

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Industrial communication networks – Fieldbus specifications –
Part 3-12: Data-link layer service definition – Type 12 elements

Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 3-12: Définition des services de couche liaison de données – Éléments
de type 12



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2019 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22.000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67.000 electrotechnical terminology entries in English and French, extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22.000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67.000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

Industrial communication networks – Fieldbus specifications –
Part 3-12: Data-link layer service definition – Type 12 elements
(standards.iteh.ai)

Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 3-12: Définition des services de couche liaison de données – Éléments
de type 12
93fbd2c08f24/iec-61158-3-12-2019

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.040.40; 35.100.20; 35.110

ISBN 978-2-8322-9112-2

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
1.1 General.....	8
1.2 Specifications	8
1.3 Conformance	8
2 Normative references	9
3 Terms, definitions, symbols, abbreviations and conventions	9
3.1 Reference model terms and definitions	9
3.2 Service convention terms and definitions	10
3.3 Data-link service terms and definitions.....	11
3.4 Symbols and abbreviations	14
3.5 Common conventions.....	16
4 Data-link layer services and concepts.....	17
4.1 Operating principle.....	17
4.2 Topology.....	17
4.3 Data-link layer overview.....	18
4.4 Error detection overview.....	19
4.5 Parameter and process data handling introduction.....	19
4.6 Node reference model.....	19
4.6.1 Mapping onto OSI Basic Reference Model.....	19
4.6.2 Data-link layer features.....	20
4.7 Operation overview.....	20
4.7.1 Relation to ISO/IEC/IEEE 8802-3.....	20
4.7.2 Type 12 modes.....	20
4.7.3 Logical topology	21
4.8 Addressing.....	22
4.8.1 Addressing overview.....	22
4.8.2 Segment addressing	22
4.8.3 Device addressing	22
4.8.4 Logical addressing.....	23
4.8.5 FMMU introduction	23
4.8.6 Sync manager introduction	24
4.9 Slave classification	24
4.9.1 Full slave.....	24
4.9.2 Basic slave	24
4.10 Structure of the communication layer in the slave	24
5 Communication services.....	26
5.1 Overview.....	26
5.2 Read services	26
5.2.1 Overview	26
5.2.2 Positional physical read (APRD).....	26
5.2.3 Configured-address physical read (FPRD).....	27
5.2.4 Broadcast read (BRD).....	28
5.2.5 Logical read (LRD)	28
5.3 Write services	29

5.3.1	Overview	29
5.3.2	Positional physical write (APWR).....	29
5.3.3	Configured-address physical write (FPWR).....	30
5.3.4	Broadcast write (BWR)	30
5.3.5	Logical write (LWR)	31
5.4	Combined read/write services	32
5.4.1	Overview	32
5.4.2	Positional physical read/write (APRW).....	32
5.4.3	Configured-address physical read/write (FPRW).....	32
5.4.4	Broadcast read/write (BRW)	33
5.4.5	Logical read/write (LRW)	34
5.4.6	Positional physical read / multiple write (ARMW)	34
5.4.7	Configured-address physical read / multiple write (FRMW)	35
5.5	Network services	35
5.5.1	Overview	35
5.5.2	Publish network variables (PNV).....	36
5.6	Mailbox	36
5.6.1	Overview	36
5.6.2	Mailbox data transmission services.....	38
6	Local interactions	41
6.1	Read local	41
6.2	Write local.....	41
6.3	Event local.....	42
Bibliography	43
	https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fd2c0824/iec-61158-3-12-2019	
Figure 1 – Mapping of logical data in an Ethernet frame consisting of a single Type 12 DLPDU		18
Figure 2 – Type 12 data-link reference model		20
Figure 3 – Type 12 segments in open mode.....		21
Figure 4 – Type 12 segment in direct mode		21
Figure 5 – Addressing mode overview.....		22
Figure 6 – Fieldbus memory management unit overview		23
Figure 7 – Layering of communication.....		25
Figure 8 – Flow of Type 12 service primitives		26
Figure 9 – Successful mailbox write sequence		37
Figure 10 – Successful mailbox read sequence.....		38
Table 1 – Auto-increment physical read (APRD)		27
Table 2 – Configured-address physical read (FPRD).....		27
Table 3 – Broadcast read (BRD)		28
Table 4 – Logical read (LRD)		29
Table 5 – Auto-increment physical write (APWR)		29
Table 6 – Configured-address physical write (FPWR)		30
Table 7 – Broadcast write (BWR)		31
Table 8 – Logical write (LWR).....		31
Table 9 – Auto-increment physical read/write (APRW)		32

Table 10 – Configured-address physical read/write (FPRW).....	33
Table 11 – Broadcast read/write (BRW)	33
Table 12 – Logical read/write (LRW)	34
Table 13 – Auto-increment physical read / multiple write (ARMW).....	34
Table 14 – Configured-address physical read / multiple write (FRMW).....	35
Table 15 – Publisher network variable (PNV)	36
Table 16 – Mailbox write	38
Table 17 – Mailbox read update	39
Table 18 – Mailbox read	40
Table 19 – Read local	41
Table 20 – Write local	41
Table 21 – Event local	42

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 61158-3-12:2019](https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019)

<https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 3-12: Data-link layer service definition –
Type 12 elements**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

Attention is drawn to the fact that the use of the associated protocol type is restricted by its 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 layer protocol type to be used with other layer protocols of the same type, or in other type combinations explicitly authorized by its intellectual-property-right holders.

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

International Standard IEC 61158-3-12 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- technical corrections in the communication services;
- editorial improvements for clarification.

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

FDIS	Report on voting
65C/945/FDIS	65C/954/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 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 61158-3-12:2019](https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019)

<https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019>

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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[IEC 61158-3-12:2019](https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019)

<https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019>

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 3-12: Data-link layer service definition – Type 12 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 International standard defines in an abstract way the externally visible service provided by the Type 12 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;
- c) the interrelationship between these actions and events, and their valid sequences.

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

- the Type 12 fieldbus application layer at the boundary between the application and data-link layers of the fieldbus reference model;
- 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 document 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 document does not specify individual implementations or products, nor does it 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 12 data-link layer services defined in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE All parts of the IEC 61158 series, as well as IEC 61784-1 and IEC 61784-2 are maintained simultaneously. Cross-references to these documents within the text therefore refer to the editions as dated in this list of normative references.

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/IEEE 8802-3, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Standard for Ethernet*

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

IEEE Std 802.1D, *IEEE Standard for Local and metropolitan area networks – Media Access Control (MAC) Bridges*; available at <http://www.ieee.org> [viewed 2018-09-11]

3 Terms, definitions, symbols, abbreviations and conventions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 Reference model terms and definitions

This document 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	DL-connectionless-mode transmission	[7498-1]
3.1.3	correspondent (N)-entities correspondent DL-entities (N=2) correspondent Ph-entities (N=1)	[7498-1]
3.1.4	DL-duplex-transmission	[7498-1]
3.1.5	(N)-entity DL-entity (N=2) Ph-entity (N=1)	[7498-1]
3.1.6	(N)-layer DL-layer (N=2) Ph-layer (N=1)	[7498-1]
3.1.7	layer-management	[7498-1]
3.1.8	peer-entities	[7498-1]
3.1.9	primitive name	[7498-3]
3.1.10	DL-protocol	[7498-1]
3.1.11	DL-protocol-data-unit	[7498-1]
3.1.12	DL-relay	[7498-1]
3.1.13	reset	[7498-1]
3.1.14	responding-DL-address	[7498-3]
3.1.15	routing	[7498-1]
3.1.16	segmenting	[7498-1]
3.1.17	(N)-service DL-service (N=2) Ph-service (N=1)	[7498-1]
3.1.18	(N)-service-access-point DL-service-access-point (N=2) Ph-service-access-point (N=1)	[7498-1]
3.1.19	DL-service-data-unit	[7498-1]
3.1.20	DL-simplex-transmission	[7498-1]
3.1.21	DL-subsystem	[7498-1]
3.1.22	systems-management	[7498-1]
3.1.23	DLS-user	[7498-1]
3.1.24	DLS-user-data	[7498-1]

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 61158-3-12:2019](https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019)

<https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019>

3.2 Service convention terms and definitions

This document 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-service-primitive;
primitive**
- 3.2.6 **DL-service-provider**
- 3.2.7 **DL-service-user**
- 3.2.8 **DL-user-optional-facility**
- 3.2.9 **indication (primitive);
acceptor.deliver (primitive)**
- 3.2.10 **request (primitive);
requestor.submit (primitive)**
- 3.2.11 **requestor**
- 3.2.12 **response (primitive);
acceptor.submit (primitive)**
- 3.2.13 **submit (primitive)**
- 3.2.14 **symmetrical service**

3.3 **Data-link service terms and definitions**

3.3.1 **application**

function or data structure for which data is consumed or produced

[IEC 61158-3-12:2019](https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019)

3.3.2 **application objects**

multiple object classes that manage and provide a run time exchange of messages across the network and within the network device

3.3.3 **basic slave**

slave device that supports only physical addressing of data

3.3.4 **bit**

unit of information consisting of a 1 or a 0

Note 1 to entry: This is the smallest data unit that can be transmitted.

3.3.5 **client**

<object> object which uses the services of another (server) object to perform a task

3.3.6 **client**

<message> initiator of a message to which a server reacts

3.3.7 **connection**

logical binding between two application objects within the same or different devices

ITIH STANDARD PREVIEW
(standards.iteh.ai)

3.3.8**cyclic**

events which repeat in a regular and repetitive manner

3.3.9**cyclic redundancy check****CRC**

residual value computed from an array of data and used as a representative signature for the array

3.3.10**data**

generic term used to refer to any information carried over a fieldbus

3.3.11**data consistency**

means for coherent transmission and access of the input- or output-data object between and within client and server

3.3.12**device**

physical entity connected to the fieldbus composed of at least one communication element (the network element) and which may have a control element and/or a final element (transducer, actuator, etc.)

iTeh STANDARD PREVIEW

3.3.13**distributed clocks**

method to synchronize slaves and maintain a global time base

<https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019>

3.3.14**DL-segment****link****local link**

single DL-subnetwork in which any of the connected DLEs may communicate directly, without any intervening DL-relaying, whenever all of those DLEs that are participating in an instance of communication are simultaneously attentive to the DL-subnetwork during the period(s) of attempted communication

3.3.15**error**

discrepancy between a computed, observed or measured value or condition and the specified or theoretically correct value or condition

3.3.16**event**

instance of a change of conditions

3.3.17**fieldbus memory management unit**

function that establishes one or several correspondences between logical addresses and physical memory

3.3.18**fieldbus memory management unit entity**

single element of the fieldbus memory management unit: one correspondence between a coherent logical address space and a coherent physical memory location

3.3.19**frame**

denigrated synonym for DLPDU

3.3.20**full slave**

slave device that supports both physical and logical addressing of data

3.3.21**interface**

shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics as appropriate

3.3.22**master**

device that controls the data transfer on the network and initiates the media access of the slaves by sending messages and that constitutes the interface to the control system

3.3.23**mapping**

correspondence between two objects in the way that one object is part of the other object

3.3.24**medium**

cable, optical fibre, or other means by which communication signals are transmitted between two or more points

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Note 1 to entry: "media" is used as the plural of medium.

[IEC 61158-3-12:2019](https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019)

3.3.25**message**

ordered series of octets intended to convey information

<https://standards.iteh.ai/catalog/standards/sist/3206e4c4-1d7f-4a14-b1fb-93fbd2c08f24/iec-61158-3-12-2019>

Note 1 to entry: Normally used to convey information between peers at the application layer.

3.3.26**network**

set of nodes connected by some type of communication medium, including any intervening repeaters, bridges, routers and lower-layer gateways

3.3.27**node**

- a) single DL-entity as it appears on one local link
- b) end-point of a link in a network or a point at which two or more links meet

[SOURCE: IEC 61158-2, for option b), with some wording adjustment]