**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |  |
| --- | --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | Updated HB-PHY header structure | |
| Date Submitted | November 13, 2019 | |
| Source | Kai Lennert Bober,  Volker Jungnickel (Fraunhofer HHI) | Voice: [ ] Fax: [ ] E-mail: [ ] |
| Re: |  | |
| Abstract | Updated text for the HB-PHY header | |
| Purpose | Contribution | |
| Notice | This document has been prepared to assist the IEEE P802.15. 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. | |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15. | |

1. **HB-PHY**
   1. 1. 1. **PHY header**

The PHY header is 168 bits long. It is transmitted over *D* consecutive OFDM symbols, where *D* may be either 1 or 2. The content of the core part is protected by the 16-bit header check sequence (HCS). The information bits contained in the HB-PHY header are as specified in Table 1.

|  |  |  |  |
| --- | --- | --- | --- |
| **Bit** | **Field** | **Number of Bits** | **Description** |
| B0-B3 | Frame Type (FT) | 4 | The FT field indicates the PHY frame type. For compatibility and coexistence with other standards, the field is reserved to have a value of 0b1100. |
| B4-B25 | PSDU Size (PS) | 22 | The PS field specifies the length of the PSDU in octets. |
| B26 | Extended Header Indication (EHI) | 1 | If EHI=”0”, the PHY header contains 168information bits. If EHI=”1”, the PHY header spans two consecutive OFDM symbols and contains 2×168 information bits in total. |
| B27 | Header Segmentation Indication (HSI) | 1 | The HSI indicates whether the header is spread over two symbols. |
| B28-B31 | ***reserved*** | 4 |  |
| B32-B47 | Message Duration (MSG\_DUR) | 16 | The MSG\_DUR indicates the transmit duration of the frame. |
| B48-B49 | Block Size (BLKSZ) | 2 | The BLKSZ determines the block size of the FEC codeword applied in the data field of the PPDU. |
| B50-B52 | FEC Rate (FEC\_RATE) | 3 | The FEC\_RATE indicates the FEC coding rate applied in the data field of the PPDU. |
| B53-B55 | Repetition Number (REP) | 3 | REP indicates the number of payload repetitions as detailed in clause [Editor insert clause number]. |
| B56-B58 | FEC concatenation factor (FCF) | 2 | The FCF is detailed in clause [Editor insert clause number]. |
| B59-B62 | Scrambler Initialization (SI) | 4 | The SI field comprises the initialization bits for the Data scrambler as detailed in clause [Editor insert clause number]. |
| B63 | ***reserved*** | 1 |  |
| B64-B68 | Bit allocation table ID (BAT\_ID) | 5 | BAT\_ID indicates the BAT used in the data field of the PPDU. |
| B69-B71 | Bandplan and subcarrier grouping identifier (BNDPLN / GRP\_ID) | 3 | The bandplan and subcarrier grouping ID. |
| B72-B74 | Guard Interval ID (GI\_ID) | 3 | The GI\_ID indicates the CP length used for the Data field of the PPDU. |
| B75-B151 | ***reserved*** | 77 |  |
| B152-B167 | Header Checksum (HCS) | 16 | The HCS uses CRC-16 as defined in Annex [Editor insert annex number]. The HCS bits shall be processed in the transmitted order. The registers shall be initialized to all ones. |

1. Structure of the HB-PHY header

Depending on the value of the extended header indication (EHI) field in the core part of the PHY‑frame header, the PHY-frame header may be extended by additional 168 bits that are transmitted over an additional *D* consecutive OFDM symbols. If the EHI bit is set to one, additional 168 bits representing the extended part of the PHY-frame header are appended to the end of the core part of the PHY-frame header. The extended part of the PHY-frame header shall be encoded and segmented exactly the same way as the core part, as described in Clause [Editor insert clause number]. The content of the extended part is reserved for future use. The core part and the extended part of the PHY-frame header shall be transmitted over separate OFDM symbols, as illustrated in Figure 1.



1. Allowed cases of PHY-frame header transmissions