**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **<Suggested Revised Text for CSMA-CA with PCA>** | |
| Date Submitted | [13 September 2012] | |
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| Re: | [] | |
| Abstract | [Presents suggested revisions to d1P802-15-4k\_Draft\_Standard.pdf .] | |
| Purpose | [To be considered during comment resolution discussion in Palm Springs, CA.] | |
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**Below is suggested replacement text for 5.1.1.4.5.**

**5.1.1.4.5 CSMA-CA with PCA**

This subclause describes the alternate backoff mechanism used for the transmission of a critical event priority message ~~when~~ *~~macPriorityChannelAccess~~* ~~is TRUE in a device~~ ~~that supports~~ when using PCA (i.e., *macPriorityChannelAccess* is TRUE). ~~This backoff mechanism shall be used when~~ *~~macPriorityChannelAccess~~* ~~is TRUE.~~

~~When operating a LECIM PHY in a nonbeacon-enabled PAN using unslotted CSMA-CA, the critical event priority transmission may be initiated at any time.~~ During transmission of a priority message, when the CCA returns a status of channel busy, the alternate backoff mechanism shall be used: the backoff exponent *BE* shall be set to the value of *macMinBE*–1 prior to the first transmission attempt, and *BE* shall remain constant for subsequent retransmissions. The PCA follows a persistent CSMA mechanism, where a device continues to monitor the channel and decrements the contention window any time the channel is sensed idle for a duration of *aUnitBackoffPeriod*, in order to gain access to the channel as soon as possible.

When operating a LECIM PHY in a nonbeacon-enabled PAN using unslotted CSMA-CA, the critical event priority transmission may be initiated at any time.

~~In a beacon-enabled PAN, a critical event priority message transmission may be initiated in any part of the~~

~~CAP. When transmission is initiated in the PCA allocations and the CCA indicates a busy channel, the alternate backoff mechanism shall be used.~~

In a beacon-enabled PAN, ~~T~~the length of a PCA allocation shall be at least 880 symbol durations. When *macPriorityChannelAccess* is TRUE, the minimum number of PCA allocations in a superframe is defined by the MAC personal area network information base (PIB) attributes *macPCAAllocationSuperRate*, *macPCAAllocationRate*, and *macCritMsgDelayTol*. The relations of the parameters are illustrated in Table 0a.

In Table 0a, *SD* is the superframe duration, indicates the closest integer less than or equal to its argument, and indicates the closest integer larger than or equal to its argument. When *macPCAAllocationSuperRate* is FALSE, ~~the~~ *macPCAAllocationRate* indicates the maximum number of consecutive superframes for which only one PCA allocation is required. When *macPCAAllocationSuperRate* is TRUE, ~~the~~ *macPCAAllocationRate* indicates the minimum number of PCA allocations required per superframe.

If there are multiple PCA allocations per superframe, the first allocation shall occur immediately after the beacon transmission. The remaining PCA allocations should be distributed throughout the superframe, but no PCA allocation shall occur outside a CAP.

When a critical event priority transmission is initiated within the CAP during a time that is not a PCA allocation, the primary CSMA-CA, as defined in 5.1.1.4, with the previously described alternate backoff mechanism shall be used.

If DSME is utilized with *macCAPReductionFlag* set to TRUE and the multi-superframe duration is longer than *macCritMsgDelayTol*, then *macPriorityChannelAccess* shall be set to FALSE. When *macPriorityChannelAccess* is TRUE, a PCA allocation cannot occur if the CAP length duration is less than *aMinCAPLength* plus the time required for a single PCA allocation.