

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Industrial communication networks – Fieldbus specifications –
Part 5-19: Application layer service definition – Type 19 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 5-19: Définition des services de la couche application – Éléments
de type 19**





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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
1.1 General.....	7
1.2 Specifications	8
1.3 Conformance	8
2 Normative references	8
3 Terms, definitions, symbols, abbreviations and conventions	9
3.1 ISO/IEC 7498-1 terms.....	9
3.2 ISO/IEC 8822 terms.....	9
3.3 ISO/IEC 9545 terms.....	9
3.4 ISO/IEC 8824-1 terms.....	10
3.5 Fieldbus application-layer specific definitions.....	10
3.6 Abbreviations and symbols	12
3.7 Conventions.....	12
3.7.1 Overview	12
3.7.2 General conventions.....	12
3.7.3 Conventions for class definitions	12
3.7.4 Conventions for service definitions	14
4 Concepts	15
5 Data type ASE	15
5.1 Bitstring types.....	15
5.1.1 BitString8	15
5.1.2 BitString16.....	16
5.1.3 BitString32.....	16
5.1.4 BitString64.....	16
5.2 Unsigned types	16
5.2.1 Unsigned16	16
5.2.2 Unsigned32	16
5.2.3 Unsigned64	17
5.3 Integer types.....	17
5.3.1 Integer16.....	17
5.3.2 Integer32.....	17
5.3.3 Integer64.....	17
5.4 Floating Point types	17
5.4.1 Float32	17
5.4.2 Float64	18
5.5 Structure types	18
5.5.1 STRING2.....	18
6 Communication model specification	18
6.1 Concepts	18
6.1.1 Communication mechanisms	18
6.1.2 IDN concept.....	18
6.2 ASEs	18
6.2.1 Identification number (IDN) ASE	18
6.2.2 CYCIDN ASE.....	21

6.2.3	Management (MGT) ASE	24
6.3	ARs	31
6.3.1	General	31
6.3.2	Point-to-point user-triggered confirmed client/server AREP (SVC)	31
6.3.3	Point-to-point network-scheduled unconfirmed publisher/subscriber AREP (RTC-MS).....	31
6.3.4	Point-to-multipoint network-scheduled unconfirmed publisher/subscriber AREP (RTC-CC).....	32
6.4	Summary of AR classes	32
6.5	Permitted FAL services by AREP role	33
	Bibliography.....	34
	Table 1 – Read service parameters.....	20
	Table 2 – Write service parameters.....	21
	Table 3 – Read service parameters.....	22
	Table 4 – Write service parameters.....	23
	Table 5 – Notify service parameters.....	24
	Table 6 – Get network status service parameters.....	25
	Table 7 – Get device status service parameters.....	26
	Table 8 – Network status change report service parameters	26
	Table 9 – Station status change report service parameters	27
	Table 10 – Set device status service parameters	27
	Table 11 – Enable RTC service parameters	28
	Table 12 – Enable hotplug service parameters.....	29
	Table 13 – Notify RTC service parameters.....	30
	Table 14 – Disable RTC service parameters	30
	Table 15 – AREP (SVC) class summary.....	32
	Table 16 – AREP (RTC-MS) class summary	32
	Table 17 – AREP (RTC-CC) class summary.....	33
	Table 18 – FAL services by AR type	33

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 5-19: Application layer service definition – Type 19 elements

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

International Standard IEC 61158-5-19 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:

- improving the hotplug and redundancy features;
- improving the phase switching and the error handling;
- editorial improvements.

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

FDIS	Report on voting
65C/947/FDIS	65C/950/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.

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 may 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 –

Part 5-19: Application layer service definition – Type 19 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 19 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 defines in an abstract way the externally visible service provided by 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 which 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 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.

Although these services specify, from the perspective of applications, how request and responses are issued and delivered, they do not include a specification of what the requesting and responding applications are to do with them. That is, the behavioral aspects of the applications are not specified; only a definition of what requests and responses they can