Wi-SUN Alliance

Test and Certification Working Group (TCWG)

Protocol Implementation Conformance Statement (PICS) for MAC layer of Echonet Lite Profile

Revision 0v05

1 Notices

1.1 Copyright

1.2 Revision History

Table 1.21 List of Revision History

Version	Date	Author	Comments
0v00	2013-12-03	Olga Kozeruk	Initial draft
0v01	2013-12-13	Olga Kozeruk	Deleted “N/A” column from “Status” column
0v02	2013-12-19	Olga Kozeruk	Removed footnote 9 and changed the numbering accordingly.
0v03	2013-12-20	Olga Kozeruk	Removed Irrelevant items
0v04	2013-12-26	Olga Kozeruk	Editorial changes
0v05	2014-01-31	Olga Kozeruk	The O.1 and O.2 footnotes were changed.

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3 References

3.1 Normative references

This section lists the normative references that define partial specifications of this standard or ones that are related to the standard.

This document is to recommend that any update in those references should be reflected in the subsequent implementations according to the standard.

[802.15.4] IEEE Std. 802.15.4-2011, IEEE Standard for Information Technology - Telecommunications and Information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs), June 2011.

[802.15.4e] IEEE Std. 802.15.4g-2012, Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs) - Amendment 3: Physical Layer (PHY) Specifications for Low-Data-Rate, Wireless, Smart Metering Utility Networks, March 2012.

[Wi-SUN-ENET] 20131023-Wi-SUN-Echonet-Profile-2v02_r1.doc, webftp.wi-sun.org.

3.2 Informative References

None

4 Abbreviations and Special Symbols

4.1 Abbreviations

ED	energy detection
FD	functional device
FFD	full-function device
HEMS	Home Energy Management System
HAN	Home Area Network
PAN	Personal Area Network
PHY	physical
PICS	protocol implementation conformance statement
PSDU	PHY service data unit
RFD	reduced-function device
SM	Smart Meter
SUN	smart utility network
TCWG	Test and Certification Working Group

4.2 Special Symbols

M	Mandatory
O	Optional
O.I	Optional, but support of at least one of the group of options labeled O.I is required.
N/A	Not applicable
X	Prohibited
I	Ignore (not tested)
“item”	Conditional, status dependent upon the support marked for the “item”

5 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).

5.1 Scope

This document provides the protocol implementation conformance statement (PICS) proforma for MAC part of Wi-SUN Echonet Lite profile defined in sections “3.6 Recommended usage for single-hop home network“ and “3.7 Recommended usage for single-hop smart meter-HEMS network” of [Wi-SUN-ENET].

5.2 Purpose

The supplier of a protocol implementation claiming to conform to MAC part of profile specification [Wi-SUN-ENET] 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, conditional or irrelevant 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.

6 Instructions for Completing the PICS Proforma

If a given implementation is claimed to conform to a particular 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 document, and shall preserve the numbering and naming and the ordering of the PICS proforma.

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

The main part of the PICS is a fixed-format questionnaire, divided into 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.

7 Identification of the Implementation

Implementation under test (IUT) identification

IUT name: NHM-10246

IUT version: RevB

System under test (SUT) identification

SUT name: NHM-10246

Software Version: 1.1.5

Hardware Version: RevB

Operating system (optional): _____

Product supplier

Name: Nagano Japan Radio Co.,Ltd.

Address: 1163 Inasato-machi Nagano-shi Nagano

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Facsimile number: +81-26-285-1023

Email address: akira@cee.njrc.co.jp

Additional information: _____

_____

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Telephone number: +81-26-285-1258

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PICS contact person

Name: Akira Nakamura

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Facsimile number: +81-26-285-1037

Email address: akira@cee.njrc.co.jp

Additional information: _____

_____

8 Identification of the Protocol

This PICS proforma applies to standards given in the following:

- IEEE Std. 802.15.4-2011 [802.15.4]
- IEEE Std. 802.15.4e-2012 [802.15.4e]
- Wi-SUN Profile for ECHONET Lite 2v01 [Wi-SUN-ENET]

9 Global Statement of Conformance

Requirement	Support
Are all mandatory features implemented?	[X]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. However, the supplier may find it helpful to continue to complete the detailed tabulations in the subclauses that follow.

10 PICS Proforma Tables

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

10.1 Profile usage (PU) types

Item number	Item description	Reference	Status	Support	
				Yes	No
PU1	Single-hop home network	[Wi-SUN-ENET] 3.6	O.1		N
PU2	Single-hop smart meter-HEMS network	[Wi-SUN-ENET] 3.7	O.1	Y	

O.1: Optional, but one and only one of the features described in PU1 and PU2 is required to be implemented. Devices under test supporting multiple Profile usages must submit separate PICS for each profile usage and must be tested separately.

10.2 Functional device (FD) types

Item number	Item description	Reference	Status		Support	
			PU1	PU2	Yes	No
FD1	FFD (PAN Coordinator)	[802.15.4] 5.1	O.2	O.2		N
FD2	RFD (End Device)	[802.15.4] 5.1	O.2	O.2	Y	
FD3	Support of 64 bit IEEE address	[802.15.4] 5.2.1.1.6	M	M	Y	
FD4	SUN PHY device	[802.15.4g] 8.1	M	M	Y	
FD5	PSDU size up to 255 octets	[Wi-SUN-ENET] 3.6.2, 3.7.2	M	M	Y	

O.2: Optional, but one and only one of the features described in FD1 and FD2 is required to be implemented. Devices under test supporting multiple Functional Device types must submit separate PICS for each device type and must be tested separately.

212 ## 10.3 MAC sub-layer functions

Item number	Item description	Reference	Status		Support	
			PU1	PU2	Yes	No
MLF1	Transmission of data	[802.15.4] 6.3	M	M	Y	
MLF2	Purge data	[802.15.4] 6.3.4, 6.3.5	O*1*3	I		N
MLF3	Reception of data	[802.15.4] 6.3	M	M	Y	
MLF4	Control of PHY receiver	[802.15.4] 6.2.9	O*2	I		N
MLF5	Beacon management	[802.15.4] 5	M	M	Y	
MLF6	Transmit beacons	[802.15.4] 5, 5.1.2.4	FD1:M FD2: X	FD1:M FD2: X		N
MLF7	Receive beacons	[802.15.4] 5, 6.2.4	M	M	Y	
MLF8	Channel access mechanism	[802.15.4] 5, 5.1.1	M	M	Y	
MLF9	Frame validation	[802.15.4] 6.3.3, 5.2, 5.1.6.2	M	M	Y	
MLF10	Acknowledged frame delivery	[802.15.4] 5, 6.3.3, 5.2.1.1.4, 5.1.6.4	M	M	Y	
MLF11	Association and disassociation	[802.15.4] 5, 6.2.2, 6.2.3, 5.1.3	O*4	I		N
MLF12	Security	[802.15.4] 7	M	M	Y	
MLF13	Unsecured mode	[802.15.4] 7	M	M	Y	
MLF14	Secured mode	[802.15.4] 7	M	M	Y	
MLF15	Data encryption	[802.15.4] 7	M	M	Y	
MLF16	Frame integrity	[802.15.4] 7	M	M	Y	
MLF17	ED	[802.15.4] 5.1.2.1, 5.1.2.1.1	FD1:M FD2: I	FD1:M FD2: I	Y	

Item number	Item description	Reference	Status		Support	
			PU1	PU2	Yes	No
MLF18	Active scanning	[802.15.4] 5.1.2.1.2	M	M	Y	
MLF19	Orphan scanning	[802.15.4] 5.1.2.1, 5.1.2.1.3	O*1	I		N
MLF20	Store one transaction	[802.15.4] 5.1.5	O*1	I		N
MLF21	MPM for all coordinators when operating at more than 1% duty cycle	[802.15.4g] 5.1.13	O*5	I		N
MLF22	EBR capability	[802.15.4e] 5.3.12	M	M	Y	
MLF23	EBR commands	[802.15.4e] 5.3.7	M	M	Y	
MLF24	EBR Enhanced Beacon request command	[802.15.4e] 5.3.7.2	M	M	Y	

*1: Not mandated for the network constructed only by devices with permanent power supply.
*2: May be employed as necessary.
*3: Not employed by FD2.
*4: Not mandated when done by upper layer.
*5: Employed when 50kbps and 100kbps modes coexist.

10.4 MAC frames

Item number	Item description	Reference	Status		Support	
			PU1	PU2	Yes	No
MF1	Beacon	[802.15.4] 5.2.2.1	M	M	Y	
MF2	Data	[802.15.4] 5.2.2.2	M	M	Y	
MF3	Acknowledgment	[802.15.4] 5.2.2.3	M	M	Y	
MF4	Command	[802.15.4] 5.2.2.4	M	M	Y	
MF5	Association request	[802.15.4] 5.2.2.4, 5.3.1	O*2	I		N
MF6	Association response	[802.15.4] 5.2.2.4, 5.3.2	O*2	I		N
MF7	Disassociation notification	[802.15.4] 5.2.2.4, 5.3.3	O*2	I		N
MF8	Data request	[802.15.4] 5.2.2.4, 5.3.4	O*1	I		N
MF9	Orphaned device notification	[802.15.4] 5.2.2.4, 5.3.6	O*1	I		N
MF10	Beacon request	[802.15.4] 5.2.2.4, 5.3.7	M	M	Y	
MF11	Coordinator realignment	[802.15.4] 5.2.2.4, 5.3.8	O*1	I		N
MF12	2-octet FCS	[802.15.4g] 5.2.1.9	M	M	Y	

*1: Not mandated for the network constructed only by devices with permanent power supply.
*2: Not mandated when done by upper layer.