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Project	ZigBee Alliance	
Title	<b>SEP 1.1 Over-the-air Bootload Cluster PICS</b>	
Date Submitted	07 October 2010	
Source	Rob Alexander Ember, Inc. 47 Farnsworth Street Ember	Voice: Fax: E-mail: rob.alexander@ember.com
Re:	OTA Spec: 095264r16, Test Spec:	
Abstract	This document lists PICS for the Over-the-air Bootload cluster as defined by the Smart Energy Profile	
Purpose	Provides a form whereby developers can proffer a statement of conformance to be tested under profile testing.	
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**Table of Contents**

1  
2 Table of Contents..... 3  
3 References..... 4  
4 1.1 ZigBee Alliance documents..... 4  
5 1.2 IEEE documents ..... 4  
6 1.3 ISO documents..... 4  
7 Change history ..... 5  
8 2 Introduction ..... 6  
9 2.1 Scope..... 6  
10 2.2 Purpose ..... 6  
11 3 Abbreviations and special symbols..... 7  
12 4 Instructions for completing the PICS proforma..... 8  
13 5 Identification of the implementation ..... 9  
14 6 Identification of the protocol..... 11  
15 7 Global statement of conformance..... 12  
16 8 PICS proforma tables ..... 13  
17 8.1 OTA Upgrade Device Classes ..... 13  
18 8.2 OTA Upgrade Image ..... 13  
19 8.3 OTA Upgrade Server Discovery ..... 14  
20 8.4 OTA Upgrade Attributes..... 14  
21 8.5 OTA Incoming Message Processing ..... 15  
22 8.6 OTA Outgoing Message Transmission..... 17  
23 8.7 OTA Upgrade Policies..... 18  
24

## 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 053474r18: ZigBee Specification 2007
- [R2] ZigBee document 105638r09: ZigBee Smart Energy Profile Specification Revision 16
- [R3] ZigBee document 075123r03, ZigBee Cluster Library Specification
- [R4] ZigBee document 04300r08: ZigBee Network Layer PICS
- [R5] ZigBee document 064147r07: ZigBee Application Layer PICS
- [R6] ZigBee document 043171r04: ZigBee Security Layer PICS
- [R7] ZigBee document 064113r07: ZigBee Cluster Library PICS
- [R8] ZigBee document 08006r03: ZigBee 2007 Layer PICS and Stack Profiles
- [R9] ZigBee document number 095264r16: ZigBee OTA Upgrade Cluster Specification
- [R10] ZigBee document number 095284r06: ZigBee OTA Upgrade Cluster PICS
- [R11] ZigBee document number 095473r03: ZigBee OTA Upgrade Cluster Test Specification

### 1.2 IEEE documents

- [R12] 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

- [R13] ISO/IEC 9646-1:1991, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.
- [R14] 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.

**Table 1 – Revision change history**

<b>Revision</b>	<b>Version</b>	<b>Description</b>
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).
R05	0.1	Updates based on revision 12 of OTA Upgrade cluster specification
R06	0.9	The document is badly out of date and formatted poorly. So I have completely recreated it based off the SE1.1 PICS to insure correct formatting, and then imported the appropriate PICS items. I added, changed, and removed other items that were not up-to-date.

## 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 [R2] 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

*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**

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3 If a given implementation is claimed to conform to this standard, the actual PICS proforma to be filled in  
4 by a supplier shall be technically equivalent to the text of the PICS proforma in this annex, and shall  
5 preserve the numbering and naming and the ordering of the PICS proforma.  
6  
7 A PICS which conforms to this document shall be a conforming PICS proforma completed in  
8 accordance with the instructions for completion given in this annex.  
9  
10 The main part of the PICS is a fixed-format questionnaire, divided into five tables. Answers to the  
11 questionnaire are to be provided in the rightmost column, either by simply marking an answer to indicate  
12 a restricted choice (such as Yes or No), or by entering a value, set, or range of values.

1 **5 Identification of the implementation**

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3 **Implementation under test (IUT) identification**

4  
5 IUT name: UtilityPRO Zigbee

6  
7 IUT version: 1.0.0

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10  
11 **System under test (SUT) identification**

12  
13 SUT name:  
14 UtilityPRO Zigbee

15  
16 Software Version:  
17 Rev 1.0.0

18  
19 Hardware Version:  
20 Rev K

21  
22 Operating system (optional):

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23  
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25  
26 **Product supplier**

27  
28 Name: Cooper Power Systems : Energy Automation Solutions

29  
30 Address:  
31 505 Highway 169N  
32 Suite 1200  
33 Minneapolis, MN 55441

34  
35 Telephone number: 763-543-7747

36  
37 Facsimile number: 763-543-7777

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39 Email address: Justin.Johnson@CooperIndustries.com

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41 Additional information: \_\_\_\_\_

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**Client**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone number: \_\_\_\_\_

Facsimile number: \_\_\_\_\_

Email address: \_\_\_\_\_

Additional information: \_\_\_\_\_

**PICS contact person**

Name: Justin Johnson

Address:

505 Highway 169N

Suite 1200

Minneapolis, MN 55441

Telephone number: 763-543-7747

Facsimile number: 763-543-7777

Email address: Justin.Johnson@CooperIndustries.com

Additional information: \_\_\_\_\_

**PICS/System conformance statement**

1 **6 Identification of the protocol**

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3 This PICS proforma applies to ZigBee SE Application Profile, cited in Reference [R2].

**7 Global statement of conformance**

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

Application Profile: ZigBee SE – 075356r16  
Cluster Profile : Over-the-air Bootload – 095264r16

- 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.

**8 PICS proforma tables**

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

**8.1 OTA Upgrade Device Classes**

**Table 2 - OTA Upgrade Device Classes**

Item number	Item description	Reference	Status	Support
OUDC1	Is the OTA upgrade cluster supported as an upgrade client?	[R9]	O	YES
OUDC2	Is the OTA upgrade cluster supported as an upgrade server?	[R9]	O	NO

**Table 3 - Zigbee Device Classes**

Item number	Item description	Reference	Status	Support
ZDC1	Is the device capable of acting as a ZigBee Coordinator (ZC) or a ZigBee Router (ZR)?	[R1]	O	YES
ZDC2	Is the device capable of acting as a ZigBee End Device (ZED)?	[R1]	O	YES

**8.2 OTA Upgrade Image**

**Table 4 - OTA Upgrade Image**

Item number	Item description	Reference	Status	Support
OUI1	Is the OTA upgrade file format supported?	[R9] 6.3	M	YES

Item number	Item description	Reference	Status	Support
OUI2	Is the OTA upgrade file format supported with the ECDSA signature tag?	[R2] D.8.1	M	YES

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2 **8.3 OTA Upgrade Server Discovery**

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Table 5 - OTA Upgrade Server Discovery

Item number	Item description	Reference	Status	Support
OUSD1	Is Upgrade Server Discovery supported?	[R9] 6.4	OUDC1:M	YES

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6 **8.4 OTA Upgrade Attributes**

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Table 6 - OTA Upgrade Cluster Client Attributes

Item number	Item description	Reference	Status	Support
OUA1	Does the device support the <i>UpgradeServerID</i> attribute?	[R9] 6.7.1	OUDC1:M	YES
OUA2	Does the device support the <i>FileOffset</i> attribute?	[R9] 6.7.2	OUDC1:O	NO
OUA3	Does the device support the <i>CurrentFileOffset</i> attribute?	[R9] 6.7.3	OUDC1:O	NO
OUA4	Does the device support the <i>CurrentZigbeeStackVersion</i> attribute?	[R9] 6.7.4	OUDC1:O	NO
OUA5	Does the device support the <i>DownloadFileVersion</i> attribute?	[R9] 6.7.5	OUDC1:O	NO
OUA6	Does the device support the <i>DownloadZigbeeStackVersion</i> attribute?	[R9] 6.7.6	OUDC1:O	NO
OUA7	Does the device support the <i>ImageUpgradeStatus</i> attribute?	[R9] 6.7.7	OUDC1:M	YES

Item number	Item description	Reference	Status	Support
OUA8	Does the device support the <i>ManufacturerID</i> attribute?	[R9] 6.7.8	OUDC1:O	NO
OUA9	Does the device support the <i>ImageTypeID</i> attribute?	[R9] 6.7.9	OUDC1:O	NO

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2 **8.5 OTA Incoming Message Processing**

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**Table 7 – OTA Incoming Message Processing Client**

Item number	Item description	Reference	Status	Support
OIMPC1	Does the device support reception and processing of the <i>Image Notify</i> message?	[R9] 6.10.3	ZDC1 & OUDC1:M <sup>1</sup>	YES
OIMPC2	Does the device support reception and processing of the <i>Query Next Image Response</i> message?	[R9] 6.10.5	OUDC1:M	YES
OIMPC3	Does the device support reception and processing of the <i>Image Block Response</i> message?	[R9] 6.10.8	OUDC1:M	YES
OIMPC4	Does the device support reception and processing of the <i>Upgrade End Response</i> message?	[R9] 6.10.10	OUDC1:M	YES
OIMPC5	Does the device support reception and processing of the <i>Query Specific File Response</i> message?	[R9] 6.10.12	OUDC1:O	NO

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**Table 8 - OTA Incoming Message Processing Server**

Item number	Item description	Reference	Status	Support
OIMPS1	Does the device support reception and processing of the <i>Query Next Image Request</i> message?	[R9] 6.10.4	OUDC2:M	NA
OIMPS2	Does the device support reception and processing of the <i>Image Block Request</i> message?	[R9] 6.10.6	OUDC2:M	NA

<sup>1</sup> Only devices that are both a ZDC1 and OUDC1 are required to support this.

Item number	Item description	Reference	Status	Support
OIMPS3	Does the device support reception and processing of the <i>Upgrade End Request</i> message?	[R9] 6.10.9	OUDC2:M	NA
OIMPS4	Does the device support reception and processing of the <i>Image Page Request</i> message?	[R9] 6.10.7	OUDC2:O	NA
OIMPS5	Does the device support reception and processing of the <i>Query Specific File Request</i> message?	[R9] 6.10.12	OUDC2:O	NA

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8.6 OTA Outgoing Message Transmission

Table 9 - OTA Outgoing Message Transmission Client

Item number	Item description	Reference	Status	Support
OOMTC1	Does the device support transmission of the <i>Query Next Image Request</i> message?	[R9] 6.10.4	OUDC1:M	YES
OOMTC2	Does the device support transmission of the <i>Image Block Request</i> message?	[R9] 6.10.6	OUDC1:M	YES
OOMTC3	Does the device support transmission of the <i>Upgrade End Request</i> message?	[R9] 6.10.9	OUDC1:M	YES
OOMTC4	Does the device support transmission of the <i>Image Page Request</i> message?	[R9] 6.10.7	OUDC1:O	NO
OOMTC5	Does the device support transmission of the <i>Query Specific File Request</i> message?	[R9] 6.10.12	OUDC1:O	NO
OOMTS6	Does the device send all supported OTA messages using APS encryption (except broadcast messages)?	[R2] D.8.1	OUDC1:M	YES

Table 10 - OTA Outgoing Message Transmission Server

Item number	Item description	Reference	Status	Support
OOMTS1	Does the device support transmission of the <i>Image Notify</i> message?	[R9] 6.10.3	OUDC2:O	NA
OOMTS2	Does the device support transmission of the <i>Query Next Image Response</i> message?	[R9] 6.10.5	OUDC2:M	NA
OOMTS3	Does the device support transmission of the <i>Image Block Response</i> message?	[R9] 6.10.8	OUDC2:M	NA
OOMTS4	Does the device support transmission of the <i>Upgrade End Response</i> message?	[R9] 6.10.10	OUDC2:M	NA

Item number	Item description	Reference	Status	Support
OOMTS5	Does the device support transmission of the <i>Query Specific File Response</i> message?	[R9] 6.10.12	OUDC2:O	NA
OOMTS6	Does the device send all supported OTA messages using APS encryption (except broadcast messages)?	[R2] D.8.1	OUDC2:M	NA

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### 8.7 OTA Upgrade Policies

Table 11 - OTA Upgrade Policies Client

Item number	Item description	Reference	Status	Support
OUPC1	Does the device support cryptographic verification of images signed using ECDSA?	[R2] D.8.1	OUDC1:M	YES
OUPC2	Does the device support aborting an active download on reception of an <i>Image Block Response</i> with a status of ABORT?	[R9] 6.10.8	OUDC1:M	YES
OUPC3	Does the device support an abort after a file has been downloaded on reception of a Default Response with a status of ABORT in response to an <i>Upgrade End Request</i> ?	[R9] 6.10.9.4	OUDC1:M	YES
OUPC4	Does the device support processing an <i>Image Block Response</i> with a status of WAIT_FOR_DATA?	[R9] 6.10.8.4	OUDC1:M	YES
OUPC5	Does the device support sending REQUIRE_MORE_IMAGE in the <i>Upgrade End Request</i> after it has finished a download (i.e. does it require multiple images to upgrade)?	[R9] 6.10.9.3	OUDC1:O	NO
OUPC6	Does the device support a time delayed upgrade sent back from the server in the <i>Upgrade End Response</i> message?	[R9] 6.10.10.4	OUDC1:M	YES

Item number	Item description	Reference	Status	Support
OUPC7	Does the device support waiting for a separate Upgrade End response command from the OTA server at a later time? (i.e. the server sends an <i>Upgrade End Response</i> with a <i>UpgradeTime</i> value of 0xFFFFFFFF)	[R9] 6.8.4	OUDC1:M	YES
OUPC8	Does the device always respond to a unicast <i>Image Notification</i> message from the OTA server?	[R9] 6.10.3.4	ZDC1 & OUDC1:M <sup>2</sup>	YES
OUPC9	Does the device support periodic discovery of an OTA server if it has not found one previous in the network, at a rate of at least once per day?	[R2] D.8.1	OUDC1:M	YES
OUPC10	Does the device support periodic query for a new upgrade image at a rate of at least once per day?	[R2] D.8.1	OUDC1:M	YES
OUPC11	Does the device support sending new <i>Image Block Request</i> commands when it is downloading a new image at a rate of at least once per hour?	[R2] D.8.1	OUDC1:M	YES

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Table 12 - OTA Upgrade Policies Server

Item number	Item description	Reference	Status	Support
OUPS1	Does the server support responding to a <i>Query Next Image Request</i> with a response that has a version number higher than in the request (upgrade)?	[R9] 6.10.5	OUDC2:M	NA
OUPS2	Does the server support responding to a <i>Query Next Image Request</i> with a response that has a version number lower than in the request (downgrade)?	[R9] 6.10.5	OUDC2:O	NA
OUPS3	Does the server support responding to a <i>Query Next Image Request</i> with a response that has a version number the same as in the request (re-install)?	[R9] 6.10.5	OUDC2:O	NA

<sup>2</sup> Only devices that are both a ZDC1 and OUDC1 are required to support this.

Item number	Item description	Reference	Status	Support
OUPS4	Does the server support sending a <i>Default Response</i> with status of NO_IMAGE_AVAILABLE when it receives an <i>Image Block Request</i> for a file that it does not have?	[R9] 6.10.6.5.2	OUDC2:M	NA

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