**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **TG4k Sponsor Recirc Comment** Resolution Details CSL | |
| Date Submitted | 19 March 2013 | |
| Source |  | Voice: +1.408.395.7732 Fax: [ NA ] E-mail: ben @ blindcreek.com |
| Re: | 802.15.4k Comment Resolution, Sponsor recirculation #1 | |
| Abstract | Comment resolution details for CIDs related to CSL, Low Energy: CIDS: 14,28, 29,30,31,32,33,34,35,37,38 | |
| Purpose | Resolve comments so we can finish the standard without breaking anything. | |
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Comment resolution details, TG4k Sponsor Recirculation 1

CIDS: 14,28, 29,30,31,32,33,34,35,37,38

Resolution: Accept in principle

Resolution details: See document # **15-13-0167-01-004k**

CSL Changes:

Change the *macCSLInterval* default value to 0. Then Step 3 in 5.1.11.1.4 doesn’t break anything.

If the *macCSLInterval* is nonzero, the CSL coordinator will stop sending the wake-up sequence only after receiving data request frames from all of the destination devices or the *macCSLMaxPeriod* expires.

In **5.2.2.8.1:**

Remove all the changes, and instead in table 4b, change “2” to “2/4”.

5.2.4.10:

Leave title alone, change inserted text first sentence to:

This IE is used in the LE Wake-up frame and shall be formatted as illustrated in Figure 48aaa.

Delete “When CSL receives a data request frame from the corresponding destination device, the MAC sublayer shall update the RZ Time field to zero.”

Change third paragraph as indicated:

The Wake-up Interval field is only present in the transmitted IE when *macCSLInterval* is nonzero. The Wake-up Interval field is the length of the interval between two successive LE wake-up frames in the wake-up sequence, in units of 10 symbols. The Wake-up Interval field shall be set to *macCSLInterval* when requesting the MAC sublayer to transmit.

**5.1.11.0**

Change subclause 5.1.11.0 title to: “LE-transmission, reception, and acknowledgment with positive handshake”

Change caption on figure 34na to “LE transmission with positive handshake”

Change first sentence:

When *macLEHSenabled* is set to TRUE in the coordinator and the device,. the data transmission, reception, and acknowledgment process illustrated in Figure 34na shall be used.

Add after third paragraph:

If the acknowledge is not received as expected, retransmission shall be performed as defined in 5.1.6.4.3. If, after sending the acknowledgment with the Frame Pending field set, the Data Request command is not received, the coordinator waits for the retransmission and repeats the acknowledgment with frame pending set.

5.1.11.1.2

Replace text with:

If the destination address of the wakeup frame matches *macShortAddress*, then the CSL coordinator checks if the wake-up frame contains the Wake-up Interval field; If the wake-up frame does not contain the Wake-up Interval field, then the CSL coordinator disables the receiver until the Rendezvous Time (RZ Time) in the wake-up frame and then enables the receiver to receive the data frame. If the wake-up frame does contain the Wake-up Interval field, and its value is nonzero, the CSL coordinator disables the receiver and transmits the data request frame with the AR field in the data frame set to one. Then the CSL coordinator waits for up to *macEnhAckWaitDuration*, as defined in Table 52j, for the enhanced acknowledgment frame. If the enhanced acknowledgment frame is received, the RZ Time is updated using the contents of the enhanced acknowledgment frame, and the receiver remains on for up to *macMaxFrameTotalWaitTime,* in order to receive the data frame.

When the wake-up frame contains the Wake-up Interval field with a nonzero value, the transmission, reception, and acknowledgment operation is illustrated in Figure 34oa.

If the destination address of wake-up frame does not match *macShortAddress*, the CSL coordinator disables the receiver until RZ Time plus the transmission time of the maximum length payload frame and the secure acknowledgment frame, and then resumes channel sampling.

**5.1.11.1.4**

In step d 3) add “If *macCSLInterval* is not zero, then…

5.1.11.1.5

Replace added step in list with:

If *macCSLInterval* is not zero, the CSL coordinator will stop sending the wake-up sequence only after receiving data request frames from all of the destination devices or the *macCSLMaxPeriod* expires.

6.4.3.2

add the following row to Table 52a

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Type** | **Range** | **Description** | **Default** |
| *macLEHSenabled* | **Boolean** | **TRUE or FALSE** | If TRUE, the device is using functionality specific to low energy hand shake | Implementation specific |