



Project	ZigBee Alliance		
Title	ZigBee SE Profile: Protocol Implementation Conformance (PICS) Proforma		
Date Submitted	[November 6, 2007]		
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Re:	ZigBee PICS for the ZigBee SE 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 SE 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.		
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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] ZigBee document 053474r17: ZigBee Specification 2007
- [R2] ZigBee document 064321r08, ZigBee Stack Profile
- [R3] ZigBee document 074855r04, ZigBee PRO Stack Profile
- [R4] ZigBee document 075356r15: ZigBee SE Application Profile Specification
- [R5] ZigBee document 075123r00, ZigBee Cluster Library Specification
- [R6] ZigBee document 04300r08: ZigBee Network Layer PICS
- [R7] ZigBee document 064147r07: ZigBee Application Layer PICS
- [R8] ZigBee document 043171r04: ZigBee Security Layer PICS
- [R9] ZigBee document 064113r07: ZigBee Cluster Library PICS

1.2 IEEE documents

- [R10] 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

- [R11] ISO/IEC 9646-1:1991, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.
- [R12] 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 (November, 2007)

Table 1 – Revision change history for revision 0

Revision	Version	Description
R00	-	Initial draft
R01	-	Updated to Revision 12 of the SE specification and Errata.
R02	-	Updated to Revision 14 of the SE specification
R03	-	Fix typo. Update SE specification reference to r14.
R04		Update SE specification reference to r15. Update section references.

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 SE Application Profile.

2.2 Purpose

The supplier of a protocol implementation claiming to conform to the ZigBee SE 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
<i>Item Number</i> : : <i>Status</i>	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: IHD1-IS

IUT version: 2.12

System under test (SUT) identification

SUT name:

Software Version:

Hardware Version:

Operating system (optional):

Product supplier

Name: Chameleon Technology UK) Ltd.
Address: Chameleon Technology (UK) Ltd.
Winter's Barn. Hags Farm. Hags Road
Follifoot. Harrogate. North Yorkshire. HG3 1EQ

Telephone number: +44 (0) 1423 815911

Facsimile number: +44 (0)1423 816099

Email address: tim.boyle@chameleontechnology.co.k

Additional information: _____

Client

Name: _____

Address: _____

Telephone number: _____

Facsimile number: _____

Email address: _____

Additional information: _____

PICS contact person

Name: _____

Address: _____

Telephone number: _____

Facsimile number: _____

Email address: _____

Additional information: _____

PICS/System conformance statement

Manufacturer:	Chameleon
Product Type:	Smart Device
Product Name:	IHD1-IS
Firmware Revision:	2.1
<i>Tested ZigBee Smart Energy Spec version:</i>	Revision 15

6 Identification of the protocol

This PICS proforma applies to ZigBee SE Application Profile, 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:

Application Profile: ZigBee SE – 075356r15

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	¹ O.1	Y
FDT2	Is this device capable of acting as a ZigBee router?	[R1]/2.5.5.5.2	O.1	N
FDT3	Is this a ZigBee end device?	[R1]/2.5.5.5.3	O.1	N

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 [R2]?	[R6] [R4]/5.2	O.2 ²	N
ZSP2	Is the device built on a ZigBee PRO Compliant Platform certified for the ZigBee PRO stack profile [R3] ?	[R3] [R4]/5.2	O.2	Y

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 Stack Profile extensions for SE

Table 4 – Stack profile extensions for SE

Item number	Item description	Reference	Status	Support
SPE1	Does the device support Application Link Keys?	[R4]/5.2 [R8]/ASLS6	M	Y
SPE2	Does this device use a stack that supports fragmentation?	[R4]/5.2 [R7]/ADF5, ADF6	M	Y
SPE3	Does this device use any SE Profile Commands that require the use of Fragmentation?	[R4]/5.2 [R7]/ADF5, ADF6	MC1: M: MS1: M	N
SPE4	Does the device adhere to the polling rate specifications given in [R4]/5.2 (i.e. Does your application poll equal to or less often as called out in the specification)?	[R4]/5.2	FDT3:M	Y

8.4 SE general requirements support

Table 5 – SE general requirements support

Item number	Item description	Reference	Status	Support
AMG1	Does the device support the ZigBee Cluster Library?	[R4]/5.10, 5.11 [R5]	M	Y
AMG2	Does the device support the ZigBee Cluster Library List specified for SE including the mandatory/optional clusters detailed in the ZCL PICs?	[R4]/5.10 [R9]	M	Y
AMG3	Does the device support the ZigBee Cluster Library with the SE reporting configuration parameters?	[R4]/5.10 [R5]	M	Y

Item number	Item description	Reference	Status	Support
AMG4	Is the device capable of joining a ZigBee SE network and does it interact with a consumer ZigBee Home Area Network only through a bridge device?	[R4]/5.1	FDT2: M FDT3: M	Y
AMG5	Does the device support “E-Mode” commissioning? SE Profile requirement: Those devices that will join an existing network must support button pushes or simple documented user interfaces to initiate the joining process.	[R4]/5.1	FDT2: M FDT3: M For joining devices	Y
AMG6	Deleted	[R4]/5.1		
AMG7	Does the device support the compatible Startup Attribute Set, Join Parameters, Security Parameters, End Device Parameters, Link Status Parameters, Concentrator Parameters, APS Transport Parameters and Binding Parameters?	[R4]/5.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.3.6, 5.3.7, 5.3.8, 5.3.9	M	Y
AMG8	Does the device support joining with pre-installed link keys?	[R4]/5.4.1	FDT2: M FDT3: M	Y
AMG9	Does the device support joining using the key establishment cluster?	[R4]/5.4.2	FDT2: M FDT3: M	Y
AMG10	Deleted	[R4]/5.5		
AMG11	Does the device support the list of SE preferred channels?	[R4]/5.7.1	O	Y
AMG12	Does the device support the SE broadcast policy?	[R4]/5.7.2	O	Y
AMG13	Does the device support the SE frequency agility policy?	[R4]/5.7.3	O	N
AMG14	Does the device support the security key update	[R4]/5.7.4	M	Y

Item number	Item description	Reference	Status	Support
	policies for SE networks?			
AMG15	Does the device support the ZCL Time Cluster and SE time synchronization?	[R4]/5.11.1.1	M	Y
AMG16	Does the device support discovery of optional attributes?	[R4]/5.10	M	Y
AMG17	Does the device application discover and handle unsupported attributes in other devices?	[R4]/5.10	M	Y
AMG18	Does the device support an indication to the user that the network has formed properly?	[R4]/5.5.1	O	Y
AMG19	Does the device support an indication to the user that a device has joined a network successfully?	[R4]/5.5.1	O	N/A
AMG20	Does the device support the commissioning modes and provide supporting commissioning documentation according to network type?	[R4]/5.5.2, 5.5.3, 5.5.4	M	Y
AMG21	Does the device use the appropriate security key per cluster?	[R4]/5.4.6	M	Y

8.5 ZigBee SE device description support

Table 6 – SE device description support

Item number	Item description	Reference	Status	Support
AMD1	Is the product programmed as an Energy Service Portal?	[R4]/6.3.1	O.3 ³	N
AMD2	Is the product programmed as a Metering Device?	[R4]/6.3.2	O.3	N
AMD3	Is the product programmed as an In-Premise Display?	[R4]/6.3.3	O.3	Y

³ O.3 – Device under test must select at least one and may select more than one of the SE device descriptions. If multiple SE device descriptions are supported in the same device then each of the supported device descriptions must be deployed on individual endpoints within the device under test.

Item number	Item description	Reference	Status	Support
AMD4	Is the product programmed as a Programmable Communicating Thermostat (PCT)?	[R4]/6.3.4	O.3	N
AMD5	Is the product programmed as a Load Control?	[R4]/6.3.5	O.3	N
AMD6	Is the product programmed as a Range Extender?	[R4]/6.3.6	O.3	N
AMD7	Is the product programmed as a Smart Appliance?	[R4]/6.3.7	O.3	N
AMD8	Is the product programmed as a Prepayment Terminal?	[R4]/6.3.8	O.3	N

8.6 AMI common clusters

The common cluster ZCL PICs restrictions/requirements are obtained from [R4]/5.10, 5.11.

Table 7 – Common cluster ZCL PICs restrictions/requirements

ZCL PICs Item number [R9]	Status	Additional Constraints	Support
FC100	M	ZCL Cluster ID enumeration is mandatory	Y
FC1	M	General ZCL Frame Format is mandatory	Y
BCC1	O	Does the device support the Basic Cluster as a client?	Y
BCS1	M	Does the device support the Basic Cluster as a server?	Y
GCC1	O	Does the device support the Groups Cluster as a client?	N
GCS1	O	Does the device support the Groups Cluster as a server?	N
ACC1	O	Does the device support the Alarms Cluster as a client?	N

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
ACS1	O	Does the device support the Alarms Cluster as a server?	N
TCS1		Deleted	
TCC1		Deleted	

Table 8 – Common cluster support

Item number	Item description	Reference	Status	Support
ASDC1	Deleted	[R4]/5.10		
ASDC2	Deleted	[R4]/5.10		
ASDC3	Deleted	[R4]/5.10		
ASDS1	Deleted		O	
ASDS2	Does the device support the server Price Cluster sent via the Anonymous Inter-PAN transmission mechanism?	[R4]/Annex D.4	O	N
ASDS3	Does the device support the server Message Cluster sent via the Anonymous Inter-PAN transmission mechanism?	[R4]/Annex D.5	O	N
SCC1	Does the device support the Key Establishment cluster as a client?	[R4]/Annex C.3.1	FTD2:M FTD3:M	Y
SCS1	Does the device support the Key Establishment cluster as a server?	[R4]/Annex C.3.1	FTD1:M	Y
PC1		[R4]/5.10	O	
PS1		[R4]/5.10	O	
DRLC1		[R4]/5.10	O	

Item number	Item description	Reference	Status	Support
DRLS1		[R4]/5.10	O	
SMC1		[R4]/5.10	O	
SMS1		[R4]/5.10	O	
MC1		[R4]/5.10	O	
MS1		[R4]/5.10	O	
CMC1		[R4]/5.10	O	
CMS1		[R4]/5.10	O	
PPC1		[R4]/5.10	O	
PPS1		[R4]/5.10	O	
AMCC1		[R4]/7.1	O	
AMCC2	Are any manufacturer-specific cluster(s) supported?	[R4]/6.1.2	O	N

8.7 ZigBee SE Device Description Capabilities

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

8.7.1 Energy Service Portal device functions

Table 9 – Energy Service Portal ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCS1	M	Time Cluster server is mandatory	N/A

Table 10 provides the SE PICs restrictions based on requirements in [R4]/6.3.1.1.

Table 10 – Energy Service Portal SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
SMC1	O	Simple Metering Cluster client is optional	N/A
SMS1	O	Simple Metering Cluster server is optional	N/A
MS1	M	Message Cluster server is mandatory	N/A
PS1	M	Price Cluster server is mandatory	N/A
DRLS1	M	Demand Response and Load Cluster server is mandatory	N/A
PC1	O	Price Cluster client is optional	N/A
MS1	O	Message Cluster client is optional	N/A
PPC1	O	Pre-payment Cluster client is optional	N/A
PPS1	O	Pre-payment Cluster server is optional	N/A

8.7.2 Metering device functions

Table 11 – Metering device ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCC1	O	Time Cluster client is optional	N/A

Table 12 provides the SE PICS restrictions based on requirements in [R4]/6.3.2.1.

Table 12 – Metering device SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
SMS1	M	Simple Metering Cluster server is mandatory	N/A
CMS1	O	AMI Tunneling (Complex Metering) Cluster server is optional	N/A
PPC1	O	Pre-payment Cluster client is optional	N/A
PC1	O	Price Cluster client is optional	N/A
MC1	O	Message Cluster client is optional	N/A

8.7.3 In-Premise display device functions

Table 13 – In-Premise display device ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCC1	O	Time Cluster client is optional	N

Table 14 provides the SE PICS restrictions based on requirements in [R4]/6.3.3.1.

Table 14 – In-Premise display device SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
DRLC1	O	Demand Response and Load Cluster client is optional	N
PC1	O	Price Cluster client is optional	N
SMC1	O	Simple Metering Cluster client is optional	N

AMI PICS Item number	Status	Additional Constraints	Support
PPC1	O	Pre-payment Cluster client is optional	N
MC1	O	Message Cluster client is optional	N

8.7.4 Programmable Communicating Thermostat (PCT) device functions

Table 15 Programmable Communicating Thermostat (PCT) ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	N/A

Table 16 provides the SE PICS restrictions based on requirements in [R4]/6.3.4.1.

Table 16 Programmable Communicating Thermostat (PCT) SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
DRLC1	M	Demand Response and Load Cluster client is mandatory	N/A
PPC1	O	Pre-payment Cluster client is optional	N/A
PC1	O	Price Cluster client is optional	N/A
SMC1	O	Simple Metering Cluster client is optional	N/A
MC1	O	Message Cluster client is optional	N/A

8.7.5 Load Control device functions

Table 17 – Load Control ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	N/A

Table 18 provides the SE PICS restrictions based on requirements in [R4]/6.3.5.1.

Table 18 – Load Control SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
DRLC1	M	Demand Response and Load Cluster client is mandatory	N/A
PC1	O	Price Cluster client is optional	N/A

8.7.6 Range Extender device functions

Table 19 – Range Extender ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
			N/A

Table 20 provides the SE PICS restrictions based on requirements in [R4]/6.3.6.1.

Table 20 –Range Extender SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
			N/A

8.7.7 Smart Appliance device functions

Table 21 – Smart Appliance ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	N/A

Table 22 provides the SE PICs restrictions based on requirements in [R4]/6.3.7.1.

Table 22 –Smart Appliance SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
DRLC1	O	Demand Response and Load Cluster client is optional	N/A
PC1	M	Price Cluster client is mandatory	N/A
SMC1	O	Simple Metering Cluster client is optional ED NOTE: This is not listed in the specification – should it be?	N/A
MC1	O	Message Cluster client is optional	N/A

8.7.8 Prepayment Terminal device functions

Table 23 – Prepayment Terminal ZCL PICS restrictions/requirements

ZCL PICS Item number [R9]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	N/A

Table 24 provides the SE PICs restrictions based on requirements in [R4]/6.3.8.1.

Table 24 – Per-payment Terminal SE PICS restrictions/requirements

AMI PICS Item number	Status	Additional Constraints	Support
DRLC1	O	Demand Response and Load Cluster client is optional	N/A
PC1	M	Price Cluster client is mandatory	N/A
SMC1	O	Simple Metering Cluster client is optional	N/A
MC1	O	Message Cluster client is optional	N/A