

Comment Resolution for the MR-O-QPSK PHY

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IEEE P802.15

Wireless Personal Area Networks

Title: Proposed Comment Resolution of the MR-O-QPSK PHY
Date Submitted: July 14, 2010
Source: Michael Schmidt - Atmel (email: michael.schmidt@atmel.com)
Re: Task Group 15.4g LB51 comment resolution
Abstract: Comment resolutions for the MR-O-QPSK PHY
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CID 827

- ▶ Comment:
 - ▶ Consider use of an alternative short preamble.
- ▶ Response:
 - ▶ Reject
- ▶ Resolution:
 - ▶ support for two alternative preamble lengths complicates interop
 - ▶ decrease fixed length from 8 octets to 7 octets
 - ▶ keep fixed length of 4 octets for EU band (4 octets suffice since SNR_{chip} is higher)

CID 879

- ▶ Comment:
 - ▶ Replace 8-bit SFD by a 16-bit SFD
- ▶ Response:
 - ▶ Accept
- ▶ Resolution:
 - ▶ single¹ SFD

$$(w_0, w_1, \dots, w_{15}) = (1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 0)$$

¹SpreadingMode $\in \{\text{DSSS}, \text{MDSSS}\}$ will not be indicated by the SFD value.

CID 890,891,912

▶ Comment:

- ▶ 2 bits for parity check is questionable.

▶ Response:

- ▶ Accept.

▶ Resolution:

- ▶ CRC-8 based HCS field with with generator polynomial $X^8 + X^2 + X + 1$
- ▶ Performance of a CRC-8 is sufficiently good, see doc # 435.

CID 904

▶ Comment:

- ▶ Consider variable FCS based on CRC-16 and CRC-32.

▶ Response:

- ▶ Reject

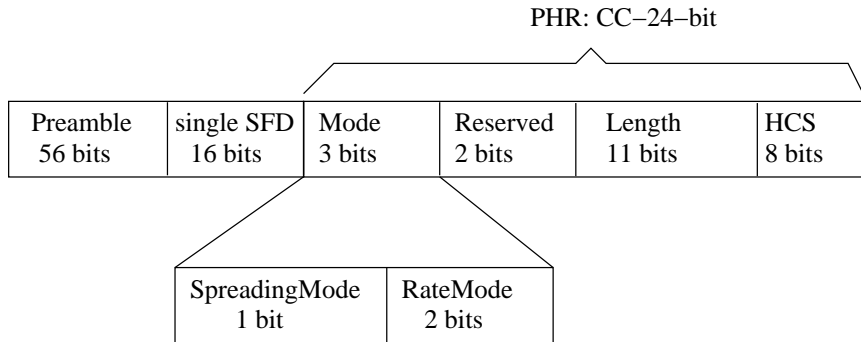
▶ Resolution:

- ▶ apply CRC-32 only
- ▶ OFDM PHY applies CRC-32 only
- ▶ For both, the OFDM PHY and the MR-O-QPSK PHY this is recommended, since a $K=7$ convolutional code introduces burst errors in case of decoding failures.

CID 1470

- ▶ Comment:
 - ▶ During PHR reduce spreading gain but introduce FEC.
- ▶ Response:
 - ▶ Accept.
- ▶ Resolution:
 - ▶ FEC based on terminated and interleaved convolutional coding
 - ▶ Option B
 - ▶ pilots to simplify traceback
 - ▶ For details see doc # 435

CID 1470



CID 1465,1475

- ▶ Comment:
 - ▶ Consider pilot sequences during PSDU part.
- ▶ Response:
 - ▶ Accept.
- ▶ Resolution:
 - ▶ see doc # 435

CID 1485

▶ Comment:

- ▶ Why is (chip) whitening used for the DSSS mode but not for the MDSSS mode?

▶ Response:

- ▶ MDSSS applies longer spreading sequences. For MDSSS, chip spreading based on a cover code is applied as described at page 80 of draft P802.15.4g/D1.

CID 1488

▶ Comment:

- ▶ Equation (33) is wrong, addressing invalid indexes of the chip sequence.

▶ Response:

- ▶ Accept.

▶ Resolution:

- ▶ Let $\{c_k\}_0^{N_{PPDU}-1}$ be the discrete-time sequence of consecutive chip samples of the PPDU, where the first chip sample, c_0 , is transmitted first in time, and the last chip sample, $c_{N_{PPDU}-1}$, is transmitted last in time. The continuous-time pulse shaped complex baseband signal is given by

$$y(t) = \sum_{n=0}^{N_{PPDU}/2-1} \xi(c_{2n})p(t-2nT_c) + j\xi(c_{2n+1})p(t-(2n+1)T_c)$$

with ...

CID 1497

▶ Comment:

- ▶ Required ACI/AACI sensitivity numbers are too poor. Consider tighter bounds.

▶ Response:

- ▶ Accept in principle.

▶ Resolution:

- ▶ ACI 10 dB
- ▶ AACI 30 dB

CID 1480

▶ Comment:

- ▶ It is not clear whether 'odd parity code' means the 'SPC Encoder' in Figure 65w.

▶ Response:

- ▶ Accept

▶ Resolution:

- ▶ Replace 'odd parity code' with 'Single Parity Check(SPC) Encoder', since 'odd parity code' of MDSSS mode means the 'SPC Encoder' in Figure 65w.

CID 1464

- ▶ Comment:
 - ▶ Specify mandatory Modes for the MR-O-QPSK PHY
- ▶ Response:
 - ▶ Accept
- ▶ Resolution:

band (MHz)	chip rate (kchip/s)	spreading	1/2 CC	data rate (kbit/s)
779-787	1000	(16,1)-DSSS	yes	31.25
902-928	1000	(16,1)-DSSS	yes	31.25
868-870	125	(4,1)-DSSS	yes	15.625
2400-2483.5	2000	(32,1)-DSSS	yes	31.25