**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |  |
| --- | --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | Study Group 4r Draft PAR | |
| Date Submitted | January 22, 2014 | |
| Source | [Ben Rolfe, BCA]  [Kunal Shah, Silver Spring Networks]  [Cristina Seibert, Silver Spring Networks]  [Clint Powell, PWC LLC] | E-Mail: [ben @ blindcreek.com]  [kshah @ silverspringnet.com]  [cseibert @ silverspringnet.com]  [cpowell @ ieee.org] |
| Re: |  | |
| Abstract | [PAR draft for the SG4r.] | |
| Purpose | [Working document for the PAR to the P802.15 Working Group.] | |
| 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. | |

**P802.15.4**

**Submitter Email:**

**Type of Project:** Amendment to IEEE Standard 802.15.4-2011

**PAR Request Date:** 20-Jan-2014

# PAR Approval Date: PAR Expiration Date:

**Status:** Unapproved PAR, PAR for an Amendment to an existing IEEE Standard

* 1. **Project Number:** P802.15.4r
  2. **Type of Document:** Standard
  3. **Life Cycle:** Full Use

**2.1 Title:** Standard for Local and metropolitan area networks--Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs) – Amendment for Radio based Distance Measurement Techniques

* 1. **Working Group:** Wireless Personal Area Network (WPAN) Working Group (C/LM/WG802.15)

# Contact Information for Working Group Chair Name: Robert Heile

**Email Address:** [bheile@ieee.org](mailto:bheile@ieee.org)

**Phone:** 781-929-4832

**Contact Information for Working Group Vice-Chair Name:** PATRICK KINNEY

**Email Address:** [pat.kinney@kinneyconsultingllc.com](mailto:pat.kinney@kinneyconsultingllc.com)

**Phone:** 847-960-3715

* 1. **Sponsoring Society and Committee:** IEEE Computer Society/LAN/MAN Standards Committee (C/LM)

**Contact Information for Sponsor Chair Name:** Paul Nikolich

**Email Address:** [p.nikolich@ieee.org](mailto:p.nikolich@ieee.org)

**Phone:** 857.205.0050

# Contact Information for Standards Representative Name: James Gilb

**Email Address:** [gilb@ieee.org](mailto:gilb@ieee.org)

**Phone:** 858-229-4822

* 1. **Type of Ballot:** Individual

# Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 11/2015

* 1. **Projected Completion Date for Submittal to RevCom: 07/2016**

**5.1 Approximate number of people expected to be actively involved in the development of this project: 50**

* + 1. **Scope of the complete standard:**

This standard defines the physical layer (PHY) and medium access control (MAC) sublayer specifications for low-data-rate wireless connectivity with fixed, portable, and moving devices with no battery or very limited battery consumption requirements typically operating in the personal operating space (POS) of 10 m.

Physical layers (PHYs) are defined for

-- Devices operating in the license-free 868-868.6 MHz, 902-928 MHz, and 2400-2483.5 MHz bands

-- Devices with precision ranging, extended range, and enhanced robustness and mobility

-- Devices operating according the Chinese regulations, Radio Management of P. R. of China doc. #6326360786867187500 or  
 current document, for one or more of the 314-316 MHz, 430-434 MHz and 779-787 MHz frequency bands

-- Devices operating in the 950-956 MHz allocation in Japan and coexisting with passive tag systems in the band.

* + 1. **Scope of the project:**

This amendment integrates wireless ranging techniques and technologies, including those existing within IEEE 802.15.4 and new to IEEE 802.15.4, into a consistent, standardized protocol addressing the needs of a wide range of applications and PHYs and enabling the interoperability of devices by different vendors using the standardized protocol. Additionally, the amendment addresses the definition of a ranging operation mode and defines necessary MAC extensions which, together with the PHY specifications, enable radio based distance measurements.

# Is the completion of this standard dependent upon the completion of another standard: No

* 1. **Purpose:** This document will not include a purpose clause.

# Need for the Project:

The purpose of this amendment is to explicitly and clearly facilitate wireless ranging mechanisms, along with wireless data communications and network technology, to provide scalable Real Time Location Service (RTLS) support for a multitude of applications and PHY layers.

The IEEE 802.15.4 standard addresses many markets where there is a substantial need for both communications and determination of distances between two devices, i.e. ranging. The following is a representative but hardly complete set of application examples.  Suffice it to say a variety of ranging accuracies, from centimeters to many 10s of meters, may need to be supported in any given market depending on application:

* a retailer needs to determine the proximity of a shopper to specific points/displays and then send the appropriate data
* a medical environment needs to determine the proximity of a staff person to a desired item and inform that staff as to specific data for that item
* lighting control networks need to determine the range between devices to facilitate binding for control, e.g. a specific switch to a specific light fixture
* TV whitespace networks require location awareness via accurate ranging  from multiple devices to determine available frequency bands
* Railroad services desire the ability for a locomotive to determine the distance to various devices for identification, etc.

Given that various regions and applications are served by numerous frequency bands following different regulatory rules, modulations, and data rates; complexity and confusion can only be avoided if ranging data is made available to higher layers in a consistent manner for location determination mechanisms. Hence there is a need for an RTLS which works with the diverse PHYs of IEEE 802.15.4.

* 1. **Stakeholders for the Standard:** The Stakeholders includes:
* Communication device manufacturers and users
* Infrastructure operators
* Device component and systems suppliers
* Industrial Automation providers
* Building Automation providers
* Intelligent Traffic System Providers
* Large Scale Monitoring for Safety providers

**Intellectual Property**

* + 1. **Is the Sponsor aware of any copyright permissions needed for this project?: No**
    2. **Is the Sponsor aware of possible registration activity related to this project?: No**
  1. **Are there other standards or projects with a similar scope?:** No
  2. **Joint Development**

**Is it the intent to develop this document jointly with another organization?:** No

**8.1 Additional Explanatory Notes (Item Number and Explanation):**