

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Resolutions to SC-PHY Related Comments]

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Abstract: [Comment Resolution on SC-PHY Related Comments Raised in Jacksonville Meeting]

Purpose: [This document provides a list of the editing staff that will be working on 802.15.3c.]

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Resolutions on SC-PHY Related Comments

NICT

High Level Summary

- This document provide resolutions to SC-PHY related comments on the following topics:
 - ACI - #484, 631
 - LDPC (Editorial) - #458
 - LFSR (Editorial) - #410
 - RSSIr - #397, 398, 592, 593, 641, 642, 643
 - SC-PHY Editorial - #460
 - IFS for MMC-PNC - #541

Comments on ACI

- Comment #484, 631:
 - HSI and AV are not providing ACI specification and it is complex to test all relative interference cases between different MCS. Therefore ACI specification in SC-PHY should be eliminated

- Resolution:
 - Accept comment to eliminate ACI specification.
 - Reasons:
 - Even if ACI specification is included in the draft, there is no practical way to control the desired to undesired signal ratio (D/U ratio), therefore making ACI rejection less realistic.
 - HSI and AV PHYs are not ready to provide ACI specifications. SC-PHY will keep consistency with them.

Comments on LDPC (1/3)

- Comment #458
 - Replace table 192 with correct LDPC codes

- Resolution:
 - The matrices have been checked and updated, as in the following pages.

Comments on LDPC (2/3)

(672,336), Code rate: 1/2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	-	-	-	5	-	18	-	-	-	-	3	-	10	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-
2	0	-	-	-	-	-	16	-	-	-	-	6	-	-	-	0	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	6	-	7	-	-	-	-	2	-	-	-	-	9	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	18	-	-	-	-	-	0	10	-	-	-	-	16	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-
5	5	-	-	-	-	-	18	-	-	-	-	3	-	10	-	-	5	-	-	-	-	-	-	4	5	-	-	-	-	-	-	-
6	-	0	-	-	-	-	-	16	6	-	-	-	0	-	-	-	-	-	7	-	4	-	-	-	-	-	10	-	-	-	-	-
7	-	-	-	6	-	7	-	-	-	-	2	-	-	-	9	-	20	-	-	-	4	-	-	-	-	-	-	19	-	-	-	-
8	-	-	18	-	0	-	-	-	-	10	-	-	-	16	-	-	-	-	9	-	-	12	-	-	4	-	-	-	-	-	-	-
9	-	5	-	-	-	-	-	18	3	-	-	-	-	10	-	-	5	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	0	-	16	-	-	-	-	6	-	-	-	0	-	-	-	-	7	-	4	-	-	-	-	-	-	-	-	-	-	-
11	6	-	-	-	-	-	7	-	-	-	-	2	9	-	-	-	-	-	20	-	-	-	4	-	-	-	-	-	-	-	-	-
12	-	-	-	18	-	0	-	-	-	-	10	-	-	-	16	9	-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-
13	-	-	5	-	18	-	-	-	-	3	-	-	-	-	10	-	-	5	-	-	4	-	-	-	-	-	5	-	7	-	-	-
14	-	-	-	0	-	16	-	-	-	-	6	-	-	-	0	-	7	-	-	-	-	4	-	10	-	-	-	-	-	-	19	-
15	-	6	-	-	-	-	-	7	2	-	-	-	-	9	-	-	-	-	20	-	-	-	4	-	19	-	-	-	-	-	-	10
16	18	-	-	-	-	-	0	-	-	-	-	10	16	-	-	-	-	9	-	-	12	-	-	-	-	-	-	4	-	17	-	-

Comments on LDPC (3/3)

(672,504), Code rate: 3/4																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	0	-	-	5	-	18	16	-	-	-	3	6	10	-	-	0	-	7	-	5	-	-	4	4	-	10	-	5	-	-	-	-
2	-	18	6	-	7	-	-	0	10	2	-	-	-	16	9	-	20	-	9	-	4	12	-	-	4	-	19	-	-	-	-	
3	5	0	-	-	-	-	18	16	6	-	-	3	0	10	-	-	5	-	7	-	4	-	-	4	5	-	10	-	19	-	-	
4	-	-	18	6	0	7	-	-	-	10	2	-	-	-	16	9	-	20	-	9	-	4	12	-	-	4	-	19	-	10	-	
5	-	5	0	-	16	-	-	18	3	6	-	-	-	0	10	-	-	5	-	7	4	4	-	-	-	5	-	-	-	-		
6	6	-	-	18	-	0	7	-	-	-	10	2	9	-	-	16	9	-	20	-	-	-	4	12	19	-	-	-	-	-		
7	-	-	5	0	18	16	-	-	-	3	6	-	-	-	0	10	7	-	5	-	-	4	4	-	10	-	5	-	7	-	19	
8	18	6	-	-	-	-	0	7	2	-	-	10	16	9	-	-	-	9	-	20	12	-	-	4	-	19	-	4	-	17	-	10

(672,588), Code rate: 7/8																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	0	18	6	5	7	18	16	0	10	2	3	6	10	16	9	0	20	7	9	5	4	12	4	4	4	10	19	5	10	-	-	-
2	5	0	18	6	0	7	18	16	6	10	2	3	0	10	16	9	5	20	7	9	4	4	12	4	5	4	10	19	19	10	-	-
3	6	5	0	18	16	0	7	18	3	6	10	2	9	0	10	16	9	5	20	7	4	4	4	12	19	5	4	10	17	19	10	-
4	18	6	5	0	18	16	0	7	2	3	6	10	16	9	0	10	7	9	5	20	12	4	4	4	10	19	5	4	7	17	19	10

Comments on LFSR

- Comment #410
 - The difference of input and output rate for the spreader in Figure 194 should be clarified.
- Resolution:
 - Add in 12.2.2.3.2 and figure 194, the sentence **“Since the output of the spreader is a factor of N larger than the input, the input shall hold while the feedback and output clock.”**

Comment on RSSI Field (1/5)

- Comments #397
 - The sentence “The RSSI_r field contains the amount that the received frame was above the sensitivity of the MCS used” is confusing

- Resolution:
 - Change sentence to “**The RSSI_r field (dB) contains the difference between the received signal power (dBm) above the sensitivity point (dBm) of the selected MCS.**”

Comments on RSSI Field (2/5)

- Comments #398, 592
 - The RSSIr field refers to the receiver sensitivity of the MCS, but the receiver sensitivity table is not complete.

- Resolution:
 - Table 122 is completed.

Data Rate for MCS	Receiver Sensitivity
50.6 Mbps (CMS)	-70 dBm
379.6 Mbps	-61 dBm
405 Mbps	-65 dBm
607.5 Mbps	-62 dBm
759.2 Mbps	-58 dBm
810 Mbps	-62 dBm
1215 Mbps	-59 dBm
1518.4 Mbps (MLR)	-55 dBm
1620 Mbps	-58 dBm
2430 Mbps	-56 dBm
2835 Mbps	-54 dBm
3024 Mbps	-53 dBm

Comments on RSSI Field (3/5)

- Comments #641
 - Bits allocated to encode RSSIr 0-28dB is not correct.
- Resolution:
 - Revise in 12.1.6.3, the sentence as “The range of RSSIr field is from 0dB to 28dB in 2dB steps with 0b0000 corresponding to less than or equal to 0dB and **0b1111 (previously 0b1110)** to greater than 28dB. For example, an RSSIr value that is greater than or equal to 8dB but less than 10dB would be encoded as 0b0101.”

Comments on RSSI Field (4/5)

- Comments #642, 593
 - Bits allocated to encode SINR 0-28dB is not correct.
 - SINR of 0dB is difficult to estimate.
- Resolution:
 - Revise in 12.1.6.3, the sentence as “The range of SINR field is from 2dB (**previously 0dB**) to 28dB in 2dB steps with 0b0000 corresponding to less than or equal to 2dB (**previously 0dB**) and **0b1110** to greater than 28dB. For example, an SINR value that is greater than or equal to 18dB but less than 20dB would be encoded as 0b1001.”

Comments on RSSI Field (5/5)

- Comments #643
 - Bits allocated to encode FER exponent -1 to -10 is not correct.
- Resolution:
 - Revise in 12.1.6.3, the sentence as “The FER field contains the exponent of the estimate of the FER ranging from 10^{-1} to 10^{-10} in steps of -1 with 0b0000 corresponding to an FER exponent of less than or equal to -1 (i.e., an FER greater than or equal to 10^{-1}), **0b1010 (previously 0b1001)** corresponding to an FER exponent of greater than -10 (i.e., an FER greater than or equal to 10^{-1}), and 0b1011-0b1111 reserved.

Comments on SC-PHY Editorial

- Comment #460
 - Explanation on hexadecimal notation of Golay codes needs to be clarified in 12.2.2.3.1.
- Resolution:
 - Add at the bottom of every table containing Golay sequences, the footnote stating **“In each hexadecimal-equivalent 4-binary-digit group, the leftmost bit shall be the msb, and the rightmost bit, the lsb.”**

Comments on IFS for MMC-PNC

- Comment #541:
 - Define the switching time between different PHY modes (SC, HSI and AV) in 12.2.9

- Resolution:
 - Reject comment. There is no need to specify additional switching IFS time between PHY modes. The current IFS options are sufficient.
 - Two different PHY mode transmission occupy two different CTAs and therefore no additional switching time is needed to be defined.