IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)
Title	**Annex P - FSK PHY Draft**
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Re:	[802.15.4 Amendment 4g]
Abstract	[Proposed Content for Clause 6 of FSK draft.]
Purpose	[For consideration for TG4g candidate draft.]
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Insert after Annex L the following new annex (Annex P):

Annex P

(informative)

Example Usage of Generic PHY Mechanism

P.1 Introduction

With the advances in communication allowing for flexible support of data rates and parameters in modern silicon devices, it has become apparent that standards can be defined to capture these features in a consistent way. Mechanisms, such as the one described here, can be provided for this purpose.

The generic PHY mechanism includes a collection of PIB attributes. These attributes form the complete set of parameters necessary to define a PHY mode, such as modulation type, data rate, modulation order, and modulation index for FSK operation (see Table 31). At a minimum, an MRFSK-compliant device supports the mandatory PHY mode but may also support the optional modes specified in Table 1a and Table 1b (6.1.1) or other modes derived using the generic PHY mechanism.

The PIB attribute *phyNumSets* contains the number of modes supported by a device, and every supported mode is included in that device's capabilities table. In addition, the device has an operating mode table that specifies the current PHY mode of operation. For a given mode, the PIB attributes are assigned values appropriate for supporting that mode, and the set of values is known as the PHY Set.

P.2 Example PHY Sets

Table P.1 shows an example capabilities table for supporting a device configured for the two optional PHY modes specified in Table 1a for the 902 MHz band.

Table P.1—Capabilities table with two optional modes[a] for a device operating in the 902 MHz band

PIB attribute	PHY Set0 (mandatory)[b]	PHY Set1	PHY Set2
phyType	FSK	FSK	GFSK
phyFSKModOrder	2-level FSK	2-level FSK	2-level FSK
phyFSKModIndex	1.0	0.5	0.5
phyFSKBT	n/a	n/a	0.5
phyDataRate	50 kb/s	150 kb/s	200 kb/s
phyChannelSpacing	200 kHz	400 kHz	400 kHz
phyFirstChannelFreq	902.2 MHz	902.4 MHz	902.4 MHz
phyNumChannels	129	64	64

[a]The PIB attribute *phyNumSets* is used to specify the number of modes supported.
[b]Supports the mandatory PHY mode, as described in 6.1.1.

Table P.2 shows an example capabilities table for supporting a device configured for five optional PHY modes for the 902 MHz band.

Table P.2—Capabilities table with five optional modes[a] for a device operating in the 902 MHz band

PIB attribute	PHY Set0[b]	PHY Set1	PHY Set2	PHY Set3	PHY Set4	PHY Set5
phyType	FSK	FSK	FSK	FSK	OFDM	DSSS
phyFSKModOrder	2-level FSK	2-level FSK	2-level FSK	2-level FSK	n/a	n/a
phyFSKModIndex	1.0	1.0	0.5	1.0	n/a	n/a
phyFSKBT	n/a	n/a	n/a	n/a	n/a	n/a
phyDataRate	50 kb/s	76.8 kb/s	100 kb/s	142.222 kb/s	750 kb/s	250 kb/s
phyChannelSpacing	200 kHz	500 kHz	300 kHz	400 kHz	800 kHz	2 MHz
phyFirstChannelFreq	902.2 MHz	902.25 MHz	902.3 MHz	902.4 MHz	902.6 MHz	904.0 MHz
phyNumChannels	129	52	85	64	32	32

[a]The PIB attribute *phyNumSets* is used to specify the number of modes supported.
[b]Supports the mandatory PHY mode, as described in 6.1.1.

Table P.3 shows an example capabilities table for supporting a device configured for the 950 MHz band (Japan). A 200 kHz interval between the neighboring channels is employed in every PHY Set.

Table P.3—Capabilities table for a device operating in the 950 MHz band[a]

PIB attribute	PHY Set0[b]	PHY Set1[b]	PHY Set2[b]	PHY Set3	PHY Set4
phyType	FSK	FSK	FSK	FSK	FSK
phyFSKModOrder	2-level GFSK	2-level GFSK	2-level GFSK	2-level GFSK	4-level GFSK
phyFSKModIndex	1.0	1.0	1.0	1.0	0.33
phyFSKBT	n/a	n/a	n/a	n/a	n/a
phyDataRate	50 kb/s	50 kb/s	100 kb/s	200 kb/s	400 kb/s
phyChannelSpacing	200 kHz	400 kHz	400 kHz	600 kHz	600 kHz
phyFirstChannelFreq	TBD	TBD	TBD	TBD	TBD
phyNumChannels	33	32	20	31	31

[a]The PIB attribute *phyNumSets* is used to specify the number of modes supported.

[b]Supports the three mandatory PHY modes, as described in 6.1.1.

P.3 Example operating mode table configurations

The operating mode table of an MRFSK device configured solely for the mandatory mode is shown in Table P.4.

Table P.4—Operating mode table configuration for mandatory mode only

Operating Mode	PHY Set
PHY Mode1	PHY Set0
PHY Mode2	Null
:	:
:	:
PHY ModeN	Null

The operating mode table of an MRFSK device configured solely for a single optional mode is shown in Table P.5.

Table P.5—Operating mode table configuration for a single optional mode only

Operating Mode	PHY Set
PHY Mode1	PHY Set2
PHY Mode2	Null
:	:
:	:
PHY ModeN	Null

The operating mode table of an MRFSK device that is configured to operate in a user-specified, multiple data rate mode with PHY data rate and modulation switching is shown in Table P.6. When multiple operating modes are specified in the operating mode table, the first entry (i.e., PHY Mode1) is the base rate signaling mode. With multiple modes and PHY switching, a modulation change can occur by means of a field in the optional PHY rate switching frame that specifies the new PHY Set (reference into the Capabilities Table) used in the following frame.

The operating mode table of an MRFSK device configured solely for one of the two mandatory modes in the 950 MHz band is shown in Table P.7.

Table P.6—Operating mode table configuration for a device supporting PHY data rate changes

Operating Mode	PHY Set
PHY Mode1	PHY Set0
PHY Mode2	PHY Set3
PHY Mode3	PHY Set4
PHY Mode4	Null
:	:
:	:
PHY ModeN	Null

Table P.7—Operating mode table configuration for one of the two mandatory modes in the 950 MHz band

Operating Mode	PHY Set
PHY Mode1	PHY Set2
PHY Mode2	Null
:	:
:	:
PHY ModeN	Null