**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 Proposed comment resolutions for Sensing: Part 2** | |
| Date Submitted | May 2024 | |
| Sources | Pooria Pakrooh (Qualcomm) |  |
| Re: |  | |
| Abstract | Resolution to comments: 107, 157, 225, 226, 228, 407, 660, 682, 848, 866, 869, 871, 884 | |
| Purpose | To propose comments resolution for “P802.15.4ab™/D (pre-ballot) C Draft Standard for Low-Rate Wireless Networks” | |
| Notice | This document does not represent the agreed views of the IEEE 802.15 Working Group or IEEE 802.15.4ab Task Group. It represents only the views of the participants listed in the “Sources” field above.It is offered as a basis for discussion and is not binding on the contributing individuals. The material in this document is subject to change in form and content after further study. The contributors reserve the right to add, amend or withdraw material contained herein. | |

***Comment Index #107 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 107 | Pooria Pakrooh | 10.39.7.2 | 128 | 5 | Bitmap offset is signed. | Change "unsigned" to "signed" |

**Discussion:**

1. Offset is relative to reference tap, which can optionally be the strongest tap. Thus, it can take negative values as well.

**Resolution: Accepted**

***Comment Index #660 and comment index #848 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 660 | Rojan Chitrakar | 10.39.4.5.2 | 110 | 1 | I/Q referes to one value or two values? Should it be I and Q? | As in comment |
| 848 | Carl Murray | 10.39.4.5.2 | 110 | 1 | It is not clear if the signed I/Q values are both encapsulated in the 16 bits or if they are individually encapsulated |  |

**Discussion:**

Agreed that the sentence needs more clarity.

**Resolution: Revised**

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

*Change Line 1 on Page 110 as follows*

For each RX chain, the CIR measurement report shall be represented using 16 bits signed representation of the in-phase CIR tap values, and 16 bits signed representation of the quadrature CIR tap values. An SDEV may optionally represent the CIR measurement report using 10, 12, or 14 bits signed representation of the in-phase CIR tap values, and 10, 12, or 14 bits bits signed representation of the quadrature CIR tap values.

***Comment Index #871 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 871 | Carl Murray | 10.39.7.1 | 124 | 2 | More clarity | In Table 28 replace "consecutive" with "adjacent" |

**Resolution: Accepted**

***Comment Index #869 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 869 | Carl Murray | 10.39.7.1 | 122 | 16 | amplitude can be positive or negative - use magnitude | Change  is the amplitude  To  is the magnitude |

**Resolution: Accepted**

***Comment Index #407 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 407 | Bin Qian | 10.39.3 | 107 | 1 | The frequency stitching could also be used for ranging to improve the resolution. The combination of MMS structure and frequency stitching is straightforward. | Suggest to consider frequency stitching in ranging applications |

**Resolution: Rejected**

**Discussion:**

This proposal was discussed with the group in DCN 2024-26/r1. This feature requires study and design for ranging and needs appropriate PHY design to enable it for ranging. Given the timeline, the group suggested to not consider this for 15.4ab.

***Comment Index #225 and comment index #228 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 225 | Billy Verso | 10.39.7.2 | 127 | 5 | To avoid confusion the "Receiver Report(s)" field should be "Receive Report List" which (I assume) is compressed in its entirety when the Compression field value is one, rather than separately compressing each "individual receive report". | Change "Receiver Repost(s)" to "Receive Report Lists" In figure 145 and paragraphs below. And change line 10 to indicate that this "Receive Report List" field is compressed as a single unit. |
| 228 | Billy Verso | 10.39.7.2 | 128 | 22 | To distinguish an "individual receiver report" from the combined Receive Report(s) field, (hopefully renamed to "Receive Report List" by my other comment)….. | Change this line to "Each individual Receive Report field in the Receive Report List field shall be formatted as shown in Figure 149."; change title of Figure149 to "Format of an individual Receive Report field". |

**Discussion:**

Agreed with the commenter that it is better to change “Receiver report(s)” to "Receiver Report List". However, the receiver report list is not compressed as a single unit, as described in DCN 2024-114/rev3, “When compression is enabled, the CIR Taps field of each receive report is compressed independently.”

**Resolution: Revised**

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

*Change Line 1 on Page 110 as follows*

1. Page 127, Figure 145, change "Receiver Repost(s)" to "Receive Report Lists" and paragraphs below.
2. Page 128, Figure 149, change title of figure to "Format of an individual Receive Report field".
3. *Page 128, Line 9 to Line 22: Replace all instances of “*"Receive Repost(s)" *with “*Receive Report List”

***Comment Index #884 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 884 | Frank Leong | 10.39.3 | 107 | 2 | Splitting frequency stitiching across multiple packets is cumbersome, and results in link budget penalty, especially when using large numbers of small frequency steps. | Specify {8,16,32} as optional numbers of segments inside the sensing field. |

**Resolution: Rejected**

**Discussion:**

The commenter specifies that for the case of large number of frequency stitching, it could be desirable to conduct frequency stitching over one sensing packet with many segments.

With the existing agreed SENS packet configurations in draft C (including 1-4 segments), the frequency stitching feature can still enable stitching over large number of overlapped channels and provide full link budget benefits. This can be done either via sending Non-SENS fields (SYNC,SFD), on a dedicated channel, or via the existing out of sequence stitching method, and longer number of symbols per SENS segment (256, or 512).

Therefore, at this stage, adding new sensing packet configurations with more segments is not suggested.

***Comment Index #157 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 157 | Benjamin Rolfe | 10.39.7.1 | 114 | 15 | " If the field value is zero, it indicates that ranging slots are not scheduled for data frames for exchange of requested information and the requested information should be embedded in the RFRAME, for example RRTI IE as described in 10.28.8.1." misuses normative language (should) and has some grammatical errors. | Change to: If the field value is zero, it indicates that ranging slots are not scheduled for transmission of data frames to exchange of requested information; in this case the requested information needs to be sent another way, for example, in the RFRAME using the RRTI IE as described in 10.28.8.1." |

**Resolution: Accepted**

***Comment Index #866 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 866 | Carl Murray | 10.39.7.1 | 122 | 8 | This doe not appear to align with the gap options in pg109, line 14 |  |

**Resolution: Revised**

**Discussion:**

Agree with the commenter. The larger gap value is 224 (for M=256, L=16). The gap values range from 0 to 224.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

*Change Line 8 on Page 122, Table 27 as follows:*

1. *Change field values range from “0-16” to “0-28”.*
2. *Change field values range from “17-31” to “29-31”.*

***Comment Index #682 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 682 | Rojan Chitrakar | 16.2.10 | 159 | 15 | How is the number of active segements signalled to a peer device? What happens if a device receives a SENS PPDU with more active segments than it supports? | as in comment |

**Resolution: Rejected**

**Discussion:**

The commenter asks for clarification and proposes no change. To clarify, the PHY parameters from sensing are negotiated during session set up and capability exchanged phase, which is done OOB. This includes number of active segments.

***Comment Index #226 in 15-24-0010-16-04ab-cc-consolidated-comments***

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| **CID** | **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| 226 | Billy Verso | 10.39.7.2 | 128 | 9 | "DEFLATE compressed", needs a normative reference to the compression/decompression algorithm to ensure | I am not sure what is the definitive reference but maybe RFC 1951 is appropriate? https://www.ietf.org/rfc/rfc1951.txt |

**Resolution: Accepted**

**Discussion:**

The reference looks reasonable. Add the reference proposed by the commenter to page 128, line 9.