

**IEEE P802.15
Wireless Personal Area Networks**

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)	
Title	Proposed Text on Common Mode and MMC-PNC	
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Re:	802.15.3c Teleconference Meeting	
Abstract	IEEE 802.15 Task Group TG3c Comment Resolution	
Purpose	Resolutions for the Comments on Common Mode and MMC-PNC	
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12.1.7 Common Mode

The Common Mode Signaling (newly abbreviated as CMS) is a common signaling that shall be supported by all PNC-capable DEVs in all PHY modes. The role of CMS is to enable interoperability among different PHY modes. Although CMS may be used for all kinds of transmission, it should be used only for beacons, command frames and omni (quasi) directional transmission.

12.1.7.1 Preamble, header and payload for CMS

The CMS is an SC signal. The frame format for CMS is shown in Figure 188. The CMS preamble shall be the long preamble as described in 12.2.3. The construction of the CMS frame header and payload are described in 12.2.4 and 12.2.5. The subblock length shall be 256, with no pilot word (PW) inserted in between subblocks.

12.1.7.2 Modulation, forward error correction and spreading for CMS

The CMS shall be modulated with $\pi/2$ -BPSK and employ RS(255,239) as the FEC. The description for the $\pi/2$ -BPSK modulation and RS(255,239) are given in 12.2.2.1.1 and 12.2.2.2.1 respectively. The spreading factor for header and payload shall be 32 and the spreading process is described in 12.2.2.3. The PHY-SAP rate of CMS is 50.6 Mb/s.

12.1.7.3 Mandatory Low Rate

The mandatory low rate (MLR) has similar modulation and FEC with CMS. MLR has a spreading factor of 1. The subblock length shall be 256, with PW length of 16 for header and 64 for payload. The PHY-SAP rate for MLR is 1518.4 Mb/s.

12.1.8 Requirements for mmWave PNCs

To enable interoperability and coexistence among DEVs from different PHY modes, the following PNC rules have been defined:

(The following rules are only reinstatement of what agreed in Jacksonville)

- All PNC-capable DEVs shall be able to transmit and receive CMS beacon and command frames.
- Beacons shall only be transmitted in CMS.
- CP shall only be conducted in CMS.

(The following are the summary of comments received in Denver, in addition to the above PNC rules. These additions can be discussed further)

- All DEVs (not only PNC-capable DEVs but also non-PNC-capable DEVs) shall be able to transmit/receive beacons and command frames in CMS.
- All DEVs shall be able to transmit/receive in MLR (PHY-SAP rate of 1518.4Mb/s with $\pi/2$ -BPSK modulation, RS(255,239) coding and spreading factor 1.).

12.1.9 Multi-mode-capable PNC

A multi-mode-capable (MMC) PNC is a PNC-capable DEV that supports multiple mmWave PHY modes. The MMC-PNC is an optional advanced PNC feature that:

- a) Enables and manages communications among DEVs operating in different PHY modes, and
- b) Mitigates potential interference among DEVs operating in different PHY modes.

An MMC-PNC shall be able to transmit and receive CMS. CMS shall be mandatory for both beaconing and the CP.

(Annex D2 in D00 with contradictory statements will be removed and replaced by the following paragraphs)

When an MMC-PNC is operating as a parent PNC, it may form multiple child piconets using the child piconet process as described in 8.2.5. The MMC-PNC shall send beacon in the parent piconet using Common Mode and may send beacons in the child piconets using other PHY modes it supports. Non-PNC-capable DEVs that support only one of the PHY modes would only be able to correctly receive one of the beacons and would then join the appropriate child piconet.

When an MMC-PNC is operating as a child PNC, it shall receive beacons in Common Mode from the parent piconet and transmit/receive command frames in CP using Common Mode. The MMC-PNC may then start its own child piconet.