Project	ZigBee Alliance	
Title	**(Alternate) ZigBee Home Automation Profile: Protocol Implementation Conformance (PICS) Proforma (Alternate)**	
Date Submitted	[18 January 2012]	
Source	[Jared Lemke] [Vantage/Legrand] [1061 S 800 E, Orem, UT 84062]	Voice: [+1 801 226 4594] Fax: [] E-mail:[jaredl@vantagecontrols.com]
Re:	ZigBee PICS for the ZigBee Home Automation Profile	
Abstract	As a part of formal conformance testing, manufacturers will be asked to submit a statement of protocol conformance with respect to the appropriate ZigBee devices required by the application profile under test. This document is intended to provide the form of that statement of conformance for the Home Automation profile.	
Purpose	This document, after review by the relevant working groups, should provide a form whereby developers can proffer a statement of protocol conformance to be tested under profile testing.	
Notice	This document has been prepared to assist the ZigBee Alliance. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.	
Release	The contributor acknowledges and accepts that this contribution will be posted in the member area of the ZigBee web site.	

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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.

1.1 ZigBee Alliance documents

[R1] Document 053474r17: ZigBee Specification,

[R2] ZigBee document 064321r08, ZigBee Stack Profile

[R3] Document 053520r26: ZigBee Home Automation Application Profile Specification

[R4] ZigBee document 075123r01, ZigBee Cluster Library

[R5] Deleted

[R6] Deleted

[R7] Deleted

[R8] Deleted

[R9] Deleted

[R10] Deleted

[R11] ZigBee document 04300r08: ZigBee Network Layer PICS

[R12] ZigBee document 064147r07: ZigBee Application Layer PICS

[R13] ZigBee document 043171r04: ZigBee Security Layer PICS

[R14] ZigBee document 064113r08: ZigBee Cluster Library PICS

1.2 IEEE documents

[R15] IEEE Standard for Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) specifications for Low Rate Wireless Personal Area Networks (LR-WPANs), 2003.

1.3 ISO documents

[R16] ISO/IEC 9646-1:1991, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.

[R17] ISO/IEC 9646-7:1995, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7. Implementation conformance statements.

Change history

The following table shows the change history for this specification.

Revision 0 (October, 2006)

Table 1 – Revision change history for revision 0

Revision	Version	Description
R00	-	Initial draft (Converted from the HCL PICS written by Don Sturek)
R05	0	
R06	0	Changed to alternate version that references the ZCL PICS and places HA-specific restrictions on them.
R07	0	Updated to reflect changes to HA specification and for recertification event. Updated reference documents, devices etc. Revalidated optional and mandatory on devices, update on optional and mandatory on groups, scenes and binding since they are now by device type and not profile wide.
R08	0	Revalidated optional and mandatory on devices, update on optional and mandatory on groups, scenes and binding since they are now by device type and not profile wide.
R09	0	Expanded Table 8.3 to list requirements from Commissioning section of HA spec (Table 5.3)

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2 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).

2.1 Scope

This document provides the protocol implementation conformance statement (PICS) proforma for the ZigBee specifications cited in Reference [R3] in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7.

This document addresses the ZigBee Home Automation Application Profile.

2.2 Purpose

The supplier of a protocol implementation claiming to conform to the ZigBee Home Automation Application Profile 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.

3 Abbreviations and special symbols

Notations for requirement status:

M	Mandatory
O	Optional
O.n	Optional, but support of at least one of the group of options labeled O.n is required.
N/A	Not applicable
X	Prohibited
Item Number:*Status*	Status is conditional on support of item number

"*Item Number*": Conditional, status dependent upon the support marked for the "*Item Number*".

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

4 Instructions for completing the PICS proforma

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

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

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

5 Identification of the implementation

Implementation under test (IUT) identification

IUT name:
_____Smart HA Thermostat CTL2181-HA_____

IUT version:
_____

_____

System under test (SUT) identification

SUT name:
_____

Software Version:
_____

Hardware Version:

_____

Operating system (optional):
_____

Product supplier

Name: __Computime Ltd. _____

Address: _17/F Great Eagle Centre, Wanchai, Hong Kong_____

_____

Telephone number: _+852 22600300_____

Facsimile number: _+852 27903996_____

Email address:
_wlha@computime.com_____

Additional information: _____

Client

Name: _____

Address: _____

_____

Telephone number: _____

Facsimile number: _____

Email address: _____

Additional information: _____

PICS contact person

Name: __Kairy Lei_____

Address: _17/F Great Eagle Centre, Wanchai, Hong Kong_____

_____

Telephone number: _____+852 22600463 _____

Facsimile number: _____+852 27903996_____

Email address:
__kairylei@computime.com_____

Additional information:
_____

PICS/System conformance statement

6 Identification of the protocol

This PICS proforma applies to ZigBee Home Automation Application Profile, cited in Reference [R3].

7 Global statement of conformance

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

Application Profile: ZigBee Home Automation – 053520r26

☐ 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 subclause. That means, by clicking the above, the statement of conformance is complete.

8 PICS proforma tables

The following tables are composed of the detailed questions to be answered, which make up the PICS proforma.

8.1 ZigBee Device Types

Table 2 - Functional device types

Item number	Item description	Reference	Status	Support
FDT1	Is this device capable of acting as a ZigBee coordinator?	[R1]/2.5.5.5.1	O.1	No
FDT2	Is this device capable of acting as a ZigBee router?	[R1]/2.5.5.5.2	O.1	Yes
FDT3	Is this a ZigBee end device?	[R1]/2.5.5.5.3	O.1	No

8.2 ZigBee Stack Profile

Table 3 – ZigBee stack profile

Item number	Item description	Reference	Status	Support
ZSP1	Is the device built on a ZigBee Compliant Platform certified for ZigBee or ZigBee PRO stack profile [R2]/8.3?	[R11]/8 [R2]/8.3	M	Yes
ZSP2	Does the device implement source binding with a binding table whose number of available entries is greater than or equal to the number of mandatory clusters supported by the device descriptions implemented?	[R3]/5.2	O By device type	No
ZSP3	Does the device adhere to the polling rate specifications given in [R3]/5.1?	[R3]/5.2	FDT3:M	No
ZSP4	Does the device support Trust Center Link Keys including the Default TRUST Center Link Key?	[R3]/5.2	M	Yes

8.3 ZigBee Home Automation general requirements support

Table 4 – HA general requirements support

Item number	Item description	Reference	Status	Support
HAG1	Does the device support the ZigBee Cluster Library PICS as defined in [R14]?	[R14]/8	M	Yes
HAG2	Does the device support at least 16 entries in the group table?	[R3]/6	O By device type	No
HAG3	Does the device support the Scenes cluster as a server?		O	Yes
HAG4	Does the device support at least 16 entries in the scenes table?	[R3]/6	HAG3:M	Yes
HAG5	Does the device support a method for the user to put the device in join mode?		By device type	Yes
HAG6	Does the device support a method for the user to use the device to form a network?		By device type	No
HAG7	Does the device support a method for allowing others to join the network?		By device type	No
HAG8	Does the device support a method for allowing a user to restore factory settings?		By device type	No
HAG9	Does the device support a method to pair devices?		By device type	No
HAG10	Does the device support a method for the user to enable identify mode?		By device type	Yes

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8.4 ZigBee Home Automation device description support

Table 5 – HA device description support

Item number	Item description	Reference	Status	Support
HAD1	Is the product programmed as an On/Off Switch?	[R3]/7.3.4	O.1	No
HAD2	Is the product programmed as a Level Control Switch?	[R3]/7.3.5	O.1	No
HAD3	Is the product programmed as an On/Off Output?	[R3]/7.3.6	O.1	No
HAD4	Is the product programmed as Level Controllable Output?	[R3]/7.3.7	O.1	No
HAD5	Is the product programmed as a Scene Selector?	[R3]/7.3.8	O.1	No
HAD6	Is the product programmed as a Configuration Tool?	[R3]/7.3.9	O.1	No
HAD7	Is the product programmed as a Remote Control?	[R3]/7.3.10	O.1	No
HAD8	Is the product programmed as a Combined Interface?	[R3]/7.3.11	O.1	No
HAD9	Is the product programmed as a Range Extender?	[R3]/7.3.12	O.1	No
HAD10	Is the product programmed as a Mains Power Outlet?	[R3]/7.3.13	O.1	No
HAD33~~101~~	Is the product a Door Lock?	R3/7.3.2	O.1	No
HAD34~~102~~	Is the product a Door Lock Controller?	R3/7.3.3	O.1	No
HAD32~~103~~	Is the product a Simple Sensor?	R3	O.1	No
HAD11	Is the product programmed as a On/Off Light?	[R3]/7.4.1	O.1	No
HAD12	Is the product programmed as a Dimmable Light?	[R3]/7.4.2	O.1	No
HAD13	Is the product programmed as a Color Dimmable Light?	[R3]/7.4.3	O.1	No

Item number	Item description	Reference	Status	Support
HAD14	Is the product programmed as an On/Off Light Switch?	[R3]/7.4.4	O.1	No
HAD15	Is the product programmed as a Dimmer Switch?	[R3]/7.4.5	O.1	No
HAD16	Is the product programmed as a Color Dimmer Switch?	[R3]/7.4.6	O.1	No
HAD17	Is the product programmed as a Light Sensor?	[R3]/7.4.7	O.1	No
HAD18	Is the product programmed as an Occupancy Sensor?	[R3]/7.4.8	O.1	No
HAD19	Is the product programmed as a Shade?	[R3]/7.5.1	O.1	No
HAD20	Is the product programmed as a Shade Controller?	[R3]/7.5.2	O.1	No
HAD35~~201~~	Is the product a Window Covering Device	R3/7.5.3	O.1	No
HAD36~~202~~	Is the product a Window Covering Controller	R3/7.5.4	O.1	No
HAD21	Is the product programmed as a Heating/Cooling Unit?	[R3]/7.6.1	O.1	No
HAD22	Is the product programmed as a Thermostat?	[R3]/7.6.2	O.1	Yes
HAD23	Is the product programmed as a Temperature Sensor?	[R3]/7.6.3	O.1	No
HAD24	Is the product programmed as a Pump?	[R3]/7.6.4	O.1	No
HAD25	Is the product programmed as a Pump Controller?	[R3]/7.6.5	O.1	No
HAD26	Is the product programmed as a Pressure Sensor?	[R3]/7.6.6	O.1	No
HAD27	Is the product programmed as a Flow Sensor?	[R3]/7.6.7	O.1	No
HAD28	Is the product programmed as a Control and Indicating Equipment?	[R3]/7.7.1	O.1	No
HAD29	Is the product programmed as an IAS Ancillary Control Equipment?	[R3]/7.7.2	O.1	No
HAD30	Is the product programmed as an IAS Zone?	[R3]/7.7.3	O.1	No

Item number	Item description	Reference	Status	Support
HAD31	Is the product programmed as an IAS Warning Device?	[R3]/7.7.4	O.1	No

8.5 Home Automation common clusters

Table 6 – Common cluster ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
BCS1	M		Yes
ICS1	M		Yes
PCCS1	O		No
TCCS1	O		No
ACS1	O		No
SMC1	O		No
SMS1	O		No

Table 7 – Common cluster support

Item number	Item description	Reference	Status	Support
HACC1	Are any clusters that receive attribute reports supported as either server or client?	[R2] 7.1	O	No
HACC2	Are any manufacturer-specific clusters supported?	[R2] 7.1	O	No

8.6 ZigBee Home Automation Device Description Capabilities

Tables in the following sub-clauses detail the capabilities specific to a device description.

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8.6.1 Simple Sensor device functions

Table 8 – Sinple Sensor ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
BICS1	HAD32:M		

~~8.6.1~~8.6.2 On/Off Switch device functions

Table 9 – On/Off Switch ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCCS1	HAD1:M		
OOCC1	HAD1:M		
SCC1	HAD1:M		
GCC1	HAD1:M		
ICC1	HAD1:M		
ZSP2	HAD1:M		

~~8.6.2~~8.6.3 Level Control Switch device functions

Table 10 – Level Control Switch ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCCS1	HAD2:M		
OOCC1	HAD2:M		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
LCCC1	HAD2:M		
SCC1	HAD2:M		
GCC1	HAD2:M		
ICC1	HAD2:M		
ZSP2	HAD1:M		
~~ICC1~~	~~HAD2:M~~		

~~8.6.3~~8.6.4 On/Off Output device functions

Table 11 – On/Off Output ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD3:M		
SCS1	HAD3:M		
GCS1	HAD3:M		

~~8.6.4~~8.6.5 Level Controllable Output device functions

Table 12 Level Controllable Output ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD4:M		
LCCS1	HAD4:M		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCS1	HAD4:M		
GCS1	HAD4:M		

~~8.6.5~~8.6.6 Scene Selector device functions

Table 13 – Scene Selector ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCC1	HAD5:M		
GCC1	HAD5:M		
ICC1	HAD5:M		

~~8.6.6~~8.6.7 Configuration Tool device functions

Table 14 – Configuration Tool ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
BCC1	HAD6:O~~M~~		
SCC1	HAD6:O~~M~~		
GCC1	HAD6:O~~M~~		
ICC1	HAD6:O~~M~~		
SCCC1	HAD6:O		
ACC1	HAD6:O		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
IMCC1	HAD6:O		
ILSC1	HAD6:O		
TMCC1	HAD6:O		
PMCC1	HAD6:O		
FMCC1	HAD6:O		
OSCC1	HAD6:O		
PCC1	HAD6:O		
SHCC1	HAD6:O		
TUIC1	HAD6:O		

~~8.6.7~~8.6.8 Remote Control device functions

Table 15 – Remote Control ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
BCC1	HAD7:M		
SCC1	HAD7:M		
GCC1	HAD7:M		
ICC1	HAD7:M		
OOCC1	HAD7:M		
LCCC1	HAD7:M		
CCCC1	HAD7:O		
PCC1	HAD7:O		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SHCC1	HAD7:O		
SCCC1	HAD7:O		
TMCC1	HAD7:O		
IMCC1	HAD7:O		
ILSC1	HAD7:O		
WCCC1	HAD7:O		
DLCC1	HAD7:O		

~~8.6.8~~8.6.9 Combined Interface device functions

Table 16 – Combined Interface ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
BCC1	HAD8:M		
SCC1	HAD8:O~~M~~		
GCC1	HAD8:O~~M~~		
ICC1	HAD8:M		
OOCC1	HAD8:O~~M~~		
LCCC1	HAD8:O~~M~~		
CCCC1	HAD8:O		
PCCCC1	HAD8:O		
SHCC1	HAD8:O		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCCC1	HAD8:O		
TMCC1	HAD8:O		
IMCC1	HAD8:O		
ILSC1	HAD8:O		
TUIC1	HAD8:O		
WCCC1	HAD7:O		
DLCC1	HAD7:O		

~~8.6.9~~8.6.10 Range Extender device functions

Table 17 – HA: Range Extender capabilities

Item number	Item description	Reference	Status	Support
RE1	Does the device support ONLY those clusters listed as mandatory in the common clusters section?	[R2] 7.2.9	HAD9:M	

~~8.6.10~~8.6.11 Mains Power Outlet device functions

Table 18 – Mains Power Outlet ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD10:M		
SCS1	HAD10:M		
GCS1	HAD10:M		

~~8.6.11~~8.6.12 On/Off Light device functions

Table 19 – On/Off Light ZCL PICS restrictions/requirements

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD11:M		
SCS1	HAD11:M		
GCS1	HAD11:M		
OSCC1	HAD11: O		

~~8.6.12~~8.6.13 Dimmable Light device functions

Table 20 – Dimmable Light ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD12:M		
LCCS1	HAD12:M		
SCS1	HAD12:M		
GCS1	HAD12:M		
OSCC1	HAD12:O		

~~8.6.13~~8.6.14 Color Dimmable Light device functions

Table 21 – Color Dimmable Light ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD13:M		
LCCS1	HAD13:M		
CCCS1	HAD13:M		
SCS1	HAD13:M		
GCS1	HAD13:M		
OSCC1	HAD13: O		

~~8.6.14~~8.6.15 On/Off Light Switch device functions

Table 22 – On/Off Light Switch ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCCS1	HAD14:M		
OOCC1	HAD14:M		
SCC1	HAD14:M		
GCC1	HAD14:M		
ICC1	HAD14:M		
ZSP2	HAD14:M		

~~8.6.15~~8.6.16 Dimmer Switch device functions

Table 23 – Dimmer Switch ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCCS1	HAD15:M		
OOCC1	HAD15:M		
LCCC1	HAD15:M		
SCC1	HAD15:M		
GCC1	HAD15:M		
ZSP2	HAD15:M		

~~8.6.16~~8.6.17 Color Dimmer Switch device functions

Table 24 – Color Dimmer Switch ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCCS1	HAD16:M		
OOCC1	HAD16:M		
LCCC1	HAD16:M		
CCCC1	HAD16:M		
SCC1	HAD16:M		
GCC1	HAD16:M		
ICC1	HAD16:M		
ZSP2	HAD16:M		

~~8.6.17~~8.6.18 Light Sensor device functions

Table 25 – Light Sensor Switch ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
IMCS1	HAD17:M		
GCC1	HAD17:O~~M~~		

~~8.6.18~~8.6.19 Occupancy Sensor device functions

Table 26 – Occupancy Sensor Switch ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OSCS1	HAD18:M		
GCC1	HAD18:O~~M~~		

~~8.6.19~~8.6.20 Shade device functions

Table 27 – Shade ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SHCS1	HAD19:M		
OOCS1	HAD19:M		
LCCS1	HAD19:M		
SCS1	HAD19:M		
GCS1	HAD19:M		

~~8.6.20~~8.6.21 Shade Controller device functions

Table 28 – Shade Controller ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SHCC1	HAD20:M		
OOCC1	HAD20:M		
LCCC1	HAD20:M		
SCC1	HAD20:M		
GCC1	HAD20:M		
ICC1	HAD20:M		
ZSP2	HAD20:M		

~~8.6.21~~8.6.22 Heating/Cooling Unit device functions

Table 29 – Heating/Cooling Unit ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
OOCS1	HAD21:M		
G~~S~~CS1	HAD21:O~~M~~		
TC1	HAD21:M		
FCCS1	HAD21:O		
LCCS1	HAD21:O		

~~8.6.22~~8.6.23 Thermostat device functions

Table 30 – Thermostat ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
TS1	HAD22:M		Yes
SCS1	HAD22:M		Yes
GCS1	HAD22:M		Yes
TMCC1	HAD22:O		No
FCCS1	HAD22:O		Yes
OSCC1	HAD22:O		No
RHMC1	HAD22:O		No
TUIS~~C~~1	HAD22:O		Yes

Table 31 – HA: Thermostat capabilities

Item number	Item description	Reference	Status	Support
TD1	Are the OccupiedCoolingSetpoint, OccupiedHeatingSetpoint, and SystemMode attributes of the Thermostat cluster supported as extension fields in the Scenes table?	[R2] 7.5.2.5	HAD22:M	Yes

~~8.6.23~~8.6.24 Temperature Sensor device functions

Table 32 – Temperature Sensor ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
TMCS1	HAD23:M		
GCC1	HAD23:O~~M~~		

~~8.6.24~~8.6.25 Pump device functions

Table 33 – Pump ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
PCS1	HAD24:M		
OOCS1	HAD24:M		
SCS1	HAD24:M		
GCS1	HAD24:M		
LCCS1	HAD24:O		
ACS1	HAD24:O		
PMCS1	HAD24:O		
TMCS1	HAD24:O		
FMCS1	HAD24:O		
PMCC1	HAD24:O		
TMCC1	HAD24:O		
FMCC1	HAD24:O		

~~8.6.25~~8.6.26 Pump Controller device functions

Table 34 – Pump Controller ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
PCC1	HAD25:M		
OOCC1	HAD25:M		
GCC1	HAD25:M		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
SCC1	HAD25:M		
ICC1	HAD25:M		
LCCC1	HAD25:O		
PMCC1	HAD25:O		
TMCC1	HAD25:O		
FMCC1	HAD25:O		
ZSP2	HAD25:M		

~~8.6.26~~8.6.27 Pressure Sensor device functions

Table 35 – Pressure Sensor ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
PMCS1	HAD26:M		
GCC1	HAD26:O~~M~~		

~~8.6.27~~8.6.28 Flow Sensor device functions

Table 36 – Flow Sensor ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
FMCS1	HAD27:M		
GCC1	HAD27:O~~M~~		

~~8.6.28~~8.6.29 IAS CIE device functions

Table 37 – IAS CIE ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
IACS1	HAD28:M		
IZCS1	HAD28:M		
SCC~~S~~1	HAD28:O~~M~~		
GCC1	HAD28:O		
WDCC1	HAD28:M		
ICC1	HAD28:M		

Table 38 – Intruder Alarm System Control and Indicating Equipment capabilities

Item number	Item description	Reference	Status	Support
CIE1	Is the DeviceEnable attribute of the Basic cluster restricted to read-only?	[R2] 7.6.1.2		

~~8.6.29~~8.6.30 IAS ACE device functions

Table 39 – IAS ACE ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
IACC1	HAD29:M		
IZCS~~C~~1	HAD29:M		
ICC1	HAD29:M		
SCS1	HAD29:O~~M~~		

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
ZSP2	HAD29:M		

Table 40 – Intruder Alarm System Ancillary Control Equipment capabilities

Item number	Item description	Reference	Status	Support
ACE1	Is the DeviceEnable attribute of the Basic cluster restricted to read-only?	[R2] 7.6.2.2	HAD29:M	

~~8.6.30~~8.6.31 IAS Zone device functions

Table 41 – IAS Zone ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
IZCC1	HAD30:M		
ZSP2~~SCS1~~	HAD30:M		

Table 42 – Intruder Alarm System Zone capabilities

Item number	Item description	Reference	Status	Support
IASZ1	Is the DeviceEnable attribute of the Basic cluster restricted to read-only?	[R2] 7.6.3.2	HAD30:M	

~~8.6.31~~8.6.32 IAS WD device functions

Table 43 – IAS WD ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
WDCS1	HAD31:M		
IZCC1	HAD31:M		
SCS1	HAD31:O~~M~~		
GCS1	HAD31☺		

Table 44 –Intruder Alarm System Warning Device capabilities

Item number	Item description	Reference	Status	Support
IWD1	Is the DeviceEnable attribute of the Basic cluster restricted to read-only?	[R2] 7.6.2.2	HAD31:M	

~~8.6.32~~8.6.33 Simple Sensor

Table 44 – Simple Sensor ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
BIC1	HAD32:M		

~~8.6.33~~8.6.34 Door Lock

Table 45 – Door Lock ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
DLC1	HAD33:M		
SCS1	HAD33:M		
GCS1	HAD33:M		
ZSP2	HAD33:M		

~~8.6.34~~8.6.35 Door Lock Controller

Table 45 – Door Lock Controller ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
DCC1	HAD34:M		
SCCS1	HAD34:M		
GCCS1	HAD34:M		

~~8.6.35~~8.6.36 Window Covering

Table 45 – Window Covering ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
WCS1	HAD35:M		
SCS1	HAD35:M		
GCS1	HAD35:M		

~~8.6.36~~8.6.37 Window Covering Controller

Table 45 – Window Covering Controller ZCL PICS restrictions

ZCL PICS Item number [R14]	Status	Additional Constraints	Support
WCC1	HAD36:M		
SCC1	HAD36:M		
GCC1	HAD36:M		
ICC1	HAD36:M		
ZSP2	HAD36:M		

Project	ZigBee Alliance	
Title	**OTA Upgrade Cluster PICS**	
Date Submitted	December 7, 2009	
Source	Jack McPeck Itron, Inc. 2111 N. Molter Road, Liberty Lake, WA 99019 USA	Voice: +1-509-891-3469 Fax: +1-509-891-3896 E-mail: jack.mcpeck@itron.com
Re:	ZigBee OTA Upgrade Cluster PICS	
Abstract	As a part of formal conformance testing, manufacturers will be asked to submit a statement of protocol conformance with respect to the appropriate ZigBee devices required by the application profile under test. This document is intended to provide the form of that statement of conformance for the ZigBee OTA Upgrade Cluster.	
Purpose	This document, after review by the relevant working groups, should provide a form whereby developers can proffer a statement of protocol conformance to be tested under profile testing.	
Notice	This document has been prepared to assist the ZigBee Alliance. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.	
Release	The contributor acknowledges and accepts that this contribution will be posted in the member area of the ZigBee web site.	

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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.

1.1 ZigBee Alliance documents

[R1] 084912r04ZB_ZARC_Interest-OTA_Upgrades_MRD

[R2] 085028r03ZB_ZARC_Interest-OTA_Upgrades_TRD

[R3] ZigBee document 08006r03, ZigBee 2007 Layer PICS and Stack Profiles

[R4] 095264r08ZB_ZARC_Interest-Zigbee_OTA_Upgrade_Cluster_Specification

[R5] 095285r00ZB_ZARC_Interest-OTA_Upgrade_Cluster_Test_Plan

Change history

The following table shows the change history for this specification.

Revision 0 (September 30, 2009)

Table 1 – Revision change history for revision 0

Revision	Version	Description
R00	-	Initial draft
R01	0.1	Added OTA Upgrade Cluster parameters, attributes and functions
R02	0.1	Cleanup typos and fix errors
R03	0.1	Turn on track changes. Added OTA Upgrade Recovery section.
R04	0.1	Updates based on revision 08 of OTA Upgrade cluster specification (095264).

2 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).

2.1 Scope

This document provides the protocol implementation conformance statement (PICS) proforma for the ZigBee specifications cited in Reference [R4] in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7.

This document addresses the ZigBee OTA Upgrade Cluster Specification, document number 095264r08ZB.

2.2 Purpose

The supplier of a protocol implementation claiming to conform to the [specification name] 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.

3 Abbreviations and special symbols

Notations for requirement status:

M	Mandatory
O	Optional
O.n	Optional, but support of at least one of the group of options labeled O.n is required.
N/A	Not applicable
X	Prohibited
Item Number: :*Status*	Status is conditional on support of item number

"*Item Number*": Conditional, status dependent upon the support marked for the "*Item Number*".

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

4 Instructions for completing the PICS proforma

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

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

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

5 Identification of the implementation

Implementation under test (IUT) identification

IUT name:
_____ Smart HA Thermostat CTL2181-HA _____

IUT version:
_____

_____

System under test (SUT) identification

SUT name:
_____

Software Version:
_____

Hardware Version:

_____

Operating system (optional):
_____

Product supplier

Name: ___ Computime Ltd. _____

Address: __17/F Great Eagle Centre, Wanchai, Hong Kong _____

_____

Telephone number: _+852 22600300_____

Facsimile number: _+852 27903996_____

Email address: ____wlha@computime.com _____

Additional information: _____

Client

Name: _____

Address: _____

_____

Telephone number: _____

Facsimile number: _____

Email address: _____

Additional information: _____

PICS contact person

Name: __Kairy Lei_____

Address: _17/F Great Eagle Centre, Wanchai, Hong Kong_____

_____

Telephone number: _____+852 22600463 _____

Facsimile number: _____+852 27903996_____

Email address: __kairylei@computime.com_____

Additional information:
_____

PICS/System conformance statement

6 Identification of the protocol

This PICS proforma applies to the ZigBee OTA Upgrade Cluster Specification, document number 095264r08ZB, cited in Reference [R4].

7 Global statement of conformance

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

ZigBee OTA Upgrade Cluster Specification: 095264r03

◉ 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 subclause. That means, by clicking the above, the statement of conformance is complete.

8 PICS proforma tables

The following tables are composed of the detailed questions to be answered, which make up the PICS proforma.

8.1 ZigBee Device Types

Table 2 - Functional device types

Item number	Item description	Reference	Status	Support
FDT1	Is this device capable of acting as a ZigBee coordinator?		O.1[1]	No
FDT2	Is this device capable of acting as a ZigBee router?		O.1	Yes
FDT3	Is this a ZigBee end device?		O.1	No

8.2 Stack Profile

Table 3 –Stack Profile

Item number	Item description	Reference	Status	Support
ZSP1	Is the device built on a ZigBee Compliant Platform certified for the ZigBee stack profile [R3]?		O.2[2]	No
ZSP2	Is the device built on a ZigBee PRO Compliant Platform certified for the ZigBee PRO stack profile?		O.2	Yes

[1] O.1 – Device under test must select only one of these options. Devices under test supporting multiple ZigBee device types must serially re-test using each supported ZigBee device type.
[2] O.2 – Device under test must be deployed on either of the ZigBee or ZigBee PRO stack profiles.

8.3 OTA Upgrade Device Classes

Table 4 – OTA Upgrade device classes

Item number	Item description	Reference	Status	Support
ODC1	Is the OTA Upgrade Cluster supported as an OTA Upgrade Server?	[R4]	O.3[3]	No
ODC2	Is the OTA Upgrade Cluster supported as an Upgrade Client?		O.3	Yes
ODC3	Is this device capable of acting as an OTA Upgrade Manager?		O.3	No

8.4 OTA Upgrade Recovery

Table 5 – OTA Upgrade Recovery

Item number	Item description	Reference	Status	Support
OTAR1	Is this device capable of OTA Upgrade recovery?	[R4]	O.4[4]	No
OTAR2	Is the device capable of reverting to the previous firmware image?		O.4	No
OTAR3	Is the device capable of uploading firmware serially if the OTA feature is unavailable?		O.4	No

8.5 OTA Upgrade Image

Table 6 – OTA Upgrade Image format

Item number	Item description	Reference	Status	Support
OTAI1	Is the OTA Upgrade Image supported?	[R4]	M	Yes
OTAI2	Is the OTA Header supported?		OTAI1:M	Yes

[3] O.3 – Device under test must select only one of these options. Devices under test supporting multiple OTA Upgrade device classes must serially re-test using each supported OTA Upgrade device class.
[4] O.3 – Device under test must select only one of these options. Devices under test supporting multiple OTA Upgrade device classes must serially re-test using each supported OTA Upgrade device class.

Item number	Item description	Reference	Status	Support
OTAI3	Is the OTA Upgrade Image with No Image Signature or Signing Certificate supported?		OTAI1:O[5]	Yes
OTAI4	Is the OTA Upgrade Image with Image Signature and No Signing Certificate supported?		OTAI1:O	No
OTAI5	Is the OTA Upgrade Image with Image Signature and Signing Certificate supported?		OTAI1:O	Yes
OTAI6	Is the OTA Upgrade Image file naming convention supported?		OTAI1:O	No

8.5.1 OTA Upgrade Image Header

Table 7 – OTA Upgrade Image Header

Item number	Item description	Reference	Status	Support
OTAH1	Is the OTA Upgrade Image Header supported?	[R4]	M	Yes
OTAH2	Is the Magic number field supported?		OTAH1:M	Yes
OTAH3	Is the Header version field supported?		OTAH1:M	Yes
OTAH4	Is the Header length field supported?		OTAH1:M	Yes
OTAH5	Is the Field control field supported?		OTAH1:M	Yes
OTAH6	Is the Manufacturer identifier field supported?		OTAH1:M	Yes
OTAH7	Is the Manufacturer device identifier field supported?		OTAH1:M	Yes
OTAH8	Is the Firmware version field supported?		OTAH1:M	Yes
OTAH9	Is the Stack version field supported?		OTAH1:M	Yes
OTAH10	Is the Header string field supported?		OTAH1:M	Yes

[5] OTAI1:O – Device under test must select one of these options.

Item number	Item description	Reference	Status	Support
OTAH11	Is the Image size field supported?		OTAH1:M	Yes
OTAH12	Is the Signature type field supported?		OTAH1:O	No
OTAH13	Is the Signer information field supported?		OTAH1:O	No
OTAH14	Is the Security credential version field supported?		OTAH1:O	No
OTAH15	Is the Upgrade file destination field supported?		OTAH1:O	No
OTAH16	Is the Minimum hardware version field supported?		OTAH1:O	No
OTAH17	Is the Maximum hardware field supported?		OTAH1:O	No

8.6 OTA Upgrade Server Discovery

Table 8 – OTA Upgrade Server Discovery

Item number	Item description	Reference	Status	Support
OTAD1	Is Upgrade Server Discovery supported?	[R4]	OTAD1:M	Yes
OTAD2	Is the device preprogrammed with the IEEE address of the authorized upgrade server?		OTAD2:O	No
OTAD3	Is sending the ZDO Match Descriptor with a single OTA cluster ID in the input Cluster attribute supported?		OTAD2:O	Yes
OTAD4	Is sending the ZDO IEEE address discovery command and storing the response in the UpgradeServerID attribute supported?		OTAD2:O	Yes
OTAD5	Is requesting an application link key with the Upgrade server supported?		OTAD2:O	Yes

8.7 OTA Upgrade Cluster parameters, attributes and functions

Table 9 – Parameters of OTA Upgrade Cluster

Item number	Item description	Reference	Status	Support
OTAP1	Are the OTA Upgrade Cluster parameters supported?	[R4]	M	Yes
OTAP2	Is the QueryJitter parameter supported?		OTAP1:M	Yes
OTAP3	Is the ImageSize parameter supported?		OTAP1:M	Yes
OTAP4	Is the ImageData parameter supported?		OTAP1:M	Yes
OTAP5	Is the UpradeCountDownOffset parameter supported?		OTAP1:M	Yes
OTAP6	Is the UpgradeCountDownUTCTime upported?		OTAP1:O	No
OTAP7	Is the UpgradeSignature parameter supported?		OTAP1:O	Yes

Table 10 – OTA Upgrade Cluster ZCL Status Codes

Item number	Item description	Reference	Status	Support
OTASC1	Are the OTA Upgrade Cluster ZCL status codes supported?	[R4]	M	Yes
OTASC2	Is the ZCL status code SUCCESS supported?		M	Yes
OTASC3	Is the ZCL status code FAILURE supported?		M	Yes
OTASC4	Is the ZCL status code NOT_AUTHORIZED supported?		M	Yes
OTASC5	Is the ZCL status code INVALID_VALUE supported?		M	Yes
OTASC6	Is the ZCL status code INSUFFICIENT_SPACE supported?	[R4]	M	Yes
OTASC7	Is the ZCL status code NOT_FOUND supported?	[R4]	M	Yes

Table 11 – OTA Upgrade cluster server capabilities

Item number	Item description	Reference	Status	Support
OTAS1	Is the OTA Upgrade Cluster supported as a server?	[R4]	O	No
OTAS2	Is the reception of Query Next Image Request command supported?		OTAS1:M	No
OTAS3	Is the reception of Image Page Request command supported?		OTAS1:O	No
OTAS4	Is the reception of Image Block Request command supported?		OTAS1:M	No
OTAS5	Is the reception of Upgrade End Request command supported?		OTAS1:M	No
OTAS6	Is the reception of Query Specific File Request command supported?		OTAS1:M	No
OTAS7	Is the generation of Image Notify command supported?		OTAS1:O	No
OTAS8	Is the generation of Query Next Image Response command supported?		OTAS1:M	No
OTAS9	Is the generation of Image Block Response command supported?		OTAS1:M	No
OTAS10	Is the generation of the last Image Block Response command with padded image data using padding byte 0xFF supported?		OTAS1:M	No
OTAS11	Is the generation of the Image Block Response command with INSUFFICIENT_SPACE supported?		OTAS1:M	No
OTAS12	Is the generation of the Image Block Response command with INSUFFICIENT_SPACE with Time Bitmask Offset time supported?		OTAS1:M	No
OTAS13	Is the generation of the Image Block Response command with INSUFFICIENT_SPACE with Time Bitmask UTC time supported?		OTAS1:M	No

Item number	Item description	Reference	Status	Support
OTAS14	Is the generation of Upgrade End Response command supported?		OTAS1:M	No
OTAS15	Is the generation of Run Upgrade Request command supported?		OTAS1:M	No
OTAS16	Is the generation of Query Specific File Response command supported?		OTAS1:M	No

Table 12 – OTA Upgrade cluster client capabilities

Item number	Item description	Reference	Status	Support
OTAC1	Is the OTA Upgrade Cluster supported as a client?	[R4]	O	Yes
OTAC2	Is the UpgradeServerID attribute supported?		OTAC1:M	Yes
OTAC3	Is the BlockSize attribute supported?		OTAC1:O	No
OTAC4	Is the BlockNumber attribute supported?		OTAC1:O	No
OTAC5	Is the CurrentFirmwareVersion attribute supported?		OTAC1:O	Yes
OTAC6	Is the CurrentZigBeeStackVersion attribute supported?		OTAC1:O	Yes
OTAC7	Is the DownloadedFirmwareVersion attribute supported?		OTAC1:O	Yes
OTAC8	Is the DownloadedZigBeeStackVersion attribute supported?		OTAC1:O	No
OTAC9	Is the ImageUpgradeStatus attribute supported?		OTAC1:O	Yes
OTAC10	Is the PageSize attribute supported?		OTAC1:O	No
OTAC11	Is the reception of Image Notify command supported?		OTAC1:M	Yes
OTAC12	Is the reception of Query Next Image Response command supported?		OTAC1:M	Yes

Item number	Item description	Reference	Status	Support
OTAC13	Is the reception of Image Block Response command supported?		OTAC1:M	Yes
OTAC14	Is the reception of the last Image Block Response command with padded image data using padding byte 0xFF supported?		OTAS1:M	No
OTAC15	Is the reception of the Image Block Response command with INSUFFICIENT_SPACE supported?		OTAS1:M	No
OTAS16	Is the reception of the Image Block Response command with INSUFFICIENT_SPACE with Time Bitmask Offset time supported?		OTAS1:M	No
OTAS17	Is the reception of the Image Block Response command with INSUFFICIENT_SPACE with Time Bitmask UTC time supported?		OTAS1:M	No
OTAC18	Is the reception of Upgrade End Response command supported?		OTAC1:M	Yes
OTAC19	Is the reception of Run Upgrade Request command supported?		OTAC1:M	Yes
OTAC20	Is the reception of Query Specific File Response command supported?		OTAC1:O	No
OTAC21	Is the generation of Query Next Image Request command supported?		OTAC1:M	Yes
OTAC22	Is the generation of Image Page Request command supported?		OTAC1:O	Yes
OTAC23	Is the generation of Image Block Request command supported?		OTAC1:M	Yes
OTAC24	Is the generation of Upgrade End Request command supported?		OTAC1:M	Yes
OTAC25	Is the generation of Query Specific File Request command supported?		OTAC1:O	No