**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title |  |
| Date Submitted |  |
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| Re: | Task Group 15.4g |
| Abstract | Comment Resolution for Letter Ballot 70, CID 39 |
| Purpose | Comment Resolution |
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# Proposal for simplifying Clause 16.1.2.5 Code-symbol interleaving

## CID 39.

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| The interleaver description is too complicated. | Simplify to a concise description of a write-in-rown/read-in-column interleaver. |

## Proposal

Accept in principle. Replace the entire sub-clause 16.1.2.5 with the following text:

<< Start of text >>



Coded symbols are written into an array of $N\_{r}$ rows and $N\_{c}$ columns. Coded symbols are written into the array row-wise, and read out column-wise. For this interleaver, $N\_{c}= N\_{r}=4, $ $N\_{interleave}= N\_{c} × N\_{r}=16$

The sequence of output coded symbols $Q(i)$ is generated from the input sequence $S(k)$

$$Q\left(i\right)= S\left(k\right)$$

where

$$k=N\_{interleave}- mod\left(i\*N\_{c},N\_{interleave}\right)- mod\left(floor\left(\frac{i}{N\_{r}}\right)N\_{c}\right)+ floor\left(\frac{i}{N\_{interleave}}\right)N\_{interleave}-1$$

and

$$i=\left[0..N-1\right] $$

$$where N is the length of the sequence, and is a non-zero integer multiple of N\_{interleave} (see Equation (5)).$$

<< End of Text >>

## Verification using a Matlab Script

S=[]

Nr=4

Nc=4

Ninter=Nr\*Nc

N=16\* 1

for i=0:N-1

 S=[S ( Ninter - mod(i\*Nc,Ninter)-mod(floor(i/Nr),Nc) ...

 + floor(i/Ninter)\*Ninter-1 ) ];

end

S

num2str(S)

## N=16

for i=0..N-1,

k= 15 11 7 3 14 10 6 2 13 9 5 1 12 8 4 0

## N=32

for i=0..N-1,

k= 15 11 7 3 14 10 6 2 13 9 5 1 12 8 4 0

31 27 23 19 30 26 22 18 29 25 21 17 28 24 20 16

## N=48

 for i=0..N-1,

K= 15 11 7 3 14 10 6 2 13 9 5 1 12 8 4 0

31 27 23 19 30 26 22 18 29 25 21 17 28 24 20 16

47 43 39 35 46 42 38 34 45 41 37 33 44 40 36 32