

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Industrial communication networks – Fieldbus specifications –
Part 6-4: Application layer protocol specification – Type 4 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 6-4: Spécification du protocole de la couche application – Eléments
de type 4**





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 It also gives information on projects, replaced and withdrawn publications.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 online collection - oc.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

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.

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 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

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.

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 online collection - oc.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

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.

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.

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.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

Industrial communication networks – Fieldbus specifications –
Part 6-4: Application layer protocol specification – Type 4 elements

Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 6-4: Spécification du protocole de la couche application – Eléments
de type 4

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.040.40; 35.100.70; 35.110

ISBN 978-2-8322-9702-5

**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	9
2 Normative references	9
3 Terms, definitions, symbols, abbreviations and conventions	9
3.1 Referenced terms and definitions.....	10
3.1.1 ISO/IEC 7498-1 terms.....	10
3.1.2 ISO/IEC 8822 terms.....	10
3.1.3 ISO/IEC 9545 terms.....	10
3.1.4 ISO/IEC 8824-1 terms.....	10
3.1.5 Fieldbus data-link layer terms.....	10
3.2 Abbreviations and symbols	11
3.3 Conventions.....	11
3.3.1 General concept	11
3.3.2 Conventions for state machines for Type 4	12
4 FAL syntax description	13
4.1 FAL-AR PDU abstract syntax	13
4.1.1 General	13
4.1.2 Abstract syntax of APDU header.....	13
4.1.3 Abstract syntax of APDU body.....	14
4.2 Data types	16
5 Transfer syntaxes	16
5.1 APDU encoding	16
5.1.1 APDU Header encoding.....	16
5.1.2 APDU body encoding.....	18
5.2 Variable object encoding and packing	20
5.2.1 Encoding of simple variables	20
5.2.2 Encoding of constructed variables	21
5.2.3 Alignment	22
5.2.4 Variable object attributes	23
5.3 Error codes	24
6 FAL protocol state machines	25
7 AP-context state machine	26
8 FAL service protocol machine (FSPM).....	27
8.1 Primitives exchanged between FAL User and FSPM	27
8.2 FSPM states	27
8.2.1 General	27
8.2.2 FSPM proxy object states	27
8.2.3 FSPM real object state machine description	32
9 Application relationship protocol machine (ARPM).....	34
9.1 Primitives exchanged between ARPM and FSPM.....	34
9.2 ARPM States	34
9.2.1 General	34

9.2.2	Sender state transitions	34
9.2.3	Receiver state transitions	35
10	DLL mapping protocol machine (DMPM)	36
10.1	Data-link Layer service selection	36
10.1.1	General	36
10.1.2	DL-UNITDATA request	36
10.1.3	DL-UNITDATA indication	36
10.1.4	DL-UNITDATA response	36
10.1.5	DLM-Set primitive and parameters	36
10.1.6	DLM-Get primitive and parameters	36
10.2	Primitives exchanged between ARPM and DLPM	36
10.3	Primitives exchanged between DLPM and data-link layer	37
10.4	DLPM states	37
10.4.1	States	37
10.4.2	Sender state transitions	38
10.4.3	Receiver state transitions	39
11	Protocol options	39
	Bibliography	40
	Figure 1 – State transition diagram	12
	Figure 2 – APDU header structure	16
	Figure 3 – Subfields of ControlStatus for Request	17
	Figure 4 – Subfields of ControlStatus for Response with error	17
	Figure 5 – Subfields of ControlStatus for Response with no error	18
	Figure 6 – DataFieldFormat encoding	18
	Figure 7 – Structure of request APDU body	19
	Figure 8 – Structure of response APDU body	19
	Figure 9 – Variable identifier	19
	Figure 10 – Code subfield of variable identifier	19
	Figure 11 – Sequence of data in the APDU body subfield	21
	Figure 12 – MSG consists of APDU header and APDU body	22
	Figure 13 – Summary of FAL architecture	26
	Figure 14 – FSPM proxy object state machine	28
	Figure 15 – FSPM real object state machine	33
	Figure 16 – ARPM state machine	34
	Figure 17 – DLPM state machine	37
	Table 1 – State machine description elements	12
	Table 2 – APDU header	13
	Table 3 – APDU body	15
	Table 4 – Transfer syntax for Array	23
	Table 5 – Transfer syntax for Structure	23
	Table 6 – Common variable object attributes	23
	Table 7 – Variable type identifiers	24
	Table 8 – FIFO variable object attributes	24

Table 9 – Error codes	25
Table 10 – Primitives exchanged between FAL-User and FSPM	27
Table 11 – REQUEST.req FSPM constraints.....	28
Table 12 – REQUEST.req FSPM actions	29
Table 13 – RESPONSE.cnf FSPM constraints	30
Table 14 – RESPONSE.cnf FSPM actions	31
Table 15 – AR Send.ind proxy FSPM constraints	32
Table 16 – AR Send.ind proxy FSPM actions	32
Table 17 – AR Send.ind real FSPM constraints.....	33
Table 18 – AR Send.ind real FSPM Actions	33
Table 19 – Primitives issued by FSPM to ARPM	34
Table 20 – Primitives issued by ARPM to FSPM	34
Table 21 – Primitives issued by ARPM to ARPM.....	34
Table 22 – AR Send.req ARPM constraints	35
Table 23 – AR Send.req ARPM actions.....	35
Table 24 – AR Acknowledge.req ARPM constraints	35
Table 25 – AR Acknowledge.req ARPM actions	35
Table 26 – AR Send.ind ARPM constraints.....	36
Table 27 – AR Send.req ARPM actions.....	36
Table 28 – Primitives issued by ARPM to DLPM.....	37
Table 29 – Primitives issued by DLPM to ARPM	37
Table 30 – Primitives issued by DLPM to data-link layer.....	37
Table 31 – Primitives issued by data-link layer to DLPM.....	37
Table 32 – AR Send.req DLPM constraints	38
Table 33 – AR Send.req DLPM actions	38
Table 34 – AR Acknowledge.req DLPM constraints.....	38
Table 35 – AR Acknowledge.req DLPM actions.....	39
Table 36 – DL-UNITDATA.ind DLPM constraints.....	39
Table 37 – DL-UNITDATA.ind DLPM actions.....	39

iteh STANDARD PREVIEW
 (standards.iteh.ai)
 IEC 61158-6-4:2019
<https://standards.iteh.ai/catalog/standards/sist/8cd656cb-ekd5-4016-b80f-7165016cc0cc/iec-61158-6-4-2019>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
FIELD BUS SPECIFICATIONS –****Part 6-4: Application layer protocol specification –
Type 4 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 61158-6-4 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

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

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

- a) additional user parameters to services;
- b) additional services to support distributed objects;
- c) additional secure services.

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

FDIS	Report on voting
65C/948/FDIS	65C/956/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 the parts of the IEC 61158 series, 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 [IEC 61158-6-4:2019](https://standards.iteh.ai/catalog/standards/sist/8cd656cb-efd5-401b-b80f-14d5cc7eed10/iec-61158-6-4-2019)
- amended. <https://standards.iteh.ai/catalog/standards/sist/8cd656cb-efd5-401b-b80f-14d5cc7eed10/iec-61158-6-4-2019>

ITEH STANDARD PREVIEW
(standards.iteh.ai)

INTRODUCTION

This document 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.

The application protocol provides the application service by making use of the services available from the data-link or other immediately lower layer. The primary aim of this document is to provide a set of rules for communication expressed in terms of the procedures to be carried out by peer application entities (AEs) at the time of communication. These rules for communication are intended to provide a sound basis for development in order to serve a variety of purposes:

- as a guide for implementors and designers;
- for use in the testing and procurement of equipment;
- as part of an agreement for the admittance of systems into the open systems environment;
- as a refinement to the understanding of time-critical communications within OSI.

This document is concerned, in particular, with the communication and interworking of sensors, effectors and other automation devices. By using this document together with other standards positioned within the OSI or fieldbus reference models, otherwise incompatible systems may work together in any combination.

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

[IEC 61158-6-4:2019](https://standards.iteh.ai/catalog/standards/sist/8cd656cb-efd5-401b-b80f-14d5cc7eed10/iec-61158-6-4-2019)

<https://standards.iteh.ai/catalog/standards/sist/8cd656cb-efd5-401b-b80f-14d5cc7eed10/iec-61158-6-4-2019>

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 6-4: Application layer protocol specification – Type 4 elements

1 Scope

1.1 General

The fieldbus application layer (FAL) provides user programs with a means to access the fieldbus communication environment. In this respect, the FAL can be viewed as a “window between corresponding application programs.”

This part of IEC 61158 provides common elements for basic time-critical and non-time-critical messaging communications between application programs in an automation environment and material specific to Type 4 fieldbus. 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 specifies interactions between remote applications and defines the externally visible behavior provided by the Type 4 fieldbus application layer in terms of

- a) the formal abstract syntax defining the application layer protocol data units conveyed between communicating application entities;
- b) the transfer syntax defining encoding rules that are applied to the application layer protocol data units;
- c) the application context state machine defining the application service behavior visible between communicating application entities;
- d) the application relationship state machines defining the communication behavior visible between communicating application entities.

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

- 1) define the wire-representation of the service primitives defined in IEC 61158-5-4, and
- 2) define the externally visible behavior associated with their transfer.

This document specifies the protocol of the Type 4 fieldbus application layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498-1) and the OSI application layer structure (ISO/IEC 9545).

1.2 Specifications

The principal objective of this document is to specify the syntax and behavior of the application layer protocol that conveys the application layer services defined in IEC 61158-5-4.

A secondary objective is to provide migration paths from previously-existing industrial communications protocols. It is this latter objective which gives rise to the diversity of protocols standardized in IEC 61158-6 series.

1.3 Conformance

This document do not specify individual implementations or products, nor do they constrain the implementations of application layer entities within industrial automation systems. Conformance is achieved through implementation of this application layer protocol specification.

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.

IEC 61158-3-4:2019, *Industrial communication networks – Fieldbus specifications – Part 3-4: Data-link layer service definition – Type 4 elements*

IEC 61158-5-4:2019, *Industrial communication networks – Fieldbus specifications – Part 5-4: Application layer service definition – Type 4 elements*

ISO/IEC 7498-1, *Information technology – Open Systems Interconnection – Basic Reference Model – Part 1: The Basic Model*

ISO/IEC 8822, *Information technology – Open Systems Interconnection – Presentation service definition*

<https://standards.iteh.ai/catalog/standards/sist/8cd656cb-efd5-401b-b80f-10/iec-61158-6-4:2019>

ISO/IEC 8824-1, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 9545, *Information technology – Open Systems Interconnection – Application Layer structure*

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

ISO/IEC 9797-1, *Information technology – Security techniques – Message Authentication Codes (MACs) – Part 1: Mechanisms using a block cipher*

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 Referenced terms and definitions

3.1.1 ISO/IEC 7498-1 terms

For the purposes of this document, the following terms as defined in ISO/IEC 7498-1 apply:

- a) application entity
- b) application process
- c) application protocol data unit
- d) application service element
- e) application entity invocation
- f) application process invocation
- g) application transaction
- h) real open system
- i) transfer syntax

3.1.2 ISO/IEC 8822 terms

For the purposes of this document, the following terms as defined in ISO/IEC 8822 apply:

- a) abstract syntax
- b) presentation context

3.1.3 ISO/IEC 9545 terms

For the purposes of this document, the following terms as defined in ISO/IEC 9545 apply:

- a) application-association
- b) application-context
- c) application context name
- d) application-entity-invocation
- e) application-entity-type
- f) application-process-invocation
- g) application-process-type
- h) application-service-element
- i) application control service element

3.1.4 ISO/IEC 8824-1 terms

For the purposes of this document, the following terms as defined in ISO/IEC 8824-1 apply:

- a) object identifier
- b) type

3.1.5 Fieldbus data-link layer terms

For the purposes of this document, the following terms as defined in IEC 61158-3-4 and IEC 61158-4-4 apply.

- a) DL-Time
- b) DL-Scheduling-policy
- c) DLCEP
- d) DLC
- e) DL-connection-oriented mode

- f) DLPDU
- g) DLSDU
- h) DLSAP
- i) network address
- j) node address
- k) node

3.2 Abbreviations and symbols

AE	Application Entity
AL	Application Layer
ALE	Application Layer Entity
APDU	Application Protocol Data Unit
AR	Application Relationship
AREP	Application Relationship End Point
ASE	Application Service Element
Cnf	Confirmation
DL-	(as a prefix) Data-link-
DLCEP	Data-link Connection End Point
DLL	Data-link Layer
DLE	Data-link Entity
DLM	Data-link-management
DLS	Data-link Service
DLSAP	Data-link Service Access Point
DLSDU	DL-service-data-unit
FME	FAL Management Entity
Ind	Indication
IP	Internet Protocol
PDU	Protocol Data Unit
Req	Request
Rsp	Response
SME	System Management Entity
.cnf	Confirm Primitive
.ind	Indication Primitive
.req	Request Primitive
.rsp	Response Primitive

3.3 Conventions

3.3.1 General concept

The FAL is defined as a set of object-oriented ASEs. Each ASE is specified in a separate subclause. Each ASE specification is composed of three parts: its class definitions, its services, and its protocol specification. The first two are contained in IEC 61158-5-4. The protocol specification for each of the ASEs is defined in this document.

The class definitions define the attributes of the classes supported by each ASE. The attributes are accessible from instances of the class using the Management ASE services specified in IEC 61158-5-4. The service specification defines the services that are provided by the ASE.

This document uses the descriptive conventions given in ISO/IEC 10731.

3.3.2 Conventions for state machines for Type 4

A state machine describes the state sequence of an entity and can be represented by a state transition diagram and/or a state table.

In a state transition diagram (see Figure 1), the transition between two states represented by circles is illustrated by an arrow beside which the transition events or conditions are presented.

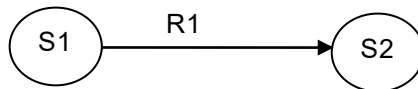


Figure 1 – State transition diagram

Table 1 – State machine description elements

#	Current state	Events or conditions that trigger this state transaction => action	Next state
Name of this transition	The current state to which this state transition applies	Events or conditions that trigger this state transaction. The actions that are taken when the above events or conditions are met. The actions are always indented below events or conditions	The next state after the actions in this transition is taken

The conventions used in the state transition table (Table 1) are as follows.

:= Value of an item on the left is replaced by value of an item on the right. If an item on the right is a parameter, it comes from the primitive shown as an input event.

xxx A parameter name.

Example:

Identifier:= reason

means value of a 'reason' parameter is assigned to a parameter called 'Identifier.'
"xxx" Indicates fixed value.

Example:

Identifier:= "abc"

means value "abc" is assigned to a parameter named 'Identifier.'

= A logical condition to indicate an item on the left is equal to an item on the right.

< A logical condition to indicate an item on the left is less than the item on the right.

> A logical condition to indicate an item on the left is greater than the item on the right.

<> A logical condition to indicate an item on the left is not equal to an item on the right.

&& Logical "AND"
 || Logical "OR"

Service.req represents a Request Primitive; Service.req{} indicates that a request primitive is sent;

Service.ind represents an Indication Primitive; Service.ind{} indicates that an Indication Primitive is received;

Service.rsp represents a Response Primitive; Service.rsp{} indicates that a Response Primitive is sent;

Service.cnf represents a Confirm Primitive; Service.cnf{} indicates that a Confirm Primitive is received.

4 FAL syntax description

4.1 FAL-AR PDU abstract syntax

4.1.1 General

The information stored in an APDU depends on whether the APDU holds a request or a response. The role of the state machine that encodes the APDU (the FSPM) determines how the APDU is encoded.

APDUs always consist of an APDU header and an APDU body. In response APDUs the APDU body may be empty.

4.1.2 Abstract syntax of APDU header

Table 2 defines the contents of the APDU header.

Table 2 – APDU header

Field name	Subfield name	Possible values	Constraint (present if)	Comment
ControlStatus	Instruction	Errorcode Method Store Load And Or Test-And-Set Segmented Load Segmented Store		
ControlStatus	Errorcode	Described in Figure 3 to Figure 5	ControlStatus.Instruction = Errorcode	
ControlStatus	Addressing method	Variable Object Flat	ControlStatus.Instruction <> Errorcode	
ControlStatus	Addressing method	Variable Object Flat	ControlStatus.Instruction =Method	Variable object means 2 octet MethodID Flat means 4 octet MethodID