**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **MCPS-DATA primitive modifications for dynamic data mode.** |
| Date Submitted | xxth April 2024 |
| Source | Billy Verso (Qorvo),  | billy.verso at qorvo.com |
| Re: | Comment Resolutions |
| Abstract | Comment Resolutions for selected comments on the Pre-Ballot Draft C of the P802.15.4ab amendment. |
| Purpose | This document provides text changes intended to be part of the final IEEE Std 802.15.4ab (amendment to IEEE Std 802.15.4), as part of resolving selected consolidated comments spreadsheet (doc 15-24-0010) that have been assigned to the author to resolve. |
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# Introduction:

This document defines changes to the MCPS-DATA primitives to incorporate the dynamic data modes of 4ab.

This is based on the P802.15.4ab™/Draft (pre-ballot) C which has introduced a new PHR field for dynamic data mode, in sub clause 16.2.7.4, which allows for signaling five HPRF mode data rates (1.95 Mb/s, 7.8 Mb/s, 31.2 Mb/s, 62.4 Mb/s, and 124.8 Mb/s) with either K=7 or LDPC coding.

On the transmit side, to allow the next higher layer to specify the data coding and data modulation rate to use for the frame to be transmitted, the MCPS-DATA.request primitive needs modification to include appropriate parameters.

On the receive side it is also desirable for the MCPS-DATA.indication primitive to include parameters to convey the the data coding and data modulation rate that was used for the received frame so that the next higher layer may take this into account for any subsequent reply.

The updates required are captured below as changes to the text in the IEEE P802.15.4me/D03 draft revision (currently in SA Ballot).

These changes update the base standard definition of the DataRate parameter in the TxOptions structure used by the MCPS-DATA.request primitive, for the HRP-EMDEV to refer to the Table 49 where the data rates and PHR1 values are defined, which itself is also updated to include the DataRate parameter. (see below)

On the receive side no additional update is needed for data rate indication, since the MCPS-DATA.indication primitive, already refers to the same Table 8-29 TxOptions structure value for the definition. We do however need to add an LDPC parameter to the MCPS-DATA.indication to indicate whether or not the received frame payload was LDPC coded, which can similarly refer to Table 8-29 for its definition.

***Change the base standard 802.15.4 ME D3 sub-clause 8.3.3 TX options structure and associated note as shown below:***

**8. MAC services**

**8.3 MAC data service**

**8.3.3 TxOptions**

**Table 8-29—Elements of the TxOptions**

| **Name** | **Type** | **Valid Range** | **Description** |
| --- | --- | --- | --- |
|  |  |  |  |
| DataRate  | Integer  | 0–7 | ~~Indicates~~ Specifies the data rate, see note. |
| LdpcCode  | Boolean  | TRUE. FALSE | TRUE if LDPC is to be used to encode the PHY payload, FALSE otherwise. |
|  |  |  |  |

NOTE––For the DataRate element of the TxOptions structure, ~~datarate~~ the following values are used:

…

— For legacy HRP UWB PHYs, values 1–4 are valid and are defined in 16.2.7. while for HRP-EMDEV values 1 to 5 are valid and specify data rate as defined in Table 49. (*Table 49 is* “*PHR1 codeword values and meaning”*).

…

***Change the base standard 802.15.4 ME D3 sub-clause 8.3.6 MCPS-DATA.indication to add new LDPC parameter (LdpcCode) to the primitive semantics and add a definition of this into Table 8-32 as shown below:***

**8.3.6** **MCPS-DATA.indication**

MCPS-DATA.indication (

SrcAddrMode,

SrcPanId,

SrcAddr,

DstAddrMode,

DstPanId

DstAddr,

Msdu,

HeaderIeList,

PayloadIeList,

MpduLinkQuality,

Dsn,

FramePending,

Timestamp,

SecurityParams,

AckSent,

RangingReportDescriptor,

DataRate,

LdpcCode,

Rssi

)

The primitive parameters are defined in Table 8-32.

**Table 8-32—MCPS-DATA.indication parameters**

| **Name** | **Type** | **Valid Range** | **Description** |
| --- | --- | --- | --- |
|  |  |  |  |
| LdpcCode  | Boolean  | TRUE. FALSE | TRUE if the received packet PHY payload was LDPC coded, FALSE otherwise. |
|  |  |  |  |

***A new columnn with the “DataRate parameter value” is inserted into Table 49 (of pre-ballot 4ab Draft C). The rest of the table is unchanged:***

**Table 49—PHR1 codeword values and meaning**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **PHR1 codeword (20 bits)** | **Minimum Hamming Distance** | **PSDU Coding** | **PHR2 nominal rate (Mb/s)** | **PSDU nominal data rate (Mb/s)** | **DataRateparameter value** | **Modulation Reference** |
| 0xFFFFF | 13 | LDPC | 1.95 × ½  | 1.95 | 1 | 16.3.4.3.2 |
| 0x04CCC | 8 | K = 7 | 1.95 | 1.95 |
| 0x01999 | 8 | LDPC | 7.8 × ½ | 7.8 | 2 | 16.3.4.3.1 |
| 0x070F0 | 8 | K = 7 | 7.8 | 7.8 |
| 0x025A5 | 8 | LDPC | 31.2 × ½ | 31.2 | 3 | 16.3.4.2.3 |
| 0x043C3 | 8 | K = 7 | 31.2 | 31.2 |
| 0x01696 | 8 | LDPC | 62.4 × ½ | 62.4 | 4 | 16.3.4.2.2 |
| 0x07F00 | 8 | K = 7 | 62.4 | 62.4 |
| 0x02A55 | 8 | LDPC | 124.8 × ½ | 124.8 | 5 | 16.3.4.2.1 |
| 0x04C33 | 8 | K = 7 | 124.8 | 124.8 |
| 0xF8000 | 12 | Reserved |
| 0x01966 | 8 |
| 0x0700F | 8 |
| 0x0255A | 8 |
| 0x0433C | 8 |
| 0x01669 | 8 |

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