

# PUBLICLY AVAILABLE SPECIFICATION

## PRE-STANDARD



**Industrial networks – Wireless communication network and communication profiles – WIA-FA**

(standards.iteh.ai)

IEC PAS 62948:2015

<https://standards.iteh.ai/catalog/standards/sist/7c70a6af-13a6-4a43-b600-32149d030dba/iec-pas-62948-2015>

Withhold



**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2015 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

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

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

**About the IEC**

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

**About IEC publications**

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

**IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)**

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

**IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)**

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

**IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

**Electropedia - [www.electropedia.org](http://www.electropedia.org)**

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

**IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)**

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

**IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

<https://standards.iteh.org/catalogue/standards/sls/iec/62484-1-2015>  
IEC 62484-1:2015  
pa-62484-2015

# PUBLICLY AVAILABLE SPECIFICATION

## PRE-STANDARD



**Industrial networks – Wireless communication network and communication profiles – WIA-FA**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 25.040.40; 35.100.01

ISBN 978-2-8322-2477-9

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	12
1 Scope.....	14
2 Normative references .....	14
3 Terms, definitions, abbreviations, and conventions.....	14
3.1 Terms and definitions.....	14
3.2 Abbreviations.....	17
3.3 Conventions.....	19
4 Data coding.....	20
4.1 Overview.....	20
4.2 Basic data type coding.....	21
4.2.1 Integer coding.....	21
4.2.2 Unsigned coding.....	21
4.2.3 Float coding.....	22
4.2.4 Octetstring coding .....	23
4.2.5 Bit Field coding.....	23
4.2.6 TimeData coding .....	23
4.2.7 KeyData coding .....	23
4.3 Structured data type coding.....	24
4.3.1 Structure type coding.....	24
4.3.2 List type coding .....	24
5 WIA-FA overview.....	24
5.1 Device types.....	24
5.1.1 Host computer.....	24
5.1.2 Gateway device.....	24
5.1.3 Access device.....	24
5.1.4 Field device.....	25
5.1.5 Handheld device.....	25
5.2 Network topology.....	25
5.3 Protocol architecture.....	26
6 System management.....	28
6.1 Overview.....	28
6.2 Device Management Application Process.....	28
6.2.1 Network manager .....	31
6.2.2 Security manager .....	31
6.2.3 Network management module.....	31
6.2.4 Security management module.....	31
6.2.5 DMAP state machines .....	31
6.3 Addressing and address assignment.....	42
6.4 Communication resource allocation.....	42
6.4.1 General .....	42
6.4.2 Communication resource allocation .....	43
6.5 Joining and leave process of field device .....	44
6.5.1 Joining process of a field device .....	44
6.5.2 Communication resource allocation to field device.....	45
6.5.3 Leaving process of a field device.....	45
6.6 Network performance monitoring.....	46

6.6.1	Device status report.....	46
6.6.2	Channel condition report.....	47
6.7	Management information base and services.....	47
6.7.1	Management information base.....	47
6.7.2	MIB services.....	57
7	Physical layer.....	61
7.1	General.....	61
7.2	General requirements based on IEEE STD 802.11-2012.....	61
7.3	Additional requirements.....	62
7.3.1	General.....	62
7.3.2	Frequency band.....	62
7.3.3	Channel bitmap.....	62
7.3.4	Transmission power.....	63
7.3.5	Data rate.....	63
8	Data Link Layer.....	64
8.1	General.....	64
8.1.1	Protocol architecture.....	64
8.1.2	WIA-FA superframe.....	64
8.1.3	Communication based on multiple access devices.....	67
8.1.4	Time synchronization.....	68
8.1.5	Aggregation/Disaggregation.....	69
8.1.6	Retransmission.....	70
8.2	Data link sub-layer data services.....	73
8.2.1	General.....	73
8.2.2	DLDE-DATA request primitive.....	73
8.2.3	DLDE-DATA indication primitive.....	74
8.2.4	Time sequence of DLL data service.....	75
8.3	Data link sub-layer management services.....	76
8.3.1	General.....	76
8.3.2	Network discovery services.....	76
8.3.3	Time synchronization services.....	78
8.3.4	Device joining services.....	80
8.3.5	Device status report services.....	83
8.3.6	Channel condition report services.....	85
8.3.7	Remote attribute get services.....	86
8.3.8	Remote attribute configuration services.....	90
8.3.9	Device leaving services.....	93
8.4	DLL frame formats.....	94
8.4.1	General frame format.....	94
8.4.2	Date frame format.....	96
8.4.3	Aggregation frame format.....	96
8.4.4	NACK frame format.....	97
8.4.5	GACK frame format.....	97
8.4.6	Beacon frame format.....	97
8.4.7	Join request frame format.....	98
8.4.8	Join response frame format.....	98
8.4.9	Leave request frame format.....	98
8.4.10	Device status report frame format.....	99
8.4.11	Channel condition report frame format.....	99

8.4.12	Time synchronization request frame format .....	99
8.4.13	Time synchronization response frame format .....	99
8.4.14	Remote attribute get request frame format .....	100
8.4.15	Remote attribute get response frame format .....	100
8.4.16	Remote attribute set request frame format .....	101
8.4.17	Remote attribute set response frame format .....	101
8.5	Data link layer state machines .....	101
8.5.1	DLL state machine of access field .....	101
8.5.2	DLL state machine of field device .....	105
8.5.3	Functions used in DLL state transitions .....	110
9	Wired specifications between GW and AD .....	111
9.1	Overview .....	111
9.2	Join process of access device .....	111
9.3	Frame formats between GW and AD .....	111
10	Application Layer .....	113
10.1	Overview .....	113
10.2	AL protocol stack .....	114
10.3	AL functions .....	114
10.3.1	Data function .....	114
10.3.2	Management function .....	114
10.3.3	Communication mode .....	115
10.4	Application data .....	115
10.4.1	General .....	115
10.4.2	Process data .....	116
10.4.3	Event data .....	117
10.5	User application process .....	118
10.5.1	General .....	118
10.5.2	User application object .....	119
10.5.3	IO data images on gateway device .....	119
10.5.4	Alarm mechanism .....	120
10.5.5	Application configuration process .....	120
10.6	Application services .....	126
10.6.1	Confirmed services and unconfirmed services .....	126
10.6.2	READ service .....	127
10.6.3	WRITE service .....	128
10.6.4	PUBLISH Service .....	129
10.6.5	REPORT Service .....	130
10.6.6	REPORT ACK .....	131
10.7	Application sublayer .....	132
10.7.1	Overview .....	132
10.7.2	ASL data service .....	132
10.7.3	ASL packet format .....	135
11	Security .....	155
11.1	General .....	155
11.1.1	Security management architecture .....	155
11.1.2	Security functions .....	156
11.1.3	Keys .....	156
11.2	Security services .....	157
11.2.1	General .....	157

11.2.2	Key establish service .....	158
11.2.3	Key update service .....	160
11.2.4	Security alarm service .....	162
11.3	Secure join .....	164
11.3.1	General .....	164
11.3.2	Secure join process of FD.....	164
11.4	Key management.....	165
11.4.1	General .....	165
11.4.2	Key establish process.....	165
11.4.3	Key update process .....	166
11.5	DLL secure communication .....	168
11.6	Security alarm.....	169
11.7	Secure frame format .....	169
11.7.1	General secure DLL frame format.....	169
11.7.2	Secure aggregation frame format.....	171
11.7.3	Key establish request frame format.....	172
11.7.4	Key establish response frame format.....	172
11.7.5	Key update request frame format.....	172
11.7.6	Key update response frame format.....	173
11.7.7	Security alarm request frame format.....	173
Annex A (informative)	Security strategy for WIA-FA network.....	174
A.1	Risk analysis for WIA-FA network .....	174
A.2	Security principles for WIA-FA network .....	174
A.3	Security objectives for WIA-FA network .....	174
A.4	Security grade of WIA-FA network .....	175
Annex B (informative)	Regional modification for compliance with ETSI standards .....	176
B.1	General.....	176
B.2	Compliance with ETSI EN 300 440-2 V1.4.1 .....	176
B.3	Compliance with ETSI EN 300 328 V1.8.1.....	176
Bibliography	.....	180
Figure 1	– Conventions used for state machines .....	19
Figure 2	– Integer coding.....	21
Figure 3	– Unsigned coding .....	21
Figure 4	– Single float coding .....	22
Figure 5	– Double float coding .....	22
Figure 6	– WIA-FA enhanced star topology.....	25
Figure 7	– OSI basic reference model mapped to WIA-FA.....	26
Figure 8	– Protocol architecture of WIA-FA .....	27
Figure 9	– Data flow over WIA-FA network.....	27
Figure 10	– System management scheme.....	28
Figure 11	– DMAP of management system.....	29
Figure 12	– DMAP state machine of gateway device.....	32
Figure 13	– DMAP state machine of gateway device for each field device.....	33
Figure 14	– DMAP state machine of a field device .....	37
Figure 15	– Long address structure of device.....	42



Figure 16 – Joining process of field device .....	44
Figure 17 – Communication resource allocation process for a field device .....	45
Figure 18 – Passive leave process of a field device .....	46
Figure 19 – Device status report process of field device .....	46
Figure 20 – Channel condition report process of field device .....	47
Figure 21 – BitMap format.....	62
Figure 22 – WIA-FA DLL protocol architecture .....	64
Figure 23 – The template of timeslot structure .....	65
Figure 24 – WIA-FA default superframe .....	66
Figure 25 – WIA-FA superframe.....	66
Figure 26 – The example of WIA-FA devices multi-channel communication.....	66
Figure 27 – An example of beacon communication based on multiple ADs.....	67
Figure 28 – Process of one-way time synchronization .....	68
Figure 29 – Process of two-way time synchronization .....	69
Figure 30 – Aggregation frame payload format.....	70
Figure 31 – Example of retransmission mode based on NACK.....	71
Figure 32 – Example of multi-unicast retransmission mode .....	72
Figure 33 – Example of multi-broadcast retransmission mode.....	72
Figure 34 – Example of GACK-based timeslot backoff mode.....	73
Figure 35 – Time sequence of period data service from FD to GW .....	75
Figure 36 – Time sequence of other data service from FD to GW .....	75
Figure 37 – Time sequence of data service from GW to FD.....	76
Figure 38 – Network discovery process.....	78
Figure 39 – Time synchronization process.....	80
Figure 40 – Device join process .....	83
Figure 41 – Device status report process .....	84
Figure 42 – Channel condition report process .....	86
Figure 43 – Remote attribute get process .....	89
Figure 44 – Remote attribute set process.....	93
Figure 45 – Device leave process .....	94
Figure 46 – General frame format .....	95
Figure 47 – DLL frame header .....	95
Figure 48 – DLL frame control format.....	95
Figure 49 – DLL Data frame format.....	96
Figure 50 – DLL Aggregation frame format .....	97
Figure 51 – NACK frame format .....	97
Figure 52 – GACK frame format.....	97
Figure 53 – GACK information .....	97
Figure 54 – DLL Beacon frame format.....	97
Figure 55 – Shared timeslot count .....	98
Figure 56 – DLL join request frame format.....	98
Figure 57 – DLL join request frame format .....	98
Figure 58 – DLL leave request frame format .....	99



Figure 59 – DLL Device status report frame format .....	99
Figure 60 – DLL Channel condition report frame format .....	99
Figure 61 – DLL time synchronization request frame format .....	99
Figure 62 – DLL time synchronization response frame format .....	99
Figure 63 – DLL Remote attribute get request frame format .....	100
Figure 64 – DLL remote attribute get response frame format .....	100
Figure 65 – DLL Remote attribute set request frame format .....	101
Figure 66 – DLL remote attribute set response frame format .....	101
Figure 67 – DLL state machine of access device .....	102
Figure 68 – DLL state machine of field device .....	106
Figure 69 – General frame format between GW and AD .....	111
Figure 70 – AL portions within WIA-FA protocol stack .....	114
Figure 71 – The relationships between UAPs and DAPs .....	118
Figure 72 – User application objects .....	119
Figure 73 – Implementation example of IO data images on the gateway device .....	120
Figure 74 – C/S VCR relationships between GW and FDs .....	122
Figure 75 – P/S VCR relationships between GW and FDs .....	123
Figure 76 – P/S VCR relationships between FDs and GW .....	123
Figure 77 – R/S VCR relationships between FDs and GW .....	124
Figure 78 – Configuration process for a field device .....	125
Figure 79 – UAO aggregation and disaggregation process .....	126
Figure 80 – READ request message format .....	127
Figure 81 – READ response(+) message format .....	127
Figure 82 – READ response(-) message format .....	127
Figure 83 – READ Service process .....	128
Figure 84 – WRITE request message format .....	128
Figure 85 – WRITE response(-) message format .....	128
Figure 86 – WRITE Service process .....	129
Figure 87 – PUBLISH request message format .....	129
Figure 88 – PUBLISH Procedure from Field Device to Gateway Device .....	130
Figure 89 – PUBLISH Procedure from Gateway Device to Field Device .....	130
Figure 90 – REPORT request message format .....	130
Figure 91 – REPORT Service process .....	131
Figure 92 – REPORT ACK request message format .....	131
Figure 93 – REPORT ACK response(+) message format .....	131
Figure 94 – REPORT ACK response(-) message format .....	131
Figure 95 – REPORT ACK Service process .....	132
Figure 96 – ASL general packet format .....	135
Figure 97 – Format of packet control field .....	135
Figure 98 – Confirmed service primitives exchanged between layers .....	137
Figure 99 – Unconfirmed service primitives exchanged between layers .....	138
Figure 100 – Primitives invoking for read/ write MIB between layers .....	139
Figure 101 – State transition diagram of AMCL .....	140

Figure 102 – State transition diagram of AMSV .....	142
Figure 103 – State transition diagram of AMPB .....	146
Figure 104 – State transition diagram of AMSB .....	149
Figure 105 – State transition diagram of AMRS .....	152
Figure 106 – State transition diagram of AMRK .....	152
Figure 107 – Security management architecture .....	155
Figure 108 – Life cycle of keys .....	157
Figure 109 – Format of NONCE .....	158
Figure 110 – Time sequence of key establishment .....	160
Figure 111 – Time sequence of key updating .....	162
Figure 112 – SecAlarmt_Struct structure .....	163
Figure 113 – Time sequence of security alarm .....	163
Figure 114 – Secure join process of field device .....	165
Figure 115 – Key establish process for field device .....	166
Figure 116 – Key update state machine for FD .....	167
Figure 117 – General secure DLL frame format .....	170
Figure 118 – Secure aggregation frame format .....	171
Figure 119 – Key establish request frame format .....	172
Figure 120 – Key establish response frame format .....	172
Figure 121 – Key update request frame format .....	172
Figure 122 – Key update response frame format .....	173
Figure 123 – Security alarm request frame format .....	173
Figure B.1 – Timeslot timing template .....	177
Table 1 – Conventions used for state transitions .....	20
Table 2 – Definition of integer data type .....	21
Table 3 – Unsigned16 coding .....	21
Table 4 – Octetstring coding .....	23
Table 5 – Coding of Bit Field data with one octet .....	23
Table 6 – Coding of Bit Field data with two octets .....	23
Table 7 – Coding of Bit Field data with three octet .....	23
Table 8 – Network management functions .....	30
Table 9 – Security management functions .....	30
Table 10 – DMAP state transition of gateway device .....	32
Table 11 – DMAP state transition of gateway device for each field device .....	34
Table 12 – DMAP state transition of a field device .....	38
Table 13 – Functions used in DMAP state transition .....	41
Table 14 – Unstructured attributes .....	48
Table 15 – Structured attributes .....	50
Table 16 – Superframe_Struct structure .....	50
Table 17 – Link_Struct structure .....	51
Table 18 – ChanCon_Struct structure .....	51
Table 19 – Device_Struct .....	52

Table 20 – Key_Struct structure .....	53
Table 21 – VcrEP_Struct definition .....	54
Table 22 – UAOCClassDesc_Struct definition .....	55
Table 23 – ProDataDesc_Struct definition .....	56
Table 24 – UAOInstDesc_Struct definition .....	57
Table 25 – DMAP-MIB-GET.request parameters .....	58
Table 26 – DMAP-MIB-GET.confirm parameters .....	59
Table 27 – DMAP-MIB-SET.request parameters .....	60
Table 28 – DMAP-MIB-SET.confirm parameters.....	60
Table 29 – PHY protocol selection .....	61
Table 30 – Coding of Modulation modes .....	62
Table 31 – Channel indices.....	63
Table 32 – Data rate .....	63
Table 33 – Parameters of timeslot template .....	65
Table 34 – DLDE-DATA.request primitive parameters.....	74
Table 35 – DLDE-DATA.indication primitive parameters.....	74
Table 36 – Management services.....	76
Table 37 – DLME-DISCOVERY.request parameters.....	77
Table 38 – DLME-DISCOVERY.confirm parameters.....	77
Table 39 – BeaconDescription_Struct parameters.....	77
Table 40 – DLME-TIME-SYN.indication parameters.....	78
Table 41 – DLME-TIME-SYN.response parameters.....	79
Table 42 – DLME-TIME-SYN.confirm parameters.....	79
Table 43 – DLME-JOIN.request parameters.....	81
Table 44 – DLME-JOIN.indication parameters.....	81
Table 45 – DLME-JOIN.response parameters .....	82
Table 46 – DLME-JOIN.confirm parameters .....	82
Table 47 – DLME-DEVICE-STATUS.request parameters .....	83
Table 48 – DLME-DEVICE-STATUS.indication parameters .....	84
Table 49 – DLME-DEVICE-STATUS.confirm parameters .....	84
Table 50 – DLME-CHANNEL-CONDITION.request parameters .....	85
Table 51 – DLME-CHANNEL-CONDITION.indication parameters.....	85
Table 52 – DLME-CHANNEL-CONDITION.confirm parameters .....	86
Table 53 – DLME-INFO-GET.request parameters .....	87
Table 54 – DLME-INFO-GET.indication parameters .....	87
Table 55 – DLME-INFO-GET.response parameters.....	88
Table 56 – DLME-INFO-GET.confirm parameters .....	89
Table 57 – DLME-INFO-SET.request parameters.....	90
Table 58 – DLME-INFO-SET.Indication parameters .....	91
Table 59 – DLME-INFO-SET response parameters.....	92
Table 60 – DLME-INFO-SET.confirm parameters.....	92
Table 61 – DLME-LEAVE.request parameters.....	93
Table 62 – DLME-LEAVE.confirm parameters.....	94

Table 63 – Frame type coding.....	96
Table 64 – Addressing mode subfields.....	96
Table 65 – DLL state transition of access device .....	103
Table 66 – DLL state transition of field device.....	107
Table 67 – Functions used in DMAP state transition .....	110
Table 68 – Wired services between GW and AD .....	112
Table 69 – Service parameters of AD join request.....	113
Table 70 – Service parameters of AD join response.....	113
Table 71 – Service parameters of GW requesting AD to send GACK.....	113
Table 72 – Parameters of GACKInfo_Struct structure .....	113
Table 73 – Service parameters of GW requesting AD to send NACK.....	113
Table 74 – Communication models between gateway device and field devices .....	115
Table 75 – SingleAnalogData definition.....	116
Table 76 – DoubleAnalogData definition .....	116
Table 77 – DigitalData8 definition .....	116
Table 78 – DigitalData16 definition .....	117
Table 79 – DigitalData32 definition .....	117
Table 80 – EventData Definition.....	117
Table 81 – UAO events definitions .....	118
Table 82 – VCR attribute configuration overview.....	121
Table 83 – Application services supported by UAPs.....	126
Table 84 – Error code definition for READ response(-) message.....	127
Table 85 – Error code definition for WRITE response(-) .....	129
Table 86 – Error code definition for REPORT ACK negative response .....	132
Table 87 – ASLDE-DATA.request primitive parameter definitions.....	133
Table 88 – ASLDE-DATA.indication primitive parameter definitions .....	133
Table 89 – ASLDE-DATA.response primitive parameter definition.....	134
Table 90 – ASLDE-DATA.confirmPrimitive Parameters .....	135
Table 91 – Service Identifier subfield definition.....	135
Table 92 – Message Type subfield definition.....	136
Table 93 –Confirmed service primitives exchanged between ASL and other layers .....	137
Table 94 – Unconfirmed service primitives exchanged between ASL and other layers.....	138
Table 95 – Primitives for read/ write MIB between layers .....	139
Table 96 – State transition table of AMCL .....	140
Table 97 – State transition table of AMSV.....	142
Table 98 – State transition table of AMPB.....	146
Table 99 – State transition table of AMSB.....	149
Table 100 – State transition table of AMRS.....	152
Table 101 – State transition table of AMRK.....	153
Table 102 – All Functions in ASLM .....	154
Table 103 – Parameters for KEY-ESTABLISH.request .....	158
Table 104 – KeyMaterial_Struct structure .....	158
Table 105 – Parameters for KEY-ESTABLISH.indication.....	159

Table 106 – Parameters for KEY-ESTABLISH.response .....	159
Table 107 – Parameters for KEY-ESTABLISH.confirm .....	160
Table 108 – Parameters for KEY-UPDATE.request .....	160
Table 109 – Parameters for KEY-UPDATE.indication .....	161
Table 110 – Parameters for KEY-UPDATE.response .....	161
Table 111 – Parameters for KEY-UPDATE.confirm .....	162
Table 112 – Parameters for SEC-ALARM.request .....	162
Table 113 – Parameters for SEC-ALARM.indication .....	163
Table 114 – Key update states .....	166
Table 115 – Key update state transition .....	168
Table 116 – Keys used in DLL secure communication .....	169
Table 117 – Available security levels for DLL .....	171
Table A.1 – Security grades for WIA-FA network .....	175
Table B.1 – Applicable EN 300 440-2 requirements list .....	176
Table B.2 – Applicable EN 300 328 requirements list .....	177
Table B.3 – Timeslot timing definitions and calculations .....	178
Table B.4 – TxMaxPHYPacket of FHSS .....	178
Table B.5 – TxMaxPHYPacket of DSSS/HR-DSSS .....	179
Table B.6 – TxMaxMPDU of OFDM .....	179

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL NETWORKS –  
WIRELESS COMMUNICATION NETWORK  
AND COMMUNICATION PROFILES –  
WIA-FA**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC PAS 62948 has been processed by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
65C/784/PAS	65C/789/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

A bilingual version of this publication may be issued at a later date.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

IEC PAS 62948:2015

<https://standards.iteh.ai/catalog/standards/sist/7c70a6af-13a6-4a43-b600-32149d030dba/iec-pas-62948-2015>