**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Kookmin Comments on NTU’s RS-FSK modes (v1)** |
| Date Submitted | [November 2016] |
| Source | Trang Nguyen, and Yeong Min Jang (Kookmin University) |
| Re: | Combined Sorted D0 Comments (477r10) |
| Abstract | Some technical comments on NTU’s RS-FSK modes before merging with Kookmin M-FSK modes. |
| Purpose | Discuss the suggested resolution on D0 comments |
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A brief comparison between Kookmin M-FSK modulation and NTU RS-FSK modulation:

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|  | **Kookmin M-FSK** | **NTU RS-FSK** | **Merging and conflicting** |
| **Usage case** | **Indoor** | **Car** | This is the major difference to start with. Merging is not mandatory due to this. |
| Preamble | fpreamble\_1 = constant  fpreamble\_2 = variable to rescale BW | fpreamble = constant | Conflicting.  But optional to merge. |
| Data frequency symbol | fpreamble\_2 upper-limits the BW for data frequencies | No relationship between fpreamble and data frequencies? | Conflicting.  But optional to merge. |
| **Frequency separation** | Δf = constant | Δf is variable | Critical conflicting.  But need to be merged. |
| **Splitter symbol** | Optional for PSDU. No splitter in sending PHY header subfield.  \* We usually do not use the guard symbol in between data symbols.  \* We optionally use 10kHz signal in between two data symbols for dual purposes: guard time and PD mode. (Please refer to our slide# 30 – doc. 15/16-0014r1). | Mandatory for PSDU (?). No splitter in sending PHY header subfields.    Splitter frequency is 7/18 aPF = 868 Hz(?). | PHY header must be supported. However, there is conflicting in selecting frequencies to send PHY header subfields.  PHY header must be sent at the lowest optical clock rate (also means data rate) among supported operating modes.  Also, change it into optional for PSDU. |
| **Frame rate variation support/**  **Asynchronous communication** | Using clock information embedded into each data symbol. A single clock information bit (Ab) leads to the division of BW into two sub-bands. Likewise, a pair of Ab bits leads to the division of BW into four sub-bands. | Division of BW into three sub-bands. This is equivalent to embedding clock information. | No conflict (supporting each other).  Can be merged. |
| **Bandwidth** | Unique BW for data bits-to-symbol mapping.  PHY header fields are sent at the same BW as PSDU. | Low BW for data bits-to-symbol mapping.  Another BW (higher BW) for PIB attributes (actually PHY header field) notification. | Critical conflicting.  PHY header must be sent at the lowest data rate supported in PSDU instead of using another BW and undefined frequencies. |
| **End symbol** | No | Yes | NTU should change the end symbol to an optional sub-field of PSDU to be compatible with existing standard. Refer to Figure 123 – IEEE 802.15.7-2011. |
| Superframe | No | Yes |  |
| MAC frame format | 6 bits overhead | 2 bytes overhead mandatory | Let’s discuss the common MAC frame format |