

INTERNATIONAL STANDARD

**Industrial communication networks – Fieldbus specifications –
Part 6-24: Application layer protocol specification – Type 24 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	9
1.3 Conformance	10
2 Normative references	10
3 Terms, definitions, symbols, abbreviated terms, and conventions	10
3.1 Referenced terms and definitions.....	10
3.1.1 Terms and definitions from ISO/IEC 7498-1	11
3.1.2 Terms and definitions from ISO/IEC 9545	11
3.1.3 Terms and definitions from ISO/IEC 8824-1	11
3.1.4 Terms and definitions from ISO/IEC 10731	11
3.1.5 Terms and definitions from ISO/IEC 19501	12
3.2 Additional terms and definitions	12
3.3 Abbreviations and symbols	17
3.4 Conventions.....	19
3.4.1 General conventions.....	19
3.4.2 PDU data type conventions.....	19
3.4.3 State machine conventions	19
4 Abstract syntax.....	22
4.1 Basic Data types.....	22
4.2 FAL PDU types	23
4.2.1 Top of APDU types: _APDU.....	23
4.2.2 PDUs for field device control service	24
4.2.3 PDUs for message service.....	37
4.3 Detailed definitions of FAL service-PDUs.....	38
4.3.1 Short PDU type	38
4.3.2 Long PDU type	45
4.3.3 Enhanced PDU type	48
4.3.4 SubCommand PDU type	58
4.3.5 Short PDU type II.....	59
4.4 Device profile	66
5 Transfer syntax.....	66
5.1 Concepts	66
5.2 Encode rules.....	66
5.2.1 INTEGER and its subtypes	66
5.2.2 REAL type and its subtypes	68
5.2.3 BIT STRING type.....	69
5.2.4 OCTET STRING type and IA5String type.....	70
5.2.5 NULL type	71
5.2.6 Structure type and Array type	71
6 Structure of FAL protocol state machine	71
7 AP-context state machine (APC SM)	73
7.1 Overview.....	73
7.2 State descriptions	74

7.3	Triggering events	75
7.4	Action descriptions at state transitions	75
8	FAL service protocol machines (FSPM)	77
8.1	Overview	77
8.2	Field Device Control Protocol Machine (FDC PM)	77
8.2.1	Protocol overview	77
8.2.2	Cyclic communication mode	78
8.2.3	Event driven communication mode	82
8.2.4	Master Protocol Machine (FDCPM-M)	83
8.2.5	Slave Protocol Machine (FDCPM-S)	92
8.2.6	Monitor Protocol Machine (FDCPM-MN)	102
8.2.7	Error procedure summary	104
8.3	Message Protocol Machine (MSGPM)	106
8.3.1	Protocol overview	106
8.3.2	Requester Protocol Machine (MSGPM-RQ)	108
8.3.3	Responder Protocol Machine (MSGPM-RS)	111
9	Application relationship protocol machine (ARPM)	113
9.1	General	113
9.2	ARPM for FDC ASE	114
9.2.1	Overview	114
9.2.2	ARPM for FDC Master (ARPM-FDCM)	116
9.2.3	ARPM for FDC Slave (ARPM-FDCS)	122
9.2.4	ARPM for FDC Monitor (ARPM-FDCMN)	129
9.3	ARPM for MSG ASE (ARPM-MSG)	131
9.3.1	State descriptions	131
9.3.2	Triggering events	132
9.3.3	Action descriptions at state transitions	133
10	DLL mapping protocol machine (DMPM)	134
Annex A (informative) Device profile and FDC command sets		135
Annex B (normative) Virtual memory space and Device Information		137
B.1	Overview	137
B.2	Device Information	137
B.2.1	Device identifier area structure	137
B.2.2	Detailed specifications of device IDs	138
Annex C (informative) Basic message function		144
Bibliography		145
Figure 1 – Tree structure of APDU types		24
Figure 2 – Encode of Integer subtypes		67
Figure 3 – Example of transfer of INTEGER value		67
Figure 4 – Encode of Unsigned subtypes		68
Figure 5 – <i>Float</i> ₃₂ type encode		68
Figure 6 – <i>Float</i> ₆₄ type encode		69
Figure 7 – Bit field definition example with named bits		70
Figure 8 – Bit field definition example with field size		70
Figure 9 – SEQUENCE type encode		71

Figure 10 – Structure of FAL protocol state machines	73
Figure 11 – Statechart diagram of APCSM	74
Figure 12 – Example communication cycle of FDC master AP	79
Figure 13 – Example communication cycle of FDC slave AP	79
Figure 14 – Synchronous command communication in sync state	80
Figure 15 – Asynchronous command communication in sync state	81
Figure 16 – Asynchronous command communication in async state	82
Figure 17 – Event-driven communication	83
Figure 18 – Statechart diagram of FDCPM-M	84
Figure 19 – Statechart diagram of FDCPM-S	83
Figure 20 – Statechart diagram of FDCPM-MN	102
Figure 21 – PDU transmission flow for user message	107
Figure 22 – PDU transmission flow for one-way message	108
Figure 23 – Statechart diagram of MSGPM-RQ	109
Figure 24 – Statechart diagram of MSGPM-RS	111
Figure 25 – Example of single transfer process	114
Figure 26 – Example of dual transfer process	114
Figure 27 – Example of Synchronous command communication	115
Figure 28 – Timing chart for individual communication cycle setting	116
Figure 29 – Statechart diagram of ARPM-FDCM	117
Figure 30 – Statechart diagram of ARPM-FDCS	123
Figure 31 – Statechart diagram of ARPM-FDCMN	129
Figure 32 – Statechart diagram of ARPM-MSG	132
Figure B.1 – Memory map of virtual memory space	137
Figure B.2 – Memory map of device I/O area	138
Table 1 – State transition descriptions	20
Table 2 – Description of state machine elements	20
Table 3 – Conventions used in state machines	21
Table 4 – Mapping for Protocol State Machines	72
Table 5 – State descriptions of APC SM	74
Table 6 – Trigger event descriptions of APC SM	75
Table 7 – Transitions of APC SM	75
Table 8 – FDC protocol mode	77
Table 9 – State descriptions of FDCPM-M	84
Table 10 – Trigger event descriptions of FDCPM-M	86
Table 11 – Transitions of main SM of FDCPM-M	87
Table 12 – Transitions of submachine of FDCPM-M	89
Table 13 – State descriptions of FDCPM-S	93
Table 14 – Trigger event descriptions of FDCPM-S	94
Table 15 – Transitions of main SM of FDCPM-S	95
Table 16 – Transitions of submachine of FDCPM-S	97
Table 17 – State descriptions of FDCPM-MN	102

Table 18 – Trigger event descriptions of FDCPM-MN.....	103
Table 19 – Transitions of main SM of FDCPM-MN.....	103
Table 20 – Transitions of submachine of FDCPM-MN.....	104
Table 21 – State descriptions of MSGPM-RQ.....	109
Table 22 – Trigger event descriptions of MSGPM-RQ.....	110
Table 23 – Transitions of MSGPM-RQ.....	110
Table 24 – State descriptions of MSGPM-RS.....	112
Table 25 – Trigger event descriptions of MSGPM-RS.....	112
Table 26 – Transitions of MSGPM-RS.....	113
Table 27 – State descriptions of ARPM-FDCM.....	117
Table 28 – Trigger event descriptions of ARPM-FDCM.....	119
Table 29 – Transitions of main SM of ARPM-FDCM.....	120
Table 30 – Transitions of submachine of ARPM-FDCM.....	121
Table 31 – State descriptions of ARPM-FDCS.....	123
Table 32 – Trigger event descriptions of ARPM-FDCS.....	125
Table 33 – Transitions of main SM of ARPM-FDCS.....	126
Table 34 – Transitions of submachine of ARPM-FDCS.....	127
Table 35 – State descriptions of ARPM-FDCMN.....	129
Table 36 – Trigger event descriptions of ARPM-FDCMN.....	130
Table 37 – Transitions of main SM of ARPM-FDCMN.....	130
Table 38 – Transitions of submachine of ARPM-FDCMN.....	131
Table 39 – State descriptions of ARPM-MSG.....	132
Table 40 – Trigger event descriptions of ARPM-MSG.....	133
Table 41 – Transitions of ARPM-MSG.....	133
Table A.1 – Example of registered device profiles.....	135
Table A.2 – Example command list of the profile '00'H.....	136
Table B.1 – Specifications of device IDs.....	138
Table C.1 – Example of measure command set.....	144

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**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 6-24: Application layer protocol specification –
Type 24 elements**

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IEC 61158-6-24 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 second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

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

- addition of a new PDU type which called "Short PDU type II" in 4.2;
- update of Table 4;
- addition of examples of Synchronous Command communication in 9.2.1, Figure 27 and Figure 28.

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

Draft	Report on voting
65C/1204/FDIS	65C/1245/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 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 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 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 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 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 can work together in any combination.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 6-24: Application layer protocol specification – Type 24 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 24 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 behavior provided by the Type 24 fieldbus application layer in terms of

- the abstract syntax defining the application layer protocol data units conveyed between communicating application entities,
- the transfer syntax defining the application layer protocol data units conveyed between communicating application entities,
- the application context state machines defining the application service behavior visibly between communicating application entities, and
- the application relationship state machines defining the communication behavior visibly between communicating application entities.

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

- define the representation-on-wire of the service primitives defined in IEC 61158-5-24, and
- define the externally visible behavior associated with their transfer.

This document specifies the protocol of the Type 24 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 61158-5-24.

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.