**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | Draft C comment resolutions B C. | |
| Date Submitted | 30th April 2024 | |
| Source | Billy Verso (Qorvo),  Carlos Aldana (Meta) | billy.verso at qorvo.com  caldana at meta.com |
| Re: | Comment Resolutions | |
| Abstract | Comment Resolutions for selected comments on the Pre-Ballot Draft C of the P802.15.4ab amendment. | |
| Purpose | This document provides text changes intended to be part of the final IEEE Std 802.15.4ab (amendment to IEEE Std 802.15.4), as part of resolving selected consolidated comments spreadsheet (doc 15-24-0010) that have been assigned to the author to resolve. | |
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***Comments addressed here:***

[1 CID # 193, 194, 195](#_Toc165413456)

[2 CID # 240](#_Toc165413457)

[3 CID # 177](#_Toc165413458)

[4 CID # 465](#_Toc165413459)

[5 CID # 891](#_Toc165413460)

[6 CID # 875](#_Toc165413461)

# CID # 193, 194, 195

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| **Index** | **Page** | **clause** | **Line** | **Comment** | Proposed Change |
| 193 | 22 | 8.3.2 | 13 | MCPS-DATA.request primitive needs update for extra dynamic data rates. | Needs update of DataRate parameter description in Table 8-27 |
| 194 | 22 | 8.3.2 | 14 | MCPS-DATA.request primitive needs update to include parameter to select coding is LDPC or not. | Add Boolean parameter LdpcEnable parameter into MCPS-DATA.request semantics, and new description line for this in Table 8-27 |
| 195 | 22 | 8.3.4 | 30 | MCPS-DATA.indication primitive needs update to include parameter to indicate whether or not LDPC coding was used. | Add Boolean parameter LdpcUsed parameter into MCPS-DATA.indication semantics, and new description line for this in Table 8-30 |

Discussion: These three comments are proposing updating MCPS-DATA primitives to include parameters to allow new dynamic data rate and LDPC coding selections to be passed through the primitives. The need to add these is clear. Comment CID # 177 addressed later in this document is asking how LDPC is specified and adding the appropriate parameter to MCPS-DATA.request primitive will answer this too.

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| Proposed  **Disposition** | Proposed **Disposition Detail** |
| **Revised** | The details of the changes are provided in separate document 15-24-0208-00-04ab-MCPS-DATA-primitive-modifications-for-dynamic-data-mode.docx |

# CID # 240

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| **Index** | **Page** | **clause** | **Line** | **Comment** | Proposed Change |
| 240 | 159 | 16.2.7.4.3 | 8 | The Ranging/Sensing bit functionality with respect to Sensing in not defined, and this PHR style is not used for sensing packets. The use of the Ranging bit is defined since 4a first introduced it. Rather than developing a functional model and text to support its sensing use, let’s just drop mention of sensing for this bit. This would not preclude a sensing use should one emerge. | Delete "/Sensing" from the field name here, and in Figure 174. |

Discussion: The Ranging bit has an historical use in the standard. That is, it could be set or not to invoke the PHY functionality needed to get a timestamp from the frame being received, which for these data packets (using the dynamic PHR) would be on the basis of analysing the preamble. While such processing does not preclude also extracting information that could be used for sensing, the 4ab sensing functionality has been defined using separate sensing specific packets with a sensing sequence. To avoid confusion and (as the commenter suggests) lots of work developing the text and a functional model of how this might be used, the recommendation is to accept the comment.

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| Proposed  **Disposition** | Proposed **Disposition Detail** |
| Accepted | - |

# CID # 177

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| **Index** | **Page** | **clause** | **Line** | **Comment** | Proposed Change |
| 177 | 163 | 16.3.3.3 |  | "for PHR2 in its dynamic data mode, and shall also use this convolutional code for the PHY payload field unless the optional low-density parity-check LDPC encoder described in 16.3.3.3.1 is being used for the PHY payload field." could be more clear and also how do we control which is used? This should be a one or the other switch (right?). Or a combination of conditions already defined? | "Define a PHY PIB to switch on LDPC when supported and change text:  for PHR2 in its dynamic data mode either the convolutional code or the LDPC code is used to encode the PHY payload field. When phyHrpLdpcEnabled is TRUE the LDPC encoder described in 16.3.3.3.1 shall be used to encode the PHY payload field; when phyHrpLdpcEnabled is FALSE, e K = 7 convolutional code shall be used to encode the PHY payload field." |

Discussion:

PHR2 is used in the HRP-EMDEV’s dynamic data mode. This sentence is saying that the EMDEV shall use the K=7 convolutional code for three cases (a) the PHR in non-dynamic data mode. (b) The PHR2 in dynamic data mode, (c) PHY data payload, except when LDPC is being used. As such the sentence is fairly clearly saying this, but perhaps could be reworded slightly.

The second point is a question of: “How to control selection of LDPC?”, and the answer is the intent was that LDPC and the data rate would be chosen dynamically (depending on needs, channel conditions and capabilities of the devices) and signaled in the PHR1 of the dynamic data mode PHR (16.2.7.4).

The receiver then would use the PHR1 info (signaling the data modulation rate and coding) to decide how to decode PHR2 and PHY data payload (including whether LDPC is being used).

On the transmit side then we need some controls to select the transmit data rate and whether or not to employ LDPC, and since this is intended to be done dynamically, the logical way to select these is via the MCPS-DATA.request that is used to initiate the data frame transmission. Indeed, 4a which had dynamic rates already included parameters in MCPS-DATA.request to select the rate.

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| Proposed  **Disposition** | Proposed **Disposition Detail** |
| Revised | Replace the sentence on lines 5 to 7 of p163 with the following:  “The HRP-EMDEV shall employ the K=7 convolutional code for the PHR or for the PHR2 in dynamic data mode. In addition, the HRP-EMDEV shall employ the K=7 convolutional code for the PHY payload field unless the optional LDPC encoder described in 16.3.3.3.1 is being used for the PHY payload field.”,  Also, modify the MCPS-DATA primitives as per 15-24-0208-00-04ab-MCPS-DATA-primitive-modifications-for-dynamic-data-mode |

# CID # 465

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| **Index** | **Page** | **clause** | **Line** | **Comment** | Proposed Change |
| 465 | 169 | 16.3.4.2.1 | 17 | How to generate the inputs to the symbol mapper (g0+g1) is not clear when LDPC is enabled. | As in the comment |

Discussion:

The editor accidently omitted a note from the source document that said, “In the case of LDPC encoding, g0(n) and g1(n) denote the even and odd bits, respectively.” This should be inserted, and for clarity we should also add that the initial bit sent is considered to be even.

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| Proposed  **Disposition** | Proposed **Disposition Detail** |
| Revised | Insert the sentence below at end of each of the paragraphs describing the mapping, i.e., after p169 line 18, after p171 line 7, p173 line 4, p174 line 21, and p176 line 7.  In the case of LDPC encoding, *g*0(*n*) and *g*1(*n*) denote the even and odd bits, respectively, with the initial bit *i*0 considered to be even numbered. |

# CID # 891

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| **Index** | **Page** | **clause** | **Line** | **Comment** | Proposed Change |
| 891 | 164 165 166 | 16.3.3.1 |  | No reference in the text to Tables 52,53,54 | Add text that refers to tables 52,53,54. Define the meaning of the matrix elements in the tables |

Discussion: Agreed. (Another accidental omission). The text proposed to describe these is provided the resolution detail below.

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| Proposed  **Disposition** | Proposed **Disposition Detail** |
| Revised | Insert the following paragraph after page 164, line 3:  Table 52 provides the matrix prototype of the parity-check matrix for codeword block length *n*= 648 bits, with a subblock size Z = 27 bits. The integer *i* denotes the cyclic-permutation matrix *Pi*, as illustrated in Figure 177. Vacant entries of the table denote null (zero) submatrices. In the same fashion, Table 53 provides the parity-check matrix prototype for block length *n*= 1296 bits, with a subblock size *Z* = 54 bits, and Table 54 provides the parity-check matrix prototype for block length *n*= 1944 bits, with a subblock size *Z* = 81 bits. |

# CID # 875

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| **Index** | **Page** | **clause** | **Line** | **Comment** | Proposed Change |
| 875 | 156 | 16.2.6.2 | 18 | The following text is a sufficiently odd requirement that it deserves a note to explain why it is a requirement.  "For the HRP EMDEV the PSR19 value of shall be supported by the transmitter, while in the receiver this value is mandatory only for devices supporting LDPC coding." |  |

Discussion:

The commenter is misquoting the line, it actually says: “For the HRP-EMDEV the PSR value of 128 shall be supported by the transmitter, while in the receiver this value is mandatory only for devices supporting LDPC coding.

An explanation for this requirement is considered useful and informative. The resolution detail below provides this.

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| Proposed  **Disposition** | Proposed **Disposition Detail** |
| **Revised** | Insert the following explanatory text at the end of the line/paragraph: The PSR value of 128 is helpful in implementations that use LDPC coding and can provide benefits in some implementations that have convolutional coding. Since some receivers may ask for a minimum PSR value of 128 from any transmitter to get more processing gain, support of this is mandatory for transmitters but not for receivers. |

<end>