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PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

Withdrawn

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

IEC/PAS 61158-3-22:2009(E)

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

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The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
65C/530/PAS	65C/534/RVD

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

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INTRODUCTION

This PAS contains an additional profile – SNpTYPE – which may be integrated into a future new edition of the IEC 61158-3 series.

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

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

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1 Scope

1.1 Overview

This part of IEC 61158-3 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 part of IEC 61158-3 defines in an abstract way the externally visible service provided by the Type SNpTYPE 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 part of IEC 61158-3 is to define the services provided to:

- the Type SNpTYPE 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 part of IEC 61158-3 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 part of IEC 61158-3 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 SNpTYPE data-link layer services defined in this part of IEC 61158-3.

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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 — Basic Reference Model: The Basic Model*

ISO/IEC 7498-3, *Information technology – Open Systems Interconnection – Basic Reference Model — Basic Reference Model: Naming and addressing*

ISO/IEC 10731, *Information technology – Open Systems Interconnection – Basic Reference Model — Conventions for the definition of OSI services*

3 Terms, definitions, symbols, abbreviations and conventions

3.1 Reference model terms and definitions

This part of IEC 61158-3 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:

3.1.1 DL-address [7498-3]

3.1.2 called-DL-address [7498-3]

3.1.3 calling-DL-address [7498-3]

3.1.4 DL-connection [7498-1]

3.1.5 DL-connection-end-point [7498-1]

3.1.6 DL-connection-end-point-identifier [7498-1]

3.1.7 DL-connection-mode transmission [7498-1]

3.1.8 DL-connectionless-mode transmission [7498-1]

3.1.9 correspondent (N)-entities [7498-1]
correspondent DL-entities (N=2)
correspondent Ph-entities (N=1)

3.1.10 decentralized multi-end-point-connection [7498-1]

3.1.11 DL-duplex-transmission [7498-1]

3.1.12 (N)-entity [7498-1]
DL-entity (N=2)
Ph-entity (N=1)

3.1.13 DL-facility [7498-1]

3.1.14 flow control [7498-1]

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3.1.15 (N)-layer [7498-1]
DL-layer (N=2)
Ph-layer (N=1)

3.1.16 layer-management [7498-1]

3.1.17 DL-local-view [7498-3]

3.1.18 multi-endpoint-connection [7498-1]

3.1.19 DL-name [7498-3]

3.1.20 naming-(addressing)-domain [7498-3]

3.1.21 peer-entities [7498-1]

3.1.22 primitive name [7498-3]

3.1.23 DL-protocol [7498-1]

3.1.24 DL-protocol-connection-identifier [7498-1]

3.1.25 DL-protocol-data-unit [7498-1]

3.1.26 DL-relay [7498-1]

3.1.27 reassembling [7498-1]

3.1.28 reset [7498-1]

3.1.29 responding-DL-address [7498-3]

3.1.30 routing [7498-1]

3.1.31 segmenting [7498-1]

3.1.32 (N)-service [7498-1]
DL-service (N=2)
Ph-service (N=1)

3.1.33 (N)-service-access-point [7498-1]
DL-service-access-point (N=2)
Ph-service-access-point (N=1)

3.1.34 DL-service-access-point-address [7498-3]

3.1.35 DL-service-connection-identifier [7498-1]

3.1.36 DL-service-data-unit [7498-1]

3.1.37 DL-simplex-transmission [7498-1]

3.1.38 DL-subsystem [7498-1]

3.1.39 systems-management [7498-1]

3.1.40 DL-user-data [7498-1]

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3.2 Service convention terms and definitions

This part of IEC 61158-3 also makes use of the following terms defined in ISO/IEC 10731 as they apply to the data-link layer:

3.2.1 acceptor

3.2.2 asymmetrical service

3.2.3 confirm (primitive); requestor.deliver (primitive)

3.2.4 deliver (primitive)

3.2.5 DL-confirmed-facility

3.2.6 DL-facility

3.2.7 DL-local-view

3.2.8 DL-mandatory-facility

3.2.9 DL-non-confirmed-facility

3.2.10 DL-provider-initiated-facility

3.2.11 DL-provider-optional-facility

3.2.12 DL-service-primitive; primitive

3.2.13 DL-service-provider

3.2.14 DL-service-user

3.2.15 DL-user-optional-facility

3.2.16 indication (primitive); acceptor.deliver (primitive)

3.2.17 multi-peer

3.2.18 request (primitive); requestor.submit (primitive)

3.2.19 requestor

3.2.20 response (primitive); acceptor.submit (primitive)

3.2.21 submit (primitive)

3.2.22 symmetrical service

3.3 Data-link service terms and definitions

3.3.1
acyclic data
data which is transferred from time to time for dedicated purposes

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