**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **SG15 PAR - Working Draft** |
| Date Submitted | 17 May 2021 |
| Source | [Phil Beecher, Wi-SUN Alliance, UK] | E-mail: [pbeecher@wi-sun.org] |
| Abstract | Draft PAR for NS-NB project. |
| Purpose | Prepare PAR for submission |
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**P802.15.15**

**Submitter Email:**

**Type of Project:** New IEEE Standard

**Project Request Type:** Initiation / New

**PAR Request Date:**

**PAR Approval Date:**

**PAR Expiration Date:**

**PAR Status:** Draft

**1.1 Project Number:** P802.15.15

**1.2 Type of Document:** Standard

**1.3 Life Cycle:** Full Use

**2.1 Project Title:** Standard for Low-Rate Wireless Networks

**3.1 Working Group:** Wireless Specialty Networks (WSN) Working Group(C/LM/802.15 WG)

**3.1.1 Contact Information for Working Group Chair:**

**Name:** PATRICK KINNEY

**Email Address:**

**3.1.2 Contact Information for Working Group Vice Chair:**

**Name:** Richard Alfvin

**Email Address:**

**3.2 Society and Committee:** IEEE Computer Society/LAN/MAN Standards Committee(C/LM)

**3.2.1 Contact Information for Standards Committee Chair:**

**Name:** Paul Nikolich

**Email Address:**

**3.2.2 Contact Information for Standards Committee Vice Chair:**

**Name:** James Gilb

**Email Address:**

**3.2.3 Contact Information for Standards Representative:**

**Name:** James Gilb

**Email Address:**

**4.1 Type of Ballot:** Individual

**4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot:**

Sep 2022

**4.3 Projected Completion Date for Submittal to RevCom:** May 2023

**5.1 Approximate number of people expected to be actively involved in the development of this project:** 30

**5.2 Scope of proposed standard:** This standard defines the physical layer (PHY) and data link layer specifications using frequency shift keying (FSK), direct sequence spread spectrum (DSSS), and orthogonal frequency division multiplexing (OFDM) modulation as defined in IEEE Std 802.15.4 for low data rate wireless connectivity with fixed, portable, and moving devices with very low energy consumption requirements. PHYs are defined for devices operating in a variety of regulatory domains.

**5.3 Is the completion of this standard contingent upon the completion of another standard?** No

**5.4 Purpose:** The standard provides for ultra-low complexity, ultra-low cost, ultra-low power consumption, and low data rate wireless connectivity among inexpensive devices, with PHY and data link layer using FSK, DSSS and OFDM modulation, especially targeting the communications requirements of what is now commonly referred to as the Internet of Things. Multiple PHYs are defined to support a variety of frequency bands.

**5.5 Need for the Project:**

INTIAL TEXT:

The success of IEEE Std 802.15.4 has caused it to evolve into a large and complex standard. This has made it increasingly difficult both to use and to amend/enhance.

The emergence and growth of IoT has helped refine the purpose and focus of sensor and actuator connectivity, much of which is using various “modes” of 802.15.4. There are lots of functions and features of 802.15.4 which are never used and don’t work – target niche applications and are not applicable for IoT. 802.15.15 is streamlined for IoT, present and future.

OR OPTION 2:

The 802.15.4-2020 standard, including the 805.15.4w-2020, 802.15.4y-2021, and 802.15.4z-2020 amendments, hereafter referred to collectively as 802.15.4-2020, is overly complex and the end-users (industry) will benefit by partitioning it into two simple focused specifications, enabling improved multi-vendor interoperability and market growth.

**5.6 Stakeholders for the Standard:** The stakeholders include manufacturers and users of telecom, medical, environmental, energy, transportation and consumer electronics equipment and users of equipment involving the use of wireless sensor and control networks.

**6.1 Intellectual Property**

**6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?**

No

**6.1.2 Is the Standards Committee aware of possible registration activity related to this project?**

Yes

**Explanation:** This standard specifies the use of Unique Identifiers (EUI) and the Company ID (CID).

**7.1 Are there other standards or projects with a similar scope?** Yes

**Explanation:** As specified in the need for the project, 802.15.4-2020 will be split into 2 different projects, IEEE P802.15.14 and IEEE P802.15.15

**7.1.1 Standards Committee Organization:** IEEE 802

**Project/Standard Number:** P802.15.14

**Project/Standard Date:**

**Project/Standard Title:** To Be completed

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

**8.1 Additional Explanatory Notes:** Currently 802.15.4-2020 is extensively implemented for an increasingly diverse range of applications referred to as the Internet of Things.

802.15.4-2020 has been adopted for a diverse range of applications which includes utility, smart city, industrial, entertainment, and other consumer products including smart phones, automotive, and the list keeps growing.

However, 802.15.4-2020 has become extremely difficult to understand and very complex to amend or enhance. Recently it has become clear that the functionality and features defined in 802.15.4-2020 can be divided broadly into 2 categories, namely i) PHY functionality and MAC features implemented for UWB, and ii) PHY functionality and MAC features implemented for frequency shift keying (FSK), direct sequence spread spectrum (DSSS), and orthogonal frequency-division multiplexing (OFDM). The content of 802.15.4-2020 has become increasingly complex to support these 2 categories. The participants of 802.15, and others who are building implementations of different parts of 802.15.4-2020, have agreed that the partitioning of 802.15.4-2020 into 2 derived standards will improve the accessibility and comprehension of each new standard and enable further amendments and enhancements to each part without encumbrance.

List of standards referenced in the PAR are as follows:

IEEE 802.15.4-2020, IEEE Standard for Low-Rate Wireless Networks

IEEE 802.15.4w-2020, IEEE Standard for Low-Rate Wireless Networks Amendment for a Low Power Wide Area

Network (LPWAN) extension to the Low Energy Critical Infrastructure Monitoring (LECIM) Physical layer (PHY)

IEEE 802.15.4y-2021, IEEE Standard for Low-Rate Wireless Networks Amendment Defining Support for Advanced Encryption Standard (AES)-256 Encryption and Security Extensions

IEEE 802.15.4z-2020, IEEE Standard for Low-Rate Wireless Networks Amendment: Enhanced Ultra Wideband (UWB) Physical Layers (PHYs) and Associated Ranging Techniques

IEEE P802.15.14, … (need to fill in once finalized by Clint)

**802.15.15**

**Submitter Email:** pat.kinney@kinneyconsultingllc.com

**Type of Project:** New IEEE Standard

**Project Request Type:** Initiation

**PAR Request Date:** July 2021

**PAR Approval Date:**

**PAR Expiration Date:**

**PAR Status:**

**1.1 Project Number:** 802.15.15

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**5.3 Is the completion of this standard contingent upon the completion of another standard?** No

**5.4 Purpose:** The standard provides for ultra-low complexity, ultra-low cost, ultra-low power consumption, and low data rate wireless connectivity among inexpensive devices, with PHY and data link layer using FSK, DSSS and OFDM modulation, especially targeting the communications requirements of what is now commonly referred to as the Internet of Things. Multiple PHYs are defined to support a variety of frequency bands.

**5.5 Need for the Project:**

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The emergence and growth of IoT has helped refine the purpose and focus of sensor and actuator connectivity, much of which is using various “modes” of 802.15.4. There are lots of functions and features of 802.15.4 which are never used and don’t work – target niche applications and are not applicable for IoT. 802.15.15 is streamlined for IoT, present and future.

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**7.1 Are there other standards or projects with a similar scope?** Yes

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

**8.1 Additional Explanatory Notes:**

Currently IEEE Std 802.15.4 is extensively implemented for an increasingly diverse range of applications including low complexity, very low cost, very low power consumption, and low data rate wireless connectivity among inexpensive devices, especially targeting the communications requirements of what is now commonly referred to as the Internet of Things. IEEE Std 802.15.4 specifies a range of PHYs which are suitable for vastly different applications. These include higher data rate PHYs for lower latency applications, and low data rate with increased link budget for challenging environments. In addition, some of the alternate PHYs provide precision ranging capability that is accurate to much better than one meter. Multiple PHYs are currently defined to support a variety of frequency bands.

802.15.4 2020 has been adopted for a diverse range of applications which includes utility, smart city, industrial, entertainment, and other consumer products including smart phones, automotive, and the list keeps growing.

However, 802.15.4 2020 has become extremely difficult to understand, , and very complex to amend or enhance. Recently it has become clear that the functionality and features defined in 802.15.4 2020 can be divided broadly into 2 categories, namely i) PHY functionality and MAC features implemented for UWB, and ii) PHY functionality and MAC features implemented for FSK, DSSS and OFDM. The content of 802.15.4 2020 has become increasingly complex to support these 2 categories. The participants of 802.15, and others who are building implementations of different parts of 802.15.4 2020 have agreed that the partitioning of 802.15.4 2020 into 2 derived standards will improve the accessibility and comprehension of each new standard and enable further amendments and enhancements to each part without encumbrance.