

INTERNATIONAL STANDARD

**Industrial communication networks – Fieldbus specifications –
Part 5-23: Application layer service definition – Type 23 elements**





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

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

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
1.1 General.....	9
1.2 Specifications	10
1.3 Conformance	10
2 Normative references	10
3 Terms, definitions, symbols, abbreviated terms and conventions	11
3.1 Referenced terms and definitions.....	11
3.1.1 ISO/IEC 7498-1 terms.....	11
3.1.2 ISO/IEC 8822 terms.....	11
3.1.3 IEC 61158-1 terms.....	11
3.2 Additional Type 23 terms and definitions.....	12
3.3 Symbols and abbreviated terms	14
3.4 Conventions.....	15
3.4.1 General conventions.....	15
3.4.2 Conventions for class definitions	16
3.4.3 Conventions for service definitions	17
4 Concept.....	18
5 Data type ASE.....	18
5.1 Overview.....	18
5.2 Fixed length types.....	19
5.2.1 Bitstring types.....	19
5.2.2 Numeric types	20
6 Communication model specification	24
6.1 Communication model.....	24
6.1.1 General	24
6.1.2 Cyclic model n:n	24
6.1.3 Cyclic model 1:n	25
6.1.4 Transient model.....	25
6.2 ASE.....	26
6.2.1 Overview type C	26
6.2.2 Overview type F.....	26
6.2.3 Cyclic data ASE type C.....	26
6.2.4 Cyclic data ASE type F	33
6.2.5 Acyclic data ASE type C	38
6.2.6 Acyclic data ASE type F	44
6.2.7 Management ASE.....	57
6.2.8 Synchronization ASE	60
6.2.9 Measurement ASE.....	61
6.2.10 Overview type T.....	62
6.2.11 Cyclic data ASE type T	63
6.2.12 Acyclic data ASE type T	65
6.2.13 Management ASE type T	73
6.2.14 Time sync data ASE type T.....	75
6.2.15 SLMP data ASE type T	77

6.3	AR type C	78
6.3.1	Overview	78
6.3.2	Connection Control	79
6.3.3	Cyclic transmission type C	83
6.3.4	Acyclic transmission type C	84
6.3.5	Common parameter dist.....	87
6.4	AR type F	92
6.4.1	Overview	92
6.4.2	Channel control	93
6.4.3	Cyclic transmission type F	100
6.4.4	Acyclic transmission type F.....	102
6.4.5	Parameter dist	105
6.4.6	Synchronous trigger.....	108
6.4.7	Measurement transmission	109
6.5	AR type T	111
6.5.1	Overview	111
6.5.2	Cyclic transmission type T	112
6.5.3	Acyclic transmission type T.....	113
6.5.4	Channel control type T.....	114
6.5.5	Time sync control	117
6.5.6	IP trans control	118
6.5.7	Handler.....	119
	Bibliography.....	120
	Figure 1 – Cyclic model (n:n type distributed shared memory, unconfirmed push model)	25
	Figure 2 – Cyclic model (1:n type distributed shared memory, unconfirmed push model)	25
	Figure 3 – Transient model (Client server model).....	25
	Figure 4 – Transient model (Push model).....	26
	Figure 5 – Structure of ASE type C of FAL Type 23	26
	Figure 6 – Structure of ASE type F of FAL Type 23.....	26
	Figure 7 – Structure of ASE type T of FAL Type 23.....	63
	Figure 8 – Structure of AR type C	78
	Figure 9 – Structure of AR type F.....	92
	Figure 10 – Structure of AR type T.....	111
	Table 1 – Ld service parameters	28
	Table 2 – Set service parameters.....	28
	Table 3 – Reset service parameters.....	28
	Table 4 – Read service parameters.....	29
	Table 5 – Write service parameters.....	29
	Table 6 – Ld service parameters	30
	Table 7 – Set service parameters.....	31
	Table 8 – Reset service parameters.....	31
	Table 9 – Read service parameters.....	32
	Table 10 – Write service parameters.....	32
	Table 11 – Ld service parameters	34

Table 12 – Set service parameters.....	35
Table 13 – Reset service parameters.....	35
Table 14 – Read service parameters.....	36
Table 15 – Write service parameters.....	36
Table 16 – Get memory access info service parameters	39
Table 17 – Run service parameters.....	40
Table 18 – Stop service parameters.....	41
Table 19 – Read memory service parameters	42
Table 20 – Write memory service parameters	43
Table 21 – Get memory access info service parameters	45
Table 22 – Run service parameters.....	46
Table 23 – Stop service parameters.....	47
Table 24 – Read memory service parameters	48
Table 25 – Write memory service parameters	49
Table 26 – Vendor command service parameters.....	50
Table 27 – Distribute node info service parameters.....	51
Table 28 – Get statistics service parameters.....	52
Table 29 – Get node info detail service parameters	54
Table 30 – AC data service parameters	56
Table 31 – AC data ND service parameters	57
Table 32 – Get attribute service parameters	58
Table 33 – Set attribute service parameters.....	59
Table 34 – Synchronization trigger service parameters	60
Table 35 – Start measurement service parameters	61
Table 36 – Get offset service parameters.....	62
Table 37 – Read service parameters.....	64
Table 38 – Write service parameters.....	64
Table 39 – Priority service parameters.....	66
Table 40 – Detection service parameters	67
Table 41 – Detection Ack service parameters	68
Table 42 – Test data service parameters	70
Table 43 – Test data ack service parameters.....	71
Table 44 – Acyclic data rsv service parameters	72
Table 45 – Acyclic data nrsv service parameters.....	73
Table 46 – Get attribute service parameters	74
Table 47 – Set attribute service parameters.....	75
Table 48 – TimeSyncMng service parameters.....	76
Table 49 – SLMP data service parameters.....	77
Table 50 – Control cyclic service parameters.....	82
Table 51 – CT Update service parameters	84
Table 52 – AC Send service parameters	85
Table 53 – AC Param send service parameters.....	87
Table 54 – CPD Set service parameters	92

Table 55 – Control cyclic service parameters 99

Table 56 – CT Update service parameters 101

Table 57 – AC Send service parameters 102

Table 58 – AC Send ND service parameters 104

Table 59 – Synchronous trigger internal service parameters 108

Table 60 – Measure send service parameters 109

Table 61 – MeasureAck send service parameters 110

Table 62 – Offset send service parameters 110

Table 63 – Update send service parameters 111

Table 64 – C Update service parameters 112

Table 65 – AC Update service parameters 114

Table 66 – Send cyclic service parameters 115

Table 67 – Send acyclic service parameters 116

Table 68 – TimeSync service parameters..... 117

Table 69 – SLMPSend service parameters..... 118

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 5-23: Application layer service definition – Type 23 elements

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

IEC 61158-5-23 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

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

- a) addition of Type T ASE (6.2.10 to 6.2.15).
- b) addition of Type T AR (6.5).

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

Draft	Report on voting
65C/1203/FDIS	65C/1244/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

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 service is provided by the application protocol making use of the services available from the data-link or other immediately lower layer. This document defines the application service characteristics that fieldbus applications and/or system management can exploit.

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 application layer service defined in this document is a conceptual architectural service, independent of administrative and implementation divisions.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

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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 23 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 document defines in an abstract way the externally visible service provided by the different Types of the fieldbus Application Layer in terms of

- a) an abstract model for defining application resources (objects) capable of being manipulated by users via the use of the FAL service,
- b) the primitive actions and events of the service;
- c) the parameters associated with each primitive action and event, and the form that they take; and
- d) the interrelationship between these actions and events, and their valid sequences.

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

- a) the FAL user at the boundary between the user and the Application Layer of the Fieldbus Reference Model, and
- b) Systems Management at the boundary between the Application Layer and Systems Management of the Fieldbus Reference Model.

This document specifies the structure and services of the IEC Fieldbus Application Layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498-1) and the OSI Application Layer Structure (ISO/IEC 9545).

FAL services and protocols are provided by FAL application-entities (AE) contained within the application processes. The FAL AE is composed of a set of object-oriented Application Service Elements (ASEs) and a Layer Management Entity (LME) that manages the AE. The ASEs provide communication services that operate on a set of related application process object (APO) classes. One of the FAL ASEs is a management ASE that provides a common set of services for the management of the instances of FAL classes.