

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Industrial communication networks – Fieldbus specifications –
Part 6-18: Application layer protocol specification – Type 18 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 6-18: Spécification des protocoles des couches d'application – Eléments
de type 18**



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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 and definitions	9
3.1 Terms and definitions from other ISO/IEC standards.....	9
3.2 Other terms and definitions.....	10
3.3 Abbreviations and symbols	16
3.4 Additional abbreviations and symbols for type 18.....	17
3.5 Conventions.....	17
4 Abstract syntax.....	17
4.1 M1 device manager PDU abstract syntax.....	17
4.2 M2 device manager PDU abstract syntax.....	17
4.3 S1 device manager PDU abstract syntax	18
4.4 S2 device manager PDU abstract syntax	18
4.5 M1 connection manager PDU abstract syntax.....	18
4.6 M2 connection manager PDU abstract syntax.....	19
4.7 S1 connection manager PDU abstract syntax.....	19
4.8 S2 connection manager PDU abstract syntax.....	20
4.9 M1 cyclic transmission PDU abstract syntax	20
4.10 M2 cyclic transmission PDU abstract syntax	20
4.11 S1 cyclic transmission PDU abstract syntax.....	21
4.12 S2 cyclic transmission PDU abstract syntax.....	21
4.13 Acyclic transmission PDU abstract syntax.....	21
5 Transfer syntax.....	22
5.1 M1 device manager PDU encoding	22
5.2 M2 device manager PDU encoding	25
5.3 S1 device manager PDU encoding.....	26
5.4 S2 device manager PDU encoding.....	26
5.5 M1 connection manager PDU encoding.....	27
5.6 M2 connection manager PDU encoding.....	31
5.7 S1 connection manager PDU encoding	32
5.8 S2 connection manager PDU encoding	33
5.9 M1 cyclic transmission PDU encoding.....	33
5.10 M2 cyclic transmission PDU encoding.....	35
5.11 S1 cyclic transmission PDU encoding	36
5.12 S2 cyclic transmission PDU encoding	37
5.13 Acyclic transmission PDU encoding	38
6 Structure of FAL protocol state machines	45
7 AP-context state machine.....	47
8 FAL service protocol machine (FSPM).....	47
8.1 Overview	47
8.2 FAL service primitives.....	47

9	AR protocol machine (ARPM)	48
9.1	Overview	48
9.2	M1 master ARPM.....	49
9.3	M2 master ARPM.....	53
9.4	Slave ARPM	56
10	DLL mapping protocol machine (DMPM).....	59
10.1	Overview	59
10.2	Primitives received from the ARPM.....	59
10.3	Indications received from the DL.....	59
	Bibliography.....	60
	Figure 1 – Parameter block 1 command parameter field.....	40
	Figure 2 – Parameter block 2 command parameter field.....	41
	Figure 3 – Relationships among protocol machines and adjacent layers	46
	Figure 4 – ARPM M1 master AR state diagram	49
	Figure 5 – ARPM M2 master AR state diagram	53
	Figure 6 – ARPM slave AR state diagram	56
	Table 1 – M1 device manager attribute format	17
	Table 2 – M2 device manager attribute format	18
	Table 3 – S1 device manager attribute format.....	18
	Table 4 – S2 device manager attribute format.....	18
	Table 5 – M1 connection manager attribute format.....	18
	Table 6 – M2 connection manager attribute format.....	19
	Table 7 – S1 connection manager attribute format	20
	Table 8 – S2 connection manager attribute format	20
	Table 9 – M1 cyclic transmission attribute format.....	20
	Table 10 – M2 cyclic transmission attribute format.....	21
	Table 11 – S1 cyclic transmission attribute format	21
	Table 12 – S2 cyclic transmission attribute format	21
	Table 13 – Acyclic transmission attribute format	21
	Table 14 – M1 device manager attribute encoding	23
	Table 15 – M2 device manager attribute encoding	25
	Table 16 – S1 device manager attribute encoding.....	26
	Table 17 – S2 device manager attribute encoding.....	27
	Table 18 – M1 connection manager attribute encoding	28
	Table 19 – M2 connection manager attribute encoding	31
	Table 20 – S1 connection manager attribute encoding	32
	Table 21 – S2 connection manager attribute encoding	33
	Table 22 – M1 cyclic transmission attribute encoding.....	34
	Table 23 – M2 cyclic transmission attribute encoding.....	36
	Table 24 – S1 cyclic transmission attribute encoding	36
	Table 25 – S2 cyclic transmission attribute encoding	38
	Table 26 – Acyclic transmission – message data encoding	38

Table 27 – Command header format	39
Table 28 – Command codes	39
Table 29 – System information command parameter field	42
Table 30 – System information command parameter field	42
Table 31 – System information command parameter field	42
Table 32 – System information command parameter field	43
Table 33 – Line test command parameter field	43
Table 34 – Memory read command parameter field	44
Table 35 – Memory write command parameter field	45
Table 36 – FSPM events	48
Table 37 – M1 master state-event table 1 – events	51
Table 38 – M1 master state-event table 2 – receipt of FSPM service primitives	51
Table 39 – M1 master state-event table 3 – receipt of DMPM service primitives	53
Table 40 – M2 master state-event table 1 – events	54
Table 41 – M2 master state-event table 2 – receipt of FSPM service primitives	55
Table 42 – M2 master state-event table 3 – receipt of DMPM service primitives	55
Table 43 – S1 connect monitoring time	57
Table 44 – S2 connect monitoring time	57
Table 45 – Slave state-event table 1 – events	58
Table 46 – Slave state-event table 2 – receipt of FSPM service primitives	58
Table 47 – Slave state-event table 3 – receipt of DMPM service primitives	58
Table 48 – ARPM to DL mapping	59
Table 49 – DL to ARPM mapping	59

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**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 6-18: Application layer protocol specification –
Type 18 elements**

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International Standard IEC 61158-6-18 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 2007. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- editorial corrections;
- addition of cyclic data segmenting.

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

FDIS	Report on voting
65C/607/FDIS	65C/621/RVD

Full information on the voting for the approval of this 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.

NOTE The revision of this standard will be synchronized 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.

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

NOTE 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 from their respective intellectual-property-right holders.

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 6-18: Application layer protocol specification – Type 18 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 standard 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 18 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 standard specifies interactions between remote applications and defines the externally visible behavior provided by the Type 18 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 standard is to define the protocol provided to

- a) define the wire-representation of the service primitives defined in IEC 61158-5-18, and
- b) define the externally visible behavior associated with their transfer.

This standard specifies the protocol of the Type 18 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 standard is to specify the syntax and behavior of the application layer protocol that conveys the application layer services defined in IEC 61158-5-18.

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 the IEC 61158-6 series.