
IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)		
Title	Report from the FSK Subgroup		
Date Submitted	[21 January 2010]		
Source	[Bob Mason] [Elster Solutions]	Voice: [] Fax: [] E-mail: [robert.t.mason@us.elster.com]	
Re:	Status report from the FSK subgroups responsible for resolving comments submitted against documents 15-10-0014-00 and 15-10-0017-00		
Abstract			
Purpose	Draft text contribution		
Notice	This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.		
Release	The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.		

Report of the Preamble Subgroup

Kojima-san, Jay R, Kory Fifield, Tim Schmidl, Daniel Popa, Hartman Van Wyk,
Henk de Ruijter, Ross Sabolcik, Cristina S, Bob Mason, Steve Shearer, Harada-san

Section 6.3.1 Preamble field

The bits in the preamble field for the MRFSK PHY shall be multiple strings of “01010101.”

The preamble length shall be defined as a PIB attribute (*phyPreambleRepetitions*) that supports a range of values for the preamble length (number of preamble repetitions) of 4 – 1000 octets.

Add to Table 31:

Attribute Identifier Type Range Description

phyPreambleRepetitions Integer 4-1000 Number of preamble repetitions in octets.

phySHRDduration, *phyPreambleSymbolLength*, *phyMaxFrameDuration* also need to be amended.

Report of the SFD Subgroup

Kojima-san, Jay R, Kory Fifield, Tim Schmidl, Khanh Le, Daniel Popa, Hartman Van Wyk, Henk de Ruijter, Ross Sabolcik, Cristina S, Bob Mason, Steve Shearer, Harada-san, Emmanuel M., Matt Boytim, George Flammer, Rodney Hemminger, John Geiger

6.3.2 SFD Field

The MRFSK SFD field consists of 2 bytes. The values are as shown in Table 28a.

The SFD used by the MRFSK PHY shall be one of the two 16-bit sequences shown in Table 28a.

Table 28a – MRFSK PHY SFD Values

SFD Value	Indicates
0x	Mandatory uncoded PHR
0x	Optional coded PHR

Process to select the SFD values:

1. Will be selected based on the following prioritized criteria:
 - a. Autocorrelation and cross correlation to the other pattern
 - b. Good image rejection (low correlation against the image)
 - c. Correlation relative to the preamble (low side lobes against the preamble)
2. The following prioritized differentiators will be used to select SFD values if multiple solutions are found with identical performance. Supporting data for item 2a shall be provided by all proposals.
 - a. The selected code should have good orthogonality against the existing 802.15.4d SFD. (Co-existence with 802.15.4d is imperative).
3. Timeline:
 - a. Harada-san: proposals provided within one month (no later than 2/22 midnight PST) and exchanged among subgroup participants. Proposals will be emailed to Harada-san and copied to all members of the SFD subgroup. Harada-san will send an email to all SFD participants.
 - b. There will be a conference call the week of 2/22 to review the proposals. Harada-san will schedule the conference call for 2/25 (we propose using the normal 4g call time)

Report of the Transmit Power Subgroup

Kojima-san, Jay R, Kory Fifield, Daniel Popa, Hartman Van Wyk,
Henk de Ruijter, Cristina S, Bob Mason, Steve Shearer, Matt Boytim, Ben Rolfe, Yvan
Castilloux, Kuor-Hsin Chang, Mark Wilbur, Larry Taylor, Will San Filippo, Jianming Yuan,
Kentaro Sakamoto, Khanh Le, Kazu Yasukawa

The original commentors agree to withdraw the comments and leave the existing wording of
802.15.4-2009.

Report of the Scrambling Subgroup

Kojima-san, Jay R, Kory Fifield, Daniel Popa, Hartman Van Wyk,
Henk de Ruijter, Cristina S, Bob Mason, Steve Shearer, Matt Boytim, Ben Rolfe, Yvan
Castilloux, Kuor-Hsin Chang, Mark Wilbur, Larry Taylor, Will San Filippo, Jianming Yuan,
Kentaro Sakamoto, Khanh Le, Kazu Yasukawa, Ross Sabolcik, Harada-san,

Agree to use the PN9 scrambling polynomial defined in 802.15.4d.

Agree that the two PIB attributes to control scrambling (*phyScramblePSDU* and *phyScramblePHR*) will remain.

Agree that the subgroup will define how devices exchange the scrambling information in the capabilities message.

Proposal to resolve comments related to coordination of seeds between devices:

Proposal #1: The seeding of the data whitening algorithm is controlled by a PIB variable *phyScrambleSeed*. The PHY uses the *phyScrambleSeed* PIB variable to set the 9-bit seed as follows:

<i>phyScrambleSeed</i> Value	Description
0	Seed value is derived from the channel value as follows: $SeedValue = 1 + ChannelNum$ (Note: Valid channel numbers are 0-500)
1-511	Value to be used for the data whitening seed

Proposal #2: Add text to the scrambling section to state that the seed is derived from the channel number using the following equation: $SeedValue = 1 + phyCurrentChannel$

Conference call to be scheduled to discuss the topic. Harada-san will schedule the conference

call.

Report of the Channel Page/Number Subgroup

Kojima-san, Jay R, Hartman Van Wyk, Daniel Popa,
Henk de Ruijter, Cristina S, Bob Mason, Steve Shearer, Yvan Castelloux, Kuor-Hsin Chang,
Jianming Yuan, Kentaro Sakamoto, Tim Schmidl, Khanh Le, Kazu Yasukawa, Harada-san,

Summary of proposed text changes are in document:

15-10-0008-01-004g-tbd-related-to-comments.doc

It is believed that this submittal addresses all comments related to channel pages and channel numbering

Report of the FEC Subgroup

Kojima-san, Jay R, Hartman Van Wyk, Daniel Popa,
 Henk de Ruijter, Cristina S, Bob Mason, Steve Shearer, Matt Boytim, Ben Rolfe, Yvan
 Castilloux, Kuor-Hsin Chang, Mark Wilbur, Larry Taylor, Jianming Yuan, Kentaro Sakamoto,
 Khanh Le, Kazu Yasukawa, Harada-san, Jeff King, Kory Fifield, Matt Boytim, George Flammer,
 Dietmar, Steve Pope

2 SFD values, one indicates that there is no convolutional coding over PHR + PSDU, second indicates that there is convolutional coding over PHR + PSDU, 1 bit in the header indicates if outer code is applied to PSDU. Outer coding will be specified as a PIB attribute whose value will include type of code

SFD	Bit	Header	Payload
0	0	-	-
0	1	-	Type2
1	0	Type1	Type3
1	1	Type1	Type3 +Type2

Candidates:

Type1:

1. BCH
2. Conv

Type3:

1. Conv
 - a. K=5, $\frac{1}{2}$ rate – $\frac{3}{4}$ rate if concatenated with Type2
 - b. K=4, $\frac{1}{2}$ rate – $\frac{1}{2}$ rate if concatenated with Type2

Type2:

1. RS

Performance of various proposals will be studied and compared. High level view of models will be presented AM1 Thursday (this never happened)

1. Criteria:

- a. Evaluate for 2 payload sizes (1500, 500 and 100 octets). Target 1% PER (PSDU) and HER does not degrade this PER by more than 1 dB (AWGN).
- b. Use consistent models – AWGN and interference scenario. Models are TBD (see above)

2. Proposals to be submitted

- a. Hartman
- b. Steve Shearer
- c. Hiroshi Harada

- d. Tim
- 3. Information to be distributed to those in the FSK subgroup
- 4. Timeline:
 - a. Timeline for presentation of channel models for FEC will be provided no later than 2/5 midnight PST. There will be a conference call the week of 2/8 to discuss the channel models. Conference call to be scheduled by Harada-san.
 - b. Harada-san: FEC proposals provided no later than 3/1 midnight PST and exchanged among subgroup participants. Proposals will be emailed to Harada-san and copied to all members of the SFD subgroup. Harada-san will send an email to all subgroup participants.
 - c. There will be a conference call the week of 3/4 to review the proposals. Harada-san will schedule the conference call

Report of the Generic PHY Subgroup

Summary of proposed text changes are in document:
15-10-0008-01-004g-tbd-related-to-comments.doc

It is believed that this submittal addresses the comments related to the generic PHY. The document was finished at the end of yesterday's PM2 session. The plan was for a final review and discussion this morning.

Work still needed to define the capabilities message.

Subgroups that have not yet officially met:

1. Mode switching – Strong start based on Channel Page and Generic PHY subgroups
2. Frequency hopping