



**Wi-SUN Alliance**

**Test and Certification Working Group (TCWG)**



**Protocol Implementation Conformance Statement (PICS)  
for IEEE 802.15.4g PHY**



**Revision 1V02**



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# 1 Notice

## 1.1 Copyright

The contents of this document are Copyright © Wi-SUN Alliance™ and are strictly confidential. No information contained herein may be supplied to any other party without prior written permission from an authorised Wi-SUN Alliance representative.

## 1.2 Release History

**Table 1 List of Revision History**

Revision	Date	Author	Comments
0V00	19 June 2012	Chin-Sean Sum	Initial draft.
0V01	3 Aug. 2012	Chin-Sean Sum and Phil Beecher	Completion of WG ballot 1. Modified based on circulation within TCWG group.
1V00	25 Feb. 2013	Chin-Sean Sum	Release of the first official revision.
1V01	14 Feb. 2014	Chin-Sean Sum	Modification in accordance to development in Echonet Profile
1V02	20 Feb. 2014	Chin-Sean Sum	Modification in accordance to development in Echonet Profile

1 **2 References**

2

3 **2.1 Normative References**

4 [A1] IEEE Std. 802.15.4-2011, IEEE Standard for Information Technology -  
5 Telecommunications and Information exchange between systems - Local and  
6 metropolitan area networks - Specific requirements - Part 15.4: Wireless Medium  
7 Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate  
8 Wireless Personal Area Networks (WPANs), June 2011.

9 [A2] IEEE Std. 802.15.4g-2012, Part 15.4: Low-Rate Wireless Personal Area  
10 Networks (LR-WPANs) - Amendment 3: Physical Layer (PHY) Specifications for Low-  
11 Data-Rate, Wireless, Smart Metering Utility Networks, March 2012.

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13 **2.2 Informative References**

14 [B1] Wi-SUN TCWG Documentation Overview.

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## 3 Abbreviations and Special Symbols

### 3.1 Abbreviations

CSM	common signaling mode
FEC	forward error correction
MR-FSK	multi-rate and multi-regional frequency shift keying
PHY	physical
PICS	protocol implementation conformance statement
PLP	PHY layer packet
PPDU	PHY protocol data unit
PSDU	PHY service data unit
RF	radio frequency
SUN	smart utility network
TCWG	Test and Certification Working Group

### 3.2 Special Symbols

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”	Conditional, status dependent upon the support marked for the “item”

1 **4 Introduction**

2 To evaluate conformance of a particular implementation, it is necessary to have a  
3 statement of which capabilities and options have been implemented for a given standard.  
4 Such a statement is called a protocol implementation conformance statement (PICS).

5

6 **4.1 Scope**

7 This document provides the protocol implementation conformance statement (PICS)  
8 proforma for standard specification [A2].

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10 **4.2 Purpose**

11 The supplier of a protocol implementation claiming to conform to standard specification  
12 [A2] shall complete the following PICS proforma and accompany it with the information  
13 necessary to identify fully both the supplier and the implementation.

14 The PICS is in the form of answers to a set of questions in the PICS proforma. The  
15 questions in a proforma consist of a systematic list of protocol capabilities and options as  
16 well as their implementation requirements. The implementation requirement indicates  
17 whether implementation of a capability is mandatory, optional, or conditional depending on  
18 options selected. When a protocol implementer answers questions in a PICS proforma,  
19 they would indicate whether an item is implemented or not, and provide explanations if an  
20 item is not implemented.

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## 1 5 Instructions for Completing the PICS Proforma

2 If a given implementation is claimed to conform to a particular standard, the actual PICS  
3 proforma to be filled in by a supplier shall be technically equivalent to the text of the PICS  
4 proforma in this document, and shall preserve the numbering and naming and the ordering  
5 of the PICS proforma.

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

8 The main part of the PICS is a fixed-format questionnaire, divided into tables. Answers to  
9 the questionnaire are to be provided in the rightmost column, either by simply marking an  
10 answer to indicate a restricted choice (such as Yes or No), or by entering a value, set, or  
11 range of values.

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# 6 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  

Telephone number:   +81-26-285-1258  

Facsimile number:   +81-26-285-1037  

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

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

## Client

Name:   Nagano Japan Radio Co.,Ltd.  

Address:   1163 Inasato-machi Nagano-shi Nagano  

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\_\_\_\_\_

1 **7 Identification of the Protocol**

2 This PICS proforma applies to standards given in the following:

- 3 - IEEE Std. 802.15.4-2011 [A1]  
4 - IEEE Std. 802.15.4g-2012 [A2]

5

## 1 8 Global Statement of Conformance

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

- 4 - IEEE Std. 802.15.4-2011 [A1]
- 5 - IEEE Std. 802.15.4g-2012 [A2]

6  
7 Note -- Answering 'No' indicates non-conformance to the specified protocol standard. Non-  
8 supported mandatory capabilities are to be identified in the following tables, with an  
9 explanation by the implementer explaining why the implementation is non-conforming.

10 The supplier will have fully complied with the requirements for a statement of conformance  
11 by completing the statement contained in this subclause. However, the supplier may find it  
12 helpful to continue to complete the detailed tabulations in the subclauses that follow.

13

## 9 PICS Proforma Tables

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

### 9.1 Major Capabilities for the PHY

The requirements for the PHY capabilities are described in this section.

#### 9.1.1 PLP Capabilities

The requirement for the PLP is described in Table 2.

**Table 2 – PHY packet**

Item number	Item description	Reference	Status	Support		
				N/A	Yes	No
PLP 1	Transmission of PPDU packets	9 [A1]	M		Y	
PLP 2	Reception of PPDU packets	9 [A1]	M		Y	
PLP3	PSDU size up to 2047 octets <sup>†</sup>	9.2 [A2]	M		Y	

<sup>†</sup> For Echonet Profile, the PSDU size is up to 255 octets.

#### 9.1.2 RF Capabilities

The requirements for the PHY RF capabilities are described in Table 3.

**Table 3 – Radio frequency (RF)**

Item number	Item description	Reference	Status	Support		
				N/A	Yes	No
RF1	SUN PHYs					
RF1.1	MR-FSK	18.1	M		Y	
RF1.2	MR-FSK Generic PHY	8.1.2.10.2	O		Y	
RF1.3	Transmit and receive using CSM	8.1	M**			N

Item number	Item description	Reference	Status	Support		
RF1.4	At least one of the bands given in Table 66 [A2]	8.1	M		Y	
RF1.5	Support of 915 MHz band in Table 66 [A2]	8.1.1	O.1			N
RF1.6	Support of 920 MHz band or 950 MHz band in Table 66 [A2]	8.1.1	O.1		Y	
RF1.7	Support of channel plan	8.1.2	M		Y	
RF2	SUN PHY operating modes					
RF2.1	Operating mode #1 in 915 MHz band	18.1	RF1.5:M			N
RF2.2	Operating mode #2 in 915 MHz band	18.1	RF1.5:O			N
RF2.3	Operating mode #3 in 915 MHz band	18.1	RF1.5:O			N
RF2.4	Operating mode #1 and #2 in 920 MHz or 950 MHz band	18.1	RF1.6:M*		Y	
RF2.5	Operating mode #3 and #4 in 920 MHz or 950 MHz band	18.1	RF1.6:O			N
RF3	MR-FSK Options					
RF3.1	MR-FSK FEC	18.1.2.4	RF1.1: O RF1.2: O			N
RF3.2	MR-FSK interleaving	18.1.2.5	RF1.1: O RF1.2: O			N
RF3.3	MR-FSK data whitening	18.1.3	RF1.1: O RF1.2: O		Y	

1 \* For Echonet Profile, mode #1 is optional

2 \*\* For Echonet Profile, if mode #1 is not supported, CSM is not supported