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| Project | ZigBee Alliance | | |
| Title | RF4CE Network PICs | | |
| Date Submitted | [June 07, 2010] | | |
| Source | [Joseph Reddy] [Texas Instruments] [San Diego, CA] | Voice: [+1 858 638 4297] Fax: [] E-mail:[jreddy@ti.com] | |
| Re: | RF4CE Network Layer PICs | | |
| Abstract | As a part of formal conformance testing, manufacturers will be asked to submit a statement of protocol conformance for their device-under-test with respect to the appropriate specification. This document is intended to provide the form of that statement of conformance for the ZigBee RF4CE network specification. | | |
| 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 conformance 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 RF4CE Specification, ZigBee Document Number 094945r00, March 2009.

1.2 IEEE documents

[R2] 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), 2006.

1.3 ISO documents

[R3] ISO/IEC 9646-1:1991, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.

[R4] 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 (June, 2010)

Table 1 – Revision change history

| Revision | Version | Description |
|----------|---------|---------------------------|
| r00 | - | Initial draft of document |

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 RF4CE network specifications cited in Reference [R1] in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7.

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 |
| <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 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.

5 Identification of the implementation

Implementation under test (IUT) identification

IUT name: **RF4CE Stack**
IUT version:

System under test (SUT) identification

SUT name: **GP501/GP711 Development Kit**
Software Version: **v2.4**
Hardware Version: **v0**
Operating system (optional):

Product supplier

Name: **GreenPeak Technologies BV**
Address: **Leidseveer 10, 3511 SB Utrecht, The Netherlands**
Telephone number: **+31 30 262 1157**
Facsimile number:
Email address: **info@greenpeak.com**
Additional information:

PICS contact person

Name: **Jan Van Moer**
Address: **Spinnerijstraat 14, 9240 Zele, Belgium**
Telephone number: **+32 52 45 87 39**
Facsimile number:
Email address: **jan.van.moer@greenpeak.com**
Additional information:

6 Identification of the protocol

This PICS proforma applies to the ZigBee RF4CE Network Specification [R1].

7 Global statement of conformance

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

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

8 PICS proforma tables

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

8.1 Network Device Types

Table 2: Network Device Types

| Item number | Item description | Reference | Status | Support |
|-------------|---|-----------|--------|---------|
| NDT1 | Is this device capable of operating in the role of an RF4CE Target? | [R1]/2.2 | O.1 | Yes |
| NDT2 | Is this device capable of operating in the role of an RF4CE Controller? | [R1]/2.2 | O.1 | No |

8.2 Physical Layer support

Table 3 – Physical Layer Support

| Item number | Item description | Reference | Status | Support |
|-------------|--|------------|--------|---------|
| PHY1 | Does the device support the 2450MHz DSSS PHY employing O-QPSK modulation as defined in [R2] | [R1]/2.4.1 | M | Yes |
| PHY2 | Does the device support measurement of the RSSI (received signal strength indicator) of received packets and using that to report the LQI? | [R1]/3.5.2 | M | Yes |

8.3 MAC layer support

Table 4: MAC Layer Support

| Item number | Item description | Reference | Status | Support |
|-------------|--|------------|--------|---------|
| MAC1 | Does the device contain a globally unique EUI-64 address assigned by IEEE? | [R1]/3.5.3 | M | Yes |

| Item number | Item description | Reference | Status | Support |
|-------------|---|--------------|--------|---------|
| MAC2 | Does the device support the 16-bit short address as defined in [R2]? | [R1]/3.5.3 | M | Yes |
| MAC3 | Does the device support the energy detect scan function as defined in [R2]? | [R1]/3.5.5.1 | NDT1:M | Yes |
| MAC4 | Does the device support the active scan function as defined in [R2]? | [R1]/3.5.5.1 | NDT1:M | Yes |
| MAC5 | Does the device support the transmission of beacon frames as defined in [R2]? | [R1]/3.5.6 | NDT1:M | Yes |

8.4 Network Layer support

Table 5 – Network Layer Support

| Item number | Item description | Reference | Status | Support |
|-------------|--|--------------|--------|---------|
| NWK1 | Does the device support standby mode of operation where the radio is operated in a duty-cycled manner? | [R1]/3.5.7 | NDT1:M | Yes |
| NWK2 | Does the device support the single channel, acknowledged unicast mode of data packet transmission? | [R1]/3.5.8.1 | M | Yes |
| NWK3 | Does the device support the multiple channel, acknowledged unicast mode of data packet transmission? | [R1]/3.5.8.1 | M | Yes |
| NWK4 | Does the device support the single channel, unacknowledged unicast mode of data packet transmission? | [R1]/3.5.8.1 | M | Yes |
| NWK5 | Does the device support the multiple channel, unacknowledged unicast mode of data packet transmission? | [R1]/3.5.8.1 | M | Yes |
| NWK6 | Does the device support the single channel, broadcast mode of data packet transmission? | [R1]/3.5.8.1 | M | Yes |
| NWK7 | Does the device support the multiple channel, broadcast mode of data packet transmission? | [R1]/3.5.8.1 | M | Yes |

| Item number | Item description | Reference | Status | Support |
|-------------|---|---------------|--------|---------|
| NWK8 | Does the device support originating the discovery procedure? | [R1]/3.5.9.1 | M | Yes |
| NWK9 | Does the device support the discovery response procedure? | [R1]/3.5.9.2 | M | Yes |
| NWK10 | Does the device support the automatic discovery response procedure? | [R1]/3.5.9.3 | M | Yes |
| NWK11 | Does the device support the pairing originator procedure? | [R1]/3.5.10.1 | M | Yes |
| NWK12 | Does the device support the pairing response procedure? | [R1]/3.5.10.2 | M | Yes |
| NWK13 | Does the device support removal of a pairing link? | [R1]/3.5.10.3 | M | Yes |
| NWK14 | Does the device support the target link key exchange procedure? | [R1]/3.5.11.1 | NDT1:M | Yes |
| NWK15 | Does the device support the pairing originator link key recovery procedure? | [R1]/3.5.11.2 | M | Yes |
| NWK16 | Does the device support applying security to outgoing network packets? | [R1]/3.5.11.3 | M | Yes |
| NWK17 | Does the device support un-securing incoming network packets? | [R1]/3.5.11.4 | M | Yes |
| NWK18 | Does the device support the evaluation of current channel conditions and change the base channel when the conditions are compromised due to interference? | [R1]/3.5.1.2 | NDT1:M | Yes |
| NWK19 | Does the device support storage of NIB attributes in non-volatile storage? | [R1]/3.5.5 | M | Yes |