**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |
| --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **SNUST - Invisible Data Embedding PHY PPDU Format and PIB Attributes Specification Revision**  |
| Date Submitted | January, 2017 |
| Source | Jaesang Cha, Kim Chan (SNUST), Chunseop Kim (QUBER Co., Ltd), Kwangmin Kim (Ntriever Co., Ltd), Kackhee Lee (Kuwoo Information Technology Co., Ltd.), Byongmoon Yang (Sunil Eleccomm Co. Ltd), Jaekwon Shin, Jintae Kim (Fivetek Co., Ltd), Daehyun Kim, Dongwoo Lee (Namuga Co., Ltd), Hyunsuk Hwang (Seoil Univ.), Yunsik Lim (Yeoju Institute of Technology), Gilsik Lee (Univ. of Texas), Yongkyu Yoon (Univ. of Florida), Ilkyoo Lee (Kongju Nat’ Univ.), Sooyoung Chang (CSUS), Vinayagam Mariappan (SNUST) | Voice: [ ]Fax: [ ]E-mail: [chajs@seoultech.ac.kr]1 |
| Re: | Draft D1 Comment Resolution based Invisible Data Embedding PHY PPDU Format and PIB Attributes Specification Revision |
| Abstract | Details of Resolutions regarding to the submitted Comments on D1 are suggested for Invisible Data Embedding PHY PPDU Format and PHY PIB Attributes Specification Revision. The Invisible Data Embedding is designed to operate on the application services like LED ID, Digital Signage with Advertisement Information. |
| Purpose | D1 Comments Resolutions and Editorial Revision. |
| 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. PPDU FORMART FOR INVISIBLE DATA EMBEDDING**

# **PPDU Format**

The Invisible Data Embedding PPDU frame structure is formatted as illustrated in Figure 4-1 for PHY VI – 2 Dimensional / Screen Source.

****

**Figure 4-1 – Invisible Data Embedding PPDU Format**

**8.6.8.1.1 SHR Field**

The SHR field is used by the transceiver to obtain optical clock synchronization with an incoming message is called Preamble. The standard defines one fast locking pattern (FLP) followed by choice of four topology dependent patterns (TDPs) for the purposes of distinguishing different PHY topologies is shown in Table 4-1.



**Table 4-1 – Preamble Pattern with Topologies**

**8.6.8.1.2 PHR Field**

The PHY VI header is described as shown in Table 4-2 and shall be transmitted with data to identify the PHY Mode, Data rate, and PSDU length to identify the transmission specification.

****

**Table 4-2 – PHY Header**

Burst Mode Field: The burst mode bit indicates that the next frame following the current frame is part of the burst mode. The Burst Mode bit shall be set TRUE if the burst mode is being used otherwise, the Burst Mode bit shall be set FALSE.

Channel Number Field: The channel number field for PHY shall be the band plan ID of the lowest wavelength. Refer to 9.3.1 for more detailed information.

MCS ID Field: The modulation and coding scheme (MCS) ID shall be indicated in the PHY header based on Table 83.

PSDU Field: The PSDU length field specifies the total number of octets contained in the PSDU.

**8.6.8.1.3 PSDU Field**

The PSDU field has a variable length and carries the data of the PHY VI frame. The FCS is appended if the PSDU has a non-zero byte payload. The structure of the PSDU field is as shown in Figure 4-2.



**Figure 4-2 – Invisible Data Embedding PHY PSDU Field Structure**

# **2. PHY PIP ATTRIBUTES FOR INVISIBLE DATA EMBEDDING**

# **PHY PIB Attributes**

The PHY PIB comprises the attributes required to manage the PHY sublayer of a device. The attributes contained in the IEEE802.15.7-2011 PHY PIB are presented in Table 125 - PHY PIB Attributes.

The additional PHY PIB attributes added on PHY for Invisible Data Embedding is presented in the Table 188 —PHY PIB attributes (continued).

|  |
| --- |
| **PHY PIB Table 100 Additions** |
| **Attribute** | **Identifier** | **Type** | **Range** | **Description** |
| phyIDEApplicationSpecificMode | 0x10 | Unsigned | 0~255 | This attribute specifies the application specific PHY mode.0 : Normal Data (Media Content, Information Content based on the Application used for)1 : ID Data 2 : Authentication Data |
| phyIDETxHSize | 0x11 | Integer | 0-65535 | This attribute specify the no of Horizontal Pixel in the 2D Display Transmitter |
| phyIDETxVSize | 0x12 | Integer | 0-65535 | This attribute specify the no of Vertical Pixel in the 2D Display Transmitter |
| phyIDETxFrequency | 0x13 | Integer | 0-65535 | This attribute specify the frame rate of IDE sequence Transmission  |

**Table 188 —PHY PIB attributes (continued for Invisible Data Embedding)**