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CONTENTS

FOREWORD 5
INTRODUCTION 7
1 Scope 8
1.1 General 8
1.2 Specifications 8
1.3 Conformance 8
2 Normative references 9
3 Terms, definitions, symbols, abbreviations and conventions 9
3.1 ISO/IEC 7498-1 terms 9
3.2 ISO/IEC 8822 terms 10
3.3 ISO/IEC 9545 terms 10
3.4 ISO/IEC 8824 terms 10
3.5 Terms and definitions from IEC 61158-5-13 11
3.6 Other terms and definitions 11
4 FAL syntax description 12
4.1 General 12
4.2 FAL-AR PDU abstract syntax 12
4.3 Abstract syntax of Asyn2 pduBody 15
5 Transfer syntax 21
5.1 Encoding of data types 21
6 FAL protocol state machines 27
7 AP context state machine 28
8 FAL service protocol machine 28
9 AR protocol machine 28
9.1 Buffered-network-scheduled bi-directional pre-established connection (BNB-PEC) ARPM 28
9.2 Buffered-network-scheduled uni-directional pre-established connection (BNU-PEC) ARPM 30
9.3 Queued user-triggered uni-directional (QUU) ARPM 33
9.4 Queued user-triggered bi-directional connectionless (QUB-CL) ARPM 35
9.5 Queued user-triggered bi-directional connection-oriented with segmentation (QUB-COS) ARPM 40
10 DLL mapping protocol machine 58
10.1 Primitive definitions 58
10.2 DMPM state machine 59
Annex A (normative) – Constant value assignments 61
A.1 Values of abort-code 61
A.2 NMT-command-ID 62
A.3 Type 13 specific error-code constants 62
A.4 EPL-node-list 64
Bibliography 65

Figure 1 – Encoding of Time of Day value 26
Figure 2 – Encoding of Time Difference value 26
Figure 3 – Primitives exchanged between protocol machines 27

Figure 4 – State transition diagram of BNB-PEC ARPM 29
Figure 5 – State transition diagram of BNU-PEC ARPM 32
Figure 6 – State transition diagram of QUU ARPM 34
Figure 7 – State transition diagram of QUB-CL ARPM 38
Figure 8 – State transition diagram of QUB-COS (CmdL) ARPM 44
Figure 9 – State transition diagram of QUB-COS (SeqL) ARPM 54
Figure 10 – State transition diagram of DMPM 59

Table 1 – Use of signaling-flags 14
Table 2 – Values of error-type 17
Table 3 – Transfer syntax for bit sequences 22
Table 4 – Transfer syntax for data type UNSIGNEDn 23
Table 5 – Transfer syntax for data type Integern 24
Table 6 – Primitives issued by user to BNB-PEC ARPM 28
Table 7 – Primitives issued by BNB-PEC ARPM to user 28
Table 8 – BNB-PEC ARPM state table – sender transactions 30
Table 9 – BNB-PEC ARPM state table – receiver transactions 30
Table 10 – Function BuildFAL-PDU 30
Table 11 – Primitives issued by user to BNU-PEC ARPM 31
Table 12 – Primitives issued by BNU-PEC ARPM to user 31
Table 13 – BNU-PEC ARPM state table – sender transactions 32
Table 14 – BNU-PEC ARPM state table – receiver transactions 32
Table 15 – Function BuildFAL-PDU 32
Table 16 – Primitives issued by user to QUU ARPM 33
Table 17 – Primitives issued by QUU ARPM to user 33
Table 18 – QUU ARPM state table – sender transactions 34
Table 19 – QUU ARPM state table – receiver transactions 35
Table 20 – Function BuildFAL-PDU 35
Table 21 – Primitives issued by user to QUB-CL ARPM 36
Table 22 – Primitives issued by QUB-CL ARPM to user 37
Table 23 – QUB-CL ARPM state table – sender transactions 39
Table 24 – QUB-CL ARPM state table – receiver transactions 40
Table 25 – Function BuildFAL-PDU 40
Table 26 – Primitives issued by user to QUB-COS (CmdL) ARPM 42
Table 27 – Primitives issued by QUB-COS (CmdL) ARPM to user 43
Table 28 – QUB-COS (CmdL) ARPM state table – sender transactions 45
Table 29 – QUB-COS (CmdL) ARPM state table – receiver transactions 47
Table 30 – Function BuildSegment 50
Table 31 – Function RoundUp 50
Table 32 – Function MoreFollows 50
Table 33 – Function AddSegment 51
Table 34 – Function GetIntermediatePDU 51

Table 35 – Primitives issued by QUB-COS (CmdL) to QUB-COS (SeqL) 51
Table 36 – Primitives issued by QUB-COS (SeqL) to QUB-COS (CmdL) 52
Table 37 – Parameters used with primitives exchanged between QUB-COS (SeqL) and QUB-COS (CmdL) 52
Table 38 – QUB-COS (SeqL) ARPM states 53
Table 39 – QUB-COS (SeqL) ARPM state table – sender transactions 55
Table 40 – QUB-COS (SeqL) ARPM state table – receiver transactions 56
Table 41 – Function BuildFAL-PDU 57
Table 42 – Function IncrementCounter 58
Table 43 – Function AddToHistoryBuffer 58
Table 44 – Primitives issued by ARPM to DMPM 58
Table 45 – Primitives issued by DMPM to ARPM 58
Table 46 – Primitives issued by DMPM to data-link layer 59
Table 47 – Primitives issued by data-link layer to DMPM 59
Table 48 – DMPM state table – sender transactions 60
Table 49 – DMPM state table – receiver transactions 60
Table A.1 – Values of abort-code 61
Table A.2 – Values of NMTCommandID 62
Table A.3 – Type 13 specific error-code constants 63
Table A.4 – EPL-node-list format 64

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 6-13: Application layer protocol specification – Type 13 elements

FOREWORD

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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 IEC 61784 series. Use of the various protocol Types in other combinations may require permission of their respective intellectual-property-right holders.

International Standard IEC 61158-6-13 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This first edition and its companion parts of the IEC 61158-6 subseries cancel and replace IEC 61158-6:2003. This edition of this part constitutes a technical addition. This part also replaces IEC/PAS 62408, published in 2005.

This edition of IEC 61158-6 includes the following significant changes from the previous edition:

a) deletion of the former Type 6 fieldbus for lack of market relevance;

b) addition of new types of fieldbuses;

c) partition of part 6 of the third edition into multiple parts numbered -6-2, -6-3, …

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

FDIS	Report on voting
65C/476/FDIS	65C/487/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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

The 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.

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 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 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.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 6-13: Application layer protocol specification – Type 13 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 13 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 13 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

1) define the wire-representation of the service primitives defined in IEC 61158- 5-13, and
2) define the externally visible behavior associated with their transfer.

This standard specify the protocol of the Type 13 fieldbus application layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498) 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 61158-5-13.

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.

1.3 Conformance

This standard does not specify individual implementations or products, nor does it 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 referenced documents are indispensable for the application 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.

IEC 61158-3-13, *Industrial communication networks – Fieldbus specifications - Part 3-13: Data-link layer service definition – Type 13 elements*

IEC 61158-4-13, *Industrial communication networks – Fieldbus specifications - Part 4-13: Data-link layer protocol specification – Type 13 elements*

IEC 61158-5-13, *Industrial communication networks – Fieldbus specifications - Part 5-13: Application layer service definition – Type 13 elements*

ISO/IEC 7498 (all parts), *Information technology – Open Systems Interconnection – Basic Reference Model*

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

ISO/IEC 8824, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1)*

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