**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Wireless Personal Area Networks | |
| Title | **TG4u Contribution in response to Call for Proposals** | |
| Date Submitted | 11 Jan 2016 | |
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| Re: | Tg4u Call for Proposals | |
| Abstract | Submission of Proposal for PHY layer amendment to support use of the 865-867 MHz band in India by adding a channel plan to the SUN FSK PHY (and nothing else). | |
| Purpose | Submission of Proposal that meets all technical requirements of the approved project scope, leverages the success of the current standard, can be implemented by millions of existing deployed devices with no additional cost, and which does not adversely affect the 802.15.4 standard. | |
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Contribution in response to Call for Proposals

# Introduction (not part of the proposed amendment)

## Purpose and objective:

Meet the requirements of the approved project by adding the channel plan to support operation of the SUN FSK PHY at in the band indicated below. Note that the all other PHY characteristics (e.g. modulation parameters, PPDU format) are identical to the SUN FSK PHY modes already defined.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India | 865-867d | Data Rate (kb/s)a | 50 | 100 |
| Modulation Index | 1.0 | 0.5 |
| Channel Spacing (MHz) | 200 | 200 |

## Summary of Project Scope

PAR scope: This amendment defines a PHY layer enabling the use of the 865-867 MHz band in India. The supported data rate should be at least 40 kb/s per second and the typical Line of Sight (LOS) range should be on the order of 5 km using omni directional antenna. Included are any channel access and/or timing changes in the MAC necessary to support this PHY layer.

|  |  |  |
| --- | --- | --- |
| **Objective from PAR scope** | **Met by this proposal** | **Notes** |
| Define a PHY Layer enabling the use of the 865-867 MHz band in India | ***YES*** | Also supports use of the same band anywhere on earth if available by local regulations |
| Data Rate at least 40kb/s | ***YES*** | Supports 50, 100 kb/s |
| Typical LOS range on the order of 5km | ***YES*** | Based on field performance of 802.15.4g deployments in other sub-GHz bands |
| Channel access and/or timing changes in the MAC necessary to support this PHY layer | ***YES*** | No channel access or timing changes are required to support the PHY in this proposal, as all PHY characteristics are identical to existing PHY defined in the standard. |

# Proposed Amendment

## Content Specific to changes to 802.15.4-2015

The following changes are based on P802.15.4REVc-D02[[1]](#footnote-1).

**10.1.1 Operating frequency range**

*Insert in order into Table 10-170:*

|  |  |
| --- | --- |
| **Band designation** | **Frequency band (MHz)** |
| 866 MHz | 865-867 |

**10.1.2.8 Channel numbering for SUN and TVWS PHYs**

*Insert in order into Table 10-179:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Frequency band (MHz)** | **Modulation** | **ChanSpacing (MHz)** | **TotalNumChan** | **ChanCenterFreq0 (MHz)** |
| 865-867 | SUN FSK operating mode #1, #2 | 0.2 | 10 | 865.1 |

**20. SUN FSK PHY**

**20.1 Introduction**

*Insert in order into Table 20-245:*

|  |  |
| --- | --- |
| **Frequency band (MHz)** | **Symbol duration used for MAC and PHY timing parameters (μs)** |
| 902–928 | 20 |

**20.3 Modulation and coding for SUN FSK**

*Insert in order into Table 20-250:*

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency band (MHz) | Parameter | Operating mode #1 | Operating mode #2 |
| 865-867 | Data rate (kb/s) | 50 | 100 |
| Modulation | 2-FSK | 2-FSK |
| Modulation index | 1.0 | 0.5 |
| Channel spacing (kHz) | 200 | 200 |

# Alternate Channel Plan proposal

The following replaces the changes to 10.1.2.8 to implement the 9 channel plan (with guard bands).

**10.1.2.8 Channel numbering for SUN and TVWS PHYs**

*Insert in order into Table 10-179:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Frequency band (MHz)** | **Modulation** | **ChanSpacing (MHz)** | **TotalNumChan** | **ChanCenterFreq0 (MHz)** |
| 865-867 | SUN FSK operating mode #1, #2 | 0.2 | 10 | 865.125 |

1. Editorial changes may be made during the IEEE publication process, with the slight chance clause, figure and table numbering may change [↑](#footnote-ref-1)