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Version 2.0

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| July 10th, 2014 | |
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| Accepted by | This document has not yet been accepted for release by the ZigBee Alliance Board of Directors |
| Abstract | The ZigBee RF4CE specification describes the protocol infrastructure and services available to applications operating on the ZigBee RF4CE platform |
| Keywords | ZRC, Profile, PICS, Testing |

July 10th, 2014

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# 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).

## Scope

This document provides the protocol implementation conformance statement (PICS) proforma for the ZigBee RF4CE ZRC 2.0 Profile specifications cited in Reference [R1] in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7, [R5].

## Purpose

The supplier of a protocol implementation claiming to conform to the ZigBee RF4CE ZRC 2.0 Profile 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.

## 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.

### ZigBee Alliance documents

1. ZigBee RF4CE ZRC Profile Action Banks, ZigBee Document Number 13-0614r07, July 2014.
2. ZigBee RF4CE Specification, ZigBee Document Number 094945, Version 1.0.1, November, 2010.
3. ZigBee RF4CE GDP 2.0 Profile Specification, ZigBee Document Number 13-0396r28, July 2014.
4. ZigBee RF4CE ZRC 2.0 Profile Specification, ZigBee Document Number 13-0442r22, July 2014.

### ISO documents

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

# 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.

# 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 that 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 multiple 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.

# Identification of the implementation

**Implementation under test (IUT) identification**

IUT name: RemoTIZRC2.0Target\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

IUT version: 1.0\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**System under test (SUT) identification**

SUT name: ­­­­­  
\_\_\_\_\_\_\_\_\_\_\_RemoTIZRC2.0Target\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Software Version: 2.0  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hardware Version: CC2531  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Operating system (optional):   
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Product supplier**

Name: Texas Instruments  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Additional information:   
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**Client**

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

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Telephone number:   
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Additional information:   
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**PICS contact person**

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# Identification of the protocol

This PICS proforma applies to the ZigBee RF4CE ZRC 2.0 Profile Specification [R4].

# Global statement of conformance

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





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. However, the supplier may find it helpful to continue to complete the detailed tabulations in the sub-clauses that follow.

# PICS proforma tables

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

## Logical device types

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| LDT1 | Is this device capable of operating in the role of a ZRC Originator? | [R4] | O.1 | N |
| LDT2 | Is this device capable of operating in the role of a ZRC Recipient? | [R4] | O.1 | Y |

Note that a product may incorporate functionality of both the ZRC Originator and ZRC Recipient device types. However, on a given RF4CE link, it must operate in a single role only. The feature requirements in this section apply to the device operation on a given RF4CE link. A product that is capable of acting in either role should fill out separate PICS statement for each role.

## Network device type

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| NDT1 | Does the device operate as an RF4CE Controller? | [R2] | LDT1: O.2  LDT2: X | N |
| NDT2 | Does the device operate as an RF4CE Target? | [R2] | LDT1: O.2  LDT2: M | Y |

## Binding

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| BD1 | Does the device function as a Binding Originator? | [R3] | LDT1: M  LDT2: X | N |
| BD2 | Does the device function as a Binding Recipient? | [R3] | LDT1: X  LDT2: M | Y |
| BD3 | Does the device function as a Proxy Binding Originator? | [R3] | LDT1: O  LDT2: X | N |
| BD4 | Does the device function as a Proxy Binding Recipient? | [R3] | LDT1: X  LDT2: O | Y |
| BD5 | Does the device support Interactive Validation functionality | [R3] | LDT1: N/A  LDT2: O | Y |

## Actions

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| ACT1 | Does the device function as an Action Originator? | [R4] | LDT1: M  LDT2: O | N |
| ACT2 | Does the device function as an Action Recipient? | [R4] | LDT1:  (NDT1: X NDT2: O)  LDT2:M | Y |

## Action mapping

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| AM1 | Does the device function as an Action Mapping client? | [R4] | LDT1: O  LDT2: (ACT1: O Else X) | N |
| AM2 | Does the device function as an Action Mapping server? | [R4] | LDT1: (NDT1: X NDT2: O)  LDT2: O | Y |
| AM3 | Does the device support the transmission of IR frames with at least one vendor specific IRDB format? | [R4] | LDT1: (AM1: O  Else X)  LDT2: (AM1: O Else X) | N |

## Home automation

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| HA1 | Does the device function as an HA Actions Originator? | [R4] | LDT1: O  LDT2: (ACT1: O Else X) | N |
| HA2 | Does the device function as an HA Actions Recipient? | [R4] | LDT1: (ACT2: O Else X)  LDT2: O | Y |
| HA3 | Does the device support HA Attributes? | [R4] | LDT1: (HA1: O  Else X)  LDT2: (HA1: O Else X) | N |

## Identification

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| ID1 | Does the device function as an Identify Client? | [R3] | LDT1: O  LDT2: O | N |
| ID2 | Does the device function as an Identify Server? | [R3] | LDT1:  (NDT1: X NDT2: O)  LDT2:M | Y |

## Polling

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| PL1 | Does the device function as a Poll Client? | [R3] | LDT1:  (NDT1: O NDT2: X)  LDT2: X | N |
| PL2 | Does the device function as a Poll Server? | [R3] | LDT1:  (NDT1: X NDT2: O)  LDT2: M | Y |

## Key exchange

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| KE1 | Does the device function as a Key Exchange Initiator? | [R3] | LDT1: O  LDT2: O | N |
| KE2 | Does the device function as a Key Exchange Responder? | [R3] | LDT1:  (NDT1: O NDT2: M)  LDT2:M | Y |
| KE3 | Does the device support key exchange using the default shared secret | [R3] | LDT1: (KEI: M KE2: M Else N/A)  LDT2: M | Y |

## Notification

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| NT1 | Does the device function as a Notification Client? | [R3] | LDT1: (PL1: M  HA3: M  AM1: M Else: O)  LDT2: (HA3: M  AM1: M Else: O) | N |
| NT2 | Does the device function as a Notification Server? | [R3] | LDT1:  (HA2: M  AM2: M ID2: M  Else:  (NDT1: X NDT2: O)  )  LDT2: M | Y |

## Device types

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| DT1 | Does the device support the functionality of a TV? | [R1]/A | O | N |
| DT2 | Does the device support the functionality of a projector? | [R1]/A | O | N |
| DT3 | Does the device support the functionality of a player? | [R1]/A | O | N |
| DT4 | Does the device support the functionality of a recorder? | [R1]/A | O | N |
| DT5 | Does the device support the functionality of a video player/recorder? | [R1]/A | O | N |
| DT6 | Does the device support the functionality of an audio player/recorder? | [R1]/A | O | N |
| DT7 | Does the device support the functionality of an audio video recorder? | [R1]/A | O | N |
| DT8 | Does the device support the functionality of a set top box? | [R1]/A | O | N |
| DT9 | Does the device support the functionality of a home theatre system? | [R1]/A | O | N |
| DT10 | Does the device support the functionality of a media centre/PC? | [R1]/A | O | N |
| DT11 | Does the device support the functionality of a game console? | [R1]/A | O | N |
| DT12 | Does the device support the functionality of a satellite radio receiver? | [R1]/A | O | N |
| DT13 | Does the device support the functionality of an IR extender? | [R1]/A | O | N |
| DT14 | Does the device support the functionality of a monitor? | [R1]/A | O | N |

## Mandatory commands

| Item number | Item description | Reference | Status | Support |
| --- | --- | --- | --- | --- |
| MC1 | Does the TV device support all of the following commands: select, up, down, left, right, root menu, exit, channel up, channel down, volume up, volume down, power toggle function, power off function and power on function? | [R1]/A | DT1: M | n/a |
| MC2 | Does the projector device support all of the following commands: select, up, down, left, right, root menu, exit, input select, power off function and power on function? | [R1]/A | DT2: M | n/a |
| MC3 | Does the player device support all of the following commands: select, up, down, left, right, root menu, exit, play, stop, pause, rewind, fast forward, power toggle function, power off function and power on function? | [R1]/A | DT3: M | n/a |
| MC4 | Does the recorder device support all of the following commands: select, up, down, left, right, root menu, exit, play, stop, pause, record, rewind, fast forward, power toggle function, power off function and power on function? | [R1]/A | DT4: M | n/a |
| MC5 | Does the video player/recorder device support all of the following commands: select, up, down, left, right, root menu, exit, play, stop, pause, record, rewind, fast forward, power toggle function, power off function and power on function? | [R1]/A | DT5: M | n/a |
| MC6 | Does the audio player/recorder device support all of the following commands: play, stop, pause, record, power toggle function, power off function and power on function? | [R1]/A | DT6: M | n/a |
| MC7 | Does the audio/video recorder device support all of the following commands: select, up, down, left, right, root menu, exit, play, stop, pause, record, rewind, fast forward, power toggle function, power off function and power on function? | [R1]/A | DT7: M | n/a |
| MC8 | Does the set top box device support all of the following commands: select, up, down, left, right, root menu, exit, channel up, channel down, volume up, volume down, power toggle function, power off function and power on function? | [R1]/A | DT8: M | n/a |
| MC9 | Does the home theatre system device support all of the following commands: select, up, down, left, right, root menu, exit, volume up, volume down, power toggle function, power off function and power on function? | [R1]/A | DT9: M | n/a |
| MC10 | Does the media centre/PC device support all of the following commands: select, up, down, left, right, root menu, exit, volume up, volume down, play, stop, pause, rewind, fast forward, power toggle function, power off function and power on function? | [R1]/A | DT10: M | n/a |

# Command function self declaration

The table below lists the mandatory functions for the devices identified in section 7.11. To allow the test house to effectively observe behavior, enter the expected results in the “Functional declaration” column. If non mandatory commands are to be tested, enter command and behavior in the rows labeled “Other commands…”.

Note that not all commands are supported by all devices – see section 7.12 for details.

| **ID** | **User operation** | **Function declaration** |
| --- | --- | --- |
| 0x00 | Select | *E.g. Menu item is activated.* |
| 0x01 | Up | *E.g. Menu cursor is moved one place upwards.* |
| 0x02 | Down | *E.g. Menu cursor is moved one place downwards.* |
| 0x03 | Left | *E.g. Cursor is moved one place to the left.* |
| 0x04 | Right | *E.g. Cursor is moved one place to the right.* |
| 0x09 | Root menu | *E.g. “Home” menu is displayed.* |
| 0x0d | Exit | *E.g. Takes user out of menu system.* |
| 0x30 | Channel up | *E.g. Channel number is incremented by 1 and new channel is displayed.* |
| 0x31 | Channel down | *E.g. Channel number is decremented by 1 and new channel is displayed.* |
| 0x41 | Volume up | *E.g. Volume level is incremented by 1 (as indicated by OSD).* |
| 0x42 | Volume down | *E.g. Volume level is decremented by 1 (as indicated by OSD).* |
| 0x44 | Play | *E.g. Playback is started or resumed if paused.* |
| 0x45 | Stop | *E.g. Playback is stopped and screen goes blank.* |
| 0x46 | Pause | *E.g. Playback is temporarily halted, leaving current frame on screen.* |
| 0x47 | Record | *E.g. The currently displayed content is recorded to the hard drive.* |
| 0x48 | Rewind | *E.g. If playback is active, playback is played backwards at twice normal speed. If playback is not active, fast rewind begins.* |
| 0x49 | Fast forward | *E.g. If playback is active, playback is played forwards at twice normal speed. If playback is not active, fast forward begins.* |
| 0x6b | Power toggle function | *E.g. Toggles the devices power state.* |
| 0x6c | Power off function | *E.g. Puts the device into inactive (standby) state. If repeated the device stays in the inactive state.* |
| 0x6d | Power on function | *E.g. Puts the device into active (non standby) state. If repeated the device stays in the active state.* |
|  |  | *Other commands…* |
|  |  | *Other commands…* |
|  |  | *Other commands…* |
|  |  | *Other commands…* |