreviations and conventions apply.

3.1 Reference model terms and definitions

This standard is based in part on the concepts developed in ISO/IEC 7498-1 and ISO/IEC 7498-3, and makes use of the following terms defined therein:

DL-address 6158-22-2010	[ISO/IEC 7498-3]
called-DL-address	[ISO/IEC 7498-3]
calling-DL-address	[ISO/IEC 7498-3]
DL-connection	[ISO/IEC 7498-1]
DL-connection-end-point	[ISO/IEC 7498-1]
DL-connection-end-point-identifier	[ISO/IEC 7498-1]
DL-connection-mode transmission	[ISO/IEC 7498-1]
DL-connectionless-mode transmission	[ISO/IEC 7498-1]
correspondent (N)-entities	[ISO/IEC 7498-1]
correspondent DL-entities (N=2)	
correspondent Ph-entities (N=1)	
decentralized multi-end-point-connection	[ISO/IEC 7498-1]
DL-duplex-transmission	[ISO/IEC 7498-1]

(N)-entity		[ISO/IEC 7498-1]
	DL-entity (N=2)	
DL-facility	Ph-entity (N=1)	[ISO/IEC 7498-1]
flow control		[ISO/IEC 7498-1]
(N)-layer		[ISO/IEC 7498-1]
	DL-layer (N=2)	
	Ph-layer (N=1)	1100 1150 5 00 11
layer-manage	ement	[JSQ/IEC 7498-1]
DL-local-view	,	[ISO/IEC 7498-3]
multi-endpoin	it-connection	IISONEC 7498-1]
DL-name		[ISOMEC 7498-3]
naming-(addr	ressing)-domain	[ISO/IEC 7498-3]
peer-entities	iTeh STAKDARIC KREY	[ISO/IEC 7498-1]
primitive nam	e (standard ith.ai)	[ISO/IEC 7498-3]
DL-protocol	IEQ 158-3-12010	[ISO/IEC 7498-1]
DL-protocol-c	connection-identifier	[ISO/IEC 7498-1]
DL-protocol-c	lata-unit	[ISO/IEC 7498-1]
DL-relay		[ISO/IEC 7498-1]
reassembling		[ISO/IEC 7498-1]
reset		[ISO/IEC 7498-1]
responding-D	L-address	[ISO/IEC 7498-3]
routing		[ISO/IEC 7498-1]
segmenting		[ISO/IEC 7498-1]
(N)-service		[ISO/IEC 7498-1]
	DL-service (N=2)	
(NI) convice o	Ph-service (N=1)	[ISO/IEC 7409 41
(N)-service-a	DL-service-access-point (N=2)	[ISO/IEC 7498-1]
	Ph-service-access-point (N=1)	
DL-service-ad	ccess-point-address	[ISO/IEC 7498-3]

DL-service-connection-identifier [ISO/IEC 7498-1] DL-service-data-unit [ISO/IEC 7498-1] [ISO/IEC 7498-1] DL-simplex-transmission DL-subsystem [ISO/IEC 7498-1] systems-management [ISO/IEC 7498-1] DL-user-data [ISO/IEC 7498-1] 3.2 Service convention terms and definitions This standard also makes use of the following terms defined in ISO(IEC 10731 as they apply to the data-link layer: acceptor asymmetrical service confirm (primitive); requestor.deliver (primitive) deliver (primitive) DL-confirmed-facility DL-facility DL-local-view DL-mandatory-facility DL-non-confirmed-facility DL-provider-initiated facility DL-provider-optional-facility DL-service-primitive, primitive DL-service-provider DL-service-user DL-user-optional-facility indication (primitive); acceptor.deliver (primitive) multi-peer request (primitive); requestor.submit (primitive) requestor response (primitive); acceptor.submit (primitive) submit (primitive) symmetrical service