**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |
| --- | --- |
| 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 | Sep. 9, 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. |

### 10.36.7.1 Application Control IE (AC IE)

***Please make the following changes (see highlighted text):***

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** | **variable** |
| 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 | OOB | Length | Bitmap Gap/Threshold | 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 Referemce 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. |
| 3 | Reserved |

The OOB 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.

How the Bitmap Gap/Threshold field is interpreted according to the value of the Bitmap Mode field. When the Bitmap Mode field is zero, the Bitmap Gap/Threshold field is formatted according to Table x2. When the Bitmap Mode field is one, the Bitmap Gap/Threshold field becomes the Threshold field. When the Bitmap Mode field is two, the Bitmap Gap/Threshold field is reserved.

**Table x2—Format of the Bitmap Gap/Threshold field when the Bitmap Mode field is zero**

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

The Length field has two uses.

⎯ When the Bitmap Mode field is zero, the Length field specifies the sub-window length, as defined in Table 12. 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. The gap between these two sub-windows are determined by the Bitmap Gap field. The choice of bitmap option is a combination of the Length field and Bitmap Gap field according to the Table x3.

⎯ 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.

**Table x3—Predifined bitmap options when Bitmap Mode=0**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CIR Bitmap Pattern index | sub-window length value  | Bitmap Gap value  | Start tap1 | End tap1 | Start tap2 | End tap2 |
| Length (B6B5) | Bitmap Gap ($B\_{4}B\_{3}\cdots B\_{0}$) |
| 0~28 | 16 | G=[0,8,…,224] | 1 | 16 | 17+G | 32+G |
| 29-31 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |
| 32-56 | 32 | G=[0,8,…,192] | 1 | 32 | 33+G | 64+G |
| 57~63 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |
| 64~80 | 64 | G=[0,8,…,128] | 1 | 64 | 65+G | 128+G |
| 81~95 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |
| 96 | 128 | G=0 | 1 | 256 | n | n |
| 97~127 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |

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

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

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