

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	
Date Submitted	Sep, 2008	
Source	[C.S. Sum, T. Baykas, J. Wang, R. Funada, M.A. Rahman, F. Kojima, Z. Lan, C.W. Pyo, H. Harada, S. Kato] [NICT]	Voice: [+81-46-847-5092] Fax: [+81-46-847-5440] E-mail: [sum@nict.go.jp]
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	
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.	

12.1.7 Requirements for mmWave PNCs

~~To enable interoperability and coexistence among DEVs from different PHY modes, Common Mode Signaling (CMS) shall be supported by all PNC capable devices. The following PNC rules have been defined:~~

In order to promote coexistence among DEVs using different PHYs, the following MAC rules have defined.

- An AV PNC-capable DEV, when operating as a PNC, shall transmit an AV beacon and a CMS beacon in every superframe. ~~If the AV beacon is transmitted in the beginning of the superframe, then the CMS beacon shall be transmitted in the CTAP, and vice versa.~~
- An HSI PNC-capable DEV, when operating as a PNC, shall transmit an HSI beacon and a CMS beacon in every superframe. ~~If the HSI beacon is transmitted in the beginning of the superframe, then the CMS beacon shall be transmitted in the CTAP, and vice versa.~~
- An AV PNC-capable DEV shall be able to receive the CMS beacon and command frames.
- An HSI PNC-capable DEV shall be able to receive the CMS beacon and command frames.

12.1.7.1 CP operation

The CPs in a piconet shall all be conducted using the same mmWave PHYmode, one of SC, HSI or AV, as the beacon. Only a near-omni MCS that is supported by both the source and destination and which is the same PHY mode as the beacon may be used in a CP. Near-omni MCSs include:

- For SC PHY, the CMS, as defined in 12.1.x, with near-omni antenna pattern
- For HSI PHY, MCS 0 and MCS 1, as defined in 12.3.x, with near-omni antenna pattern
- For AV PHY, any LRP mode index

A Directional CP (DCP) is a CP in which the DEVs are allowed to use directional antennas, as described in 8.6.6. In a DCP, any MCS that is supported by both the source and destination and which is in the same PHY mode as the beacon may be used. This includes MCSs that are not near-omni. In a DCP, either the source or the destination is the PNC.

12.1.8 Common Mode Signaling (CMS)

~~The Common Mode Signaling (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. CMS may be used for both interference mitigation and data transmission purposes.

12.1.8.1 MCS dependant parameters for CMS

The MCS dependant parameters for CMS shall be set according to Table 99. The chip rate shall be 1728Mchip/s. The CMS shall be modulated with $\pi/2$ -BPSK and employ RS(255,239) as the FEC. The burst length shall be 256, with pilot word length of 0.

Table 99 MCS Dependant Parameters for CMS

MCS Identifier	PHY-SAP (Mb/s)	Modulation Scheme	Spreading factor	FEC type	FEC rate
CMS	50.6	$\pi/2$ -BPSK/(G)MSK	32	RS(255,239)	0.937

12.1.8.2 Header rate dependant parameters for CMS

The header rate dependant parameters for CMS shall be set according to Table 100. The chip rate for the CMS header shall be 1728Mchip/s. The burst length shall be 256, with pilot word length of 0.

Table 100 MCS Dependant Parameters for CMS

Header Rate (Mb/s)	Modulation Scheme	Spreading factor	FEC type	FEC rate
27.8	$\pi/2$ -BPSK/(G)MSK	32	RS(33,17)	0.515

12.1.8.3 Modulation and Coding for CMS

Editorial notes: ~~Partially copy~~ Forward reference to 12.2.2.1 Modulation 12.2.2.2 Forward error correction to this subclause.

12.1.8.4 Preamble for CMS

Editorial notes: ~~Partially copy~~ Forward reference to 12.2.3 PHY preamble, 12.2.3.1 Frame Synchronization, 12.2.3.3 Frame SFD, 12.2.3.3 Channel estimation sequence to this subclause.

12.1.8.5 PHY Header for CMS

Editorial notes: ~~Partially copy~~ Forward reference to 12.2.4 Frame header, 12.2.4.1 PHY header to this subclause.

12.1.8.6 Frame payload for CMS

Editorial notes: ~~Partially copy~~ Forward reference to 12.2.5 Frame payload to this subclause.

12.1.9 Multi-mode-capable PNC

A multi-mode-capable (MMC) PNC is a PNC-capable DEV that supports multiple mmWave PHY modes.

An MMC-PNC is able to:

- a) enable and manage communications among DEVs operating in different PHY modes, and
- b) mitigate potential interference among DEVs operating in different PHY modes.

12.1.9.1 SC/HSI MMC-PNC

The SC/HSI MMC-PNC is a PNC-capable DEV that supports both SC and HSI modes. The SC/HSI MMC-PNC shall be able to transmit and receive CMS beacon and command frames. Beacons and CP shall be conducted in CMS.

The SC/HSI MMC-PNC shall first transmit CMS beacon and reserve CTAs to operate in either SC or HSI modes. Any device which supports CMS may join the piconet applying the association procedure defined in 8.3, by using CMS in CP. In the CTAP, DEVs of these PHY modes may then join respective piconets using the association procedure.

12.1.9.2 SC/AV MMC-PNC

The SC/AV MMC-PNC is a PNC-capable DEV that supports both SC and AV modes. The SC/AV MMC-PNC shall start a parent or dependent SC piconet if one does not already exist.

