**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Proposed Draft Text for the CIR Report field of AC IE** |
| Date Submitted | Oct. 10, 2023 |
| Source | Chenchen Liu, Bin Qian, Lei Huang, Xiaohui Peng, David Xun Yang (Huawei Technologies) |
| Re: | Contribution to IEEE 802.15.4ab  |
| Abstract |  |
| Purpose | This submission proposes text to for the IEEE Std 802.15.4ab specification framework document. |
| 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 “Source(s)” field above. 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. |

**Comment Index** **#43 and # 194 in 15-23-0475-16-04ab-cc-consolidated-comments**

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| --- | --- | --- | --- | --- | --- |
| **Commenter** | **Sub-Clause** | **Page** | **Line** | **Comment** | **Proposed Change** |
| Li-Hsiang Sun | 10.36.7.1 | 81 | 7 | CIR tap threshold config should it be in the sensing control | add a field for this info |
| Pooria Pakrooh | 10.36.7.1 | 82 | 8 | Adding field descriptions | Change to "When the Bitmap Mode field is zero, the Length field specifies the number of taps in each string of ones, represented by L in subclause 10.36.4.5.1. |
|  |  |  |  |  |  |

**Resolution: Revised**

**Proposed text changes**

Discussion:

Main changes:

1. The Reference Tap field, the Report Mode field and the Threshold field are added
2. The Bitmap Gap field and the Threshold field are combined to form the Mode Dependent Parameter field.
3. The fields in Figure 84 are reordered to show the common fields earlier
4. Corresponding field descriptions are added

### 10.36.7.1 Application Control IE (AC IE)

***Please make the following changes (see highlighted text, yellow highlight for inserted text and green highlight for reordered text，the baseline is DCN 23-0496r1 and P802.15.4ab-pre-ballot-B):***

Figure 84—CIR Report Parameters subfield of the Sensing Control field of the AC IE

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits:** **0-1** | **2-3** | **4** | **5** | **6** | **7-16** | **17** | **18-19** | **20** | **21-22** | **23-29** | **30-31** | **Octets:****0/4/8/16/32** |
| CIR I/Q number of bits | Bitmap mode | Process CIR report for Range | Process CIR report for Velocity | Process CIR report for AoA measurement | Bitmap offset | Compression | Reference Tap | Report Mode | Length | Mode Dependent Parameter | Reserved | Bitmap |

The Reference Tap field indicates the reference tap for the window-based CIR report according to the Table x1.

**Table x1—Values of Reference Tap subfield of the CIR Report Parameters subfield**

|  |  |
| --- | --- |
| **Reference Tap subfield value** | **Meaning** |
| 0 | The earliest detected tap is specified as reference point (mandatorily supported). |
| 1 | The strongest detected tap is specified as reference point (optionally supported). |
| 2 | The reference point is specified via OOB (optionally supported). |
| 3 | Reserved |

The Report Mode field when set to one indicates the CIR report will be sent via out of band radio, otherwise, the CIR report will be sent in the UWB band.

The Mode Dependent Parameter field is interpreted according to the value of the Bitmap Mode field. When the Bitmap Mode field is zero, the Mode Dependent Parameter field is formatted according to Table x2, where the Bitmap Gap field shall have one of the values specified in Table x3. When the Bitmap Mode field is one, the Mode Dependent Parameter field becomes the Threshold field. When the Bitmap Mode field is two, the Mode Dependent Parameter field is reserved.

**Table x2—Format of the Mode Dependent Parameter field when the Bitmap Mode field is zero**

|  |  |
| --- | --- |
| Bits：23-27 | Bits：28-29 |
| Bitmap Gap | Reserved |

**Table x3—Values of Bitmap Gap subfield of the CIR Report Parameters subfield**

|  |  |
| --- | --- |
| **Bitmap Gap subfield value** | **Meaning** |
| 0 | The gap between the two sub-windows is 0. |
| 1 | The gap between the two sub-windows is 8. |
| 2 | The gap between the two sub-windows is 16. |
| $$\cdots $$ | $$\cdots $$ |
| 16 | The gap between the two sub-windows is 128. |
| 17-31 | Reserved |

The Length field has two uses.

⎯ When the Bitmap Mode field is zero, the Length field specifies the number of taps in each sub-window, represented by L in subclause 10.36.4.5.1. In this case, the bitmap is chosen from one of the predefined bitmap options. These options consist of two sub-windows of equal length, both filled with all ones, where the first CIR tap of the first sub-window also serves as the first tap in the window. The gap between these two sub-windows is determined by the Bitmap Gap field.

⎯ When the Bitmap Mode field is value is one or two, the Length field specifies the length of the Bitmap field, as defined in Table 12.

The Threshold field indicates the amplitude threshold level, where the responder only reports the CIR taps above or equal to the amplitude threshold level. Let T denotes the value of the Threshold field in the unit of dB, then the amplitude threshold level $S\_{T}$ is determined according to the following equation

$$S\_{T}=S\_{max}10^{-\frac{T}{20}}$$

where $S\_{max}$ is the amplitude of the strongest detected CIR tap.