



ZigBee®
Control your world

1

Base Device Behavior PICS Proforma v1.0 Errata

ZigBee Document 16-02829-003

August 29th, 2017

Sponsored by: ZigBee Alliance

Accepted by This document has not yet been accepted for release by the
ZigBee Alliance Board of Directors

Abstract This specification defines the base device behavior
specification for devices operating on the ZigBee-PRO
stack, ensuring profile interoperability between application
profiles. Note: this document supercedes errata document
16-02010.

Keywords Base device, ZigBee-PRO, PICS, Errata

Copyright © ZigBee Alliance, Inc. (1996-2018). All rights reserved.

508 Second Street, Suite 206 Davis, CA 95616 - USA

<http://www.zigbee.org>

Permission is granted to members of the ZigBee Alliance to reproduce this document for their own use or the use of other ZigBee Alliance members only, provided this notice is included. All other rights reserved. Duplication for sale, or for commercial or for-profit use is strictly prohibited without the prior written consent of the ZigBee Alliance.

2

3

This page is intentionally blank

4 Notice of use and disclosure

5 Copyright © ZigBee Alliance, Inc. (1996-2018). All rights Reserved. This
6 information within this document is the property of the ZigBee Alliance and its use
7 and disclosure are restricted.

8 Elements of ZigBee Alliance specifications may be subject to third party intellectual
9 property rights, including without limitation, patent, copyright or trademark rights
10 (such a third party may or may not be a member of ZigBee). ZigBee is not responsible
11 and shall not be held responsible in any manner for identifying or failing to identify
12 any or all such third party intellectual property rights.

13 No right to use any ZigBee name, logo or trademark is conferred herein. Use of any
14 ZigBee name, logo or trademark requires membership in the ZigBee Alliance and
15 compliance with the ZigBee Logo and Trademark Policy and related ZigBee policies.

16 This document and the information contained herein are provided on an “AS IS” basis
17 and ZigBee DISCLAIMS ALL WARRANTIES EXPRESS OR IMPLIED,
18 INCLUDING BUT NOT LIMITED TO (A) ANY WARRANTY THAT THE USE
19 OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OF
20 THIRD PARTIES (INCLUDING WITHOUT LIMITATION ANY
21 INTELLECTUAL PROPERTY RIGHTS INCLUDING PATENT, COPYRIGHT OR
22 TRADEMARK RIGHTS) OR (B) ANY IMPLIED WARRANTIES OF
23 MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE OR
24 NONINFRINGEMENT. IN NO EVENT WILL ZIGBEE BE LIABLE FOR ANY
25 LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OF DATA,
26 INTERRUPTION OF BUSINESS, OR FOR ANY OTHER DIRECT, INDIRECT,
27 SPECIAL OR EXEMPLARY, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL
28 DAMAGES OF ANY KIND, IN CONTRACT OR IN TORT, IN CONNECTION
29 WITH THIS DOCUMENT OR THE INFORMATION CONTAINED HEREIN,
30 EVEN IF ADVISED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGE. All
31 Company, brand and product names may be trademarks that are the sole property of
32 their respective owners.

33 The above notice and this paragraph must be included on all copies of this document
34 that are made.

37

This page is intentionally blank

38

Revision history

Revision	Date	Details	Editor
000	August 24 th , 2016	First update base on 15-0283-04. Fixes CCBs: 2148, 2149, 2184, 2191 & 2194.	Phil Jamieson
001	August 24 th , 2016	Added document number.	Phil Jamieson
002	July 4 th , 2017	Addressed CCBs: 2277, 2290, 2366, 2367, 2368, 2388 & 2389.	Phil Jamieson
003	August 29 th , 2017	Addressed CCB 2190.	Phil Jamieson

39

40

41

42

This page is intentionally blank

43

44	Table of Contents	
45	1	Introduction..... 9
46	1.1	Scope 9
47	1.2	Purpose 9
48	1.3	Abbreviations and special symbols 9
49	1.4	Instructions for completing the PICS proforma 10
50	1.5	PICS proforma tables 10
51	1.6	Errata 10
52	2	References..... 11
53	2.1	ZigBee Alliance documents 11
54	3	Implementation declaration 12
55	3.1	Identification of the implementation 12
56	3.2	Identification of the protocol 14
57	3.3	Global statement of conformance..... 14
58	4	Base device PIXIT 15
59	4.1	Internal attributes..... 15
60	4.2	Commissioning combinations 16
61	4.3	Miscellaneous 16
62	5	General requirements 18
63	5.1	[ZLT] ZigBee logical device types 18
64	5.2	[NSM] Network security models 19
65	5.3	[LK] Link keys 19
66	5.4	[UIC] Use of install codes 19
67	5.5	[GRC] Commissioning..... 20
68	5.6	[MRD] Minimum requirements for all devices..... 22
69	5.7	[DRC] Default reporting configuration 24
70	5.8	[MDP] MAC data polling..... 25
71	5.9	[ZPD] ZigBee persistent data 26
72	5.10	[UGP] Use of green power 26
73	6	Initialization 27
74	6.1	[INP] Initialization procedure 27

75	7	[COM] Commissioning	28
76	7.1	[NSO] Network steering procedure for a node on a network.....	28
77	7.2	[NSN] Network steering procedure for a node not on a network	28
78	7.3	[NFP] Network formation procedure	29
79	7.4	[FBT] Finding & binding procedure for a target endpoint.....	30
80	7.5	[FBI] Finding & binding procedure for an initiator endpoint	30
81	7.6	[TLI] Touchlink procedure for an initiator.....	30
82	7.7	[TLT] Touchlink procedure for a target	32
83	8	Reset.....	35
84	8.1	[RBC] Reset via the basic cluster	35
85	8.2	[RTL] Reset via the touchlink commissioning cluster	35
86	8.3	[RNL] Reset via network leave command	36
87	8.4	[RLZ] Reset via the Mgmt_Leave_req ZDO command	36
88	8.5	[RLA] Reset via local action	36
89	9	Security	37
90	9.1	[RLK] Receiving a new Trust Center link key.....	37
91	9.2	[AIC] Adding an install code	38
92	9.3	[ANN] Adding a new node into the network	39
93	9.4	[BKN] Behavior when a known node joins	40
94	9.5	[TCP] Trust center policies	40
95			
96			
97			
98			
99			

1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given standard. Such a statement is called a protocol implementation conformance statement (PICS).

1.1 Scope

This document provides the protocol implementation conformance statement (PICS) proforma for the Base Device Behavior specification [R2] in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7.

1.2 Purpose

The supplier of a protocol implementation claiming to conform to the Base Device Behavior specification shall complete the following PICS proforma and accompany it with the information necessary to identify fully both the supplier and the implementation.

The PICS is in the form of answers to a set of questions in the PICS proforma. The questions in a proforma consist of a systematic list of protocol capabilities and options as well as their implementation requirements. The implementation requirement indicates whether implementation of a capability is mandatory, optional, or conditional depending on options selected. When a protocol implementer answers questions in a PICS proforma, they would indicate whether an item is implemented or not, and provide explanations if an item is not implemented.

1.3 Abbreviations and special symbols

Notations for requirement status:

Symbol	Description
<Item Number>	PICS item reference composed of an item set abbreviation and a numeric item identifier, e.g. ZLT1.
<Status>	Implementation requirement status for this item (see below).
<Item Number>: <Status>	<i>Status</i> is conditional on support of <i>Item Number</i> .
<Item number>.<i>	<i> is a sub-item of <Item number>.
✖	Specific negative test case item.
M	Feature is mandatory.
O	Feature is optional.
R	Feature is optional but recommended.
O.n	Feature is optional, but support of at least one of the group of options labeled O.n is required.

Symbol	Description
N/A	Feature is not applicable.
X	Feature is prohibited.
~	Boolean NOT operator.
&&	Boolean AND operator.
	Boolean OR operator.

124

125 Unless explicitly stated, items that do not match may be considered optional.

126 For example, FD1: O.1 indicates that the status is optional but at least one of the
 127 features described in FD1 is required to be implemented, if this implementation is to
 128 follow the standard of which this PICS proforma is a part.

129

130 **1.4 Instructions for completing the PICS proforma**

131 If a given implementation is claimed to conform to this standard, the actual PICS
 132 proforma to be filled in by a supplier shall be technically equivalent to the text of the
 133 PICS proforma in this document, and shall preserve the numbering and naming and
 134 the ordering of the PICS proforma.

135 A PICS which conforms to this document shall be a conforming PICS proforma
 136 completed in accordance with the instructions for completion given in this document.

137 The main part of the PICS is a fixed-format questionnaire. Answers to the
 138 questionnaire are to be provided in the rightmost column, either by simply marking an
 139 answer to indicate a restricted choice (such as Yes or No), or by entering a value, set,
 140 or range of values.

141 If an implementation supports multiple application devices on multiple endpoints, a
 142 separate PICS proforma SHALL be completed for each device.

143 **1.5 PICS proforma tables**

144 The tables in clauses 4 onwards are composed of the detailed questions to be
 145 answered, which make up the PICS proforma. References are to the Base Device
 146 Behavior Specification [R2] unless otherwise indicated.

147 **1.6 Errata**

148 Any errata against this specification can be found in [R5].

149

2 References

The following standards contain provisions, which, through reference in this document, constitute provisions of this standard. All the standards listed are normative references. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

2.1 ZigBee Alliance documents

- [R1] ZigBee Specification, ZigBee document 05-3474.
- [R2] Base Device Behavior Specification, ZigBee document 13-0402.
- [R3] ZigBee Cluster Library, ZigBee document 07-5123.
- [R4] ZigBee Application Architecture, ZigBee document 13-0589.
- [R5] Errata for Base Device Behavior PICS, ZigBee document 16-02010.

3 Implementation declaration

3.1 Identification of the implementation

Implementation under test (IUT) identification

IUT name	Philips Hue Product Family 0111
IUT software version	1.48.3_r25759
IUT hardware version	MP1.0
Operating system (optional)	

Product supplier

Name	Philips Lighting B.V.
Address	P.O. Box 80020 5600 JM Eindhoven The Netherlands
Telephone number	
Fax number	
Email address	
Additional information	

172 **Client**

Name	Musa Unmehopa
Address	(See above)
Telephone number	+31-(0)611385957
Fax number	
Email address	musa.unmehopa@philips.com
Additional information	

173

174 **PICS contact person**

Name	Rob Houtepen
Address	(See above)
Telephone number	
Fax number	
Email address	rob.houtepen@philips.com
Additional information	

175

176

177

178

3.2 Identification of the protocol

This PICS proforma applies to the Base Device Behavior specification [R2].

3.3 Global statement of conformance

The implementation described in this PICS proforma meets all of the mandatory requirements of the referenced standards:

Base Device Behavior specifications [R2]

☒ Yes

☐ No

Note -- Answering 'No' indicates non-conformance to the specified protocol standard. Non-supported mandatory capabilities are to be identified in the following tables, with an explanation by the implementer explaining why the implementation is non-conforming.

The supplier will have fully complied with the requirements for a statement of conformance by completing the statement contained in this sub-clause. That means, by clicking the above, the statement of conformance is complete.

194 **4 Base device PIXIT**195 **4.1 Internal attributes**

Item number	Feature	Reference	Used By		Support
			ZLT1	ZLT2/ ZLT3	
IA1	<i>bdbCommissioningGroupID</i> : What is the list of groups the node is able to use for finding & binding?	5.3.1	Yes	Yes	
IA2	<i>bdbJoinUsesInstallCodeKey</i> : Does the Trust Center policy require all nodes to join using an install code?	5.3.6	Yes	No	
IA3	<i>bdbPrimaryChannelSet</i> : What is the primary channel set?	5.3.10	Yes	Yes	0x02108800 //Channels 11, 15, 20, 25
IA4	<i>bdbScanDuration</i> : What is the scan duration?	5.3.11	Yes	Yes	0x02 //60ms
IA5	<i>bdbSecondaryChannelSet</i> : What is the secondary channel set?	5.3.12	Yes	Yes	0x05EF7000 //Channels 12,13,14,16,17,18,19, 21,22,23,24,26
IA6	<i>bdbTCLinkKeyExchangeAttemptsMax</i> : What is the maximum number of attempts a node will try to exchange its Trust Center link key?	5.3.14	No	Yes	0x03
IA7	<i>bdbTCLinkKeyExchangeMethod</i> : What is the Trust Center link key exchange method?	5.3.15	No	Yes	0x00
IA8	<i>bdbTrustCenterNodeJoinTimeout</i> : What is the Trust Center node join timeout?	5.3.16	Yes	No	
IA9	<i>bdbTrustCenterRequireKeyExchange</i> : Does the Trust Center's policy require a node to exchange its initial link key with a new link key generated by the Trust Center?	5.3.17	Yes	No	

196

197

4.2 Commissioning combinations

The actions specified in this section serve as a guide for testing the individual commissioning mechanisms. Verification of commissioning feature support is covered later in this document.

Indicate support of all relevant combinations and add any further combinations supported by the device.

Item number	Feature	Status	Support
CC1	Can the product be stimulated to invoke touchlink commissioning only?	O	/No
CC2	Can the product be stimulated to invoke network formation only?	O	/No
CC3	Can the product be stimulated to invoke network steering only?	O	/No
CC4	Can the product be stimulated to invoke finding & binding only?	O	/No
CC5	Can the product be stimulated to invoke touchlink commissioning followed by network steering?	O	/No
CC6	Can the product be stimulated to invoke network formation followed by network steering?	O	/No
CC7	Can the product be stimulated to invoke network steering followed by network formation?	O	/No
CC8	Can the product be stimulated to reset before network formation?	O	/No
CC9	Can the product be stimulated to automatically form a network upon startup when factory new?	O	/No
	...		

4.3 Miscellaneous

Item number	Feature	Status	Support
M1	Can the node disable network steering via local application trigger?	O	/No
M2	Can the node store more than one NWK outgoing frame counters?	O	/No

Item number	Feature	Status	Support
M3.0	If supported, give the endpoint identifier of a cluster that has at least one writable attribute.	O	11
M3.1	If supported (in M3.0), give the identifier of the cluster that has at least one writable attribute.	O	0x0300
M3.2	If supported (in M3.1), give the attribute identifier of the writable attribute.	O	0x4010
M4	Does the stack filter the scan channels based on a prior energy detection scan?	O	/No
M5.0	If supported, give the endpoint identifier of a cluster that has at least one reportable attribute.	O	11
M5.1	If supported (in M3.0), give the identifier of the cluster that has at least one reportable attribute.	O	0x0008
M5.2	If supported (in M3.1), give the attribute identifier of the reportable attribute.	O	0x0000

207

5 General requirements

5.1 [ZLT] ZigBee logical device types

Item number	Feature	Reference	Status	Support
ZLT1	Is the logical device type specified as a ZigBee coordinator?	[R1]/2.5.4.5.1	O.1	/No
ZLT1.1	Does the node encompass the role of the Trust Center?	6.1	ZLT1: M ZLT2: X ZLT3: X	/No
ZLT1.2	Does the node form a centralized security network?	6.1	ZLT1: M ZLT2: X ZLT3: X	/No
ZLT1.3	Does the node NOT attempt to join another network?	6.1	ZLT1: M	/No
ZLT2	Is the logical device type specified as a ZigBee router?	[R1]/2.5.4.5.2	O.1	Yes/
ZLT2.1	Can the router node join another network?	6.1	ZLT2: M	Yes/
ZLT2.2	Does the node form a distributed network?	6.1	ZLT1: X ZLT2: O ZLT3: X	/No
ZLT3	Is the logical device type specified as a ZigBee end device?	[R1]/2.5.4.5.5	O.1	/No
ZLT3.1	Can the end device node join another network?	6.1	ZLT3: M	/No
ZLT3.2	Is the end device sleepy?	-	ZLT3: O	/No
ZLT4	Can the node switch between ZLT1 and ZLT2 types under application control.	6.1	O.1	/No

Notes:

O.1 A node SHALL support one of ZLT1 or ZLT2 or ZLT3 or (ZLT1 and ZLT2, switchable under application control).

215 **5.2 [NSM] Network security models**

Item number	Feature	Reference	Status	Support
NSM1	Can the node join a centralized security network?	6.2	ZLT1: X ZLT2: M ZLT3: M	Yes/
NSM2	Can the node join a distributed security network?	6.2	ZLT1: X ZLT2: M ZLT3: M	Yes/

216

217 **5.3 [LK] Link keys**

Item number	Feature	Reference	Status	Support
LK1	Does the node contain the default global Trust Center link key?	6.3	M	Yes/
LK2	Does the node contain the distributed security global link key?	6.3	ZLT2: M ZLT3: M	Yes/
LK3	Does the node contain an install code derived preconfigured link key?	6.3	ZLT2: M ZLT3: M	Yes/
LK4	Does the node contain the touchlink preconfigured link key?	6.3	GRC5: M	Yes/

218

219 **5.4 [UIC] Use of install codes**

Item number	Feature	Reference	Status	Support
UIC1	Does the node support install codes?	6.4	M	Yes/
UIC2	Will the node not be available via retail channels and be professionally installed?	6.4	O.2	/No
UIC3	Will the node be available via retail channels?	6.4	O.2	Yes/
UIC4	Is the node configured to only require the use of install codes on joining?	6.4	UIC2: O UIC3: X	/No

Item number	Feature	Reference	Status	Support
UIC5	Does the node have a user configuration mechanism that allows switching between a mode in which only networks that require the use of install codes for joining are considered and a mode in which all networks are considered for joining?	6.4	UIC3: O.3	/No
UIC6	Does the node not have a user configuration mechanism that allows switching between a mode in which only networks that require the use of install codes for joining are considered and a mode in which all networks are considered for joining?	6.4	UIC3: O.3	Yes/
UIC7	Does the node default to requiring potential networks to use of install codes on joining?	6.4	UIC5: O UIC6: X	/No
UIC8	Can the node be switched into a mode whereby all networks are considered for joining?	6.4	UIC5: M	/No
UIC9	Can the node join all types of networks?	6.4	UIC6: M	Yes/
UIC10	Does the Trust Center require the use of install codes for all joining nodes?	6.4	ZLT1: O	/No

220

221 Notes:

222 O.2 One of the items marked O.2 SHALL be supported.

223 O.3 One of the items marked O.3 SHALL be supported.

224

225 **5.5 [GRC] Commissioning**

Item number	Feature	Reference	Status	Support
GRC1	Does the node support network steering?	6.5	M	Yes/
GRC2.1	Is the device implemented as having a simple device class (see [R4])?	6.5	O.4	Yes/

Item number	Feature	Reference	Status	Support
GRC2.2	Is the device implemented as having a dynamic device class (see [R4])?	6.5	O.4	/No
GRC2.3	Is the device implemented as having a node device class (see [R4])?	6.5	O.4	/No
GRC4	Does the device support finding & binding as either an initiator or a target?	6.5	GRC2.1: M GRC2.2: O GRC2.3: O	Yes/
GRC5	Does the device support touchlink commissioning as either an initiator or a target or both?	6.5	O	Yes/
GRC5.1	Does the device support touchlink commissioning as an initiator.	6.5	GRC5: O.5	/No
GRC5.2	Does the device support touchlink commissioning as a target.	6.5	GRC5: O.5	Yes/
GRC6	If touchlink commissioning as an initiator is attempted and is successful does the device not attempt any further commissioning operations?	6.5	GRC5.1: M	/No
GRC7	If network steering is attempted does the node follow the correct steering procedure dependent on whether the node is joined to a network or not?	6.5	M	Yes/
GRC8	Does the node only form a network if the node is not yet joined to a network?	6.5	ZLT1.2: M ZLT2.2: M	/No
GRC9	Can the node form a centralized network?	6.5	ZLT1.2: M	/No
GRC10	Can the node form a distributed network?	6.5	ZLT2.2: M	/No
GRC11	Does the node skip network formation?	6.5	ZLT3: M	/No
GRC12	Does the node attempt finding & binding only if it is joined to a network?	6.5	ZLT2: M ZLT3: M	Yes/

Item number	Feature	Reference	Status	Support
GRC13	Does the node instigate finding & binding on one or more endpoints implemented on the node?	6.5	GRC4: O	/No
GRC14	Does the node attempt finding & binding as an initiator endpoint if the endpoint supports a type 1 client or type 2 server cluster?	6.5	GRC4: O.6	/No
GRC15	Does the node attempt finding & binding as a target endpoint if the endpoint supports a type 1 server or type 2 client cluster?	6.5	GRC4: O.6	Yes/
GRC16	Is the node capable of binding to a group during finding & binding?		GRC4: O	/No
GRC17	Is the device able to transmit groupcast messages?		O	Yes/

226

227 Notes:

228 O.4 One of the items marked O.4 SHALL be supported.

229 O.5 One of the items marked O.5 SHALL be supported.

230 O.6 One of the items marked O.6 SHALL be supported.

231

232 **5.6 [MRD] Minimum requirements for all devices**

Item number	Feature	Reference	Status	Support
MRD1	Can the node process the ZDO <i>Active_EP_req</i> command and respond with the ZDO <i>Active_EP_rsp</i> command?	6.6	M	Yes/
MRD1.1	Can the node process the ZDO <i>Node_Desc_req</i> command and respond with the ZDO <i>Node_Desc_rsp</i> command?	6.6	M	Yes/
MRD2	Can the node process the ZDO <i>Simple_Desc_req</i> command and respond with the ZDO <i>Simple_Desc_rsp</i> command?	6.6	M	Yes/

Item number	Feature	Reference	Status	Support
MRD3	Can the node process the ZDO <i>IEEE_Addr_req</i> command and respond with the ZDO <i>IEEE_Addr_rsp</i> command?	6.6	M	Yes/
MRD4	Can the node process the ZDO <i>NWK_Addr_req</i> command and respond with the ZDO <i>NWK_Addr_rsp</i> command?	6.6	M	Yes/
MRD5	Can the node process the ZDO <i>Match_Desc_req</i> command and respond with the ZDO <i>Match_Desc_rsp</i> command?	6.6	M	Yes/
MRD6	Can the node process the ZDO <i>Mgmt_Bind_req</i> command and respond with the ZDO <i>Mgmt_Bind_rsp</i> command?	6.6	M	Yes/
MRD7	Can the node process the ZDO <i>Mgmt_Lqi_req</i> command and respond with the ZDO <i>Mgmt_Lqi_rsp</i> command?	6.6	M	Yes/
MRD8	Can the node process the ZDO <i>Bind_req</i> command and respond with the ZDO <i>Bind_rsp</i> command?	6.6	M	Yes/
MRD9	Can the node process the ZDO <i>Unbind_req</i> command and respond with the ZDO <i>Unbind_rsp</i> command?	6.6	M	Yes/
MRD10	Can the node process the ZDO <i>Mgmt_Leave_req</i> command and respond with the ZDO <i>Mgmt_Leave_rsp</i> command?	6.6	M	Yes/
MRD11	If the node supports finding & binding as an initiator, can it process at least one <i>identify</i> cluster, <i>identify query response</i> command after broadcasting an <i>identify</i> cluster, <i>identify query</i> command?	6.6	GRC13: M	/No
MRD12	If the node supports finding & binding as an initiator, can it process more than one <i>identify</i> cluster, <i>identify query response</i> command after broadcasting an <i>identify</i> cluster, <i>identify query</i> command?	6.6	GRC13: O	/No

Item number	Feature	Reference	Status	Support
MRD13	If the node supports finding & binding as an initiator, does it implement a binding table whose number of entries is \geq the sum of cluster instances supported on each device?	6.6	GRC13: M	/No
MRD14	Regardless of the commissioning mechanism, is the binding table consistent such that its contents can be retrieved using the <i>ZDO Mgmt_Bind_req</i> command?	6.6	M	Yes/
MRD15	Does the node have a default reporting configuration for every implemented attribute that is specified as mandatory and reportable?	6.6	DRC1: M	Yes/
MRD16	Does the node have a cluster which is the target of an application transaction?	6.6	O	Yes/
MRD17	Does the node support group addressing and at least 8 memberships in the group table?	6.6	MRD16: M	Yes/

233

234 5.7 [DRC] Default reporting configuration

Item number	Feature	Reference	Status	Support
DRC1	Does the node have at least one attribute that is specified as reportable?	6.7	O	Yes/
DRC2	Does the node have a default reporting configuration for every attribute that is specified as reportable?	6.7	DRC1: M	Yes/
DRC3	Does the node automatically send reports to a node that binds with a cluster containing an attribute that is specified as reportable?	6.7	DRC2: M	Yes/
DRC4	If any default reporting configuration is overwritten, is the updated reporting configuration used instead?	6.7	DRC1: M	Yes/

Item number	Feature	Reference	Status	Support
DRC5	If the maximum reporting interval of an attribute is greater than 0x0000, is a report generated when the time that has elapse since the previous report of the same attribute is equal to the maximum reporting interval for that attribute?	6.7	DRC1: M	Yes/
DRC6	If the maximum reporting interval of an attribute is equal to 0x0000, is a report generated when the attribute value changes?	6.7	DRC1: M	Yes/

235

236 **5.8 [MDP] MAC data polling**

Item number	Feature	Reference	Status	Support
MDP1	Is the MAC data polling rate dynamic based on the operating state of the node?	6.8	ZLT3: R	/No
MDP2	Does the node have at least a fast and a slow MAC data polling rate?	6.8	ZLT3: R	/No
MDP3	Does the device poll more frequently than once per 7.5 seconds?	6.8	ZLT3: R	/No
MDP4	While waiting for an active response message, does the node poll at its fast rate?	6.8	MDP2: R	/No
MDP5	Is the fast poll rate at least once every 3 seconds?	6.8	MDP2: R	/No
MDP6	While not actively waiting for messages, does the node poll at its slow rate?	6.8	MDP2: O	/No
MDP7	Does the node poll at its fast rate during commissioning?	6.8	MDP2: R	/No

237

238 **5.9 [ZPD] ZigBee persistent data**

Item number	Feature	Reference	Status	Support
ZPD1	Does the node preserve the value of the <i>bdbNodeIsOnANetwork</i> attribute across resets?	6.9	M	Yes/

239

240 **5.10 [UGP] Use of green power**

Item number	Feature	Reference	Status	Support
UGP1	Does the node support the Green Power proxy basic functionality?	6.10	ZLT1: M ZLT2: M ZLT3: O	Yes/

241

242 6 Initialization

243 6.1 [INP] Initialization procedure

Item number	Feature	Reference	Status	Support
INP1	Does the node support the initialization procedure?	7.1	M	Yes/
INP2	Does the node restore its persistent ZigBee data?	7.1	M	Yes/
INP3	If the node is a ZigBee End Device and was previously on a network, does it attempt to rejoin the network?	7.1	ZLT3: M	/No
INP4	On successful rejoining, does the node broadcast a <i>device_annce</i> ZDO command?	7.1	ZLT3: M	/No
INP5	If the node is a ZigBee Router and supports touchlink but was not previously on a network, does it switch to a touchlink primary channel?	7.1	(ZLT2 && GRC5): M	Yes/

244

245 **7 [COM] Commissioning**

Item number	Feature	Reference	Status	Support
COM1	Does the implementation provide a mechanism to invoke network steering?	8	M	Yes/
COM2	Does the implementation provide a mechanism to invoke finding & binding?	8	GRC4: M	Yes/

246

247 **7.1 [NSO] Network steering procedure for a node on a network**

Item number	Feature	Reference	Status	Support
NSO1	Is the <i>network steering for a node on a network</i> procedure supported?	8.2	M	Yes/
NSO2	Does the node first broadcast the <i>Mgmt_Permit_Joining_req</i> ZDO command?	8.2	M	Yes/
NSO3	If the node is a ZigBee Coordinator or a ZigBee Router, does the node activate its permit joining flag for $\geq bdbcMinCommissioningTime$?	8.2	(ZLT1 ZLT2): M	Yes/

248

249 **7.2 [NSN] Network steering procedure for a node not on a**
250 **network**

Item number	Feature	Reference	Status	Support
NSN1	Is the <i>network steering for a node not on a network</i> procedure supported?	8.3	ZLT1: X ZLT2: M ZLT3: M	Yes/
NSN2	Does the node attempt to discover networks over a set of channels?	8.3	NSN1: M	Yes/
NSN3	If suitable networks were found, does the node attempt to join one of them using MAC association?	8.3	NSN1: M	Yes/

Item number	Feature	Reference	Status	Support
NSN4	If the join was not successful and there are more suitable networks to join, does the node attempt to join another network?	8.3	NSN1: M	Yes/
NSN5	If the join was successful, does the node wait <i>apsSecurityTimeOutPeriod</i> milliseconds to receive the network key?	8.3	NSN1: M	Yes/
NSN6	If the network key is not received within <i>apsSecurityTimeOutPeriod</i> milliseconds, the network key is received but could not be decrypted or the authentication fails does the node reset its network parameters?	8.3	NSN1: M	Yes/
NSN7	Does the node broadcast a <i>Device_annce</i> ZDO command?	8.3	NSN1: M	Yes/
NSN9	If the TC link key exchange is not successful, does the node reset its network parameters and remove itself from the network?	8.3	NSN1: M	Yes/
NSN10	If the TC link key exchange is successful, does the node broadcast the <i>Mgmt_Permit_Joining_req</i> ZDO command?	8.3	NSN1: M	Yes/
NSN11	Does the node activate its permit joining flag if new nodes can join this node?	8.3	(ZLT1 ZLT2): M	Yes/

251

252 7.3 [NFP] Network formation procedure

Item number	Feature	Reference	Status	Support
NFP1	Is the <i>network formation</i> procedure supported?	8.4	ZLT1: M ZLT2: O	/No
NFP2	Does the node attempt to form a network over a set of channels?	8.4	NFP1: M	/No
NFP3	If formation is successful and the node is a ZigBee Coordinator, does it initiate its Trust Center functionality?	8.4	(NFP1 && ZLT1): M	/No

253

254 **7.4 [FBT] Finding & binding procedure for a target endpoint**

Item number	Feature	Reference	Status	Support
FBT1	Is the <i>finding & binding for a target endpoint</i> procedure supported?	8.5	GRC15: M	Yes/
FBT2	Does the target identify itself for at least <i>bdbMinCommissioningTime</i> seconds?	8.5	FBT1: M	Yes/
FBT3	Does the target respond to <i>Identify</i> cluster <i>Identify Query</i> commands?	8.5	FBT1: M	Yes/

255

256 **7.5 [FBI] Finding & binding procedure for an initiator endpoint**

Item number	Feature	Reference	Status	Support
FBI1	Is the <i>finding & binding for an initiator endpoint</i> procedure supported?	8.6	GRC14: M	/No
FBI2	Is the <i>Identify</i> cluster <i>Identify Query</i> command broadcast supported?	8.6	FBI1: M	/No
FBI3	Is the simple descriptor of each respondent obtained with the <i>Simple_Desc_req</i> ZDO command?	8.6	FBI1: M	/No
FBI4	Does the initiator create a binding table entry for each matching cluster to the respondent?	8.6	FBI1: M	/No
FBI5	If a group binding is requested, does the initiator add the respondent to an appropriate group?	8.6	(FBI1 && GRC16): M	/No

257

258 **7.6 [TLI] Touchlink procedure for an initiator**

Item number	Feature	Reference	Status	Support
TLI1	Is the <i>touchlink for an initiator</i> procedure supported?	8.6	GRC5.1: M	/No
TLI2	Does the initiator broadcast 5 <i>scan request</i> inter-PAN command frames on the first primary touchlink channel and then once for each remaining primary channel?	8.6	TLI1: M	/No

Item number	Feature	Reference	Status	Support
TLI3	Does the initiator broadcast a <i>scan request</i> inter-PAN command frames on each secondary touchlink channel when using touchlink for formation or joining?	8.6	TLI1: O	/No
TLI4	If the initiator is not on a network, does it ignore any <i>scan request</i> command frames from other factory new initiators?	8.6	TLI1: M	/No
TLI5	If the initiator is not on a network, does it switch into a target mode if any <i>scan request</i> command frames are received from other non-factory new initiators?	8.6	TLI1: O	/No
TLI6	If a target is found, does the initiator transmit a <i>device information request</i> inter-PAN command frame to the selected target?	8.6	TLI1: O	/No
TLI6.1	If a <i>device information request</i> inter-PAN command frame is sent to the selected target but no response is received, does the initiator terminate the touchlink procedure for an initiator?	8.6	(TLI1 && TLI6): O	/No
TLI7	If a target is found, does the initiator transmit one or more <i>identify request</i> inter-PAN command frame to the selected target?	8.6	TLI1: O	/No
TLI8	If a <i>scan request</i> command frame is received from a target on the same network as the initiator with the <i>network update identifier</i> field lower than <i>nwkUpdateId</i> , does the initiator transmit a <i>network update request</i> inter-PAN command frame to the selected target and then terminate the touchlink procedure?	8.6	TLI1: M	/No
TLI9	If a target is found on a different network to the initiator and the initiator is on a centralized network, does it terminate the touchlink procedure?	8.6	TLI1: M	/No

Item number	Feature	Reference	Status	Support
TLI10	If the initiator is not on a network and the target is a ZigBee Router, does the initiator transmit a <i>network start request</i> inter-PAN command frame to the selected target?	8.6	TLI1: M	/No
TLI11	If the initiator is on a network and the target is a ZigBee Router, does the initiator transmit a <i>network join router request</i> inter-PAN command frame to the selected target?	8.6	TLI1: M	/No
TLI12	If the initiator is on a network and the target is a ZigBee End Device, does the node transmit a <i>network join end device request</i> inter-PAN command frame to the selected target?	8.6	TLI1: M	/No
TLI13	If the initiator is an end device and a <i>network start request</i> inter-PAN command frame was sent to the selected target, does the node rejoin the network?	8.6	(ZLT3 && TLI1): M	/No

259

260 7.7 [TLT] Touchlink procedure for a target

Item number	Feature	Reference	Status	Support
TLT1	Is the <i>touchlink for a target</i> procedure supported?	8.7	GRC5.2: M	Yes/
TLT2	Does the target discard any touchlink commissioning command other than a <i>scan request</i> command and terminate the procedure?	8.7	TLT1: M	Yes/
TLT3	Does the target discard <i>scan request</i> command frames with an RSSI lower than a product specific threshold and terminate the procedure?	8.7	TLT1: M	Yes/
TLT4	Does the target respond to a <i>scan request</i> command frame with a <i>scan response</i> command frame?	8.7	TLT1: M	Yes/

Item number	Feature	Reference	Status	Support
TLT5	Does the target respond to a <i>device information request</i> command frame with a <i>device information response</i> command frame?	8.7	TLT1: M	Yes/
TLT6	Does the target identify itself on receipt of a <i>identify request</i> command frame?	8.7	TLT1: M	Yes/
TLT7.1	Does the target allow itself to start a new network?	8.7	TLT1: O	Yes/
TLT7.2	If the target receives a <i>network start request</i> command frame, is a ZigBee Router and decides not to start a network, does it respond with a <i>network start response</i> command frame with the <i>Status</i> field set to 0x01 (failure)?	8.7	(TLT1 && ZLT2 && ~TLT7.1): M	/No
TLT7.3	If the target receives a <i>network start request</i> command frame, is a ZigBee Router and decides to start a network, does it perform a network discovery?	8.7	(TLT1 && ZLT2 && TLT7.1): M	Yes/
TLT8	Does the target allow itself to be joined to another network?	8.7	TLT1: O	Yes/
TLT8.1	If the target receives a <i>network join router request</i> command frame, is a ZigBee Router and decides not to be joined to another network, does it respond with a <i>network join router response</i> command frame with the <i>Status</i> field set to 0x01 (failure)?	8.7	(TLT1 && ZLT2 && ~TLT8): M	Yes/
TLT8.2	If the target receives a <i>network join router request</i> command frame, is a ZigBee Router and decides to join the network of the initiator, does it respond with a <i>network join router response</i> command frame with the <i>Status</i> field set to 0x00 (success)?	8.7	(TLT1 && ZLT2 && TLT8): M	Yes/
TLT9.1	If the target receives a <i>network join end device request</i> command frame, is a ZigBee End Device and decides not to be joined to another network, does it respond with a <i>network join router response</i> command frame with the <i>Status</i> field set to 0x01 (failure)?	8.7	(TLT1 && ZLT3 && ~TLT8): M	/No

Item number	Feature	Reference	Status	Support
TLT9.2	If the target receives a <i>network join end device request</i> command frame, is a ZigBee End Device and decides to join the network of the initiator, does it respond with a <i>network join end device response</i> command frame with the <i>Status</i> field set to 0x00 (success)?	8.7	(TLT1 && ZLT3 && TLT8): M	/No
TLT10	If target is already part of a network, does it leave its current network?	8.7	TLT1: M	Yes/
TLT11	If requested by the initiator, does the target start a new network and respond with a <i>network start response</i> command frame?	8.7	TLT1: M	Yes/
TLT12	After starting a new network, does the target direct join the initiator to its new network?	8.7	TLT1: M	Yes/

261

262

263

264 **8 Reset**265 **8.1 [RBC] Reset via the basic cluster**

Item number	Feature	Reference	Status	Support
RBC1	Does the target support reception of the <i>reset to factory defaults</i> command frame?	9.1	O	/No
RBC2	Does the initiator transmit a <i>reset to factory defaults</i> command frame to a target?	9.1	O	/No
RBC3	On receipt of a <i>reset to factory defaults</i> command frame, does the target reset all attributes of all clusters to their default values?	9.1	RBC1: M	/No
RBC4	On receipt of a <i>reset to factory defaults</i> command frame, does the target not reset its network parameters?	9.1	RBC1: M	/No

266

267 **8.2 [RTL] Reset via the touchlink commissioning cluster**

Item number	Feature	Reference	Status	Support
RTL2	Does the initiator transmit a <i>reset to factory new</i> command frame to a target?	9.2	GRC5.1: M	/No
RTL3	On receipt of a <i>reset to factory new</i> command frame and if the target is on a distributed security network, does it leave the network?	9.2	GRC5.2: M	Yes/
RTL4	On receipt of a <i>reset to factory new</i> command frame and if the target is on a centralized security network, does it ignore the command?	9.2	GRC5.2: O	/No
RTL5	Does the initiator use an extended channel scan during a reset via the touchlink commissioning cluster?	9.2	GRC5.1: M	/No

268

269 8.3 [RNL] Reset via network leave command

Item number	Feature	Reference	Status	Support
RNL1	Does a node transmit a <i>leave</i> NWK command frame to another node to trigger the other node to leave?	9.4	O	/No
RNL2a	On receipt of a <i>leave</i> NWK command frame with the <i>request</i> bit set to 1 when the <i>nwkLeaveRequestAllowed</i> NIB attribute is set to TRUE, does the router node leave the network?	9.4	ZLT2: M	Yes/
RNL2b	On receipt of a <i>leave</i> NWK command frame with the <i>request</i> bit set to 1, does the end device node leave the network?	9.4	ZLT3: M	/No

270

271 8.4 [RLZ] Reset via the *Mgmt_Leave_req* ZDO command

Item number	Feature	Reference	Status	Support
RLZ1	Does a node transmit an <i>Mgmt_Leave_req</i> ZDO command frame to another node?	9.5	O	/No
RLZ2a	On receipt of an <i>Mgmt_Leave_req</i> ZDO command frame when the <i>nwkLeaveRequestAllowed</i> NIB attribute is set to TRUE, does the node leave the network?	9.5	ZLT2: M	Yes/
RLZ2b	On receipt of an <i>Mgmt_Leave_req</i> ZDO command frame, does the end device node leave the network?	9.5	ZLT3: M	/No

272

273 8.5 [RLA] Reset via local action

Item number	Feature	Reference	Status	Support
RLA1	Does the node provide a local reset mechanism?	9.6	O	/No
RLA2	On activation of the local reset mechanism, does the node reset itself?	9.6	RLA1: M	/No

274

9 Security

275

9.1 [RLK] Receiving a new Trust Center link key

Item number	Feature	Reference	Status	Support
RLK0	Does the node exchange its link key during network steering on a centralized security network?	10.2.5	ZLT2: M ZLT3: M	Yes/
RLK1a	Does the node execute the appropriate steps defined by the alternative link key exchange mechanism?	10.2.5, step 1	(RLK0 && (IA7!=0x00)): M	/No
RLK1b	If the alternative mechanism is successful, does the node terminate the node link key exchange procedure?	10.2.5, step 1	RLK1a: M	/No
RLK3	If the APS Request Key method is used or the alternative mechanism is not successful, does the node transmit the <i>Node_Desc_req</i> ZDO command to the Trust Center?	10.2.5, step 3	(RLK0 && (IA7==0x00)): M RLK1a: M	Yes/
RLK4a	If a <i>Node_Desc_rsp</i> ZDO command is not received within <i>bdbcTCLinkKey-ExchangeTimeout</i> seconds does the node retry up to the maximum attempts permitted?	10.2.5, step 4	RLK3: M	Yes/
RLK4b	If a <i>Node_Desc_rsp</i> ZDO command is not received after the maximum number of attempts permitted, does it terminate the node link key exchange procedure?	10.2.5, step 4	RLK3: M	Yes/
RLK5	If a <i>Node_Desc_rsp</i> ZDO command is received and the server mask of the node descriptor indicates a core stack of r20 or earlier, does the node terminate the node link key exchange procedure?	10.2.5, step 5	RLK3: M	Yes/
RLK7	If a <i>Node_Desc_rsp</i> ZDO command is received and the server mask of the node descriptor indicates a core stack of r21 or later, does the node request a new link key using the <i>Request Key</i> APS command frame to the Trust Center, encrypted with its initial link key?	10.2.5, step 7	RLK3: M	Yes/

Item number	Feature	Reference	Status	Support
RLK8a	If a <i>Transport Key</i> APS command is not received within <i>bdbcTCLinkKey-ExchangeTimeout</i> seconds does the node retry up to the maximum attempts permitted?	10.2.5, step 8	RLK7: M	Yes/
RLK8b	If a <i>Transport Key</i> APS command is not received after the maximum number of attempts permitted, does it terminate the node link key exchange procedure?	10.2.5, step 8	RLK7: M	Yes/
RLK9	If a <i>Transport Key</i> APS command frame is received from the Trust Center, containing a new link key, does the node update its Trust Center link key with the new key?	10.2.5, step 9	RLK7: M	Yes/
RLK11	Does the node verify the new key using the <i>Verify Key</i> APS command frame to the Trust Center?	10.2.5, step 11	RLK7: M	Yes/
RLK12a	If a <i>Confirm Key</i> APS command is not received within <i>bdbcTCLinkKey-ExchangeTimeout</i> seconds does the node retry up to the maximum attempts permitted?	10.2.5, step 12	RLK11: M	Yes/
RLK12b	If a <i>Confirm Key</i> APS command is not received after the maximum number of attempts permitted, does it terminate the node link key exchange procedure?	10.2.5, step 12	RLK11: M	Yes/

276

277 **9.2 [AIC] Adding an install code**

Item number	Feature	Reference	Status	Support
AIC0	Does the Trust Center allow the input of an install code?	10.3.1	ZLT1: O	/No
AIC2	On receipt of an installation code, does the Trust Center create an entry in its node/link key mapping table (<i>apsDeviceKeyPairSet</i>) with the installation code derived key?	10.3.1, step 2	(AIC0 && (IA2==True)): M	/No

278

279 **9.3 [ANN] Adding a new node into the network**

Item number	Feature	Reference	Status	Support
ANN1	On receipt of an <i>Update Device</i> APS command frame, does the Trust Center follow the procedure for adding a new node into the network?	10.3.2	ZLT1: M	/No
ANN2	If an install code is required and the new node is not in <i>apsDeviceKeyPairSet</i> , does the Trust Center terminate the Trust Center link key exchange procedure?	10.3.2	(ANN1 && (IA2==True)): M	/No
ANN3	If an install code is not required and the new node is not in <i>apsDeviceKeyPairSet</i> , does the Trust Center create an entry in its <i>apsDeviceKeyPairSet</i> for the joining node?	10.3.2	(ANN1 && (IA2==False)): M	/No
ANN4	Does the Trust Center send the network key to the joining node using a <i>Transport Key</i> APS command frame, encrypted with the entry in <i>apsDeviceKeyPairSet</i> corresponding to the joining node?	10.3.2	ANN1: M	/No
ANN5	If a <i>Request Key</i> APS command frame is not received and the Trust Center requires the new node to exchange its link key, does it request the new node leaves the network?	10.3.2	(IA9==TRUE): M	/No
ANN6	On receipt of a <i>Request Key</i> APS command frame from the joining node, encrypted with its initial link key, does the Trust Center generate a new link key and transport it to the joining node using a <i>Transport Key</i> APS command frame?	10.3.2	ANN5: M	/No
ANN7	If a <i>Verify Key</i> APS command frame is not received by the Trust Center from the joining node, does it request the new node leaves the network?	10.3.2	ANN6: M	/No

Item number	Feature	Reference	Status	Support
ANN8	Does the Trust Center receive a <i>Verify Key</i> APS command frame from the joining node, update the entry in <i>apsDeviceKeyPairSet</i> corresponding to the joining node with the new key and respond with a <i>Confirm Key</i> APS command frame?	10.3.2	ANN7: M	/No

280

281 9.4 [BKN] Behavior when a known node joins

Item number	Feature	Reference	Status	Support
BKN1	Does the Trust Center allow a known node to join but in a fresh state?	10.3.3	ZLT1: M	/No
BKN2	Does the Trust Center store the original install code derived link key for devices that have joined?	10.3.3	ZLT1: O	/No
BKN3	Does the Trust Center overwrite the link key for a joining node with the original install code derived link key?	10.3.3	((IA2==TRUE) && BKN2): M	/No
BKN4	Does the Trust Center overwrite the link key for a joining node with the default global Trust Center link key?	10.3.3	(IA2==FALSE): M	/No

282

283 9.5 [TCP] Trust center policies

Item number	Feature	Reference	Status	Support
TCP1.1	Does the Trust Center allow any nodes to join (Trust Center policy <i>useWhiteList</i>)?	[R1] Table 4.33	ZLT1.1: O.7	/No
TCP1.2	Does the Trust Center allow only known nodes to join (Trust Center policy <i>useWhiteList</i>)?	[R1] Table 4.33	ZLT1.1: O.7	/No

Item number	Feature	Reference	Status	Support
TCP2.1	Does the Trust Center allow a node on the network that transmits a ZDO Mgmt_Permit_Join with a significance set to 1 to affect the Trust Center policy (Trust Center policy <i>allowRemoteTc-PolicyChange</i>)?	[R1] Table 4.33	ZLT1.1: O.8	/No
TCP2.2	Does the Trust Center forbid a node on the network that transmits a ZDO Mgmt_Permit_Join with a significance set to 1 to affect the Trust Center policy (Trust Center policy <i>allowRemoteTc-PolicyChange</i>)?	[R1] Table 4.33	ZLT1.1: O.8	/No

284

285 Notes:

286 O.7 One or both of the items marked O.7 SHALL be supported.

287 O.8 One or both of the items marked O.8 SHALL be supported.

288

289